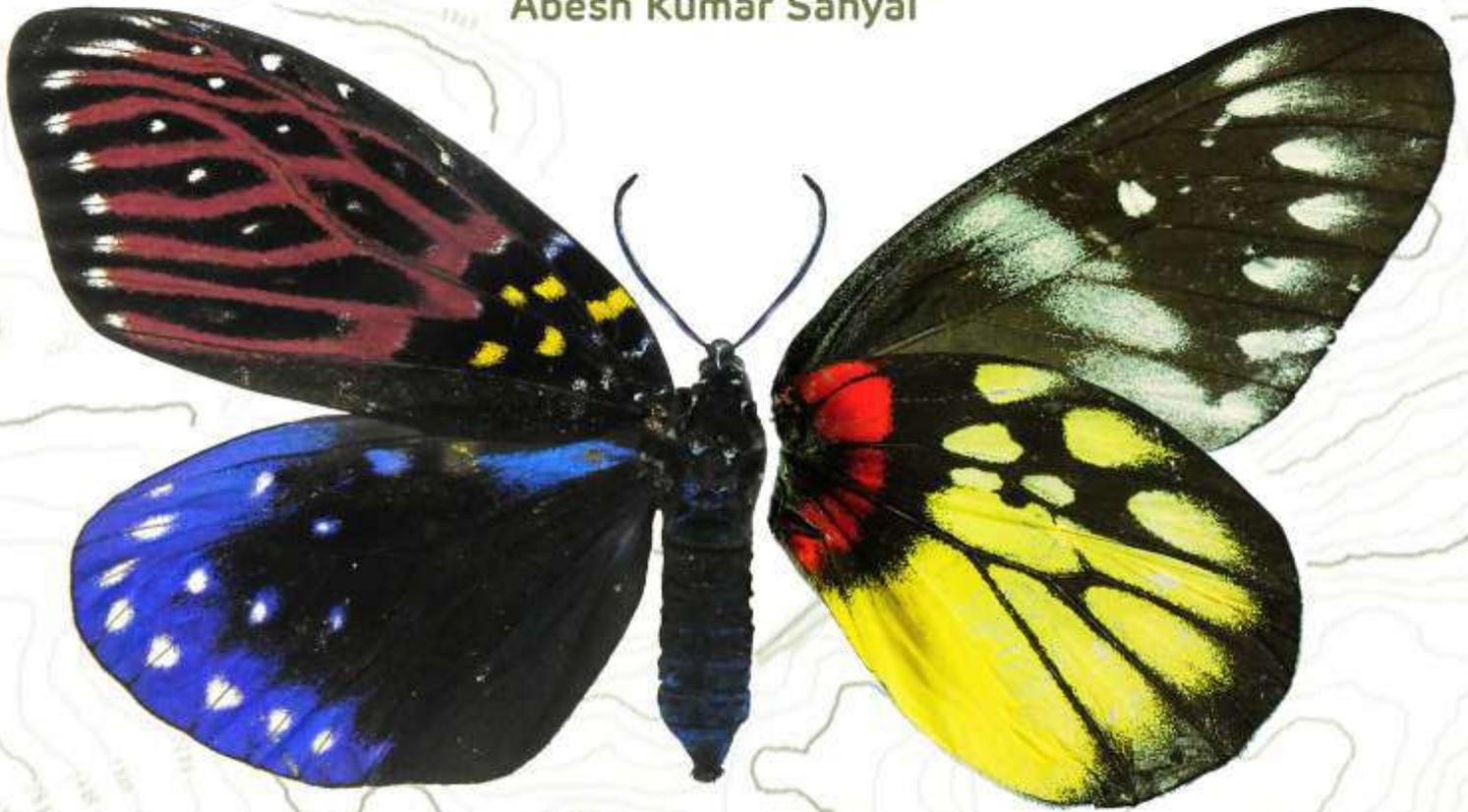


Ministry of Environment,
Forest & Climate Change

ASSEMBLAGES of LEPIDOPTERA IN INDIAN HIMALAYA THROUGH LONG TERM MONITORING PLOTS

Kailash Chandra
Vikas Kumar
Navneet Singh
Angshuman Raha
Abesh Kumar Sanyal



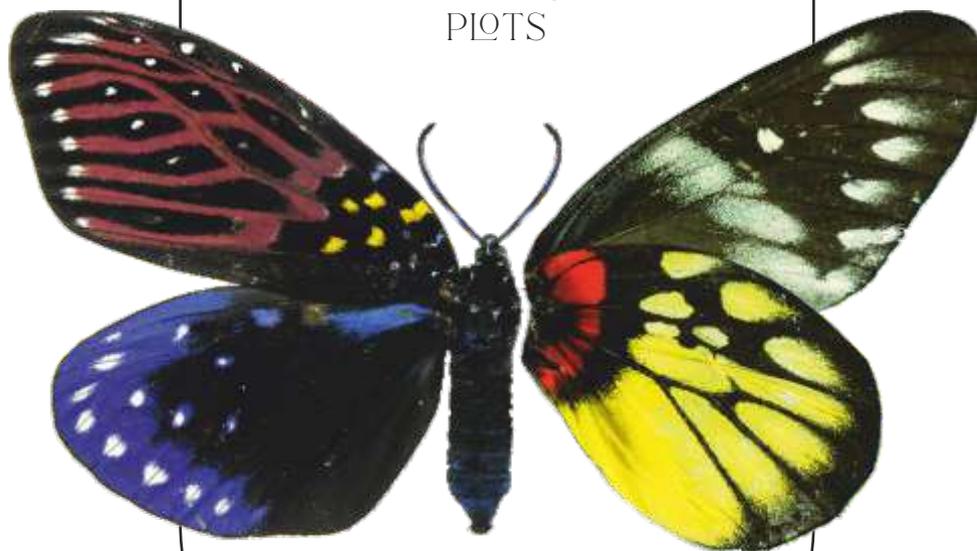
ZOOLOGICAL SURVEY OF INDIA

ASSEMBLAGES
of
LEPIDOPTERA



**IN INDIAN
HIMALAYA**

through
LONG TERM
MONITORING
PLOTS



KAILASH CHANDRA
VIKAS KUMAR
NAVNEET SINGH
ANGSHUMAN RAHA
ABESH KUMAR SANYAL

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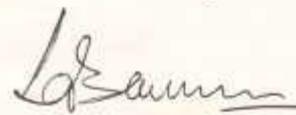
FOREWORD

Life has evolved through billions of years ensuing the enormous biological diversity and we are blessed with witnessing such variety of life forms in present times. Unfortunately, since the past few decades, such blessing is doomed with the extinction of species, mainly due to increased globalisation and over exploitation. Currently, climate change coupled with global warming is the most talked-about conservation issue that daunts over the existence of natural resources in near future.

The majestic Himalaya, one of the 36 biodiversity hotspots in the world, due to its unique physiography and climatic heterogeneity represents a significant percentage of the enormous biological diversity in India. It is incredibly rich in endemic species and centre for grandiose cultural diversity sustaining the lives of millions of people. Like other mountain systems of the world, the Himalayan ecosystems are severely threatened by anthropogenic activities and ongoing climate change.

I am quite enthralled to know about the initiative undertaken by the Zoological Survey of India to monitor impacts of ongoing climate change on the biodiversity of Indian Himalayan Region by using Lepidoptera as an indicator surrogate taxon for other faunal groups. This endeavour of ZSI, to the best of my knowledge, is novel to the Indian scenario and surely has bidirectional implications. Firstly, setting a foundation for long-term monitoring of biodiversity to assess climate change impacts on Himalayan ecosystems and secondly, generating awareness among nature enthusiasts and researchers about the immense ecological roles of insects and their conservation significance. I am delighted to bring forward this book on the **“Assemblages of Lepidoptera in Indian Himalaya through Long Term Monitoring Plots”** by ZSI as a milestone in biodiversity monitoring programmes of India. This book creates a baseline, yet significant, information for the robust long-term database on the Lepidoptera assemblages of Indian Himalaya required for assessing climate change impact. I am confident enough to state that, like all other publications of ZSI, this book will be useful to students, researchers, conservation managers and policy makers. I congratulate the Director and the whole team of this project for their untiring efforts in bringing out this commendable publication.

With the expectations to witness more of such outstanding documents in coming days, I wish ZSI all the very best for their future initiatives.


(Ravi Agrawal)



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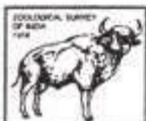
PREFACE

Climate change has become the limelight of all environmental and conservation related discussion worldwide since the dawn of this century. The Himalayas, reservoir of remarkably rich and unique biological diversity and lifeline of millions of people, is severely threatened by anthropogenic activities and ongoing climatic perturbations. So, conservation of unique Himalayan ecosystems and its biodiversity is definitely of absolute priority and global concern. Biodiversity monitoring programme focusing on a single indicator taxon or group of taxa in the Indian Himalayan Region (IHR) is largely missing. Thus, Zoological Survey of India has taken an initiative to assess the impacts of climate change on the rare Himalayan biodiversity by monitoring community dynamics of Lepidoptera, a potent ecological indicator group, across IHR. This book as the initial benchmark of this huge initiative has been prepared with the goal to generate a taxonomically sound species database at different spatial and temporal scale across the length and breadth of Indian Himalaya.

Field sampling was undertaken during 2016-2018 in selected Protected Areas across 5 Indian Himalayan Biogeographic Provinces viz. Ladakh, Trans-Himalaya; Great Himalayan National Park, North West Himalaya; Govind and Askot Wildlife Sanctuary, West Himalaya; Neora Valley and Singalila National Park, Central Himalaya; Namdapha National Park and Dihang-Dibang Biosphere Reserve, Eastern Himalaya. Long Term Monitoring plots were established covering a complete altitudinal gradient in each landscape, representing different vegetation types from Tropical Wet Evergreen Forests of Namdapha to Alpine Pastures of Ladakh. Overall effort till now revealed a total of 1758 species of Lepidoptera including 484 species of butterflies under 222 genera and 1274 species of moths under 704 genera. This represents nearly 12% and 33% of the Lepidoptera richness known from India and IHR, respectively. Moreover, the study reported 88 species of Lepidoptera as novel addition to the Indian fauna.

This book is a significant addition to our previous publication on the 'Faunal Diversity of Indian Himalaya' and a great leap forward in biodiversity monitoring programme targeting an indicator group of taxa in Indian Himalaya focusing on Climate change aspects. The methodologies and outcomes of this study can be adopted for other faunal groups and elsewhere in India. This book will be of immense interest to amateur naturalists, biodiversity researchers, conservation managers and policy makers and will generate awareness among local stakeholders of IHR. I hope this attempt will be another significant contributions of ZSI to the nationwide holistic campaign in protecting our natural resources from the threats of climate change.


Dr. Kailash Chandra



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MESSAGE

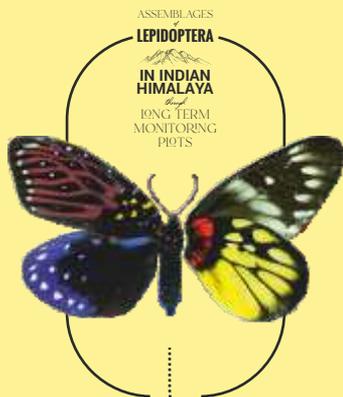
At a time where most governments regard the documentation of wildlife as a nuisance or drain on resources, it comes as a breath of fresh air to see India blazing the trail and living up to international commitments derived from the "Rio Convention" (Convention on Biological Diversity, 1992). Long term ecological monitoring of a species rich insect order is no mean undertaking. That the Zoological Survey of India have committed to this project, in a logistically challenging suite of locations, makes the effort even more merit worthy. All the behind the scenes preparatory action: hundreds of hours of specimen curation; photographing the plates; drafting, redrafting, proofing of texts, the devil is truly in the detail here; collating all the supporting documentation; the list seems endless when the process is ongoing. Make no mistake, the effort herein is huge. But is it worth it? From a conservationist's perspective, I have to say, resoundingly, yes. Even though human impacts upon the world in which we live have been ongoing for millennia, it is only in the last few hundred years that we have started to outstrip the biological resources upon which we depend for our own existence. Whilst monitoring Lepidoptera isn't going to fix our predicament, it will tell us in greater depth than ever before that we are indeed negatively impacting Mother Earth and that we (*all of us*) must take immediate action to reverse this unsustainable consumption. Publishing ongoing updates and results of biological monitoring helps with mainstreaming of biological diversity - reaching out to all humans through education about how we must take better care of the only planet we know that supports life.

Lepidoptera are the global canaries, responding rapidly to environmental changes that take place; natural changes and the changes brought about by human activities. Long term monitoring allows us to grasp the severity of the impacts of habitat loss, climate change, pollution and other human related issues, as well as gaining insight on what actions we should take to remediate the situation. How the butterflies and moths respond in the long term, and thus how *Homo sapiens* fares as a top end consumer in the food web, depends upon what actions we, as a species, choose to take. Should we ignore the plight of the Lepidoptera, then we may not be around in the long term to continue this monitoring programme; should we take positive action *now* to restore wildlife habitats to their rightful place as the lungs of the world, as carbon sinks and as sustainable providers of food and all the other biological resources upon which we are reliant, then we will be able to witness the revitalisation of Lepidoptera in the Himalayan region, and the world over.

Dr. R. C. Kendrick

Founder: Asian Lepidoptera Conservation Symposium

Director: C & R Wildlife, Hong Kong.



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MONITORING LEPIDOPTERA ASSEMBLAGES OF INDIAN HIMALAYA THROUGH LTM PLOTS : AN OVERVIEW

*Angshuman Raha, Navneet Singh, Vikas Kumar,
Kailash Chandra, Abesh Kumar Sanyal*

HIMALAYAS

The Himalayas, most unique, diversified and complex among the mountain systems of the world, isolates south Asia from the central and northern part of the continent (Singh, 2006). It is the longest as well as the highest mountain range extending somewhat in a crescent about 3000 km in length and occupying nearly 7,50,000 km² area from Afghanistan, northern Pakistan, Nepal, Bhutan, China including Tibet, Northern Myanmar, and the North-Western and North-Eastern parts of India (Mittermeier et al., 2005; Pandit et al., 2007; Shrestha et al., 2012). It is the youngest mountain range of the world whose formation resulted from the collisions between Indian and Asian tectonic plates during early Eocene (soft collision) and Miocene (hard collision) periods (Gansser, 1964; Rowley, 1996). Its complex orogeny and evolution in different phases over 50-million-year time period provided perfect foundation for the biotic elements of the neighboring region to colonize here, flourish and eventually diversify into unique ecosystems (Das, 1966; Singh & Singh, 1987; Pandit et al., 2000; Telwala et al., 2013). The newly-colonized flora and fauna in these ever-evolving ecosystems experienced tremendous evolutionary divergence and thus, speciation due to exposure to

novel selection pressures (Kumar, 1983). Immense topographical and altitudinal variations justify prodigious climate and habitat heterogeneity of the region. The summer monsoon and winter westerlies occur largely due to the obstruction formed to atmospheric circulation by the enormous altitudinal limits of the mighty Himalayas (Xu et al., 2009). Thus, the average annual precipitation varies extremely from as low as 45 mm in the cold desert of Trans-Himalaya to as high as 11,000 mm in the eastern Himalayas (Hofer & Messerli, 2006). The region is bestowed with diverse climatic zones and ecosystems existing along a prominent humidity gradient. Such immense variations are reflected in the vegetation profile as well, varying from north-western subtropical deserts and steppe grasslands to the south-eastern tropical semi-evergreen and evergreen rainforests (Schickhoff, 2005). The huge altitudinal range of the Himalayas from <500 m to >8,000 m accounts for a variety of habitats from alluvial grasslands (among the highest in the world) and subtropical broadleaf forests along the foothills to temperate broadleaf forests in the mid elevation, mixed conifer and conifer forests in the higher elevations, and alpine meadows above the tree line.





As a consequence, the region acts as an excellent repository of rich and endemic biota. The Himalayas boasts 13 ecoregions, out of the total 825 found globally (Olson & Dinerstein, 2002) and 4 biodiversity hotspots (the Himalaya, Central Asian Mountains, Indo-Burma and South-western China) among 36 hotspots of the world (Xu et al., 2009). It is considered as the "water tower of Asia", as it is the source of 8 principal rivers of Asia whose tributaries support the livelihood of nearly 1.5 billion people, thus, impacting lowland areas tremendously (Immerzeel et al., 2010). All rivers are snow fed and nearly 20% of its area is sheathed by glaciers which may be as long as 70 km in length. This mountain range has the thickest snow cover, following the Antarctica and the Arctic, occupying nearly 40% of its area (Singh, 2006; Chandra et al., 2018), and often termed as "Third Pole". Like its rich biological diversity, its ethnicity and culture are immensely diverse (Shrestha et al., 2012).





INDIAN HIMALAYAN REGION: AN OVERVIEW



The floral component of the eastern part of IHR includes, approximately 8000 angiosperm species, in contrary, the western part harbors about 5000 species of angiosperms. IHR comprises about 50% of the total angiosperm diversity of India, of which nearly 30% species are endemic. Such distribution heterogeneity in the biotic components resulted intricate biogeographical attributes of the region (Rao, 1994; Samant, 1998). Out of the ten Biogeographic Zones of India, IHR comprises two zones viz. (1) Trans Himalaya and (2) Himalaya. Trans Himalaya is characterized by the cold desert and arid mountainous tract of the high-altitude areas of Kargil and Ladakh (Jammu & Kashmir), Pooh, Lahaul and Spiti valleys (Himachal Pradesh), small parts of Nanda Devi range (Uttarakhand) and Kangchendzonga range (Sikkim) (Mehta & Julka, 2001). This zone represents dry mountain ranges situated north of the main Himalayan chain including Zaskar, Ladakh and Karakoram ranges, having an average altitude of ~4,000 m (Mani, 1974). It is further divided into three biogeographic provinces viz. (1A) Ladakh Mountains, (1B) Tibetan Plateau and (1C) Trans Himalaya-Sikkim (Rodgers et al., 2002). This zone has sparse vegetation, somewhat devoid of trees and is dominated by dry and moist temperate and subalpine types of plant forms, which grows during very short growing season (Reddy et al., 2015; Kumar et al., 2017). Due to jarring cold climate prevailing majority of the year, both flora and fauna of this zone are remarkably specialized in their biological and ecological requirements, therefore, highly vulnerable to subtle environmental perturbations. The Himalaya biogeographic zones situated to south of the main Great Himalayan Range and includes Siwalik and Lesser Himalayan Ranges. It further comprises four biogeographic provinces, (2A) North-West Himalaya, includes parts of Jammu & Kashmir and majority of Himachal Pradesh; (2B) West Himalaya, includes few areas of Himachal Pradesh and majority of Uttarakhand; (2C) Central Himalaya, encompasses Sikkim and

The Indian Himalayan Region (IHR), covers nearly 3,95,485 km² area comprising six states, Jammu & Kashmir (currently the Union Territory of Jammu-Kashmir and Union Territory of Ladakh), Himachal Pradesh, Uttarakhand, Sikkim, northern part of West Bengal (the Kalimpong and Darjeeling districts) and Arunachal Pradesh. The spatio-temporal variations in physiography and climate along IHR consequently impacted the distribution pattern of its biotic elements.



Biogeographic Zones	Total Area (km ²)	% Area of India	Biogeographic Provinces	% Area of India
(1) Trans Himalaya	1,84,823	5.62	(1A) Ladakh Mountains	3.30
			(1B) Tibetan Plateau	2.20
			(1C) Trans Himalaya-Sikkim	<0.10
(2) Himalaya	2,10,662	6.41	(2A) North West Himalaya	2.10
			(2B) West Himalaya	1.60
			(2C) Central Himalaya	0.20
			(2D) East Himalaya	2.50
Total	3,95,485	12.03		

Table 1.1: Biogeographic classification of IHR (Rodgers et al., 2002)

Darjeeling hills of West Bengal; (2D) Eastern Himalaya, includes the whole state of Arunachal Pradesh (Table 1.1). Analyzing the physiography, floral and faunal composition of North West and West Himalaya, Kumar et al., 2017 proposed a reclassification of Trans-Himalaya biogeographic zone into four provinces by incorporating cold arid regions of eastern Himachal Pradesh and upper Uttarakhand as 1C and Trans Himalaya-Sikkim as 1D. Nevertheless, the more accepted prevailing classification of Rodgers et al., 2002 has been followed here.

CLIMATIC HETEROGENEITY

IHR, because of remarkable altitudinal and latitudinal extent, has varying degrees of annual mean temperature and annual precipitation. The trans-Himalayan region has mean summer temperature below 8°C and winter temperature as low as -30°C and receives annual rainfall below 50 mm. While, in the Himalaya zone the annual mean temperature ranges from sub-zero to 25°C and annual precipitation from 1,500 mm to more than 4,800 mm.

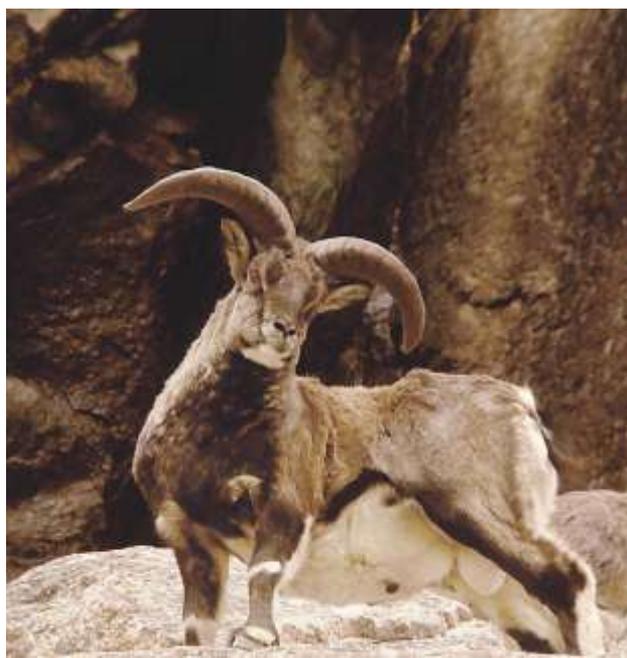
OVERALL VEGETATION PROFILE

The forest cover of IHR is dense and abundant having multitudinous floral diversity. Predominant forest types include moist temperate forest throughout the length of Himalayas, dry temperate forest found at Sikkim and other high elevation areas, subtropical pine forest, tropical moist deciduous forest, tropical wet evergreen forest found in Eastern Himalaya, subtropical broadleaf forest mostly found at lower altitudes, subtropical dry evergreen forest observed at the Himalayan foothills, montane wet temperate forest of Eastern Himalaya etc. (Champion & Seth, 1968; Reddy et al., 2015). The Eastern Himalaya, regarded as the cradle of

flowering plants, is blessed with more dense and lush evergreen forests and extended treeline because of year-long precipitation than its North-West and Western counterparts.

BIODIVERSITY RICHNESS

Although representing only 12% of the total geographic area of India, IHR contributes to nearly 40% of the known terrestrial faunal diversity of the Country. Out of 1,01,681 faunal species (Protozoa and Animalia) known from India (Animal Discoveries, 2018), including 81,237 species from landscape and 20,444 species from seascape, a total of 30,377 species/subspecies are reported from IHR (Chandra et al., 2018). Among the biogeographic provinces of IHR, Central Himalaya is reported to hold the maximum faunal richness with 14,183 species/subspecies, following which Western Himalaya has the second highest species number with 12,022 species/subspecies. North-West Himalaya stands next having 8,731 species/subspecies followed by Eastern Himalaya with 5,542 species/subspecies which seems an obviously underrepresented figure, may be due to insufficient faunal exploration. The Trans-Himalaya,





due to harsh climatic conditions, harbors much less faunal diversity, but with more unique and specialist species. Ladakh Mountains reveal 1,561 species/subspecies richness followed by Tibetan Plateau and Trans Himalaya-Sikkim with 1,320 and 1,112 species/subspecies, respectively. Arthropods, as usual, contribute more than 85% (26,392 species/subspecies) of the total fauna known from IHR, of which more than 90% species (24,784 species/subspecies) belong to the class Insecta (Chandra et al., 2018). Order-wise species richness of insects of IHR somewhat follows the global pattern with Coleoptera being the largest order having 10,533 species/subspecies followed by Lepidoptera (5,356 species/subspecies). Vertebrates account for 1,814 species including an enchanting 940 species/subspecies of birds which is approximately 10% of the global bird diversity. IHR being located at the transition of different zoogeographic elements, serves as an excellent mixing ground showing faunal affinities to both the Central-Asian Highland steppe fauna and Eastern Humid Tropical fauna and the Sutlej River basin acts as the hypothetical biogeographic transition. East of this river shows predominance for the Indo-Chinese and Malayan fauna of the Oriental realm, while the western side has a more concentration of Palearctic, Ethiopian and Mediterranean fauna (Mani, 1974). This humungous and unique faunal diversity is doomed with 133 threatened vertebrates as well, representing a noteworthy 22.3% of the total threatened vertebrate fauna found in India.

THREATS TO HIMALAYAN BIODIVERSITY AND ECOSYSTEMS: A GLOBAL CONCERN

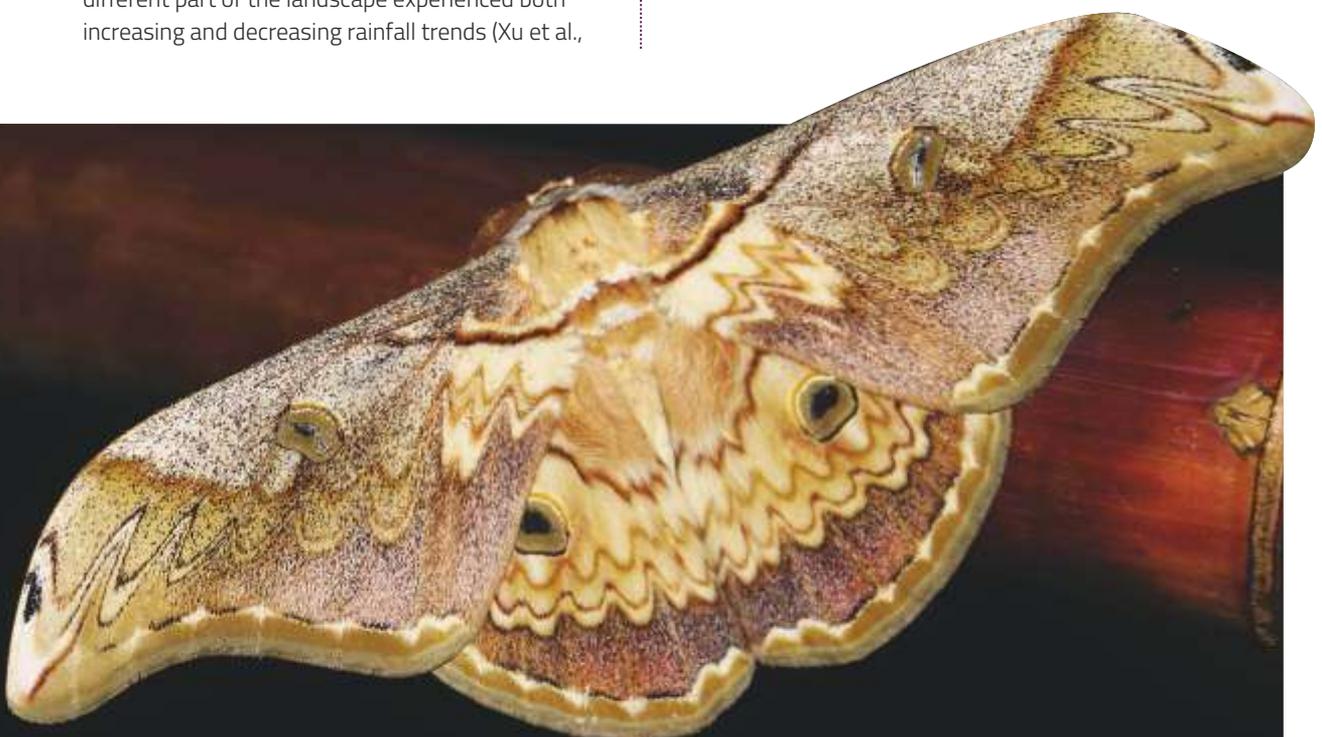
The Himalayas, due to its uniqueness and unimaginable ecosystem services, is one of the most ecologically, biologically, economically and culturally important site in the world. Therefore, the anthropogenic threats lingering over the sustenance of its unique ecosystems are matters of global concern. Majority of the factors threatening the ecosystems and biodiversity of IHR recently, are actually direct resultant of uncontrolled human activities for the extraction of natural resources over just a small gap of few decades. Principal anthropogenic threats include habitat loss, fragmentation and modification (for unrestrained agricultural expansion, intensive livestock grazing), deforestation (for high scale timber extraction, agriculture and human settlements, industrial development), air pollution (for greenhouse gas emission and other undesired industrial activities), widespread hunting and poaching and most importantly, Climate Change and Global Warming. It is evident that deforestation is a significant driving force for the major loss of biodiversity in tropical ecosystems (Brooks et al., 1997, 1999; Laurance, 1999; Sala et al., 2000), yet information on the long ranging impacts of deforestation in biodiversity hotspots of the tropics, such as IHR, are scanty

According to the IUCN Red List of Threatened Taxa (2017), the fauna of IHR includes 14 Critically Endangered, 35 Endangered and 84 Vulnerable vertebrate species. The region is rich in endemism harboring a total of 1,549 endemic angiosperm and 188 endemic vertebrate species (97 freshwater fishes, 35 amphibians, 29 reptiles, 15 birds and 12 mammals) (Ghosh, 1997; Pandit et al., 2007; Chandra et al., 2011). Eastern Himalaya has a greater number of endemic species than the western part, while the later shows high endemism above the treeline (Dhar, 2002).



(Mittermeier et al., 2005; Myers et al., 2000; Brooks et al., 2002; Sodhi & Brook, 2006). Species extinction pattern as a function of the quality of forest cover is merely investigated (Pandit et al., 2007). IHR houses rich assemblages of endemic, specialist and rare taxa having low resilience and thus, highly vulnerable to these anthropogenic and stochastic changes (Price, 1981). Considering the current worrying trend of deforestation in IHR, by the year 2100 merely 10% of its land area will remain covered with dense forest having a canopy cover of <40%. As a consequence, nearly a quarter of the endemic species of IHR is projected to be extinct including 366 vascular plant and 35 vertebrate species (Pandit et al., 2007). The ongoing climate change and global warming has already started impacting the Greater Himalayas (Beniston, 2003; Cruz et al., 2007). The most severe of the impacts is the rapid melting of glaciers, thus, influencing downstream water supplies in mere future (Yao et al., 2004; Barnett et al., 2005; Nogues-Bravo et al., 2007). Consequently, cascades of adverse impacts are predicted on river flows, natural hazards, groundwater recharge, biodiversity, such as ecosystem composition, structure, and function, and even human livelihoods (Nijssen et al., 2001; Parmesan, 2006; Bates et al., 2008; Ma et al., 2009). It has been observed that the rate of warming at high elevations of the Himalayas are thrice than that of global average (Liu & Hou, 1998; Shrestha et al., 1999; Liu & Chen, 2000; IPCC, 2007). During past few decades, climate change has tremendously influenced the precipitation pattern across IHR, as different part of the landscape experienced both increasing and decreasing rainfall trends (Xu et al.,

2007). The monsoon patterns across the landscape have shifted significantly as well, but the actual scenario is still unclear (Shrestha et al., 2000). Due to such unpredictable monsoon and intense high precipitation, severe natural calamities in the form of massive flash floods, landslides and debris flow are fairly common, now a days, in different areas of IHR. During last few decades the global land temperature has shown a significant increase by about 0.6-0.8°C on an average (Bluemle et al., 1999; Folland et al., 2001). Such climate warming is highly detrimental to mountain biodiversity inducing species' range shifts and local extinctions (Grabherr et al., 1994; Parmesan & Yohe, 2003; Thuiller et al., 2005). It is revealed through several studies in mountain ecosystems that warming resulted considerable altitudinal and latitudinal ascends in species ranges (Wilson et al., 2005; Hickling et al., 2006). In high altitude ecosystems, species existence is mainly governed by low temperature (Körner & Larcher, 1988; Aeschmann & Guisan, 1995). So, montane species, in virtue of the fact that their distribution is primarily governed by climate associated ecological factors prevalent in high altitude areas, are highly vulnerable to subtle climatic perturbations (Telwala et al., 2013). Thus, IHR due to its remarkable altitudinal gradient can provide suitable platform to assess climate change impacts.





CLIMATE CHANGE IMPACTS ON INSECTS



One of the primary responses of biodiversity to rising temperature is change in plant phenology which might have serious effects on associated animals (Corlett & Lafrankie, 1998). Floral characteristics may get altered in the due course of time, because of continuous exasperation of climate change. More rigid species are replaced by floppy ones having wider niches resulting in the dominance of eurythermal species. Simultaneously, phytophagous fauna, especially insects will show stochasticity according to the floral perturbations. Several facets of climate change, such as elevated CO₂ and O₃ concentrations, elevated temperature and UV radiation, and changes in rainfall patterns directly affect host plant abundance, chemistry, physiology and morphology which are expected to impact insect-plant interactions to an unimaginable extent (Cornelissen, 2011). Insects undergo changes in physiology, behavior and life history parameters and ultimately reduction in abundance, richness and diversity (Fajer, 1989; Marks & Lincoln, 1996; Smith & Jones, 1998; Goverde & Erhardt, 2003; Stiling et

al., 2003; Thuiller et al., 2005; Kazakis et al., 2007; Stiling & Cornelissen, 2007). One of the major threats posed due to climate change and increased temperature is the concomitant development in the phenology of life history events for many plant and animal species (Memmott et al., 2007) with the potential to interrupt synchrony between interacting pairs (Cornelissen, 2011). Due to climatic alterations blooming in angiosperms shows temporal shifts resulting in asynchrony in flowering and availability of insect pollinators, as increased temperature acts as a thermal cue that advances the onset of insect life cycles for many species (Stange & Ayres, 2010). Thus, disrupting the overall pollination process which in turn affects the vegetation composition of the area. Volatile Organic Compounds (VOCs) released by plants are directly involved in positive interactions, such as pollination, seed dispersal etc., as well as negative interactions, like defense, between plants and insects. Production and emission of these compounds are expected to be influenced immensely by the ongoing climate change resulting in reduced ability of insects to perceive and utilize plant VOCs in interactions (Penuelas & Staudt, 2010).

Such anomalies are expected to create havoc in terrestrial ecosystems because a majority of terrestrial biodiversity, approximately 50% of known species, apparently belong to plants and associated phytophagous insects (Wilson, 1988; Chapman, 2009).



Animals generally show an upward dispersion owing to the ever-increasing temperature where they ultimately perish due to unavailability of food or preferred habitats. In contrary, the increase in temperatures related to climate changes will sufficiently influence (and frequently intensify) insect species' population dynamics, but the responses vary on individual insect species' geographic range, trophic level and natural history (Stange & Ayres, 2010).

LEPIDOPTERA AS INDICATOR TO CLIMATE CHANGE

The intricacies of responses of biodiversity towards environmental or habitat change are difficult to interpret if we target dynamics of every community in an ecosystem. So, the impact is better understood if we target one habitat specialist taxon or a group of taxa and use it/them as the surrogate for other associated taxa. Ecologists and conservationists throughout the world are in unison with the concept of using a potent biological indicator to simplify measurements of a complex system, thus minimizing the loss of important information (Ferris & Humphrey, 1999). Several workers have propounded criteria for identifying suitable indicator species suggesting that no indicator can comply with all the set criteria, but should have the potential to satisfy majority of them (Landres et al., 1988; Rodriguez et al., 1998; Hilty & Merenlender, 2000). Indicator species signal chemical/physical changes in the environment through fluctuations in their occurrence, abundance, richness and diversity are considered as an ecological indicator (Landres et al., 1988; Simberloff, 1998; McGeoch, 1998).

Lepidopterans have been established as potent ecological indicators of environmental health through numerous studies in different regions of the world (Rosenberg et al., 1986; New et al., 1995; Beccaloni & Gaston, 1995; Oostermeijer & van Swaay, 1998). Lepidoptera, being one of the largest herbivorous insect orders succumbs to minute vegetation alterations ensued due to climate change. The order comprises numerous species specific to a particular host plant or a group of host plants. Some species are even so specific that their larvae may be found devouring some targeted parts of a particular plant species. Such attributes justify Lepidoptera to be a perfect indicator of the floral health of a particular area. Moreover, many Lepidoptera, especially butterflies, are well known taxonomic entities with their life history and biology elaborately documented (Nelson & Anderson, 1994; Wood & Gillman, 1998). Their physical requirements, limits and fluctuations with changing environments have been quantitatively envisaged (Warren, 1985; Bowman et al., 1990; Thomas & Harrison, 1992;





(2003) predicted several potential impacts of climatic perturbations on Lepidoptera assemblage. For instance, prolonged development stage, increasing rate of overwintering, alterations in the synchronization of pest and host plant, more invasion of alien species and migrant pests. Several studies have indicated significant decrease in abundance of different Lepidoptera species over a time period of few decades (Roberts et al., 1993; Conrad et al., 2004; Conrad et al., 2006), yet few other studies have shown increasing trend in abundance (Salama et al., 2007).

The responses of Lepidoptera species to climate change differ significantly for different habitats (e.g. elevation), feeding characteristics (e.g. monophagous or polyphagous) and host vegetation (Kocsis & Hufnagel, 2011). Range shifts in Lepidoptera, particularly latitudinal and altitudinal ascends are quite evident in few studies.



Greatorex-Davies et al., 1993; Sparks et al., 1996; Oostermeijer & van Swaay, 1998; Pollard et al., 1998; Schultz, 1998; Swengel, 1998). Besides, with all other indicating properties of insects, most Lepidopterans, especially butterflies are charismatic, well accepted and popular among the public, thus invoking 'vertebrate approach' in insect conservation (Kitching, 2007). Both moth and butterfly being highly sensitive to the abiotic changes of the environment, they can, therefore, be regarded as efficient indicator species in assessing climate change (Ronkay, 2004). Studies on the potential influences of climate change on Lepidoptera started in the late 20th century (Peters, 1990; Dennis & Shreeve, 1991; Dennis, 1993; Williams & Liebhold, 1995; Harrington & Woiwod, 1995). Like other insects, Lepidoptera species show three main responses to the climate change: abundance dynamics, range and distribution shifts and alterations in phenology (Woiwod, 1997). Again, possible interaction between these attributes should be clearly investigated before concluding on the impacts of climate change, as distribution may be influenced by the number of individuals and changes in phenology may greatly influence species' abundance (Kocsis & Hufnagel, 2011). Appropriate interpretation of abundance variability of a species due to climate change requires intensive monitoring of long-term data sets or robust historical records (Woiwod, 1991). Porter et al., (1991) and Logan et al.,

In Europe, nearly 60% of the resident butterflies have stretched their distributions by 35-240 km northwards due to shift in climatic isotherms by 120 km northwards during the past century (Parmesan et al., 1999). The northward range expansion of several North-European species of Lepidoptera occurred mainly due to warmer summer (Parmesan, 2006). More than 50 species of butterflies in Japan showed northward range extensions due to increasing temperature (Kiritani, 2006). On Mount Kinabalu in Borneo, average elevations of the species of Geometrid moths showed upward shifts due to regional warming of about 0.7°C (Chen et al., 2009). Another study in tropics revealed nearly 53% of the tropical insect might be threatened with extinction due to 1000 m range shift in isotherms (Colwell et al., 2008).

BACKGROUND OF THE STUDY AND IMPORTANCE OF LTM PLOTS

IHR possesses an exceptionally diverse assemblage of Lepidoptera accounting to a total of 5,356 species/subspecies which includes 1,249 subspecies/1,013 species of butterflies (Das et al., 2018a) and 4,107 species of moths (Sanyal et al., 2018), which is nearly 36% of the total documented Lepidopteran diversity of India, about 15,000 species under 84 families (Ramakrishna & Alfred, 2007). This huge diversity is expected to harbor many species with restricted range distribution. Due to limitations in the physiological requirements, endemic species are restricted to a particular geographical attribute of any landscape based on altitude, precipitation or vegetation type (Cornelissen, 2011). Lepidoptera of mid and high-altitude areas of IHR, being highly sensitive and stringent to particular sets of environmental variables, subtle alterations in their microhabitat due to climate change will be manifested through their reduced abundance and richness, shifted distribution or local extinction and phenological idiosyncrasies (Woiwod 1997; Colwell et al., 2008; Hufnagel & Kocsis, 2011). Apollo butterflies and many moths belonging to subfamilies such as Larentiinae (Family Geometridae) and Noctuidae (Noctuidae) are high altitude inhabitants with restricted distributions (Mani, 1986; Brehm & Fiedler, 2003; Axmacher et al., 2004; Beck & Chey, 2008; Sanyal, 2015). The ongoing global warming may cause temperature to exceed the physiological threshold for these species, resulting range shifts towards higher altitude areas or in various cases local extinction also, and it is expected that many species have already been wiped out without even being described or documented (Dunn, 2005; Samways, 2007; Kiritani, 2006; Chen et al., 2009; Wilson & Maclean, 2011). Yet, reliable studies related to climate change impacts on a particular taxon or group of taxa in the Indian Himalayan region are practically nil. Considering the scenario, Zoological Survey of India initiated systematic sampling of



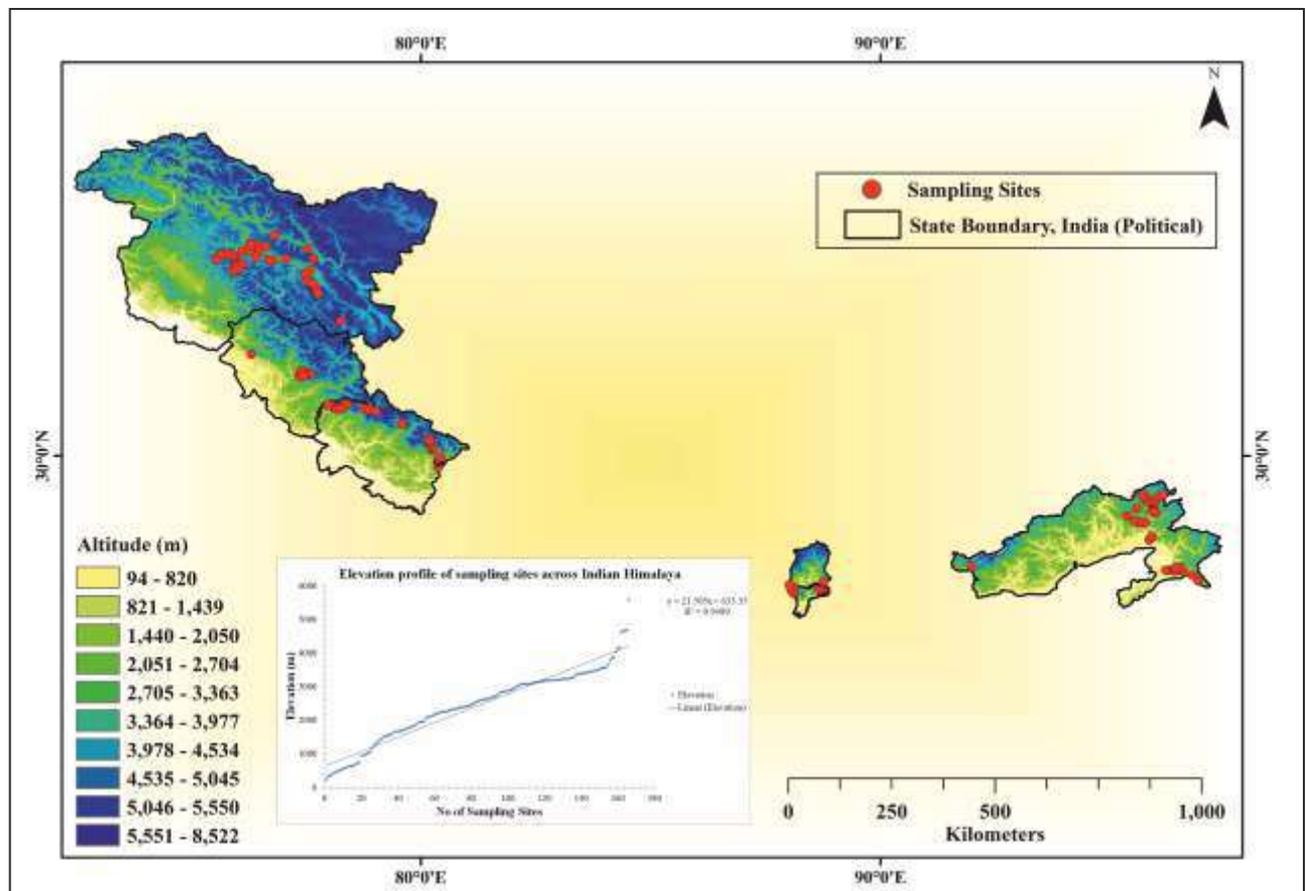
Lepidoptera across IHR to generate robust time-series databases on the assemblage pattern of the taxon from selected landscapes covering six provinces of the Trans-Himalaya and Himalayan biogeographic zones. Such robust datasets are indispensable for logically interpreting climate change effects in near future (Lawrence et al., 2010). For long-term monitoring of any taxon, establishment of well-marked sampling plots referred here as Long-Term Monitoring (LTM) plots, are necessary, which can be visited in near future and sampled repeatedly for the particular focal group at certain time-intervals over a long period of time (Conly & Kamp, 1999; Lindenmayer et al., 2012) to detect any changes in their abundance and composition. As in Himalayan altitudinal gradient plant community composition as well as forest type changes at different altitude bands after few hundred meters of vertical distance (Bhattarai & Vetaas, 2003; Bhatta et al., 2018), these LTM plots are needed to be established accordingly in stratified manner to assess the changes in diversity along the complete gradient. Such plots are also helpful to enumerate diversity and richness pattern of Lepidopteran species in different vegetation/forest types. Moreover, since LTM plots cover all possible ecologically significant altitude bands along a gradient, altitudinal ranges of all recorded species can be generated which is essential for identifying restricted-range species and significant range shifts of conservation concern.



For the present study, eight landscapes falling in five Indian Himalayan states have been primarily selected, which are:

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|----------|---|----------|--|
| 1 | Ladakh
<i>Jammu & Kashmir</i> | 5 | Singalila National Park
<i>West Bengal</i> |
| 2 | Great Himalayan National Park
<i>Himachal Pradesh</i> | 6 | Neora Valley National Park
<i>West Bengal</i> |
| 3 | Govind Wildlife Sanctuary
<i>Uttarakhand</i> | 7 | Dihang-Dibang Biosphere Reserve
<i>Arunachal Pradesh</i> |
| 4 | Askot Wildlife Sanctuary
<i>Uttarakhand</i> | 8 | Namdapha National Park
<i>Arunachal Pradesh</i> |

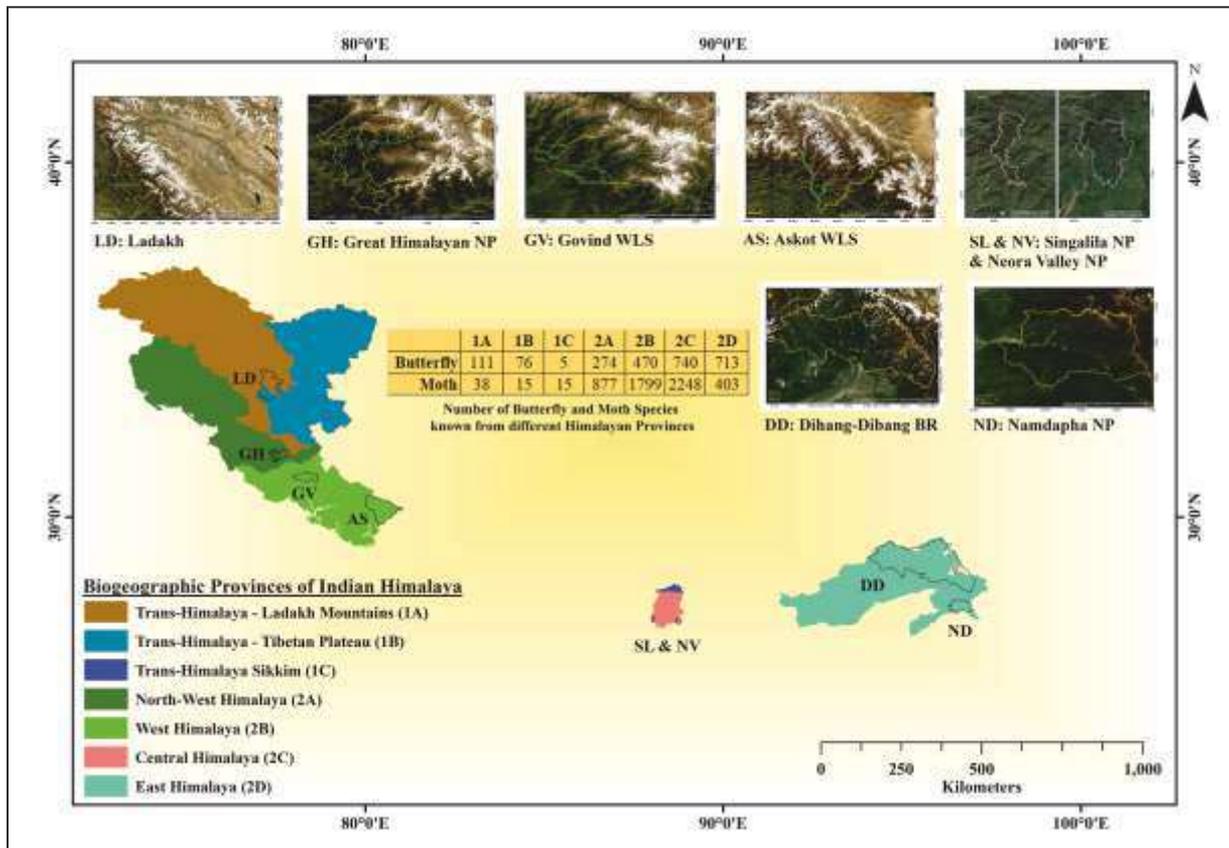
Figure 1.1: All the Sampling sites in the entire IHR on Digital Elevation Map



The selected landscapes cover six out of the seven biogeographic provinces of IHR (Fig. 1.1, 1.2) and each one of them represents wide altitudinal gradient, so as to encounter maximum Lepidoptera richness. Butterflies and moths were sampled along these gradients, recording their abundance pattern and suits of biotic-abiotic components. The Primary aim of the current compilation is to create a taxonomically sound species database of Himalayan Lepidoptera, identified preliminarily from these selected landscapes.

The document presents an extensive as well as informative list of identified species including number of individuals studied/sampled across all the LTM plots sampled, their known distribution ranges in India as well as in the world and their detailed bionomy (flight period, temperature-humidity range and associated habitats). Life-size habitus photographs of all species depicting both upper and under side of the wings are provided. Furthermore, richness patterns in every landscape along different altitudinal zones and vegetation types are outlined with notes on their biogeographic affinities. Furthermore, abundant and rare as well as restricted-range species of butterflies and moths of every altitudinal zone in each landscape is identified, so that indicator as well as threatened species can be easily selected for future monitoring programs. Our overall goal is thus to create an initial information base for Himalayan Lepidoptera which can be accessible to wide range of users, so that long-term scientific monitoring with accuracy in species-level identification can be initiated and accelerated.

Figure 1.2: The Protected Areas sampled in various Biogeographic Provinces of Himalaya





SYNOPSIS OF THE CURRENT STUDY

Field sampling was conducted from 2016–18 in the selected Protected Areas of IHR. During this period, 175 LTM plots were established covering a complete altitudinal gradient in each PA, which represented 30 different vegetation types. Sampling gradient covered altitudinal variation from as low as 250 m in tropical wet evergreen forests of Namdapha NP to 5060 m in alpine pastures of Ladakh. Each LTM plot was systematically sampled for moth and butterfly abundance, vegetation, disturbance and environmental parameters. Altogether, 10,092 individuals of Lepidoptera were sampled, revealing 484 species of butterflies under 222 genera of 29 subfamilies under 6 families and 1,274 species of moths under 704 genera of 89 subfamilies under 25 families and 12 Superfamilies. Presently identified 1758 species of Lepidoptera represents nearly 12% and 33% of the total Lepidoptera richness known from India and IHR, respectively. Besides, the study reported 1 species of butterfly and 88 species of moths novel to the Indian fauna. Among butterfly families, Nymphalidae was most dominant with 203 species, followed by Lycaenidae (103 species), Hesperidae (72 species), Pieridae (51 species), Papilionidae (44 species) and Riodinidae (11 species). Moth assemblage was dominated by Geometridae with 342 species, followed by Erebidae (297 species) and Noctuidae (164 species). Other major moth families included Crambidae (99 species), Notodontidae (81 species), Sphingidae (63 species), Drepanidae (48 species) and Nolidae (35 species). Maximum number of new records to the country were revealed from Dihang–Dibang Biosphere Reserve with 23 species, followed by Ladakh with 21 species, 13 species each from Govind WLS, Askot WLS and Neora Valley NP and with 10 species each from Great Himalayan NP and Namdapha NP. Several Oncers, i.e., species which have only been observed at the time and place of their original description, were recorded since it had been described. Besides, seven moth species, hitherto known from the contiguous landscape of North-Eastern Hills and Valleys, were recorded for the first time from IHR. Significant range extensions for around 570 species were documented, in both altitudinal and geographical expanse. At habitat level, in North West and West Himalaya, Chir-pine, Moist temperate deciduous, Western mixed coniferous forests were frequented with very high abundance of

lepidopteran species, whereas, in Central and East Himalaya, Sub-tropical wet evergreen and Wet temperate forests were most diverse. Zoogeographic affinity of sampled butterfly assemblage revealed that Oriental share is dominant, with 60% affinity with Palearctic fauna. Only about 5% species show distribution up to Australian region. Among Indian Biogeographic Provinces, 76% butterfly species are shared with North-Eastern Hills & Valleys, whereas 36% species are commonly occurring in Gangetic Plains followed by 23% Coastal, 20% with Deccan Peninsula, 18% with Semi-arid and 16% species common with Western Ghats. The moth assemblage is dominated by 94% species of Oriental origin, whereas, around 57.5% species have affinities for Palearctic fauna. 19% species are distributed up to Australian region, while only 8% species have Ethiopian affinity. Nearly 56% species of the Himalayan moths identified are shared with North-Eastern Hills & Valleys, while representation of other Indian Biogeographic provinces are extremely low, all below 25%, majority among them being Deccan Peninsula with 24% species share and 22% with Western Ghats. Although none of the Lepidoptera species recorded in the present study is threatened, according to the latest IUCN Red List of Threatened Taxa, but 17 and 78 species of butterflies are categorized as Schedule I and Schedule II, respectively under Wildlife (Protection) Act, 1972. The study reflected several species of moths showing restricted distribution in specialized habitat of Alpine Pastures over 3500 m altitude. These species, due to their habitat stringency, are highly sensitive to any subtle alterations in the habitat and climate, thus should be the candidate for long-term population monitoring to evaluate climate change impacts on Himalayan biodiversity.





SAMPLING DESIGN AND METHODOLOGY

SAMPLING DESIGN

The initial step for long-term monitoring of Lepidopteran assemblages in different PAs was to establish LTM plots along different elevation gradients across the landscapes. These plots were then systematically sampled for the past three years in different seasons to encounter maximum species richness for selected landscape of IHR. These LTM plots were established with the sole objective to generate robust time-series database on Himalayan Lepidoptera through long-term repetitive sampling in future.

SELECTION AND ESTABLISHMENT OF LTM PLOTS

Initially, multiple GRADSECTs, i.e., altitudinal transects covering a complete altitudinal gradient were chosen in each landscape/PA. LTM plots selected through Stratified Random sampling were established along these GRADSECTs at every 200 m or 300 m vertical distance, to cover maximum possible habitat-heterogeneity (**Fig. 2.1**). One LTM plot was designed as a cluster of three Nested Quadrats (NQs for vegetation sampling), 50 m apart from each other, and the centre of each NQ was the light trap (LT) station for moth sampling (**Fig. 2.2**). Altogether 175 LTM plots were established across

IHR in all the selected study sites.

Sampling was performed in such a manner that two nearby LTM plots were never sampled consecutively. A gradient was covered in a downward fashion, i.e., starting from the highest altitudinal site and moving towards lower areas. This ensured minimum overlapping of species assemblage from two adjacent altitudinal sites. Butterflies were sampled using random transects laid close to each LTM plot. Light traps for moths were installed at each site and two to three nightly catches were performed to record abundance of every species.





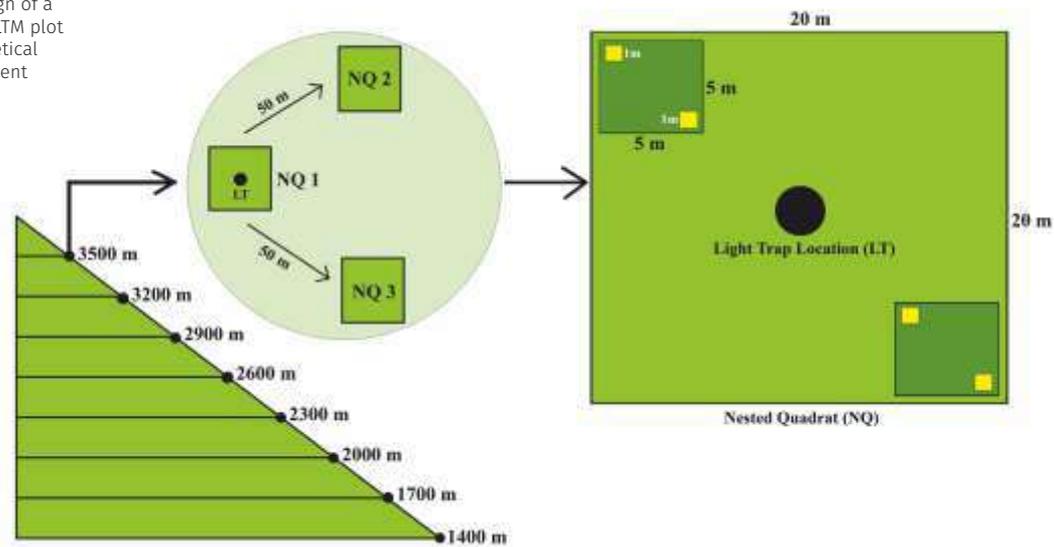


BUTTERFLY SAMPLING

For butterfly sampling, Modified Pollard Walks were undertaken on a sunny day with no strong wind in each selected transect close to a LTM plot. Each transect was 500 m long and sampled for 30 minutes in between 09:00 and 13:00 hrs., walking through an imaginary $5 \times 5 \times 5 \text{ m}^3$ box. Number of individuals of encountered species were recorded directly. Butterflies that were too far to be easily identified were not counted. Species that could not be readily identified visually were either photographed or captured. GPS coordinates and

different abiotic parameters like temperature, humidity and light intensity data were also noted at the start, mid and end points of the transects. Geographic coordinates of the sampling sites were recorded using GARMIN ETrex 30 GPS device. Environmental parameters such as temperature, relative humidity and wind speed were recorded using Kestrel 3000 Weather Meter and day-light intensity was measured using Lutron LX-101 Luxmeter.

Figure 2.1: Design of a representative LTM plot along a hypothetical altitudinal gradient



MOTH SAMPLING

Moth sampling was done using Light Trap (Fry & Waring, 1996) in front of white sheet measuring 2 m X 2 m, reflecting light from artificial light-source, in most of the cases as in remote areas, a combination of solar-powered Light-Emitting-Diode (LED) lamp of 48 Watt with 32 bulbs (1.5 W each) and pressurized-paraffin lamp (petromax) of 80 Watt with white incandescent light. Mercury Vapour (MV) lamp of 160 Watt was used wherever electricity was available.

COLLECTION AND CURATION OF SPECIMENS



Lepidoptera samples were collected with a sweep net, made of very soft terylene material and attached with a telescopic folding handle. The net was swiftly swept back and forth through vegetation, or in the air for catching a flying individual, so that minimum damage is caused to their delicate and fragile wings. Small clean vials or glass jars were used as killing bottles in which either Ethyl Acetate or Benzene vapor was used as killing agent. A small cotton swab soaked with the killing agent was kept at the bottom of the killing jar with a layer of filter paper above it, so that the specimens caught inside the jars were not damaged by the direct contact with the chemical. Moth specimens encountered on the white sheet were carefully caught inside the killing bottles, so that the scales on



the moth wings were not damaged. Before catching, they were photographed for future reference using Nikon D7000 digital single-lens reflex (DSLR) camera with Nikkor 105 mm macro-lens. Collected specimens were kept inside insect envelopes made of oil paper, labeled properly with collection details (collection date and site name). Measures were taken to ensure that the specimens are properly dry and completely moisture free to prevent fungal growth, before they can be put into cardboard boxes and packed for carrying back into the laboratory safely. After the specimens were taken to the laboratory, the process of curation was done following Dickson (1976). Pinning of specimens was done with entomological pins of different sizes (0 to 5 number) depending on the size of the specimens. Specimens were set and dried following standard procedure.

Dried and set voucher specimens were stored in insect boxes with proper label which included information on collection date, collection locality, habitat and GPS coordinates and the name of the collector. Wooden insect boxes were used to temporarily store voucher specimens. Naphthalene balls were kept as pest-repellent, which also prevented the growth of fungus and were replaced periodically as they are volatile. Silica gels were also used as dehydrating agent which absorbed the moisture in insect boxes.

Voucher specimens were photographed using the Nikon camera apparatus mentioned before and a digital database was prepared. These images were used for the preparation of photographic plates provided in this book.



IDENTIFICATION OF VOUCHER SPECIMENS

Following morphological characters were taken in to consideration for specimen identification: Vertex, Frons, Antennal type and length, vestiture and length of Labial Palps, Proboscis, Tibial spurs and spines, dorsal thoracic scale tufts, abdominal pattern, Fore and Hindwing venation and markings (reniform, orbicular, claviform, discal spots and antemedial, medial, postmedial and subterminal lines). Where morphological description was not enough to confirm a species identity, which is especially common in the case of moths, genitalia dissection was performed. For genitalia study, the abdomens from specimens (preferably male) were cut from the 4th segment and soaked overnight in 20% Potassium Hydroxide (KOH) solution. Next morning, the soaked abdominal segments were dissected carefully in 20% Ethyl Alcohol (Robinson, 1796) using fine forceps and soft brush for cleaning the fats and excess tissues. The dissected genitalia were photographed under Leica S8APO HD binocular microscope for the observation of following species-determining characters: in case of male-Uncus, Tegumen, Juxta, Valva, Saccus, Aedeagus etc. and in case of female-Papillae Anales, Ostium Bursae, Signum etc. After



Figure 2.2:
Male
genitalia
structure of
few
Lepidoptera
families

examination, the genitalia were stored in 70% alcohol and specimens were deposited to the National Zoological Collection, ZSI, Kolkata.

BUTTERFLY IDENTIFICATION

For identification of butterflies, field guides by d'Abrera (1982, 1985 & 1986), Haribal (1992), Kehimkar (2008, 2016), Sondhi & Kunte (2014, 2018), Smetacek (2015) were used. Apart from these, few web resources such as Butterflies of India, Butterflies of India-annotated checklist and A Check List of Butterflies in Indo-China chiefly from Thailand, Laos & Vietnam were also an aid in butterfly identification. Few more literature by de Nicéville (1886, 1890), Bingham (1905, 1907), Evans (1927, 1932, 1949), Talbot (1939, 1947), Wynter-Blyth (1957), Cantlie (1963), Racheli & Cotton (2009, 2010) are also notable. Other prominent literature referred for identification are tabulated below. The current valid names of all the species and subspecies are followed after Varshney & Smetacek (2015).



Family	References followed
Hesperiidae	Subfamily Coeliadinae: Chiba (2009); Genus <i>Matapa</i> : de Jong (1983); Genus <i>Aeromachus</i> : Evans (1943); Genus <i>Scobura</i> : Fan et al. (2010); Genus <i>Pyrgus</i> : de Jong (1972); Genus <i>Parnara</i> : Chiba & Eliot (1991)
Papilionidae	Genus <i>Lamproptera</i> : Hu et al (2014); Genus <i>Graphium</i> : Page & Treadaway (2013), Cotton et al (2019); Subfamily Parnassiinae: Ackery (1975)
Pieridae	Genus <i>Delias</i> : Braby & Pierce (2007); Genus <i>Colias</i> : Grieshuber & Lamas (2007), Petersen (1963); Genus <i>Gonepteryx</i> : Sondhi & Roy (2013); Genus <i>Eurema</i> : Yata (1994, 1995)
Riodinidae	Callaghan (1997 (2000), 2009)
Lycaenidae	Genus <i>Arhopala</i> : Evans (1957); Genus <i>Euaspa</i> : Sidhu (2007); Genus <i>Drupadia</i> : Cowan (1974); Genus <i>Polyommatus</i> : Bálint & Johnson (1997), Bálint (1999); Genus <i>Curetis</i> : Eliot (1990); Genus <i>Poritia</i> : Eliot (1957); Genus <i>Tarucus</i> : Evans (1955); Genus <i>Heliophorus</i> : Riley (1929), Eliot (1965); Genus <i>Ypthima</i> : Elwes & Edward (1893)
Nymphalidae	Genus <i>Boloria</i> : Warren (1944), Genus <i>Neptis</i> : Eliot (1969a), Smetacek (2011a); Genus <i>Elymnias</i> : Wei et al. (2017); Genus <i>Euthalia</i> : Yokochi (2010); Genus <i>Calinaga</i> : Sondhi et al (2016); Genus <i>Polyura</i> : Smiles (1982); Genus <i>Charaxes</i> : Müller et al (2010); Genus <i>Euploea</i> : Corbet (1943); Genus <i>Aulocera</i> : Sharma & Rose (2014); Genus <i>Symbrenthia</i> : Kunte (2010); Genus <i>Lasiommata</i> : Sharma & Rose (2008); Genus <i>Callerebia</i> : Roy (2013); Genus <i>Lethe</i> : de Lesse (1956), Lang (2017); Genus <i>Libythea</i> : Kawahara (2013)

MOTH IDENTIFICATION

Moths were initially identified following keys, descriptions and illustrations given in Hampson (1892-1896), Barlow (1982), Haruta (1992-2000), Holloway (1987-2011), Robinson et al. (1994); Kendrick (2002), Sanyal (2015) and Raha (2018). For genitalia comparison, family, subfamily or even genus-specific research papers were also consulted for identification (Table 2.2). Higher classification was followed after van Nieuwerkerken et al. (2011). The current valid names for the species were followed as per latest references and LepIndex website (Beccaloni et al., 2003).



Family	References followed
Pyralidae & Crambidae	Sutton et al. (2012), Pyralids of Borneo, Mathew (2006), Bae et al. (2008)
Lasiocampidae	Zolotuhin & Pinratana (2005)
Eupterotidae	Forbes (1955), Raha et al. (2017)
Saturniidae	d'Abrera (1995, 1998), Naumann (2003), Naumann & Nässig (2010), Naumann et al. (2012), Peigler (2013), Shangpliang & Hajong (2015)
Sphingidae	Bell & Scott (1937), Chandra et al. (2014), Kitching (2019)
Geometridae	Kirti et al. (2019), Genus <i>Biston</i> : Jiang et al. (2011); Genus <i>Cleora</i> : Sato (1991); Genus <i>Hypomecis</i> : Sato (1984); Genus <i>Krananda</i> : Jiang et al. (2017); Genus <i>Cidaria</i> : Choi (1998); Genus <i>Timandra</i> : Cui et al. (2019a); Genus <i>Problepsis</i> : Xue et al. (2018); Genus <i>Synegiodes</i> : Cui et al. (2018); Genus <i>Rhodostrophia</i> : Cui et al. (2019b); Genus <i>Comibaena</i> : Han et al. (2012); Genus <i>Chlororithra</i> : Han et al. (2006); Genus <i>Timandromorpha</i> : Han & Xue (2004); Genus <i>Psyra</i> : Liu et al. (2013); Genus <i>Luxiaria</i> : Jiang et al. (2014); Genus <i>Ophthalmitis</i> : Jiang et al. (2011); Genus <i>Fascellina</i> : Cui et al. (2014); Genus <i>Thalassodes</i> : Han & Xue (2011); Genus <i>Astygisa</i> : Stuning & Walia (2009)
Notodontidae	Schintlmeister & Pinratana (2007), Schintlmeister (2008), Kobayashi et al. (2008)
Erebidae	Genus <i>Barsine</i> : Bayarsaikhan et al. (2018), Černý, & Volynkin (2016), Kaleka (2003), Volynkin et al. (2017); Genus <i>Cyana</i> : Kaleka (2002), Bayarsaikhan & Bae (2016); Genus <i>Miltochrista</i> : Kaleka & Rose (2002); Genus <i>Lyclene</i> : Singh et al. (2013); Genus <i>Nannoarctia</i> : Vladimir & Kishida (2010); Genus <i>Nyctemera</i> : Spitsyn & Bolotov (2018); Genus <i>Spilarctia</i> : Kirti & Gill (2010); Černý & Pinratana (2009), Kononenko & Pinratana (2005, 2013), Kirti & Singh (2015 & 2016), Spitsyn & Scheglova (2019)
Noctuidae	Genus <i>Tambana</i> : Behounek et al. (2015); Genus <i>Dasypolia</i> : Benedek et al. (2016); Genus <i>Spodoptera</i> : Brambila (2013); Genus <i>Agrotis</i> : Feizpoor et al. (2014); Genus <i>Phlogophora</i> : Gyulai et al. (2015), Han & Kononenko (2017); Genus <i>Hermonassa</i> : Han & Li (2007); Genus <i>Nacna</i> : Kirti et al. (2016); Genus <i>Hypobarathra</i> : Saldaitis et al. (2016); Genus <i>Heliophobus</i> : Simonyi et al. (2015); Genus <i>Diarsia</i> : Varga & Ronkay (2007); Genus <i>Oroplexia</i> : Volynkin et al. (2019); Genus <i>Polia</i> : Varga et al. (2018); Genus <i>Craniophora</i> : Kiss (2017); Genus <i>Diphtherocome</i> : Hreblay et al. (1999), Gyulai et al. (2014), Gyulai et al. (2017); Genus <i>Mythimna</i> : Hreblay et al. (1996); Genus <i>Dicerogastra</i> : Ronkay et al. (2017); Noctuidae Europaeae (vol. 1 to 13), Matov et al. (2008)
Endromidae & Bombycidae	Wang et al. (2015), Saldaitis et al. (2015), Kitching et al. (2018)
Drepanidae	Genus <i>Cyclidia</i> : Spitsyn et al. (2018); Genus <i>Oreta</i> : Song et al. (2012), Park et al. (2012); Yoshimoto (1988), Jiang et al. (2015, 2016)

DISTRIBUTION SEARCH FOR IDENTIFIED LEPIDOPTERA SPECIES

Apart from the key literature mentioned previously, species' distribution was compiled from following major literature:

Butterfly: de Niceville (1894), Antram (1924), Frühstorfer (1927), Evans (1949), d'Abrera (1982, 1985 & 1986), Mani (1986), Gupta & Shukla (1988), Corbet et al. (1992), Tshikolovets (2005), Smetacek (2007), Gogoi (2012), Sondhi, & Kunte (2014, 2016) and Singh (2017).

Moth: Kirti & Sodhi (2003), Kirti et al. (2005, 2013), Shubhalaxmi et al. (2011), Kaleka (2012, 2015), Kaleka & Sharma (2014), Singh et al. (2014), Sondhi & Sondhi (2016), Arandhara et al. (2017), Shah et al. (2017), Chandra et al. (2018), Mathew et al. (2018), Kumar et al. (2018), Shubhalaxmi (2018).

Following web resources were used: Moths of India, FUNET, Global Biodiversity Information Facility (GBIF), iNaturalist, The Biodiversity Heritage Library, Internet Archive, Barcode of Life Data (BOLD) System, Lepidoptera Barcode of Life, Pyralids of Borneo, Global Information System on Pyraloidea, Catalog of Japanese Moths etc.

ABUNDANCE CATEGORIES

- Raare: <10 individuals, found in 1 occasion only
- Abundant: <20 individuals, found in 2 occasions
- High-Abundant: 20-30 individuals, found in 5 occasions
- Super-Abundant: >50 individuals, found in >10 occasions

HOW TO USE THE SPECIES INFORMATION

For a particular species of interest, please note the Plate No. (e.g. 80.2), locate the species from plate number in Species List provided (Pg. 147-329). From the list, look for the Material Examined column to know from where it has been reported. Interpretation of Location Code is provided in Pg. 149-150. Indian and Global distribution are provided in the Species List.

GENERAL ABBREVIATIONS USED:

LTM:	Long Term Monitoring	S Arid:	Semi-Arid
IHR:	Indian Himalayan Region	W Ghats:	Western Ghats
PA:	Protected Area	D Penin:	Deccan Peninsula
NP:	National Park	G Plains:	Gangetic Plains
WLS:	Wildlife Sanctuary	NE H & V:	North Eastern Hills & Valleys
BR:	Biosphere Reserve	Him:	Himalayan





3



**LEPIDOPTERAN
ASSEMBLAGES OF SELECTED
PROTECTED AREAS**



LADAKH, JAMMU & KASHMIR, TRANS-HIMALAYA

Mohd. Ali, Gaurab Nandi Das, Kaushik Mallick, Arna Mazumder, Kamalika Bhattacharyya, Uttaran Bandyopadhyay

INTRODUCTION

LANDSCAPE

Ladakh, meaning “Land of High Passes”, is located in the state of Jammu & Kashmir (currently the Union Territory of Ladakh), and is bounded in the north by Karakoram Mountain, to the south by western extreme of Great Himalaya and to the west by Zaskar Range. Lying in the rain-shadow of Himalaya which acts as a formidable barrier to seasonal monsoon clouds, the area receives only 50-100 cm Mean Annual Precipitation, resulting in arid or cold-desertic climate. Altitude generally ranging from 2800-7600 m, the terrain is extremely rugged, dominated by high proportion of cliffs, scree and exposed rocks. The entire landscape can be divided into distinct landform units like rolling, undulating meadows adjacent to broader river-valleys; glacier-driven boulders or Moraines on lower mountain slopes; scree or barren mountain slopes; deep, narrow mountain Gorges; high-rising crags and ridges; and, high-altitude Table-lands or plateaus. Vegetation of the area is regarded as Eremic (desertic) or Hemi-Eremic (sub-desertic)

characterized by complete absence of forest cover, thanks to sandy-clayey and coarse-gravelly soil which is nutrient-poor and low-fertile. Once covered by extensive lake systems, vestiges of which still exists as lake Tso-Moriri, Tso-Kar and Pangong-Tso, Ladakh plateau is drained by a number of small to large rivers, notably Indus and its tributaries like Zaskar, Markha, Shyok, Nubra and Suru. Accordingly, entire landscape can be divided into broad river-valleys like Indus valley, Suru valley, Drass valley, Changthang and Nubra valley. The general climate of the area is characterized by long cold periods without favourable conditions for growth in winter, when the temperature ranges from -20°C to -35°C , and most of the precipitation is in the form of snow associated with extra-tropical disturbances known as “Western Disturbance”. Summer is characterized by short growing season with marked diurnal variation in temperature ranging from 3°C to 35°C . Heavy snow during winter month feeds the glaciers, from which melt-water carried down by canals or streams help to irrigate agricultural fields in summer (Kala, 2011; Tewari & Kapoor, 2013).







BRIEF NOTE ON IMPORTANT FLORA & FAUNA

The region represents a diverse range of natural ecosystems harboring globally important flora and fauna due to the region's peculiar geographical, topographical and climatic conditions. More than 650 species of vascular plants are documented from Ladakh, distributed over 250 genera and 58 families, dominant among which are Asteraceae, Poaceae, Brassicaceae, Fabaceae etc. Around 55 plant species (Kala, 2011) falls under rare and endangered

categories, all having medicinal properties, prominent among which are Wild Asfoetida, Saw-Worts, Black Henbane, Violet and Round-leafed Monkshood, Chinese Milkwort etc. Ladakh is virtually tree-less except for cultivated varieties of Poplar and Willow species along major water-courses. Presence of shrubs like *Hippophae-Myricaria* in the valleys and Junipers on the slopes provide shelter to many wild ungulates like Ladakh Urial, Tibetan Argali, Himalayan Ibex, Blue Sheep. Besides charismatic and endangered Snow-Leopard, Ladakh is home to Himalayan Lynx, Pallas's Cat, Tibetan Wolf, Red Fox, Tibetan Snow Fox, Mountain Weasel, Marmot, Kiang, Ladakh Pica and Nubra Pica etc. Around 225 bird species are recorded, prominent among which are Black-Necked Crane, Snowcocks, Golden and Steppe Eagle etc.

BRIEF HISTORY OF LEPIDOPTERA STUDY IN LADAKH

BUTTERFLIES

The Butterfly study in Ladakh begun as early in 1850s, when Czech geologist and naturalist Dr. Ferdinand Stoliczka collected rich Lepidoptera materials, which was identified by Cajetan Felder and Rudolf Felder, and subsequently by Frederic Moore. Charles Lionel Augustus de Niceville and John Henry Leech in a joint expedition mode visited Ladakh in 1887. Andrej Nikolaevich Avinov, Director of Carnegie Museum of Natural History, holds a special place in history of butterfly studies in Ladakh. A long period of political conflict made the area inaccessible to biologists after 1947, with very few exceptions like

visit by Collin Wyatt in 1956 and expeditions of Prof. D. Muting, Y. Yazaki, H. Mikami between 1970-1990s. Vadim V. Tshikolovets of National Museum of Natural History of Ukraine visited the territory of Ladakh several times between 1995 and 2004, when 61 species of butterflies were collected from several natural habitats. His account of 101 species is regarded as the most comprehensive catalogue of Butterflies of Ladakh till date (Tshikolovets, 2005). Sidhu et al. (2012) and Tara & Hussain (2016) reported few butterfly species from the area. In most recent times, Sondhi et al. (2017) documented 32 species during a 12-day survey from various localities of Ladakh.



MOTH

Contrary to butterflies, moths of the region are very poorly explored. The Tiger moths of Ladakh and Zaskar were studied by W. Thomas (1992) with report of 8 species. V. Weisz (1996) studied selected Lepidoptera families including Sesiidae from Ladakh. Smetacek & Kitching (2012) reported 3 additional species to the known list of Hawkmoths of Ladakh. Dar (2014) studied families Erebidae and Noctuidae from far-flung localities of Jammu & Kashmir with new records of *Catocala* and *Cucullia* from Leh. Ganai & Khan (2015) explored Tortricid moths which are prominent pests in the apple orchards of the region.



SAMPLING DETAILS

During the course of current study (2016–2018), butterfly transects and light trapping for moths were undertaken in 36 sites (Table 3.1, Fig. 3.1, 3.2). The sampling sites were categorized into 5 dominant vegetation types (Fig. 3.3) according to Champion & Seth (1968) classification, which are as follows:

Hippophae-Myricaria Scrub (13/151)

Characterized by more or less pure thickets of *Hippophae salicifolia* with *Salix*, *Myricaria* and optional *Populus*. Grasses and herbs like *Thymus* dominate the ground cover. Ten sampling sites fell under this category.

Dwarf Juniper Scrub (16/E1)

Characterized by presence of *Caragana-Lonicera-Artemisia* formation with dominating patches of *Juniperus communis*. Scattered herbs may be present but grass cover is completely lacking due to very dry sandy soil. Six sampling sites fell under this category.

Deciduous Alpine Scrub (15/C2/E1)

Characterized by dense cover of deciduous scrub (approximately 1 m high), seldom broken up by grasses and rarely associated with outlying patches of *Rhododendron* colonies and dwarf Junipers. Nine sampling sites fell under this category.

Alpine Pastures (15/C3)

Characterized by undulating meadows composed mostly of perennial mesophytic herbs like *Anemone*, *Fritillaria*, *Gentiana* etc. with little grass cover. Only three sampling sites came under this category.

Dry Alpine Scrub (16/C1)

Characterized by presence of xerophytic dwarf shrubs associated with occasional herbs like *Sedum crassipes*, *Primula minutissima*, *Potentilla fruticosa* etc. Six sampling sites fell under this category.





Table 3.1:
Details of
Sampling
Sites, Dates
and Weather
parameters in
Ladakh (LD),
Jammu &
Kashmir

SL. No.	Location	Date	Details			
			Location Code	Latitude (°N)	Longitude (°E)	Altitude (m)
1	Darchiks	18.ix.2017	LD01A	34.6336	76.3876	2714
2	Sanjak	18.ix.2017 03.vi.2018	LD02A LD02B	34.5867	76.5275	2786
3	Minjee	06.ix.2017	LD03A	34.4985	76.1194	2796
4	Thovina	23.vi.2017 11.ix.2017 22.v.2018	LD04A LD04B LD04C	34.3636	75.9728	2909
5	Thasgam	26.v.2018	LD05A	34.2884	75.9743	3000
6	Sharchay	17.ix.2017	LD06A	34.6553	76.2935	3004
7	Jasgond	22.vi.2018	LD07A	34.4198	75.8928	3069
8	Regyaling	25.viii.2017	LD08A	34.2200	75.9574	3102
9	Nubra	09.vi.2018	LD09A	34.5548	77.5441	3117
10	Sangrah	26.viii.2017	LD10A	34.2149	75.9572	3120
11	Turtuk	08.vi.2018	LD11A	34.8395	76.8143	3124
12	Kukatay	30.v.2018	LD12A	34.4882	76.2730	3149
13	Goshun Drass	31.viii.2017	LD13A	34.4424	75.7529	3190
14	Youljud	24.viii.2017	LD14A	34.1609	75.9464	3205
15	Choshoth	15.vi.2018	LD15A	34.0808	77.6048	3233
16	Matayen	02.ix.2017	LD16A	34.3712	75.5904	3252
17	Namsuru	25.viii.2017	LD17A	34.1390	75.9621	3255
18	Prandrass	01.ix.2017	LD18A	34.4096	75.6365	3257
19	Hanu	19.ix.2017 02.vi.2018	LD19A LD19B	34.5911	76.6214	3281
20	Hagnis	21.ix.2017	LD20A	34.4775	76.4690	3345
21	Wakha	10.viii.2017 19.vi.2018	LD21A LD21B	34.3647	76.4187	3373
22	Lamayouru	08.viii.2017 17.vi.2018	LD22A LD22B	34.2819	76.7893	3393
23	Bartoo	28.v.2018	LD23A	34.2245	76.1268	3532
24	Zojila	03.ix.2017 21.vi.2018	LD24A LD24B	34.3048	75.5471	3540
25	Silmo	15.ix.2017 01.vi.2018	LD25A LD25B	34.6167	76.3018	3541
26	Tangole	22.viii.2017 25.vi.2018	LD26A LD26B	34.0479	75.9320	3563
27	Shokpachan	16.vi.2018	LD27A	34.3231	77.0677	3788
28	Foto La	09.viii.2017 18.vi.2018	LD28A LD28B	34.3001	76.6931	3910

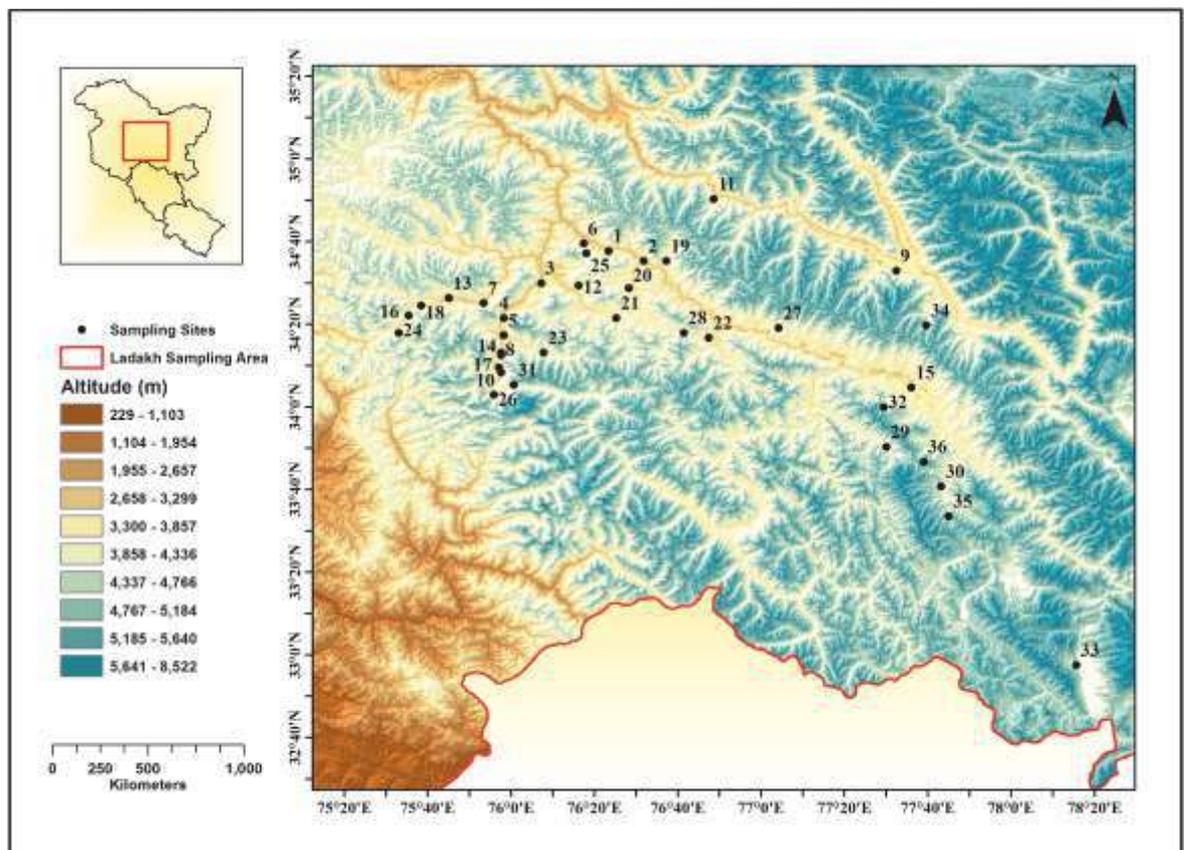
Vegetation Type	Avg. Temp. (°C)		Avg. Hum. (%)		Moon Phase
	Day	Night	Day	Night	
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	27.5		21.3		
Dwarf Juniper Scrub (16/E1)	25.15	18.4	24.8	33.9	WN xiii
	29.6	23.05	22.65	16.2	WN v
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	30		24.5		
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	27.3	18.5		45.19	WN xiv
	20.35	12.08	22.2	48.86	WN v
					WX vii
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	22.28		31.93		
Deciduous Alpine Scrub (15/C2/E1)	22.1		33.9		
Deciduous Alpine Scrub (15/C2/E1)	22.95		29.55		
Deciduous Alpine Scrub (15/C2/E1)		14.2		40.35	WX iii
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	30.9	19.85	13.1	33	WN xi
Deciduous Alpine Scrub (15/C2/E1)	23.35		40.2		
Dwarf Juniper Scrub (16/E1)	28.4		17.25		
Deciduous Alpine Scrub (15/C2/E1)	22.7	17.35	31.05	29.4	WN i
Deciduous Alpine Scrub (15/C2/E1)	21.95		58.3		
Dwarf Juniper Scrub (16/E1)	25.55	16.35	30.45	38.5	WX ii
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	18.75	19.3	42.55	30.85	WX i
Deciduous Alpine scrub (15/C2/E1)	17.3	12.5	41.55	63.35	WX xi
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	20.8		35.8		
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	15.3		41.45		
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	27.7		19.7		
		14.8		52.25	WN iv
Deciduous Alpine Scrub (15/C2/E1)	25.2		26.3		
Dwarf Juniper Scrub (16/E1)	26.35	16.55	38.07	51.55	WN iii
	22.8	15.8	29.8	37.9	WX v
Deciduous Alpine Scrub (15/C2/E1)	27.65	22	34.7	23	WN i
	23.1		28.9		
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	16.4		44.15		
Alpine Pasture (16/C3)	16.7		66.8		
	16.2		37.65		
<i>Hippophae-Myricaria</i> Scrub (13/1S1)	25.75	14.85	23.05	44.35	WN ix
	15.6		35		
Dwarf Juniper Scrub (16/E1)	21.9	16.3	29.6	46.4	NM
	21.9	14.85	25.15	44.05	WX xi
Dry Alpine Scrub (16/C1)	19.6	13.05	26	30.5	WX ii
Dry Alpine Scrub (16/C1)	26.65		28.45		
	19.05		24.7		



SL. No.	Location	Date	Details			
			Location Code	Latitude (°N)	Longitude (°E)	Altitude (m)
29	Hangkar	13.vii.2017	LD29A	33.8384	77.5007	3990
30	Lato-Geya	14.vi.2018	LD30A	33.6816	77.7234	4028
31	Parkachik	21.viii.2017 24.vi.2018	LD31A LD31B	34.0889	76.0067	4343
32	Stok	22.vii.2017 24.vii.2017	LD32A LD32B	34.0012	77.4947	4506
33	Tsomoriri	01.viii.2017	LD33A	32.9637	78.2593	4553
34	Khardong La	28.vii.2017 07.vi.2018	LD34A LD34B	34.3325	77.6555	4634
35	Taglang La	13.vi.2018	LD35A	33.5584	77.7454	4648
36	Nimaling	08.vii.2017	LD36B	33.7806	77.6510	5061



Figure 31: Sampling sites (36) in the Trans-Himalayan region of Ladakh, Jammu & Kashmir on Digital Elevation Map



Vegetation Type	Avg. Temp. (°C)		Avg. Hum. (%)		Moon Phase
	Day	Night	Day	Night	
Dwarf Juniper Scrub (16/E1)	13.35	22.5	83.6	36.75	WN iv
Dry Alpine Scrub (16/C1)	30.3	14	13.3	25.35	NM
Dry Alpine Scrub (16/C1)	24.92		36.42		
	18.25	17.1	34.62	39.6	WX x
Alpine Pasture (16/C3)	20.88	14.27	32.92	50.22	WN xiii
	16.7	15.2	53	48.3	WX i
Dry Alpine Scrub (16/C1)	21.05		41.1		
Dry Alpine Scrub (16/C1)	16.5		16.25		
	18.4		11.5		WN ix
Dry Alpine Scrub (16/C1)	17.8		24.65		
Alpine Pasture (16/C3)	15.7		42.3		

*WX= Waxing Phase, i.e. New Moon to Full Moon Period (e.g. WX iii refers to the 3rd day after No Moon); WN= Waning Phase, i.e. Full Moon to New Moon Period (e.g. WN iii refers to the 3rd day after Full Moon); NM= No Moon.

The days with no mention of moonphase were only devoted to day-time butterfly sampling.

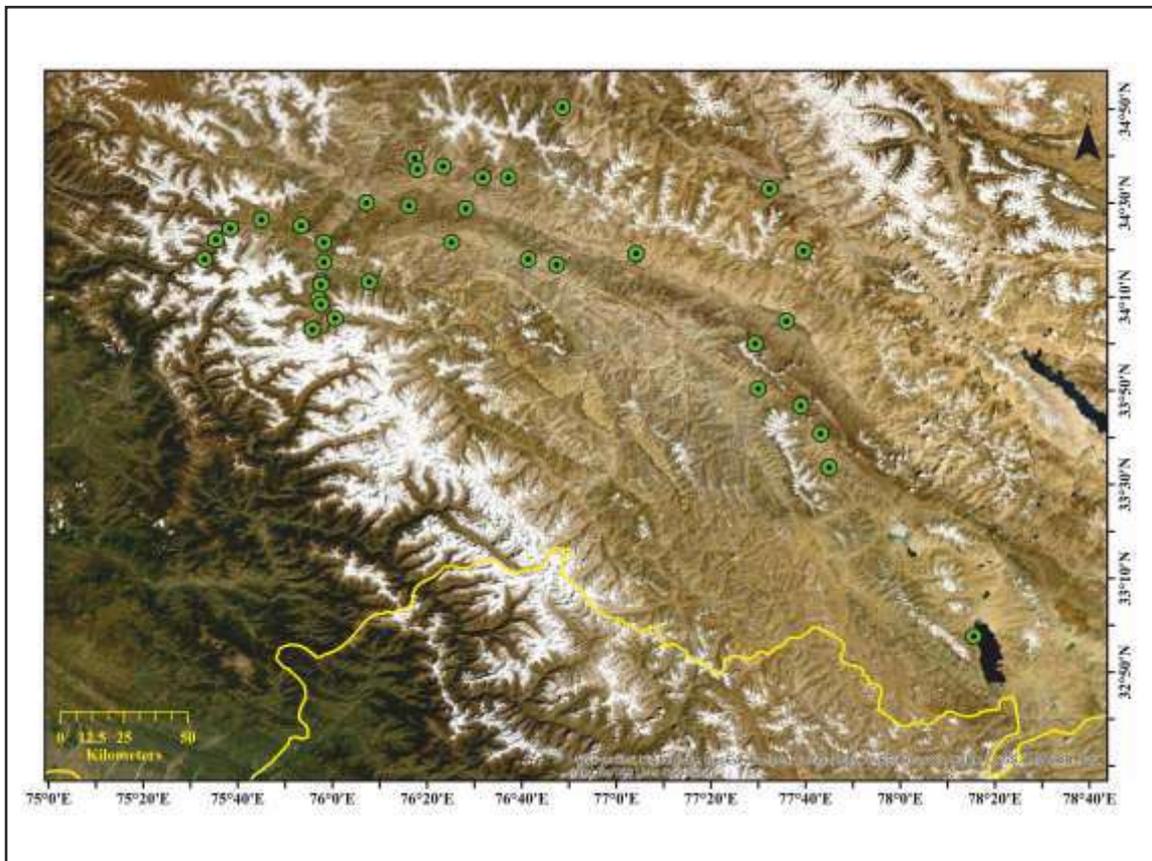


Figure 3.2:
All the sampling sites in Ladakh shown on Topographic Map



Figure 3.3:

Major vegetation types sampled in Ladakh:

- i. *Hippophae-Myricaria* Scrub;
- ii. Deciduous Alpine Scrub;
- iii. Alpine Pasture;
- iv. Dwarf Juniper Scrub



LEPIDOPTERAN ACCOUNT

BUTTERFLY

ASSEMBLAGE COMPOSITION

During the current course of study, 51 species of butterflies were recorded from various localities, representing 32 genera belonging to 5 families and 10 subfamilies. Nymphalidae was the most species-rich family (18 species), closely followed by Pieridae (17 species) and Lycaenidae (12 species). Papilionidae (3 species) and Hesperidae (1 species) had minor representation. Pierinae (11 species) was the most species-rich subfamily, very closely followed by Polyommatae and Satyrinae (10 species each). Among all the subfamilies, Coliadinae

was most abundant, largely due to 2 super-abundant species, viz. *Colias erate* and *C. fieldii fieldii*. Among Pieridae, *Pontia daplidice moorei* and *Pieris rapae* were most abundant. Among Polyommatae, *Polyommatus ariana* and *P. stoliczkana* were recorded in high abundance, whereas, *Lasiommata menava* and *Hyponephele pulchella* were most abundant species of Satyrinae. Among 51 species of Ladakh butterflies, 34 species, i.e. 66% of total richness were unique, i.e., recorded only from Ladakh Trans-Himalaya, and nowhere else from other Himalayan Provinces sampled (Fig. 3.4).

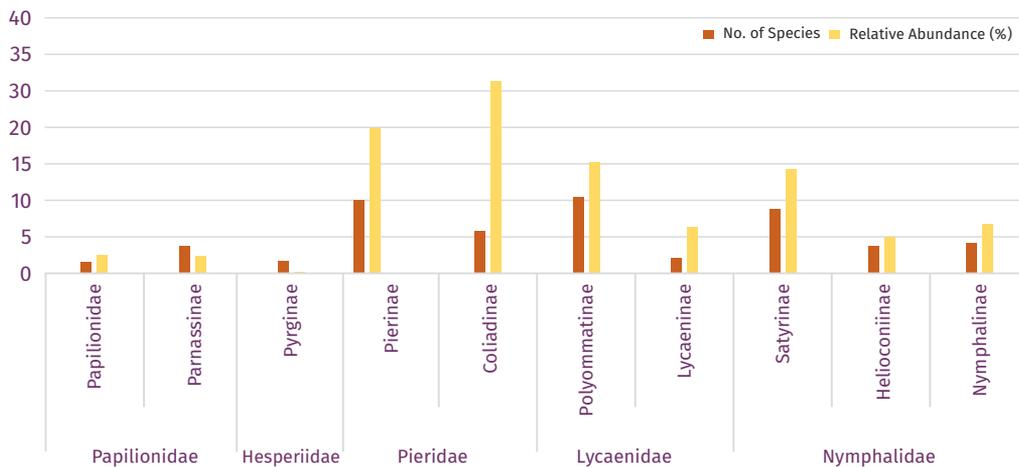


Figure 3.4: No. of species and Relative Abundance (%) of different families and subfamilies of butterflies of Ladakh Trans-Himalaya

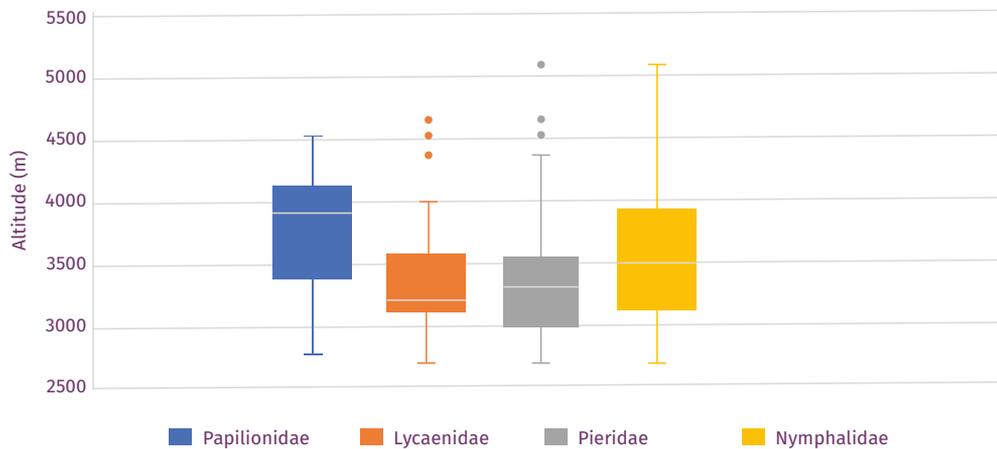
ALTITUDINAL PATTERN

Altitudinal stratification of the families revealed that, species range of Nymphalidae extended from lowest to highest altitudinal sites, while mean distribution of the family was recorded around 3500 m. *Aglia ladakensis* was recorded only from sites above 4000 m, with highest abundance at 4648 m. Another high-altitude-restricted species *Aulocera brahminus brahminus* was reported from sites above 3500 m. Among all the 5 butterfly families, mean abundance of Papilionidae species were reported at around 4000 m, highest among all the families. The pattern was largely due to 2 species of Apollos, *Parnassius*

charltonius and *P. hardwickii hardwickii*, which were always restricted between 3500-4500 m. Mean distribution of family Lycaenidae and Pieridae were recorded at comparatively lower altitude, around 3200 m, with *Colias ladakensis* and *Lycaena phlaes baralacha* were abundant in sites above 4000 m. Only 4 species were recorded above 5000 m, viz. *Baltia butleri butleri*, *Pontia callidice kalora*, *Colias ladakensis* and *Aglia ladakensis* (Fig. 3.5). A high-mountain restricted species, *Baltia butleri butleri* ranging from 3800-5400 m, was recorded from significantly lower altitude zone at 2900 m from Thovina.



Figure 3.5: Altitudinal distribution of four major butterfly families in Ladakh Trans-Himalaya



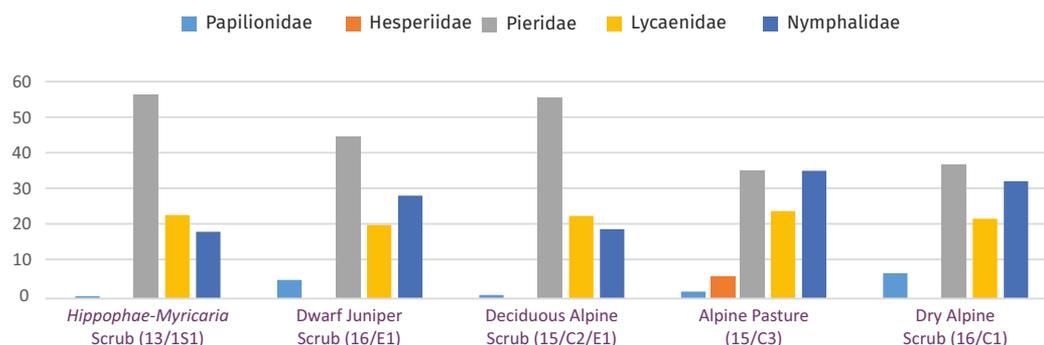
ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among 5 vegetation types sampled in Ladakh Trans-Himalaya, butterfly abundance was maximum in *Hippophae-Myricaria* Scrub (13/1S1) habitats, followed by Deciduous Alpine Scrub (15/C2/E1) and Dwarf Juniper Scrub (16/E1). Although Alpine Pasture (15/C3) habitat represented least abundance, it was the only habitat where all the 5 families were recorded, including single Hesperiiidae species, *Pyrgus cashmirensis cashmirensis*. If we consider specialization of different families among all the habitats, Papilionidae was most abundant in Dry Alpine Scrub (16/C1), whereas, Pieridae were equally abundant among both *Hippophae-Myricaria* Scrub and Deciduous Alpine Scrub habitats. Lycaenidae and Nymphalidae were most active in Alpine Pastures (**Fig. 3.6**).

BIOGEOGRAPHIC AFFINITY

It was clearly evident that butterflies of Ladakh Trans-Himalaya were completely of Palearctic origin, with only 40% species which were also distributed in Oriental region. Among Indian Biogeographic zones and provinces. sampled, assemblage showed 68% affinity with another Trans-Himalayan province Tibetan Plateau (1B), and North-Western Himalayan Province (2A). The affinities gradually decreased East-ward, with only 15% affinity with Eastern Himalayan Province (2D). While with other Indian Biogeographic zones, Ladakh butterfly assemblage has negligible overlapping, only 13% species were shared with Gangetic Plains, followed by 11% species shared with both Semi-Arid and North Eastern Hills & Valleys (**Fig. 3.7**).

Figure 3.6 Relative Abundance (%) of 5 butterfly families in different Trans-Himalayan habitats



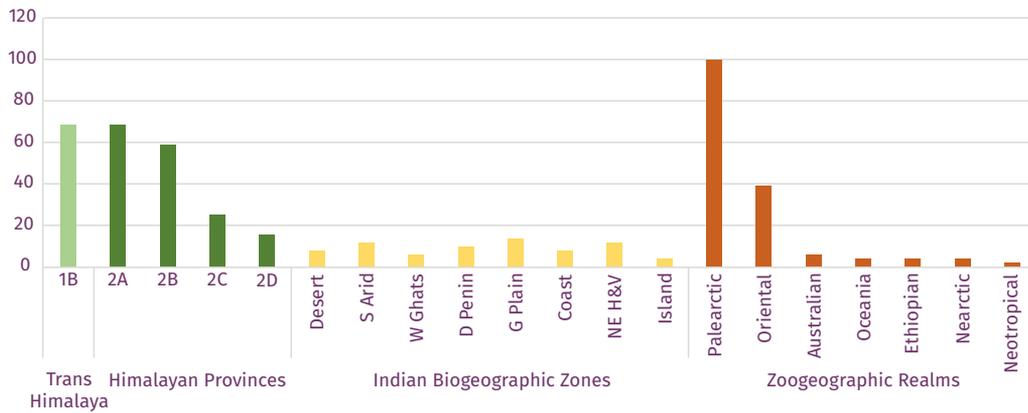


Figure 3.7: Biogeographic affinities (% representation) of Ladakh butterflies with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms

MOTH

ASSEMBLAGE COMPOSITION

Altogether, 57 species of moths were recorded from different sites in Ladakh Trans-Himalaya, corresponding to 44 genera and distributed among 7 families and 20 subfamilies, which included Cossidae (1 species), Saturniidae (3), Sphingidae (4), Geometridae (14), Notodontidae (3), Erebidae (10) and Noctuidae (22).

Noctuidae was the most species-rich family, especially subfamily Noctuinae having 13 species. Among Noctuidae, an overwhelming number of 11

species were reported for the first time from India, viz. *Acronicta megacephala*, *Cucullia thomasi*, *Shargacucullia verbasci*, *Anarta farnhami*, *Heliophobus bulcsui*, *Heliothis maritima*, *Agrotis exclamationis*, *Euxoa aquilina*, *E. ochrogaster*, *Mythimna vitellina* and *Panchrysia deaurata*, majority of them were previously known from Central Asian Highlands and European countries. Another 3 Noctuidae, viz. *Cucullia pullata*, *Hadena albimacula*, *Mythimna renimaculata* were recorded for the first time from Trans-Himalaya, while their previous range were known up to Himachal Pradesh.

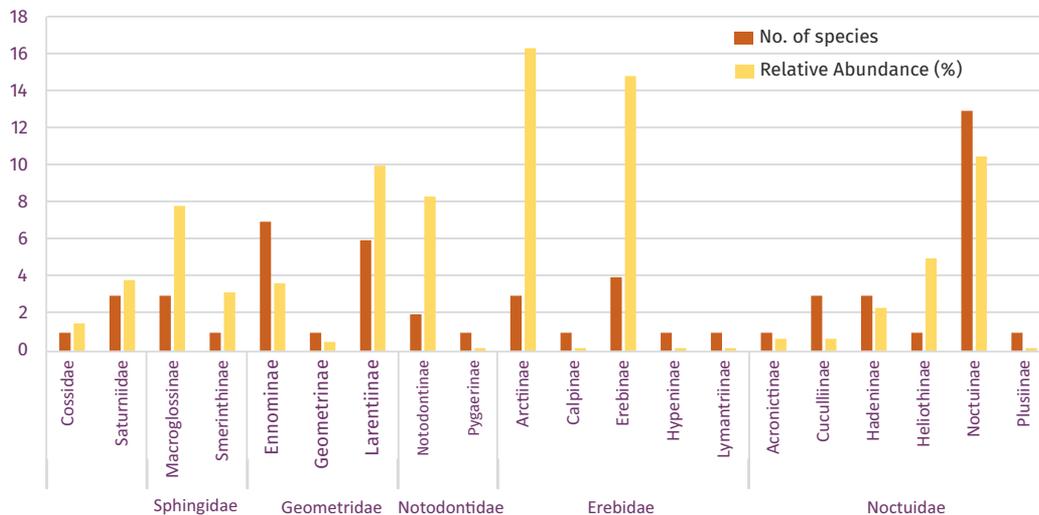


Figure 3.8: No. of species and Relative Abundance (%) of major families and subfamilies of moth from Ladakh Trans-Himalaya



Geometridae was the second largest family with dominant subfamilies Ennominae (7 species) and Larentiinae (6 species). 2 species of Ennominae, viz. *Alcis trikotaria* and *Odontopera muscularia* were reported as new record to India, where they were previously reported from Central Asia up to Pakistan. Another 4 Ennominae known till date up to Himachal Pradesh were reported as new to Trans-Himalaya, viz. *Alcis admissaria*, *Biston betularia*, *Eilicrinia cordiaria* and *Hypomecis cineracea*.

Among Larentiinae, *Cidaria distinctata* was reported as new to India, while the species was previously known from Central Asia up to Afghanistan and Pakistan. Another 3 Larentiinae species were reported first time from Trans-Himalaya, among which *Scotopteryx nasifera* and *Stamnodes pauperaria pamphilata* were previously restricted up to North-Western Himalaya, whereas, *Perizoma peculiare* was known up to Central Himalaya.

Among 10 species of Erebidae recorded, subfamily Erebiinae had 4 species while Arctiinae was represented by 3 species. The Arctiinae species

Spilarctia inayatullahi which was recently described from Pakistan, was reported as new to India. Moreover, 3 Erebidae species, viz. *Scotopteryx libatrix*, *Drasteria cailino* and *Drasteria caucasica* were recorded first time from Indian subregion, all being typical Palearctic species well distributed in Central Asian Highlands. *Catocala concubia* was also first report from Trans-Himalaya.

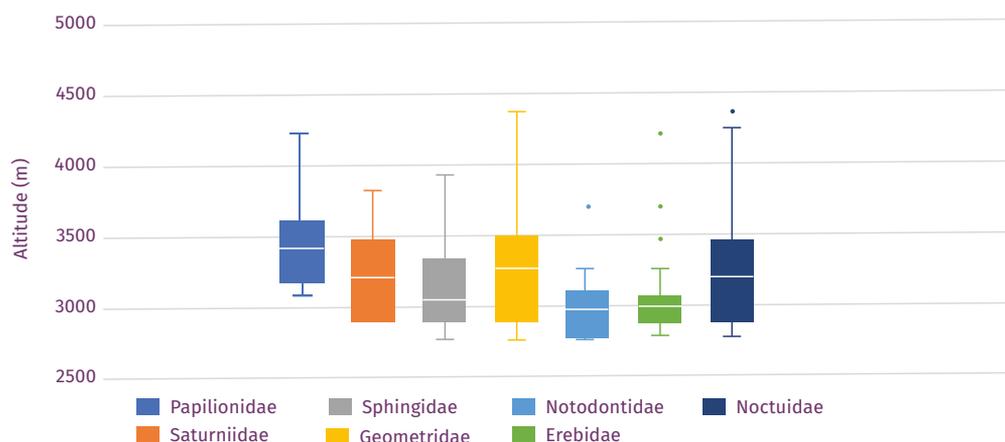
Notodontidae species *Clostera anachoreta anachoreta* was reported as new to Trans-Himalaya, known till date only from Himachal Pradesh, whereas, Saturniidae species *Neoris codyi* described from Pakistan was included to Indian moth fauna.

The entire moth assemblage was dominated by few super-abundant species, remarkable among which were *Callindra principalis* and *Spilarctia inayatullahi* (Arctiinae), *Drasteria cailino* and *D. caucasica* (Erebidae), *Cerura himalayana* (Notodontidae), *Stamnodes pauperaria* (Larentiinae), *Hyles hippophaes* (Sphingidae) and *Heliothis maritima* (Noctuidae). Species of Calpinae, Hypeninae, Lymantriinae and Plusiinae were very rarely encountered (Fig. 3.8).

ALTITUDINAL PATTERN

Among all the families of moths recorded, mean altitudinal distribution of Cossidae was highest, as *Catopta cashmirensis* was recorded in high abundance from sites above 3600 m (Fig. 3.9). While all other families were more or less homogenously distributed along the entire altitudinal gradient, majority of the Erebidae and Notodontidae species were active below 3500 m. *Dichagyris himalayensis*, *Isochlora viridis* (Noctuidae) and *Alcis admissaria* (Geometridae) were most prominent species recorded from sites above 4500 m.

Figure 3.9: Altitudinal distribution of moth families in Ladakh Trans-Himalaya



ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among 5 vegetation types sampled, moth abundance was particularly high in *Hippophae-Myricaria* Scrub (13/1S1), where all the families were active in high abundance, Erebidae being the most dominant. Alpine Pasture (15/C3) was the least preferred habitat, except very few individuals of Geometridae and Noctuidae. Dwarf Juniper Scrubs (16/E1) was dominated by Erebidae, whereas, Dry Alpine Scrub(16/C1) was mostly frequented by Noctuidae. Deciduous Alpine Scrub (15/C2/E1) habitat was equally frequented by Sphingidae, Notodontidae and Erebidae (Fig. 3.10).

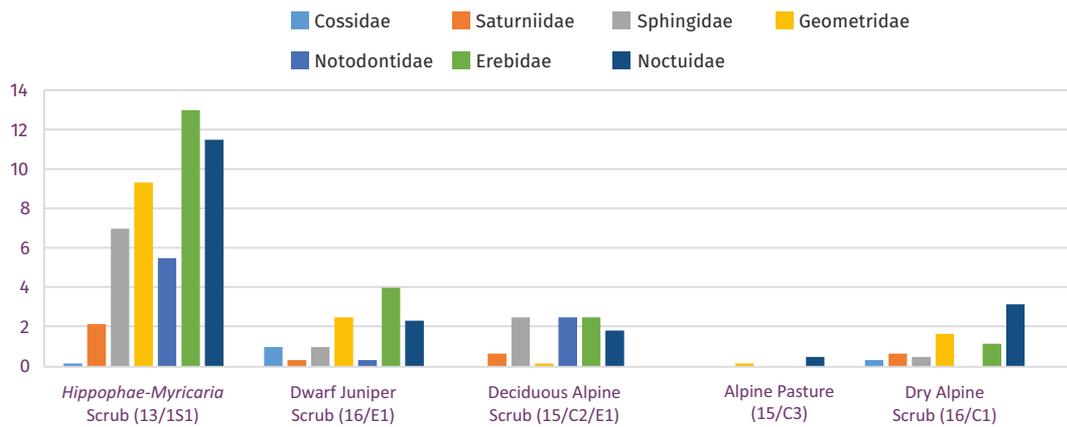


Figure 3.10: Relative Abundance (%) of different moth families in various Trans-Himalayan habitats

BIOGEOGRAPHIC AFFINITY

Entire moth assemblage was of purely Palearctic origin, while only 33% species were also distributed in Oriental region. Among other Zoogeographical Realms, 16% species were shared by Nearctic region, while 10% species had affinities for Ethiopian realm. 39% species were shared by Tibetan Plateau (1B), while 46% species were distributed up to North-Western Himalaya (2A). Like butterflies, affinity greatly decreased east-ward, with only 5% species shared with Eastern Himalaya (2D). Among other biogeographic zones of the country, 8% species were shared with North Eastern Hills & Valleys, while only 3.5% species were distributed in each of the zones of Semi-Arid, Deccan Peninsula, Gangetic Plains and Coast (Fig. 3.11).

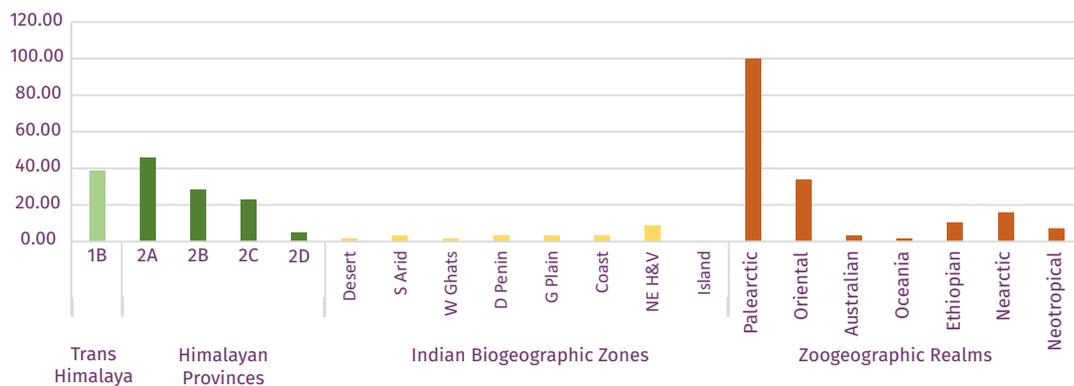


Figure 3.11: Biogeographic affinities (% representation) of Ladakh moths with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms



GREAT HIMALAYAN NATIONAL PARK, HIMACHAL PRADESH, NORTH-WESTERN HIMALAYA

Kaushik Mallick, Arna Mazumder, Uttaran Bandyopadhyay, Sheikh Sajan, Dibyajyoti Ghosh

INTRODUCTION

LANDSCAPE

The Great Himalayan National Park (GHNP) Conservation Area, located in Kullu District of Himachal Pradesh, falls under the North-Western Himalayan Biotic Province-2A, covering an area of 1171 km² and showing altitudinal variation of 1300-6110 m. Initially constituted in 1984, the Park was formally notified in 1999 and was subsequently awarded World Heritage Natural Site in 2014, including Sainj and Tirthan Wildlife Sanctuary. The park is surrounded by three protected areas: Rupi Bhaba WLS in the east, Pin Valley National Park in the north-east and Kunawar WLS in North West, and together these areas form a large, contiguous area of natural wilderness. This park consists of the catchment areas of the four tributaries of Beas River, viz. Jiwanal, Sainj, Parvati and Tirthan. Around 50% of

GHNP is above 4000 m altitude and the entire terrain is characterized by high ridges, rocky caves, glaciers, narrow valleys and deep gorges. Mainly, three prominent seasons can be identified i.e. Summer (April - June), Monsoon (July - September) and Winter (October - March). Mean Annual Temperature varies from 9.59 - 16.38 °C with Mean Annual Precipitation ranging between 1000-2000 mm. The winter precipitation is mainly in the form of snow when the Park receives 5-7 m deep snow. Around 68% area of the park falls under alpine zone, while only 17% area is under forest cover, remaining area remains under permanent snow cover. There are five different altitudinal zones found in the area: Lower Temperate (1500-2000 m), Mid Temperate (2000-2800 m), Upper Temperate (2800-3300 m), Subalpine (3300-3600 m) and Alpine (above 3600 m) (Gaston et al., 1981; Uniyal & Mehra, 1996; Singh & Rawat, 2000).







BRIEF NOTE ON IMPORTANT FLORA & FAUNA

A total number of 832 plant species are recorded from GHNP, of which 794 species are Angiosperms, 11 species are Gymnosperms and 27 species are Ferns, including 250 species of medicinal plants traditionally used by local people, among which prominent species are Hathpanja, Brahma Kamal, Ban Kakri, Jatamansi, Dhoop, Atees and Blue Poppy. Important tree species are Silver Fir, Maple, Horse Chestnut, Alder, Birch, Deodar, Hazelnut, Blue Pine, Kharsu Oak, Rhododendron, whereas shrubs include

Aconitum, *Atropa*, *Saussurea*, *Berberis*, *Polygonatum*, *Taxus*, *Juniperus* etc. Besides, 192 species of Lichens are also reported including *Usnea longissimi*, highly used by wild ungulates during winter season. 31 species of mammals are reported which include Snow Leopard, Brown Bear, Himalayan Black Bear, Red Fox, Himalayan Musk Deer, Blue Sheep, Serow, Himalayan Tahr. 209 species of birds are reported including Western Tragopan, Himalayan Monal, Koklash Pheasant, Cheer Pheasant, Golden Eagle, Griffon Vulture. Besides, 12 Reptilian species, 9 Amphibians and 125 insects are reported from the park (Gaston et al., 1993; Ramesh et al., 1998; Uniyal & Mathur, 1998).

BRIEF HISTORY OF LEPIDOPTERA STUDY IN GHNP & HIMACHAL PRADESH

BUTTERFLIES

Earliest studies on the butterflies of Himachal Pradesh were done by de Nicéville in 1880 from Kotgarh region; simultaneously he also reported 147 species from Shimla. In 1931, De Rhe-Philipe published a series in Journal of Bombay Natural History Society, consisting of 246 species from Shimla Hills. In between 1940 to 1945, Wynter-Blyth documented a total of 294 species also from Shimla Hills. After independence major works on butterflies of GHNP and Himachal Pradesh includes: Uniyal & Mehra (1996), Uniyal & Kumar (1997), Uniyal &



Mathur (1998), Uniyal & Singh (1996), Mehta *et al.* (2002, 2003), Thakur *et al.* (2002), Bhardwaj (2005), Kittur *et al.* (2006), Thakur *et al.* (2006), Sharma (2007), Uniyal (2007), Singh (2008), Arora *et al.* (2009), Bhardwaj & Uniyal (2009), Kumar (2009), Pathania & Kumari (2009, 2011), Thakur & Mattu (2010), Singh & Banyal (2012, 2013), Thakur & Bhardwaj (2012), Chandel *et al.* (2014), Kumar & Thakur (2014), Kumar & Mattu (2014), Bogtapa (2015), Sharma & Kumar (2015), Kumar *et al.* (2016) and Kirti *et al.* (2016).

MOTHS

Earliest reference on moths of Himachal Pradesh can be extracted from A.G. Butler's seminal publication "On the Collection of Lepidoptera from India" (1886), where collection from Dharamshala were included. Frederick Moore published a list of Lepidoptera collected by Rev. J.H. Hocking (1888), chiefly from Kangra district. Cotes & Swinhoe in their "Catalogue of Indian Moth" (1887-1889) mentioned several species from Kullu. In Hampson's Fauna of British India (1892-1896) and subsequent supplementary manuscripts in Journal of Bombay Natural History Society, several species from Himachal Pradesh were included, mainly from Shimla, Kullu, Dharamshala, Kangra and Dalhousie. Mani & Singh (1962), in the survey of High-altitude insects of nival zones of North-West Himalaya listed few species from Kullu, Kangra, Dharamshala. Kapur & Arora (1967) documented several Noctuidae species from Himachal Pradesh. Pajni & Walia (1983-1984), Walia & Pajni (1984-1987) and Walia (1988-2005) reported around 281 species of Geometridae from Himachal Pradesh. Microlepidopteran families like Gelichiidae, Lecithoceridae, Oecophoridae were extensively worked out from Shivalik Himalayas of Himachal Pradesh by Pathania & Rose (2004), Pathania et al. (2006-2009), Pathania (2010). Sekhon (2015) published faunistic records of Noctuidae moths from Chamba. Moths from GHNP are very poorly studied except a mention of 17 species by Uniyal & Mathur (1998).



SAMPLING DETAILS

During the course of current study (2016-2018), butterfly transects and light trapping for moths were undertaken in 23 sites (Table 3.2, Fig. 3.12, 3.13). The sampling sites were categorized into 11 dominant vegetation types (Fig. 3.14, 3.15) according to Champion & Seth (1968) classification, which are as follows:

Himalayan Chir Pine Forest (9/C1b)

High forest of *Pinus roxburghii*, predominant between 1200-1800 m on easy sloping grounds with scanty shrub undergrowth and grass-cover growing during monsoon only. Two sampling sites fell under this category.

Moist Temperate Deciduous Forest (12/C1e)

A high deciduous forest of *Acer caesium*, *A. pictum*, *Aesculus indica*, *Betula alnoides*, *Juglans regia*, *Pyrus lanata*, *Cornus*, *Corylus*, *Ulmus* sp., grown on gentler slopes between 1800-2700 m. The undergrowth is rather thin and consists mainly of *Berberis*, *Cotoneaster*, *Aconitum*, *Impatiens* etc. Four sampling sites came under this category.

Alder Forest (Riverine) (12/1S1)

A pure forest of *Alnus nitida*, *Populus ciliata*, *Ulmus villosa* grown along stream sides on moist unstable hill slopes between 1800-2200 m. Only one sampling site was categorized under this.

Moist Deodar Forest (12/C1c)

A pure forest of mainly Deodar, with occasional Blue Pine, Oaks and Rhododendrons grown on cool and moist slopes between 1700-2500 m, with tall shrub layer, mainly of *Parrotia*. A single sampling site was categorized under this.

Western Mixed Coniferous Forest (12/C1d)

Varying mixture of conifer trees like *Picea*, *Cedrus*, *Abies pindrow*, *Pinus wallichiana* with varying mixture of broadleaved like *Quercus dilatata*, *Q. incana*, *Q. semicarpifolia* grown between 2400-3000 m, often broken by open grassy meadows. Two sampling sites fell under this category.



Low Level Blue Pine Forest (12/2S1)

Typically, of pure *Pinus wallichiana*, sometimes intermixed with Deodar and grown on cool, moist sites between 1600-2800 m. Undergrowth mainly of *Berberis*, *Indigofera* and *Desmodium*. Three sampling sites came under this group.

West Himalayan Upper Oak-Fir Forest (12/C2b)

A two-storied high forest with *Abies pindrow* standing singly over *Quercus semicarpifolia*, *Acer*, *Taxus*, *Corylus* grown on sheltered slopes between 2600-3400 m. Generally associated with good shrub cover of *Rosa*, *Rubus*, *Viburnum* and luxuriant herbaceous growth of *Galium*, *Fragaria*, *Ainsliaea*, *Valeriana*. Four sampling sites fell under this category.

West Himalayan Sub-alpine High-Level Fir Forest (14/C1a)

An irregular forest consisting of *Abies spectabilis*, *Pinus wallichiana*, *Picea smithiana* and *Betula utilis* with dense undergrowth of *Rhododendron campanulatum*, *Strobilanthes*, *Smilax* grown on snow-free slopes above 3000 m. Three sampling sites fell under this group.

Sub-Alpine Pastures (14/DS1)

A degraded type of subalpine forest with predominating grass covers mainly of *Agropyron*, *Brachypodium*, *Bromus* etc. Single site was categorized under this.

Dwarf Rhododendron Scrub (15/C2/E1)

Characterized by dense patches of *Rhododendron anthopogon*/ *R. lepidotum*/ *R. campanulatum* grown on dry and arid alpine ground chiefly between 3200-4100 m. Single site was categorized under this.

Birch Rhododendron Scrub Forest (15/C1)

A very dense thicket of *R. campanulatum* associated with *Betula utilis*, *Sorbus foliolosa*, *Viburnum nervosum* and *Primula denticulata* grown on thick layer of black humus on very wet soil which remain under snow-cover for most of the year. Only one site was categorized under this type.



Table 3.2:
Details of Sampling Sites, Dates and Weather parameters in Great Himalayan (GH) NP, Himachal Pradesh

Sl. no.	Location	Date
1	Ropa FRH	26.viii.2016
		04.ix.2016
		11.ix.2016
		01.vi.2017
		02.iv.2018
		03.iv.2018
2	Jungla	23.iv.2018
		16.vi.2017
3	Denga Pool	04.iv.2018
		26.v.2018
4	Khain	15.vi.2017
5	Raghdhini	14.vi.2018
6	Shakti	30.viii.2016
		13.iv.2018
7	Shakti Water Fall	27.v.2018
8	Lapah	27.viii.2016
9	Riush Thatch	06.vi.2018
10	Bhagisaree	02.vi.2017
11	Padhar	06.ix.2016
		19.vi.2018
12	Marrorh	02.vi.2018
13	Gajnao	20.vi.2018
14	Baghi Thatch	03.vi.2017
15	Kherchar	30.v.2018
16	Vred Nala	08.vi.2018
17	Thati	08.ix.2016
		22.vi.2018
18	Parkachi	17.ix.2016
		18.iv.2018
		01.vi.2018
19	Dawada	08.vi.2017
20	Majan Golu	10.vi.2018
21	Thihnhi	07.ix.2016
		21.vi.2018
22	Dhung	05.vi.2017
23	Dhel Hut	29.viii.2016
		12.vi.2018

Details								
Location Code	Latitude (°N)	Longitude (°E)	Altitude (m)	Vegetation Type	Avg. Temp. (°C)	Avg. Hum. (%)	Moon Phase*	
GH01A GH01B GH01C GH01D GH01E GH01F	31.7655	77.3576	1515	Himalayan Chir Pine Forest (9/C1b)	19.3	79.1	WN viii	
					18.2	89.7	WX iii	
					18.9	88.2	WX x	
					18.5	84.2	WX vi	
					15.3	72.1	WN ii	
					14.9	75.3	WN iii	
GH02A GH03A GH03B	31.7802	77.3917	1751	Himalayan Chir Pine Forest (9/C1b)	17.25	99	WN vii	
					12.3	82.8	WN iv	
GH04A GH05A	31.7841	77.4424	1970	Moist Temperate Deciduous Forest (12/C1e)	17.1	52.6	WX xi	
					14.5	76.4	WN vi	
GH06A GH06B	31.7942	77.3806	2072	Moist Temperate Deciduous Forest (12/C1e)	16.1	88.1	NM	
					11.3	92.7	WN xii	
GH07A GH08A	31.7883	77.4908	2137	Moist Temperate Deciduous Forest (12/C1e)	9.6	80.1	WN xiii	
					12.7	60.5	WX xii	
GH09A GH10A	31.7708	77.4271	2247	Moist Deodar Forest (12/C1c)	12.6	83.6	WN ix	
					17.2	88.5	WN viii	
GH11A GH11B	31.7861	77.4927	2425	Western Mixed Coniferous Forest (12/C1d)	13.1	89.1	WX vii	
					12.2	87.1	WX v	
GH12A GH13A	31.7499	77.3732	2437	Low Level Blue Pine Forest (12/2S1)	14.9	84.7	WX v	
					15.9	71	WN iv	
GH14A GH15A	31.7882	77.5318	2480	Low Level Blue Pine Forest (12/2S1)	15.5	68.9	WX vi	
					17.6	61.3	WX viii	
GH16A GH17A GH17B	31.7413	77.3772	2618	West Himalayan Upper Oak-Fir Forest (12/C2b)	16.3	58.1	WN i	
					14.9	90.3	WN x	
GH18A GH18B GH18C	31.7391	77.3587	2917	West Himalayan Upper Oak-Fir Forest (12/C2b)	10.2	92.1	WX vii	
					13.2	67.3	WX viii	
					8.9	82.3	FM	
GH19A GH20A	31.7987	77.6016	3033	West Himalayan Sub-alpine High-Level Fir forest (14/C1a)	7.3	87.2	WX ii	
					10.5	70	WN iii	
GH21A GH21B	31.8686	77.4284	3049	Sub-Alpine Pastures (14/DS1)	10.2	74.5	WX xiii	
					13.1	88	WN xii	
GH22A GH23A GH23B	31.7662	77.4734	3166	West Himalayan Sub-alpine High-Level Fir forest (14/C1a)	8.1	89.9	WX vi	
					11.6	85.25	WX vii	
GH22A GH23A GH23B	31.8314	77.4201	3324	West Himalayan Sub-alpine High-Level Fir forest (14/C1a)	14	84.6	WX x	
					7.9	91.3	WN xi	
GH23A GH23B	31.7568	77.4614	3567	Birch Rhododendron Scrub Forest (15/C1)	9.3	78.5	WN x	

*WX= Waxing Phase, i.e. New Moon to Full Moon Period (e.g. WX iii refers to the 3rd day after No Moon); WN= Waning Phase, i.e. Full Moon to New Moon Period (e.g. WN iii refers to the 3rd day after Full Moon); FM= Full Moon.



Figure 3.12: Sampling sites (23) in the Great Himalayan National Park, Himachal Pradesh on Digital Elevation Map

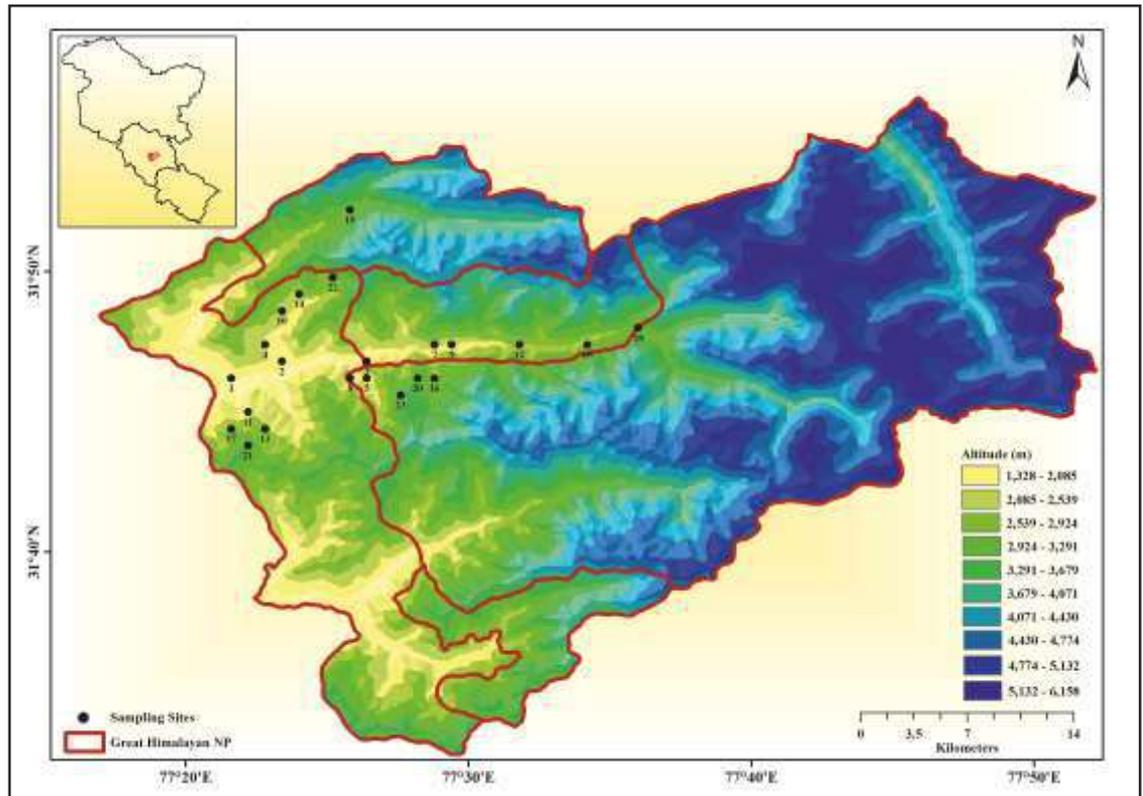
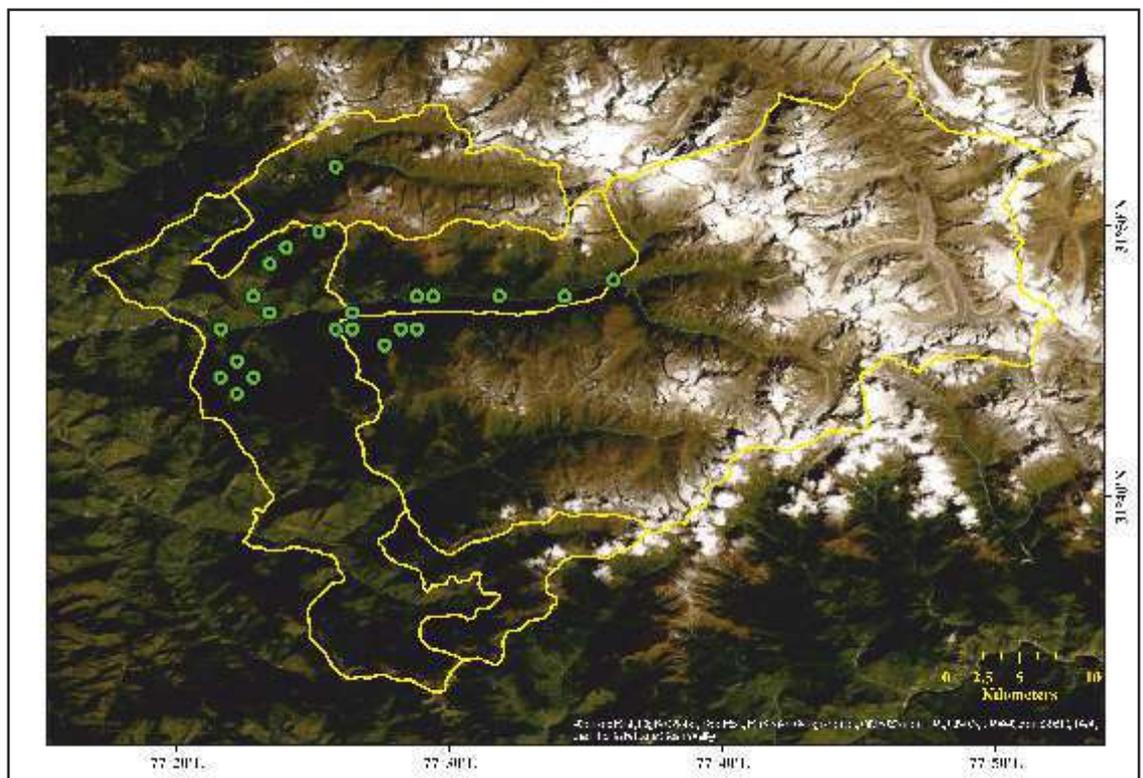


Figure 3.13: All the sampling sites in GHNP shown on Topographic Map





i.

Figure 3.14:

Major vegetation types sampled in GHNP: i. Chir Pine Forest; ii. Moist Temperate Deciduous Forest; iii. Western Mixed Coniferous Forest; iv. Low Level Blue Pine Forest



ii.



iii.



iv.



Figure 3.15:

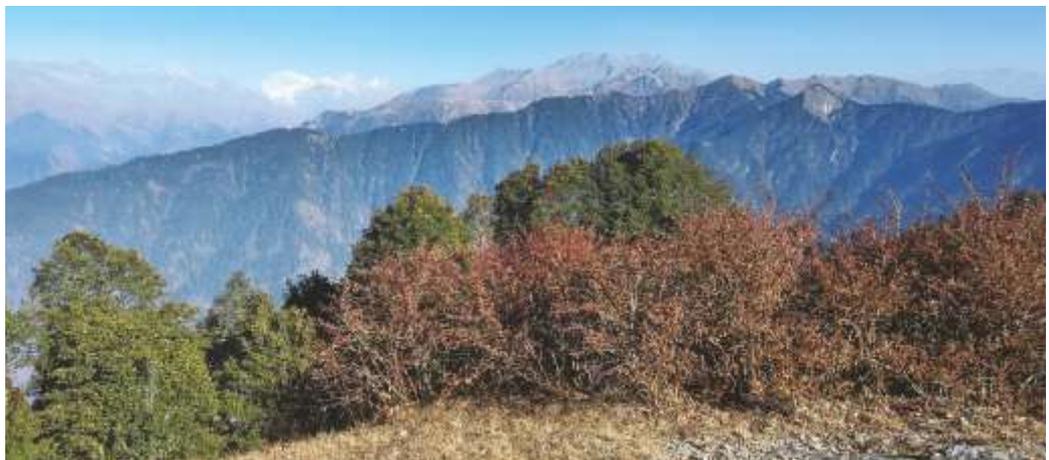
Major vegetation types sampled in
GHNP: **v.** West
Himalayan Upper
Oak-Fir Forest;
vi. West Himalayan
Sub-alpine High-Level
Fir forest; **vii.** Dwarf
Rhododendron Scrub;
viii. Birch
Rhododendron Scrub
Forest



vi.



vii.



viii.



LEPIDOPTERAN ACCOUNT

BUTTERFLY

ASSEMBLAGE COMPOSITION

In the current course of study, 62 species of butterflies were recorded from various sampling sites, representing 42 genera belonging to 16 subfamilies and 5 families. Nymphalidae was the most species-rich family with 32 species representing 3 major subfamilies, Nymphalinae (12 species), Satyrinae (11 species) and Limenitidinae (7 species). Among other families Lycaenidae had 10 species, all belonging to subfamily Lycaeninae, followed by Pieridae (8 species), Papilionidae (4 species) and Hesperidae (2 species). Among Pieridae, subfamily Pierinae was represented by 5 species and Coliadinae by 3 species. Among all the subfamilies, Lycaeninae was most abundant with

high abundance of *Lycaena phlaeas baralacha* and *Celastrina argiolus kollari*. Among Nymphalinae, abundance of subfamily Nymphalinae was high, with *Symbrenthia lilaea khasiana* and *Junonia iphita iphita* recorded in high abundance. Among subfamily Satyrinae, *Lethe sidonis* and *Lasiommata schakra schakra* were most abundant. Among subfamily Limenitidinae, *Neptis sankara sankara*, *Neptis soma butleri* and *Athyma opalina opalina* were highly abundant. Among family Pieridae and subfamily Pierinae, *Pieris ajaka* was super-abundant, whereas *Pieris canidia indica* was also recorded in high numbers (Fig. 3.16). Among 62 species of GHNP butterflies, 8 species, i.e., 13% were unique to GHNP, and recorded from nowhere else in other Himalayan Provinces.

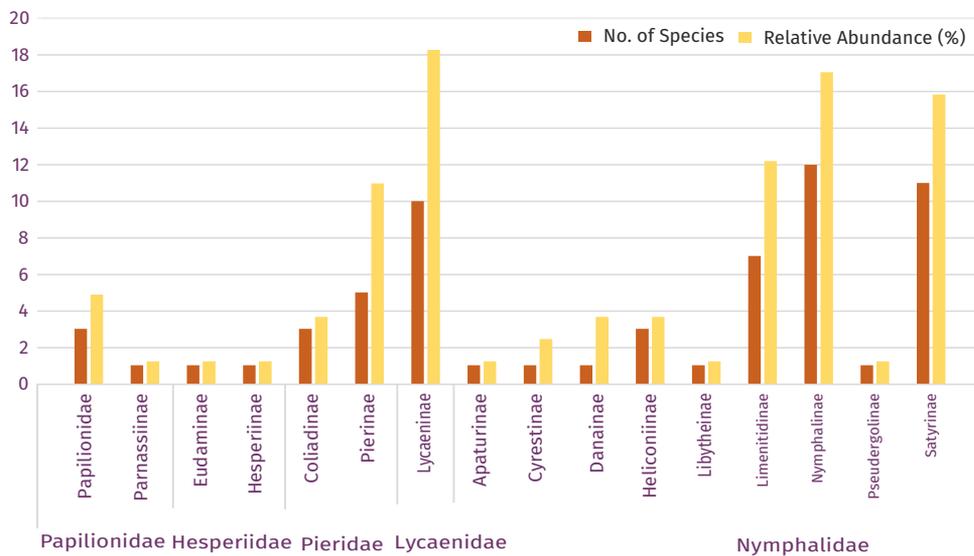


Figure 3.16: No. of species and Relative Abundance (%) of different families and subfamilies of butterflies of GHNP

Most interestingly, Lycaenidae species *Chaetoprocta odata* which had two subspecies, viz. *C. o. odata* reported from Kinnaur, Himachal Pradesh and *C. o. peilei* reported from Mussoorie, Uttarakhand. During current study *C. o. peilei* was reported from GHNP, which may signify that boundary between these two subspecies is still not clearly understood.

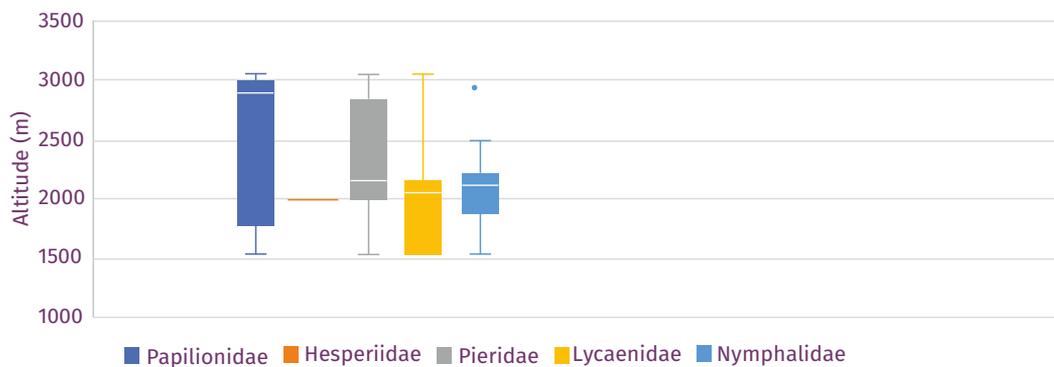


ALTITUDINAL PATTERN

Altitudinal distribution pattern among butterflies revealed that Papilionidae, Pieridae and Lycaenidae were distributed all through the gradient surveyed. Mean abundance of the Family Papilionidae was recorded at around 2800 m, highest among all the families. The pattern was largely due to 2 species, viz. *Papilio machaon asiatica* and *Parnassius hardwickii hardwickii*, which were recorded between 2700-3050 m. Among Pieridae, *Pieris brassicae nepalensis*,

Gonepteryx nepalensis and *Colias fieldii fieldii* were reported from sites above 3000 m. For Lycaenidae, majority of the species were distributed up to 2000 m, whereas, *Lycaena phlaeas baralacha* was recorded from 1500-3000 m. Mean abundance of Nymphalidae was always in the lower quarter of the gradient, with only single species, *Aulocera padma padma* recorded only from 3000 m (Fig. 3.17).

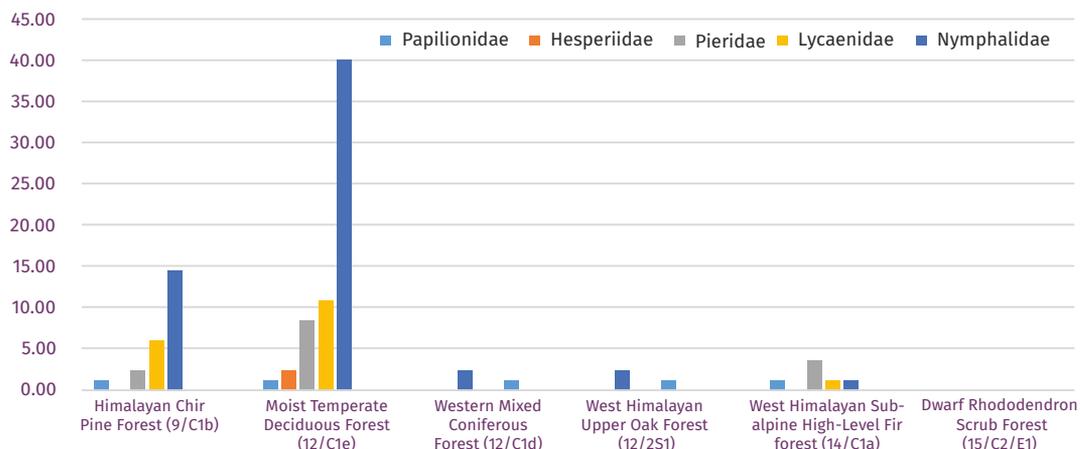
Figure 3.17: Altitudinal distribution of butterfly families in GHNP



ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among seven major vegetation/habitat types sampled in GHNP, butterfly abundance was maximum in Moist Temperate Deciduous Forest (12/C1e), followed by Himalayan Chir Pine Forest (9/C1b). Maximum abundance of Nymphalidae was reported in Moist Temperate Deciduous Forest. The single Hesperidae species was recorded from this habitat type only. Butterfly activity was recorded as almost negligible from other five habitats, with minor exception for West Himalayan Sub-alpine High-Level Fir forest (14/C1a) where all the families were active with dominance of Pieridae. Surprisingly the study failed to report any butterfly activity from highest habitat, Dwarf Rhododendron Scrub Forest (15/C2/E1) (Fig. 3.18).

Figure 3.18: Relative Abundance (%) of 5 butterfly families in different habitats of GHNP



BIOGEOGRAPHIC AFFINITY

The butterfly assemblage of GHNP was typically of Palearctic origin with 76% species which were also distributed in Oriental Region. Among Indian Biogeographic zones and Provinces, the sampled assemblage showed 87% and 80% affinities with two Trans-Himalayan provinces, Ladakh Mountains (1A)

and Tibetan Plateau (1B), respectively. Almost 97% species were also shared by Western Himalaya (2B), whereas, 58% and 46% species were shared between Central (2C) and Eastern Himalaya (2E) respectively. Among other Indian Biogeographic zones, species share was maximum with North-Eastern Hills & Valleys (45%), followed by Gangetic Plains (29%) and Semi-Arid (27%) (Fig. 3.19).

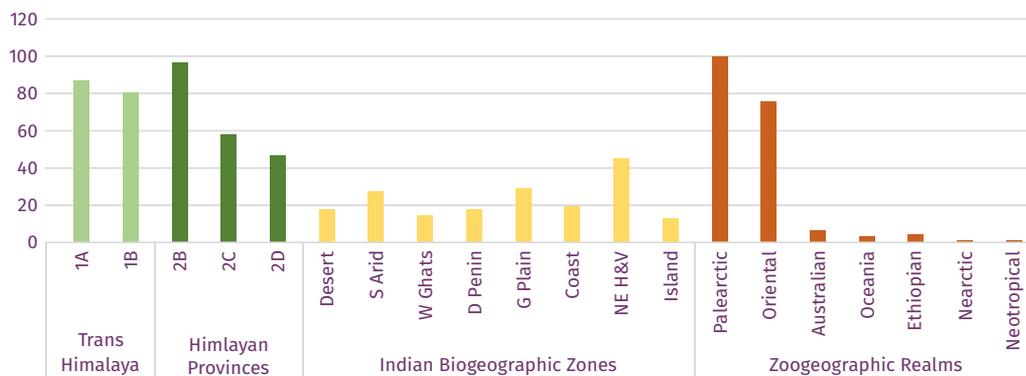


Figure 3.19: Biogeographic affinities (% representation) of GHNP Butterflies with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms

MOTH

ASSEMBLAGE COMPOSITION

Total 237 species of moths under 178 genera belonging to 45 subfamilies of 16 families attributed to 8 superfamilies were recorded during current course of study, which included Cossidae (2 species), Callidulidae (1), Crambidae (14), Drepanidae (9), Lasiocampidae (1), Brahmaeidae (1), Endromidae (1), Saturniidae (1), Sphingidae (7), Uraniidae (2), Geometridae (96), Notodontidae (12), Erebidae (44), Euteliidae (2), Nolidae (3) and Noctuidae (41)

(Fig. 3.20).

Species richness of the Family Geometridae was highest, having 96 species under 67 genera followed by Erebidae, having 44 species under 30 genera and Noctuidae, having 41 species under 31 genera. Subfamily Ennominae hold highest number of species

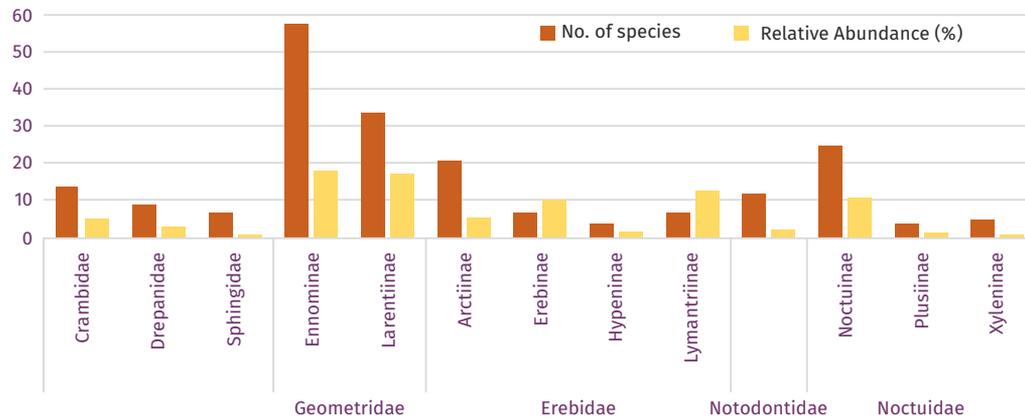
and individuals among Geometridae, i.e., 58 species under 41 genera followed by Larentiinae, having 34 species under 23 genera.

In family Erebidae, subfamily Arctiinae (21 species under 11 genera) having the highest number of species, followed by Erebiniae and Lymantriinae, having 7 species under 7 genera and 7 species under 6 genera respectively. Subfamily Hypeninae was most abundant among Erebidae, due to the super-abundance of *Hypena obductalis*.

In case of Family Noctuidae, the species richness and abundance of subfamily Noctuinae was highest, having 25 species under 17 genera, followed by Xyleninae and Plusiinae having 5 and 4 species respectively.



Figure 3.20: No. of species and Relative Abundance (%) of different families and subfamilies of Moths of GHNP



Arichanna flavinigra, *Menophra subplagiata*, *Ourapteryx ebuleata* and *Odontopera kametaria* were most abundant species under subfamily Ennominae. Among subfamily Arctiinae, *Cyana adita*, *Barsine orientalis* and *Ghoria postfusca* were the most abundant species. *Lygephila dorsigera*, *Catocala patala* and *Supersynpnoides kirbyi* were the most abundant species under the subfamily Erebininae. *Lymantria concolor concolor*, *Gonitis mesogona* and *Calliteara horsfieldi* were other abundant species recorded from GHNP under the family Erebinidae. Among other major families: *Nomophila noctuella*, *Patania ruralis* and *Syngamia falsidicalis* from Crambidae; *Drepana pallida*, *Oreta vatama* from Drepanidae and *Clostera anachoreta anachoreta*, *Micromelalopha undulata*, *Gazalina apsara* and *Gazalina chrysolopha* from Notodontidae were major abundant species recorded from GHNP.

Cossidae species *Zeuzera nepalense* was reported for the first time from India, known previously from Pakistan, Nepal and Bhutan. Uraniidae species *Epiplema adamantina* known previously only from Nepal was reported as new to India. Five Larentiinae species, all known earlier only from Nepal, were added to Indian fauna: *Dysstroma planifasciata*,

Electrophaes tsermosaria, *Photoscotosia pallidimaculata*, *Venusia roseicosta* and *Xenortholitha falcata*. Eutellidae species *Anuga japonica* restricted previously to China, Japan and Korea, was reported as new to India. Two Noctuidae species, viz. *Ebertidia haderonides* and *Hermonassa oxyspila*, known till date from Nepal and China, were reported as novel to Indian moth fauna.

Another 68 species were reported for the first time from North-Western Himalaya, while they were restricted previously in other Himalayan Provinces. Two species of *Oxymacaria* (Ennominae), *O. maculosata* and *O. oliva* were reported as novel to Himalayan moth fauna, while they were known till date only from Garo and Khasi Hills, Meghalaya. Among 237 species of GHNP moths, 56 species (23.6%) were uniquely recorded from GHNP only and nowhere else from other Himalayan Provinces.

ALTITUDINAL PATTERN

Among major families of GHNP moth species, altitudinal distribution of Geometridae and Noctuidae were recorded all through the gradient, the mean abundance of Geometridae being around 2100 m, whereas for Noctuidae, it was around 1700 m (Fig. 3.21).

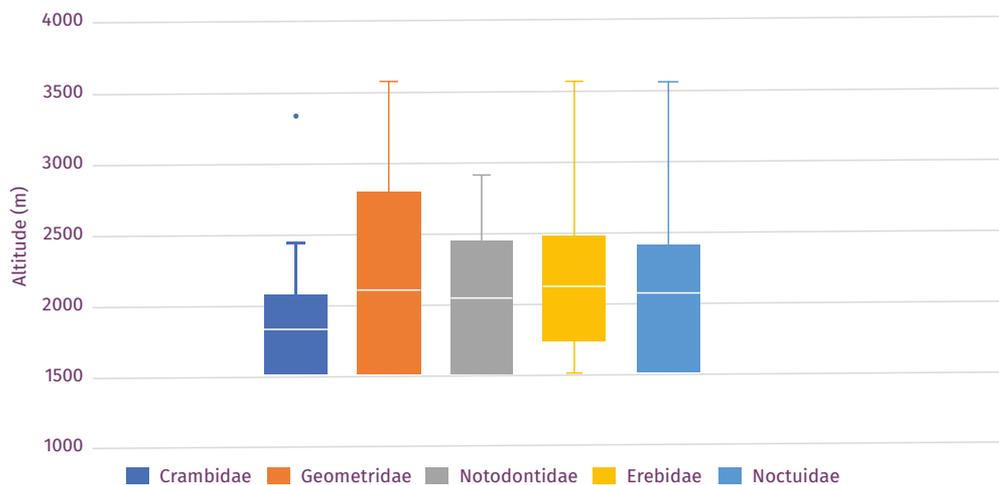


Figure 3.21:
Altitudinal
distribution of
major moth
families in
GHNHP

Among Geometridae, 3 Ennominae species, viz. *Arichanna flavinigra*, *Arichanna tenebraria* and *Opisthograptis tridentifera* were recorded only from altitude above 3500 m, may be those species are highly specific to Alpine habitats, whereas, *Menophra subplagiata* and *Odontopera kametaria* were recorded only from altitude below 2100 m, suggesting that the distribution of those species may be specific to low altitudinal habitats of Pine Forest or Temperate Broadleaved Forest. *Ourapteryx ebuleata*, recorded all through the gradient sampled, had highest abundance in lowest altitudinal site, suggesting that this species may be a generalist in its food choice. Among subfamily Larentiinae, *Photoscotosia amplicata*, although present all through the gradient sampled, was highly abundant at highest altitudinal point, whereas, *Photoscotosia miniosata*, had highest abundance in 3567 m. The pattern of Larentiinae moth clearly indicated that they highly prefer the alpine habitats.

Noctuid species like *Helicoverpa armigera*, *Agrotis ipsilon*, *Mythimna sinuosa*, *Tiracola plagiata*, *Trachea auriplena* and *Thysanoplusia orichalcea* were recorded mainly from lower altitudinal zones of GHNHP, but *Diphtherocome pallida* was recorded from 2800–3567 m and its abundance was highest at the higher elevation in alpine habitats. Other major Noctuid species, viz. *Polia culta*, *Anaplectoides perviridis*, *Dichagyris triangularis*, *Hermonassa oxyspila*, *H. sinuata*, *Paraxestia flavicaudata*, *Perissandria sikkima*, *Phlogophora pectinata*, *Oroplexia luteifrons*, and *Valeriodes heterocampa* were recorded only from 3567 m.

The family Erebidae, although distributed along the entire gradient, maximum species were recorded between 1700–2500 m. *Catocala patala* was the only Erebid recorded from 3567 m, while Arctiinae species *Spilosoma erythrozona* was recorded throughout 1900–3000 m. *Cyana adita* and *Barsine orientalis* were recorded from the altitude up to 2500 m but abundance of those species was higher around the altitude of 1500–2000 m in Pine Forest and Broadleaved Forest. *Ghoria postfusca* recorded all through the gradient, had higher abundance in 2800–3000 m, suggesting that this species may be specific to Conifer Forest. Species of subfamily Lymantriinae, *Lymantria concolor concolor* and *Gonitis mesogona* were only recorded from lower altitude, whereas *Calliteara horsfieldi* was only found from 2800 m.

Majority of Crambidae species were present between 1500–2000 m, except a single species *Syngamia falsidicalis* was present up to 3324 m, whereas *Patania verecunda* was reported only from 2400 m. Mean distribution of Notodontidae was around 2100 m, among which *Gazalina chrysolopha* and *Micromelalopha undulata* were recorded from 2900 m.



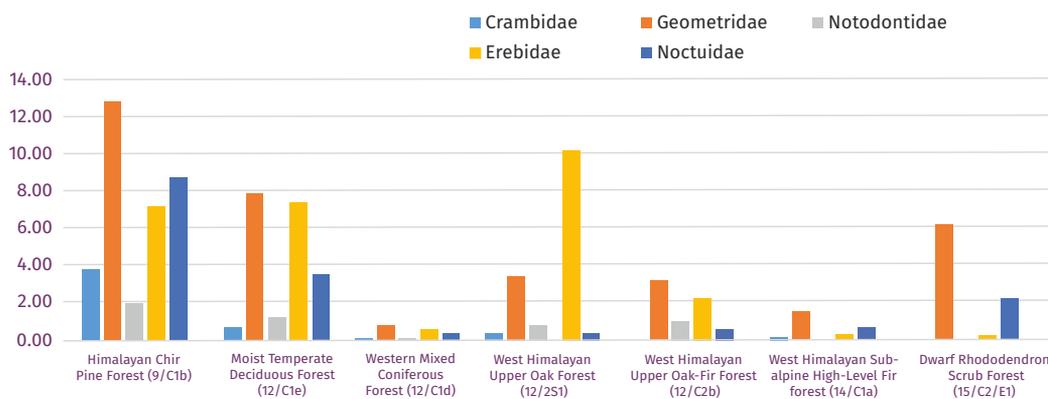
ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among the 7 major habitat/vegetation types sampled, all the major families were active only in Himalayan Chir Pine (9/C1b) and Moist Temperate Deciduous Forest (12/C1e). Geometridae being the most dominant among these two habitats, Noctuidae was most abundant in Chir Pine forest. Activity of Erebidae was highest in Low Level Blue

Pine Forest (12/2S1), while it was almost negligibly present in Western Mixed Conifer Forest (12/C1d), West Himalayan Sub-alpine High-Level Fir forest (14/C1a) and Dwarf Rhododendron Scrub (15/C2/E1). Moth activity was generally very low in Western Mixed Conifer Forest. The two high altitude habitats of West Himalayan Sub-alpine High-Level Fir forest and Dwarf Rhododendron Scrub was dominated by mainly Geometridae and Noctuidae (Fig. 3.22).

Figure 3.22:

Relative Abundance (%) of 5 major Moth families in different habitats of GHNP

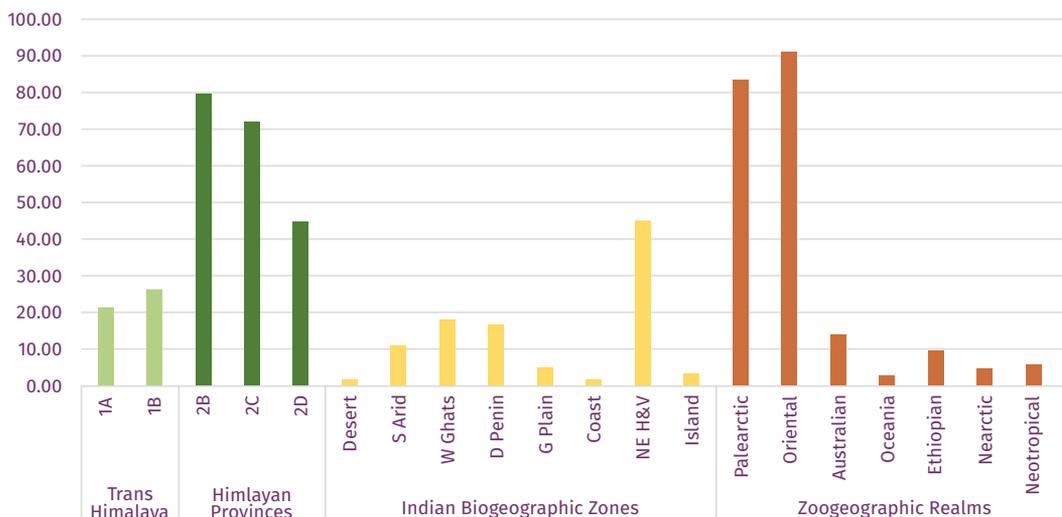


BIOGEOGRAPHIC AFFINITY

Among the sampled moth assemblage of GHNP, 91% species were of Oriental origin, while 83.5% species had affinities towards Palearctic region. 14% species were distributed up to Australian Realm, while only 10% species had Ethiopian affinity. Among Indian Biogeographic Zones and Provinces, only 21% and 26% species were distributed in 2 Trans-Himalayan Provinces, Ladakh Mountain (1A) and Tibetan Plateau (1B). Almost 80% species were shared with Western Himalaya (2B), 72% with Central Himalaya (2C) and 45% species with Eastern Himalaya (2D). 45% species were shared with North Eastern Hills and Valleys, whereas 18% and 17% species were shared with Western Ghats and Deccan Peninsula, respectively (Fig. 3.23).

Figure 3.23:

Biogeographic affinities (% representation) of GHNP Moths with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms







GOVIND WILDLIFE SANCTUARY, UTTARAKHAND, WESTERN HIMALAYA (GARHWAL)

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Manish Bhardwaj, Mohd. Ali*

INTRODUCTION

LANDSCAPE

Govind Wildlife Sanctuary (GWLS) is part of Western Himalayan highland, situated in Puroala Tehsil of the Uttarkashi district in Uttarakhand state. GWLS covers an area of 953.12 km², of which 472.08 km² have been demarcated as National Park encompassing the upper catchment of river Tons, which is the main tributary of river Yamuna. One of the oldest Protected Areas of Uttarakhand, GWLS spans between 1290 m to 6323 m and is drained by two major rivers, Rupin and Supin merging at Netwar village to form the river Tons. A major portion of the landscape falls under alpine conditions that are characterized by moist alpine habitats in Greater Himalaya and dry alpine habitat in Trans Himalaya

sections. The climate of the area is variable, with subtropical climate in lower part of the valley having hot and humid monsoon and cold and dry winter with heavy snowfall in higher areas. The area receives average annual rainfall of 1500 mm, with permanent snowline occurring at 5000 m elevation. About 47 villages are scattered throughout the Sanctuary, where people subsist mainly on livestock, cultivation, and forest products. Being under serious impact of tectonic movement, GWLS is prone to large scale landslides and serious earthquakes (Anonymous, 1986; Sathyakumar, 1994; Uniyal & Ramesh 2004).







BRIEF NOTE ON IMPORTANT FLORA & FAUNA

The forests in GWLS are generally dense and the tree height in canopy usually varies from 15-30 m. There is an admixture of the species of tropical, temperate and subalpine biomes in these forests. The forests bordering habitations suffers heavily from lopping and felling. Fortunately, considerable area and parts of the valley forest is not under serious threat and supports luxuriant growth of dense forest. The fauna of the study area is poorly known other than a few scattered references. This PA is the only site in the

state Uttarakhand where Government of India initiated Project Snow Leopard. This area also represents the easternmost distribution of Western Tragopan. A total of 244 species of birds and 32 species of mammals have been recorded so far from the area. Major wildlife species are Snow Leopard, Brown Bear, Asiatic Black Bear, Musk Deer, Himalayan Tahr, Red Fox, Leopard Cat, Leopard, Yellow-throated Marten, Mountain Weasel, Sambar, Barking Deer, Blue Sheep, Royale's Pika, Red Giant Flying Squirrel and Indian Crested Porcupine. The important avifauna of the area is Himalayan Bearded Vulture, Western Tragopan, Satyr Tragopan, Himalayan Monal, Koklash and Cheer Pheasant which also comes under scheduled species in Indian Wildlife (Protection) Act, 1972 (Dang, 1968; Kumar & Gupta, 2004).

BRIEF HISTORY OF LEPIDOPTERA STUDY IN GWLS & GARHWAL REGION, UTTARAKHAND

BUTTERFLIES

The earliest account on Uttarakhand butterflies, especially from Garhwal region was documented by Hutton (1847) from Mussoorie. Mackinnon & de Nicéville (1897-98) published an extensive account of 323 butterflies from Mussoorie and adjacent areas. The study was based on collections made by Mackinnon in his eleven years field collection which resulted in the largest compilation of species from Western Himalaya. In 1930, Ollenbach documented 144 species of butterflies in and around Mussoorie. Shull (1958) reported 68 species from Mussoorie in a single day survey and again in 1962, he reported over 100 species of butterflies from the same area. Arora & Mandal (1977) recorded 45 species from Garhwal Himalaya. Mandal (1984) recorded 17 species from Garhwal and Tons Valley forest. Baidur (1993) documented 27 species from Nanda Devi National Park. Arora (1994) recorded 68 species from



Rajaji National Park. In 1999, Singh listed butterflies of New Forest Campus, Dehradun, including 148 species. Rose & Sidhu (1997) documented 34 species of Lycaenidae from Mussoorie. Singh & Bhandari (2006) recorded 183 species from Doon Valley. A list of 35 species was documented by Uniyal (2004) from Nanda Devi National Park. A checklist of 147 species of butterflies was published by Singh (2009) from Kedarnath Musk Deer Sanctuary. Bhardwaj (2013) studied butterfly diversity along an elevational gradient in the Tons valley and listed 79 species. Sidhu (2011) prepared a checklist of 66 species of Lycaenidae butterflies from Mussoorie. Uniyal et al. (2013) reported few butterflies from the Gangotri Landscape. Most recently, Singh & Sondhi (2016) provided a consolidated account of 407 species by compiling previous literature and their records of 349 species from Uttarakhand.

SAMPLING DETAILS



MOTHS

Earliest reference of moths on Garhwal region can be extracted from Hampson's Fauna of British India (1892-1896) where several species from Mussoorie and Dehradun in Uttarakhand were mentioned. Roonwal et al. (1963) published a systematic catalogue of the moths recorded from Forest Research Institute, Dehradun. Arora et al. (1977) documented 45 species of moths distributed over 35 genera in 11 families collected from Garhwal district of Uttarakhand during Swiss Zoological Expedition to India. Arora (1997) published an account of moth fauna from Nanda Devi Biosphere Reserve. In State Fauna Series on Uttarakhand published by Zoological Survey of India in 2010, Majumder listed 8 species of Arctiidae, Majumder & Kumar listed 41 species of Sphingidae while Maulik documented 25 species of Lasiocampidae. Uniyal et al. (2016) published a record of 169 Geometridae species from different Protected Areas of Uttarakhand. 248 species of moths were recorded by Sondhi & Sondhi (2016) from Dehradun and Mussoorie and Devalsari in Tehri Garhwal District in Uttarakhand.



During the course of current study (2009-2018), butterfly transects and light trapping for moths were undertaken in 24 sites (**Table 3.3, Fig. 3.24-3.25**). The sampling sites were categorized into 11 dominant vegetation types (**Fig. 3.26-3.27**) according to Champion & Seth (1968) classification, which are as follows:

Himalayan Chir Pine Forest (9/C1b)

High forest of *Pinus roxburghii*, predominant between 1200-1800 m on easy sloping grounds with scanty shrub undergrowth and grass-cover growing during monsoon only. One sampling site fell under this category.

Banj Oak Forest (12/C1a)

A closed canopy forest of *Quercus incana*, *Carpinus*, *Cedrela* grown generally along damp ravines between 1800-2300 m, with association of *Rhododendron arboreum* and *Lyonia ovalifolia*, with shrubby undergrowth. This forest type is generally overlapped with the Chir Pine Forest. Two sampling sites fell under this category.

Moist Deodar Forest (12/C1c)

A pure forest of mainly Deodar, with occasional Blue Pine, Oaks and Rhododendrons grown on cool and moist slopes between 1700-2500 m, with tall shrub layer, mainly of *Parrotia*. Only 2 sampling sites were categorized under this.

Western Mixed Coniferous Forest (12/C1d)

Varying mixture of conifer trees like *Abies pindrow*, *Picea smithiana*, with varying mixture of broadleaved like *Quercus semicarpifolia*, *Euonymus*, *Rhamnus*, *Meliosma*, grown between 2400-3000 m, often broken by open grassy meadows, and with undergrowth of *Rosa*, *Lonicera*, *Strobilanthes*, *Smilax*. Three sampling sites fell under this category.

Moist Temperate Deciduous Forest (12/C1e)

A high deciduous forest of *Aesculus indica*, *Acer caesium*, *A. pictum*, *Betula alnoides*, *Juglans regia*, *Cornus*, *Corylus*, *Taxus baccata*, *Ulmus sp.*, grown on gentler slopes between 1800-2700 m. The undergrowth is rather thin and consists mainly of *Thamnocalamus*, *Viburnum*, *Rubus*, *Berberis*, *Strobilanthes* etc. Three sampling sites came under this category.



Kharsu Oak (12/C2a)

A dense crop of *Quercus semicarpifolia*, *Abies pindrow*, associated with *Rhododendron arboreum*, *Prunus*, *Ilex*, *Acer*, often with dense breaks of dwarfs Bamboo and ground cover of deciduous shrubs of *Rosa*, *Cotoneaster*, *Salix*. Generally grown in moist zone between 2500–3300 m, in areas of short summer and winter with heavy snow fall. Three sampling sites came under this category.

West Himalayan Upper Oak-Fir Forest (12/C2b)

A two-storied high forest with *Abies pindrow*, *Picea smithiana* standing over *Quercus semicarpifolia*, *Q. dilatata*, *Ulmus*, *Aesculus* grown on sheltered slopes between 2600–3400 m. Generally associated with good shrub cover of *Strobilanthes*, *Rubus*, *Sarcococca*, *Rosa* and luxuriant herbaceous growth of *Vitis*, *Schzandra*, *Hedera* etc. Three sampling sites fell under this category.

West Himalayan Sub-alpine High-Level Fir Forest (14/C1a)

An irregular forest consisting of *Abies spectabilis*, *Pinus wallichiana*, *Picea smithiana* and *Betula utilis* with dense undergrowth of *Rhododendron campanulatum*, *Strobilanthes*, *Smilax* grown on snow-free slopes above 3000 m. Two sampling sites fell under this group.

West Himalayan Birch-Fir Forest (14/C1b)

An irregular forest consisting of *Abies spectabilis*, *Betula utilis*, *Quercus semicarpifolia* with dense undergrowth of *Rhododendron campanulatum*, *Sorbus*, *Arundinaria*, *Cotoneaster*, *Rosa* grown on snow-free slopes above 3000 m. Two sampling sites fell under this group.

Birch Rhododendron Scrub Forest (15/C1)

A very dense thicket of *R. campanulatum*, *R. lepidotum* associated with *Betula utilis*, *Sorbus foliolosa*, *Quercus semicarpifolia*, *Berberis*, *Cotoneaster* grown on thick layer of black humus on very wet soil which remain under snow-cover for most of the year. Two sites were categorized under this type.

Deciduous Alpine Scrub (15/C2)

A low deciduous scrub formation of *Rhododendron anthopogon*/ *R. lepidotum*/ *R. campanulatum* grown on dry and arid alpine ground chiefly between 3200–4100 m, with outlying colonies of *Betula* and broken up by grass. A single site was categorized under this.



Table 3.3:
Details of Sampling Sites, Dates and Weather parameters in Govind (GV) WLS, Uttarakhand

SL. No.	Location	Date	Location Code
1	Netwar	29.v.2009	GV01A
		01.xi.2009	GV01B
		24.iv.2010	GV01C
		18.v.2010	GV01D
		01.xi.2010	GV01E
		22.vi.2011	GV01F
		02.xi.2011	GV01G
2	Sankri	08.vi.2009	GV02A
		14.xi.2010	GV02B
		29.xi.2011	GV02C
		31.x.2012	GV02D
3	Changsil I	24.vii.2012	GV03A
4	Haltadi	09.vi.2011	GV04A
		10.vi.2011	GV04B
		18.vii.2017	GV04C
5	Istragad	02.v.2011	GV05A
		08.v.2011	GV05B
6	Kedar Kanta I	10.v.2010	GV06A
		11.v.2010	GV06B
7	Changsil II	20.vii.2012	GV07A
		23.vii.2012	GV07B
8	Jarmola	13.v.2010	GV08A
		15.v.2010	GV08B
9	Jakhol	21.v.2010	GV09A
		23.v.2010	GV09B
10	Taluka I	22.vi.2010	GV10A
		25.10.2010	GV10B
		09.vi.2012	GV10C
		10.vi.2012	GV10D
11	Changsil III	10.vii.2012	GV11A
12	Kedar Kanta II	25.v.2012	GV12A
		26.v.2012	GV12B
13	Changsil IV	12.v.2011	GV13A
		19.vii.2012	GV13B
14	Taluka II	11.vi.2012	GV14A
		12.vi.2012	GV14B
15	Kedar Kanta III	27.v.2012	GV15A

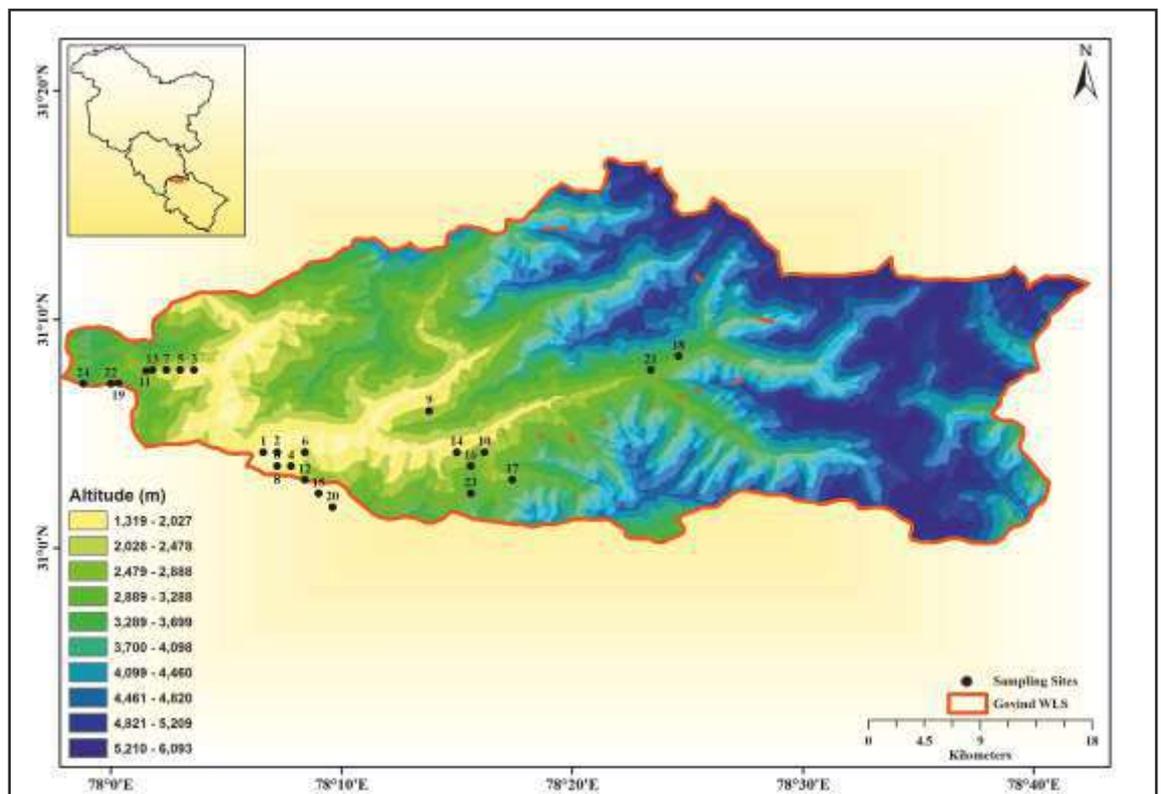
Details									
Latitude (°N)	Longitude (°E)	Altitude (m)	Vegetation Type	Avg. Temp. (°C)		Avg. Hum. (%)		Moon Phase	
				Day	Night	Day	Night		
31.0687	78.1059	1430	Himalayan Chir Pine Forest (9/C1b)	46.4	24.8	86	88.4	WX vi	
				39	14.2	45.2	64	WX xiv	
				40.1	22.4	76	87	WX x	
				22.3	8	35	44.3	WX iv	
				26	10.6	44	73.5	WN x	
				34.4	17.5	73	79.6	WN vi	
				21	10.5	56	68	WX vi	
31.0667	78.1183	1810	Banj Oak Forest (12/C1a)	40.3	23.3	65.4	86.2	WX xiii	
				24.1	8.5	54	56.5	WX viii	
				22.1	10.4	42	43	WX iv	
				26	10.5	75	81	WN i	
31.1319	78.0599	1825	Banj Oak Forest (12/C1a)	36	24.1	99	97.7	WX v	
31.0609	78.1272	2000	Moist Deodar Forest (12/C1c)	33.1	20.1	54	67.3	WX vii	
				45	20.2	66	93.5	WX viii	
				30.1	22.3	52	98.7	WN xiv	
31.1324	78.0463	2030	Moist Deodar Forest (12/C1c)	28.4	12.3	68	61	WN xiv	
				28	10.2	42	59.1	WX v	
31.0702	78.1386	2200	Western Mixed Coniferous Forest (12/C1d)	36	13.2	62	90.3	WN xii	
				38	14.3	66	89	WN xiii	
31.1268	78.0427	2265	Moist Temperate Deciduous Forest (12/C1e)	31	17.3	93	99	WX I	
				24	20.3	99	99	WX iv	
31.0642	78.1200	2420	Western Mixed Coniferous Forest (12/C1d)	32	21.2	64	87	WN xiv	
				37.5	20.4	54	64	WX i	
31.1021	78.2275	2435	Western Mixed Coniferous Forest (12/C1d)	38.2	19.8	78	96.9	WX vii	
				46.2	19.5	54	68.8	WX ix	
31.0710	78.2703	2440	Moist Temperate Deciduous Forest (12/C1e)	38	11.5	54	42	WX viii	
				22	5.4	64	54	WN ii	
				29	10.2	99	99	WN v	
				31	12.7	76	73	WN vi	
31.1251	78.0328	2442	Moist Temperate Deciduous Forest (12/C1e)	28	11.4	41	96	WN vi	
31.0525	78.1380	2610	Kharsu Oak (12/C2a)	35	14.5	65	56.3	WX iv	
				38	12.3	56	75.5	WX v	
31.1256	78.0281	2630	Kharsu Oak (12/C2a)	36	11.4	65	80.4	WX ix	
				38	16.2	85	93	NM	
31.0675	78.2518	2633	Kharsu Oak (12/C2a)	36	11.7	78	83.5	WN vii	
				39	15.3	55	57.5	WN viii	
31.0438	78.1515	2815	West Himalayan Upper Oak-Fir Forest (12/C2b)	42	9.25	45	74.5	WX vi	



SL. No.	Location	Date	Details			
			Location Code	Latitude (°N)	Longitude (°E)	Altitude (m)
16	Taluka III	14.vi.2012	GV16A	31.0626	78.2635	2830
		15.vi.2012	GV16B			
17	Taluka IV	16.vi.2012	GV17A	31.0524	78.2902	3008
18	Harkidun I	24.vi.2012	GV18A	31.1411	78.4102	3020
		26.vi.2012	GV18B			
19	Changsil V	13.vii.2012	GV19A	31.1222	77.9994	3025
		14.vii.2012	GV19B			
20	Kedar Kanta IV	29.v.2012	GV20A	31.0286	78.1618	3230
21	Harkidun II	22.vi.2012	GV21A	31.1319	78.3911	3240
		28.vi.2012	GV21B			
22	Changsil VI	13.v.2011	GV22A	31.1233	77.9962	3443
		18.v.2011	GV22B			
23	Taluka V	17.vi.2012	GV23A	31.0434	78.2625	3447
24	Changsil VII	15.vii.2012	GV24A	31.1248	77.9829	3583
		17.vi.2012	GV24B			



Figure 3.24:
Sampling sites
(24) in the
Western
Himalayan
Landscape of
GWLS,
Uttarakhand on
Digital
Elevation Map



Vegetation Type	Avg. Temp. (°C)		Avg. Hum. (%)		Moon Phase
	Day	Night	Day	Night	
West Himalayan Upper Oak-Fir Forest (12/C2b)	40	14.4	76	73.2	WN x
	38	13.2	34	69.5	WN xi
West Himalayan Upper Oak-Fir Forest (12/C2b)	46	9.6	74	70.5	WN xii
West Himalayan Sub-Alpine High-level Fir Forest (14/C1a)	42	10.8	56	86.4	WX v
	34	9.4	62	74.5	WX vii
West Himalayan Sub-Alpine High-level Fir Forest (14/C1a)	42	9.5	88	94.4	WN ix
	32	11.3	54	74.3	WN x
West Himalayan Birch-Fir forest (14/C1b)	40	8.7	26	76.6	WX viii
West Himalayan Birch-Fir forest (14/C1b)	31	11.9	96	99	WX iii
	43	12.6	85	65.7	WX x
Birch-Rhododendron Scrub Forest (15/C1)	36	10.5	76	78.3	WX x
	37	9.8	69	87	WN i
Deciduous Alpine Scrub (15/C2)	42	12.1	99	91.7	WN xiii
Deciduous Alpine Scrub (15/C2)	21	9.4	99	98.2	WN xi
	29	9.5	98	97.7	WN xiii

*WX= Waxing Phase, i.e. New Moon to Full Moon Period (e.g. WX iii refers to the 3rd day after No Moon); WN= Waning Phase, i.e. Full Moon to New Moon Period (e.g. WN iii refers to the 3rd day after Full Moon).

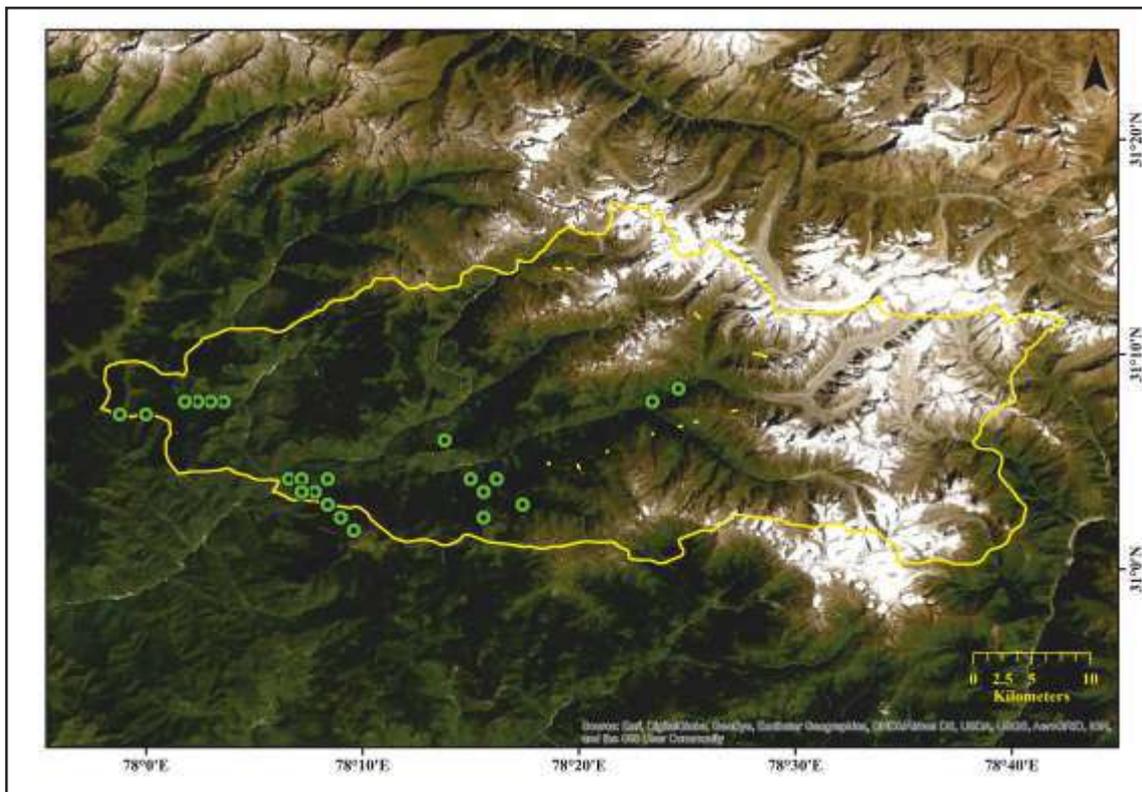


Figure 3.25: All the sampling sites in GWLS shown on Topographic Map



Figure 3.26:

Major vegetation types sampled in GWLS: i. Chir Pine Forest; ii. Banj Oak Forest; iii. Western Mixed Coniferous Forest; iv. Moist Temperate Deciduous Forest

i.



ii.



iii.



iv.





v.

Figure 3.27:

Major vegetation types sampled in GWLS: v. Kharsu Oak Forest; vi. Sub-Alpine High-Level Fir Forest; vii. Birch-Rhododendron Scrub Forest; viii. Deciduous Alpine Scrub



vi.



vii.



viii.



LEPIDOPTERAN ACCOUNT

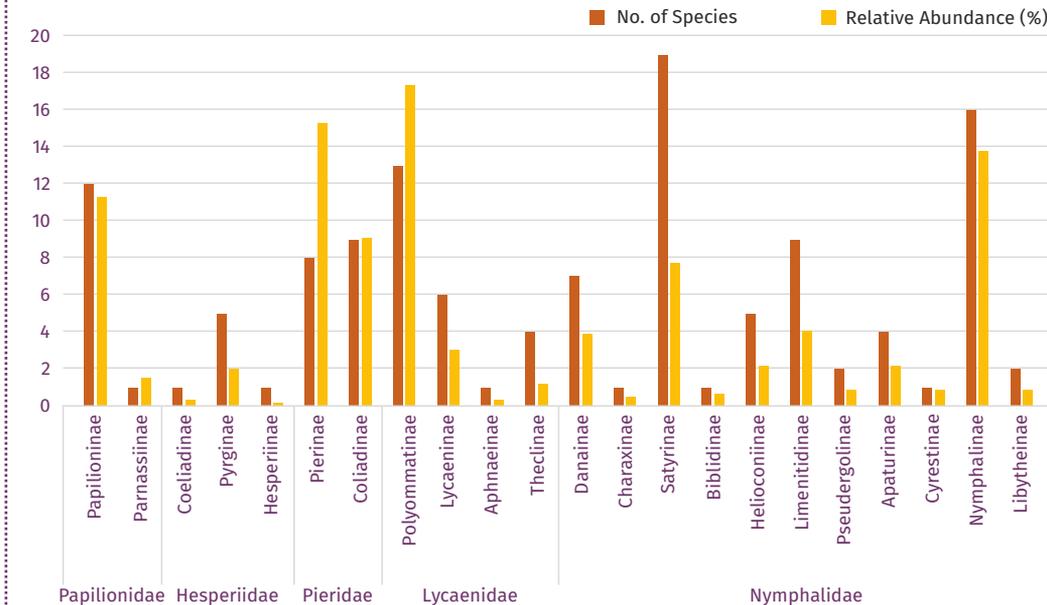
BUTTERFLY

ASSEMBLAGE COMPOSITION

A total number of 130 species of butterflies belonging to 81 genera representing 22 subfamilies of 6 families were recorded from various sampling localities of Govind Wildlife Sanctuary (GWLS). Among subfamilies of Papilionidae, Papilioninae was diverse with 12 species among which *Papilio protenor protenor*, *P. machaon* and *Pachliopta aristolochiae aristolochiae* were most abundant. Parnassiinae was represented by a single species *Parnassius hardwickii hardwickii* of which total 8 individuals were recorded. In Hesperidae, subfamily Pyrginae was most

speciose with 5 species, among which *Celaenorrhinus leucocera* and *Sarangesa dasahara dasahara* were most abundant. For family Pieridae, Pierinae and Coliadinae were diverse with 8 and 9 species respectively. *Pieris canidia indica* of Pierinae and *Gonepteryx nepalensis* of Coliadinae were highly abundant. Among Lycaenidae, Polyommatainae had 13 species with *Lampides boeticus* being most abundant. Lycaeninae and Theclinae were represented by 6 and 4 species respectively with *Lycaena phlaeas baralacha* (Lycaeninae) and *Chliaria kina kina* (Theclinae) were recorded with high number of individuals.

Figure 3.28: No. of species and Relative Abundance (%) of different families and subfamilies of Butterflies of GWLS



Nymphalidae was the most diverse family with 11 subfamilies among which Satyrinae had 19 species while Nymphalinae had 16 species (Fig. 3.28). *Mycalesis mineus mineus* was most abundant for Satyrinae and *Aulocera padma padma* and *Lasiommata schakra schakra* were also recorded in high numbers. Nymphalinae was most abundant subfamily with *Junonia orithya ocyale*, *Vanessa cardui* and *Aglais caschmirensis caschmirensis* being recorded in high numbers. Among other major subfamilies,

Limenitidinae having 9 species with *Neptis mahendra mahendra* as most abundant and Heliconiinae represented by 5 species with *Issoria issaea* as most abundant species. *Dodona durga durga* and *Dodona eugenes* were the only 2 species of Riodinidae recorded from GWLS. *Graphium doson axionides*, *Pachliopta aristolochiae aristolochiae* (Papilionidae), *Tirumala septentrionis septentrionis* and *Dilipa morgiana* (Nymphalidae) were reported exclusively from GWLS.

ALTITUDINAL PATTERN

Altitudinal stratification of butterflies of GWLS revealed only Pieridae and Nymphalidae to be distributed through the entire gradient, with mean abundance of Pieridae recorded around 2700 m, highest among all the families. *Pieris canidia indica* and *Colias erate* were among the species recorded from highest sites above 3500 m. Mean species abundance of Nymphalidae was around 2100 m with 4 species recorded above 3400 m among which *Aulocera swaha garuna* was recorded only from 3400 m, while *Issoria issaea*, *Aglais caschmirensis caschmirensis* and *Nymphalis xanthomelas fervescens* were reported above 3200 m. Major species distribution of Hesperidae was confined between a

narrow altitudinal belt of 1800 m to 2200 m with mean species distribution at 2000 m. None of the species were recorded above 2600 m, but *Choaspes benjaminii japonica* and *Spialia galba galba* were recorded from 2600 m. Mean species distribution of Papilionidae was around 2100 m with only *Parnassius hardwickii hardwickii* and *Papilio machaon* recorded above 3000 m. Mean species distribution of Lycaenidae was around 2400 m with most of the species recorded between 2100 m to 2800 m. The species which were abundant above 3000 m were *Lycaena kasyapa*, *Lycaena phlaeas baralacha* and *Celastrina huegelii huegelii*. *Lampides boeticus* was abundant all through the gradient from 1400 m to 3400 m (Fig. 3.29).

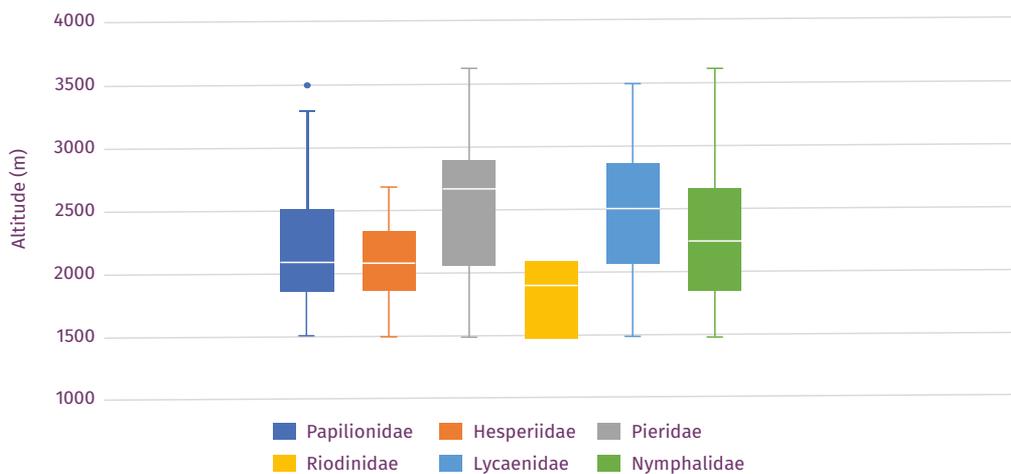


Figure 3.29: Altitudinal distribution of Butterfly families in GWLS

ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

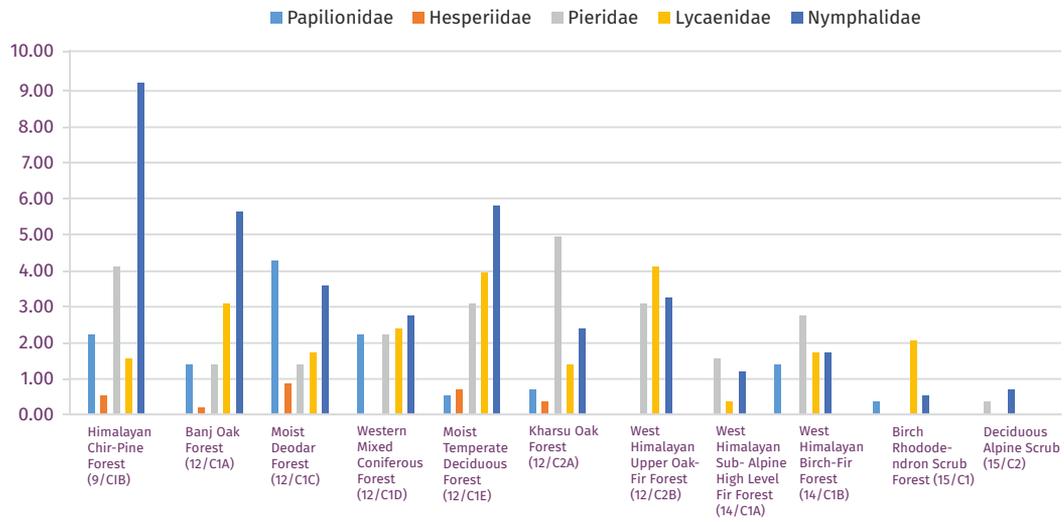
Among 11 habitat types sampled, Papilionidae and Hesperidae were most abundant in Moist Deodar Forest (12/C1c). Family Pieridae was mostly active in Kharsu Oak Forest (12/C2a) followed by Chir Pine (9/C1b), whereas it was completely absent from Birch-Rhododendron Scrub Forest (15/C1). Abundance of Lycaenidae was high in Moist Temperate Deciduous Forest (12/C1e), Western Himalayan Upper Oak-Fir Forest (12/C2b) and Banj Oak Forest (12/C1a). Nymphalidae was the only family present in all the habitats being highly abundant in Chir Pine Forest with considerable abundance in Banj Oak and Moist Temperate Deciduous Forest. The family was least abundant from Birch-Rhododendron Scrub Forest (Fig. 3.30).





Figure 3.30:

Relative Abundance (%) of 5 Butterfly families in different habitats of GWLS



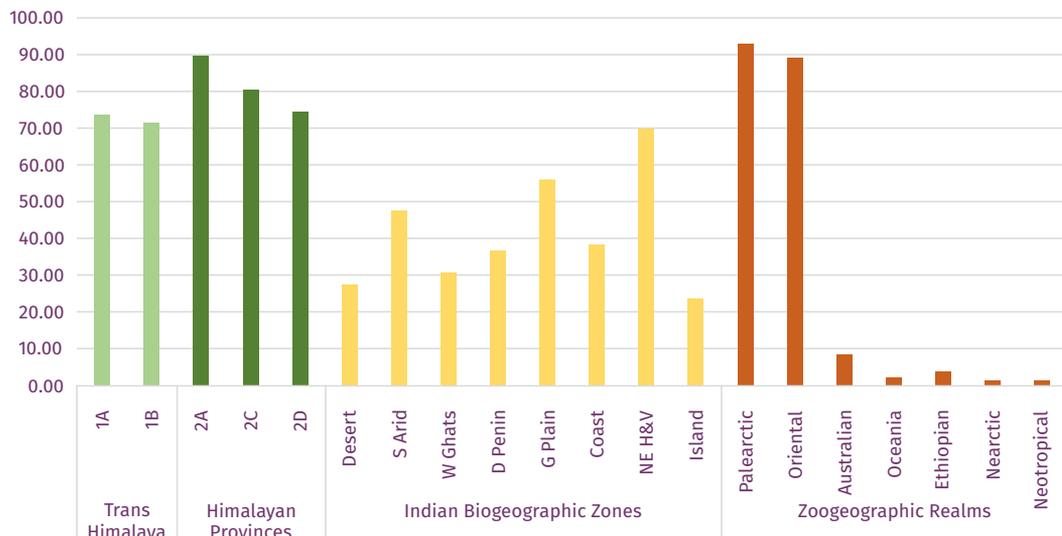
BIOGEOGRAPHIC AFFINITY

Butterfly assemblage of GWLS had 93% affinity with Palearctic fauna while 89% affinity with Oriental fauna. Among other realms, 8.5% species were shared with Australian fauna and 4% with Ethiopian fauna. Among Himalayan provinces the assemblage had 90% overlap with North-Western province (2A) followed by 80% with Central Himalaya (2C) and 74% with Eastern Himalaya (2D). The two Trans-

Himalayan provinces (Ladakh Mountain- 1A and Tibetan Plateau- 1B) were shared by 73% and 71% species respectively. Among other Indian biogeographic Zones and Provinces 70% overlap was found with North Eastern Hills and Valleys, followed by 56% with Gangetic Plains, 47% with Semi-Arid regions. 38% species were also shared with Coastal zones (Fig. 3.31).

Figure 3.31:

Biogeographic Affinities (% representation) of GWLS butterflies with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms



MOTH

ASSEMBLAGE COMPOSITION

From GWLS, 358 species of moths were recorded representing 276 genera under 60 subfamilies belonging to 21 families which included Cossidae (1 species), Limacodidae (6), Zygaenidae (1), Callidulidae (1), Pyralidae (7), Crambidae (27), Drepanidae (16), Lasiocampidae (6), Eupterotidae (1), Brahmaeidae (1), Endromidae (1), Bombycidae (1), Saturniidae (5), Sphingidae (13), Uraniidae (4), Geometridae (114), Notodontidae (24), Erebiidae (65), Euteliidae (1), Nolidae (3) and Noctuidae (60).

The superfamily Pyraloidea was represented by 7 species of Pyralidae and 27 species of Crambidae, later having 5 subfamilies among which Spilomelinae was most diverse with 21 species. The species *Hyaloplaga pulchralis* (Pyraustinae) was super abundant with 3 other Spilomelinae viz. *Glyphodes crithealis*, *Nagiella quadrimaculalis* and *Nomophila noctuella* recorded in high abundance. Family

Drepanidae was represented by 16 species with *Gaurena sinuata dierli* and *Drepana pallida* recorded in high abundance. Family Sphingidae was represented by 13 species in 3 subfamilies with *Hippotion rosetta*, *Leucophlebia lineata* and *Psilogramma increta* as highly abundant species.

Among the largest family Geometridae, Ennominae was represented by 60 species, amidst which *Heterolocho phoenicotaeniata*, *Lassaba albidaria*, *Anonychia violacea* and *Abraxas sylvata* were recorded in very high numbers. Subfamily Larentiinae was represented by 32 species with super abundance of *Perizoma albofasciata* as well as *Martania seriata*, *Ecliptopera postpallida*, *Euphyia subangulata* and *Photoscotosia amplicata* were also recorded in high numbers. Subfamily Geometrinae was represented by 15 species (Fig. 3.32) among which *Comostola subtiliaria* was most abundant. *Pingasa ruginaria*, *Pelagodes veraria* were other abundant Geometrinae.

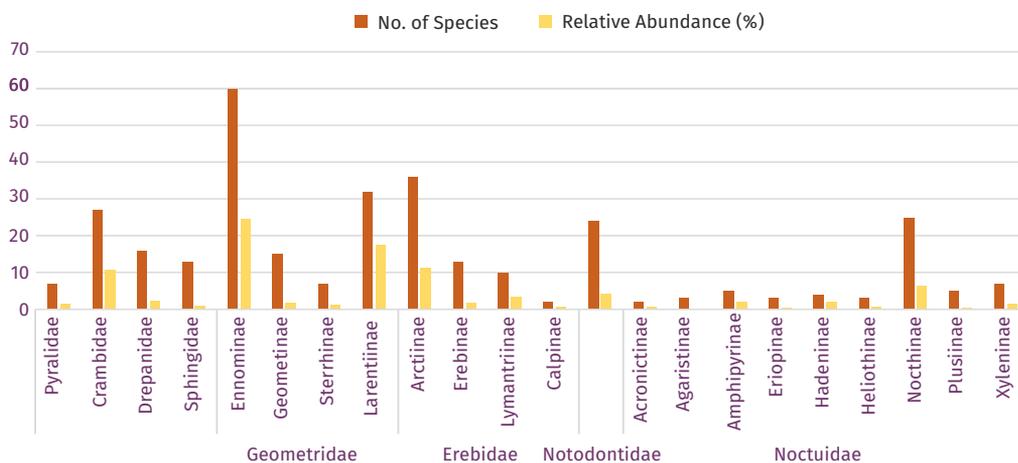


Figure 3.32: No. of species and Relative Abundance (%) of different families and subfamilies of Moths of GWLS

Family Erebiidae was represented by 8 subfamilies among which Arctiinae had 38 species with 3 very super-abundant species *Churinga beema*, *Spilarctia leopardina* and *Spilosoma erythrozona*. Subfamily Erebininae was represented by 13 species, *Ericea pertendens* being the most abundant. Subfamily Lymantriinae had 10 species with *Artaxa vitellina* recorded in highest abundance.

Total 24 species of family Notodontidae were recorded representing 8 subfamilies, *Rachia plumosa*

being very highly abundant followed by 2 Thaumetopoeinae species *Gazalina apsara* and *G. chrysolopha*. Noctuidae was represented by 60 species under 12 subfamilies among which Noctuinae was most species-rich and abundant, followed by Xyletinae. Among the most abundant Noctuidae species *Diphtherocome pallida*, *Polia culta* and *Xestia bdelygma* can be mentioned.

Interestingly, 13 species were reported as new to Indian Fauna: *Gaurena sinuata dierli* (Drepanidae),



known previously from Nepal and Tibet; Ennominae species *Hydatocapnia gemina* known previously from Pakistan, Nepal upto Sundaland; 3 Larentiinae species *Venusia roseicosta* and 2 *Photoscotosia* species, *P. funebris* and *P. pallidimaculata* all known from Nepal previously; 1 Notodontidae species *Honveda nepalina*, restricted only to Nepal; 1 Arctiinae (Erebidae) species *Lemyra melli*; 6 species of Noctuidae, among which 3 *Xestia* viz. *X. angara*, *X. bdelygma* and *X. gandakiensis*, *Heliophobus texturata*, *Ebertidia haderonides* and *Phlogophora meticulodina* all known previously from Nepal and China were reported as novel to Indian moth fauna.

All in all, 70 species of moths known previously from other Himalayan Provinces were recorded for the first time from Western Himalayan (2B) landscape of GWLS. One Notodontidae, *Hexafrenum collaris* was reported for the first time from Indian Himalayas, which was previously known from Assam and Meghalaya. An overwhelming number of 89 species, that is 25% species of the assemblage, were unique to GWLS, which were recorded from nowhere else in the Himalayas.

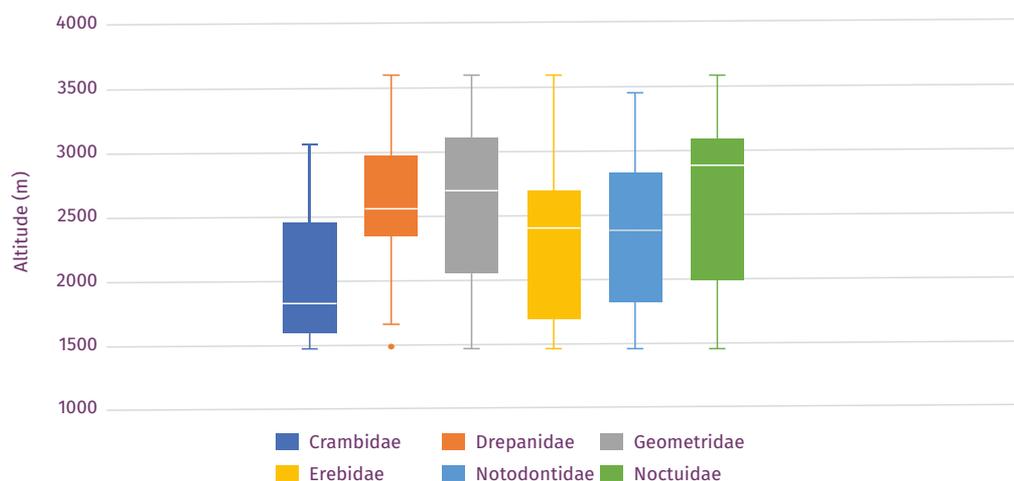
ALTITUDINAL PATTERN

Altitudinal stratification of 6 major families reveal that mean species distribution of family Crambidae was lowest, recorded around 1800 m, where most of the species were active between 1600–2400 m. *Glyphodes crithealis* was the only species recorded above 3000 m. Mean species distribution of Drepanidae was around 2600 m with most of the species active between 2400–3000 m. Among the Drepanidae species, recorded from high elevation, 2 species of *Gaurena*, *G. sinuata dierli* and *G. florens* were most prominent.

Geometridae, present throughout the entire gradient, have mean species distribution around 2600 m with maximum species activity up to 3200 m. Among the family, *Abraxas irrorata*, *Arichanna tenebraria*, *Venusia crassisigna* and *V. roseicosta* showed activity only above 3500 m. Other generelist species like *Lassaba albidaria*, *Electrophaes recta* and *Martania seriata* were active all through the gradient.

Erebidae, though distributed throughout the gradient, were mostly distributed between 1600–2600 m with mean species distribution at 2100 m. Among the Erebidae species of high-altitude sites *Cladarctia quadriramosa*, *Aloa lactinea*, *Lemyra melli* (Arctiinae), *Cymatophoropsis sinuata* (Calpinae) were prominent. Mean distribution of Notodontidae was at 2300 m with most of the species active between 1800 m to 2800 m, *Rachia plumosa* was the most prominent species of high-altitude sites. Among all the families, mean species distribution of Noctuidae was at highest sites at around 2900 m with maximum species activity up to 3200 m. Several species were active between 3000–3500 m, most prominent among them being *Diphtherocome pallida*, *Dichagyris triangularis*, *Paraxestia flavicaudata* and *Valeriodes heterocampa*. Two typical Noctuid genera *Hermonassa* and *Xestia* had preference only for the high-altitude sites (Fig. 3.33).

Figure 3.33: Altitudinal distribution of major Moth families in GWLS



ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among 11 vegetation types sampled, abundance was high in Moist Temperate Deciduous (12/C1e), Kharsu Oak (12/C2a) and Western Himalayan Upper Oak-Fir Forest (12/C2b), basically due to very high abundance of Geometridae in these three habitats. While Erebids were most dominant in lowest

altitudinal habitats of Chir Pine Forest (9/C1b), Noctuids were abundant in highest altitude habitats of Deciduous Alpine Scrub (15/C2). Birch-Rhododendron Scrub Forest (15/C1) was the least preferred habitat for moths. Clear preference of Notodontidae was ambiguous except for Banj Oak Forest (12/C1a), whereas, Crambidae was most dominant at Moist Temperate Deciduous, Kharsu Oak and Banj Oak Forest (Fig. 3.34).

BIOGEOGRAPHIC AFFINITY

While 96% species of moths of GWLS were of Oriental origin, 74% were also distributed in Palearctic region. 16.5% species were shared with Australian realm with 11% affinity reported with Ethiopian realm. Among Indian Biogeographic Zones and Provinces, only 19% and 22% species were shared with two Trans-Himalayan habitats (Ladakh Mountain- 1A and Tibetan Plateau- 1B). 74% species were also distributed in Central Himalaya (2C), followed by 68% species in North-Western Himalaya (2A) and 48% with Eastern Himalaya (2D). Almost 55% species were shared with North Eastern Hills and Valleys, while 27% and 24% species were shared between Deccan Peninsula and Western Ghats respectively (Fig. 3.35).

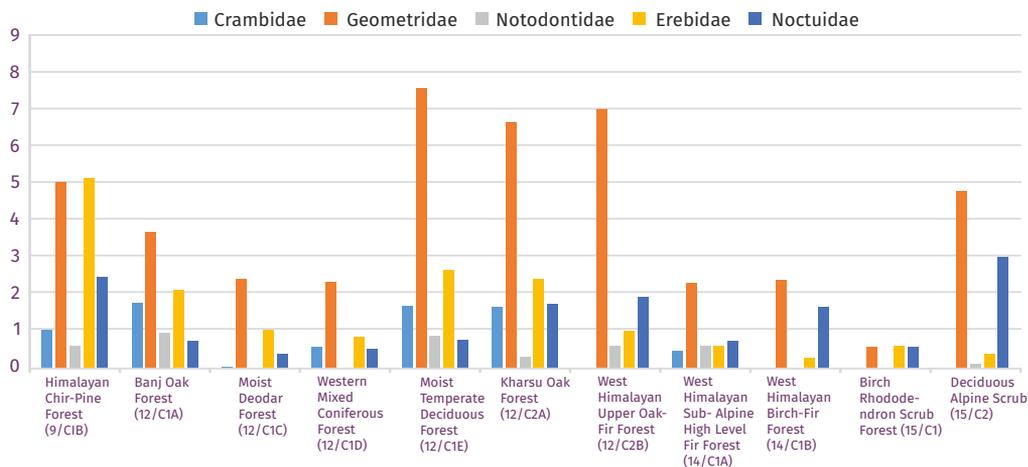


Figure 3.34: Relative Abundance (%) of major Moth families in different habitats of GWLS

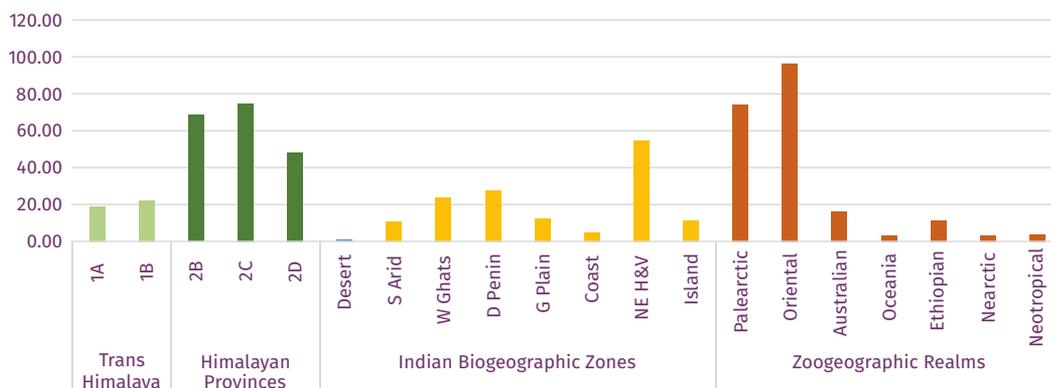


Figure 3.35: Biogeographic Affinities (% representation) of GWLS moths with other Himalayan Provinces, Indian Biogeographic Zones and Zoogeographic Realms



ASKOT WILDLIFE SANCTUARY, UTTARAKHAND, WESTERN HIMALAYA (KUMAON)

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Kaushik Mallick, Kamalika Bhattacharyya*

INTRODUCTION

LANDSCAPE

Askot Wildlife Sanctuary (AWLS) is located in the north of Pithoragarh District in the Kumaon Himalayas of Uttarakhand. The Landscape is biogeographically unique being situated in the conjunction of the Western and Eastern Himalayas and Tibetan Plateau, sharing International boundaries with Nepal, India and Tibet (China). The area covers 600 km² land mass (Samant et al., 1998 a) of which 289 km² is Reserved Forests, 225 km² Civil and Van Panchayats and 85 km² is Agricultural lands. The northern boundary of the Landscape runs in a straight line near Lipu Lekh and goes west to the

Lissar Yangti river. The Eastern boundary is marked by the river Kali from Nabhidang to Jauljibi along with Indo-Nepal border moving south-west. The Western boundary runs with river Gori from Jauljibi till Ralam Gadh. It also includes the entire Ralam basin. The altitudinal variation ranges from 630 m at Jauljibi, which is situated in the junction of the two major rivers Gori and Kali, to 7434 m at the summit of Nanda Devi East. This huge altitudinal range is represented by six major Biomes, viz., Subtropical, Warm Temperate, Cool Temperate, Sub-Alpine, Alpine and Nival (permanent snow), with corresponding climate types as subtropical, warm temperate, cool temperate, boreal, sub polar and polar (Samant et al., 1998b; Negi, 2012).







BRIEF NOTE ON IMPORTANT FLORA & FAUNA

Biogeographic uniqueness and variety of habitats in AWLS gives rise to massive biodiversity value and high species richness. Mainly, 11 major forest communities were identified from the landscape, with 573 species of plants recorded, among which 124 trees, 112 shrubs, 24 climbers, 35 orchids and 278 species of herbs were identified (Bisht et al., 2015). A total of 16 plant species were of conservation importance, like *Aconitum heterophyllum*, *Dactylorhiza hatagirea*,

Picrorhiza kurroa, *Podophyllum hexandrum*, *Saussurea obvallata* etc. 480 species of birds were recorded, mainly from Gori Ganga Valley (Raza, 2005), including 10 species of pheasants, prominent among which were Satyr Tragopan, Himalayan Monal, Cheer Pheasant. 40 species of mammals were reported, among which important Carnivore species were Snow Leopard, Eurasian Lynx, Leopard Cat and Tiger reported recently from 3050 m altitude (Bhattacharya et al., 2015). Five families of butterflies, 19 families of moths and 7 families of beetles are known, with report of 12 species of fishes (Rajput et al., 2015).

BRIEF HISTORY OF LEPIDOPTERA STUDY IN AWLS & KUMAON REGION, UTTARAKHAND

BUTTERFLIES

The earliest account on Kumaon butterflies was documented by Doherty (1886) with an extensive list of 271 species. Between 1910 and 1915, Hannyngton published a series of papers in Journal of Asiatic Society of Bengal, listing 378 species butterflies from Kumaon. Smetacek had published significant work on Kumaon butterflies, with review notes on Himalayan Neptini. New altitudinal range record of *Rapala pheretimus* from Kumaon was reported by Smetacek (1995). He also described a

new sub-species of *Mycalesis suaveolens* from this region. *Ypthima kedarnathensis*, a new species described by Singh (2007) from Kedarnath WLS was also reported by Smetacek (2010) from Kumaon. Later, the species was synonymized under *Ypthima sakra* by Sharma (2013).





MOTHS

Most significant work on Kumaon moths were published by Smetacek (1994, 2008, 2009 & 2011b, 2011c) recorded from different elevations in Bhimtal region of Nainital district based on his observation from 1970s, and material collection by Hauenstein and Hacker in Germany and some specimens in the Natural History Museum, London and in the University Museum, Oxford. A recent report published from AWLS documented about 110 species of moths belonging to 19 families (Sanyal et al., 2015).



SAMPLING DETAILS

During the course of current study (2016-2018), butterfly transects and light trapping for moths were undertaken in 27 sites (Table 3.4, Fig. 3.35-3.36). The sampling sites were categorized into 12 dominant vegetation types (Fig. 3.37-3.38) according to Champion & Seth (1968) classification, which are as follows:

Dry Siwalik Sal Forest (5B/C1a)

A dry deciduous forest of irregular canopy, grown on shallow, sandy soil, derived from Siwalik sand rock. Dominated by *Shorea robusta*, *Anogeissus latifolia*, *Diospyros*, *Terminalia*, *Cassia fistula* and often associated with *Lagerstroemia*, *Mallotus*, *Dendrocalamus*. Only one sampling site was categorized under this type.

Himalayan Chir Pine Forest (9/C1b)

High forest of *Pinus roxburghii*, predominant between 1200-1800 m on easy sloping grounds with scanty shrub undergrowth and grass-cover growing during monsoon only. Five sampling sites fell under this category.

Banj Oak Forest (12/C1a)

A closed canopy forest of *Quercus incana*, *Carpinus*, *Cedrela*, grown generally along damp ravines between 1800-2300 m, with association of *Rhododendron arboreum* and *Lyonia ovalifolia*, with shrubby undergrowth. This forest type is generally overlapped with the Chir Pine Forest. A single sampling site fell under this category.

Moist Deodar Forest (12/C1c)

A pure forest of mainly Deodar, with occasional Blue Pine, Oaks and Rhododendrons grown on cool and moist slopes between 1700-2500 m, with tall shrub layer, mainly of *Parrotia*. Only one sampling site was categorized under this.

Rianj Oak (*Q. lanuginosa*) Forest

This type of forest can be found between 1500-2000 m on rocky and drier slopes, chiefly of *Quercus lanuginosa* associated with *Rhododendron arboreum*. Three sampling sites fell under this category. Along with Banj and Moru Oak, this typical Oak forest is considered under Lower Western Himalayan Temperate Forest.

Western Mixed Coniferous Forest (12/C1d)

Varying mixture of conifer trees like *Abies pindrow*, *Picea smithiana*, with varying mixture of broadleaved like *Quercus semicarpifolia*, *Euonymus*, *Rhamnus*, *Meliosma* grown between 2400-3000 m, often broken by open grassy meadows, and with undergrowth of *Rosa*, *Lonicera*, *Strobilanthes*, *Smilax*. Three sampling sites fell under this category.



Kharsu Oak (12/C2a)

A dense crop of *Quercus semicarpifolia*, *Q. dilatata*, *Betula alnoides*, *Pyrus lanata* associated with *Meliosma*, *Rhododendron arboreum*, *R. barbatum*, *Sorbus*, *Acer* often with dense breaks of dwarf Bamboo and ground cover of deciduous shrubs of *Rosa*, *Viburnum*, *Cotoneaster*, *Strobilanthes*. Generally grown in moist zone between 2500-2900 m, in areas of short summer and winter with heavy snow fall. One sampling site came under this category.

West Himalayan Upper Oak-Fir Forest (12/C2b)

A two-storied high forest with *Abies pindrow*, standing singly over *Quercus semicarpifolia*, *Q. dilatata*, *Pyrus lanata*, *Rhododendron arboreum*, *R. barbatum* grown on sheltered slopes between 2600-3400 m. Generally associated with good shrub cover of *Rosa*, *Viburnum*, *Berberis* etc. and often associated with *Arundinaria*, *Thamnocalamus*. Two sampling sites fell under this category.

West Himalayan Birch-Fir Forest (14/C1b)

An irregular forest consisting of *Abies spectabilis*, *Betula utilis*, *Quercus semicarpifolia* with dense undergrowth of *Rhododendron campanulatum*, *Sorbus*, *Arundinaria*, *Cotoneaster*, *Rosa* grown on snow-free slopes above 3000 m. Two sampling sites fell under this group.

Birch Rhododendron Scrub Forest (15/C1)

A very dense thicket of *R. campanulatum*, *R. lepidotum* associated with *Betula utilis*, *Sorbus foliolosa*, *Quercus semicarpifolia*, *Berberis*, *Cotoneaster* grown on thick layer of black humus on very wet soil which remain under snow-cover for most of the year. Only one sampling site was categorized under this type.

Deciduous Alpine Scrub (15/C2)

A low deciduous scrub formation of *Rhododendron anthopogon*/ *R. lepidotum*/ *R. campanulatum* grown on dry and arid alpine ground chiefly between 3200-4100 m, with outlying colonies of *Betula* and broken up by grass. Three sampling sites fell under this group.

Alpine Pasture (15/C3)

Meadow type of habitat, grown in areas having very short snow free period, composed mostly of perennial mesophytic herbs, mainly *Primula*, *Anemone*, *Fritillaria*, *Iris*, *Gentiana* with very little grass. Two sampling sites fell under this category.



Table 3.4:
Details of Sampling Sites, Dates and Weather parameters in Askot (AS) WLS, Uttarakhand

Sl. no.	Location	Date	Location Code
1	Jauljivi	28.v.2013	AS01A
		05.vi.2013	AS01B
		19.ix.2016	AS01C
		10.vi.2017	AS01D
		24.ix.2017	AS01E
2	Ganagaon	24.xi.2016	AS02A
		11.vi.2017	AS02B
3	Baram Pool	26.ix.2016	AS03A
4	40 Khet Pool	02.vi.2017	AS04A
5	Jalebi Bend	09.vi.2018	AS05A
6	Chilamdhar	09.x.2017	AS06A
		03.vi.2017	AS07A
		11.vi.2018	AS07B
7	Kanar I	04.vii.2018	AS07C
		27.ix.2017	AS08A
8	Pamdiyo	13.vi.2018	AS09A
9	Kanar II	22.ix.2016	AS10A
		04.vi.2017	AS10B
		14.vi.2018	AS10C
10	Gowalghat I	07.x.2017	AS11A
11	Syuni	28.ix.2017	AS12A
12	Babaldhar	16.vi.2018	AS13A
13	Gowalghat II	08.x.2017	AS14A
14	Main Singh Top	05.vi.2017	AS15A
		18.vi.2018	AS15B
15	Jimjari	20.vi.2018	AS16A
16	Ringal Forest I	25.ix.2016	AS17A
17	Ringal Forest II	06.x.2017	AS18A
18	Mapang	03.vii.2018	AS19A
19	Vayman Field	06.vi.2017	AS20A
20	Vayman Gufa	30.ix.2017	AS21A
		23.ix.2016	AS22A
21	Railkot	23.vi.2018	AS22B
		05.x.2017	AS23A
22	Vayman	24.vi.2018	AS24A
23	Burfu	01.x.2017	AS25A
24	Vatyakhan	26.vi.2018	AS26A
25	Martoli	30.vi.2018	AS27A
26	Tejamkhaya		
27	Chipla Kedar		

Details						
Latitude (°N)	Longitude (°E)	Altitude (m)	Vegetation Type	Avg. Temp. (°C)	Avg. Hum. (%)	Moon Phase*
29.7508	80.3788	632	Dry Siwalik Sal Forest (5B/C1a)	18.6	94.36	WN iii
				18.33	96.15	WN xi
				18.25	88.5	WN ii
				19.1	94.3	WN I
				22.8875	95.3875	WX iv
29.7543	80.3820	749	Himalayan Chir Pine Forest (9/C1b)	6.25	83.125	WN x
				19.8	87.56	WN ii
29.8690	80.3718	1121	Himalayan Chir Pine Forest (9/C1b)	17.1	85.5	WN ix
29.8847	80.3895	1272	Himalayan Chir Pine Forest (9/C1b)	19.5	92.375	WX vii
29.8869	80.3908	1430	Himalayan Chir Pine Forest (9/C1b)	22.26	91.7	WN xi
30.1375	80.2478	1714	Himalayan Chir Pine Forest (9/C1b)	20.96	73.46	WN iii
29.9049	80.4039	1843	Banj Oak Forest (12/C1a)	18.125	97.5	WX viii
				19.225	82.075	WN xiii
				17.2	80.125	WN vi
30.1574	80.2446	2009	Moist Deodar Forest (12/C1c)	22.8	82.2	WX vii
29.9113	80.4069	2061	Rianj Oak (<i>Q. lanuginosa</i>) Forest	20.2	89.56	WN xv
29.9139	80.4033	2248	Rianj Oak (<i>Q. lanuginosa</i>) Forest	14.02	97.33	WN v
				18.6	93.33	WX ix
				17.7	94.02	NM
30.1971	80.2267	2279	Western Mixed Coniferous Forest (12/C1d)	17.1	85.6	WN i
30.1783	80.2317	2442	Western Mixed Coniferous Forest (12/C1d)	15.25	94.775	WX viii
29.9178	80.4001	2462	Rianj Oak (<i>Q. lanuginosa</i>) Forest	16.62	97.92	WX ii
30.1779	80.2440	2547	Western Mixed Coniferous Forest (12/C1d)	17.633	74.3	WN ii
29.9290	80.3880	2655	Kharsu Oak (12/C2a)	13.85	85.25	WX x
				14.76	79.442	WX iv
29.9237	80.3930	2800	West Himalayan Upper Oak-Fir Forest (12/C2b)	13.86	89.98	WX vi
29.9245	80.3916	2932	West Himalayan Upper Oak-Fir Forest (12/C2b)	13.12	98.75	WN viii
30.2737	80.2161	3015	West Himalayan Birch-Fir Forest (14/C1b)	16.033	65.366	FM
29.9271	80.3898	3065	West Himalayan Birch-Fir Forest (14/C1b)	11.34	96.48	WN v
29.9291	80.3880	3166	West Himalayan Birch-Fir Forest (14/C1b)	8.25	98.75	WX xi
30.3112	80.2081	3150	West Himalayan Birch-Fir Forest (14/C1b)	13.3	83.15	WX x
29.9319	80.3884	3225	Birch-Rhododendron Scrub Forest (15/C1)	9.125	97.63	WN vi
				10.36	95.44	WX ix
30.3683	80.1876	3343	Deciduous Alpine Scrub (15/C2)	11.175	79.35	WX xv
29.9403	80.3972	3390	Deciduous Alpine Scrub (15/C2)	10.66	96.1	WX x
30.3438	80.1910	3427	Deciduous Alpine Scrub (15/C2)	12.48	87.36	WX xi
29.9470	80.3970	3700	Alpine Pasture (15/C3)	10.04	97.5	WX xii
29.9663	80.4259	4216	Alpine Pasture (15/C3)	8.95	100	WN

*WX= Waxing Phase, i.e. New Moon to Full Moon Period (e.g. WX iii refers to the 3rd day after No Moon); WN= Waning Phase, i.e. Full Moon to New Moon Period (e.g. WN iii refers to the 3rd day after Full Moon); NM= No Moon, FM= Full Moon.



Figure 3.35: Sampling sites (27) in the Western Himalayan Landscape of AWLS, Uttarakhand on Digital Elevation Map

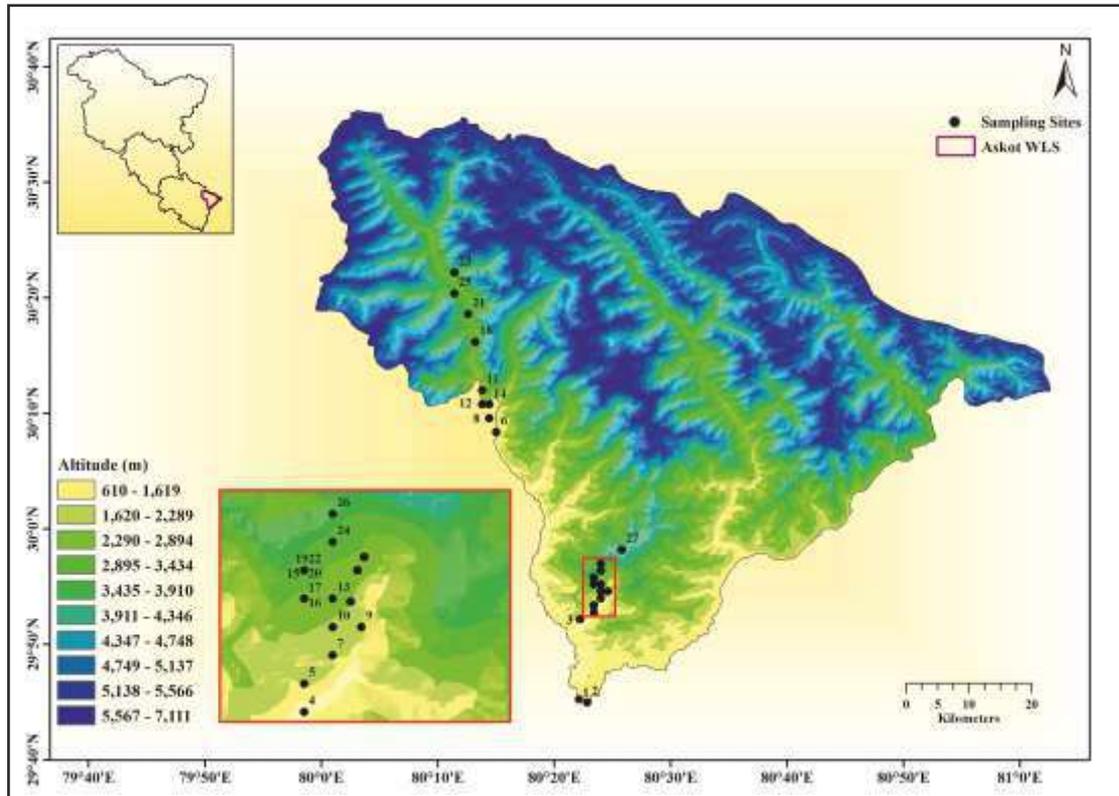
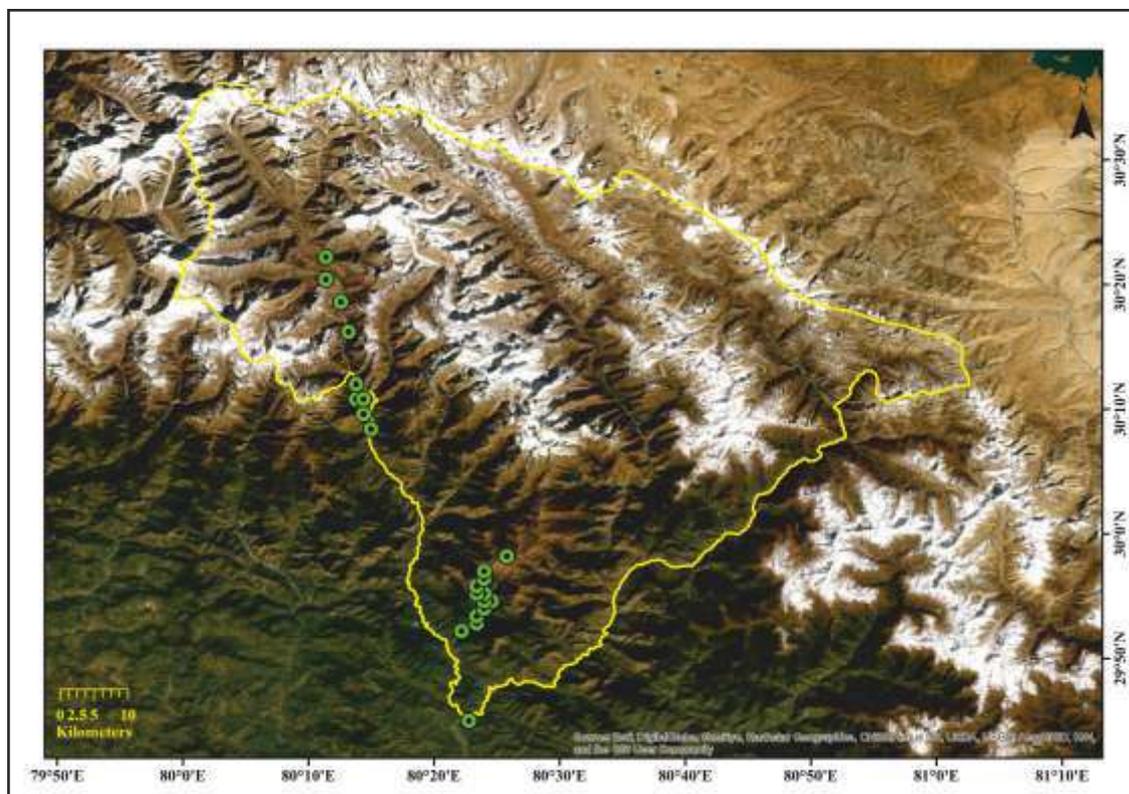


Figure 3.36: All the sampling sites in AWLS shown on Topographic Map





i.

Figure 3.37:

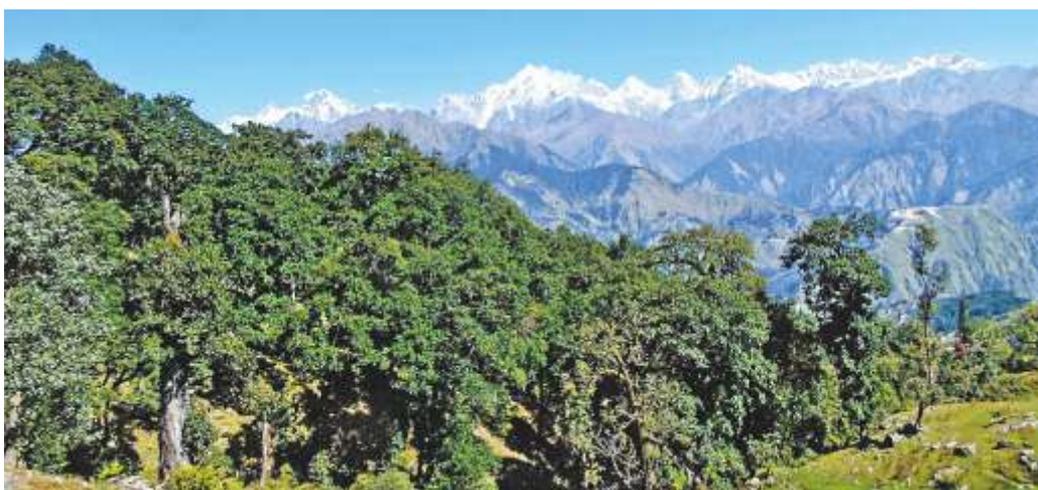
Major vegetation types sampled in AWLS: i. Dry Siwalik Sal Forest; ii. Rianj Oak Forest; iii. Western Mixed Coniferous Forest; iv. Kharsu Oak Forest



ii.



iii.



iv.



Figure 3.38:

Major vegetation types sampled in
AWLS: v. West
Himalayan Upper
Oak-Fir Forest; vi.
West Himalayan
Birch-Fir Forest; vii.
Birch-Rhododendron
Scrub Forest;
viii. Alpine Pasture

v.



vi.



vii.



viii.



LEPIDOPTERAN ACCOUNT

BUTTERFLY

ASSEMBLAGE COMPOSITION

Collectively, 153 species of butterflies were recorded from various sites situated in Askot Wildlife Sanctuary (AWLS), representing 94 genera of 24 subfamilies belonging to 6 families. Family Papilionidae represented by 2 subfamilies among which Papilioninae had 8 species under 3 genera with 4 species under *Papilio* and 3 species of *Graphium*.

Family Hesperidae was represented by 4 subfamilies

among which Hesperinae was most species rich with 7 species (**Fig. 3.39**), among which *Borbo bevani* was most abundant. Subfamily Pyrginae was represented by 6 species among which *Pseudocoladenia faith* and *Sarangesa dasahara dasahara* were recorded in high numbers. Family Pieridae was represented by 2 subfamilies; Coliadinae represented by 7 species with *Colias fieldii fieldii* and *Catopsilia pyranthe pyranthe* as most abundant. Subfamily Pierinae was represented by 8 species with *Pieris canidia indica* recorded in high number of individuals.

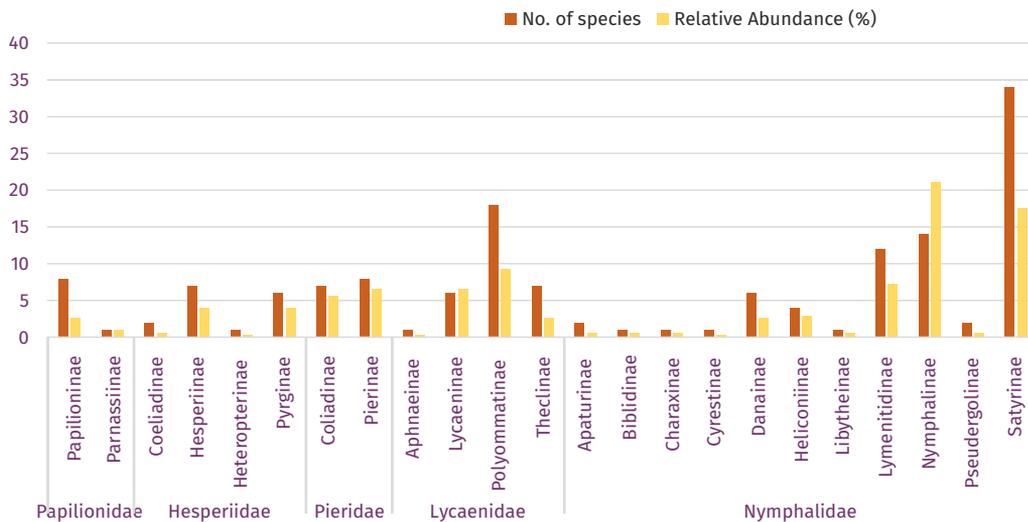


Figure 3.39: No. of species and Relative Abundance (%) of different families and subfamilies of butterflies of AWLS, Uttarakhand

Family Lycaenidae was represented by 4 subfamilies among which Polyommatainae had 18 species with *Celastrina huegeli huegeli* and *Polyommatus dux dux* as most abundant species. Interestingly, *P. dux dux* was rediscovered after 91 years for the first time after its description from the same area of Milam-Burfu region of Johar Valley, along the river Gori as its type locality. Subfamily Theclinae was represented by 7 species, whereas Lycaeninae was represented by 6 species.

The family Riodinidae was represented by 3 species,

2 of them recorded from 1100 m while *Dodona durga durga* recorded from 2650 m.

The largest family Nymphalidae was represented by 11 subfamilies in which Satyrinae was most speciose with 34 species, among which the most abundant species were *Ypthima nikaia* and *Lethe sidonis*. The subfamily Nymphalinae was represented by 14 species with most abundant species recorded as *Aglais caschmirensis aesis*, *Junonia iphita iphita* and *Vanessa cardui*. The subfamily Limenitidinae was represented by 12 species among which *Athyra*



opalina opalina was recorded in maximum number. *Lethe dura gammiei* was recorded for the first time from Western Himalaya (2B) while it was previously known from Central Himalaya (2C), Eastern Himalaya (2D) and Garo Hills. Total 26 species (17%) were unique to AWLS and recorded from nowhere else of in other Himalayan Provinces.

Polyommatus dux dux was reported as only second record since its discovery, from the same region as type locality, after 91 years. Interestingly, *Lethe dura*

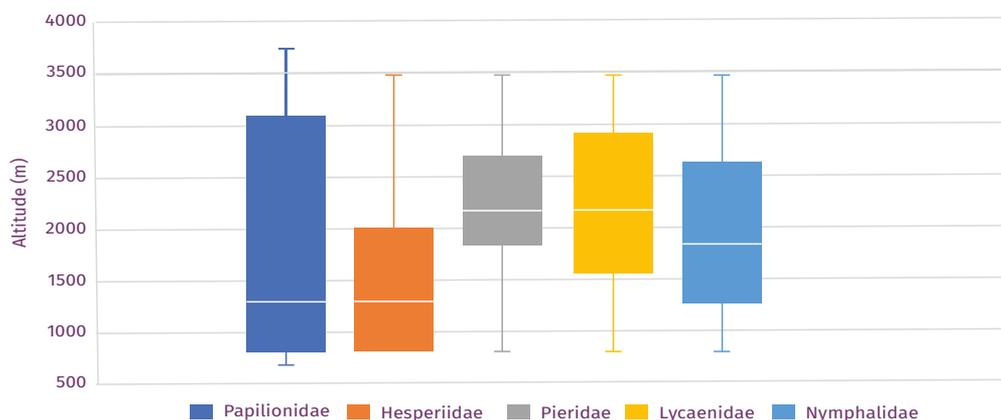
was recorded from Kanar village, previously known from Sikkim to Eastern Himalaya (Sondhi & Kunte 2018). This should be probable range extension of the species towards Western Himalaya. Species like, *Cyrestis thyodamas ganescha* and *Arhopala ganesa ganesa*, were recorded at an elevation 3577 m, where both the species were previously known from around 2500 m. *Carterocephalus avanti avanti* and *Esakiozephyrus icana* were among other rare species, recorded from elevation of 3100 m at Vayman and Kanar (2200 m), respectively.

ALTITUDINAL PATTERN

Altitudinal stratification of 5 families reveals that most of the species of Papilionidae were distributed from 600-3000 m with mean species distribution at around 1100 m. *Parnassius hardwickii hardwickii* was recorded from 3000-3700 m. Maximum number of species of Hesperidae was recorded between 600-1850 m with mean species distribution at around 1100 m. Among Hesperidae 2 species were recorded above 3000 m viz. *Polytremis eltola eltola* from 3400 m and *Carterocephalus avanti avanti* from 3200 m. Although species occurrence of Pieridae were recorded from 600-3400 m, maximum number of species and individuals were encountered between 1700 m and 2600 m with mean species distribution at around 2050 m. *Colias fieldii fieldii*, *Belenois aurota aurota*, *Pieris brassicae nepalensis* and *P. canidia indica* were recorded at sites above 3000 m altitude. Maximum diversity of Lycaenidae was documented between 1600 m and 2800 m with mean species distribution at 2050 m. 6 species of Lycaenidae were abundant above 3000 m viz. *Heliophorus sena*, *Celastrina argiolus kollari*, *Oreolyce vardhana vardhana*, *Polyommatus dux dux*, *Arhopala ganesa ganesa* and *Tajuria diaeus*.

Maximum numbers of Nymphalidae species were recorded between 1300 m and 2600 m with mean species distribution recorded at 1700 m. *Aglais caschmirensis aesis* was reported in high numbers all through the gradient up to 3400 m while 2 other species *Polygonia c-album cognata* and *Aulocera brahminus dokwana* were recorded only from 3400 m (Fig. 3.40).

Figure 3.40: Altitudinal distribution of butterfly families of AWLS, Uttarakhand



ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among 11 habitats samples at AWLS, butterfly activity was recorded in high numbers from Dry Siwalik Sal (5B/C1a), Himalayan Chir Pine (9/C1b) and Western Mixed Coniferous Forest (12/C1d). Least diverse habitat was Western Himalayan Upper Oak-Fir Forest (12/C2b), where only Nymphalidae was present and Alpine

Pasture (15/C3) from where only Papilionidae activity was documented. Nymphalidae though ubiquitously present in all the habitats, their activity was at peak in Himalayan Chir Pine Forest (9/C1b).

Diversity of Lycaenidae was most notable in Himalayan Chir Pine, Mixed Coniferous Forest and Deciduous Alpine Scrubs (15/C2). Hesperidae abundance was highest in Himalayan Chir Pine Forest, whereas Pieridae was maximum in Western Mixed Coniferous, Himalayan Chir Pine Forest and Deciduous Alpine Scrubs (Fig. 3.41).

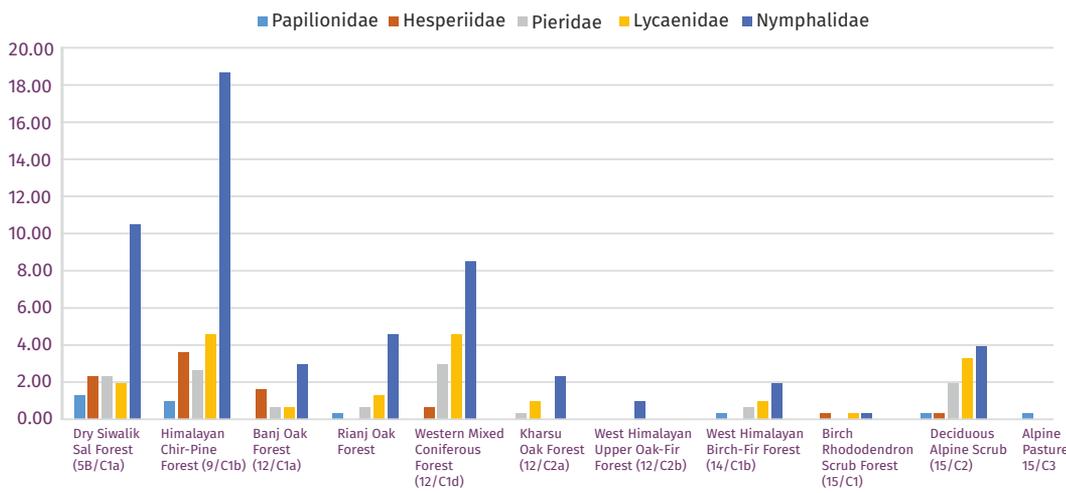


Figure 3.41: Relative Abundance (%) of 5 butterfly families in different habitats of AWLS, Uttarakhand

BIOGEOGRAPHIC AFFINITY

Among 153 butterfly species recorded from AWLS, affinity towards Palearctic and Oriental Realms were almost equal to 91% and 90% respectively; only 8% species were shared with Australian realm. Among Indian Biogeographic Zones and Provinces, 60% affinity was recorded with both the Trans-Himalayan habitats (Ladakh Mountain- 1A and Tibetan Plateau-

1B), whereas, maximum species share, i.e., around 86% was with North-Western Himalaya (2A), followed by 75% share with Central Himalaya (2C) and 68% with Eastern Himalaya (2D). Among other Indian Biogeographic zones, 64% species were shared with North Eastern Hills and Valleys, 45% species shared with Gangetic Plain. High affinities were also recorded with Coast (32%) and Deccan Peninsula (31%) (Fig. 3.42).

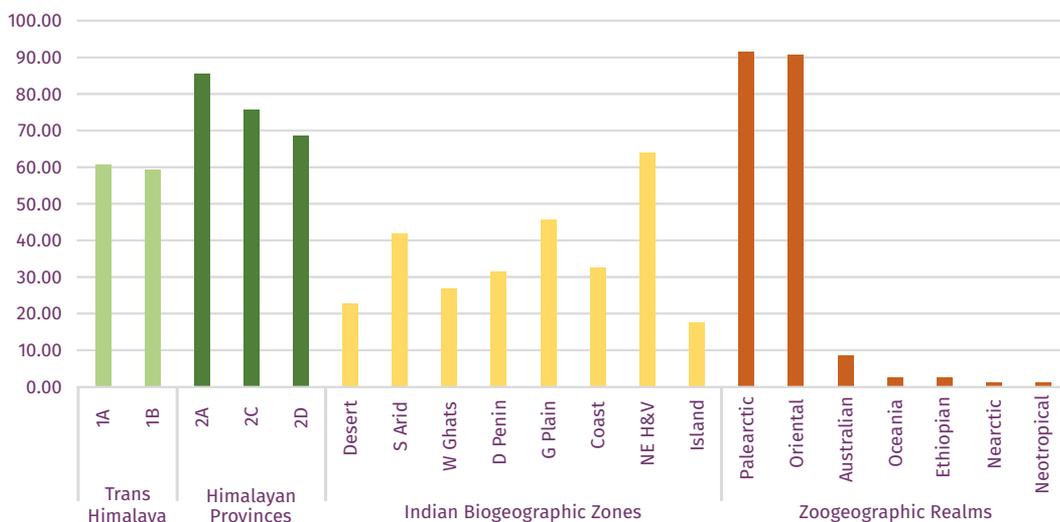


Figure 3.42: Biogeographic affinities (% representation) of AWLS Butterflies with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms



MOTH

ASSEMBLAGE COMPOSITION

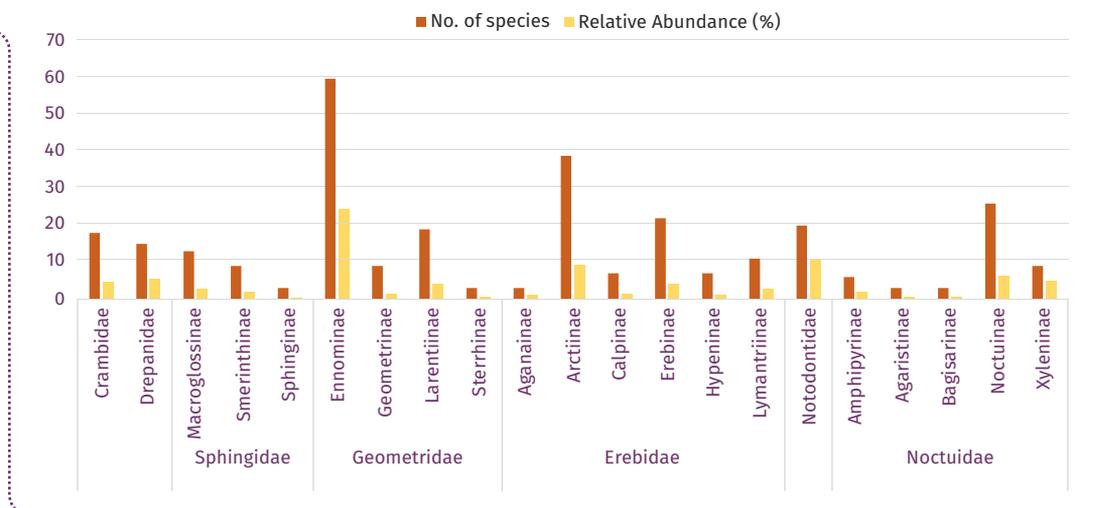
Altogether, 364 species of moths were recorded from AWLS under 265 genera belonging to 69 subfamilies of 22 families within 10 superfamilies which included Cossidae (3 species), Limacodidae (4), Zygaenidae (3), Thyrididae (3), Callidulidae (1), Pyralidae (4), Crambidae (18), Drepanidae (15), Lasiocampidae (7), Eupterotidae (4), Brahmaeidae (2), Endromidae (2), Bombycidae (1), Saturniidae (3), Sphingidae (25), Uraniidae (1), Geometridae (91), Notodontidae (20), Erebidae (94), Euteliidae (1), Nolidae (7) and Noctuidae (55).

Erebidae was most species rich family with 94 species belonging to 10 subfamilies among which Arctiinae was represented by 39 species. *Cretonotos transiens*, *Cyana adita* and *Preparctia hanningtoni* were recorded in high number of individuals. Erebiniae was the second largest subfamily with high abundance of *Mocis undata*, *Catocala patala*, *Lacera procellosa*. Lymantriinae was represented by 11 species with *Numenes patrana* and *Mardara calligramma* recorded in high numbers. Among other subfamilies, abundance of *Asota producta* (Aganainae) was high.

The second largest family was Geometridae with 91 species distributed among 4 subfamilies of which Ennominae was represented by 60 species. *Abraxas nigrivena*, *Hirasa muscosaria* and *Hypomecis infixaria* were recorded in high numbers while *Loxospilates hastigera* was super abundant. Subfamily Larentiinae was represented by 19 species with *Photoscotosia fulguritis*, *Venusia roseicosta* recorded in high abundance.

Family Noctuidae was represented by 55 species belonging to 13 subfamilies, among which, Noctuinae was most diverse with 26 species with highest abundance of *Trachea guttata* followed by *Mythimna consimilis*. Xyleninae was represented by 9 species among which 2 most abundant species were *Oroplexia decorata* and *Phlogophora plumbeola*. Amphipyriinae was represented by 6 species with high abundance of *Diphtherome pallida*. Among all the other subfamilies, *Helicoverpa armigera* of Heliiothinae was encountered in high abundance (Fig. 3.43).

Figure 3.43: No. of species and Relative Abundance (%) of different families and subfamilies of Moths of AWLS



Total 20 species of Notodontidae were recorded belonging to 8 subfamilies among which Notodontinae was the most diverse with 8 species, with most abundant species being *Peridea moorei moorei*, *Cleapa latifascia*. Two Thaumetopoeinae species viz. *Gazalina apsara* and *G. chrysolopha* were recorded in very high numbers. Overall 25 Sphingidae species were recorded with Macroglossinae (13 species) and Smerinthinae (9 species) being most diverse. *Nephele hespera* was highly abundant species of Macroglossinae, while *Leucophlebia lineata* of Smerinthinae was recorded in high number. In case of Drepanidae, 15 species were recorded, representing 3 subfamilies among which genus *Oreta* of subfamily Drepaninae was most diverse. For Crambidae, 18 species were recorded under 3 subfamilies. Spilomelinae was most diverse among them with *Endocrossis flavibasalis* as most abundant species, while *Strepsinoma croesusalis* of Acentropinae was encountered in very high abundance.

Interestingly, 13 species of moths were recorded for the first time from AWLS; *Teliphasa similalbifusa*, a Pyralidae species, previously reported from China; *Euthrix imitatrix* of Lasiocampidae, previously known from

Myanmar and China; *Nothomiza costinotata* (Geometridae : Ennominae), previously reported only from Nepal and Bhutan; *Eucyclodes albisparsa* (Geometridae : Geometrinae) was known from Sundaland till date; 2 species of Larentiinae (Geometridae) viz. *Photoscotosia pallidimaculata* and *Venusia roseicosta* previously known from Nepal only; Arctiinae (Erebidae) species *Lemyra melli* was known from Nepal and Tibet till date; among subfamily Noctuidae (Noctuidae), 3 species of genus *Apamea* viz. *A. chhiringi*, *A. gratissima* and *A. schawerdae* all known from Nepal and China earlier; 2 species of *Hermonassa*, *H. marginata* and *H. oxyspila*, known to be restricted to Nepal and Tibet.

Four species were recorded for the first time from Indian Himalaya, which includes, *Telchines vialis* (Thyrididae), previously restricted to Meghalaya; 2 Notodontids namely *Nerice pictibasis* earlier reported from Assam, Meghalaya and *Pheosiopsis niteria* from Assam and Thailand; *Hypena albisigna* (Erebidae) was previously known from Meghalaya and Hong Kong. Another 91 species were reported as novel to Western Himalayan (2B) moth fauna. 93 species (25.55%) of the assemblage were uniquely recorded from AWLS and nowhere else from other Himalayan Provinces.

ALTITUDINAL PATTERN

Altitudinal stratification of major moth families in AWLS revealed that superfamily Pyraloidea consisting of families Pyralidae and Crambidae were distributed mainly up to 1700 m with major species present between 850 m and 1250 m with mean species distribution at around 1100 m. *Glyphodes lacustralis* and *Leucinodes orbonalis* were only recorded from 2600 m, whereas, *Udea ferrugalis* was the only species of Crambidae recorded from 3700 m. Distribution of family Geometridae was all through the gradient, while most of the abundance was encountered between 1850 m and 3400 m with mean species distribution at 2500 m. Among Geometrids of high altitude, *Loxaspilates hastigera* (Ennominae) was super abundant between 3700 m and 4200 m while other 8 species viz. *Anonychia lativitta*, *Apoheterolocha patalata*, *Biston falcata*, *Lassaba cervina*, *Opisthograptis sulphurea*, *O. tridentifera*, *Sirinopteryx harutai* and *S. longipennis* were prominent above 3500 m. 3 Larentiinae species, *Amnesicoma bicolor*, *Photoscotosia dejuta* and *P. fulguritis* were abundant between 3200–4200 m.

Maximum numbers of Notodontidae were recorded between a narrow altitudinal belt of 1850 m to 2650

m with mean species distribution at 2450 m. *Spatalia sikkima* was uniquely recorded from 600 m as well as at 3300–4200 m being altogether absent in between. Another species *Gazalina chrysolopha* was present throughout the entire gradient. Majority of Erebid species were recorded between 600 m and 2250 m with mean abundance at around 750 m, lowest recorded among all the families. Among them *Preparctia hannyingtoni* (Arctiinae) and *Catocala patala* (Erebinae) were only abundant from 3700 m to 4200 m. *Preparctia hannyingtoni*, the typical high-altitude species, recorded only from sites at 3700 m and 4200 m, was rediscovered after 109 years after its first description. The species was originally described from Niti Pass of Kumaon Himalaya at 5000 m.

Noctuids, though distributed all through the gradient, majority of them were encountered between 2200 m and 3500 m with mean abundance at around 3000 m, highest among all the moth taxa. Several species of Noctuidae were abundant at sites above 3000 m, highest among them being *Cucullia pullata*, *Anaplectoides inexpectata*, *Agrotis ipsilon*, *Xestia isochroma* and 4 species of *Apamea*, viz. *A. chhiringi*, *A. gratissima*, *A. schawerdae*, *A. purpurina*, first three being first time recorded from Indian Himalaya (Fig. 3.44).

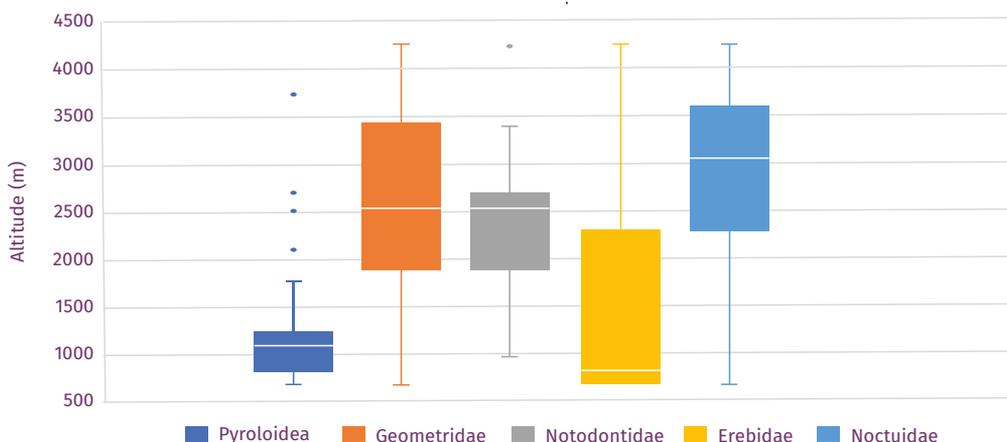


Figure 3.44: Altitudinal distribution of major Moth families in AWLS



Assemblages of Lepidoptera in Indian Himalaya through Long Term Monitoring Plots

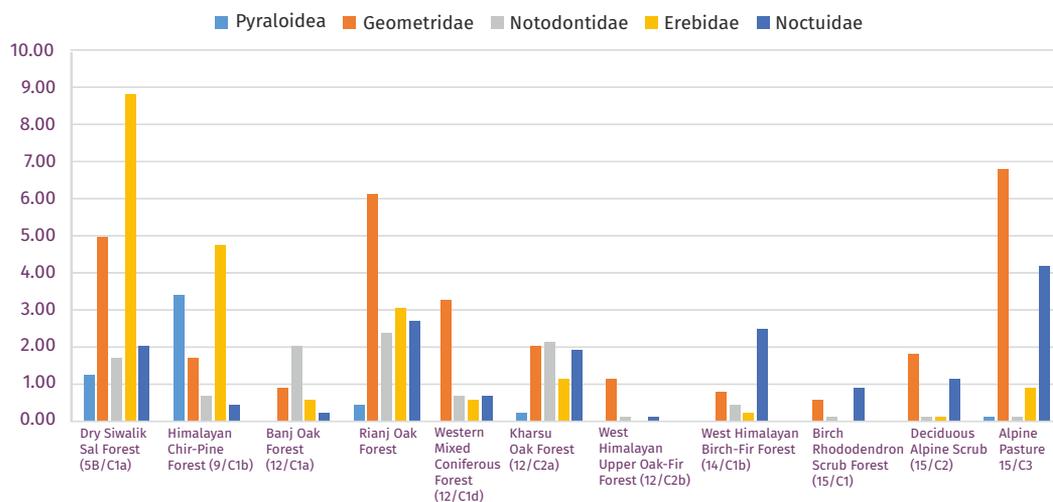


ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among 11 habitats and vegetation types sampled in AWLS, maximum moth abundance was recorded in Dry Siwalik Sal Forest (5B/C1a) (Fig. 3.45), which was certainly dominated by species of Erebidae. Himalayan Chir Pine Forest (9/C1b) was dominated by Pyralids and Crambids along with Erebrids. Banj Oak Forest (12/C1a) was comparatively less preferred with dominance of Notodontidae species. All the major families of moths, except Crambidae, were active in Rianj Oak Forest with dominance of Geometrids. In Western Himalayan Mixed Coniferous

Forest (12/C1d), moth activity was low with abundance of certain Geometrids. The Kharsu Oak (12/C2a) habitat was more or less preferred by all the families with dominance of Notodontids. West Himalayan Oak Fir Forest (12/C2b) was least diverse, while Western Himalayan Birch-Fir Forest (14/C1b) was dominated by Noctuids. Sub-Alpine habitats of Birch Rhododendron Scrubs (15/C1) was dominated by few species of Noctuidae and Geometridae. Highest altitude habitat of Alpine Pasture (15/C3) yielded super-abundance of moths, mainly of Geometrids, Noctuids and few Erebrids. Interestingly abundance of both Geometrids and Noctuids were recorded highest in Alpine Pastures.

Figure 3.45: Relative Abundance (%) of major Moth families in different habitats of AWLS



BIOGEOGRAPHIC AFFINITY

The moth assemblage of AWLS was chiefly Oriental (97%) with 71% species having distributions in Palearctic region also (Fig. 3.45). 19% species were shared with Australian realm, whereas 11% species had affinity for Ethiopian realm. Among Indian Biogeographic Zones and Provinces, only 20% species were shared with two Trans-Himalayan

habitats (Ladakh Mountain- 1A and Tibetan Plateau- 1B), whereas, 80% species were distributed in Central Himalaya (2C), followed by 66% and 54% species shared with North-Western Himalaya (2A) and Eastern Himalaya (2D) respectively. 57% species were also distributed in North Eastern Hills and Valleys; 33% and 25% shared with Deccan Peninsula and Western Ghats respectively.

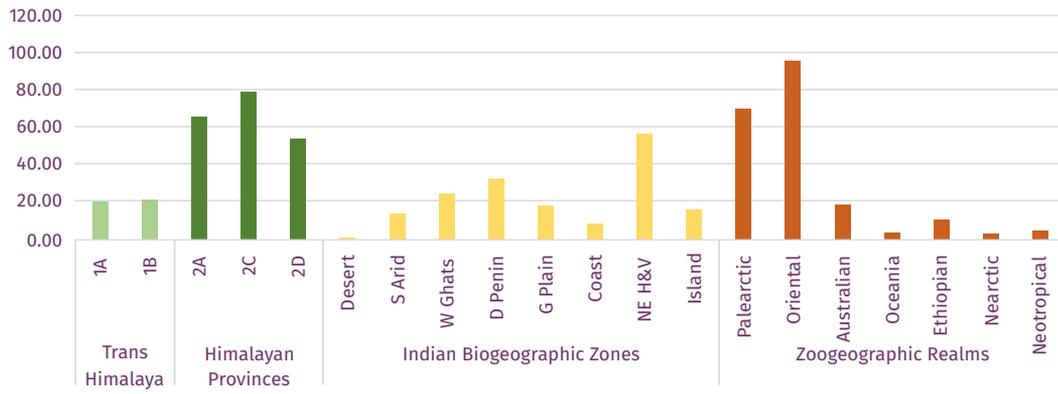


Figure 3.46: Biogeographic Affinities (% representation) of AWLS moths with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms





NEORA VALLEY AND SINGALILA NATIONAL PARK, WEST BENGAL, CENTRAL HIMALAYA

Kamalika Bhattacharyya, Paromit Chatterjee, Arna Mazumder, Rushati Dey, Mohd. Ali, Rahul Ranjan, Uttaran Bandyopadhyay

INTRODUCTION

LANDSCAPE

Central Himalayan landscape in West Bengal, encompassing only .59% of total area of IHR, is represented by two major Protected Areas: Neora Valley National Park (NVNP), established in 1881 and situated in Kalimpong district; Singalila National Park (SNP), established in 1992 and situated in Darjeeling district. Both the NPs are an integral part of the Kanchenjunga Sacred Landscape. NVNP covers an area of 159.89 km², contiguous with the state of Sikkim in north and Bhutan in north-east, while it is contiguous with other major Protected Areas: Pangolakha Wildlife Sanctuary (Sikkim), Jigme Khesar Strict Reserve (Bhutan), Chapramari WLS and the Gorumara National Park (West Bengal). Spanning between 760-3200 m, the area has varied climatic conditions with summer as warm as 30°C while

winter as cold as reaching sub-zero temperature and receiving around 4000 mm annual precipitation.

SNP, covering an area of 79 km², is situated in transboundary location with Nepal and Sikkim and spans between 2400 m and 3650 m representing two broad vegetation zones, viz. temperate and sub-alpine. In summer, the area experiences an average temperature of 7-17°C and in winter, 1-10°C in temperate zone. The sub-alpine region experiences sub-zero temperature and heavy snowfall above 3000 m. The highest peak of West Bengal, Sandakphu is located inside the park, and is known as the 'mountain of poisonous plants' due to presence of large concentration of Himalayan Cobra Lillies (*Arisaema consanguineum*). BirdLife International has declared the area as an 'Important Bird Area' (Sharma & Chettri, 2005; Chettri et al., 2007; Sinha et al., 2018; Anonymous, 2019).







BRIEF NOTE ON IMPORTANT FLORA & FAUNA

NVNP, considered as crowning glory of West Bengal due to its rich biodiversity owing to presence of diverse ecosystems, is inhabited by 226 species of plants with 40 tree species, 59 shrubs, 101 herbs and 6 species of Geophytic orchids. Among plant species of conservation importance, *Acer sikkimensis*, *Aconitum bisma*, *Impatiens stenantha* can be mentioned. Among 24 species of Mammals, large

carnivores include Tiger, Leopard, Clouded Leopard, Golden Cat, Indian Wild Dog, while Red Panda, Himalayan Goral, Himalayan Serow were other threatened species. 308 species of birds are known while around 14 major species of Herpetofauna are recorded. More than 2000 species of Angiosperms are reported from Singalila National Park with a startling diversity of 18 species of Rhododendrons. While 350 species of birds are reported with most prominent species as Satyr Tragopan, Blood Pheasant, most important mammalian fauna included Red Panda and Himalayan Black Bear (Mukhopadhyay, 1996; Chakraborty et al., 2008)

BRIEF HISTORY OF LEPIDOPTERA STUDY IN CENTRAL HIMALAYA, WEST BENGAL

BUTTERFLIES

One of the first account of Butterflies of Darjeeling Hills were compiled by Moore (1865) from the extensive collections made by A. E. Russell, W. S. Atkinson and Capt. Lind Sherwill. After that de Nicéville published a series of papers (1881-1885) covering 313 species from Central Himalayan landscape of Sikkim and Darjeeling area. Elwes & Moller (1888) documented 537 species from this region. In 1949, Maude published a series on butterflies, recorded in Darjeeling area between 1700 and 4400 m. Recently, seasonal variation and habitat preference of butterflies of Garumara



National Park was investigated by Das et al. (2012), with covering 170 species. Sengupta et al. (2014) documented the seasonal diversity of butterflies and their larval food plants and provided an account of 161 species from Neora Valley National Park. Ghorai & Sengupta (2014) reported Papilionid butterflies from Gorumara National Park and Neora Valley National Park.



MOTHS

Altogether 908 species belonging to 579 genera of moths are reported from the hill districts of Darjeeling & Kalimpong, worked out mainly by, Mandal (1992), Gupta (1997), Mandal & Ghosh (1997), Mandal & Maulik (1997), Ghosh & Choudhury (1997), Bhattacharya (1997a,b), Arora (2000), Acharya and Vijayan (2011), Biswas et al. (2015) and Mitra et al. (2018). Till date, only 52 species of moths (Mandal, 1992; Shah et al., 2017) are reported specifically from NVNP.



SAMPLING DETAILS

During the course of current study (2016-2018), butterfly transects and light trapping for moths were undertaken in 12 sites in NVNP and 5 sites in SNP (**Table 3.5, Fig. 3.47-3.48**). The sampling sites were categorized into 5 dominant vegetation types (**Fig. 3.49**) according to Champion & Seth (1968) classification, which are as follows:

Eastern Himalayan Moist Mixed Deciduous Forest (3C/C3b)

A tall and closed forest of *Lagerstroemia*, *Careya*, *Bauhinia*, *Terminalia* grown on well-drained soil in the heavy rainfall zone between 650-1000 m, with abundant shrubby undergrowth of *Litsea*, *Mallotus* but more or less without grass cover. Three sampling sites fell under this type.

Sub Himalayan Secondary Wet Mixed Forest (2B/C1/2S3)

A dense evergreen forest of *Michelia*, *Schima*, *Machilus*, *Syzygium*, *Ilex*, *Elaeocarpus* with permanent ground cover grown on very wettest ground between 700-1700 m. Five sampling sites came under this category.

Eastern Himalayan Sub-tropical Wet Hill Forest (8B/C1)

Hill forest of *Castanopsis*, *Schima*, *Bohmeria*, *Elgelhardtia*, grown between 1200-1800 m in heavy rainfall zone, with shrubby undergrowth and with numerous Climbers, Epiphytes and Orchids. Sometime with association of *Dendrocalamus*. Four sampling sites were categorized under this type.



East Himalayan Wet Temperate Forest (11B/C1b)

Closed evergreen high forest type dominated by *Lauraceae*, *Quercus lamellosa*, *Castanopsis*, *Acer*, *Michelia*, *Machilus* grown generally between 1700–2700 m, with undergrowth of *Polygonum*, *Rubus* and many Ferns. Three sampling sites fell under this type.

East Himalayan Mixed Coniferous Forest (12/C3a)

A dense evergreen forest of *Tsuga*, *Abies*, *Quercus*, *Acer*, *Betula*, *Taxus* grown between 2300–3000 m with dense undergrowth of Bamboo, Rhododendron and with abundant Epiphytic growth broken by open grassy meadows. Two sampling sites were categorized under this category.



Table 3.5:
Details of
Sampling
Sites, Dates
and
Weather
parameters
in Neora
Valley (NV)
& Singalila
(SL)
National
Park, West
Bengal

Sl. no.	Location	Date	Location Code
1	Ashaley Camp	03.iii.2017	NV01A
		19.vi.2017	NV01B
		07.xii.2017	NV01C
		17.xii.2017– 19.xii.2017	NV01D
2	Suntale Khola	06.xi.2016 –	NV02A
		09.xi.2016	
		03.i.2017	NV02B
		26.ii.2017–	NV02C
		02.iii.2017	
		20.vi.2017–	NV02D
		23.vi.2017	
20.xi.2017 –	NV02E		
01.xii.2017			
08.vii.2018	NV02F		
3	Mithun Khari	27.vi.2017	NV03A
4	Burkey Camp	20.xii.2017	NV04A
5	Mouchaki	08.xi.2016 –	NV05A
		09.xi.2016	
		03.iii.2017	NV05B
		12.vi.2017 –	NV05C
14.vi.2017			
6	Chhangay Falls	17.ix.2016 –	NV06A
19.ix.2016			
7	Mou falls	03.i.2017	NV07A
8	Bhotekhola Trail	24.vi.2017	NV08A
9	Kolakham	14.ix.2016	NV09A
10	Lava	09.xi.2016	NV10A
		09.xii.2016	NV10B
		13.ix.2016 –	NV10C
		16.ix.2016	
24.ii.2017	NV10D		
11	Rishop	03.ix.2016 –	NV11A
		05.ix.2016	
12	Chaudapheri	12.vii.2018	NV12A
13	Manebhanjan	16.x.2018	SL01A

Details

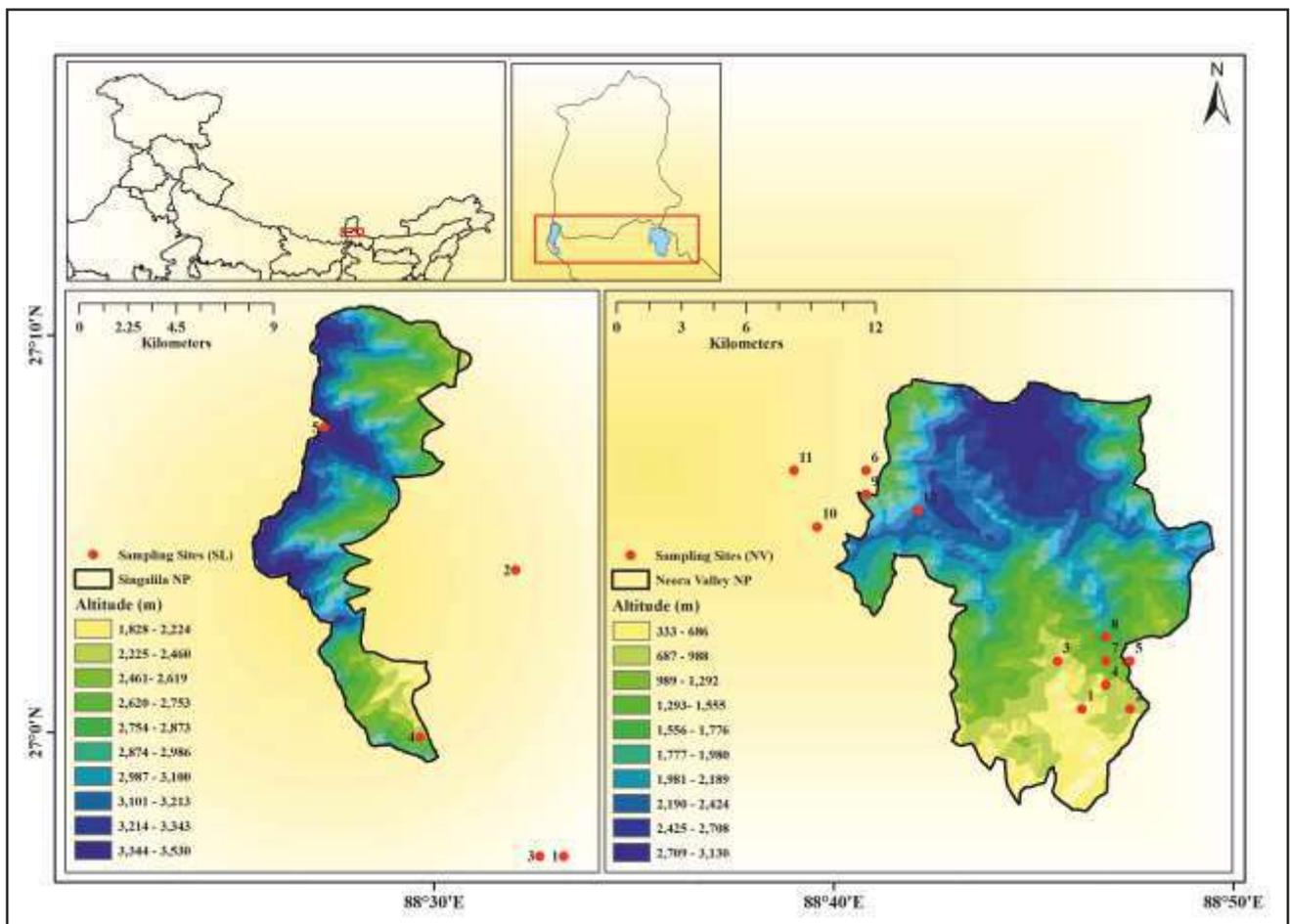
Latitude (°N)	Longitude (°E)	Altitude (m)	Vegetation Type	Avg. Temp. (°C)	Avg. Hum. (%)	Moon Phase*
27.0127	88.7708	695	Eastern Himalayan Moist Mixed Deciduous Forest (3C/C3b)	16.2	86.55	WX v
				22.1	97.44	WN x
				13.4	55.22	WN iv
				12.9	63.36	WN xiv -WX i
27.0104	88.7899	760	Eastern Himalayan Moist Mixed Deciduous Forest (3C/C3b)	16.4	69	WX v-viii
				12.3	52	WX v
				13.9	67.81	NM- WX iv
				22.7	99.11	WN xi-xiv
				14.1	95.2	WX ii-xiii
24.27	96.95	WN x				
27.0316	88.7585	808	Eastern Himalayan Moist Mixed Deciduous Forest (3C/C3b)	24.7	100	WX iii
27.0166	88.7786	950	Sub Himalayan Secondary Wet Mixed Forest (2B/C1/2S3)	13.1	76	WX ii
27.0267	88.7860	1208	Sub Himalayan Secondary Wet Mixed Forest (2B/C1/2S3)	11.3	96	WX ix-x
				14.7	65	WX v
				21.2	100	WN iii-v
27.1128	88.6788	1311	Sub Himalayan Secondary Wet Mixed Forest (2B/C1/2S3)	20.6	83	WN i-iii
27.0104	88.7898	1338	Sub Himalayan Secondary Wet Mixed Forest (2B/C1/2S3)	9	97.2	WX v
27.0356	88.7788	1513	Sub Himalayan Secondary Wet Mixed Forest (2B/C1/2S3)	21.2	89.7	NM
27.1000	88.6800	1748	Eastern Himalayan Sub-tropical Wet Hill Forest (8B/C1)	19.5	96.47	WX xiii
27.0863	88.6596	2083	Eastern Himalayan Sub-tropical Wet Hill Forest (8B/C1)	15.5	100	WX x
				14.9	93.85	WX x
				18.8	86	WX xii-xv
				11.2	90	WN xxiv
27.1123	88.6511	2136	Eastern Himalayan Sub-tropical Wet Hill Forest (8B/C1)	17.2	92.32	WX ii-iv
27.0931	88.7016	2348	Eastern Himalayan Sub-tropical Wet Hill Forest (8B/C1)	17.68	88.12	WN xiv
26.9870	88.1191	1975	East Himalayan Wet Temperate Forest (11B/C1b)	12.5	91.66	WX vii



Sl. no.	Location	Date	Details			
			Location Code	Latitude (°N)	Longitude (°E)	Altitude (m)
14	Manedara	27.x.2018	SL02A	27.1147	88.1000	2168
15	Chitrey	25.viii.2016	SL03A	26.9913	88.1119	2366
16	Meghma	18.v.2018	SL04A	27.0158	88.0899	2733
17	Molley Camp	26.v.2018	SL05A	27.1699	88.0202	3510



Figure 3.47: Sampling sites (17) in the Central Himalayan Landscape of NVNP and SNP, West Bengal on Digital Elevation Map



Vegetation Type	Avg. Temp. (°C)	Avg. Hum. (%)	Moon Phase*
East Himalayan Wet Temperate Forest (11B/C1b)	9	95.53	WN iii
East Himalayan Wet Temperate Forest (11B/C1b)	8	91	WN vii
East Himalayan Mixed Coniferous Forest (12/C3a)	10.5	83.8	WX iii
East Himalayan Mixed Coniferous Forest (12/C3a)	8	100	WX xi

*WX= Waxing Phase, i.e. New Moon to Full Moon Period (e.g. WX iii refers to the 3rd day after No Moon); WN= Waning Phase, i.e. Full Moon to New Moon Period (e.g. WN iii refers to the 3rd day after Full Moon); NM= No Moon.

Figure 3.48: All the sampling sites in NVNP & SNP shown on Topographic Map

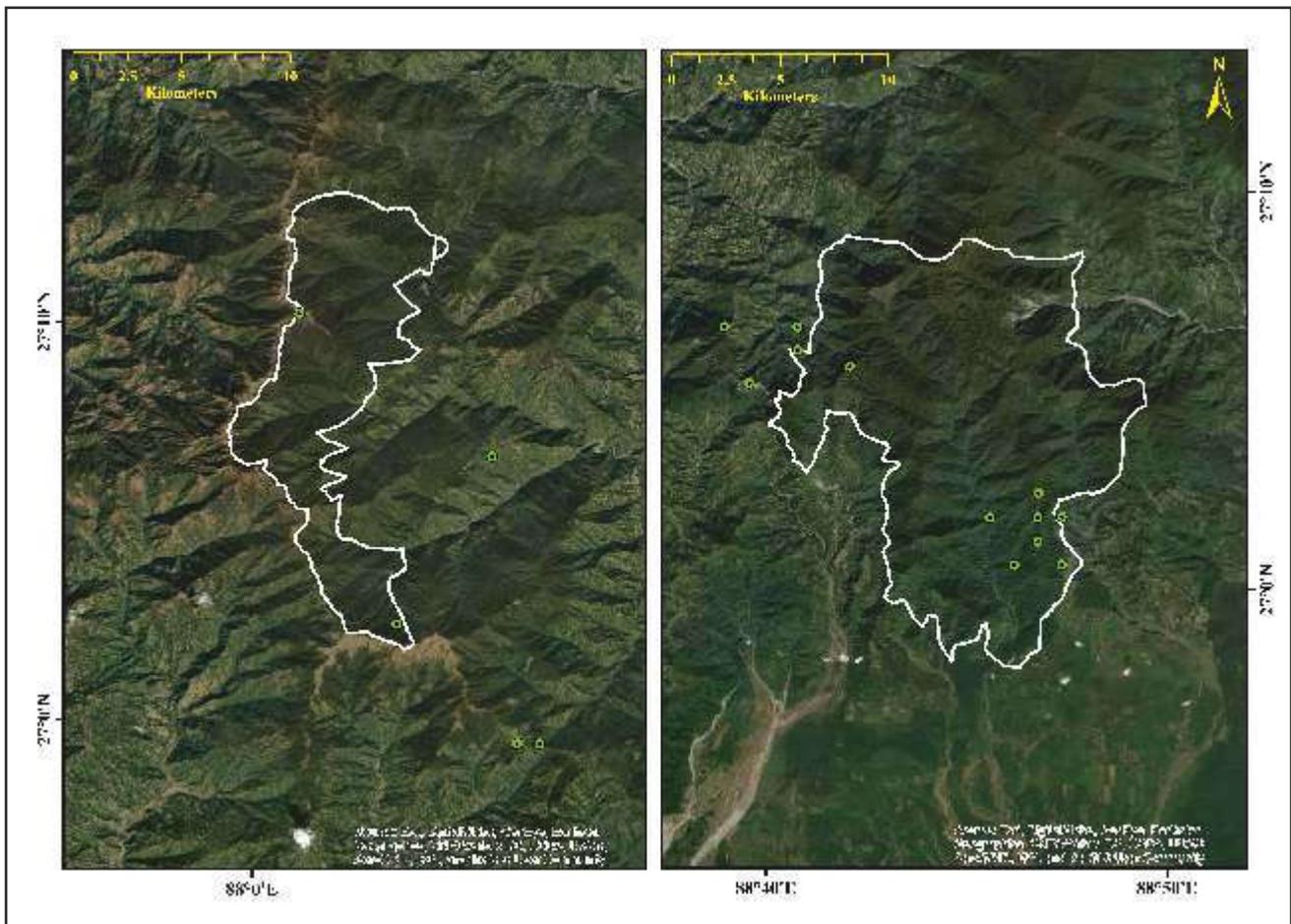
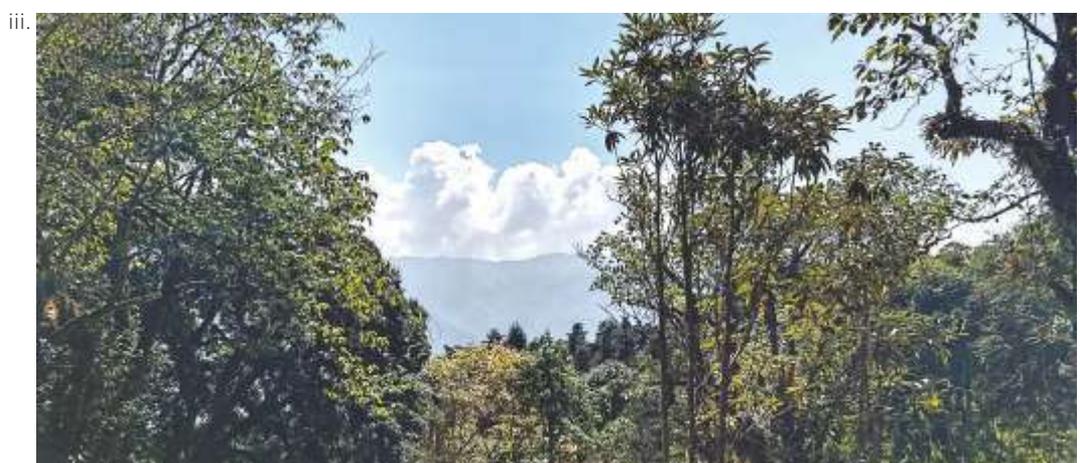
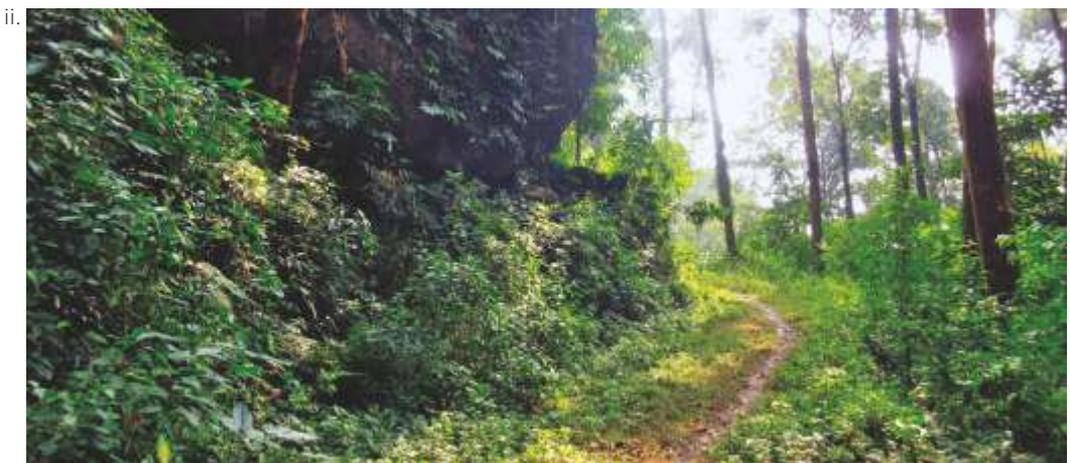
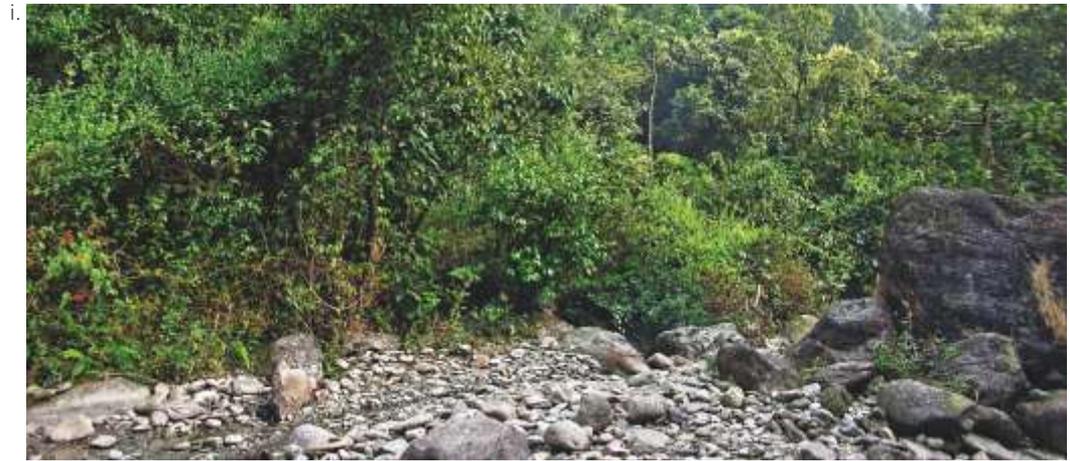




Figure 3.49:

Major vegetation types sampled in NVNP & SNP: i. Eastern Himalayan Moist Mixed Deciduous Forest; ii. Sub Himalayan Secondary Wet Mixed; iii. Eastern Himalayan Sub-tropical Wet Hill Forest; iv. East Himalayan Mixed Coniferous Forest



LEPIDOPTERAN ACCOUNT

BUTTERFLY

ASSEMBLAGE COMPOSITION

A total number of 78 species of Butterflies were recorded from NVNP & SNP under 54 genera representing 18 subfamilies of 6 families, Family Papilionidae consisted of 2 species, *Meandrusa lachinus lachinus* and *Papilio helenus helenus* belonging to single subfamily Papilioninae (Fig. 3.50).

Family Hesperidae consisted of 6 species, 5 of them belonging to subfamily Hesperinae, and a single species, *Pseudocoladenia dan fabia* of Pyrginae. Family Pieridae was represented by 11 species, belonging to 2 subfamilies, among which Pierinae being most diverse having 8 species, of which *Pieris canidia indica*, *Cepora nadina nadina*, *Leptosia nina* and *Pareronia avatar avatar* were most abundant. Subfamily Coliadinae, was represented by 3 species of which *Eurema blanda silhetana* and *E. hecabe hecabe* were most abundant.

Family Lycaenidae was represented by 13 species belonging to 3 subfamilies of which Polyommatae was most diverse with 6 species followed by Lycaeninae with 4 species and Theclinae with 3 species. Among Lycaenidae, *Heliophorus moorei moorei* was encountered in high numbers. Family Riodinidae consisted of 2 species belonging to single subfamily Riodininae of which both species, viz., *Zemeros flegyas flegyas* and *Abisara fylla* were equally abundant.

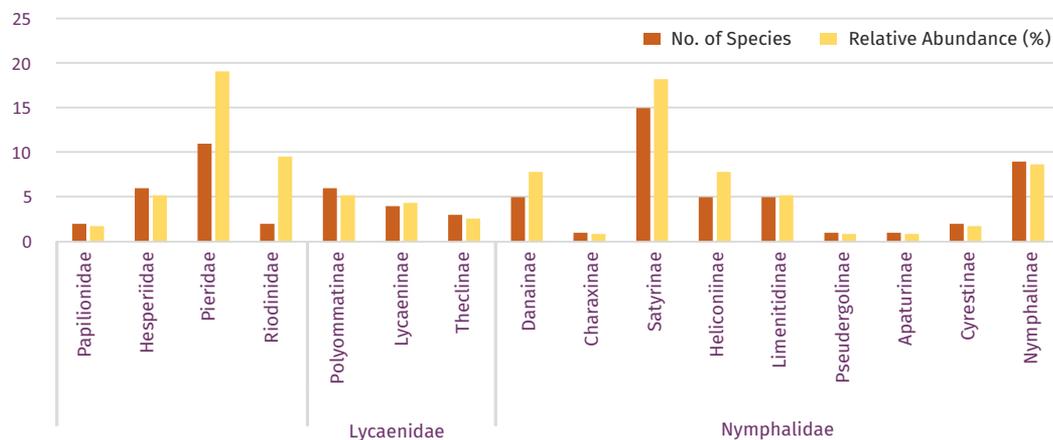


Figure 3.50: No. of species and Relative Abundance (%) of different families and subfamilies of Butterflies of NVNP and SNP, West Bengal

Family Nymphalidae had 44 species consisting of 9 subfamilies of which Satyrinae was most diverse with 15 species among which, *Melanitis leda leda* was super abundant. Subfamily Nymphalinae consisted of 9 species of which, *Junonia iphita iphita* was highly abundant. Subfamily Limenitidinae, Heliconiinae and Danainae were equally diverse, among which *Parantica aglea melanoides* and *P. sita sita* of

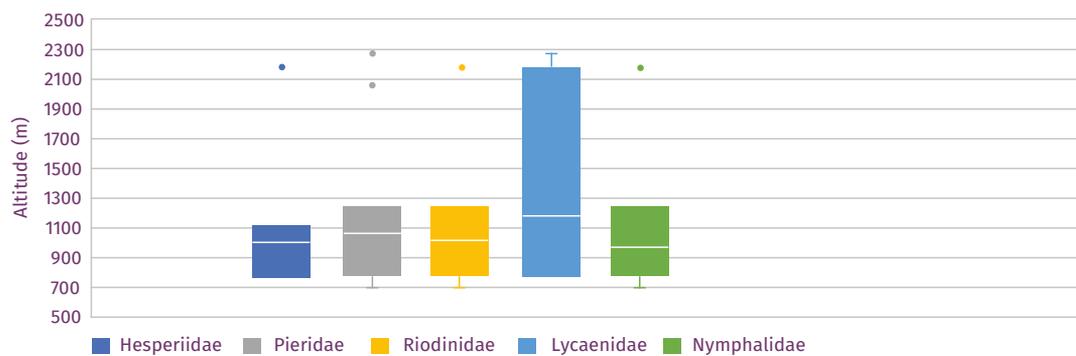
Danainae; *Cethosia biblis tisamena* and *Cirrochroa aoris aoris* of Heliconiinae; *Tanaecia julii appiades* of Limenitidinae were reported in high numbers. Three species viz., *Flos areste*, *Tanaecia lepidea lepidea* and *Doleschallia bisaltide indica* were recorded only from Central Himalayan Landscape (2C) and no other Himalayan Provinces.



ALTITUDINAL PATTERN

Stratification of butterfly families in Central Himalayan altitudinal gradient in NVNP & SNP revealed that Family Hesperidae had major species distribution between 750-1100 m with a single species *Pseudocoladenia danfabia* reported at 2100 m. In case of Papilionidae, where only 2 species were recorded viz., *Papilio helenus helenus* was recorded at 760 m while, *Meandrusa lachinus lachinus* recorded around 2100 m. Distribution of major Pieridae species were from 750 m to 1200 m with a single species viz., *Pieris canidia indica* reported up to 2100 m. The pattern was same for Riodinidae, with *Zemerus flegyas flegyas* distributed up to 2000 m. Maximum abundance of family Lycaenidae was between 750 m and 2100 m, with *Flos areste* recorded only around 2200 m. Maximum abundance of Nymphalidae was recorded between 750 m and 1200 m with 3 species *Lethe sidonis*, *L. sura* and *Aglais caschmirensis aesis* reported from 2100 m (Fig. 3.51).

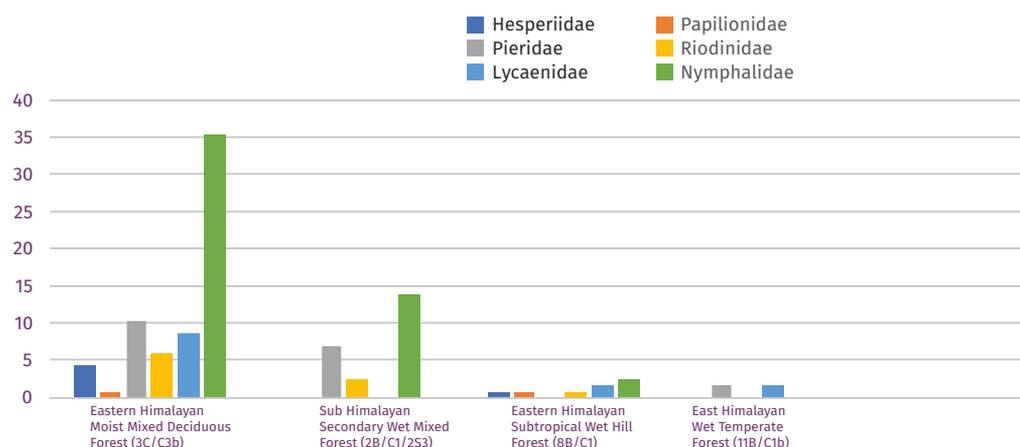
Figure 3.51: Altitudinal distribution of butterfly families of NVNP and SNP, West Bengal



ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Most of the butterfly activity of NVNP and SNP were recorded in Eastern Himalayan Moist Mixed Deciduous Forest (3C/C3b), where family Nymphalidae was most dominant, followed by Pieridae and Lycaenidae. Sub-Himalayan Secondary Wet Mixed Forest (2B/C1/2S3) was frequented by medium abundance of Nymphalidae, Pieridae and Riodinidae. Butterfly activity was very low in Eastern Himalayan Sub-tropical Wet Hill Forest (8B/C1) and Eastern Himalayan Wet Temperate Forest (11B/C1b), while the later habitat was frequented by Pieridae and Lycaenidae (Fig. 3.52).

Figure 3.52: Relative Abundance (%) of 6 butterfly families in different habitats of NVNP and SNP, West Bengal



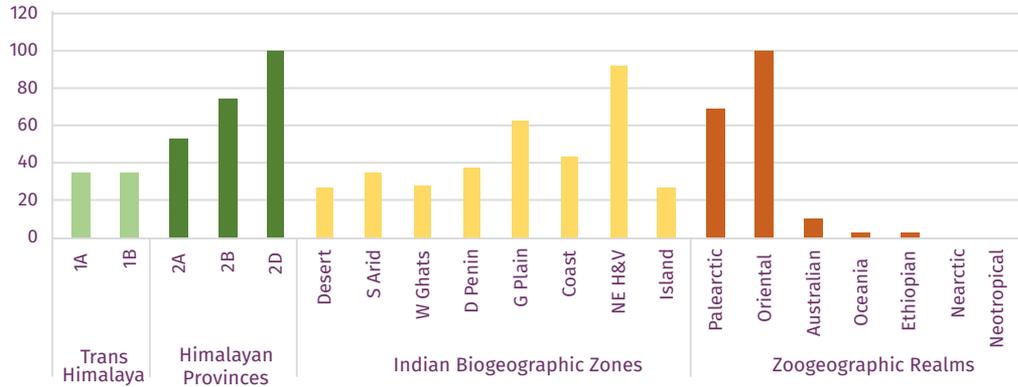


Figure 3.53: Biogeographic affinities (% representation) of NVNP and SNP Butterflies with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms

BIOGEOGRAPHIC AFFINITY

The butterfly assemblage of NVNP and SNP was typically of Oriental origin with around 70% species affinity for Palearctic realm. 10% species were also shared with Australian realm. Among Indian Biogeographic Zones and Provinces, 34% species were shared with two Trans-Himalayan provinces (Ladakh Mountain- 1A and Tibetan Plateau- 1B), whereas all the species were equally distributed in Eastern Himalayan Province (2D). The species share with Western Himalayan Provinces (2B) and North-Western Himalayan Provinces (2A) were 74% and 52% respectively. 92% species were shared with North Eastern Hills and Valleys, while 62% species were also distributed in Gangetic Plains. 43% species were shared with Coast while 34-37% species were shared with Semi-Arid and Deccan Peninsula (Fig. 3.53).

MOTH

ASSEMBLAGE COMPOSITION

Collectively, 464 species of moths belonging to 315 genera under 61 subfamilies of 23 families were recorded from NVNP and SNP, which includes Hepialiidae (1 species), Cossidae (3), Limacodidae (7), Zygaenidae (4), Thyrididae (3), Hyblaeidae (1), Pyralidae (7), Crambidae (38), Drepanidae (19), Lasiocampidae (12), Eupterotidae (1), Brahmaeidae (1), Endromidae (5), Bombycidae (3), Saturniidae (8), Sphingidae (21), Uraniidae (2), Geometridae (115), Notodontidae (22), Erebidae (129), Euteliidae (5), Nolidae (18) and Noctuidae (39) (Fig. 3.54).

Family Erebidae were most species-rich with 129 species belonging to 9 subfamilies of which Erebinae with 52 species was most diverse, followed by Arctiinae with 31 species, Lymantriinae with 15 species and Calpinae with 13 species. Eight species of Hypocalinae and 5 species of Aganainae were also

reported. Among Erebinae, *Arcte modesta*, *Daddala lucilla* and *Mocis undata* were most abundant species, while among Arctiinae, *Aglaomorpha plagiata*, *Amerila astreus*, *Chrysaeglia magnifica*, *Cretonotos transiens*, *Cyana signa*, *C. adita*, *Spilarctia casigneta* and *Vamuna remelana* were recorded with high number of individuals. Among subfamily Lymantriinae, *Calliteara horsfieldi*, *Cispia punctifascia*, *Lymantria bivitta bivitta*, *Imaus munda* and *Numenes siletti* showed high abundance. Among subfamily Calpinae, *Oraesia rectistria*, *O. provocans*, *O. emarginata* and *Oxyodes scrobiculata* were most abundant. Aganainae species *Asota caricae*, Hypeninae species *Dichromia quadralis*, Hypocalinae species *Eudocima phalonia* and *Hypocala subsatura*, Scoliopteryginae species *Anomis flava* and *Rusicada revocans* were among other abundant Erebidae species.



Family Geometridae was represented by 115 species belonging to 6 subfamilies, among which Ennominae had 74 species, Geometrinae 20 species, Larentiinae 13 species, Sterrhinae 4 species and 2 species each of Desmobaethrinae and Oenochrominae. Species of Ennominae which were recorded in high abundance are: *Achrosis costimaculata*, *Antipercnia belluaria*, *Percnia felinaria*, *Biston suppressaria*, *Hypochrosis hyadaria*, *Hyposidra talaca*, *Krananda semihyalina* and *Luxiaria mitorrhaphes*. Among subfamily Geometrinae, *Lophophelma erionoma*, *Maxates thetydaria* and *Tanaorhinus viridiluteata* were abundant. Among Larentiinae, *Eustroma inextricata* and *Agnibesa pictaria* had maximum individuals. Among other minor subfamilies of Geometridae, *Ozola picaria* (Desmobaethrinae) and *Sarcinodes restitutaria* (Oenochrominae) were most distinct.

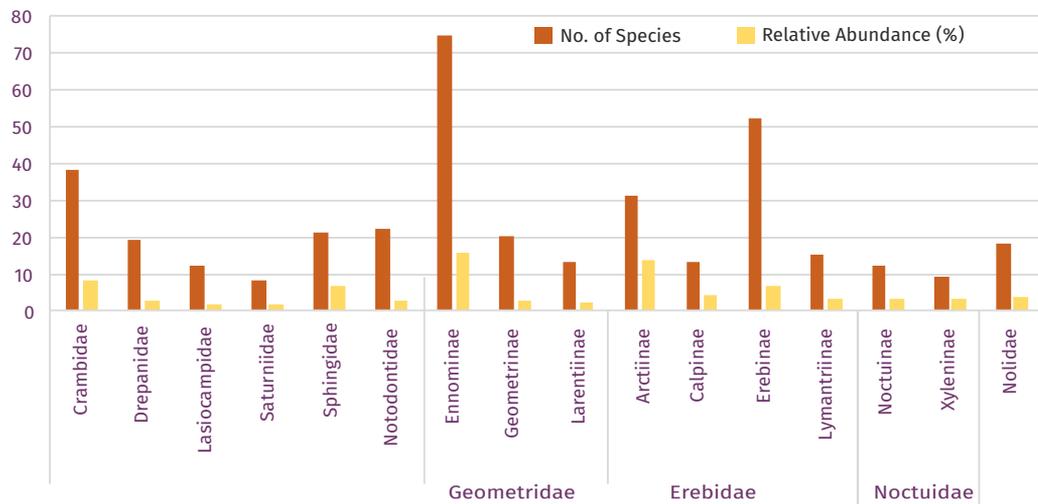
Family Crambidae was represented by 38 species, belonging to 4 subfamilies, of which Spilomelinae was most species-rich with 32 species. *Agathodes ostentalis*, *Glyphodes canthusalis* and *Pygospila tyres* were most abundant within Spilomelinae. Among other subfamilies, *Paracymoriza rivularis* of

Acentropinae, *Pagyda salvalis* and *Rhagoba octomaculalis* of Pyraustinae were recorded in high abundance. Family Pyralidae had 7 species of which *Teliphasa similalbifusa* (Epipaschiinae) and *Endotricha albicilia* (Pyralinae) were most abundant.

Family Noctuidae consisted of 39 species under 12 subfamilies, among which Noctuinae and Xyleninae were most diverse. Noctuinae species, *Tiracola plagiata* and *Anaplectoides tamsi* were recorded in high numbers while, Xyleninae species, *Phlogophora costalis*, *P. calamistrata*, *P. distorta* and *Oroplexia decorata* were most abundant. *Helicoverpa armigera* of Heliothinae, *Diphtherocome viridissima* of Amphipyridae, *Chrysodeixis eriosoma* of Plusiinae were other abundant Noctuid species.

Family Notodontidae had 22 species belonging to 7 subfamilies, most diverse among which was Notodontinae with 13 species, of which, *Chlorostauropus alternus alternus*, *Acmeshachia gigantea*, *A. albifascia*, *Netria viridescens continentalis* and *Teleclita centristicta* were highly abundant.

Figure 3.54: No. of species and Relative Abundance (%) of different families and subfamilies of Moths of NVNP and SNP



Family Sphingidae, having 21 species was represented by most diverse subfamilies as Macroglossinae with 14 species, followed by Sphinginae with 5 species and Smerinthinae with 2 species. Among subfamily Macroglossinae, *Theretra nessus*, *T. boisduvalii* and *Rhagastis albomarginatus* were most abundant, while for Sphinginae, *Psilogramma menephron* and *Agrius convolvuli* were recorded in high numbers of individuals.

Family Drepanidae, consisting of 19 species, had 3 subfamilies, of which, Drepaninae was represented

by 9 species, followed by Thyatirinae with 8 species and Cyclidiinae with 2 species. *Gaurena argentisparsa*, *Habrosyne plagiosa* (Thyatirinae) and *Cyclidia rectificata* (Cyclidiinae) were among most abundant Drepanidae.

Family Nolidae had 18 species, under 3 subfamilies, of which Chloephorinae was most abundant with *Tyana callichlora* and *T. chloroleuca* recorded with maximum number of individuals. *Gadirtha pulchra*, *Westermannia elliptica* (Westermanninae) and *Risoba repugnans* (Risobinae) were also abundant.

Lasiocampidae consisted 12 species, belonging to 2 subfamilies, of which *Paralebeda plagifera* was super abundant. Family Saturniidae was represented by 8 species, of which *Loepa katinka* and *Actias maenas* (Saturniinae) were highly abundant. Limacodidae had 7 species with *Chalcoscelides castaneipars* and *Phocoderma velutina* recorded in high numbers.

Family Endromidae had 5 species with high abundance of *Comparmustilia sphingiformis* and *C. gerontica*. Family Euteliidae had 5 species, all recorded in low numbers, while Family Bombycidae had 3 species of which *Penicillifera apicalis* was highly abundant. *Pidorus glaucopsis* was most abundant among Zygaenidae, which consisted of only 4 species.

Total 13 species from NVNP and SNP were recorded for the first time from India, which were: *Zeuzera nepalense* (Cossidae), known earlier from Pakistan, Nepal and Bhutan; *Herdonia gigantea* (Thyrididae), previously known from Nepal, Vietnam & Thailand; *Teliphasa similalbifusa* (Pyrallidae), previously known only from China; *Gaurena sinuata dierli* (Drepanidae), known till date from Tibet and Nepal; *Kunugia sinjaevi* (Lasiocampidae), recently described from Vietnam; *Comparmustilia gerontica* (Endromidae), known till date from Taiwan; *Cleora determinata* (Geometridae),

known till now from Bhutan to Australia; *Hydatocapnia gemina* (Geometridae), known till now from Pakistan to Thailand; *Krananda fulva* (Geometridae), previously restricted to Nepal; *Ercheia pulchripenula* (Erebidae), known till now from Sundaland; *Diphtherocome viridissima* (Noctuidae), previously known from Vietnam and Thailand; *D. thainympha*, recently described from Thailand; *Diarsia tincta*, known earlier from Nepal, China & Thailand.

A striking number of 195 species, i.e., 42% species were recorded uniquely from Central Himalayan Landscape of NVNP & SNP, and nowhere else from other Himalayan Provinces sampled. All in all, 69 species were reported as novel to Central Himalaya, reported earlier from other Himalayan Provinces. Five species were reported as new to Indian Himalaya: *Telchines vialis* (Thyrididae), known previously from Garo and Khasi Hills, *Hexafrenum collaris* (Notodontidae), previously reported from Garo and Khasi Hills; *Pheosiopsis niteria* (Notodontidae), previously reported from North Eastern Hills and Valleys; *Oraesia provocans* (Erebidae), previously known from Western Ghats, *Gadirtha pulchra* (Nolidae), previously known from Western Ghats.

ALTITUDINAL PATTERN

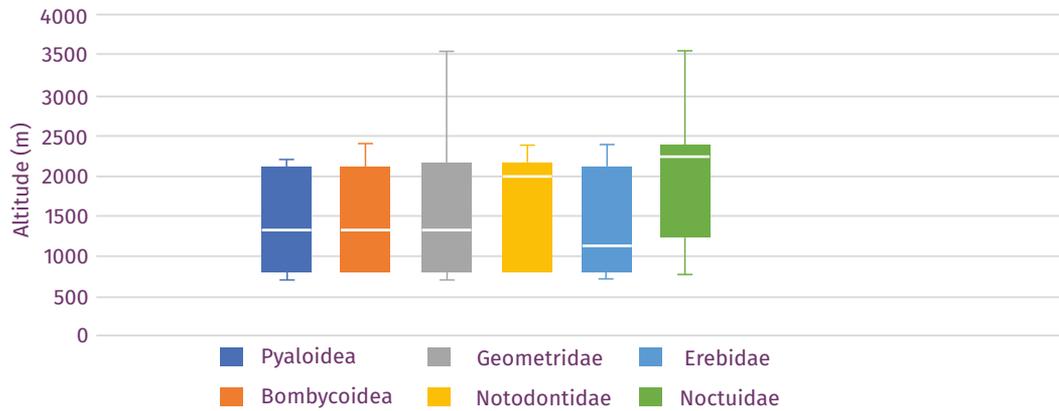
All the major families of moths except Noctuidae were majorly distributed between 750 m and 2100 m (Fig. 3.55). Among Pyraloidea, *Pygospila tyres* were highly abundant at around 2100 m while, *Patania deficiens* was recorded only at 2150 m. Among superfamily Bombycoidea, the Saturniidae species *Loepa katinka* was distributed all through the gradient, whereas Sphingidae species *Hippotion celerio* and *Theretra pallicosta* were recorded only at 2400 m. Species distribution of Geometridae were all through the altitudinal gradient with majority of the species recorded between 700 m and 2100 m. Ennominae species *Apophyga sericea* and Larentiinae species *Eustroma inextricata* were highly abundant only around 2700 m whereas, *Docirava fulgurata* and *Electrophaes niveonotata* were recorded from 3500 m altitude. Mean species distribution of family Notodontidae was around 2000 m with *Syntypistis umbrosa*, *Rachia striata* and *Besaia rubiginea* were active above 2000 m. Upper limit of Erebidae activity was 2350 m while mean species distribution was at around 1200 m. Among Erebidae species, *Dichromia*

tripicalis (Erebinae) and *Heracula discivitta* (Lymantriinae) were active only around 2350 m. Majority of the Noctuidae species were recorded between 1200 m and 2400 m, with mean distribution around 2200 m, highest among all the families. Noctuidae species recorded from highest altitudinal site at 3500 m were: 2 species of *Anaplectoides* viz., *A. inexpectata* and *A. tamsi*, *Oroplexia decorata* and 3 species of *Phlogophora* viz., *P. albovittata*, *P. calamistrata* and *P. conservuloides*.





Figure 3.55: Altitudinal distribution of major moth families of NVNP and SNP, West Bengal



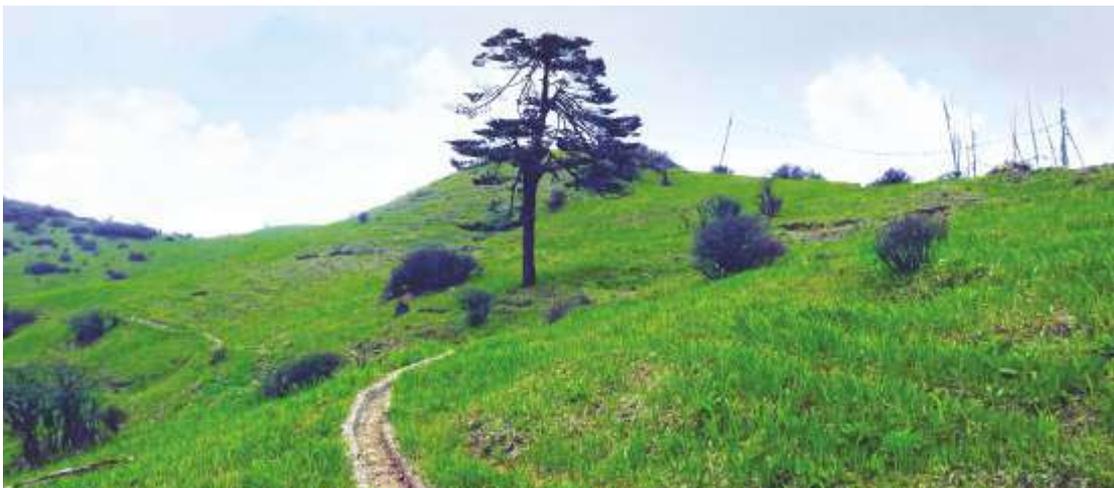
ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Eastern Himalayan Moist Mixed Deciduous Forest (3C/C3b) were dominated by all the major moth families with maximum abundance of family Erebidae. Sub-himalayan Secondary Wet Mixed Forest (2B/C1/2S3) and Eastern Himalayan Sub-tropical Wet Hill Forest (8B/C1) were also dominated by Erebidae whereas Eastern Himalayan Wet Temperate Forest (11B/C1b) and Eastern Himalayan Mixed Coniferous Forest (12/C3a) were frequented only by Geometrids and Noctuids (**Fig. 3.56**).

BIOGEOGRAPHIC AFFINITY

82% of sampled moth assemblage of NVNP & SNP were of Oriental origin with around 44% species affinity for Palaeartic realm. 26% species were also shared with Australian realm. Among Indian Biogeographic Zones and Provinces only about 9% species were shared with two Trans-Himalayan

habitats (Ladakh Mountain- 1A and Tibetan Plateau- 1B). 52% species were distributed in Eastern Himalayan Province (2D), whereas, 48% and 36% species were shared with Western Himalaya (2B) and North-Western Himalaya (2A). 61.5% species were shared with North Eastern Hills and Valleys, whereas 29% species were shared with both Western Ghats and Deccan Peninsula (**Fig. 3.57**).



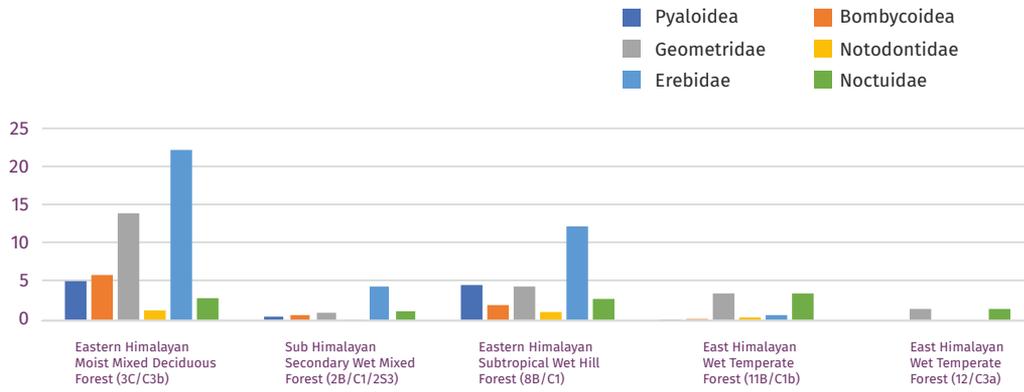


Figure 3.56: Relative Abundance (%) of major Moth families in different habitats of NVNP and SNP

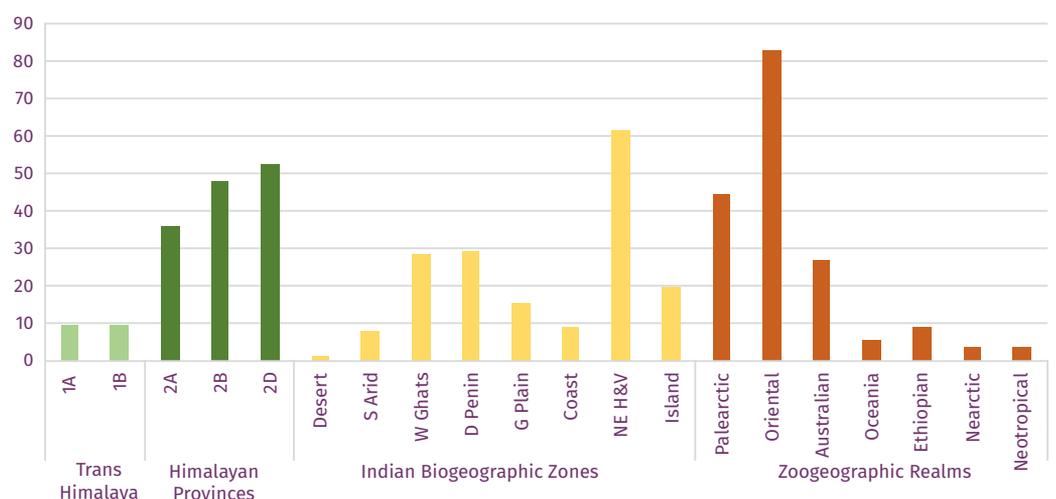


Figure 3.57: Biogeographic Affinities (% representation) of NVNP & SNP moths with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms





NAMDAPHA NATIONAL PARK, ARUNACHAL PRADESH, EASTERN HIMALAYA

*Arna Mazumder, Gaurab Nandi Das, Arajush Payra, Deepak CK,
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INTRODUCTION

LANDSCAPE

Namdapha National Park (NDNP) located in the Changlang district of Arunachal Pradesh is the third largest Protected area of India in terms of area and has three major biomes- tropical, temperate, and alpine. The area lies close to the Indo-Myanmar-China trijunction. Forests are contiguous across the international boundary with Myanmar, with several adjoining protected areas. Wedged between Mishmi Hills and Patkai hills, biogeographically the area is adjoined by the Palearctic sub-region, biotic provinces of Himalayan-Karakoram and Szechwan in Oriental sub-region. It falls in the Eastern Himalaya (2D) biogeographic province of India covering Palearctic and the Indo-Malayan (Oriental) realms (Rodgers and Panwar 1988). The region features soil rich in organic matter which supports extensive Dipterocarpus forests, the northernmost lowland tropical rainforests in the world (Proctor et al., 1998;

Deb and Sundriyal, 2007). Namdapha was originally declared a Wildlife Sanctuary in 1972, then a National Park in 1983 and became a Tiger Reserve under the Project Tiger scheme in the same year. NDNP covers an area of 1886.82 km² (Ghosh 1985) with 177 km² area of buffer zone and 1808 km² of the core area (Adhikari et al., 2007). Among last remote lowland wilderness tracts of Asia, the entire area is mountainous with altitudinal ranges from 200-4571 m. The land comprises the catchment of the Noa-Dihing River, a tributary of the great Brahmaputra river which flows westwards through the middle of Namdapha. The mountainous part of the area enjoys a temperate climate while the low-lying plains and valleys experience tropical climate. The seasons here can be broadly divided into winter (December to February), pre-monsoon (March to May), monsoon (June to September) and post-monsoon (October to November). This remarkable climatic gradient offers favorable rainfall (4000 mm average annual), temperature (15 °C-30 °C) and humidity gradients (47%-93% Relative Humidity).







BRIEF NOTE ON IMPORTANT FLORA & FAUNA

The area is covered with Tropical Evergreen Forest subdivided into following principal categories: Northern Tropical Evergreen Forest/Assam Valley Tropical Wet Evergreen forest; North Indian Tropical Moist deciduous Forest and Miscellaneous forest. *Dipterocarpus macrocarpus* dominated well-drained areas and *Shorea assamica*, an endemic and locally threatened species dominated drier, gravelly soil in

Namdapha (Nath et al., 2005). The area is a treasure house of endangered, wild relatives of cultivated and rare plants like wild tea, wild coffee, wild mango. Overall, about 73 species of lichens, 59 species of bryophytes, 112 species of Pteridophytes, 5 species of gymnosperms and 870 species of angiosperms have been recorded so far in the protected area (Adhikari et al., 2003). The faunal diversity is also high with 96 species of mammals, 233 species of birds, 76 species of fishes, 25 species of amphibians, 28 species of reptiles, 188 species of beetles, 24 species of Hemiptera and 115 species of Mantodea (Ghosh, 1985).

BRIEF HISTORY OF LEPIDOPTERA STUDY IN EASTERN HIMALAYA, ARUNACHAL PRADESH

BUTTERFLIES

Studies on butterflies in Arunachal Pradesh was started as early as 1845 by Doubleday, followed by Moore (1857). During Abor expedition in 1911-1912, Evans (1912) collected butterflies from Abor Hills. Simultaneously, Bailey conducted Lepidopteran survey in Mishimi Hills including Western China and South Eastern Tibet in 1911 followed by another expedition in 1913 to Western Arunachal Pradesh and into eastern Bhutan (South, 1913; Evans, 1914). In 1950, Bettes reported butterflies from Balipara Frontier Tract and Subansiri areas. In 1971, Varshney & Chanda documented butterflies from Tirap and

Changlang districts. Athreya et al. conducted a faunistic survey in 1997 in Namdapha Tiger Reserve. Scarce Jester (*Symbrenthia silana*) was rediscovered by Kunte (2010) from Eastern Himalaya, including Namdapha. Sethy et al. (2014) reported 113 species under 73 genera from South-eastern part of Namdapha Tiger Reserve. Recently, A new species of *Hypolycaena*, *Hypolycaena narada* was described from Namdapha Tiger Reserve (Kunte, 2015). In 2015, Thombre & Kehimkar recorded *Ideopsis similis persimilis* from Namdapha. Singh (2017) published a total of 415 species along with their association with major forest types from Arunachal Pradesh.





MOTHS

Review of the available literature reveals that Arunachal Pradesh is a state where works on moths have rarely been attempted. Gupta & Shukla (1977) published a document on moths of Arunachal Pradesh which dealt with 14 species from 4 families. In 1982, Arora & Choudhury published a monograph which dealt on 55 species over 26 genera and 6 subfamilies of Arctiidae from Arunachal Pradesh and adjoining areas of Assam. In 1990, 15 species of moths from 9 families were listed by Ghosh & Chaudhury. A study on family Ctenuchidae from Arunachal Pradesh was made by Arora, Ghosh & Chaudhury (1992). In 2001, Kirti & Sodhi published a systematic list of Pyraustinae of family Pyralidae which contained 102 species from Northeastern India. Chandra & Sambath (2013) documented 102 species from Tawang district of Arunachal Pradesh.



SAMPLING DETAILS

During the course of current study (2015-2018), butterfly transects and light trapping for moths were undertaken in 15 sites (Table 3.6, Fig. 3.58-3.59). The sampling sites were categorized into 3 dominant vegetation types (Fig. 3.60) according to Champion & Seth (1968) classification, which are as follows:

Assam Valley Tropical Wet Evergreen Forest (1B/C1)

Tall evergreen forest of giant *Dipterocarpus macrocarpus* and *Shorea assamica* standing over closed evergreen canopy of *Mesua*, *Vatica*, *Eugenia* grown from plains up to 1200 m in areas receiving annual rainfall above 2500 mm with dense growth of *Dendrocalamus*, *Bambusa*. Six sampling sites fell under this type.

Upper Assam Valley Tropical Evergreen Forest (1B/C2)

A climax forest type replacing the previously mentioned *Dipterocarpus*-*Mesua* forest with dominance of *Kayea assamica*, *Dysoxylum*, *Echinocarpus*. Six sampling sites fell under this type.

Sub-Himalayan Light Alluvial Semi-Evergreen Forest (2B/C1/1S1)

A close, largely evergreen, high forest of *Terminalia myriocarpa*, *Phoebe*, *Ailanthus*, *Mesua* with dense middle storey and varied undergrowth of Cane and Bamboos, occurring on well drained slopes. Three sampling sites fell under this type.



Table 3.6:
Details of
Sampling
Sites, Dates
and Weather
parameters
in Namdapha
(ND) National
Park,
Arunachal
Pradesh

Sl. no.	Location	Date	Location Code
1	Miao	4.x.2016	ND01A
2	10 Mile	15.x.2016	ND02A
3	Deban Forest Rest House	06.x.2016-	ND03A
		14. x.2016	ND03B
		20.x.2016-	ND03C
		30. x.2016	ND03D
		6.xi.2016-	ND03E
		15.xi.2016	ND03F
		22.xi.2016	ND03G
		28.ii.2017-	ND03H
		08.iii.2017	ND03I
		16.iii.2017	ND03J
		11.vi.2017	ND03K
		23.vi.2017	ND03L
		24.vi.2017	
25.vi.2017			
26.vi.2017	ND03H		
27.vi.2017			
28.vi.2017			
29.vi.2017			
30.vii.2017	ND03I		
16.xii.2017	ND03J		
21.xii.2017	ND03K		
- 27.xii.2017			
05.viii.2018	ND03L		
4	27 Mile	21.x.2016-	ND04A
		29. x.2016	
5	29 Mile	28.x.2015	ND05A
		29.x.2015	
		30.x.2015	
		31.x.2015	
		02.xi.2015	ND05B
		12.xi.2015	
6	Lankhai Nala	31.x.2016	ND06A
		05.iii.2017	ND06B
		17.xii.2017	ND06C
7	Anamika Fall	07.x.2016	ND07A
8	Burma Nala	08.viii.2018	ND08A
9	19 Mile	13.x.2016	ND09A
10	Nibodi	09.viii.2018	ND10A



Details

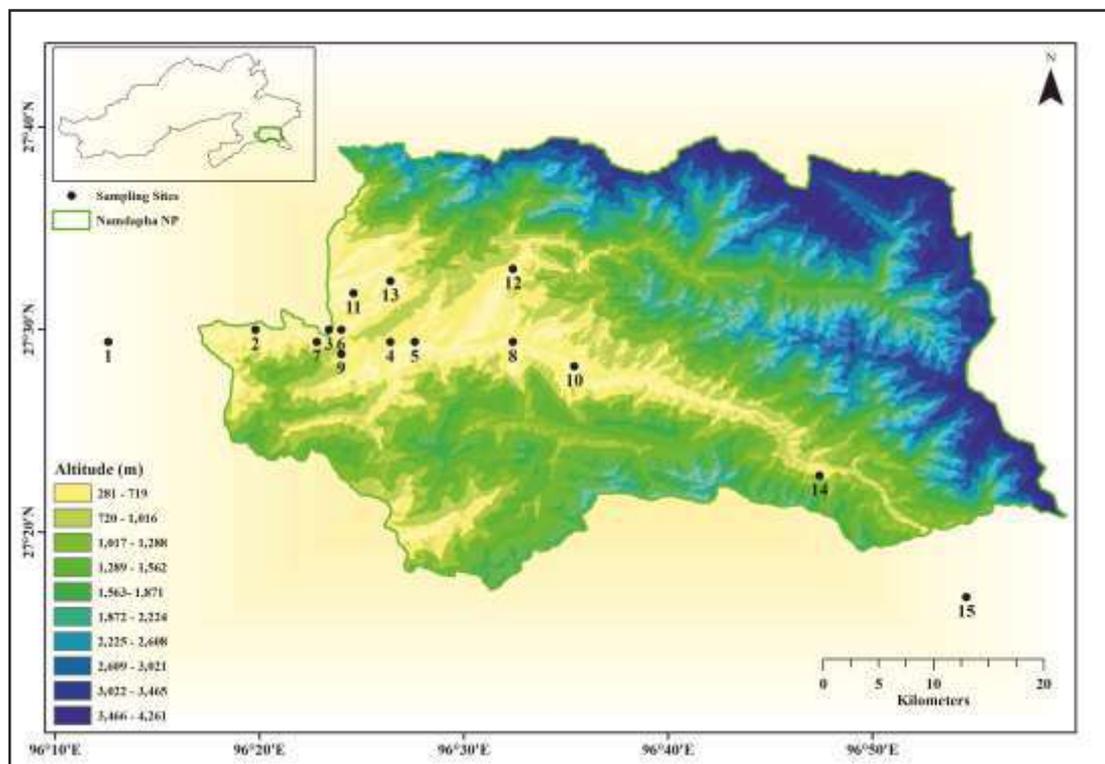
Latitude (°N)	Longitude (°E)	Altitude (m)	Vegetation Type	Avg. Temp. (°C)	Avg. Hum. (%)	Moon Phase*
27.4901	96.2071	256	Assam Valley Tropical Wet Evergreen Forest (1B/C1)	28.5	98	
27.5023	96.3315	319	Assam Valley Tropical Wet Evergreen Forest (1B/C1)	26.8	85	
27.4971	96.3911	345	Assam Valley Tropical Wet Evergreen Forest (1B/C1)	30.4	76	
				29	84.7	
				31.7	92.4	WX xiii
				20.4	64.3	WN viii
				15.4	74	WX iii
				16	82.3	WX xi
				28.9	98.7	WN ii
				24.3	99	WN xiv
					100	NM
				18.9	100	WX i
				22.7	94.3	WX ii
				26	91.5	WX iii
				25.3	100	WX iv
				31.7	99.6	WX v
				24	100	WX vii
				13.4	42.6	
				12.6	48.1	
				26.6	99	
27.4891	96.4438	370	Assam Valley Tropical Wet Evergreen Forest (1B/C1)	11.9	78.6	NM
27.4877	96.4584	371	Assam Valley Tropical Wet Evergreen Forest (1B/C1)	19	85	WN i
				16.2	82.7	WN ii
				21.5	87.3	WN iii
				20.3	75.9	WN iv
				11.4	74	WX xiii
				12	62	WN viii
27.5037	96.3968	375	Assam Valley Tropical Wet Evergreen Forest (1B/C1)	26	71	
				25.8	82.5	
				12.9	42.6	
27.4933	96.3780	413	Upper Assam Valley Tropical Evergreen Forest (1B/C2)	24	48	
27.4904	96.5383	436	Upper Assam Valley Tropical Evergreen Forest (1B/C2)	24.2	86	
27.4777	96.4012	466	Upper Assam Valley Tropical Evergreen Forest (1B/C2)	21.5	42	
27.4705	96.5896	477	Upper Assam Valley Tropical Evergreen Forest (1B/C2)	30	65.7	



Sl. no.	Location	Date	Details			
			Location Code	Latitude (°N)	Longitude (°E)	Altitude (m)
11	Haldibari	30.x.2016	ND11A	27.5263	96.4125	564
		08.iii.2017	ND11B			
12	Farmbase	05.xi.2016	ND12A	27.5529	96.5368	611
13	Hornbill	30.x.2016	ND13A	27.5385	96.4378	657
		01.xi.2016-09.xi.2016	ND13B			
		13.iii.2017	ND13C			
		18.xii.2017-20.xii.2017	ND13D			
14	Yacheley	10.viii.2018-20.viii.2018	ND14A	27.3846	96.7920	918
15	Gandhigram	15.viii.2018	ND15A	27.2771	96.9130	1051



Figure 3.58: Sampling sites (15) in the Eastern Himalayan Landscape of NDNP, Arunachal Pradesh on Digital Elevation Map



Vegetation Type	Avg. Temp. (°C)	Avg. Hum. (%)	Moon Phase*
Upper Assam Valley Tropical Evergreen Forest (1B/C2)	13.1	40.4	WN i
	18.3	72	
Upper Assam Valley Tropical Evergreen Forest (1B/C2)	22	48.3	
Sub-Himalayan Light Alluvial Semi-Evergreen Forest (2B/C1/1S1)	14.1	52	
	14.9	50.5	WX v
	17.1	79	WN i
	22.4	40.7	
Sub-Himalayan Light Alluvial Semi-Evergreen Forest (2B/C1/1S1)	26	95.8	
Sub-Himalayan Light Alluvial Semi-Evergreen Forest (2B/C1/1S1)	24.3	96.1	

*WX= Waxing Phase, i.e. New Moon to Full Moon Period (e.g. WX iii refers to the 3rd day after No Moon); WN= Waning Phase, i.e. Full Moon to New Moon Period (e.g. WN iii refers to the 3rd day after Full Moon).

The days with no mention of moonphase were only devoted to day-time butterfly sampling.

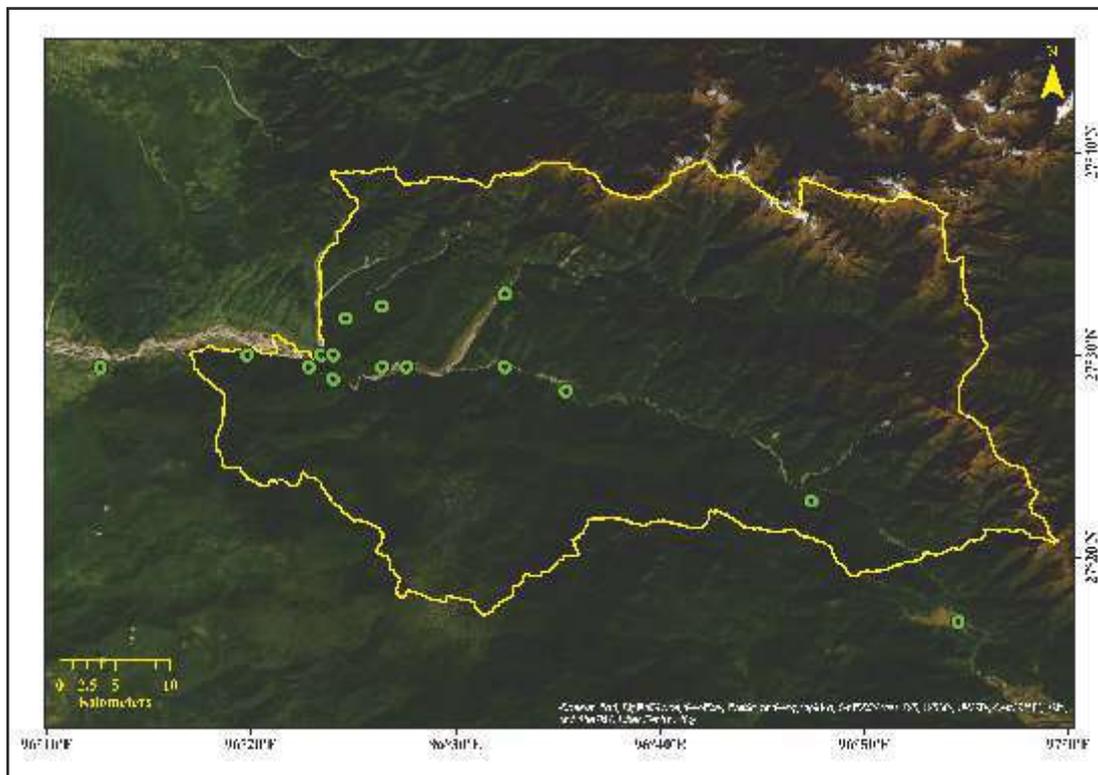


Figure 3.59: All the sampling sites in NDNP shown on Topographic Map



Figure 3.60:

Major vegetation types sampled in NDNP: i. Assam Valley Tropical Wet Evergreen Forest; ii. Assam Valley Tropical Wet Evergreen Forest; iii. Upper Assam Valley Tropical Evergreen Forest; iv. Sub-Himalayan Light Alluvial Semi-Evergreen Forest



LEPIDOPTERAN ACCOUNT

BUTTERFLY

ASSEMBLAGE COMPOSITION

From NDNP, 272 species of butterflies belonging to 152 genera representing 24 subfamilies of 6 families were recorded (Fig. 3.61).

Family Papilionidae had 25 species, belonging to single subfamily Papilioninae, among which *Graphium agamemnon agamemnon*, *Lamproptera curius curius*, *Papilio alcmenor alcmenor* and *Papilio paris paris* were most abundant.

A total of 58 species of Hesperidae, belonging to 3 subfamilies were recorded, among which, Hesperinae was most species rich with 31 species, followed by Pyrginae having 18 species and Coeliadinae had 9 species. Among Hesperinae, *Notocrypta curvifascia curvifascia*, *Pyrroneura margherita margherita*, *Polytremis eltola eltola* and *P. lubricans lubricans* were most abundant. Most encountered species of Coeliadinae was *Burara jaina jaina*. Among subfamily Pyrginae, *Celaenorrhinus aurivittatus aurivittatus*, *C. nigricans nigricans*, *C. patula* and *Gerosis phisara phisara* were most prominent.

Family Pieridae was represented by 22 species belonging to 2 subfamilies, among which Pierinae, having 18 species, were most abundant followed by Coliadinae with 4 species. Among Pierinae, *Appias indra indra*, *Cepora nadina nadina* and *Pareronia avatar avatar* were most abundant, whereas, *Eurema hecabe hecabe* of Coliadinae was also recorded in high number of individuals.

Family Lycaenidae was represented by 54 species belonging to 7 subfamilies of which Polyommatae was most diverse with 26 species followed by Theclinae with 21 species. Among most abundant species of Polyommatae, *Caleta elna noliteia*, *Celastrina lavenderis limbata*, *Nacaduba beroe gythion* and *Udara dilecta dilecta* were most prominent. Among subfamily Theclinae, *Arhopala centaurus pirthous*, *Chliaria othona othona*, *Hypolycaena erylus himavantus* and *Zeltus amasa amasa* were recorded in high abundance. Among other subfamilies, *Heliophorus epicles latilimbatai* (Lycaeninae) was also recorded with high number of individuals.

Family Riodinidae, was represented by 4 species belonging to single subfamily, Riodininae of which *Zemeros flegyas flegyas* was most abundant.

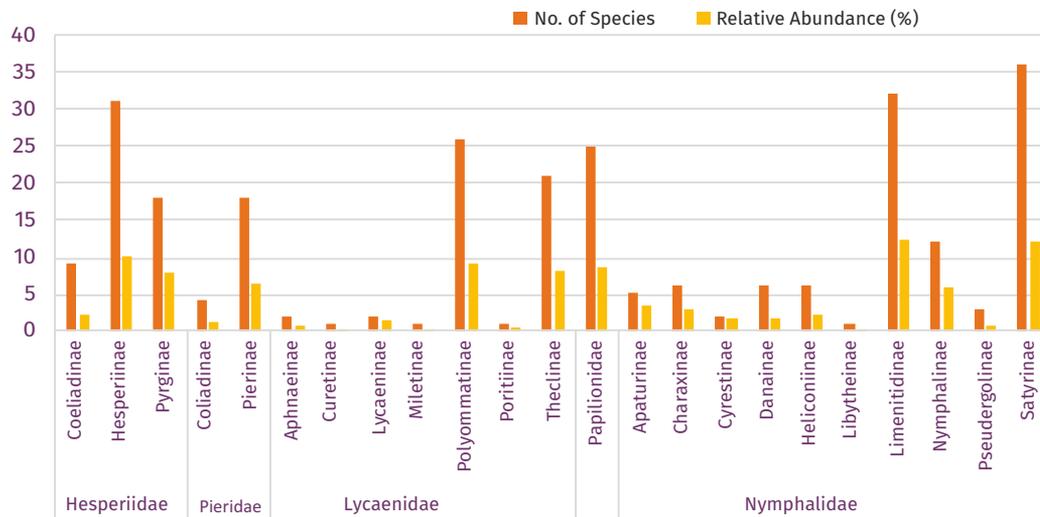
Family Nymphalidae had 109 species resented by 10 subfamilies of which Satyrinae, with 36 species, was most species-rich followed by Limenitidinae with 32 species and Nymphalinae with 12 species. Among Satyrinae, most abundant species were *Mycalesis adamsoni*, *Neope bhadra* and *Ragadia crisilda crisilda*. Among Limenitidinae, *Athyma kanwa phorkys*, *A. pravara acutipennis*, *A. selenophora bahula* and *Neptis clinia susruta* were in high abundance. Among 12 species of Nymphalinae, *Kallima inachus inachus*, *Symbrenthia hypselis cotanda*, *S. lilaia khasiana* and *Vanessa indica indica* were most prominent. Among other subfamilies of Nymphalidae, *Mimathyma ambica ambica* (Apaturinae), *Polyura bhārata* (Charaxinae) and *Chersonesia risa risa* (Cyrestinae) were recorded with maximum abundance.

An overwhelming number of 137 species, i.e., 50.63% were uniquely recorded from NDNP, that is nowhere else from other Himalayan Provinces.





Figure 3.61: No. of species and Relative Abundance (%) of different families and subfamilies of butterflies of NDNP, Arunachal Pradesh



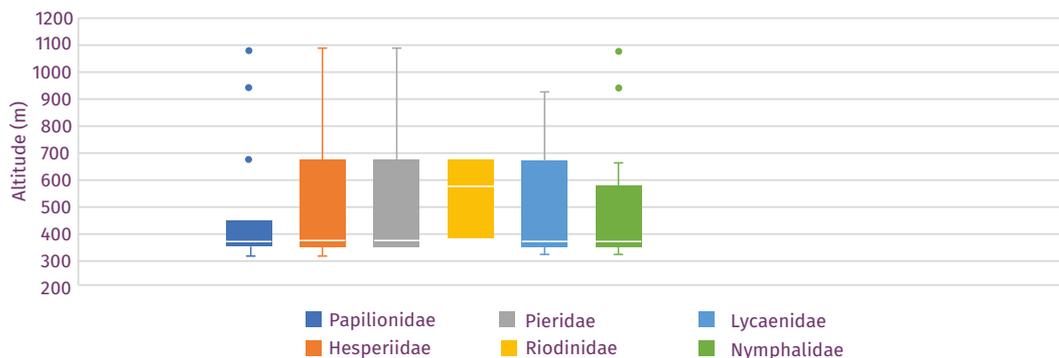
Rare species like *Capila zennara* was recorded from Hornbill, while another species *Capila jayadeva* was recorded from Deban, both of them were previously not recorded from Namdapha. Interestingly, *Byasa polla* was recorded at elevation 918 m from Yacheley village, while its previously known altitudinal range was 1200-2400 m and distributed in East Bhutan, Nagaland and Manipur. *Hypolycaena narada* described recently in 2015 from Bodhisatta village near Namdapha, was recorded from Deban, whereas species *Creteus cyrina* was recorded from Yacheley village, which was treated as vary rare by Evans (1932).

ALTITUDINAL PATTERN

Within the short altitudinal gradient surveyed in NDNP between 300 m and 1000 m, all the major families of butterflies had mean species distribution at around 400 m (Fig. 3.62). Most of the species of Papilionidae was encountered within a narrow range from 350 m to 450 m with *Byasa polla* and *Lamproptera meges virescens* recorded from 1100 m. Distribution of family Hesperioidea was well laid with majority of species recorded between 350 m and 650 m, whereas *Aeromachus jhora creta*, *Creteus cyrina*, *Thoressa cerata* and *T. hyrie* were recorded above 900 m. Among Pieridae, only *Delias belladonna*

lugen was only active between 900-1000 m, whereas, *Eurema hecabe hecabe* and *Pareronia avatar avatar* were encountered throughout the gradient. Among 4 Riodinidae species, *Stiboges nymphidia nymphidia* was recorded only from 650 m whereas all the other species were encountered around 350 m. Species of Lycaenidae were more or less evenly distributed with *Heliophorus indicus indicus* and *Anthene emolus emolus* recorded only from 900 m. Nymphalidae distribution was restricted between 350 m and 550 m, with 4 species distributed up to 1000 m, namely, *Argynnis hyperbius hyperbiu*, *Parasarpa zayla zayla*, *Kallima inachus inachus* and *Symbrenthia lilaea khasiana*.

Figure 3.62: Altitudinal distribution of butterfly families of NDNP, Arunachal Pradesh



ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among 3 habitats surveyed in NDNP, butterfly abundance was maximum in Tropical Wet Evergreen Forest (1B/C1) where Nymphalidae was most dominant with high abundance of both Hesperiiidae and Lycaenidae (Fig. 3.63). The other 2 habitats, Tropical Evergreen Forest (1B/C2) and Sub-Himalayan Light Alluvial Semi-Evergreen Forest (2B/C1/1S1) were comparatively less diverse, mainly dominated by Nymphalidae while abundance of Hesperiiidae and Lycaenidae were more in later one.

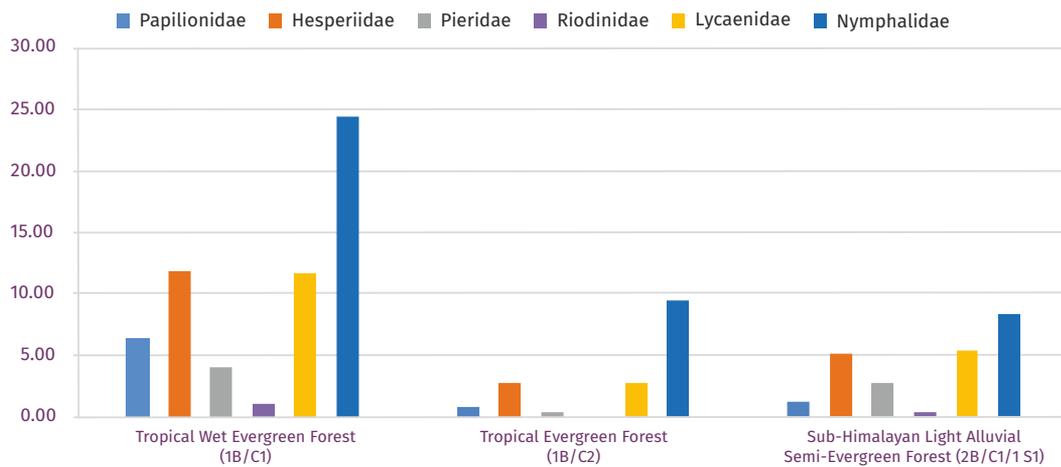


Figure 3.63: Relative Abundance (%) of butterfly families in different habitats of NDNP

BIOGEOGRAPHIC AFFINITY

All the 272 species of butterflies in NDNP are of Oriental origin, with around 43% species shared with Palearctic zone (Fig. 3.64). Only 5.5% species showed Australian affinity. Among Indian Biogeographic Zones and Provinces, only 17% species were shared with two Trans-Himalayan provinces (Ladakh Mountain- 1A and Tibetan Plateau- 1B) while 89% species had distribution in Central Himalaya (2C). The percentage of share gradually decreased westward with 50% species distributed in Western Himalaya (2B) and only 28% species shared with North-Western Himalaya (2A). The assemblage was almost 98% similar with North Eastern Hills and Valleys, with 46% species share with Gangetic Plain and around 30% species with Coast.

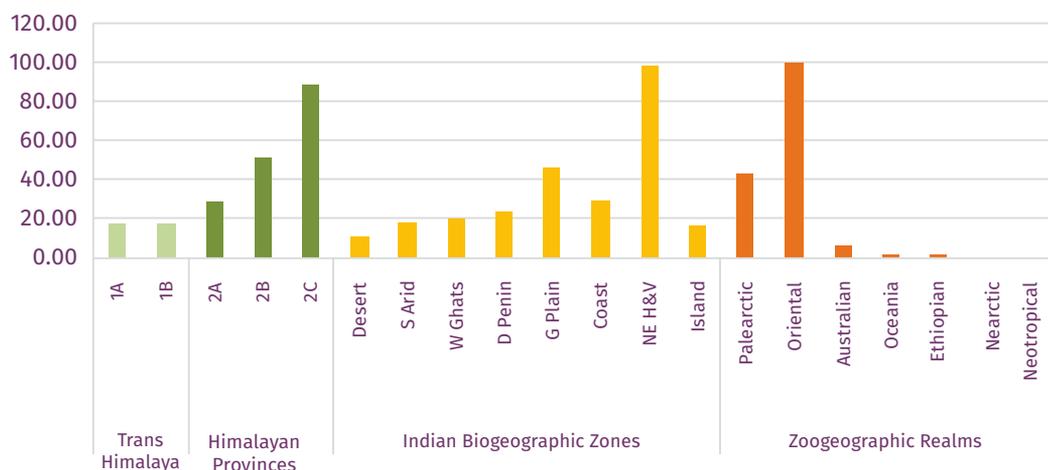


Figure 3.64: Biogeographic Affinities (% representation) of NDNP Butterflies with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms



MOTH

ASSEMBLAGE COMPOSITION

A total number of 247 species of moths belonging to 196 genera under 46 subfamilies of 20 families were recorded from various sites of NDNP which includes Cossidae (5 species), Limacodidae (6), Zygaenidae (5), Thyrididae (2), Callidulidae (2), Pyralidae (4), Crambidae (42), Drepanidae (1), Lasiocampidae (6), Brahmaeidae (1), Endromidae (1), Bombycidae (1), Sphingidae (19), Uraniidae (3), Geometridae (55), Notodontidae (14), Erebiidae (71), Euteliidae (1), Nolidae (3) and Noctuidae (8).

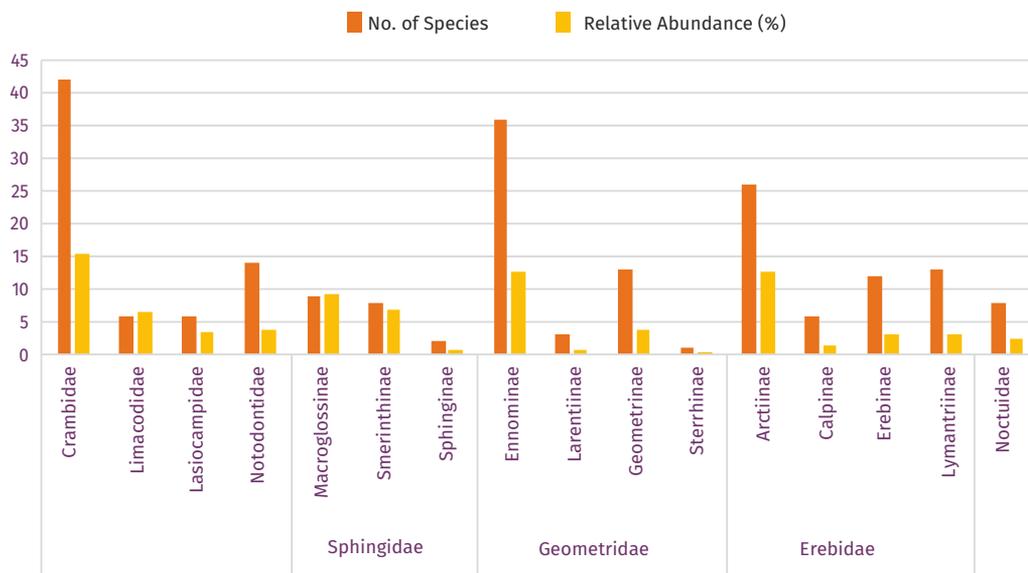
Erebiidae was the most speciose family with 71 species belonging to 9 subfamilies, of which Arctiinae with 26 species was most diverse, followed by Lymantriinae with 13 species and Erebiinae with 12 species. Among most abundant species of Arctiinae, 3 were most prominent viz. *Amerila astreus*, *Chrysaeglia magnifica* and *Spilarctia sagittifera*. Among Lymantriinae, 2 species were highly abundant namely, *Lymantria brotea lepcha* and *Numenes siletti*. Among Erebiinae, *Anisoneura salebrosa* and *Ercheia pulchrivenula* were recorded in high numbers (**Fig. 3.65**).

The second largest family was Geometridae with 55 species belonging to 4 subfamilies, among which Ennominae was most diverse with 36 species

followed by Geometrinae with 13 species. Among Ennominae, *Antipercnia belluaria*, *Hypomecis lioptilaria*, *Krananda latimarginaria*, *Mimochroa angulifascia* and *Zeheba aureata* were most abundant. Among Geometrinae, *Pingasa ruginaria*, *Pelagodes bellula* and *Lophophelma erionoma* were highly abundant.

Family Crambidae was the third largest family with 42 species, belonging to 4 subfamilies, among which Spilomelinae was most diverse with 38 species, most abundant among which were *Glyphodes canthusalis*, *Herpetogramma luctuosalis*, *Heterocnephes lymphatalis*, *Pygospila tyres* and *Sameodes pictalis*. Among other subfamilies of Crambidae, a Pyraustinae species, *Rhagoba octomaculalis* was highly abundant. Total 19 species of Sphingidae were recorded representing 3 subfamilies among which Macroglossinae with 9 species was most diverse, followed by Smerinthinae with 8 species. Among subfamily Macroglossinae, *Theretra nessus*, *Acosmeryx socrates*, *A. omissa*, *A. anceus subdentata* were recorded with high number of individuals. Among subfamily Smerinthinae, *Ambulyx ochracea* and *Dolbina inexacta* were most abundant. Family Notodontidae was recorded with 14 species belonging to 5 subfamilies, among which, Spataliinae was most diverse with 4 species with *Spatalina desiccata stolid* being most dominant.

Figure 3.65:
No. of species and Relative Abundance (%) of different families and subfamilies of Moths of NDNP



Collectively, 8 species of Noctuidae were recorded belonging to 4 subfamilies among which Noctuinae being the most diverse with *Diarsia nigrosigna* being most abundant. A total of 6 species of Limacodidae were recorded, of which *Squamosa ocellata*, *Chalcoscelides castaneipars* and *Phocoderma velutina* were most abundant. Among 6 Lasiocampidae species, *Euthrix isocyma* and *E. inobtrusa* were recorded with high number of individuals. 5 species of Cossidae all belonging to subfamily Zeuzerinae were recorded of which *Chalcidia minea* was most abundant. 5 species of Zygaenidae were recorded among which *Pidorus glaucopis* was abundant. 4 species of Pyralidae were documented with *Locastra muscosalis* being super abundant.

Interestingly, 10 species were recorded for the first time and were added to the Indian Moth fauna from NDNP: A Thyrididae species viz., *Herdonia approximata*, previously recorded from only Thailand; 4 Ennominae species viz., *Alcis periphracta*, previously known from Myanmar, China and Sundaland; *Cleora determinata*, was known from Bhutan, Myanmar, Sundaland up to Australia till date; *Hypomecis costaria*, previously known from only Sundaland; *Krananda latimarginaria*, previously known from China, Taiwan, Hong Kong, Sundaland, Japan and

Korea; 1 Geometrinae species viz., *Pelagodes bellula*, previously known from Myanmar and China; 3 Erebidae species viz., *Ercheia pulchrivenula*, previously known only from Sundaland; *Phyllodes verhuelli*, till date known from Myanmar and Sundaland; *Nygmia epirotica*, known only from Sundaland; 1 Eutelidae species, *Anuga insuffusa*, was previously known from Myanmar and Sundaland only.

An overwhelming number of 98 species were recorded as novel to Eastern Himalayan Province (2D), among which most interesting records were: *Phragmataecia impura* (Cossidae) recorded previously from Gangetic Plains and Western Ghats; *Palpita annulifer* (Crambidae) was previously known only from Deccan Peninsula and Western Ghats; *Chiasmia pseudonora* (Geometridae) was earlier distributed in Deccan Peninsula; *Tarsolepis japonica* (Notodontidae) was known from Western Himalaya (2B) while, *Pterogonia cardinalis* (Nolidae) from Deccan Peninsula. Three species which had doubtful occurrence from India were reported for the first time from NDNP: *Lophophelma loncheres* (Geometridae), *Simplicia schaldusalis* and *Carsina flavibrunnea* (Erebidae). Total 114 species (46%) were recorded only from NDNP, and nowhere else from other Himalayan sites.

BIOGEOGRAPHIC AFFINITY

The recorded assemblage of moths from NDNP was entirely of Oriental origin with around 42 % species having affinity for Palaearctic realm. Significant species affinity was also with Australian realm (28%). Among Indian Biogeographic Zones and Provinces, only 6% species were shared with two Trans-Himalayan provinces (Ladakh Mountain- 1A and Tibetan Plateau- 1B), while almost 80% species were also distributed in Central Himalaya (2C) and species share gradually decreased westwards, 46% with Western Himalaya (2B) and 32% with North-Western Himalaya (2A). Almost, 73% species were shared with North Eastern Hills and Valleys while, 33 -35% species had distribution in Western Ghats and Deccan Peninsula. 14% species were shared with Gangetic Plains (Fig. 3.66).

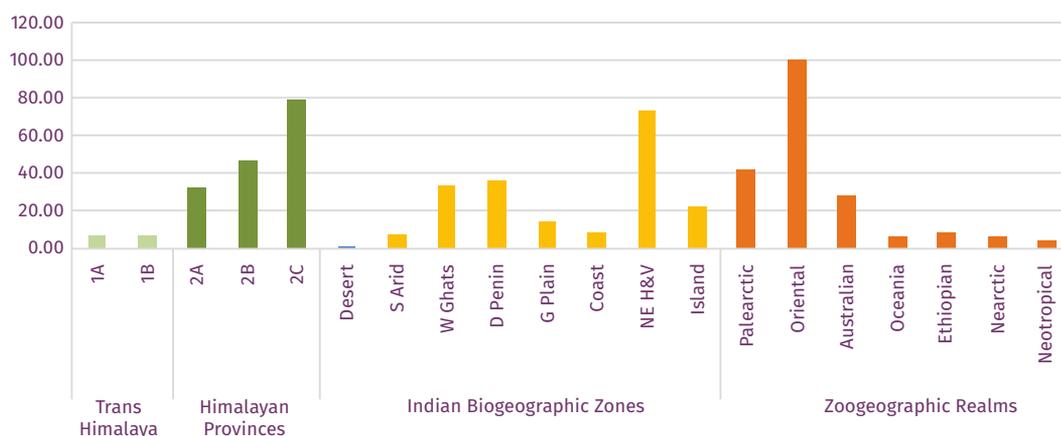


Figure 3.66: Biogeographic affinities (% representation) of NDNP moths with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms



DIHANG-DIBANG BIOSPHERE RESERVE, ARUNACHAL PRADESH, EASTERN HIMALAYA

Subrata Gayen, Gaurab Nandi Das, Rahul Ranjan, Kaushik Mallick, Kamalika Bhattacharyya, Arna Mazumder

INTRODUCTION

LANDSCAPE

Dihang–Dibang Biosphere Reserve (DDBR) established under the UNESCO's Man and Biosphere (MAB) program in 1998 is the largest Biosphere reserve of Arunachal Pradesh. Lying towards the extreme north-eastern part of Arunachal Pradesh, this area shares its international boundary and continuous forested lands with the Chinese territory. DDBR, spanning between 500–6000 m, occupies a total area of 5112 Km² with 4095 Km² as the core zone and 1017 Km² as the buffer zone. Stretched across Dibang Valley, East Siang and West Siang districts, the area is characterized with robust mountainous terrain and violent erosive rivers like Mathu, Dri, Ithun etc. The Dibang River, originating in the Western part of China, flows through the

biosphere reserve in north-south direction before meeting the mighty Brahmaputra. Popularly known as Mishmi Hill and inhabited majorly by the Mishmi tribes, the region is being longitudinally extended along the Indo-Tibetan Trans-Himalayan zone and spread across the tri-junction of Oriental, Indo-Malayan and Palearctic biotic provinces. Following major seasons can be noted: winter (November to February), pre-monsoon (March to May), monsoon (June to August) and post-monsoon (September to November). With high rainfall around 5000 mm annually, temperature ranges between -14°C to 37°C and relative humidity gradient fluctuates between 50%–99% causing dense floral diversity leading to diverse faunal resources of endemic and locally restricted species (Mishra et al., 2006; Aiyadurai, 2012; Borang, 2004).







BRIEF NOTE ON IMPORTANT FLORA & FAUNA

DDBR being exceptionally rich in biodiversity, 10 major forest types were identified which falls under 5 major biomes namely Tropical, Subtropical, Temperate, Sub-Alpine and Alpine with major plant genera like *Michelia*, *Quercus*, *Magnolia*, *Saussurea*, *Sedum*, *Saxifraga*, *Rhododendron* etc. 180 species of mammals, 492 species of birds, 106 species of

reptiles, 43 species of amphibia and 93 species of fishes are documented from the area (Rangini et al., 2013). Mishmi Takin, Red Goral, Gongshan Muntjac, Mechuka Giant Squirrel are endemic and newly described mammals from the area, whereas bird species Blue-and-White Flycatcher (*Cyanoptera cyanocephala*) was added as novel to Indian fauna from this area (Datta et al., 2003; Choudhury, 2010; Mize et al., 2014).

BRIEF HISTORY OF LEPIDOPTERA STUDY IN DDBR, MISHMI HILLS, ARUNACHAL PRADESH

BUTTERFLIES

Very limited Lepidopteran studies have been carried out till date in the Mishmi Hills area of DDBR. Doubleday (1845) and Moore's account included few species of butterflies from Mishmi Hills, whereas Evan's collection from Abor Hills included several species from the foothills of Lower Dibang valley. South (1913) documented butterflies from Mishmi Hills including Western China and South-Eastern Tibet during Capt. F.M. Bailey's expedition in 1911. After a gap of almost 100 years, Borang et al. (2008) enlisted butterflies of Dihang-Dibang Biosphere Reserve including 134 species from Arunachal



Pradesh. An extensive list of 294 butterflies from lower Dibang Valley were documented by Gogoi (2012). In 2013, Roy described a new species *Callerebia dibangensis* from Mithun Valley, Upper Dibang Valley. Simultaneously, Singh (2013) reported *Sasakia funebris* from Upper Dibang Valley after 88 years. Karimbukara et al. (2016) reported *Tongeia pseudozuthus* as a new record to India from Ithun Valley and recorded another individual between Mayodia and Hunli. In the same year, Roy (2016) reported *Cigaritis zhengweilie* from Upper Dibang Valley for the first time from India. Most recently, *Drupadia scaeva cyara* was recorded from Dibang Valley after 83 years (Das et al., 2018b).



MOTHS

Moth study has been rarely carried out in this landscape, with exception of Arora & Gupta (1979) publishing 3 species of Non-Mulberry Silkmoths from Roing, Lower Dibang Valley. Gogoi et al. (2014) published a preliminary account of moths of Arunachal Pradesh consisting of 104 species. A new species of Zygaenidae, *Elcysma ziroensis* was described from Zero Valley by Chada et al. (2017). Sondhi & Kunte (2018) recorded 148 species of moths from Pakke Tiger Reserve which is an almost similar kind of landscape as DDBR.



SAMPLING DETAILS

During the course of current study (2016-2018), butterfly transects and light trapping for moths were undertaken in 29 sites (Table 3.7, Fig. 3.67-3.68). The sampling sites were categorized into 6 dominant vegetation types (Fig. 3.69) according to Champion & Seth (1968) classification, which are as follows:

Sub-Himalayan Light Alluvial Semi-Evergreen Forest (2B/C1/1S1)

A largely evergreen high and close forest of *Terminalia myriocarpa*, *Phoebe*, *Ailanthus*, *Mesua* with dense middle storey and varied undergrowth of Cane and Bamboos, occurring on well drained slopes. Two sampling sites fell under this type.

Upper Assam Valley Tropical Evergreen Forest (1B/C2)

Grown on undulating old alluvium soil on extreme east on the north bank of Brahmaputra Valley, in annual rainfall zone about 2300-3800 m, this forest type is dominated by *Kayea assamica*, *Dysoxylum*, *Echinocarpus*, *Pterospermum*, *Terminalia*. Three sampling sites fell under this category.

Eastern Himalayan Sub-tropical Wet Hill Forest (8B/C1)

Hill forest of *Castanopsis*, *Schima*, *Bohmeria*, *Elgelhardtia* grown between 1200-1800 m in heavy rainfall zone, with shrubby undergrowth and with numerous Climbers, Epiphytes and Orchids. Sometime with association of *Dendrocalamus*. Seven sampling sites were categorized under this.



East Himalayan Wet Temperate Forest (11B/C1)

Closed, evergreen, high forest type grown in area receiving over 5000 mm annual rainfall zone in altitudinal range of 1800-2400 m, dominated by *Quercus lamellosa*, *Q. pachyphylla*, *Castanopsis*, *Acer*, *Michelia*, *Betula*, *Machilus* etc. with association of *Rhododendron*, *Lyonia*, *Polygonum* and many Ferns. Ten sampling sites fell under this type.

East Himalayan Mixed Coniferous Forest (12/C3a)

A dense evergreen forest of *Tsuga*, *Abies*, *Quercus*, *Acer*, *Betula*, *Taxus* etc. grown between 2300-3000 m with dense undergrowth of Bamboo, *Rhododendron* and with abundant ferns. Five sampling sites came under this category.

East Himalayan Sub-Alpine Birch/Fir Forest (14/C2)

A Sub-Alpine forest type, grown above 3000 m in heavy rainfall zone dominated by *Abies densa*, *Juniperus wallichiana*, *Rhododendron wightii*, *R. lepidotum*, *Larix*, *Picea*, *Spinulosa*, *Salix* etc. Three sampling sites came under this category.



Table 3.7: Details of Sampling Sites, Dates and Weather parameters in Dihang-Dibang (DD) Biosphere Reserve, Arunachal Pradesh

Sl. no.	Location	Date	Location Code
1	Eduli	07.i.2017	DD01A
2	Roing	23.viii.2016	DD02A
3	Theei	10.xi.2016	DD03A
		10.xii.2016	DD03B
		12.xii.2016	DD03C
4	Anilieh	06.xii.2016	DD04A
		08-09.xii.2016	DD04B
5	Engalin I	22.xii.2016	DD05A
6	Engalin II	21.xii.2016	DD06A
7	Etabe	15-16.v.2018	DD07A
8	Mahe	10.iv.2018	DD08A
		24.v.2017	DD08B
9	Anini	02.iv.2017	DD09A
		10.v.2017	DD09B
10	Oldschool	05.iv.2018	DD10A
		30.iii.2017	DD10B
		21.iv.2017	DD10C
		21.v.2017	DD10D
		13.v.2018	DD10E
11	Base	15. v.2017	DD11A
		04.iv.2018	DD11B
		14.v.2018	DD11C
12	Kbali	25.v.2017	DD12A
13	Chaipani	16.iv.2017	DD13A
14	Chigkupati	26.iv.2017	DD14A
15	Basam	26.v.2017	DD15A
16	Patharnallah	19.iv.2017	DD16A
		20.v.2017	DD16B
17	Chapupani	13.iv.2018	DD17A

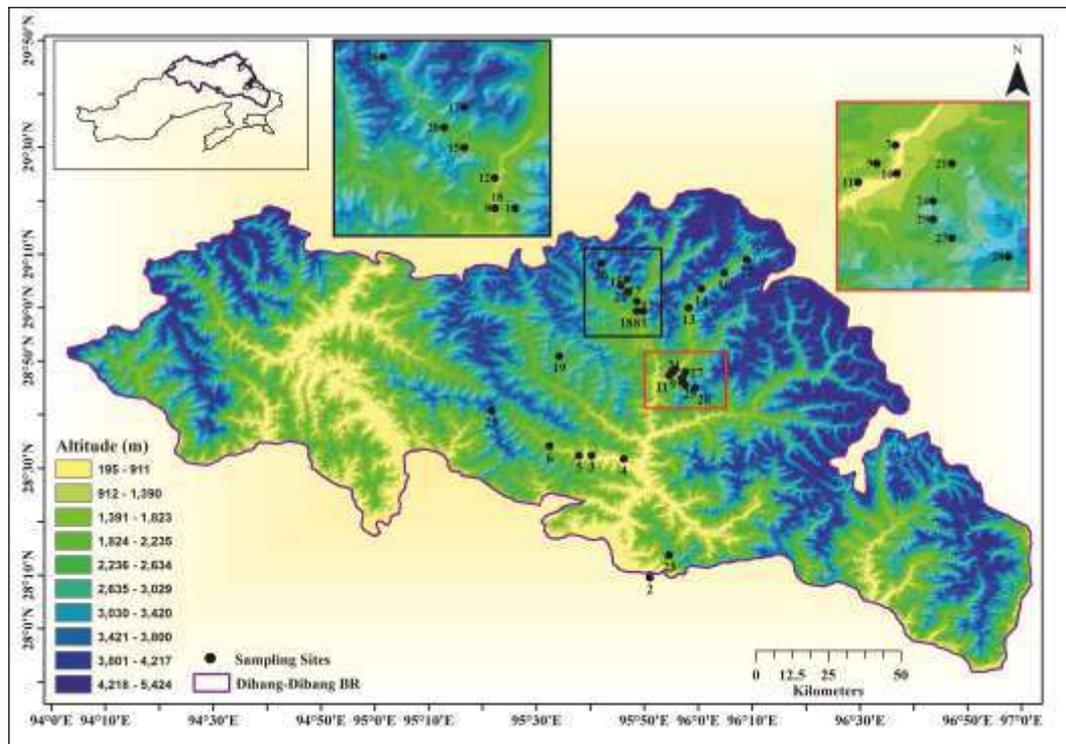
Details							
Latitude (°N)	Longitude (°E)	Altitude (m)	Vegetation Type	Avg. Temp. (°C)	Avg. Hum. (%)	Moon Phase*	
28.9921	95.8271	447	Sub-Himalayan Light Alluvial Semi-Evergreen Forest (2B/C1/1S1)	22.4	64	WX ix	
28.1569	95.8472	607	Sub-Himalayan Light Alluvial Semi-Evergreen Forest (2B/C1/1S1)	32	68	WN v	
28.5416	95.6652	820	Upper Assam Valley Tropical Evergreen Forest (1B/C2)	27	86	WX xi	
				29.2	83	WX xi	
				21.7	87	WX xiii	
28.5281	95.7718	868	Upper Assam Valley Tropical Wet Evergreen Forest (8B/C1)	21.2	89	WX vii	
				19.6	89	WX x	
28.5434	95.6312	925	Upper Assam Valley Tropical Wet Evergreen Forest (8B/C1)	22.1	88	WN viii	
28.5706	95.5443	1278	East Himalayan Subtropical Wet Evergreen Forest (8B/C1)	22.6	84	WN vii	
28.8071	95.9348	1397	East Himalayan Subtropical Wet Evergreen Forest (8B/C1)	23.1	87	NM	
28.9937	95.8057	1522	East Himalayan Subtropical Wet Evergreen Forest (8B/C1)	22.2	82	WN x	
28.9955	95.8068	1556	East Himalayan Subtropical Wet Evergreen Forest (8B/C1)	25.3	89	WN xiii	
28.7981	95.9151	1626	East Himalayan Subtropical Wet Evergreen Forest (8B/C1)	18.2	67	WX v	
				28.8	58.2	WX xiv	
29.7969	95.9151	1639	East Himalayan Subtropical Wet Evergreen Forest (8B/C1)	24.1	78	WN iii	
				17.2	70	WX ii	
				22.2	75	WN x	
				21.6	72	WN x	
				19.3	74	WN xiii	
29.7871	95.9094	1675	East Himalayan Subtropical Wet Evergreen Forest (8B/C1)	21.2	84	WN iv	
				24.7	74	WN iv	
				17.2	87	WN xiv	
29.0159	95.8066	1723	East Himalayan Wet Temperate Forest (11B/C1)	22.1	84	WN xiv	
29.0037	95.9703	1776	East Himalayan Wet Temperate Forest (11B/C1)	19.2	83	WN v	
29.0574	96.0143	1848	East Himalayan Wet Temperate Forest (11B/C1)	18.3	89	NM	
29.0545	95.7837	1968	East Himalayan Wet Temperate Forest (11B/C1)	23.4	99	NM	
29.1053	96.0807	2029	East Himalayan Wet Temperate Forest (11B/C1)	18.2	99	WN viii	
				17.5	99	WN ix	
29.0880	95.7838	2038	East Himalayan Wet Temperate Forest (11B/C1)	24.2	98	WN xiii	



Sl. no.	Location	Date	Location Code	Details		
				Latitude (°N)	Longitude (°E)	Altitude (m)
18	Mippi	23.v.2017	DD18A	28.9948	95.8060	2066
19	Cheepe	19.xii.2016	DD19A	28.8525	95.5717	2110
20	Chagu	28.v.2017	DD20A	29.0667	95.7614	2251
21	Etabe-23	06.iv.2017	DD21A	28.8009	95.9594	2273
22	Brunighupha	20.iv.2017	DD22A	29.1535	96.1486	2436
		13.v.2017	DD22B			
23	Mayodia	29.vii.2016	DD23A	28.2331	95.9081	2463
		29.viii.2016	DD23B			
		29.xii.2016	DD23C			
24	Ephehudo	18.v.2018	DD24A	28.7843	95.9501	2622
25	Pabbow	29.v.2017	DD25A	28.6797	95.3610	2774
26	Chapu	30.v.2017	DD26A	29.1380	95.6973	2954
27	Amika	05.vi.2018	DD27A	28.7641	95.9612	3070
28	Krupra	07-08.vi.2018	DD28A	28.7532	95.9910	3250
29	Ahipu	09.vi.2018	DD29A	28.7716	95.9488	3800
		12.vi.2018	DD29B			



Figure 3.67: Sampling sites (29) in the Eastern Himalayan Landscape of DDR, Arunachal Pradesh on Digital Elevation Map



Vegetation Type	Avg. Temp. (°C)	Avg. Hum. (%)	Moon Phase*
East Himalayan Wet Temperate Forest (11B/C1)	23.2	86	WN xii
East Himalayan Wet Temperate Forest (11B/C1)	16.1	84	WN v
East Himalayan Wet Temperate Forest (11B/C1)	21.1	99	WX ii
East Himalayan Wet Temperate Forest (11B/C1)	29.4	68	WX ix
East Himalayan Mixed Coniferous Forest (12/C3a)	22.2	98	WN ix
	23.2	99	WN ii
	19.1	82	WN ix
East Himalayan Mixed Coniferous Forest (12/C3a)	17.3	80	WN xi
	14.4	80	NM
	19.4	84	WX iii
East Himalayan Mixed Coniferous Forest (12/C3a)	17.2	98	WX iii
East Himalayan Mixed Coniferous Forest (12/C3a)	26.4	87	WX iv
East Himalayan Sub-Alpine Birch/Fir Forest (14/C2)	28.8	58.2	WN vii
East Himalayan Sub-Alpine Birch/Fir Forest (14/C2)	24.2	82	WN x
East Himalayan Sub-Alpine Birch/Fir Forest (14/C2)	20.1	87	WN xi
	21.2	88	WN iv

*WX= Waxing Phase, i.e. New Moon to Full Moon Period (e.g. WX iii refers to the 3rd day after No Moon); WN= Waning Phase, i.e. Full Moon to New Moon Period (e.g. WN iii refers to the 3rd day after Full Moon); NM= No Moon.

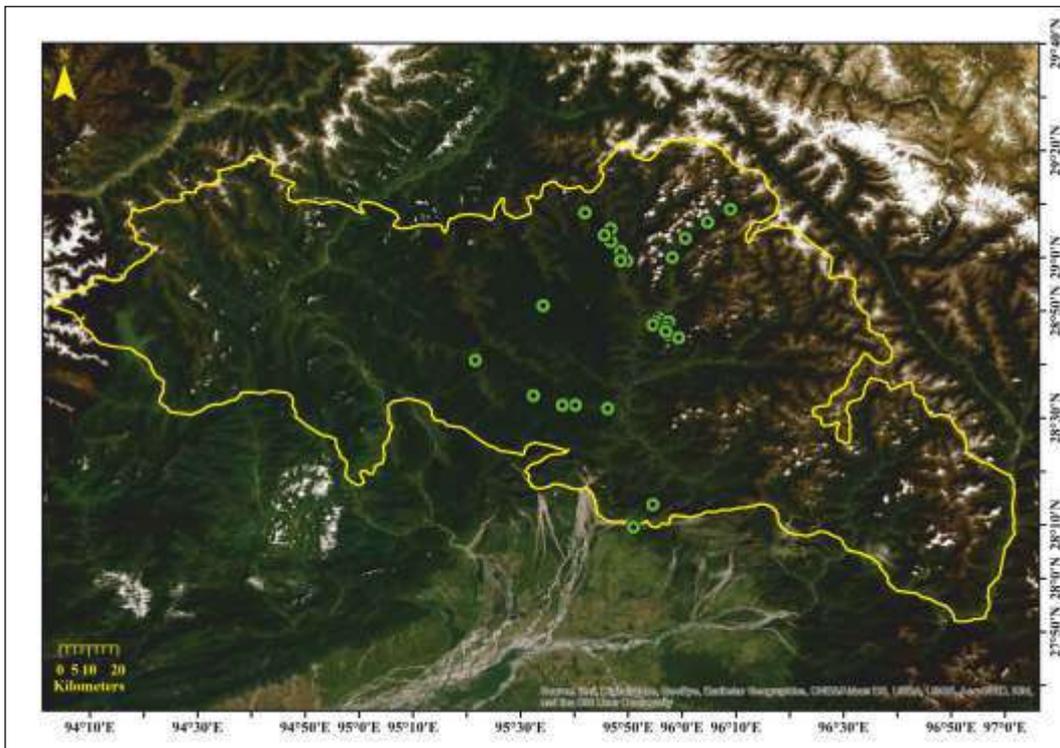
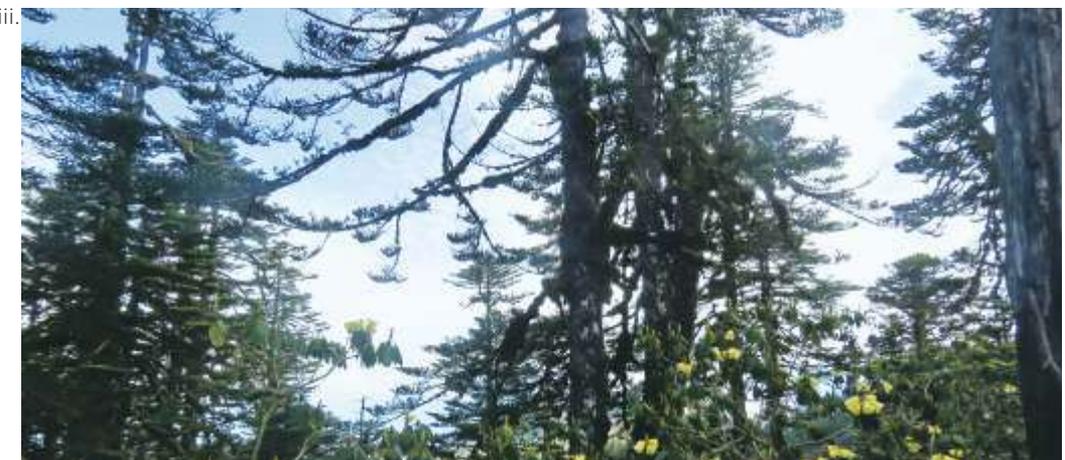
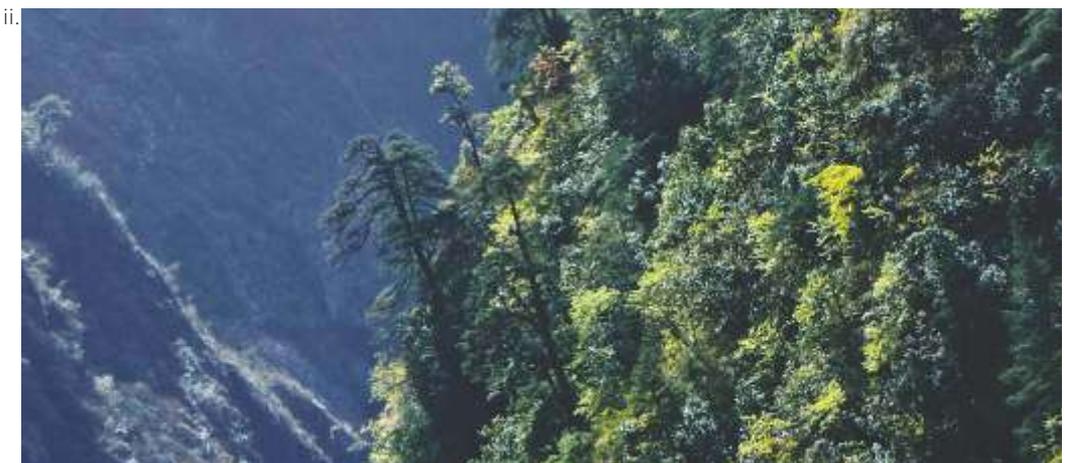


Figure 3.68:
All the sampling sites in DDR shown on Topographic Map



Figure 3.69: Major vegetation types sampled in DDBR: i. Sub-Himalayan Light Alluvial Semi-Evergreen Forest; ii. East Himalayan Subtropical Wet Evergreen Forest; iii. East Himalayan Mixed Coniferous Forest; iv. East Himalayan Sub-Alpine Birch-Fir Forest



LEPIDOPTERAN ACCOUNT

BUTTERFLY

ASSEMBLAGE COMPOSITION

Altogether, 206 species of butterflies were reported from various sites of Dihang-Dibang Biosphere Reserve (DDBR) representing 104 genera under 6 families and 20 subfamilies (Fig. 3.70).

Family Papilionidae was represented by only a single subfamily Papilioninae with 26 species of which *Papilio agestor agestor* and *P. alcmenor alcmenor* were most abundantly recorded.

Family Hesperidae was represented by 2 subfamilies and 17 species among which subfamily Hesperinae was most diverse with *Aeromachus jhoreta* recorded with maximum number of individuals. Two other subfamilies, Coeliadinae and Pyrginae,

both were represented by 4 species each, *Hasora vitta indica* (Coeliadinae) and *Pseudocoladenia danfabia* (Pyrginae) being recorded in high abundance.

Family Pieridae represented by 25 species, of which subfamily Pierinae having 17 species with *Appias lalage lalage* being recorded in high number of individuals and subfamily Coliadinae, represented by 8 species, had *Eurema blanda silhetana* with high abundance record.

Family Lycaenidae was represented by 37 species, of which subfamily Lycaeninae had 36 species with most abundant species recorded being *Lampides boeticus* and *Udara dilecta dilecta*. *Curetis acuta dentata* was the single species of subfamily Curetinae.

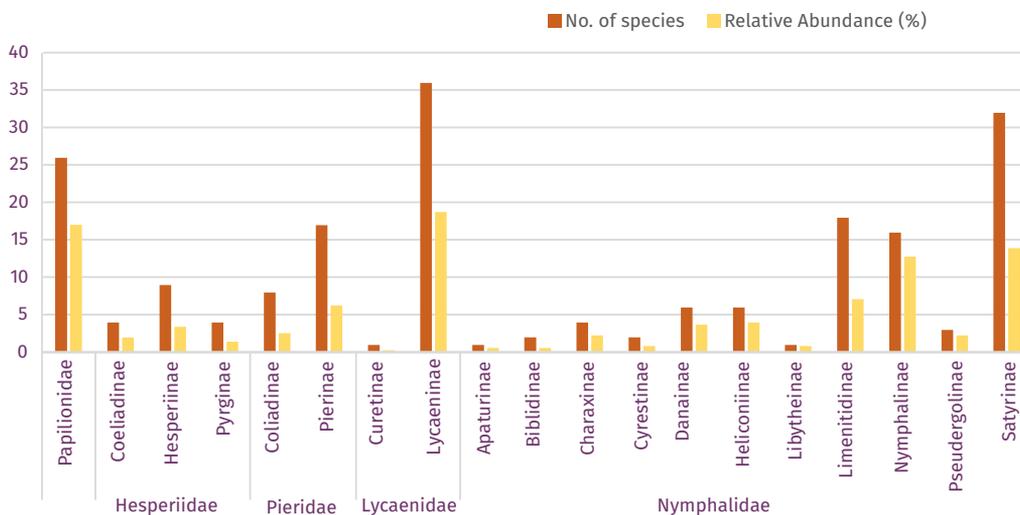


Figure 3.70: No. of species and Relative Abundance (%) of different families and subfamilies of Butterflies of DDBR, Arunachal Pradesh

The most diverse family, Nymphalidae was represented by 91 species, belonging to 11 subfamilies, among which Satyrinae was most diverse with 32 species among which *Neope pulaha pulahoides* was encountered in maximum abundance, while species like *Lethe verma sintica*, *L. dura gammiei*, *Ypthima sacra sacra* were also with high abundance. Subfamily Limenitidinae was represented by 18 species, with *Sumalia daraxa*

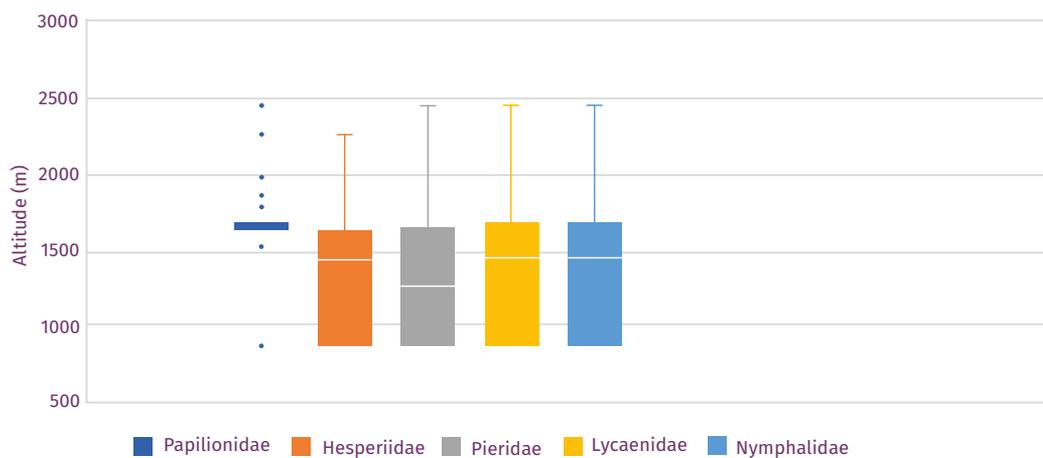
daraxa and *Neptis clinia susruta* being recorded in high numbers. Subfamily Nymphalinae was represented by 16 species with *Vanessa cardui* as most abundant species. Among other major subfamilies Heliconiinae and Danainae had 6 species each, of which *Issoria issaea* (Heliconiinae), *Euploea mulciber mulciber* and *Parantica sita sita* (Danainae) were reported as highly abundant.



Total 53 species (25.8%) of the assemblage were uniquely recorded from DDBR. During study period, few rare butterflies were recorded: *Euaspa motokii* from Anini which is the first report of this species from India, previously described from Kachin State of Myanmar. *Euaspa mikamii*, also recorded from Anini is only the second record of the species from India previously collected from Lohit District in 1991.

Drupadia scaeva cyara from Atali village is the first record of the subspecies from India after 83 years. *Gonepteryx amintha thibetana*, originally described from Lolung, South-Western Tibet and confirmedly included into Indian fauna by Sondhi & Roy (2013) from Anini, DDBR & Eaglenest WLS, were recorded in high abundance from DDBR between 1600-2000 m.

Figure 3.71: Altitudinal distribution of butterfly families of DDBR, Arunachal Pradesh



ALTITUDINAL PATTERN

The altitudinal stratification of butterfly families of DDBR reveals that there was hardly any butterfly activity recorded above 1700 m, maybe due to very dense canopy cover and undergrowth above this region (Fig. 3.71). From our data, it was clear that most of the Papilionidae was recorded at 1600 m, with occasional record of *Graphium eurous sikkimica* at 2400 m, *Papilio alcmenor alcmenor* and *P. krishna krishna* at 2200 m. Majority of species record of other 4 families were between 850 m and 1650 m. Among Hesperidae, a single species *Choaspes xanthopogon xanthopogon* was recorded at 2200 m and *Gerosis phisara phisara* was recorded from 1950 m. Among Pieridae, *Pieris ajaka* and *P. extensa bhutya* were recorded from 2400 m, whereas, *Udara dilecta dilecta* and *Lampides boeticus* (Lycaenidae) were rarely encountered up to 2400 m. Among Nymphalidae, species which were active beyond 2000 m were *Lethe isana dinarbas*, *L. sinorix sinorix*, *Neope pulaha pulahoides*, *Issoria issaea*, *Kaniska canace canace*, *Polygonia c-album agnicula* and *Vanessa cardui*.

ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among 5 vegetation types, butterfly activity was significantly visible in Upper Tropical Evergreen Forest (1B/C2) and Eastern Himalayan Subtropical Wet Evergreen Forest (8B/C1) (Fig. 3.72). For the first habitat, Nymphalidae was most dominant, followed by Lycaenidae, Pieridae, Hesperidae and Papilionidae. In Eastern Himalayan Subtropical Wet Evergreen Forest, activity of all the families except

Pieridae increased significantly. Though this habitat was dominated by Nymphalidae, almost all the Papilionidae species recorded from DDBR were active in this habitat. Family Lycaenidae was almost equally abundant in these two habitats. The Eastern Himalayan Wet Temperate Forest (11B/C1) was frequented by all the 5 families with Nymphalidae being most dominant. In Eastern Himalayan Coniferous Forest (12/C3a), abundance of all the families decreased to a negligible proportion with significant presence of only Nymphalidae and Lycaenidae.

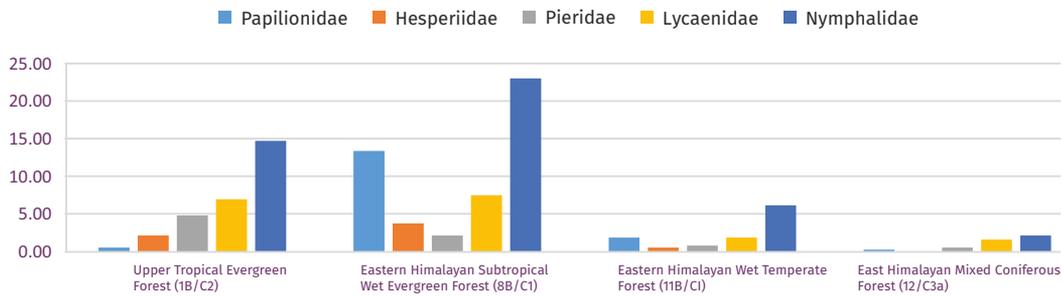


Figure 3.72: Relative Abundance (%) of butterfly families in different habitats of DDBR

BIOGEOGRAPHIC AFFINITY

The DDBR butterfly assemblage was completely of Oriental origin with almost half of the species (55%) having affinity for Palearctic region (Fig. 3.73). Among Indian Biogeographic Zones and Provinces, 26% species were shared with two Trans-Himalayan habitats (Ladakh Mountain- 1A and Tibetan Plateau- 1B), while almost 92% species were shared with

Central Himalaya (2C). 60% species were shared with Western Himalaya (2B) and around 40% species with North-Western Himalaya (2A). Around 90% species were shared with most spatially close Biogeographic zone of North Eastern Hills and Valleys, while, around 46% species were shared with Gangetic Plains and 31% species were shared with Coasts. 20-27% species were shared with Semi-Arid zone, Western Ghats and Deccan Peninsula.

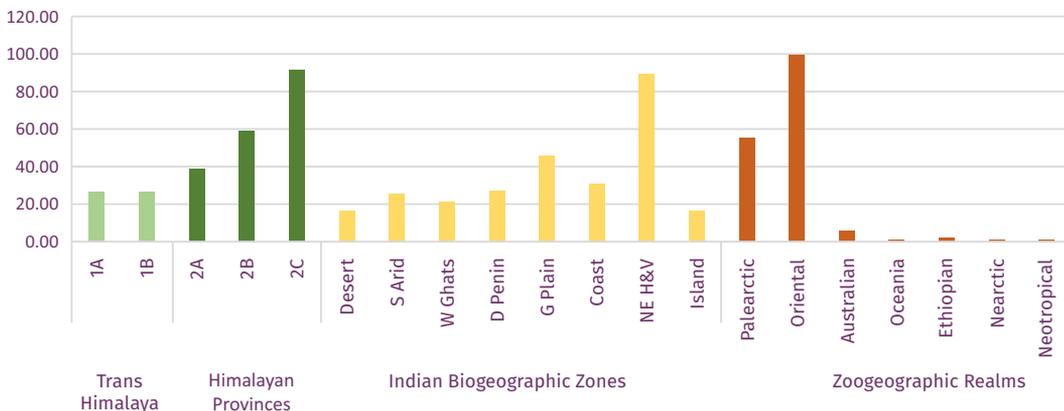


Figure 3.73: Biogeographic affinities (%) representation of DDBR Butterflies with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms



MOTH

ASSEMBLAGE COMPOSITION

DDBR moth assemblages were composed of 356 species belonging to 261 genera under 52 subfamilies and 19 families which includes: Cossidae (2 species), Limacodidae (4), Zygaenidae (2), Thyrididae (1), Pyralidae (4), Crambidae (21), Drepanidae (27), Lasiocampidae (5), Eupterotidae (6), Endromidae (4), Saturniidae (9), Sphingidae (9), Epicoptidae (1), Uraniidae (1), Geometridae (132), Notodontidae (30), Erebidae (53), Nolidae (14) and Noctuidae (31) (Fig. 3.74).

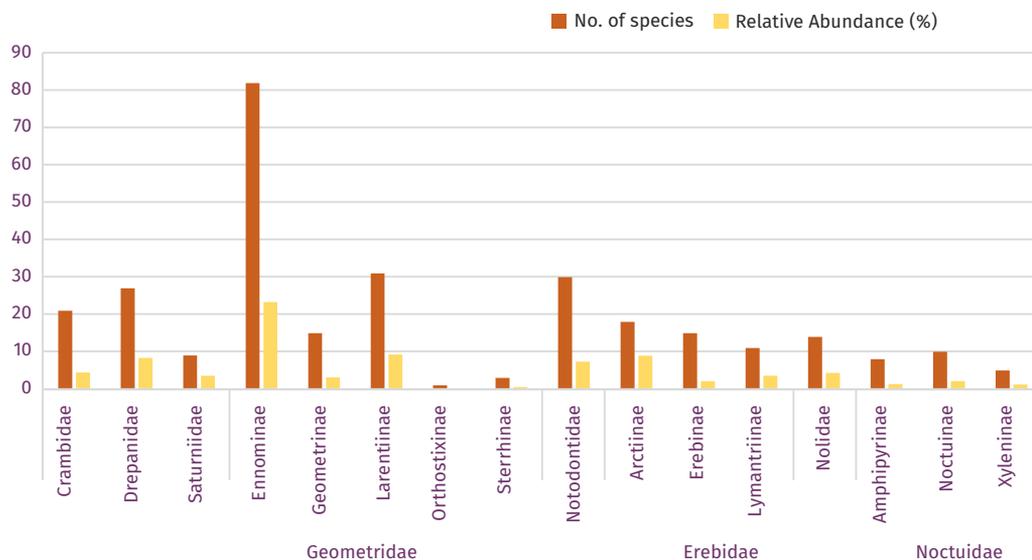
Total 132 species of Geometridae belonging to 5 families were reported, among which Ennominae had highest species richness (82 species) and abundance, followed by Larentiinae with 31 species and Geometrinae with 15 species. Among Ennominae, *Apophya sericea*, *Chorodna obliterata*, *Sirinopteryx quadripunctata*, *S. rufivinctata*, *Myrioblephara duplexodes*, *Heterolocho phoenicotaeniata* and *Darisa mucidaria* were the most abundant species. Among subfamily Larentiinae, *Heterophleps quadripuncta*, *Electrophaes niveopicta*, *E. zaphenges*, *Eustroma inextricata* and *Agnibesa*

recurvilineata were recorded with high number of individuals, while in case of Geometrinae, *Maxates thetydaria* and *Dindica polyphaenaria* were most abundant.

The second largest family Erebidae, consisting of 53 species, belonging to 7 subfamilies, had highest richness and abundance of subfamily Arctiinae having 18 species, with *Chrysorabdia viridata*, *Spilarctia sagittifera* and *Vamuna remelana* being most abundant. Erebinae, the second largest subfamily, was represented by 15 species, of which *Hypersypnoides submarginata* was most abundant. Lymantriinae was represented by 11 species, of which *Dasychira complicata* and *Birnara bicolor* were recorded with high abundance.

Family Noctuidae was represented by 31 species, belonging to 8 subfamilies, among which Noctuiinae was most diverse, having 10 species, of which *Agrotis ipsilon* was most abundant. Subfamily Amphipyriinae had 8 species, most abundant among which was *Callyna monoleuca*. Among other subfamilies, *Sarbanissa insocia* (Agaristinae), *Thysanoplusia orichalcea* (Plusiinae), *Oroplexia decorata* (Xyleninae) and *Nacna malachitis* (Acronictinae) were most abundant.

Figure 3.74: No. of species and Relative Abundance (%) of different families and subfamilies of Moths of DDBR



Family Notodontidae was represented by 30 species, belonging to 8 subfamilies, of which Notodontinae was most diverse with 12 species, with *Semidonta basalis* and *Pheosiopsis niteria* recorded in high number of individuals. *Clostera pallida* (Pygaerinae), *Neopheosia fasciata fasciata* (Heterocampinae) and *Besaia rubiginea* (Spataliinae) were other abundant Notodontid species. Family Drepanidae had 27 species belonging to 3 subfamilies, among which Thyatirinae and Drepaninae were most species rich. *Gaurena florescens*, *G. nigrescens*, *G. pretiosa* and *G. florens* of Thyatirinae and *Oreta vatama*, *Ditrigona triangularis* of Drepaninae were highly abundant. Family Crambidae had 21 species under 4 subfamilies, among which Spilomelinae was most diverse, of which *Palpita warrenalis* and *Glyphodes canthusalis* were most abundant. A Pyraustinae species, *Neadeloides glaucoptera* was also recorded in high number of individuals.

The family Nolidae had 14 species belonging to 3 subfamilies, of which Chloephorinae was most species rich with *Tyana chloroleuca*, *T. elongata* and *Topadesa sanguinea* as most prominent. In case of Subfamily Westermanniinae, *Westermannia elliptica* was highly abundant. Total 9 species of Saturniidae were recorded belonging to 2 subfamilies, Saturniinae and Salassinae. Among 6 species of Saturniinae, *Calligula anna* was super-abundant with high abundance of *Samia canningii*, whereas *Salassa lola* and *Sinobirma bouyeri* of Salassinae were most abundant.

Family Sphingidae was represented by 9 species in 4 subfamilies, of which *Theretra boisduvalii* (Macroglossinae) and *Marumba irata* (Smerinthinae) were highly abundant. Family Eupterotidae had 6 species of which *Palirisa cervina* was highly abundant. Family Lasiocampidae had 5 species of which *Argonestis flammans* was most abundant. Family Limacodidae and Endromidae both were represented by 4 species each. *Parasa lepida* and *Soteira ostia*

ALTITUDINAL PATTERN

Among 5 major families of DDBR moth, family Drepanidae was distributed from 1400 m to 3800 m whereas, majority of the species were distributed between 2000 m and 3050 m, with mean species distribution at 2450 m. *Gaurena nigrescens* and *G. pretiosa* were highly abundant between 2700 m and 3200 m while *Macrothyatira danieli* and *Parapsestis lichenea* were reported from 3800 m (Fig. 3.75).

(Limacodidae) and *Comparmustilia sphingiformis* (Endromidae) were mostly abundant.

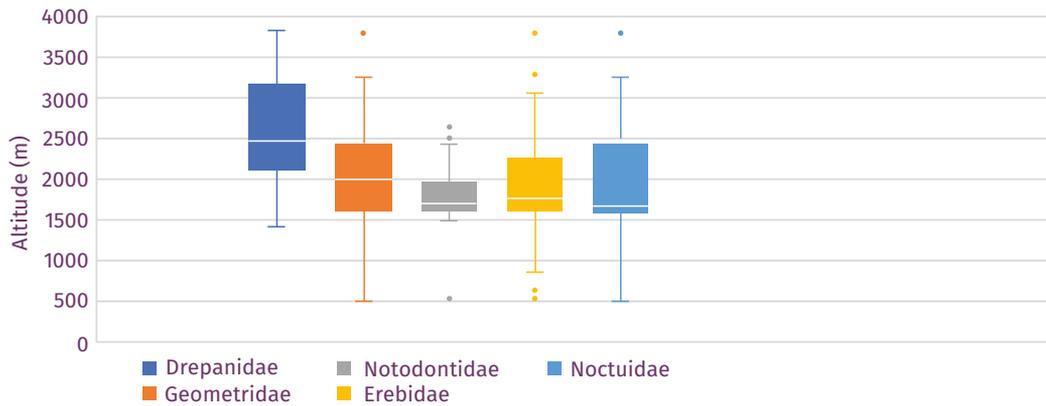
23 species were recorded for the first time to Indian moth fauna from DDBR: *Soteira grandis* (Limacodidae) previously distributed in China and Thailand; *Teliphasa similalbifusa* (Pyralidae) previously known from China; 5 species of Drepanidae, among which 3 species of *Gaurena*, *G. nigrescens*, *G. pretiosa* and *G. sinuata dierli* known mainly from China and Nepal earlier: *Hiroshia albinigra* and *Macrothyatira danieli*, recorded previously from China, Vietnam and Nepal respectively; *Apha horishana* (Eupterotidae) previously described only from Taiwan; *Comparmustilia gerontica* (Endromidae), till date known from Taiwan; *Burmeia leesi* (Epicopeiidae) recently described from Myanmar and China; 2 Ennominae species *Platyserota homoema*, known from Nepal, Taiwan and *Pseudomiza aurata*, known from China, Taiwan; 2 Geometrinae species *Agathia succedanea* and *Timandromorpha enervate* previously known from Malaysia, Indonesia and China, Japan, Korea respectively; Larentiinae species *Electrophaes tsermosaria*, previously restricted to Nepal; 2 Notodontidae species, *Syntypistis nigribasalis tropica*, previously known from China, Sundaland and *Periergos genitale*, restricted up to China, Myanmar and Thailand; 3 Erebidae species, *Eurogramma obliquilineata* previously known from Nepal and China; *Supersynoides malaise* previously described from Myanmar and *Eudocima okurai*, previously known from Nepal, Bhutan, Taiwan up to Sundaland; 2 Noctuids, *Diphtherocome bryochlora*, previously known from Nepal, Vietnam and Thailand and *D. chloronympha* from Nepal; 1 Nolidae *Meganola scriptoides* previously recorded from China and Thailand.

An overwhelming number of 184 species were added to Eastern Himalayan (2D) fauna from DDBR. 5 species were recorded as new to Indian Himalaya previously known from North Eastern Biogeographic Provinces. 144 species (40.5%) were uniquely recorded from DDBR with no sighting records from other Himalayan Protected Areas sampled.





Figure 3.75: Altitudinal distribution of major moth families of DDBR, Arunachal Pradesh



Family Geometridae was distributed almost throughout the gradient from 450 m to 3250 m with maximum abundance of species between 1650 m and 2450 m, with mean species distribution at 1950 m. Seven Ennominae species viz. *Arichanna subaenescens*, *Garaeus absona*, *Lassaba cervina*, *Micronidia subpunctata*, *Opisthograptis sulphurea*, *O. tridentifera* and *Pristostegania trilineata* were reported between 3000 m and 3800 m. Among subfamily Larentiinae, *Agnibesa recurvilineata*, *Electrophaes niveopicta*, *Electrophaes tsermosaria*, *Eustroma inextricata*, *Martania plumbeata*, *Melanthia catenaria*, *Photoscotosia amplicata*, *P. dejuta*, *Venusia crassisigna* and *V. lilacina* were mostly abundant between 3100 m and 3800 m.

Family Notodontidae was restricted between a narrow altitudinal band of 1600 m to 1950 m with *Chadisa bipars*, *Phalera goniophora*, *Besaia rubiginea* and *Gazalina chrysolopha* being abundant between 2400 m and 2600 m.

Family Erebidae though having species distribution all through the gradient had maximum species range between 1600 m and 2250 m with mean species distribution at around 1800 m. The species *Chrysozabdia viridata* was distributed from 1500 m to 2900 m, while *Ghoria postfusca* and *Lemyra stigmata* were reported from only above 3000 m. *Birnara bicolor* (Lymantriinae) was abundant up to 2700 m.

Maximum number of species of Noctuidae were recorded between 1600 m and 2450 m with mean species distribution at around 1700 m with 3 Amphipyriinae species, *Diphtherocome chloronympha*, *D. fasciata* and *D. pallida*, 3 Noctuinae species, *Diarsia nigrosigna*, *D. postpallida* and *Perissandria sikkima* and 3 Xyleninae species, *Oroplexia decorata*, *Phlogophora costalis* and *Valeriodes heterocampa* reported between 3050 m and 3800 m.

ABUNDANCE PATTERN IN DIFFERENT VEGETATION TYPES

Among 6 major vegetation types of DDBR, the 2 lowest altitudinal habitats of Sub-Himalayan Light Alluvial Semi Evergreen Forest (2B/C1/1S1) and Upper Tropical Evergreen Forest (1B/C2) were poorly represented by moth activities, maybe due to sampling inadequacy (Fig. 3.76). Eastern Himalayan Sub Tropical Wet Evergreen Forest (8B/C1) was dominated by all the major families with high abundance of Geometridae, while Notodontidae, Erebidae and Noctuidae had maximum abundance in this typical habitat compared to other vegetation types. Moth abundance, especially of Geometridae was at its peak in Eastern Himalayan Wet Temperate Forest (11B/C1), where the family Drepanidae was also in highest abundance. Eastern Himalayan Mixed Coniferous Forest (12/C3a) was dominated by Geometridae, Erebidae and Drepanidae. The highest altitudinal habitat, Eastern Himalayan Sub-Alpine Birch-Fir Forest (14/C2) was frequented by high numbers of Drepanidae and Noctuidae besides super-abundance of Geometridae.

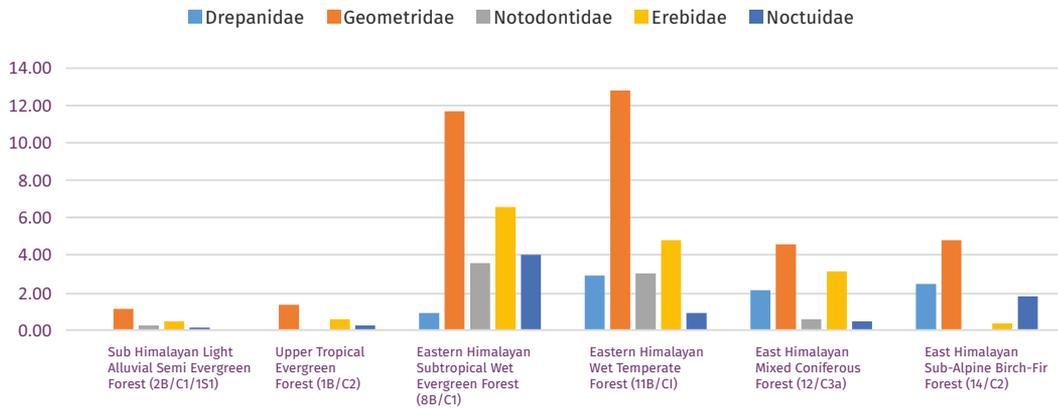


Figure 3.76: Relative Abundance (%) of major Moth families in different habitats of DDBR

BIOGEOGRAPHIC AFFINITY

The sampled assemblage of DDBR was purely of Oriental origin with only 48% affinity with Palearctic realm (Fig. 3.77). Around 12.5% species was shared by Australian realm. Among Indian Biogeographic Zones and Provinces, only 8-9% species were shared with two Trans-Himalayan habitats (Ladakh Mountain- 1A and Tibetan Plateau- 1B), 80% species

were shared with Central Himalaya (2C), followed by 53% with Western Himalaya (2B) and 44% with North-Western Himalaya (2A). 52% species had affinities with North Eastern Hills and Valleys. Species sharing of all the other zones were almost negligible with only 12-13% affinities with Western Ghats and Deccan Peninsula.

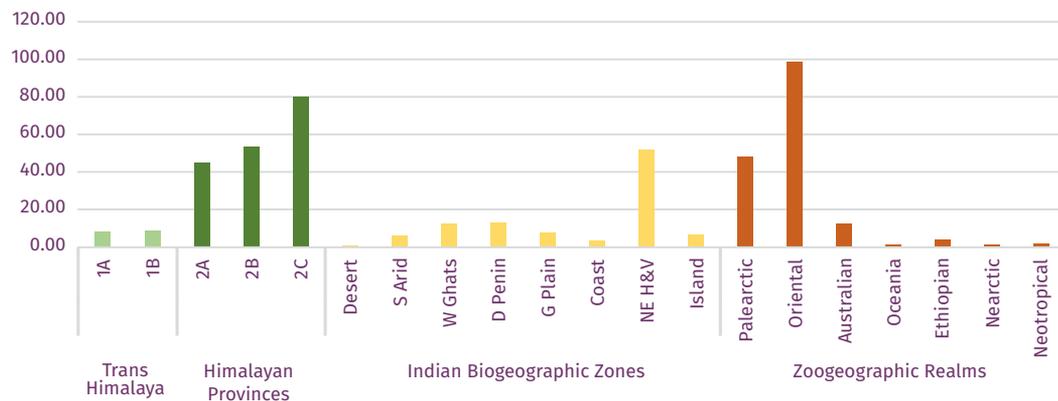


Figure 3.77: Biogeographic affinities (% representation) of DDBR Moths with other Himalayan Provinces, Indian Biogeographic Zones and World Zoogeographic Realms



OTHER MISCELLANEOUS LOCATIONS SAMPLED

Apart for these 7 major landscapes sampled, moth surveys were undertaken in few other sites spanning from North-Western Himalaya to Eastern Himalaya, details of which are provided below (**Table 3.8, Figure Fig. 3.78**).



Table 3.8:
Details of Sampling Sites, Dates and Weather parameters in miscellaneous localities

Sl. No.	State (Biogeographic Province)	Area/ National Park	Location	Date	Location Code
1	Himachal Pradesh (2A)	Dharamshala	Cant. Nala	1.xi.2018	DS01A
2	Uttarakhand (2B)	Gangotri National Park	Harsil	23.x.2008	GT01A
			Bhaironghati	21.x.2008	GT02A
			Chirwasa	13.x.2008	GT03A
		Valley of Flower National Park	Ghangaria	28.viii.2016	VF01A
3	Sikkim (2C)	Kyongnosla Alpine Sanctuary	Padamchen	31.v.2017	KA01
4	Arunachal Pradesh (2D)	Tawang	Jang	09.xi.2017	TW01A



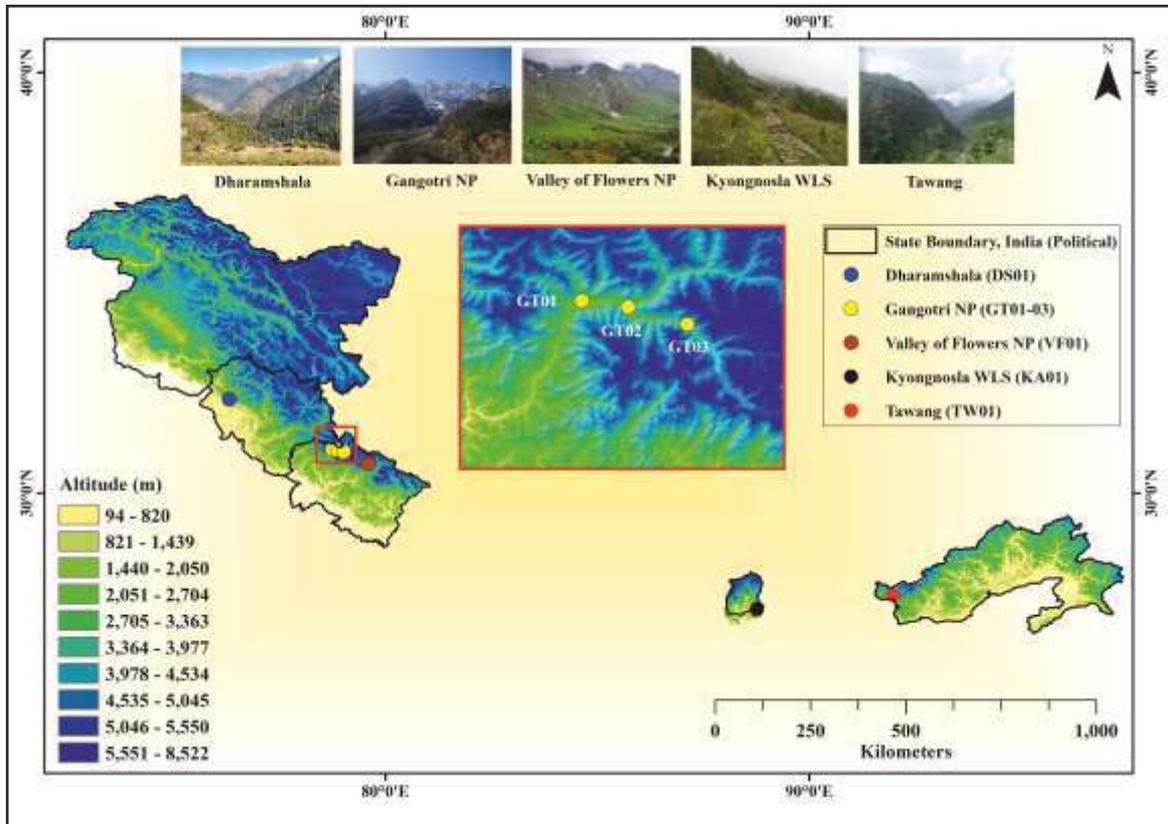


Figure 3.78: Miscellaneous Sampling Sites (7) in the Indian Himalaya

Details

Latitude (°N)	Longitude (°E)	Altitude (m)	Vegetation Type	No. of Species Identified
32.2317	76.3141	1492	Himalayan/ Upper Chir Pine Forest (9/CI)	7
31.0424	78.7476	2600	Western Mixed Conifer Forest (12/CIId)	3
31.0267	78.8679	2834	West Himalayan Upper Oak Forest (12/CIIf)	1
30.9812	79.0213	3452	Deciduous Alpine Scrub (15/CIJ)	6
30.7012	79.5940	3128	West Himalayan Sub-alpine Birch/ Fir Forest (14/CI)	24
27.2402	88.7672	2215	East Himalayan Wet Temperate Forest (11B/CIb)	16
27.5750	91.9864	2649	East Himalayan Wet Temperate Forest (11B/CI)	2



4



SYNTHESIS



ASSEMBLAGE PATTERN & BIOGEOGRAPHIC AFFINITIES OF HIMALAYAN LEPIDOPTERA

*Abesh Kumar Sanyal, Angshuman Raha, Kaushik Mallick,
Arna Mazumder, Uttaran Bandyopadhyay, Gaurab Nandi Das, Navneet Singh, Kailash Chandra*

OVERALL LEPIDOPTERA RICHNESS PATTERN

The study conducted in 175 LTM plots across 7 landscapes covering 6 biogeographic provinces of IHR encountered 10,092 individuals of Lepidoptera over the course of 2016-2018, in a staggering altitudinal gradient, starting at 250 m in Tropical Wet Evergreen Forest of Namdapha NP to 5060 m in Alpine Pasture Landscape of Ladakh Trans-Himalaya across a huge variety of 30 different vegetation types. The study documented 484 species of butterflies, belonging to 222 genera under 29 subfamilies and 6 families, representing nearly 48% of Himalayan species (**Table 4.1**). Altogether, the assemblage represented 32% of Indian and 2.5% of total global butterfly fauna. Alongside, the study also recorded 1,274 species of moth under 704 genera belonging to 89 subfamilies, 25 families and 12 Superfamilies, representing around 31% of total Himalayan (**Table 4.2**) and around 13% of total Indian moth fauna.







Table 4.1: Comparison of present and existing database of Himalayan butterfly richness

Family	Indian Himalaya (Das et al., 2018a)		Current Study	
	Genera	Species / Subspecies	Genera	Species / Subspecies
Papilionidae	12	153	9	44
Hesperiidae	80	220	47	72
Pieridae	22	87	19	51
Riodinidae	4	18	4	11
Lycaenidae	114	312	62	103
Nymphalidae	111	459	81	203
Total	343	1249	222	484

NOVEL ADDITIONS TO THE INDIAN LEPIDOPTERA FAUNA

BUTTERFLY

Butterfly being a well-studied taxa in Indian context, the study reported only 1 species, viz., *Euaspa motokii* (Lycaenidae: Theclinae) described recently from contiguous landscape of Northern Myanmar, as a novel addition to Indian fauna. Remarkably, the study reported few very rare species for the first time since description. Among these, *Polyommatus dux dux* from Milam valley in Uttarakhand and *Drupadia scaeva cyara* from DDBR are being reported after a gap of more than 80 years. Additionally, *Chaetoprocta odata peilei* was reported from GHNP as novel to North-West Himalaya, which was previously known only from Uttarakhand, while *Lethe dura gammiei* was encountered from mid elevation range in AWLS far from its known distribution range of Central to Eastern Himalaya and Garo-Khasi Hills.

Chaetoprocta odata peilei Forster, 1980



MOTH

88 species, i.e., 7% of the total moth assemblages are reported new to the Indian fauna, out of which Noctuidae was most dominant with 32 species followed by 23 species of Geometridae and 11 species of Erebidae. Among other families, 5 species of Drepanidae, 3 species of Notodontidae, 2 species each of Thyrididae, Lasiocampidae and Euteliidae, and 1 species each of Cossidae, Pyralidae, Eupterotidae, Endromidae, Saturniidae, Epicopeiidae, Uraniidae and Nolidae were novel addition to Indian moth fauna. Among these 88 species, majority were previously known from neighbouring countries like Nepal, China or Pakistan, with the exception of 6 species, viz. *Drasteria caillino* (Erebidae), *Acronicta megacephala*, *Shargacucullia verbasci*, *Heliolithis maritima*, *Euxoa ochrogaster* (Noctuidae), which were purely of Palearctic origin distributed in Central Asian mountains, Russian Far East and extreme European or Nearctic species. All these abrupt range extensions were documented from Trans-Himalayan sites, signifying a possibility of unusual infiltration of high latitude species from the north to southwards, rather than in the opposite direction, i.e., poleward shift, usually expected to occur under climate change. These also clearly indicate that, more inventory studies should be carried out in the Trans-Himalayan zone of Indian Himalaya to understand the species range shift pattern happening globally, although it can't be denied that being recorded from a region where taxonomic inventory of moths never reached a saturation limit. Unlike the more popular Eastern regions, at least some of these range extensions may be of species that were overlooked in the past.



Heliophobus bulcsui Simonyi, 2015

Interestingly, apart from these 88 species, 7 are new addition to the fauna of Indian Himalaya, which were known from contiguous landscape of North Eastern Hills and Valleys, viz. *Telchines vialis* (Thyrididae) and *Hexafrenum collaris* (Notodontidae) have been recorded from Western to Eastern Himalaya, while they were known previously only from Meghalaya; *Nerice pictibasis* (Notodontidae) recorded from two sites of Uttarakhand, was only known from Meghalaya before this; *Pheosiopsis niteria* (Notodontidae) known previously from Assam valley; *Oraesia provocans* (Erebidae) recorded from NVNP and *Hypena albisigna* (Erebidae) from AWLS, was known previously from far-away landscape of Western Ghats.

Furthermore, many species have been found as novel to different Himalayan Biogeographic Provinces, viz., 14 species to Trans-Himalaya, 72 species to North-Western Himalaya, 148 species to Western Himalaya, 73 species to Central Himalaya and an overwhelming number of 263 species have been documented as new to Eastern Himalaya. Supposedly, these high numbers of new records from different provinces are due to first such extensive and systematic sampling in remote corners of Himalaya like Askot Landscape and Dihang-Dibang BR, having excellent representation of typical forest types, yet previously unexplored due to remoteness and inaccessible terrains.



S. No.	Family	Indian Himalaya (Sanyal et al. 2018)		Current Study	
		Genera	Species	Genera	Species
1.	Hepialidae	04	09	01	01
2.	Cossidae	12	25	07	08
3.	Limacodidae	27	57	14	18
4.	Zygaenidae	34	82	11	11
5.	Thyrididae	15	37	06	06
6.	Hyblaeidae	01	02	01	01
1.	Callidulidae	06	07	03	03
2.	Pyralidae	58	109	11	15
3.	Crambidae	177	346	72	99
4.	Drepanidae	28	53	27	48
5.	Lasiocampidae	24	39	13	21
6.	Eupterotidae	08	17	05	08
7.	Brahmaeidae	01	02	01	02
8.	Endromidae	-	-	02	05
9.	Bombycidae	11	16	04	04
10.	Saturniidae	13	37	12	23
11.	Sphingidae	54	184	34	63
12.	Epicopeiidae	02	03	01	01
13.	Uraniidae	13	34	06	10
14.	Geometridae	309	879	166	342
15.	Notodontidae	85	137	52	81
16.	Erebidae	348	913	141	297
17.	Euteliidae	17	36	06	08
18.	Nolidae	44	103	22	35
19.	Noctuidae	207	525	87	164
	Total	1639	4107*	705	1274

Table 4.2: Comparison of present and existing database of Himalayan moth richness

*The number also includes 455 species of various Microlepidoptera families



RICHNESS PATTERN IN DIFFERENT HIMALAYAN BIOGEOGRAPHIC PROVINCES

Sampling simultaneously across different Biogeographic Provinces gave us a unique opportunity to do a comparative assessment of genera and species richness of butterflies and moths, although, there was certainly a problem of under-sampling in case of butterflies in North-West and Central Himalaya. The preliminary data trend revealed both genus and species richness gradually increased from West to East axis, both in case of butterflies and moths (Table 4.3). Richness was recorded highest in Western Himalaya in case of moths, whereas, for butterflies Eastern Himalaya was certainly the richness hotspot.



Euaspa motokii Koiwaya, 2002

Table 4.3:
Number of
genera and
species of
Butterflies and
Moths
recorded from
different
Biogeographic
Provinces of
IHR

	BUTTERFLY		MOTH	
	No. of Genera	No. of Species	No. of Genera	No. of Species
Trans Himalaya	32	51	44	58
North-Western Himalaya	42	62	178	237
Western Himalaya	108	211	391	578
Central Himalaya	54	78	315	464
Eastern Himalaya	176	354	395	566

MOST SPECIOSE GENERA IN DIFFERENT BIOGEOGRAPHIC PROVINCES

Euaspa mikamii Koiwaya, 2002



Different Himalayan Biogeographic Provinces were dominated by various genera of moths and butterflies. Trans-Himalayan butterfly assemblage was dominated by *Pieris* (5 species) and *Colias* (5 species) of family Pieridae, whereas, in case of moths, *Mythimna* (3 species) and *Euxoa* (3 species) were most dominant Noctuidae. Sphingidae genus *Hyles* and Saturniidae genus *Neoris* also frequented the landscape. North-Western and Western Himalayan gradient were mostly dominated by Larentiinae moths, among which *Photoscotosia* was encountered in maximum numbers. Among Western and Eastern Himalayan butterflies, *Papilio* and *Lethe* were typically abundant genera with high species richness, viz. 15 species and 7 species of *Papilio*, while 13 species and 9 species of *Lethe* from Eastern and Western Himalaya respectively. Among landscape specific genera, *Ypthima* (6 species), *Junonia* (6) and *Aulocera* (5) were dominant in Western Himalaya, whereas, *Graphium* (10), *Athyma* (10) and *Mycalesis* (10) were most species-rich Eastern genera.



Figure 4.1: Richness of Butterfly families recorded in different Himalayan Provinces

In Central Himalayan landscape, Spingid genera *Theretra* (7 species) and Noctuid genera *Phlogophora* (7) were most species-rich while, *Cyana* (6), *Eudocima* (6) and *Bastilla* (6) (Erebidae) dominated the assemblage composition. Apart from high species richness of Larentiinae genus *Photoscotosia*, Western Himalayan gradient was dominated by Noctuid genera *Phlogophora* (7) and *Hermonassa* (7). Ennominae genera *Abraxas* (5 species), *Biston* (4) and Erebid genera *Lymantria* (6) and *Cyana* (7) were with high species richness. In Eastern Himalaya, large number of species were documented for Noctuidae genus *Diphtherercome* (6), Drepanidae genus *Gaurena* (6) and Nolidae genus *Tyana* (5). *Electrophaes*, *Chorodna* and *Dalima* were especially rich Geometrid genera (Fig. 4.2). Genus *Cyana* can be especially mentioned with high species richness in all the Himalayan Provinces.

Drupadia scaeva cyara (Hewitson, 1878)

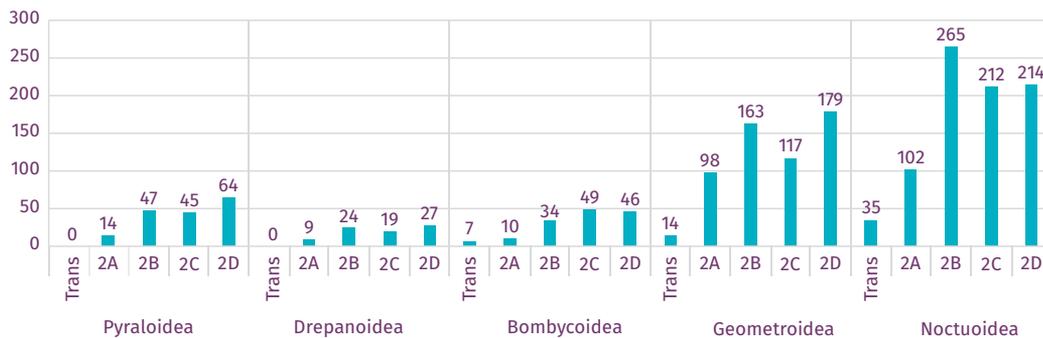


Figure 4.2: Richness of Moth Superfamilies recorded in different Himalayan Provinces



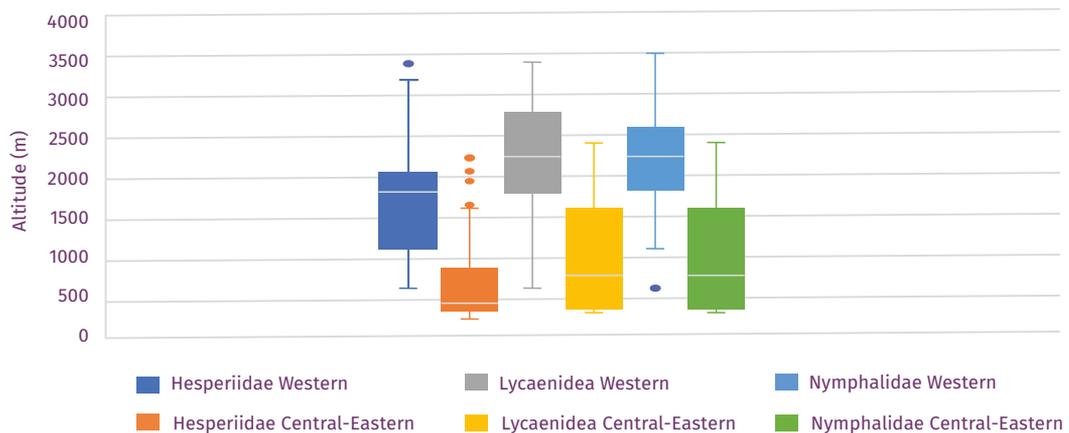
ALTITUDINAL DISTRIBUTION OF MAJOR LEPIDOPTERAN FAMILIES

Complete altitudinal gradient sampled across Himalayan Biogeographic Provinces provided a backdrop to analyse the altitudinal distribution pattern among major Lepidopteran families sampled. Among three most dominant butterfly families, difference in mean abundance pattern was highly variable between Western and Eastern extreme for HesperIIDae. Mean species abundance of the family was around 1800 m in Western Himalaya, while it was around only 400 m in Central and Eastern Himalaya. The family was recorded up to 3200 m in Western Himalaya, while it was restricted only up to 1600 m in Central and Eastern sector. Pattern was almost similar for Lycaenidae, whose species had mean abundance around 2300 m in Western Himalaya, while only around 750 m in Eastern Himalaya. Maximum species of Nymphalidae were recorded between 1800-2600 m in Western extreme, whereas in Central and Eastern part they were majorly distributed between 400-1600 m (Fig. 4.3).



Kunugia sinjaevi Zolotuhin & Witt, 2000

Figure 4.3: Comparison of Altitudinal Distribution of Three Dominant Families of Butterflies from Western, Central and Eastern Himalaya



For all major families of moth in Himalayan gradient, mean species distribution was always at higher altitude in Western Sector. Mean abundance of Geometridae varied almost by 800 m between Western and Eastern extreme. Mean species distribution of Erebidae was at 2100 m in Western part, compared to 1200 m in Central-Eastern sector. Species upper range of this family was at quite high altitude, i.e., at 3800 m in Central-Eastern sector, compared to 3700 m in Western part, basically due to high abundance of Arctiinae although the Central Himalayan gradient. Distribution range of Noctuidae was comparatively higher than other families in both sectors, its upper range of major species distribution being at 3200 m in Western Himalaya, while it was at around 2350 m in Eastern and Central Himalaya (Fig. 4.4).

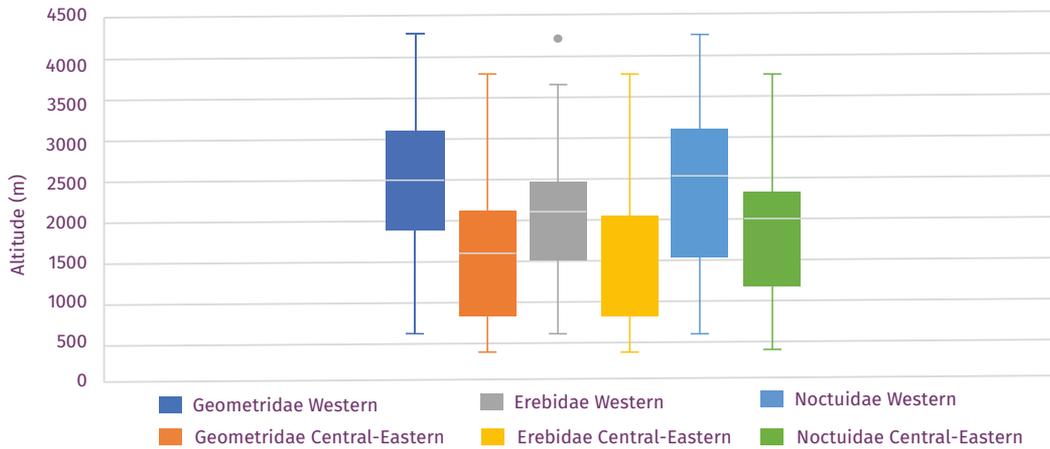


Figure 4.4: Comparison of Altitudinal Distribution of Three Dominant Families of Moths from Western, Central and Eastern Himalaya

RICHNESS PATTERN IN VEGETATION TYPES COMMONLY OCCURRING IN IHR

Lower altitudinal zone of both North-West and Western Himalaya was covered with extensive patches of Himalayan Chir-Pine Forest, which was exceptionally high in Lepidoptera richness and abundance. Moist Temperate Deciduous Forest represented the transitional zone between lower and mid-altitude zone of North-West and Western Himalaya, whereas, above this region, Western Mixed Coniferous Forest dominated which was frequented by very high abundance of Lepidopteran species. In Central and Eastern Himalaya, lower altitudinal zones were covered with extensive patches of Sub-Tropical Wet Evergreen Forest which was exceptionally species-rich. The mid to high altitude areas came under Wet Temperate Forest which was especially species rich in Eastern Himalaya. Tropical Wet Evergreen Forest in Namdapha NP was one of the most unique habitats sampled in the entire landscape, whereas, exceptionally high diversity of unique species, especially of Noctuids was recorded above 4000 m in Alpine Pastures of Western Himalaya.

Krananda fulva (Yazaki, 1994)

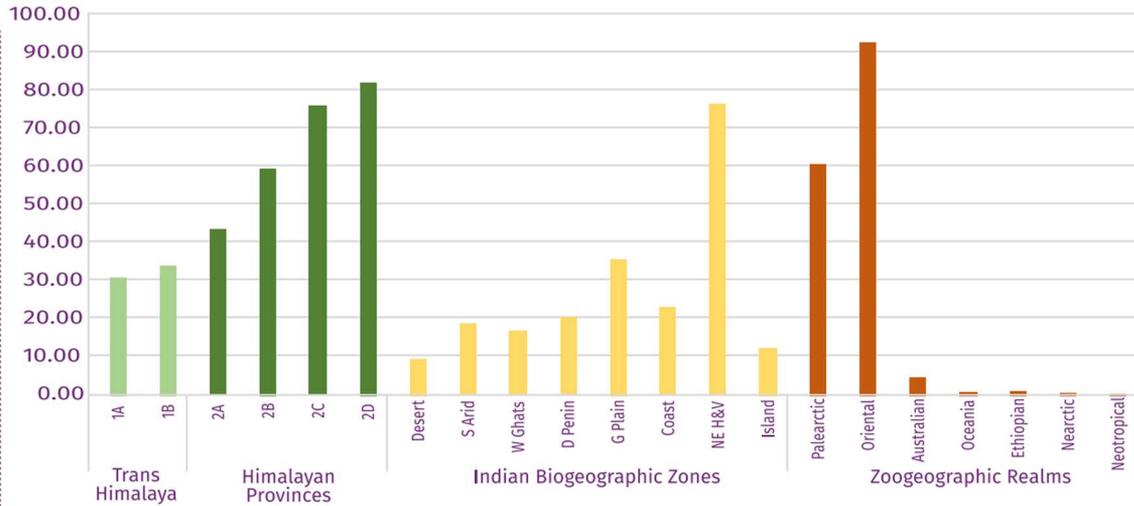


BIOGEOGRAPHIC AFFINITIES OF SAMPLED LEPIDOPTERAN ASSEMBLAGE

Analysis of Biogeographic affinities among Lepidopteran assemblages of different Himalayan Provinces revealed that proportion of Palearctic and Oriental species interchanges as we move across west to east axis. While assemblages of Ladakh and GHNP butterflies were almost 100% Palearctic, proportion of Oriental species was lowest in case of Trans-Himalayan assemblage, only around 40%, while it increased to 75% in case of North-Western assemblage and to 90% for Western Himalaya. In Western Himalayan butterfly assemblage, proportion of Palearctic and Oriental species were almost equal, around 80-90%. Affinities for Palearctic region started to decrease significantly from Central Himalaya. Central Himalayan butterflies were almost 100% Oriental where proportion of Palearctic species decreased to 70%. Share of Palearctic species diminished further to 55% for DDBR butterfly assemblage, while further southward, assemblage recorded from Namdapha NP had only 40% Palearctic affinity. In case of Indian Biogeographic zones and provinces, Trans-Himalayan assemblage had almost negligible affinity for other Indian Biogeographic zones, while species share with North Eastern Hills and Valleys and Gangetic Plains tended to increase from Western to Eastward. Western Himalayan butterflies showed around 70% affinity with North Eastern species pool, while it increased up to 90% for Central Himalayan assemblage.



Figure 4.5: Biogeographic affinities (% representation) of total Himalayan Butterflies recorded in this study

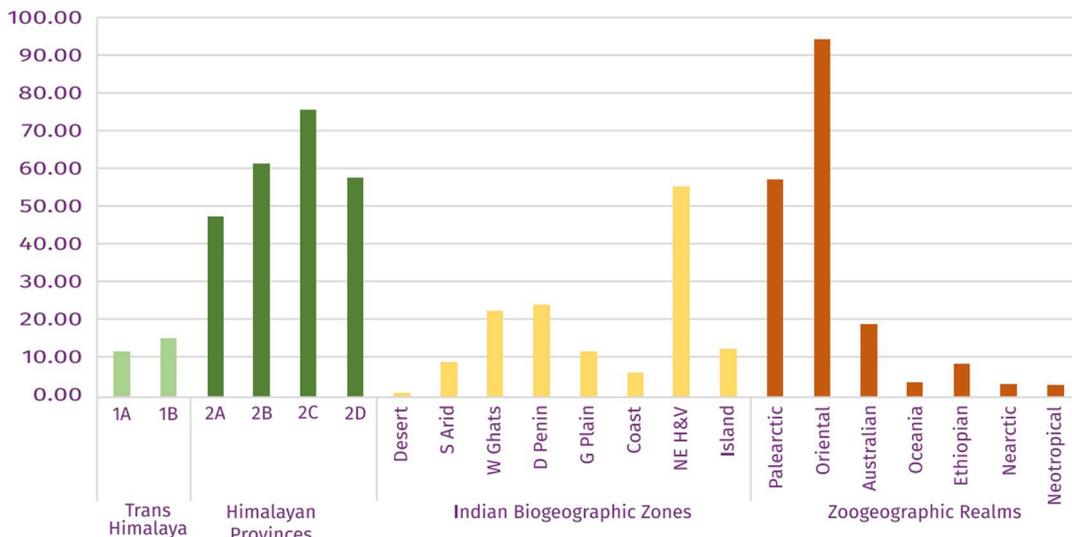


In case of moths, the fluctuations between Palaearctic and Oriental affinities showed almost similar trend as in butterflies, with Trans-Himalayan assemblage being 84% Palaearctic, the percentage getting reduced to around 40% for Eastern Himalayan assemblage. Entire assemblage was of purely of Oriental origin except Trans-Himalaya, which shares only 34% Oriental species. Among other major realms, Australian fauna had minor presence especially in case of Central Himalayan assemblage with a share of 26% species.

The total butterfly assemblage sampled from entire Himalayan length and breadth, species with Oriental affinities dominated (93%), while a significant percentage was of Palaearctic origin (61%). Only about 5% species were distributed up to Australian region. Among Indian Biogeographic Provinces, 76% species

were shared with North-Eastern Hills & Valleys, 36% species were commonly occurring in Gangetic Plains. 23% species had coastal distribution, while only 20% species were common with Deccan Peninsula. Semi-Arid and Western Ghats Provinces had minor representation, 18% and 16% respectively (Fig. 4.5). Around 94% species among sampled moth assemblage was of Oriental origin, whereas, around 57.5% species had affinities for Palaearctic region. 19% species were distributed up to Australian region, while only 8% species had Ethiopian affinity. Nearly 56% species among Himalayan moths sampled were shared with North Eastern Hills and Valleys, while representation of other Indian Biogeographic Provinces was extremely low, all below 25%, majority among them being Deccan Peninsula with 24% species share and 22% with Western Ghats (Fig. 4.6).

Figure 4.6: Biogeographic affinities (% representation) of total Himalayan Moths recorded in this study



SPECIES OF CONSERVATION CONCERN

Himalayan region, being most affected by habitat modification and anthropogenic perturbations, harbours several species which are vulnerable to extinction threats, which is likely to be a major concern for those which have restricted choices for resource utilizations, particularly due to specialization to certain habitat conditions or host plant choice. But till date, due to lack of studies focusing on species-specific abundance status, not a single Himalayan or Indian Lepidoptera has been included in IUCN Red List of Threatened Taxa. Our study documented few rare species among which 17 species of butterflies were categorized under Schedule I in Wildlife (Protection) Act, 1972 (WPA), e.g., *Agriades leela* recorded from Ladakh, *Byasa polla* and *Arhopala ammonides elira* reported from Namdapha NP, *Drupadia scaeva cyara* and *Athyma jina jina* reported from DDBR, are among few mentionable ones. The sampled assemblage also consisted of 78 species categorized under Schedule II, including *Parnassius charltonius* recorded from Ladakh.

Altogether, 12 species of butterflies and 30 species of moths were reported which were never recorded outside Indian territory. While few among them are described from India in recent years, majority may be truly endemic to India, which can't be stated with full

certainty due to insufficient database. Among them, most prominent butterflies were *Polygonia c-album kashmira* reported from Ladakh and 2 very restricted range species reported from Uttarakhand: *Polyommatus dux dux* and *Lethe baladeva aisa*. Among moths, few species worth mentioning are: *Acronicta bicolor* Known only from Himachal Pradesh, *Neotephria ramalaria* Known from Trans and North Western Himalaya, *Docirava postochrea* reported from North Western and Western Himalaya, *Toxoides undulata* and *Polythlipta peragrata* known from Central Himalaya.

About 8 species of moths were recorded which were always restricted to specialized habitat of Alpine Pastures above 3500 m and can be regarded as most vulnerable to climate-change driven range contraction, among them: 2 species of *Neoris* (Saturniidae), 2 species of genus *Hermonassa* and 1 species each of *Phlogophora*, *Trachea*, *Paraxestia* (Noctuidae) and *Preparctia* (Erebidae) were notable. Furthermore, notable differences were observed between past and present altitudinal range of few species, e.g., *Trachea auriplena*, *Diphtherocome fasciata*, *Arhopala ganesa ganesa*, *Cyrestis thyodamas ganescha* have shown significant upward range extension, whereas, *Baltia butleri butleri*, *Colias ladakensis*, *Euchloe daphalis* showed significant altitudinal range contraction. Few species, majorly active agricultural pest like *Pieris canidia indica* and *Lampides boeticus* were 2 butterfly species recorded from every landscapes surveyed, while Noctuid moth *Agrotis ipsilon* were super-abundant in all the Biogeographic provinces.

Polyommatus dux dux Riley, 1926





SIGNIFICANCE OF THE STUDY

- Current compilation creates an extensive database of Himalayan Lepidoptera, across all the altitudinal stratification and biogeographic extremes of Indian Himalaya, which can be considered as first of its kind, as such type of compilation across IHR has not been attempted till date for any of the faunal groups. Simultaneous sampling in 8 different landscapes in 6 Himalayan states yielded comprehensive distribution of every studied species, pinpointing exact habitat and biotic-abiotic envelopes of each species.
- Much of the knowledge on distribution of Himalayan Lepidoptera, especially moths, were till date restricted to the century-old pioneering documents like Fauna of British India, where only broad category of distribution information like state records were used. Current compilation fulfills this gap with exact geo-climatic information for every species along with their abundance status, which will be helpful in assessing climate-change vulnerability of every species through Distribution Modelling.
- Furthermore, the current database can be considered as the foundation with which future datasets on Himalayan Lepidoptera can be compared to reveal any distributional shift, phenological inconsistency or changes in abundance status which are the likely consequences of climate change.
- As any long-term monitoring involves pre-targeted set of taxa which typically represents the bioclimatic conditions of their habitats, choice of such taxa from huge diversity of Himalayan fauna with little or no information on their abundance status is really a substantial problem. Current database indicating most abundant, rare and restricted-range species of every altitudinal zone of different biogeographic provinces will help to choose set of Indicator species for long-term monitoring and management interventions.
- As long-term monitoring requires easy and accessible way to identify a particular species in field, proper guidebook depicting the identifying features of every species is an essential requirement, which is really lacking in Indian scenario, especially in case of moths. Current compilation fulfills this gap to some extent, with the species-plates depicting each species in their life-size photographs indicating identifying markings on both dorsal and ventral wing surface.





Future Scopes

- Extensive landscapes of western extremity of North-western Himalayan province, trans-Himalayan sectors of Himachal Pradesh and Sikkim, western Arunachal Pradesh are still unexplored corners of Indian Himalaya in terms of knowledge on Lepidopteran species composition and diversity. Targeting systematic sampling in those inaccessible and remote terrain will be a future priority.
- As vegetation structure and composition determine the inhabiting lepidopteran species assemblage and abundance status, enumerating such parameters across Himalayan landscape including data on canopy, shrub and herbaceous layers will be a valuable addition for more clear understanding of species ecology. Furthermore, generating information on species-specific traits related to host plant use and diet breadth should be integrated in future studies which will help to understand the larval ecology of Himalayan Lepidoptera.
- Predicting future species distribution under projected climate change scenarios will help to identify species which are more prone to extinction or will attain the status of outbreaking pest under changing climate. This will not only favour policy makers in designing effective conservation strategies for the management of vulnerable ecosystems, but also agricultural or forestry sectors in adopting best approach for Integrated Pest management.



5



SPECIES LIST



INTERPRETATION OF SPECIES TABLE



MATERIAL EXAMINED COLUMN

Number of individuals observed or number of specimens collected is provided as:

Location code (Number of individuals), e.g. LD04A(2) shall be interpreted as

LD	=	Protected area sampled
04	=	Site code
A/B/...	=	Date code
(2)	=	Abundance/ Number of specimens

For Protected area code, please refer:

LD (Ladakh):	Refer Table No. 3.1 (Pg. 029)
GH (Great Himalayan NP):	Refer Table No. 3.2 (Pg. 043)
DS (Dharamshala):	Refer Table No. 3.8 (Pg. 133)
GV (Govind WLS):	Refer Table No. 3.3 (Pg. 059)
GT (Gangotri NP):	Refer Table No. 3.8 (Pg. 133)
VF (Valley of Flowers NP):	Refer Table No. 3.8 (Pg. 133)
AS (Askot WLS):	Refer Table No. 3.4 (Pg. 075)
KA (Kyongnosla Alpine Sanctuary):	Refer Table No. 3.8 (Pg. 133)
NV (Neora Valley NP):	Refer Table No. 3.5 (Pg. 091)
SL (Singalila NP):	Refer Table No. 3.5 (Pg. 091)
TW (Tawang):	Refer Table No. 3.8 (Pg. 133)
ND (Namdapha NP):	Refer Table No. 3.6 (Pg. 107)
DD (Dihang-Dibang BR):	Refer Table No. 3.7 (Pg. 121)

DISTRIBUTION COLUMN

India: Indian states given in abbreviation (provided in following table) and arranged according to Biogeographic Zones and Provinces of India, order of which is maintained as follows: Himalayan (JK, HP, UT, SK, WB, AR), North-Eastern Hills and Valleys (AS, ME, NL, MN, MI, TR), Gangetic Plains (BH, JH, UP), Semi-Arid and Arid Zones (DL, HR, PB, GJ, RJ), Deccan Peninsula (MP, CT, AP, TS, MH, KA), Western Ghats (TN, KL), Coasts (GA, OD, PY), Islands (AN).

The state code(s) is given in bold font when a species was first time record from that state.



State Name	State Code	State Name	State Code
Andaman and Nicobar Islands	AN	Madhya Pradesh	MP
Andhra Pradesh	AP	Maharashtra	MH
Arunachal Pradesh	AR	Manipur	MN
Assam	AS	Meghalaya	ME
Bihar	BH	Mizoram	MI
Chandigarh	CH	Nagaland	NL
Chhattisgarh	CT	Odisha	OD
Delhi	DL	Pondicherry	PY
Goa	GA	Punjab	PB
Gujarat	GJ	Rajasthan	RJ
Haryana	HR	Sikkim	SK
Himachal Pradesh	HP	Tamil Nadu	TN
Jammu and Kashmir	JK	Telangana	TS
Jharkhand	JH	Tripura	TR
Karnataka	KA	Uttar Pradesh	UP
Kerala	KL	Uttarakhand	UT
Lakshadweep	LD	West Bengal	WB

Table:
Indian State Codes used
(Source: Regional Transport Authority)

Elsewhere : Countries are arranged in the following order:

Himalayan (Afghanistan, Pakistan, Nepal, Bhutan), Indian Sub-Continent (Bangladesh, Sri Lanka), Oriental (Myanmar, China*, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Indonesian Islands), Australian (Papua New Guinea, Australia, Timor, Solomons, New Zealand), Palearctic (Japan, Korea, Russia, Central Asian countries, European countries), Ethiopian, Nearctic, Neotropical countries.

[*China falling under both Oriental and Palearctic region, is considered here within Oriental cluster of countries, whereas, species reported from Tibet is provided as *China (Tibet)*].



Table: Details of Butterfly species / subspecies recorded from IHR

Symbols used: * = First Report to India; b = First Report to North-Western Himalaya; j = First Report to Western Himalaya, I= Schedule I, The Wildlife (Protection) Act, 1972; II= Schedule II, The Wildlife (Protection) Act, 1972; IV= Schedule IV, The Wildlife (Protection) Act, 1972

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Superfamily: Papilionoidea Latreille, 1802					
Family: Papilionidae Latreille, 1802					
Subfamily: Papilioninae Latreille, 1802					
1	1.1	<i>Atrophaneura aidoneus</i> (Doubleday, 1845)	ND03A(1)	UT, SK, WB, AR, AS, ME, MN, NL, MI	Nepal, Bhutan, Bangladesh, Myanmar, China, Laos, Vietnam, Thailand
2	1.2	<i>Byasa dasarada dasarada</i> (Moore, 1858)	ND04A(1); DD09B(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan
3	2.1	<i>Byasa polla</i> (de Nicéville, 1897)	ND14A(1)	AR, NL, MN	Bhutan
4	2.2	<i>Byasa polyeuctes polyeuctes</i> (Doubleday, 1842)	ND06B(1); DD09B(2)	SK, WB, AR, AS, ME, NL, MN, TR	Bhutan, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
5	3.1	<i>Graphium agamemnon agamemnon</i> (Linnaeus, 1758)	ND03A(1), ND04A(1), ND08A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, JH, BH, OD	Nepal, Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java, Bali), Philippines
6	3.2	<i>Graphium agetes agetes</i> (Westwood, 1843)	DD09B(2)	SK, WB, AR, AS, ME, NL	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
7	3.3	<i>Graphium antiphates pompilius</i> (Fabricius, 1787)	DD09B(2)	SK, WB, AR, AS, ME, NL, MN, MI, TR, JH, CT, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
8	3.4	<i>Graphium chironides chironides</i> (Honrath, 1884)	ND03A(1); DD09A(1), DD09B(1)	SK, WB, AR, AS, ME, NL, MN, BH	Nepal, Bhutan, Bangladesh, Myanmar, Thailand, Laos, Vietnam
9	3.5	<i>Graphium cloanthus cloanthus</i> (Westwood, 1841)	GH01C(1); GV01B(3), GV06A(1); AS03B(1); ND13B(1); DD09B(2), DD11A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN	Pakistan, Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
10	3.6	<i>Graphium doson axionides</i> (Page & Treadaway, 2014)	GV09B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, UP, DL, PB, HR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
11	3.7	<i>Graphium eurous sikkimica</i> (Heron, 1899)	DD09B(1), DD13A(1), DD14A(1), DD22A(1)	UT, SK, WB, AR, ME, NL	Nepal, Bhutan
12	3.8	<i>Graphium eurypylus acheron</i> (Moore, 1885)	ND03A(2)	SK, WB, AR, AS, ME, MI, MN	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
13	3.9	<i>Graphium macareus indicus</i> (Rothschild, 1895)	ND06B(1); DD09B(1)	SK, WB, AR, AS	Nepal, Bhutan

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
14	3.10	<i>Graphium mandarinus paphus</i> (de Nicéville, 1886)	DD09B(1)	SK, WB, AR, ME, NL	Nepal, Bhutan
15	3.11	<i>Graphium nomius nomius</i> (Esper, 1799)	AS03B(1)	HP, UT, SK, WB, AR, BH, JH, UP, DL, CH, MP, CT, MH, GA, TS, KA, TN, KL, OD	Nepal, Bhutan, Sri Lanka
16	3.12	<i>Graphium sarpedon sarpedon</i> (Linnaeus, 1758)	GV01D(2), GV13B(1); AS03B(1); ND04A(1), ND06C(1); DD09B(2)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, TR, BH, DL, PB	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java, Bali, Lombok), Australia, Japan, Korea
17	3.13	<i>Lamproptera curius curius</i> (Fabricius, 1787)	ND02A(1), ND08A(1), ND14A(1)	AR, AS, ME, NL, MI, MN, TR	Bangladesh, Myanmar, China, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java), Philippines
18	3.14	<i>Lamproptera meges virescens</i> (Butler, 1870)	ND14A(1), ND15A(1)	AR, AS, ME, NL, MI, MN	Myanmar, Vietnam, Laos, Thailand, Malaysia
19	4.1	<i>Meandrusa lachinus lachinus</i> (Fruhstorfer, 1902) ¹¹	NV10C(1); ND13B(1); DD15A(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan
20	4.2	<i>Meandrusa payeni evan</i> (Doubleday, 1845)	ND03B(1)	SK, WB, AR, AS, ME	Bhutan
21	4.3	<i>Pachliopta aristolochiae aristolochiae</i> (Fabricius, 1775)	GV01E(7), GV06A(3)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, BH, JH, UP, DL, PB, HR, CH, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD	Pakistan, Nepal, Bhutan, Bangladesh
22	4.4	<i>Papilio agestor agestor</i> Gray, 1831	DD09A(3), DD11A(3)	SK, WB, AR, AS, ME, NL, MI	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
23	4.5	<i>Papilio alcmenor alcmenor</i> C. & R. Felder, [1864]	GV04B(2); ND03A(1), ND03B(1), ND06B(1); DD09B(2), DD11A(2), DD21A(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Myanmar, Vietnam, Laos, Thailand
24	5.1	<i>Papilio arcturus arcturus</i> Westwood, 1842	DD09B(2), DD15A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
25	5.2	<i>Papilio bianor gladiator</i> Fruhstorfer, 1902	ND04A(1); DD08B(1), DD09B(2)	AR, AS, ME, NL, MI, MN	Myanmar, Laos, Cambodia, Thailand
26	5.3	<i>Papilio bianor polycctor</i> Boisduval, 1836	GH03B(1); GV02D(2), GV11A(1); AS01E(1)	JK, HP, UT	Pakistan
27	6.1	<i>Papilio bootes janaka</i> Moore, 1857	DD08B(1)	UT, SK, WB, AR	Nepal, Bhutan



Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
28	6.2	<i>Papilio demoleus demoleus</i> Linnaeus, 1758	GV01A(1), GV02E(1); ND01A(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, DL, PB, HR, CH, GJ, RJ, MP, MH, CT, AP, TS, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Philippines
29	6.4	<i>Papilio epycides epycides</i> Hewitson, 1864 ¹	DD09B(2), DD11A(2)	SK, WB, AR, AS, ME, NL	Nepal, Bhutan
30	6.5	<i>Papilio helenus helenus</i> Linnaeus, 1758	GV04A(1), GV06A(2); NV02F(1); ND01A(1), ND03A(1); DD09B(2), DD11A(3)	UT, SK, WB, AR, AS, ME, MI, MN, BH	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
31	5.4	<i>Papilio krishna krishna</i> Moore, 1858	DD20A(1)	SK, WB, AR	Nepal, Bhutan
32	6.6	<i>Papilio machaon asiatica</i> Menetries, 1855	GH15A(1), GH17A(1); GV04B(4), GV09B(2), GV13A(3), GV21A(2); AS01E(1)	JK, HP, UT	Pakistan
33	6.7	<i>Papilio machaon ladakensis</i> Moore, 1884	LD02B(1), LD19B(1), LD26B(1), LD27A(1), LD28B(1), LD30A(1), LD31A(1), LD32A(1)	JK, HP	Pakistan, Myanmar
34	7.1	<i>Papilio memnon agenor</i> Linnaeus, 1758	ND03A(1); DD09B(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
35	6.3	<i>Papilio nephelus chaon</i> Westwood, 1844	ND08A(1); DD09A(1), DD09B(1)	SK, WB, AR, AS, ME, NL, MN, TR, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
36	7.3	<i>Papilio paradoxa telearchus</i> (Hewitson, 1852) ¹	ND03L(1)	AR, AS, ME, NL, MN	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
37	5.5	<i>Papilio paris paris</i> Linnaeus, 1758	ND01A(1), ND06B(1), ND08A(1); DD09B(1), DD11A(1), DD15A(1)	UT, SK, WB, AR, AS, ME, NL, MN, MI, AP, TN, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Hong Kong, Vietnam, Laos, Cambodia, Thailand
38	7.2	<i>Papilio polytes romulus</i> Cramer, [1775]	GV02A(5), GV05B(2); AS01E(1); ND01A(1), ND03A(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, DL, PB, HR, CH, GJ, RJ, MP, MH, CT, AP, TS, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, Vietnam, Laos, Cambodia, Thailand, Malaysia
39	7.5	<i>Papilio protenor euprotenor</i> Fruhstorfer, 1908	ND03A(1), ND03L(1); DD09B(2)	SK, WB, AR, AS, ME, NL, MN, MI	Nepal, Myanmar, China, Vietnam, Laos, Thailand
40	7.4	<i>Papilio protenor protenor</i> Cramer, [1775]	GV04C(7), GV05A(8), GV09A(3); AS01E(1)	JK, HP, UT	
41	7.6	<i>Troides aeacus aeacus</i> (C. & R. Felder, 1860)	GV05B(1), GV10B(2); AS09A(1)	UT, SK, WB, AR, AS, ME, NL, MN, BH	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
42	7.7	<i>Troides helena cerberus</i> (C. & R. Felder, 1865)	ND03H(1); DD09A(1)	SK, WB, AR, AS, ME, NL, MN, MI, TR, BH, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
Subfamily: Parnassiinae Swainson, 1840					
43	7.8	<i>Parnassius charltonius</i> Gray, [1853] ⁱⁱ	LD21A(1), LD22A(4), LD28A(1), LD29A(1), LD31B(2)	JK, HP, UT	Afghanistan, Pakistan, China (Tibet), Kyrgyzstan, Tajikistan
44	7.9	<i>Parnassius hardwickii hardwickii</i> Gray, 1831	LD26B(1); GH18A(1); GV09A(1), GV20A(4), GV21B(2), GV22B(2); AS18A(1), AS25A(1), AS26A(1)	JK, HP, UT, SK	Pakistan, Nepal, Bhutan, China (Tibet)
Family: Hesperidae Latreille, 1809					
Subfamily: Coeliadinae Evans, [1937]					
45	8.1	<i>Bibasis sena sena</i> (Moore, [1866]) ⁱⁱ	ND03A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, MP, MH, KA, TN, KL, GA, OD, AN	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand
46	8.2	<i>Burara jaina jaina</i> (Moore, [1866])	AS03B(1); ND13A(1), ND13B(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
47	8.3	<i>Burara oedipodea belesis</i> (Mabille, 1876)	ND13B(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
48	8.4	<i>Burara vasutana</i> (Moore, [1866])	ND13A(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
49	8.5	<i>Choaspes benjaminii japonica</i> Murray, 1875	GV04A(1), GV14A(1); ND13B(1); DD11A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Thailand
50	8.6	<i>Choaspes xanthopogon xanthopogon</i> (Kollar, [1844])	ND03C(1); DD04B(1), DD20B(1)	JK, HP, UT, SK, WB, AR, AS, ME	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand
51	8.7	<i>Hasora anura anura</i> de Nicéville, 1889	ND11B(1); DD04D(1)	UT, SK, WB, AR, AS, ME, NL, MN, MI	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
52	8.8	<i>Hasora badra badra</i> (Moore, [1858])	ND03A(1)	SK, WB, AR, AS, ME, NL, MN, BH, GJ, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java, Flores, Sulawesi), Philippines, Japan
53	8.9	<i>Hasora vitta indica</i> Evans, 1932 ^{iv}	ND03C(1); DD09A(2), DD10B(1)	SK, WB, AR, AS, ME, NL, MN, CH, KA, TN, KL, GA, OD	Bhutan, Myanmar, China, Laos, Thailand



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Eudaminae Mabille, 1877					
54	8.10	<i>Lobocla liliانا ignatius</i> (Ploetz, 1882)	GH03B(1)	JK, HP, UT	Pakistan
Subfamily: Pyrginae Burmeister, 1878					
55	8.11	<i>Capila jayadeva</i> Moore, [1866]	ND03H(1)	SK, WB, AR, AS, ME, NL	Nepal, Bhutan, Vietnam, Laos
56	8.12	<i>Capila zennara</i> (Moore, [1866])	ND13A(1)	SK, WB, AR, AS, NL, MN	Bhutan, Laos, Thailand
57	8.13	<i>Celaenorrhinus aurivittatus aurivittatus</i> (Moore, 1878)	ND03B(2), ND13D(2)	AR, AS, ME, NL, MN, MI, TR, AN	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
58	8.14	<i>Celaenorrhinus dhanada dhanada</i> (Moore, 1865)	AS03B(1), AS07C(1)	HP, UT, SK, WB	Bhutan, Nepal, Thailand
59	8.15	<i>Celaenorrhinus leucocera</i> (Kollar, [1844])	GV07A(3); AS03B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, CH, GJ, MP, MH, AP, KA, TN, KL, GA, OD, AN	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand, Malaysia
60	9.1	<i>Celaenorrhinus nigricans nigricans</i> (de Nicéville, 1885)	ND02A(2), ND03A(2), ND03B(1), ND04A(2), ND09A(2), ND13B(2)	SK, WB, AR, AS, ME, NL, MN	Bhutan, Myanmar, Vietnam, Laos, Thailand, Malaysia
61	9.2	<i>Celaenorrhinus patula</i> de Nicéville, 1889	ND02A(1), ND13A(2)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Myanmar, China, Vietnam, Laos, Thailand
62	9.3	<i>Celaenorrhinus zea</i> Swinhoe, 1909	ND12A(1)	WB, AR, AS, ME	
63	9.4	<i>Coladenia agni agni</i> (de Nicéville, [1884])	ND13B(1)	SK, WB, AR, AS, ME, NL, MN, TR	Myanmar, China, Laos, Thailand
64	9.5	<i>Coladenia indrani indrani</i> (Moore, [1866])	AS03B(1)	HP, UT, SK, WB, AR, AS, ME	Nepal, Bhutan, Bangladesh
65	9.6	<i>Ctenoptilum vasava vasava</i> (Moore, [1866])	ND03G(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
66	9.7	<i>Darpa hanria</i> Moore, [1866]	ND06B(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
67	9.8	<i>Gerosis phisara phisara</i> (Moore, 1884)	ND06A(1), ND06B(1), ND13B(1); DD15A(1)	UT, SK, WB, AR, AS, ME, NL, MN, TR, OD	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand, Malaysia
68	9.9	<i>Gerosis sinica narada</i> (Moore, 1884)	ND03C(1)	SK, WB, AR, AS, ME, NL, MN	Bhutan, Myanmar, Vietnam, Laos, Thailand
69	9.10	<i>Mooreana trichoneura pralaya</i> (Moore, [1866])	ND09A(1)	UT, SK, WB, AR, AS, ME, NL, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
70	9.11	<i>Odontoptilum angulata angulata</i> (C. & R. Felder, 1862)	ND03A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, CH, GJ, MH, AP, KA, TN, KL, GA, OD	Pakistan, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java, Bali)
71	9.12	<i>Pseudocoladenia dan fabia</i> (Evans, 1949)	NV10C(1); ND13A(1); DD04A(1), DD04C(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Bangladesh, Bhutan, Myanmar, China, Vietnam, Laos, Thailand

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
72	9.13	<i>Pseudocoladenia fatih</i> (Kollar, [1844])	GV04C(1), GV05B(1); AS06A(2), AS14A(1)	JK, HP, UT, PB, HR	Pakistan, Nepal
73	9.14	<i>Pseudocoladenia festa</i> (Evans, 1949)	DD04B(1)	SK, WB, AR, ME, NL, MN	Bhutan, Myanmar, China, Vietnam, Thailand
74	9.15	<i>Pyrgus cashmirensis cashmirensis</i> Moore, 1874	LD24A(1)	JK, HP, UT	Pakistan, Bhutan
75	10.1	<i>Sarangesa dasahara dasahara</i> (Moore, [1866])	GV01B(1), GV05A(2); AS01E(2)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, BH, PB, HR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
76	10.2	<i>Seseria sambara sambara</i> (Moore, [1866])	ND03A(1), ND13A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN	Bhutan, Myanmar, Vietnam, Laos
77	10.3	<i>Spialia galba galba</i> (Fabricius, 1793)	GV11A(1), GV12A(1); AS03B(1), AS07B(1); DD11A(1)	HP, UT, SK, WB, AR, AS, ME, MI, MN, TR, BH, JH, UP, DL, HR, CH, GJ, MP, MH, CT, AP, KA, TN, KL, GA, OD	Pakistan, Nepal, Bhutan, Sri Lanka, Thailand
78	10.4	<i>Tagiades litigiosa litigiosa</i> Fruhstorfer, 1910	GV01F(1), GV02B(1); ND03A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, JH, GJ, MH, AP, KA, TN, KL, GA, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Laos, Thailand
79	10.5	<i>Tagiades menaka menaka</i> (Moore, [1866])	AS06A(1); ND03A(1)	JK, HP, UT, SK, AR, AS, ME, MI, NL, MN, PB	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
80	10.6	<i>Tagiades parra gala</i> Evans, 1949	ND03A(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand
Subfamily: Heteropterinae Aurivillius, [1925]					
81	10.7	<i>Carterocephalus avanti avanti</i> (de Nicéville, 1886)	AS22B(1)	UT, SK	Nepal, Bhutan
Subfamily: Hesperinae Latreille, 1809					
82	10.8	<i>Aeromachus jhora creta</i> Evans, 1949	ND14A(1); DD09B(3)	AR, AS, ME, NL, MN	Myanmar, China, Vietnam, Laos, Thailand, Malaysia
83	10.9	<i>Aeromachus kali</i> (de Nicéville, 1895)	ND08A(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos
84	10.10	<i>Aeromachus pygmaeus</i> (Fabricius, 1775)	ND01A(1)	WB, AR, AS, ME, TR, MH, KA, TN, KL, GA	Nepal, Bhutan, Bangladesh, Myanmar
85	10.11	<i>Ampittia dioscorides dioscorides</i> (Fabricius, 1793)	ND01A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, UP, DL, GJ, MH, AP, KA, TN, KL, GA, OD	Nepal, Bhutan, Myanmar
86	10.12	<i>Astictopterus jama olivascens</i> Moore, 1878	ND03A(1), ND14A(1)	UT, SK, WB, AR, AS, ME, NL, TR, MI, MN, AN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
87	10.13	<i>Borbo bevani</i> (Moore, 1878)	AS01E(4), AS03B(1), AS07B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, PB, HR, GJ, MP, CT, KA, TN, KL, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Indonesia (Sumatra, Java, Sulawesi), Australia



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
88	10.14	<i>Cephrenes acalle oceanica</i> (Mabille, 1904)	ND04A(1)	WB, AR, AS, ME, NL, MN, MH, KA, TN, KL, GA, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
89	10.15	<i>Creteus cyrina</i> (Hewitson, 1876)	ND14A(1)	SK, WB, AR, AS, ME	Bhutan, Vietnam, Laos, Thailand
90	11.1	<i>Cupitha purreea</i> (Moore, 1877)	ND03A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR, JH, CT, KA, TN, KL, OD, AN	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java, Sulawesi), Philippines
91	11.2	<i>Halpe filda</i> Evans, 1949	ND03L(1)	SK, WB, AR	Nepal, China (Tibet)
92	11.3	<i>Halpe zema zema</i> (Hewitson, 1877)	ND08A(2)	SK, WB, AR, AS, ME, NL, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand
93	11.4	<i>Halpe zola zola</i> Evans, 1937	ND08A(1)	AR, AS, ME, MN	Myanmar, Vietnam, Laos, Thailand
94	11.5	<i>Hyarotis adrastus praba</i> (Moore, [1866]) ^v	ND07A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, AP, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java), Philippines
95	11.6	<i>Iambrix salsala salsala</i> (Moore, [1866])	NV02C(1); ND02A(1); DD09A(1)	UT, SK, WB, AR, AS, ME, MI, NL, MN, TR, CT, MH, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Java)
96	11.7	<i>Iton semamora semamora</i> (Moore, [1866])	ND06A(1)	SK, WB, AR, AS, ME, MI, NL, MN, TR	Bangladesh, Myanmar, Vietnam, Laos, Thailand, Malaysia
97	11.8	<i>Koruthaialos butleri</i> (de Nicéville, [1884])	ND13A(1)	SK, WB, AR, AS, ME, NL, MN, TR	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
98	11.9	<i>Matapa aria</i> (Moore, [1866])	ND03K(1); DD09A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, BH, JH, GJ, MP, AP, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java), Philippines
99	11.10	<i>Notocrypta curvifascia curvifascia</i> (C. & R. Felder, 1862)	AS07B(1); NV02B(1); ND03A(2), ND03L(1); DD09A(1)	HP, UT, SK, WB, AR, AS, ME, MI, NL, MN, TR, BH, JH, UP, CT, AP, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Japan
100	11.11	<i>Notocrypta feisthamelii alysos</i> (Moore, [1866])	NV02B(1); ND04A(1); DD08B(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand, Malaysia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
101	11.12	<i>Notocrypta paralysos asawa</i> Fruhstorfer, 1911	ND03A(1), ND06B(1); DD04A(1)	UT, SK, WB, AR, AS, ME, NL, MI, TR	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
102	11.13	<i>Ochus subvittatus subvittatus</i> (Moore, 1878)	ND02A(1), ND15A(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
103	11.14	<i>Oriens goloides</i> (Moore, [1881])	GV01A(1); AS01E(1); NV02C(1); ND03E(1); DD04A(2)	UT, SK, WB, AR, AS, ME, NL, AP, MH, KA, TN, KL, GA, OD	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand, Malaysia
104	11.15	<i>Parnara guttatus</i> (Bremer & Grey, [1852])	AS07B(1); ND01A(2)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, UP, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos
105	12.1	<i>Pedesta masuriensis masuriensis</i> (Moore, 1878)	GH03B(1); AS03B(1)	HP, UT, SK, WB, AS	Nepal, Bhutan
106	12.2	<i>Polytremis eltola eltola</i> (Hewitson, 1869)	AS25A(1); ND03B(2), ND07A(1); DD09A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand
107	12.3	<i>Polytremis lubricans lubricans</i> (Herrich-Schäffer, 1869) ^{IV}	ND01A(2), ND03A(2), ND03E(1)	UT, SK, WB, AR, AS, ME, NL, MN, BH, UP, KA, TN, KL, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Java, Borneo, Lombok, Sumbawa, Sulawesi), Timor
108	12.4	<i>Potanthus mara</i> (Evans, 1932)	DD09B(1)	UT, SK, WB, AR, AS	Nepal, Vietnam, Laos
109	12.5	<i>Pyronaura margherita margherita</i> (Doherty, 1889)	ND03A(1), ND07A(2)	AR, AS, NL, MN	
110	12.6	<i>Scobura cephalis</i> (Hewitson, 1876)	ND13A(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Myanmar, China, Vietnam, Thailand, Malaysia
111	12.7	<i>Sebastonyma dolopia dolopia</i> (Hewitson, 1868)	ND03G(1)	SK, WB, AR, AS, ME, NL, MI, TR	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
112	12.8	<i>Telicota bambusae</i> (Moore, 1878)	ND03A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, JH, DL, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra)
113	12.9	<i>Thoressa cerata</i> (Hewitson, 1876)	ND14A(1)	SK, WB, AR, AS, ME, NL, MI, MN	Bhutan, Myanmar, Vietnam, Laos, Thailand
114	12.10	<i>Thoressa hyrie</i> (de Nicéville, 1891)	ND14A(1)	AR, ME, NL, MN	Bhutan, Myanmar, China (Tibet), Vietnam, Laos, Thailand
115	12.11	<i>Udaspes folus</i> (Cramer, [1775])	AS03B(1); NV02C(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, BH, JH, UP, DL, CH, PB, HR, GJ, RJ, MP, CT, AP, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Japan, Malaysia, Indonesia (Sumatra, Java, Lombok, Sumbawa)



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
116	12.12	<i>Zographetus satwa</i> (de Nicéville, [1884])	ND03A(1)	UT, SK, WB, AR, AS, ME, NL, MN, OD	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java)
Family: Pieridae Swainson, 1820					
Subfamily: Pierinae Swainson, 1820					
117	13.1	<i>Aporia agathon agathon</i> (Gray, 1831)	DD09A(1)	SK, WB, AR, AS, ME, NL	Nepal, Bhutan, Myanmar, China
118	13.2	<i>Aporia agathon caphusa</i> (Moore, 1872) ^{iv}	AS07A(1)	HP, UT	Nepal
119	13.3	<i>Aporia agathon phryxe</i> (Boisduval, [1836]) ^{iv}	GH03B(1); GV07B(1), GV14A(3)	JK, HP, UT	Nepal
120	13.4	<i>Appias galba</i> (Wallace, 1867) ⁱⁱ	ND03A(1)	WB, AR, AS, ME, NL, MN	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
121	13.7	<i>Appias indra indra</i> (Moore, 1857)	ND13A(1), ND13D(1), ND14A(1); DD04A(1), DD04B(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
122	13.8	<i>Appias lalage lalage</i> (Doubleday, 1842)	NV02A(1); ND04A(1); DD04B(1), DD09B(1), DD11A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, TN, KL	Nepal, Bhutan, Bangladesh, Myanmar, China, Laos, Thailand
123	13.5	<i>Appias libythea</i> (Fabricius, 1775) ⁱⁱ	AS01D(1)	HP, UT, WB, JH, PB, HR, GJ, RJ, MP, CT, AP, MH, KA, TN, KL, GA	Pakistan, Sri Lanka
124	13.6	<i>Appias lycinda eleonora</i> (Boisduval, 1836)	NV02A(1); ND03K(1), ND13D(1); DD04A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, CT, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Thailand
125	13.9	<i>Baltia butleri butleri</i> Moore, 1882 ⁱⁱ	LD04A(1), LD32A(5), LD35A(3), LD36A(5)	JK, HP, UT	Pakistan, Nepal
126	14.1	<i>Belenois aurota aurota</i> (Fabricius, 1793)	LD22A(1); GV01C(3), GV10A(6), GV15B(1), GV19B(2); AS24A(1)	JK, HP, UT, SK, WB, BH, JH, UP, MP, MH, KA, TN, KL, OD	Pakistan, Nepal, Bangladesh
127	13.10	<i>Cepora nadina nadina</i> (Lucas, 1852)	NV02A(1), NV05A(1); ND03A(1), ND06C(1), ND14A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
128	14.3	<i>Delias acalis pyramus</i> (Wallace, 1867)	ND12A(1); DD04A(1)	SK, WB, AR, AS, ME, NL, MI, MN, BH	Nepal, Bhutan, Bangladesh, Myanmar, Laos, Thailand
129	14.4	<i>Delias agostina agostina</i> (Hewitson, 1852)	ND13B(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
130	14.5	<i>Delias belladonna horsfieldii</i> (Gray, 1831)	GV01A(4), GV12A(2), GV16A(1); AS06A(1), AS14A(1)	JK, HP, UT	Pakistan, Nepal
131	14.6	<i>Delias belladonna lugens</i> Jordan, 1925	ND14A(1), ND15A(1); DD09B(1)	AR, ME, NL, MI, MN	Myanmar

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
132	14.2	<i>Delias hyparete indica</i> (Wallace, 1867)	ND03A(1)	UT, SK, WB, AR, AS, ME, TR, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
133	14.7	<i>Delias pasithoe pasithoe</i> (Linnaeus, 1767)	ND13B(1); DD04B(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR, BH	Nepal, Bhutan, Bangladesh, Myanmar, China, Laos, Thailand
134	14.8	<i>Delias sanaca bhutya</i> Talbot, 1937	DD09A(1)	AR	Bhutan
135	15.6	<i>Euchloe daphalis</i> (Moore, 1865)	LD19B(1)	JK, HP, UT	Pakistan
136	15.4	<i>Hebomoia glaucippe glaucippe</i> (Linnaeus, 1758)	NV05A(1); ND03A(2); DD04B(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR, BH	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
137	15.5	<i>Ixias pyrene familiaris</i> Butler, 1874	NV05A(1); ND06C(1); DD04B(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
138	15.1	<i>Leptosia nina</i> (Fabricius, 1793)	NV02A(1), NV02C(1); ND03A(1); DD04C(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, PB, CH, HR, GJ, MP, MH, AP, TS, CT, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand, Malaysia
139	15.2	<i>Pareronia avatar avatar</i> (Moore, [1858]) ^h	NV01A(1), NV05A(1); D03E(1), ND06C(1), ND13A(1), ND13D(1); DD04B(1)	SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, Myanmar, Laos, Thailand
140	15.3	<i>Pareronia hippia</i> (Fabricius, 1787)	GV03A(1), GV04B(1), GV10A(2); AS07B(1)	JK, HP, UT, SK, WB, ME, TR, BH, JH, UP, DL, PB, CH, HR, GJ, RJ, MP, CT, TS, MH, KA, TN, KL, GA, OD, PY	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand, Malaysia
141	15.8	<i>Pieris brassicae nepalensis</i> Gray, 1846	LD07A(2), LD15A(3), LD19A(5), LD21B(3), LD26B(2), LD27A(1), LD30A(2), LD31B(4), LD34B(1); GH18A(1); GV06A(3), GV09B(4), GV13A(5), GV21A(2); AS11A(1), AS14A(1), AS25A(1); DD15A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, UP, DL, PB, HR, RJ	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
142	15.7	<i>Pieris canidia indica</i> Evans, 1926	LD04A(1), LD04B(1), LD06A(1), LD10A(2), LD13A(3), LD14A(2), LD17A(1), LD18A(1), LD22A(1), LD24B(1); GH03B(2); GV01C(8), GV12A(4), GV13B(6), GV16A(3), GV19A(2), GV20A(4), GV24B(1); AS01E(2), AS06A(3), AS08A(1), AS09A(1), AS14A(2), AS21A(1), AS25A(1); NV02C(1); ND01A(1), ND03H(1); DD04D(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, UP, DL, PB, HR, GJ, RJ, MP, CT, MH, OD	Pakistan, Nepal, Myanmar, China, Taiwan



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
143	15.9	<i>Pieris deota</i> (de Nicéville, [1884]) ⁱⁱ	LD04A(1), LD27A(1), LD29A(1), LD30A(1), LD33A(2), LD34B(2), LD35A(2)	JK	Afghanistan, Pakistan, China (Tibet), Tajikistan, Kyrgyzstan
144	16.1	<i>Pieris extensa bhutya</i> Talbot, 1939	DD16A(1), DD22A(1)	AR	Bhutan
145	16.3	<i>Pieris krueperi devta</i> (de Nicéville, [1884]) ⁱ	LD02B(2), LD19B(1), LD30A(6)	JK	Pakistan, China (Tibet), Tajikistan, Kyrgyzstan, Mongolia
146	16.2	<i>Pieris ajaka</i> Moore, 1865	GH01C(2), GH06B(1), GH07A(1); GV21A(3); AS12A(1); ND03F(1); DD09A(1), DD22A(1)	JK, HP, UT, SK, AR, AS, ME, NL, MI, MN	Pakistan, Nepal, Bhutan
147	16.4	<i>Pieris rapae</i> (Linnaeus, 1758)	LD02A(1), LD02B(1), LD05A(1), LD09A(1), LD14A(1), LD15A(2), LD19B(7), LD34B(1)	JK	China, Vietnam, Australia, Russia, Kazakhstan, Morocco, Algeria, Italy, Germany, France, United Kingdom, Netherlands, Spain, Romania, Switzerland, Norway, Austria, USA, Canada
148	16.7	<i>Pontia callidice kalora</i> (Moore, 1865)	LD31A(1), LD32A(2), LD35A(1), LD36A(1)	JK, HP, UT	Pakistan, Nepal
149	16.6	<i>Pontia chloridice alpina</i> (Verity, 1911) ⁱⁱ	LD19B(2), LD29A(2), LD30A(1), LD35A(1)	JK, HP, UT	Pakistan
150	16.5	<i>Pontia daplidice moorei</i> (Roeber, [1907])	LD03A(2), LD04B(1), LD13A(1), LD14A(2), LD16A(1), LD18A(1), LD19A(3), LD20A(4), LD21A(1), LD22A(4), LD22B(2); GH03B(1); GV04C(4), GV09B(5), GV11A(6), GV20A(4)	JK, HP, UT, SK, WB, AR, AS, NL, MN, PB	Pakistan, Nepal, Bhutan, China
151	16.8	<i>Prioneris philonome clemathe</i> (Doubleday, 1842)	ND03A(1)	SK, WB, AR, AS, ME, NL, MN	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
152	16.9	<i>Prioneris thestylis thestylis</i> (Doubleday, 1842)	ND04A(1); DD04C(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand

Subfamily: Coliadinae Swainson, 1827

153	17.1	<i>Catopsilia pomona</i> (Fabricius, 1775)	GV03A(1), GV03B(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, UP, DL, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Java, Borneo), Philippines
154	17.2	<i>Catopsilia pyranthe pyranthe</i> (Linnaeus, 1758)	GV01D(1), GV04C(1), GV12B(1); AS01E(2), AS09A(1); NV02A(1); ND03J(1); DD04C(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, JH, UP, DL, PB, CH, HR, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Java, Borneo, Celebes, Maluku), Philippines, Japan

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
155	17.3	<i>Colias eogene eogene</i> C. & R. Felder, 1865 ⁱⁱ	LD14A(1), LD32B(1)	JK, HP, UT	Pakistan
156	17.4	<i>Colias erate</i> (Esper, 1805)	LD01A(3), LD02A(4), LD03A(16), LD04B(2), LD05A(3), LD06A(9), LD10A(4), LD13A(1), LD14A(2), LD15A(1), LD16A(1), LD18A(1), LD19A(9), LD20A(6), LD21A(2), LD21B(2), LD22A(2), LD25A(8), LD26A(2); GV02A(1), GV13A(2), GV24A(1)	JK, HP, UT	Pakistan, Nepal, Bhutan
157	17.5	<i>Colias fieldii fieldii</i> Menetries, 1855	LD03A(2), LD04A(3), LD05A(5), LD06A(3), LD07A(3), LD10A(1), LD13A(5), LD14A(6), LD16A(1), LD17A(1), LD19A(2), LD20A(1), LD21A(3), LD21B(2), LD22A(2), LD24A(7), LD24B(3), LD25A(3), LD26B(7), LD30A(1), LD31A(5), LD31B(1); GH18B(1); GV14B(6), GV19A(3), GV20A(1); AS06A(1), AS11A(1), AS14A(1), AS15B(1), AS18A(1), AS21A(1), AS23A(2), AS25A(1); DD11B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, UP, DL, AP, MH	Pakistan, Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
158	17.6	<i>Colias ladakensis</i> C. & R. Felder, 1865 ⁱⁱ	LD05A(1), LD35A(8)	JK, HP, UT	Pakistan, Nepal
159	17.7	<i>Colias stoliczkana stoliczkana</i> Moore, 1878	LD32A(1), LD36A(1)	JK, HP	Pakistan
160	17.8	<i>Dercas lycorias lycorias</i> (Doubleday, 1842) ⁱⁱ	DD21A(1)	SK, WB, AR, ME, NL, MN	Bhutan, China (Tibet), Vietnam, Laos
161	17.9	<i>Dercas verhuelli doubledayi</i> Moore, [1905]	ND09A(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
162	18.1	<i>Eurema blanda silhetana</i> (Wallace, 1867)	GV03A(3); AS01E(1); NV01A(1), NV02A(2); ND13B(1); DD04B(2)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, BH, JH, HR, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand
163	18.2	<i>Eurema brigitta rubella</i> (Wallace, 1867)	GV01B(1), GV02B(1); AS03B(1); DD04B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, JH, UP, DL, PB, HR, CH, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China
164	18.3	<i>Eurema hecabe hecabe</i> (Linnaeus, 1758)	GH03B(1); GV01A(3), GV07A(2), GV10B(1); AS01E(1); NV05A(4); ND03A(1), ND15A(1); DD04B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, JH, UP, DL, PB, HR, CH, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, AN	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java), Philippines, Japan



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
165	18.4	<i>Eurema laeta laeta</i> (Boisduval, 1836)	GV01C(2), GV05B(2), GV06A(1); AS06A(1)	JK, HP, UT, WB, JH, UP, PB, HR, GJ, RJ, MP, AP, TS, MH, KA, TN, KL, GA, AN	Pakistan, Bangladesh
166	18.5	<i>Gonepteryx amintha thibetana</i> Nekrutenko, 1968	DD10B(1)	AR	China (Tibet)
167	18.6	<i>Gonepteryx nepalensis</i> Doubleday, 1847	LD06A(1), LD19A(5), LD19B(1), LD25A(1); GH18A(1); GV01E(2), GV15A(2), GV16B(11), GV19B(2), GV20A(2); AS06A(1)	JK, HP, UT, SK, WB	Pakistan, Nepal, Bhutan, China (Tibet)

Family: Riodinidae Grote, 1895

Subfamily: Riodiniinae Grote, 1895

168	19.1	<i>Abisara chela chela</i> de Nicéville, 1886	DD05A(1)	SK, WB, AR	Bhutan
169	19.3	<i>Abisara fylla</i> (Westwood, 1851)	AS03B(1); NV01A(1), NV02A(3), NV05A(1); ND03A(1); DD04A(1), DD04B(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
170	19.2	<i>Abisara neophron neophron</i> (Hewitson, 1861)	ND04A(1), ND06C(1); DD04B(1), DD09A(1), DD11A(1)	SK, WB, AR, AS, ME, MI	Bangladesh
171	19.4	<i>Dodona adonira adonira</i> Hewitson, 1866 ⁱⁱ	DD11A(2), DD16A(1)	SK, WB, AR, ME	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
172	14.5	<i>Dodona dipoea dipoea</i> Hewitson, 1865 ⁱⁱ	DD04A(1), DD15A(1)	UT, SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
173	14.6	<i>Dodona durga durga</i> (Kollar, [1844])	GV05A(2); AS15B(1)	JK, HP, UT	Pakistan, Nepal, Bhutan
174	14.7	<i>Dodona egeon egeon</i> (Westwood, [1851]) ⁱⁱ	DD09B(1), DD11A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
175	14.8	<i>Dodona eugenus</i> Bates, [1868]	GV01C(1), GV05A(2); DD09A(1), DD21A(1)	JK, HP, UT, SK, WB, AR, AS, ME	Pakistan, Nepal, Myanmar
176	14.9	<i>Dodona ouida ouida</i> Moore, 1866	DD09A(1), DD10A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
177	14.10	<i>Stiboges nymphidia nymphidia</i> Butler, 1876	ND13B(1); DD03C(1)	AR, ME, NL	Bhutan, Myanmar, Laos, Cambodia, Thailand, Malaysia
178	14.11	<i>Zemerus flegyas flegyas</i> Fruhstorfer, 1898	AS03B(1); NV02A(2), NV02C(1), NV05A(2), NV10C(1); ND01A(1), ND03A(1), ND13B(1); DD04A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, China, Vietnam, Cambodia

Family: Lycaenidae Leach, 1815

Subfamily: Poritiinae Doherty, 1886

179	20.1	<i>Poritia hewitsoni hewitsoni</i> Moore, 1866 ⁱⁱ	ND03C(1), ND04A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, UP, OD	Nepal, Bhutan, Bangladesh, Myanmar, Thailand
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Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Miletinae Corbet, 1939					
180	20.2	<i>Miletus chinensis longeana</i> (de Nicéville, 1898)	ND03E(1)	AR, NL, MI, MN	Myanmar
Subfamily: Curetinae Hübner, [1819]					
181	20.3	<i>Curetis acuta dentata</i> Moore, 1879	ND02A(1); DD09B(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, JH, UP, GJ, MP, AP, MH, KA, TN, KL, GA, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
Subfamily: Polyommatae Swainson, 1827					
182	20.4	<i>Acytolepis puspa gisca</i> (Fruhstorfer, 1910)	GV04C(2), GV05B(1), GV16A(1); NV10C(1); ND06C(1); DD04B(2)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, BH, JH, UP, MP, CT, AP, TS, MH, KA, TN, OD, AN	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
183	20.7	<i>Agricides jaloka</i> (Moore, [1875])	LD28B(1), LD31B(3), LD26B(1)	JK	Pakistan
184	20.8	<i>Agricides leela</i> (de Nicéville, 1884) ⁱ	LD04A(1), LD34A(1)	JK	Pakistan
185	20.9	<i>Alpherakya devanica</i> (Moore, [1875]) ⁱⁱ	LD28A(1), LD28B(1), LD29A(1), LD32B(1)	JK	Afghanistan, Pakistan, Tajikistan
186	20.5	<i>Anthene emolus emolus</i> (Godart, 1824)	ND14A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, CT, AP, MH, KA, TN, KL, GA, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
187	20.6	<i>Anthene lycaenina lycambes</i> (Hewitson, [1878])	ND08A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
188	20.10	<i>Caleta elna noliteia</i> (Fruhstorfer, 1918)	ND03K(1), ND06C(1), ND07A(1), ND08A(1), ND10A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR, JH, AP, KA, TN, OD, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Laos, Thailand
189	20.11	<i>Caleta roxus roxana</i> (de Nicéville, 1897)	ND02A(1)	AR, AS, ME, NL, MI, MN, TR	Bhutan, Myanmar, China, Vietnam, Cambodia, Laos, Thailand
190	20.12	<i>Castalius rosimon rosimon</i> (Fabricius, 1775)	GV05A(1); ND03A(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, JH, UP, DL, PB, HR, CH, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java, Bali, Sulawesi), Timor
191	20.13	<i>Catochrysops panormus exiguus</i> (Distant, 1886)	DD04A(1)	WB, AR, AS, ME, NL, MI, MN, CT, MH, KA, TN, KL	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java, Lombok, Sulawesi), Philippines



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
192	20.14	<i>Celastrina argiolus kollari</i> (Westwood, [1852])	LD01A(1), LD19B(1), LD22A(1), LD19A(1), LD26A(1); GH01A(1), GH01C(1), GH07A(1); GV07A(1); AS06A(1), AS11A(1), AS14A(1), AS25A(1)	JK, HP, UT	Pakistan, Nepal
193	20.15	<i>Celastrina gigas</i> (Hemming, 1928)	AS14A(1)	JK, HP, UT	Pakistan, Nepal
194	21.1	<i>Celastrina huegelii huegelii</i> (Moore, 1882)	GH03B(1); GV07B(2), GV11A(3), GV16B(1), GV22A(1); AS06A(2)	JK, HP, UT	Pakistan
195	21.2	<i>Celastrina lavendularis limbata</i> (Moore, 1879)	ND06B(1), ND12A(1), ND13A(1); DD04A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
196	21.3	<i>Celatoxia marginata marginata</i> (de Nicéville, 1884)	DD04B(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand
197	21.4	<i>Chilades pandava pandava</i> (Horsfield, [1829])	GV01D(1); AS03B(1)	HP, UT, SK, WB, AR, AS, ME, MN, BH, JH, UP, DL, CH, HR, PB, GJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Myanmar
198	21.5	<i>Euchrysops cnejus cnejus</i> (Fabricius, 1798) "	AS01E(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Papua New Guinea, Australia, Fiji, Japan
199	21.6	<i>Everes argiades diporides</i> Chapman, 1909 "	GV01F(1); AS03B(1), AS06A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
200	21.7	<i>Freyeria trochylus orientalis</i> Forster, 1980	AS01E(1), AS03B(1); DD04A(1)	HP, UT, AR, UP, PB, GJ, MH, KA, TN, KL	Laos, Thailand
201	22.1	<i>Ionolyce helicon merguiana</i> (Moore, 1884) "	ND13A(1), ND13B(1)	SK, WB, AR, AS, ME, NL, MI	Nepal, Myanmar, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines
202	21.10	<i>Jamides alecto euryaces</i> (Fruhstorfer, 1916)	NV02A(1); ND03E(1); DD04A(1)	SK, WB, AR, AS, ME, NL, MN, TR, BH, JH, CT, AP, TS, MH, KA, TN, KL, OD	Nepal, Bhutan, Bangladesh, Myanmar, Thailand
203	21.11	<i>Jamides bochus bochus</i> (Stoll, [1882])	DD11A(2)	HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand
204	21.12	<i>Jamides celeno celeno</i> (Cramer, [1775])	GV03B(2); AS03B(1); ND03C(1); DD04A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, GJ, RJ, MP, CT, TN, KL	Pakistan, Nepal, Bhutan, Bangladesh, Vietnam, Thailand, Malaysia, Indonesia (Sumatra)

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
205	21.8	<i>Lampides boeticus</i> (Linnaeus, 1767) ⁱⁱ	LD18A(2), LD10A(1), LD13A(4); GH01F(1); GV01B(4), NV06A(11), GV07A(5), GV10C(7), GV12A(4), GV13B(3), GV15B(19), NV20A(7), GV21B(3), GV22B(9); AS08A(1), AS22B(1); NV02A(1); ND03C(1); DD09A(2), DD11A(1), DD13A(1), DD14A(1), DD21A(2), DD22A(3)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, China, Vietnam, Thailand, Philippines, Papua New Guinea, Australia, Japan, Turkey, Israel, France, Spain, Belgium, Romania, Italy, Switzerland, Morocco, Congo, Kenya, South Africa, Madagascar
206	21.9	<i>Leptotes plinius plinius</i> (Fabricius, 1793)	GV08A(2); AS01E(1); NV02A(1); ND03E(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Papua New Guinea, Australia, Solomons, Mariana
207	21.13	<i>Megisba malaya sikkima</i> Moore, 1884	AS03B(1); ND13B(1); DD04A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, UP, OD, AN	Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Java, Sulawesi), Philippines
208	22.2	<i>Nacaduba beroe gythion</i> Fruhstorfer, 1916	ND03A(1), ND03B(1), ND13A(1)	WB, AR, AS, ME, MH, KA, TN, KL, GA, AN	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
209	22.3	<i>Nacaduba kurava euplea</i> Fruhstorfer, 1916	ND03H(1), ND13B(1); DD04B(1)	UT, SK, WB, AR, AS, ME, NL, MN, TR, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
210	22.4	<i>Nacaduba pactolus continentalis</i> Fruhstorfer, 1916	DD04B(1)	SK, WB, AR, AS, ME, NL, MI, MN, MH, KA, TN, KL, GA	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand
211	22.10	<i>Oreolyce vardhana vardhana</i> (Moore, [1875])	GV03A(1), GV14B(2); AS25A(1)	JK, HP, UT	Pakistan, Nepal
212	21.14	<i>Orthomiella pontis pontis</i> (Elwes, 1887) ⁱⁱ	DD21A(1)	SK, WB, AR, NL	Nepal, Bhutan, Thailand
213	22.11	<i>Pamiria metallica</i> (C. & R. Felder, [1865])	LD25A(1), LD32A(1)	JK, HP, UT	Afghanistan, Pakistan, China
214	22.12	<i>Pamiria omphisa</i> (Moore, [1875])	LD32A(1), LD33A(1)	JK, HP	Pakistan
215	21.15	<i>Pithecops fulgens fulgens</i> Doherty, 1889 ⁱⁱ	ND03A(1), ND13B(1)	AR, AS, MN	China, Vietnam
216	22.13	<i>Polyommatus ariana</i> Moore, 1865	LD01A(1), LD03A(4), LD04B(5), LD04A(1), LD05A(1), LD10A(5), LD14A(3), LD16A(1), LD20A(1), LD22A(1), LD25A(1), LD26A(1), LD31A(2), LD32B(1),	JK, HP, UT	Afghanistan, Pakistan, Nepal, China



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
217	22.14	<i>Polyommatus dux dux</i> Riley, 1926	AS23A(1), AS25A(2)	UT	
218	22.15	<i>Polyommatus stoliczkana</i> (C. & R. Felder, [1865])	LD03A(1), LD04A(4), LD04B(2) LD10A(4) LD13A(2), LD14A(2), LD19A(1), LD18A(1), LD21A(2), LD25A(1), LD26A(1), LD31A(1)	JK, HP	Pakistan, China
219	22.5	<i>Prosotas aluta coelestis</i> (Wood-Mason & de Niceville, [1887]) ⁱⁱ	ND13A(1)	UT, SK, WB, AR, AS, ME, NL, AN	Bhutan, Myanmar, Vietnam, Laos, Thailand
220	22.6	<i>Prosotas nora ardates</i> (Moore, [1875])	AS03B(1); ND13B(1); DD04D(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, Vietnam, Laos, Cambodia
221	22.16	<i>Pseudophilotes vicrama cashmirensis</i> (Moore, 1874)	LD01A(4), LD04C(1), LD11A(1), LD19B(2), LD34B(1)	JK	Pakistan
222	23.1	<i>Pseudozizeeria maha maha</i> (Kollar, [1844])	GV02B(2), GV03B(1), GV07B(1), GV10C(2), GV11A(1); AS03B(1), AS08A(1); NV02A(1); ND03E(1); DD04A(1), DD09A(4)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, PB, HR, GJ, RJ, MP, CT, MH, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
223	23.4	<i>Shijimia moorei moorei</i> (Leech, 1889)	ND03A(1), ND10A(1)	WB, AR, AS, ME	Myanmar, China, Vietnam, Laos
224	22.7	<i>Tarucus ananda</i> (de Nicéville, [1884]) ^{iv}	ND08A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, MP, MH, KA, TN, KL, GA, OD	Nepal, Bhutan, Bangladesh, Myanmar
225	22.8	<i>Tarucus indicus</i> Evans, 1932	ND01A(1)	JK, HP, UT, WB, AR, AS, BH, JH, UP, PB, HR, GJ, RJ, MP, CT, TS, MH, KA, TN	Pakistan
226	22.9	<i>Tarucus venosus</i> Moore, 1882	AS01E(1)	JK, HP, UT, AS, ME	Pakistan, Bangladesh
227	23.5	<i>Udara albocaerulea albocaerulea</i> (Moore, 1879) ^v	ND08A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Japan
228	23.6	<i>Udara dilecta dilecta</i> (Moore, 1879)	GV02A(1); AS15B(1); ND03K(1), ND06C(1), ND12A(2), ND13B(1); DD04A(1), DD04B(1), DD09B(2), DD11A(1), DD14A(1), DD22A(3)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, BH	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Japan
229	23.7	<i>Una usta</i> (Distant, 1886) ⁱⁱ	ND13B(1)	SK, AR, ME, NL, MI, MN	Bhutan, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Sulawesi)
230	23.2	<i>Zizeeria karsandra</i> (Moore, 1865)	GV01B(1), GV05A(2); AS14A(1); NV02A(1); ND03C(1); DD04A(1), DD11A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, New Guinea, Australia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
231	23.3	<i>Zizina otis otis</i> (Fabricius, 1787)	DD04A(1)	SK, WB, AR, AS, ME, NL, MI, MN, AN	Bhutan, Bangladesh
Subfamily: Lycaeninae Leach, 1815					
232	23.10	<i>Heliophorus bakeri</i> (Evans, 1927)	GH07A(1)	JK, HP	Pakistan, Nepal
233	23.9	<i>Heliophorus brahma brahma</i> (Moore, [1858])	GV05A(2); NV02A(1); DD11A(1)	UT, SK, WB, AR	Nepal, Bhutan
234	23.11	<i>Heliophorus epicles latilimbata</i> Eliot, 1963	AS03B(1); NV02A(1); ND03J(1), ND06C(1), ND14A(3); DD04A(2)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, AN	Nepal, Bhutan, Bangladesh, Myanmar, Laos, Cambodia, Thailand
235	23.12	<i>Heliophorus indicus indicus</i> (Fruhstorfer, 1908)	ND14A(1); DD04A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
236	23.13	<i>Heliophorus moorei coruscans</i> (Moore, 1882)	GH01C(1), GH03B(1); AS06A(1), AS11A(1), AS12A(1), AS14A(2), AS15B(2)	JK, HP, UT	Nepal
237	23.14	<i>Heliophorus moorei moorei</i> (Hewitson, 1865)	NV10C(1); DD08B(1), DD09A(2), DD10B(1), DD11A(1)	SK, WB, AR	Bhutan, Myanmar, China (Tibet)
238	23.8	<i>Heliophorus sena</i> (Kollar, [1844])	GH03B(1); GV02B(1), GV03A(2); AS01E(1), AS06A(1)	JK, HP, UT, AR, PB	Pakistan, Nepal
239	23.15	<i>Heliophorus tamu tamu</i> (Kollar, [1844])	GV11A(1); AS08A(1), AS11A(1); NV02A(1); DD10A(1)	UT, SK, WB, AR	Nepal, Bhutan
240	24.1	<i>Lycaena kasyapa</i> (Moore, 1865)	LD24B(7), LD26B(6); GV23A(1)	JK, HP, UT	Pakistan
241	24.2	<i>Lycaena panava</i> (Westwood, 1852)	GV03B(1), GV10C(1); AS11A(1), AS14A(1), AS15B(1), AS18A(1), AS21A(1)	JK, HP, UT	Pakistan, Nepal
242	24.3	<i>Lycaena phlaeas baralacha</i> (Moore, 1884)	LD04B(2), LD10A(2), LD13A(1), LD14A(1), LD17A(3), LD18A(1), LD20A(1), LD24A(2), LD28B(1), LD31B(6); GH01A(1), GH06B(1), GH18A(1); GV01A(2), GV06A(1), GV12B(1), GV16A(2), GV19A(2), GV22B(1); AS21A(1), AS23A(1), AS25A(2)	JK, HP, UT, SK, WB, AR	Pakistan, Nepal, Bhutan
Subfamily: Aphnaeinae Distant, 1884					
243	24.4	<i>Spindasis elima elima</i> (Moore, 1877)	ND03A(1)	SK, WB, AS, BH, UP, MP, AP, MH, TN, KL, GA	Pakistan, Bangladesh
244	24.5	<i>Spindasis lohita himalayanus</i> (Moore, 1884)	GV02C(2); ND03A(1), ND08A(1); DD09A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
245	24.6	<i>Spindasis nipalicus</i> (Moore, 1884)	AS07B(1)	HP, UT, WB	Nepal, Bhutan



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Theclinae Swainson, [1820]					
246	24.7	<i>Ancema ctesia ctesia</i> (Hewitson, 1865)	ND13B(1), ND13D(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand, Malaysia
247	24.8	<i>Arhopala ammonides elira</i> (Corbet, 1941) ¹	ND06B(1)	AR, AS, ME, MN	Bangladesh
248	24.9	<i>Arhopala bazalus teesta</i> (de Nicéville, 1866)	ND04A(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand
249	24.10	<i>Arhopala centaurus piriuous</i> (Moore, [1884])	ND03F(1), ND03H(1), ND08A(1)	UT, SK, WB, AR, AS, ME, NL, MN, TR, UP, CT, AP, OD	Nepal, Bhutan, Bangladesh, China
250	24.11	<i>Arhopala ganesa ganesa</i> (Moore, [1858])	GV03A(2); AS25A(1)	JK, HP, UT, SK, WB, AR	Pakistan, Nepal, Bhutan
251	24.12	<i>Arhopala paraganesa paraganesa</i> (de Nicéville, 1882)	AS09A(1)	UT, SK, WB	Nepal, Bhutan
252	24.13	<i>Arhopala paramuta paramuta</i> (de Nicéville, [1884])	ND06B(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, China, Hong Kong, Vietnam, Laos, Thailand
253	24.14	<i>Arhopala rama rama</i> (Kollar, [1844])	AS07B(1), AS09A(1)	JK, HP, UT, SK, WB, AR, AS, HR	Pakistan, Nepal, Bhutan, China
254	24.15	<i>Bindahara phocides phocides</i> (Fabricius, 1793) ¹¹	ND13B(1)	SK, WB, AR, AS, ME, NL, AN	Bangladesh, Myanmar, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines
255	25.1	<i>Catapaecilma major major</i> Druce, 1895	DD09B(1)	UT, SK, WB, AR, AS, CT, OD	Nepal, Bhutan, Myanmar, Thailand
256	25.2	<i>Chaetoprocta odata peilei</i> Forster, 1980 ^b	GH03B(1)	HP, UT	Nepal
257	25.3	<i>Cheritra freja evansi</i> Cowan, 1965	ND08A(1)	UT, WB, SK, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand
258	25.4	<i>Cheritrella truncipennis</i> de Nicéville, 1887 ¹¹	DD09A(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Laos, Thailand
259	25.5	<i>Chliaria kina kina</i> (Hewitson, 1869) ¹¹	GV02A(1), GV02D(2); ND06B(1), ND14A(1); DD15A(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
260	25.6	<i>Chliaria othona othona</i> (Hewitson, 1865) ¹	AS01E(1); ND03A(1), ND03J(1), ND13A(1), ND14A(1)	UT, SK, WB, AR, AS, ME, NL, MN, CT, AP, MH, KA, TN, KL, OD	Nepal, Bhutan, Bangladesh, Myanmar, Laos, Cambodia, Thailand
261	25.7	<i>Deudorix epijarbas</i> (Moore, 1857)	GV04A(1); ND04A(1)	JK, HP, UT, WB, AR, AS, ME, NL, MN, JH, UP, GJ, MH, KA, TN, KL, GA, OD, AN	Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java, Sulawesi), Philippines

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
262	25.8	<i>Drupadia scaeva cyara</i> (Hewitson, 1878) ⁱ	DD04A(1)	SK, AR	Bhutan, Myanmar
263	25.9	<i>Esakiozephyrus icana</i> (Moore, [1875]) ⁱⁱ	AS09A(1)	HP, UT	Nepal, Bhutan
264	25.10	<i>Euaspa mikamii</i> Koiwaya, 2002	DD09A(1)	AR	Myanmar
265	25.11	<i>Euaspa motokii</i> Koiwaya, 2002 *	DD09A(1)	AR	Myanmar
266	25.12	<i>Flos areste</i> (Hewitson, 1862) ⁱⁱ	SL02A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
267	25.13	<i>Hypolycaena erylus himavantus</i> Fruhstorfer, 1912	NV02A(1); ND03J(1), ND03K(2), ND06C(1), ND14A(1); DD04A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR, OD	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand
268	25.14	<i>Hypolycaena narada</i> Kunte, 2015	ND03E(1)	AR	
269	25.15	<i>Mota massyla</i> (Hewitson, 1869)	ND03F(1)	AR, AS, ME, NL, MN	Bhutan, Myanmar, Vietnam, Thailand
270	26.1	<i>Pratapa icetas</i> (Hewitson, 1865) ⁱⁱ	DD04B(1)	HP, UT, SK, WB, AR, ME	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
271	26.2	<i>Rapala nissa nissa</i> (Kollar, [1844])	GH06B(1); AS09A(1)	JK, HP, UT, SK, WB	Pakistan, Nepal
272	26.3	<i>Rapala nissa ranta</i> Swinhoe, 1897	ND06C(1); DD09A(1), DD10B(1)	SK, AR, AS, ME, NL, MN	Myanmar, Laos, Thailand
273	26.4	<i>Rapala pheretima petosiris</i> (Hewitson, 1863)	ND03A(1)	UT, SK, WB, AR, AS, ME, NL, MN, TR, MP, CT, OD	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand
274	26.5	<i>Rapala selira</i> (Moore, 1874)	GH03B(1)	JK, HP, UT	Pakistan, Nepal, Bhutan
275	26.6	<i>Rapala varuna</i> (Horsfield, [1829])	GV05B(1); ND13B(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, JH, UP, GJ, AP, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, Vietnam, Laos, Thailand, Malaysia
276	26.7	<i>Remelana jangala ravata</i> (Moore, [1866])	ND03J(1), ND13B(1)	SK, WB, AR, AS, ME, NL, MN, TR, BH	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand
277	26.8	<i>Sinthusia chandrana grotei</i> (Moore, [1884]) ⁱⁱ	ND04A(1)	SK, WB, AR, AS, ME, NL, MN	Bangladesh, Myanmar, Laos, Thailand
278	26.9	<i>Tajuria diaeus</i> (Hewitson, 1865) ⁱⁱ	AS25A(1)	HP, UT, SK, AR, WB, ME, NL, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
279	26.10	<i>Ticherra acte acte</i> (Moore, [1858])	NV02A(1); ND03J(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos, Cambodia, Thailand
280	26.11	<i>Yasoda tripunctata</i> (Hewitson, 1863) ⁱⁱ	ND03A(1), ND03L(1); DD04A(1)	SK, WB, AR, AS, ME, MN, NL	Bangladesh, Myanmar, Laos, Cambodia, Thailand
281	26.12	<i>Zeltus amasa amasa</i> (Hewitson, 1865)	ND02A(1), ND03C(1), ND03K(1), ND03L(1); DD04A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, AP, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Thailand



Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Family: Nymphalidae Rafinesque, 1815					
Subfamily: Danainae Boisduval, 1833					
282	27.1	<i>Danaus chrysippus chrysippus</i> (Linnaeus, 1758)	GH03B(1), GH06B(1), GH07A(1); GV10D(3), GV11A(1); AS01E(1), AS03B(1); NV02A(1); ND03J(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Sulawesi), Philippines, Japan, Spain, Italy, Morocco, Algeria, Kenya, South Africa, Madagascar
283	27.2	<i>Danaus genutia genutia</i> (Cramer, [1779])	GV09A(1); AS03B(1); NV02A(1); ND03A(1); DD10B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Philippines
284	27.3	<i>Euploea core core</i> (Cramer, [1780])	GV01F(5), GV06B(1); AS01E(2); DD04A(1)	JK, HP, UT, SK, WB, AP, AR, AS, ME, NL, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, TS, MH, KA, TN, KL, GA, OD, PY	Pakistan, Nepal, Bhutan, Bangladesh
285	27.4	<i>Euploea mulciber mulciber</i> (Cramer, [1777]) ^{iv}	GV01E(1), GV10B(2); AS03B(2); NV02F(1); ND01A(1), ND04A(1), ND08A(1); DD09B(2), DD11A(2)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, UP, DL, PB, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
286	27.5	<i>Euploea radamanthus radamanthus</i> (Fabricius, 1793)	ND04A(1)	SK, WB, AR, AS, ME, MI, NL, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra)
287	27.6	<i>Parantica aglea melanoides</i> Moore, 1883	GV02A(1), GV13B(1); AS03B(1); NV01A(1), NV05A(2); ND06B(1); DD04C(1), DD09A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, PB, HR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
288	27.7	<i>Parantica sita sita</i> (Kollar, [1844])	GV06B(1), GV19A(2); AS15B(1); NV02A(2), NV02C(1); ND03J(1); DD04A(1), DD04B(1), DD11A(2)	JK, HP, UT, WB, SK, AR, AS, NL, MN, ME, MI	Afghanistan, Pakistan, Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
289	27.8	<i>Tirumala septentrionis septentrionis</i> (Butler, 1874)	GV01E(1), GV04C(2), GV07B(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, BH, AN	Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra)
Subfamily: Charaxinae Guenée, 1865					
290	28.1	<i>Charaxes aristogiton aristogiton</i> C. & R. Felder, [1867] ⁱⁱ	ND04A(1)	SK, WB, AR, AS, ME, NL, MN, MI	Nepal, Bhutan, Bangladesh, Myanmar, Laos, Thailand

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
291	28.2	<i>Charaxes bernardus hierax</i> C. & R. Felder, [1867] ⁱⁱ	ND04A(2)	SK, WB, AR, AS, ME, NL, MI, MN, TR, JH, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
292	28.3	<i>Charaxes kahruba</i> (Moore, [1895]) ⁱⁱ	ND02A(1), ND04A(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand
293	28.4	<i>Charaxes marmax marmax</i> Westwood, 1847 ⁱⁱ	NV02F(1); ND03A(1), ND08A(2)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, Laos, Thailand
294	28.5	<i>Polyura bharata</i> (C. & R. Felder, [1867])	GV07A(3); AS01E(1), AS06A(1); ND02A(1), ND04A(1), ND08A(1), ND13A(1); DD04A(1), DD09B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, JH, GJ, RJ, MP, CT, MH, KA, TN, KL, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos, Cambodia, Thailand
295	28.6	<i>Polyura dolon carolus</i> (Fruhstorfer, 1904) ⁱⁱ	DD15A(1)	AR	Myanmar, China (Tibet)
296	28.7	<i>Polyura eudamippus eudamippus</i> (Doubleday, 1843)	ND08A(1); DD09B(1)	SK, WB, AR, AS, ME, NL, MI, MN, OD	Nepal, Bhutan, Bangladesh
297	28.8	<i>Polyura narcaeus</i> (Hewitson, 1854)	DD09B(1), DD11A(2), DD15A(1)	AR, NL	Myanmar, China (Tibet), Taiwan, Vietnam, Thailand

Subfamily: Satyrinae Boisduval, 1833

298	28.9	<i>Aulocera brahminus brahminus</i> Blanchard, 1853 ⁱⁱ	LD26A(2), LD31A(1), LD35A(1)	JK, HP, UT	Pakistan
299	28.10	<i>Aulocera brahminus dokwana</i> Evans, 1923	AS25A(1)	UT	Nepal
300	29.1	<i>Aulocera padma padma</i> (Kollar, [1844])	LD06A(1), LD31A(2); GH18A(1); GV01C(2), GV07B(1), GV20A(1); AS24A(1)	JK, HP, UT, SK	Pakistan, Nepal
301	29.2	<i>Aulocera saraswati saraswati</i> (Kollar, [1844])	GV09A(1), GV09B(1); AS08A(1), AS14A(1)	JK, HP, UT	Pakistan, Nepal
302	29.3	<i>Aulocera swaha garuna</i> Fruhstorfer, 1911	GH06A(1); GV22B(1)	JK, HP, UT	Nepal
303	29.4	<i>Callerebia hybrida</i> Butler, 1880	GH03B(1); GV02A(1), GV06A(1), GV15B(1); AS07B(1)	HP, UT	Nepal, Bhutan
304	29.5	<i>Callerebia scanda scanda</i> (Kollar, [1844])	GV11A(1); AS06A(2)	JK, HP, UT	Nepal
305	29.6	<i>Discophora timora timora</i> Westwood, [1850]	ND03K(1)	SK, WB, AR, AS, ME, NL, TR	Bhutan, Bangladesh, Myanmar, Thailand
306	29.7	<i>Elymnias hypermnestra undularis</i> (Drury, 1773)	GV02C(1), GV02D(1); AS01E(1), AS03B(1); DD04A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, PB, MP, CT, AP, TS, MH, OD	Nepal, Bhutan, Bangladesh, Myanmar
307	29.8	<i>Elymnias malelas malelas</i> (Hewitson, 1863)	ND08A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand, Malaysia



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
308	29.9	<i>Elymnias patna patna</i> (Westwood, 1851)	AS07C(1); ND03B(1), ND03E(1); DD04B(1)	UT, SK, WB, AR, AS, ME, NL, TR, MN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
309	29.10	<i>Elymnias peali</i> Wood-Mason, 1883 ¹	ND11A(1)	AR, AS, ME, NL, MN	
310	29.11	<i>Elymnias vasudeva deva</i> (Moore, 1893)	ND03C(1)	AR, AS, ME, NL, MI, MN	Bangladesh
311	29.12	<i>Enispe euthymius euthymius</i> (Doubleday, 1845)	NV05A(1); ND02A(1), ND03J(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Myanmar
312	29.13	<i>Ethope himachala</i> (Moore, 1857)	ND01A(1)	SK, WB, AR, AS, ME, MI, MN, NL	Bhutan, Bangladesh, Myanmar, Thailand
313	29.14	<i>Faunis canens arcesilas</i> Stichel, 1933	ND03J(1), ND07A(1)	SK, WB, AR, AS, ME, NL, MI	Bhutan, Myanmar, Bangladesh, China, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra)
314	30.1	<i>Hipparchia parisatis shiva</i> (Le Cerf, 1913)	LD01A(4), LD02A(1), LD03A(4), LD06A(1)	JK, HP, UT	Pakistan, Nepal
315	30.2	<i>Hyponephele brevistigma</i> (Moore, 1893)	LD21A(2)	JK	Pakistan, China
316	30.3	<i>Hyponephele pulchella</i> (C. & R. Felder, [1867])	LD03A(1), LD10A(7), LD20A(1), LD24A(1), LD28A(4), LD31A(2)	JK, HP, UT	Pakistan, Nepal, China
317	30.4	<i>Hyponephele pulchra</i> (C. & R. Felder, [1867])	LD28A(1), LD31B(2)	JK, HP, UT	Afghanistan, Pakistan, China, Tajikistan
318	30.5	<i>Karanasa astorica</i> Tytler, 1926	LD28A(2)	JK	Pakistan, China
319	30.6	<i>Lasiommata menava</i> Moore, 1865	LD01A(1), LD03A(3), LD06A(1), LD10A(1), LD11A(6), LD19A(1), LD25A(3)	JK, HP	Afghanistan, Pakistan, Nepal, Kazakhstan, Tajikistan
320	30.7	<i>Lasiommata schakra schakra</i> (Kollar, [1844])	GH07A(2); GV01D(4); AS14A(1)	JK, HP, UT, WB	Nepal, Pakistan
321	30.8	<i>Lethe baladeva aisa</i> Fruhstorfer, 1911 ⁱⁱ	AS15B(1)	UT	
322	30.9	<i>Lethe chandica chandica</i> (Moore, [1858])	NV02A(1); ND08A(2)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Laos, Thailand
323	30.10	<i>Lethe confusa confusa</i> Aurivillius, 1898	AS01E(1), AS09A(1); NV02A(1); DD11A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos, Cambodia, Thailand
324	30.11	<i>Lethe dura gammiei</i> (Moore, [1892]) ^{i i}	AS07B(1); DD11A(3)	UT, SK, WB, AR, ME	Bhutan
325	30.12	<i>Lethe isana dinarbas</i> (Hewitson, 1863)	DD20A(1)	SK, WB, AR, ME, NL	Nepal, Bhutan
326	30.13	<i>Lethe isana isana</i> (Kollar, [1844]) ⁱⁱ	GH03B(1), GH07A(1); GV02A(1), GV07A(1); AS06A(1), AS14A(1)	JK, HP, UT	
327	31.1	<i>Lethe kansa</i> (Moore, 1857)	ND13D(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Cambodia, Thailand

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
328	31.2	<i>Lethe mekara zuchara</i> Fruhstorfer, 1911	ND08A(1), ND11A(1)	AR, AS, ME, NL, MN, TR	Bangladesh, Myanmar
329	31.3	<i>Lethe naga</i> Doherty, 1889 ¹	ND11A(2)	AR, AS, ME, NL, MN	Myanmar, Laos, Thailand
330	31.4	<i>Lethe nicetas</i> (Hewitson, 1863)	GH07A(1); AS15B(1), AS18A(1), AS25A(1); DD15A(1)	HP, UT, SK, WB, AR, MN	Nepal, Bhutan, Myanmar, China (Tibet), Vietnam
331	31.5	<i>Lethe rohria rohria</i> (Fabricius, 1787)	GV11A(1), GV13B(2); AS06A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, PB	Pakistan, Nepal, Bhutan, Myanmar, China, Vietnam, Thailand
332	31.6	<i>Lethe sidonis</i> (Hewitson, 1863)	GH03B(1), GH07A(1); GV04B(2), GV16A(1); AS06A(2), AS12A(1), AS14A(3), AS16A(1); NV10C(1); DD08B(1), DD15A(1)	HP, UT, SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, China (Tibet), Vietnam
333	31.7	<i>Lethe sinorix sinorix</i> (Hewitson, 1863) ¹	AS06A(1); ND02A(1); DD21A(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar
334	31.8	<i>Lethe sura</i> (Doubleday, [1849])	NV10C(1); DD09A(1), DD11A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, China (Tibet), Vietnam, Thailand
335	31.9	<i>Lethe verma sintica</i> Fruhstorfer, 1911	NV05A(2); DD09A(1), DD09B(2)	SK, WB, AR, AS, NL, MN, ME	Nepal, Bhutan, China
336	31.10	<i>Lethe verma verma</i> (Kollar, [1844])	GV01A(1), GV13B(1); AS09A(1)	JK, HP, UT	Pakistan
337	31.11	<i>Lethe vindhya vindhya</i> (C. & R. Felder, 1859)	NV05A(1); ND06C(1); DD05A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
338	31.12	<i>Melanitis leda leda</i> (Linnaeus, 1758)	GV01E(1), GV04B(2); AS06A(1); NV02A(3), NV05A(1), NV05B(1); ND11A(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines, Japan
339	31.13	<i>Melanitis phedima bela</i> Moore, 1857	GV03A(1); AS06A(1); ND12A(1); DD09A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, UP, RJ, GJ	Nepal, Bhutan, Bangladesh, Myanmar, Thailand
340	31.14	<i>Melanitis zitenius zitenius</i> (Herbst, 1796) ¹	AS03B(1); ND06C(1); DD09A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR	Nepal, Bhutan, Myanmar, Bangladesh
341	32.1	<i>Mycalesis adamsoni</i> Watson, 1897 ¹	ND01A(1), ND03C(1), ND03J(1), ND06C(1), ND08A(1)	AR, AS, ME, MN	Myanmar, Vietnam, Laos, Thailand
342	32.2	<i>Mycalesis francisca sanatana</i> Moore, [1858]	GH03B(1); GV03A(2), GV10C(1); NV02A(1); ND13D(1); DD09A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, Bangladesh, Myanmar, Laos, Thailand
343	32.3	<i>Mycalesis gotama charaka</i> Moore, [1875] ¹	DD04A(1)	WB, AR, AS, ME, NL, MN	Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand
344	32.4	<i>Mycalesis heri</i> Moore, 1857 ¹	AS07B(1)	UT, SK, WB, AR	Nepal, Bhutan



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
345	32.5	<i>Mycalesis lepcha lepcha</i> (Moore, 1880)	AS03B(1)	HP, UT	Nepal, Bhutan
346	32.6	<i>Mycalesis malsarida</i> Butler, 1868 ⁱⁱ	ND13B(1)	AR, AS, ME, NL	Bangladesh
347	32.7	<i>Mycalesis mestra</i> Hewitson, 1862 ⁱⁱ	DD09A(1)	SK, WB, AR, AS, ME, NL	Bhutan, Myanmar
348	32.8	<i>Mycalesis mineus mineus</i> (Linnaeus, 1758)	GV01B(2), GV04A(1), GV05A(2); AS03B(1), AS07B(1), AS09A(1); NV02A(1); ND01A(1), ND03C(1); DD04A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, BH, UP, HR, AN	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, China, Taiwan
349	32.9	<i>Mycalesis misenus misenus</i> de Nicéville, 1889 ⁱⁱ	ND03E(1); DD04D(1)	SK, WB, AR, AS, ME, MN	Vietnam
350	32.10	<i>Mycalesis perseus blasius</i> (Fabricius, 1798)	GV05B(2); AS03B(1); NV05A(1); ND01A(1); DD04A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar
351	32.11	<i>Mycalesis suaveolens</i> Wood - Mason & de Nicéville, 1883 ⁱⁱ	AS07B(1); ND15A(1); DD09A(2), DD09B(1)	UT, SK, WB, AR, AS, NL, MN, TR	Nepal, Bhutan
352	32.12	<i>Mycalesis visala visala</i> Moore, [1858]	AS01E(1); NV02A(1); ND04A(1); DD04A(1)	UT, SK, WB, AR, AS, ME, NL, MN, TR, BH, JH, PB, HR, GJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD	Nepal, Bhutan, Bangladesh, Myanmar, Laos, Thailand
353	32.13	<i>Neope armandii khasiana</i> Moore, 1881	DD11A(1)	AR, ME, NL, MN	Myanmar, China, Vietnam, Thailand
354	32.14	<i>Neope bhadra</i> (Moore, 1857)	ND03A(1), ND03J(1), ND12A(1), ND13D(1); DD04B(1)	SK, WB, AR, ME, MI, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
355	32.15	<i>Neope pulaha pandyia</i> Talbot, [1949] ⁱ	AS06A(1)	HP, UT	Nepal
356	33.1	<i>Neope pulaha pulahoides</i> (Moore, [1892])	DD09A(4), DD11A(1), DD13A(1), DD14A(1), DD21A(2), DD22A(1)	AR, ME, NL, MN	Myanmar, China (Tibet), Thailand
357	33.2	<i>Neope yama yama</i> (Moore, [1858]) ⁱⁱ	DD15A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, China (Tibet), Thailand
358	33.4	<i>Neorina patria westwoodi</i> Moore, 1891 ⁱⁱ	DD05A(1)	AR, AS, ME	Myanmar, Vietnam, Laos, Thailand
359	33.3	<i>Orinoma damaris damaris</i> Gray, 1846	AS14A(2); ND12A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
360	34.1	<i>Orsotriaena medus medus</i> (Fabricius, 1775)	NV02A(1); ND01A(1); DD04A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, DL, HR, MP, CT, TS, MH, KA, TN, OD, AN	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java, Moluccas, Sulawesi), Papua New Guinea, Philippines
361	33.5	<i>Paralasa mani</i> (de Nicéville, 1881)	LD29A(1), LD32A(3)	JK, HP, UT	Pakistan
362	33.6	<i>Paralasa shallada shallada</i> (Lang, 1881)	GH07A(2)	JK, HP, UT	Pakistan
363	34.2	<i>PentHEMA lisarda lisarda</i> (Doubleday, 1845) ⁱⁱ	ND08A(2)	SK, WB, AR, AS, ME, NL, MI, MN	Bhutan

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
364	33.7	<i>Pseudochazara lehana</i> (Moore, 1878)	LD06A(3), LD04A(1), LD10A(1), LD19A(1), LD29A(2), LD32A(2), LD32B(1)	JK	Afghanistan, Pakistan, China (Tibet), Tajikistan
365	34.3	<i>Ragadia crisilda crisilda</i> Hewitson, 1862	ND03B(1), ND03C(1), ND10A(1)	AR, AS, ME	Bangladesh, Myanmar, Thailand
366	34.4	<i>Rhaphicera moorei moorei</i> (Butler, 1867)	GH01C(1)	HP, UT	Nepal, Bhutan, China (Tibet)
367	34.5	<i>Stichophthalma camadeva camadeva</i> (Westwood, 1848)	ND08A(1), ND10A(1)	SK, WB, AR	Nepal, Bhutan
368	34.6	<i>Stichophthalma sparta tytleri</i> Rothschild, 1918	ND10A(1)	AR, AS, NL, MN	Myanmar
369	34.7	<i>Thaumantis diores diores</i> Doubleday, 1845	ND03A(1), ND08A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, Thailand
370	34.8	<i>Ypthima baldus baldus</i> (Fabricius, 1775)	GV02B(1), GV05B(1); AS01E(1); NV02A(2); ND03C(1); DD04A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, TR, BH, JH, PB, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
371	34.9	<i>Ypthima asterope</i> (Klug, 1832)	GV01E(1); AS01E(2)	HP, UT, SK, WB, AR, AS, ME, MN, TR, PB, HR, GJ, RJ, MP, CT, MH, TN, KL, OD	Pakistan, Nepal, Bhutan, Bangladesh
372	34.10	<i>Ypthima huebneri</i> Kirby, 1871	DD04A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, UP, JH, GJ, RJ, MP, CT, MH, TN, KL, OD	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand, Malaysia
373	34.11	<i>Ypthima indecora</i> Moore, 1882	AS01E(1)	JK, HP, UT, AR	Nepal
374	34.12	<i>Ypthima nareda</i> (Kollar, [1844])	AS03B(1), AS08A(1), AS09A(1)	JK, HP, UT, PB	Pakistan, Nepal
375	34.13	<i>Ypthima newara</i> Moore, [1875]	ND03A(1); DD04A(1)	UT, SK, WB, AR, AS, ME, NL, MN, TR	Nepal, China (Tibet)
376	34.14	<i>Ypthima nikaia</i> Moore, [1875]	GH03B(1); AS06A(2), AS09A(2)	JK, HP, UT, PB	Pakistan, Nepal
377	34.15	<i>Ypthima sakra sakra</i> Moore, 1857	GV05A(1), GV13A(1); AS06A(1); NV02A(1); DD09B(1), DD11A(2)	UT, SK, WB, AR	Nepal, Bhutan
378	35.1	<i>Zipaetis scylax scylax</i> Hewitson, 1863	ND09A(1)	SK, WB, AR, AS, ME, NL	Bhutan, Myanmar
Subfamily: Biblidinae Boisduval, 1833					
379	35.2	<i>Ariadne merione tapestrina</i> (Moore, 1884)	GV01E(3), GV02B(1); AS01E(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, HR, PB, GJ, RJ, MP, CT, MH, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
Subfamily: Calinaginae Moore, 1895					
380	35.3	<i>Calinaga aborica</i> Tytler, 1915	DD09B(1)	AR	Myanmar
Subfamily: Heliconiinae Swainson, 1822					
381	35.8	<i>Acraea issoria issoria</i> (Hübner, [1819])	AS03B(1), AS06A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, China



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
382	35.5	<i>Argynnis childreni childreni</i> Gray, 1831	DD11A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Thailand
383	35.4	<i>Argynnis childreni sakontala</i> (Kollar, 1848)	AS11A(1), AS14A(1), AS18A(1)	JK, HP, UT	Pakistan, Nepal
384	35.6	<i>Argynnis hyperbius hyperbius</i> (Linnaeus, 1763)	GV01D(2), GV10B(1), GV15A(1), GV15B(1); NV05A(1); ND03B(1), ND15A(1); DD04A(1), DD09A(1), DD11A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, UP, DL, PB, GJ, RJ, MP, OD	Pakistan, Nepal, Bhutan, China, Taiwan, Myanmar, Vietnam, Laos, Thailand, Japan, Korea
385	35.7	<i>Argynnis jainadeva persephone</i> Hemming, 1934 "	LD06A(1), LD10A(1), LD14A(1), LD18A(2), LD21A(2), LD21B(1), LD24A(3), LD26A(1)	JK	Pakistan, Nepal, China (Tibet)
386	36.1	<i>Argynnis kamala</i> (Moore, 1857)	GH11B(1); GV13A(1)	JK, HP, UT, SK	Pakistan, Nepal
387	36.2	<i>Boloria jerdoni</i> (Lang, 1868)	LD24B(6)	JK	Pakistan
388	36.3	<i>Boloria sipora nitida</i> Warren, 1944	LD26B(3)	JK	Pakistan
389	36.4	<i>Cethosia biblis tisamena</i> Fruhstorfer, 1912	NV02A(1), NV05A(2); ND03B(1), ND08A(1), ND13D(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, Thailand
390	36.5	<i>Cethosia cyane cyane</i> (Drury, [1773])	GV02C(2); NV05A(1); ND04A(1); DD04A(1), DD09B(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, OD, AN	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand
391	36.6	<i>Cirrochroa aoris aoris</i> Doubleday, [1847]	NV02A(2), NV02F(1); ND03L(1), ND10A(1); DD04A(1), DD04B(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan
392	36.7	<i>Issoria issaea</i> (Doherty, 1886)	LD24B(2); GH16A(1); GV20A(2), GV21B(3); AS16A(1), AS22B(1), AS25A(2); DD09A(2), DD11B(1), DD22A(2)	JK, HP, UT, SK, WB, AR	Pakistan, Nepal, Bhutan, China
393	36.8	<i>Phalanta phalantha phalantha</i> (Drury, [1773])	GH03B(1); GV11A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines, Japan
394	36.9	<i>Vagrans egista sinha</i> (Kollar, [1844])	AS01E(1); NV05A(1); ND03K(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, BH, JH, OD, PB	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra, Java), Philippines
395	36.10	<i>Vindula erota erota</i> (Fabricius, 1793)	ND01A(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
Subfamily: Limenitidinae Behr, 1864					
396	37.1	<i>Abrota ganga ganga</i> Moore, 1857	ND03A(1)	SK, WB, AR, ME, NL, BH	Nepal, Bhutan, Myanmar, China (Tibet)

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
397	37.2	<i>Athyma cama cama</i> Moore, [1858]	AS01E(1), AS06A(1); ND03A(1); DD09A(1), DD09B(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, Bangladesh, Myanmar, Thailand
398	37.3	<i>Athyma inara inara</i> Westwood, 1850	ND03A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, CH, CT, AP, MH, KA, TN, KL, GA, OD	Nepal, Bhutan, Bangladesh
399	37.4	<i>Athyma jina jina</i> Moore, [1858] ¹	DD09A(1), DD15A(1)	SK, WB, AR, MN	Nepal, Bhutan, Myanmar, Vietnam, Laos
400	37.5	<i>Athyma kanwa phorkys</i> (Fruhstorfer, 1913) ¹¹	ND02A(1), ND11A(2)	AR, AS, ME, NL, MI, TR	Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand
401	37.6	<i>Athyma opalina opalina</i> (Kollar, [1844])	GH01C(2); GV09B(3), GV14A(1); AS06A(3), AS09A(1), AS12A(1), AS14A(1)	JK, HP, UT, SK, WB, ME, MN	Pakistan, Nepal, Bhutan, China
402	37.7	<i>Athyma orientalis</i> Elwes, 1888	DD09A(1), DD11A(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos
403	37.8	<i>Athyma perius perius</i> (Linnaeus, 1758)	GV01G(1), GV06B(1); AS01E(2); NV03A(1); ND03A(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, PB, CH, GJ, RJ, MP, AP, TS, MH, KA, TN, KL, GA, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Philippines, Japan
404	37.9	<i>Athyma pravara acutipennis</i> Fruhstorfer, 1906 ¹¹	ND02A(1), ND03E(1), ND11A(1)	SK, WB, AR, AS, ME, NL, MI	Bangladesh, Myanmar
405	37.10	<i>Athyma ranga ranga</i> Moore, [1858] ¹¹	ND03E(1)	SK, WB, AR, AS, ME, NL, MN, TR, JH, CH, OD	Nepal, Bhutan, Bangladesh, Myanmar, Laos, Thailand
406	37.11	<i>Athyma selenophora bahula</i> Moore, 1858	ND02A(1), ND03F(1), ND06B(1), ND13D(1)	AR, AS, ME, NL, MI, MN, TR	Bangladesh, Myanmar, Laos, Cambodia, Thailand
407	37.12	<i>Athyma zeroca zeroca</i> Moore, 1872	ND03H(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan
408	37.13	<i>Euthalia aconthea garuda</i> (Moore, [1858])	GV01B(2); AS01E(1)	JK, HP, UT, SK, WB, AR, AS, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand
409	37.14	<i>Euthalia alpheda jama</i> (C. & R. Felder, [1867])	ND03A(1), ND13B(1)	WB, SK, AR, AS, ME, NL, MN, MI	Nepal, Bhutan, Bangladesh
410	37.15	<i>Euthalia anosia anosia</i> (Moore, [1858]) ¹¹	ND13A(1)	WB, AR, AS, ME	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
411	38.1	<i>Euthalia eriphylae delmana</i> Swinhoe, 1893	ND03B(1), ND13A(1)	AR, ME, NL	Myanmar
412	38.2	<i>Euthalia franciae franciae</i> (Gray, 1846) ¹¹	NV03A(1); ND11A(1); DD05A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan
413	38.3	<i>Euthalia monina kesava</i> (Moore, 1859)	ND03E(1), ND13D(1)	SK, WB, AR, AS, ME, MI, TR	Nepal, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
414	38.4	<i>Euthalia phemius phemius</i> (Doubleday, [1848])	ND03A(1), ND13B(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand, Malaysia



Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
415	38.5	<i>Euthalia telchinia</i> (Menetries, 1857)	ND03B(1), ND13D(1)	SK, WB, AR, AS, ME, NL, KA, TN, KL, GA	Nepal, Bhutan, Myanmar, Laos, Thailand
416	39.1	<i>Lasippa viraja viraja</i> (Moore, 1872)	ND10A(1), ND13A(1)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand
417	38.6	<i>Lexias dirtea khasiana</i> (Swinhoe, 1890)	ND03A(1), ND13D(1)	SK, WB, AR, AS, MI, ME, NL, MN, TR	Bhutan, Bangladesh, Myanmar
418	38.7	<i>Lexias cyanipardus cyanipardus</i> (Butler, [1869]) ⁱⁱ	ND03A(1)	AR, AS, ME	Bangladesh, China
419	38.8	<i>Limenitis trivena trivena</i> Moore, 1864	GH07A(1); GV10C(2)	JK, HP, UT	Pakistan, Nepal
420	38.9	<i>Moduza procris procris</i> (Cramer, [1777])	AS01C(1); ND03J(1), ND06B(1); DD04A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP	Bangladesh, Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
421	39.2	<i>Neptis clinia praedicta</i> Smetacek, 2011	AS06A(1)	UT, DL	
422	39.3	<i>Neptis clinia susruta</i> Moore, 1872	ND02A(1), ND03F(1), ND06B(1), ND13B(1), ND14A(1); DD04A(1), DD05A(1), DD15A(1)	SK, WB, AR, AS, ME, NL, MI, TR, BH, JH, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand
423	39.4	<i>Neptis hylas kamarupa</i> Moore, [1875]	GV04B(1), GV09A(1); AS06A(1); ND03F(1); DD04C(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, JH, UP, HR, PB	Bangladesh, Nepal, Bhutan, Myanmar, China (Tibet), Vietnam, Laos, Cambodia, Thailand
424	39.5	<i>Neptis mahendra mahendra</i> Moore, 1872	GH08A(1); GV08A(4), GV15A(1), GV15B(1); AS06A(1)	JK, HP, UT, SK, WB, AR, AS, PB	Pakistan, Nepal
425	39.6	<i>Neptis manasa manasa</i> Moore, [1858] ⁱ	DD11A(1)	SK, WB, AR	Nepal, Bhutan, Myanmar, Thailand
426	39.7	<i>Neptis miah miah</i> Moore, 1857	ND02A(1), ND03F(1); DD04A(1)	SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, China
427	39.8	<i>Neptis nata adipala</i> Moore, 1872	ND06B(1); DD04C(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR, JH	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos, Cambodia, Thailand
428	39.9	<i>Neptis nata yerburii</i> Butler, 1886	GH01C(1); GV03B(3), GV07A(1); AS01E(1), AS06A(1)	JK, HP, UT	Pakistan
429	39.10	<i>Neptis pseudovikasi</i> (Moore, 1899)	ND03A(1), ND13B(1); DD05A(1)	UT, SK, WB, AR, AS, ME	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
430	39.11	<i>Neptis sankara sankara</i> (Kollar, [1844]) ⁱ	GH01C(2); GV01D(1)	JK, HP, UT	Pakistan, Nepal
431	39.12	<i>Neptis sappho astola</i> Moore, 1872	GH03B(1); AS01E(1), AS06A(1), AS09A(1); NV03A(1); ND03F(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos, Thailand
432	39.13	<i>Neptis soma butleri</i> Eliot, 1969	GH07A(2); AS06A(1)	JK, HP, UT	Pakistan, Nepal
433	39.14	<i>Neptis soma soma</i> Moore, 1858 ⁱⁱ	DD11A(1)	SK, WB, AR, AS, NL, ME, MI, MN, TR	Nepal, Bhutan, Bangladesh
434	40.1	<i>Neurosigma siva siva</i> (Westwood, [1850]) ⁱⁱ	ND13A(1)	SK, WB, AR, AS, ME, NL	Nepal, Bhutan, Bangladesh

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
435	39.15	<i>Pantoporia hordonia hordonia</i> (Stoll, [1784])	GV02A(1); AS01E(1); DD04A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, UP, CH, GJ, AP, TS, MH, KA, TN, KL, GA, OD	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
436	40.2	<i>Parasarpa dudu dudu</i> (Doubleday, [1848]) ⁱⁱ	DD09A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan, Myanmar, China
437	40.3	<i>Parasarpa zayla zayla</i> (Doubleday, [1848])	ND15A(2)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan, China
438	40.4	<i>Sumalia daraxa daraxa</i> (Doubleday, [1848])	ND03A(1), ND03J(1); DD09A(1), DD11A(2)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Thailand
439	40.5	<i>Sumalia zulema</i> (Doubleday, [1848]) ⁱ	ND13B(1)	SK, WB, AR, ME	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Thailand
440	40.6	<i>Tanaecia jahnu jahnu</i> (Moore, [1858])	ND06C(1), ND13D(1)	SK, WB, AR, AS, ME, NL, MI	Bhutan, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Thailand
441	40.7	<i>Tanaecia julii appiades</i> (Menetries, 1857)	NV02F(1), NV05A(1); ND03A(1), ND03F(1); DD04C(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh
442	40.8	<i>Tanaecia lepidea lepidea</i> (Butler, 1868) ⁱⁱ	NV05A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, UP	Nepal, Bhutan, Bangladesh
Subfamily: Pseudergolinae Jordan, 1898					
443	40.9	<i>Dichorragia nesimachus nesimachus</i> (Doyere, 1840)	ND03A(1); DD04A(1), DD11A(1), DD13A(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos, Cambodia, Thailand
444	40.10	<i>Pseudergolis wedah wedah</i> (Kollar, 1848)	GH01C(1); GV03B(1), GV09A(1); AS06A(1); NV03A(1); ND09A(1); DD09A(1), DD15A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos, Thailand
445	40.11	<i>Stibochiona nicea nicea</i> (Gray, 1846)	GV07A(3); AS06A(1); ND13B(1); DD11A(3)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos
Subfamily: Apaturinae Boisduval, 1840					
446	41.1	<i>Dilipa morgiana</i> (Westwood, [1850]) ⁱ	GV04A(1), GV07A(3)	JK, HP, UT, WB, AR, ME, NL, MN	Pakistan, Nepal, Bhutan, Myanmar, China (Tibet), Vietnam, Laos
447	41.2	<i>Euripus nyctelius nyctelius</i> (Doubleday, 1845) ⁱⁱ	ND03A(1), ND03H(1)	SK, WB, AR, AS, ME, NL, MI, MN, TR	Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand
448	41.3	<i>Hestinalis nama nama</i> (Doubleday, 1844)	GV08B(3), GV12A(1), GV14B(1); AS03A(1); NV02F(1); ND02A(1), ND03A(1), ND08A(1); DD04A(1), DD15A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
449	40.12	<i>Mimathyma ambica ambica</i> (Kollar, [1844])	GH06A(1); GV01B(1), GV03A(1); ND02A(2), ND03A(1), ND03J(1), ND11A(1), ND14A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Bangladesh, Myanmar
450	41.4	<i>Rohana parisatis parisatis</i> (Westwood, 1850)	ND03J(1), ND13B(1), ND14A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, OD	Nepal, Bhutan, Bangladesh, Myanmar
451	41.5	<i>Sephisa chandra chandra</i> (Moore, [1858]) ¹	ND13B(1)	UT, SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Myanmar, China (Tibet), Vietnam, Laos, Thailand
452	41.6	<i>Sephisa dichroa</i> (Kollar, [1844])	GV01A(1), GV05A(2); AS14A(1)	JK, HP, UT	Pakistan, Nepal, Bhutan, China
Subfamily: Cyrestinae Guenée, 1865					
453	41.7	<i>Chersonesia risa risa</i> (Doubleday, [1848])	NV02F(1); ND03A(1), ND04A(1), ND08A(1), ND11A(1), ND14A(1); DD04A(1)	UT, SK, WB, AR, AS, ME, NL, MI, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos, Cambodia, Thailand, Malaysia
454	41.8	<i>Cyrestis thyodamas ganescha</i> (Kollar, 1848)	GH01C(1), GH03B(1); GV02C(2), GV07A(3); AS01E(1)	JK, HP, UT	Pakistan
455	41.9	<i>Cyrestis thyodamas thyodamas</i> Boisduval, 1846	NV02F(1); ND03K(1), ND13B(1); DD09B(2)	SK, WB, AR, AS, ME, NL, MI, MN, BH, UP	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Vietnam, Laos, Cambodia, Thailand
Subfamily: Nymphalinae Rafinesque, 1815					
456	41.10	<i>Aglais caschmirensis aesis</i> Fruhstorfer, 1912	GV06B(2), GV15B(1), GV16A(1), GV19B(2), GV20A(3), GV23A(1), GV24B(2); AS06A(2), AS08A(1), AS11A(1), AS14A(1), AS15B(1), AS18A(2), AS21A(1), AS23A(1), AS25A(4); NV10B(1)	HP, UT, SK, WB, AR, ME, NL, MN	Nepal, Bhutan
457	41.11	<i>Aglais caschmirensis caschmirensis</i> (Kollar, [1844])	GH07A(1)	JK, HP	Pakistan, Nepal, China (Tibet)
458	41.12	<i>Aglais ladakensis</i> (Moore, 1878)	LD30A(1), LD33A(1), LD34B(2), LD35A(9), LD36A(1)	JK, HP, UT, SK	Pakistan, Nepal, Bhutan, China (Tibet)
459	41.13	<i>Doleschallia bisaltide indica</i> Moore, 1899	NV02F(1)	SK, WB, AR, AS, ME, NL, MI, MN	Nepal, Bhutan, Bangladesh
460	42.1	<i>Hypolimnas bolina jacintha</i> (Drury, 1773)	GV02B(1), GV03A(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, UP, DL, GJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra), Yemen, Madagascar, Mauritius

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
461	42.2	<i>Hypolimnas misippus</i> (Linnaeus, 1764) ¹	GV01C(1), GV01G(1); AS06A(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Sri Lanka, Taiwan, Indonesia (Java), Papua New Guinea, Australia, Japan, Portugal, Kenya, Tanzania, Angola, Mozambique, Madagascar, South Africa, USA, Brazil, Ecuador, Chile
462	42.3	<i>Junonia almana almana</i> (Linnaeus, 1758)	GH03B(1); GV02A(1), GV03B(2); AS01E(2), AS03B(1); NV02A(1); ND03J(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Java, Bali, Lombok, Sumbawa), Philippines, Japan
463	42.4	<i>Junonia atlites atlites</i> (Linnaeus, 1763)	GV01E(4); AS01E(2), AS03B(1); NV02A(1); ND03J(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines
464	42.5	<i>Junonia hierta hierta</i> (Fabricius, 1798)	GH03B(1); GV01B(1), GV10D(3); AS01E(1), AS03B(1); NV02A(1); ND03J(1); DD04C(1)	JK, HP, UT, SK, WB, AR, AS, ME, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand
465	42.6	<i>Junonia iphita iphita</i> (Cramer, [1779])	GH01C(1), GH03B(1); GV10D(1), GV14A(1); AS01E(2), AS03B(3), AS06A(2), AS07B(1), AS08A(1), AS09A(2), AS12A(1), AS14A(3), AS15B(2); NV01A(1), NV02A(1); ND03J(1), ND13B(1); DD04A(1), DD04B(1), DD09B(1)	JK, HP, UT, SK, WB, AR, AS, ME, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
466	42.7	<i>Junonia lemonias lemonias</i> (Linnaeus, 1758)	GH01C(1); GV02C(2), GV05A(1); AS01E(2), AS03B(2), AS07B(1), AS11A(1); NV01A(1); ND01A(1), ND03J(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, PY, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
467	42.8	<i>Junonia orithya ocyale</i> Huebner, [1819]	GH06B(1); GV01F(7), GV05A(4), GV15A(3), GV17A(2); AS06A(1); NV02A(1); ND03J(1); DD04C(1), DD09A(1), DD09B(1), DD10B(1), DD11B(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, BH	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Cambodia, Thailand



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
468	42.9	<i>Kallima inachus inachus</i> (Boisduval, 1846)	GV03A(1); AS03B(1); ND03A(1), ND04A(1), ND06B(1), ND11A(1), ND11B(1), ND15A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, JH, HR, PB, GJ, MP, CT, AP, MH, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, Vietnam
469	42.10	<i>Kallima knyvetii</i> de Nicéville, 1886 ⁱⁱ	ND13B(1)	SK, WB, AR, AS, NL, MN	Bhutan, Myanmar, Thailand
470	43.1	<i>Kaniska canace canace</i> (Linnaeus, 1763)	GV01C(2), GV07A(1); AS14A(1); DD09B(1), DD11A(1), DD13A(1), DD21A(1), DD22A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, BH	Pakistan, Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
471	43.2	<i>Nymphalis xanthomelas fervezens</i> (Stichel, [1908])	LD23A(1); GH07A(1); GV03B(2), GV07B(1), GV13A(1), GV19B(1), GV24B(2)	JK, HP, UT	Pakistan, Nepal
472	42.12	<i>Polygonia c-album agnicula</i> (Moore, 1872) ⁱⁱ	DD13A(1), DD14A(1), DD22A(2)	SK, AR	Nepal, Bhutan
473	42.11	<i>Polygonia c-album cognata</i> (Moore, 1899)	GH09A(1); AS25A(1)	JK, HP, UT	Pakistan
474	42.13	<i>Polygonia c-album kashmira</i> Evans, 1932	LD01A(1), LD02A(1), LD04C(1), LD19A(1), LD25A(1)	JK	
475	43.5	<i>Rhinopalpa polynice birmana</i> Fruhstorfer, 1898 ⁱⁱ	ND02A(1), ND03J(1)	AR, AS, ME, NL, MI, MN	Bangladesh, Myanmar, Vietnam, Laos, Thailand
476	44.1	<i>Symbrenthia brabira brabira</i> Moore, 1872	DD04A(1), DD15A(1)	JK, HP, UT, SK, WB, AR	China (Tibet)
477	44.2	<i>Symbrenthia hypselis cotanda</i> Moore, [1875]	GV01G(1), GV03B(1); ND03E(1), ND04A(1), ND11B(1), ND13A(1); DD04A(1), DD04B(1)	UT, SK, WB, AR, AS, ME, NL, MN, TR	Nepal, Bhutan, Bangladesh, China
478	44.3	<i>Symbrenthia lilaea khasiana</i> Moore, [1875]	GH03B(1), GH06B(1); GV08A(3); AS01E(1); NV02A(1); ND11B(1), ND13B(1), ND15A(1); DD04A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, PB, AP, KA, OD	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar
479	44.4	<i>Symbrenthia niphanda hysudra</i> Moore, 1874 ⁱⁱ	GH01C(1)	JK, HP, UT	
480	44.5	<i>Symbrenthia silana</i> de Nicéville, 1885 ⁱ	DD09B(1)	SK, WB, AR, AS, ME, NL, MN	Bhutan, China (Tibet)
481	43.3	<i>Vanessa cardui</i> (Linnaeus, 1758)	LD03A(1), LD05A(1), LD11A(1), LD16A(1), LD18A(1), LD19B(1), LD21A(2), LD22A(2), LD23A(2), LD26B(1), LD29A(1); GH07A(1); GV01B(3), GV01D(2), GV03A(3), GV15A(2), GV18B(2), GV21B(1); AS06A(1), AS08A(1), AS09A(1), AS11A(1), AS14A(2), AS15B(1), AS16A(1), AS18A(1), AS23A(1), AS25A(1); DD09A(2), DD09B(1), DD10B(1), DD11A(1), DD13A(1), DD14A(1), DD21A(2), DD22A(2)	JK, HP, UT, SK, WB, AR, AS, ME, MI, MN, TR, BH, JH, UP, DL, CH, HR, PB, GJ, RJ, MP, CT, AP, TS, MH, KA, TN, KL, GA, OD, AN	Pakistan, China, Vietnam, Russia, Algeria, Morocco, Germany, Austria, Italy, Spain, France, Switzerland, Norway, Romania, Kenya, Canada, USA, Mexico, Brazil, Ecuador, Peru

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
482	43.4	<i>Vanessa indica indica</i> (Herbst, 1794)	GH01C(1); GV13A(2), GV15A(1), GV22A(1); AS06A(1), AS08A(1); ND03A(1), ND11B(1), ND13B(1); DD09A(1), DD10B(1), DD11A(3)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, PB	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Philippines, Japan, Korea, Russia
Subfamily: Libytheinae Boisduval, 1833					
483	44.6	<i>Libythea lepita lepita</i> Moore, [1858] ⁱⁱ	GH07A(1); GV12A(1), GV16B(2); ND02A(1); DD09A(1), DD11A(2)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, OD	Pakistan, Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
484	44.7	<i>Libythea myrrha sanguinalis</i> Fruhstorfer, 1898	GV07A(2); AS01E(1), AS03B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI, MN, TR, BH, UP, PB	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand



Table: Details of Moth species / subspecies recorded from IHR

Symbols used: * = First Report to India; # = First Report to Indian Himalayas; a = First Report to Trans-Himalaya; b = First Report to North-Western Himalaya; i = First Report to Western Himalaya; d = First Report to Central Himalaya q = First Report to Eastern Himalaya.

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Superfamily: Hepialoidea Stephens, 1829					
Family: Hepialidae Stephens, 1829					
Subfamily: Unassigned					
1	45.1	<i>Hepialiscus nepalensis</i> (Walker, 1856)	SL04A(1)	HP, UT, SK, WB, ME	Nepal, China
Superfamily: Cossioidea Leach, [1815]					
Family: Cossidae Leach, 1815					
Subfamily: Catoptinae Yakovlev, 2009					
2	45.2	<i>Catopta cashmirensis</i> (Moore, 1879) ^{b i}	LD09A(1), LD14A(2), LD21A(2), LD26A(4), LD27A(1), LD31A(1); GH01A(2), GH01B(1), GH04A(1), GH10A(1), GH14A(1), GH15A(1); AS10C(1)	JK, HP, UT	Afghanistan, Pakistan, Nepal, Bhutan, China
Subfamily: Zeuserinae Boisduval, [1828]					
3	45.3	<i>Chalcidia minea</i> (Cramer, 1779)	ND03H(2)	SK, WB, AR, AS, BH, OD	Bangladesh, Thailand, Cambodia, Indonesia (Borneo), Philippines, Papua New Guinea, Australia
4	45.4	<i>Neurozerra conferta</i> (Walker, 1856)	ND03H(1)	AR, AS, MN, ME, MI, NL, TR, AN	Bangladesh, Sri Lanka, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia, Philippines, Papua New Guinea
5	45.5	<i>Phragmataecia impura</i> Hampson, 1891 ^q	ND03H(1); DD07A(2)	AR, BH, DL, TN, KL	Nepal, China, Vietnam, Laos, Thailand, Indonesia (Java)
6	45.6	<i>Phragmataecia parvipuncta</i> (Hampson, 1892) ^q	ND03H(1)	AR, NL, TN	Sri Lanka, Vietnam
7	45.7	<i>Polyphagozeira coffeae</i> (Niether, 1861)	AS01E(1); NV02C(1)	UT, SK, WB, NL, CT, KA, TN, OD, AN	Bangladesh, Sri Lanka, Myanmar, China, Thailand, Malaysia, Indonesia (Borneo, Maluku), Papua New Guinea
8	45.8	<i>Zeurrora indica</i> (Herrich-Scheffer, [1854]) ^q	ND03G(1)	JK, HP, UT, SK, WB, AR, NL	Nepal, Bangladesh, Myanmar, Vietnam, Thailand, Malaysia, Indonesia (Borneo), Papua New Guinea, Australia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
9	45.9	<i>Zeuzera multistrigata</i> Moore, 1881	GV03A(1); AS09A(1); NV11A(3); DD23A(1)	JK, HP, UT, SK, WB, AR, NL, KL, AN	Pakistan, Bangladesh, Sri Lanka, Myanmar, China (Tibet), Taiwan, Vietnam, Cambodia, Thailand, Malaysia, Japan, Korea, Mongolia, Russia
10	45.10	<i>Zeuzera nepalense</i> Daniel, 1962 *	GH09A(1); SLO1A(1); NV02F(1)	HP, WB	Pakistan, Nepal, Bhutan
Superfamily: Zygaenoidea Latreille, 1809					
Family: Limacodidae Duponchel, 1845					
Subfamily: Limacodinae Duponchel, 1845					
11	46.1	<i>Miresa albipuncta</i> (Herrich-Schäffer, 1854)	GV03A(2)	UT, WB, MP	Nepal, Sri Lanka, Myanmar, Indonesia (Java)
12	46.2	<i>Miresa bracteata</i> Butler, 1880	AS09A(2); KA01A(1)	UT, SK, WB, NL, KL	Nepal, China, Laos, Thailand, Malaysia, Indonesia
13	45.12	<i>Scopelodes testacea</i> Butler, 1886 ^d	NV10A(1)	UT, WB, AR, AS, CT	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Java)
14	45.11	<i>Scopelodes venosa</i> Walker, 1855	GV01F(3), GV03A(4); NV02D(1), NV08A(1)	UT, SK, WB, AR, KL	Nepal, Bhutan, Bangladesh, Sri Lanka, China, Laos
15	46.3	<i>Thosea sinensis</i> (Walker, 1855) ⁱ	GV01F(2)	UT, AS	Myanmar, China, Taiwan, Hong Kong, Laos, Indonesia (Java), Korea
Subfamily: Unassigned					
16	46.4	<i>Altha nivea</i> Walker, 1862	NV02A(2), NV02C(1)	JK, UT, SK, WB, AS, TR, JH, CT, MP, MH, OD, S India	Pakistan, Nepal, Bhutan, Sri Lanka, Taiwan, Laos, Malaysia, Indonesia (Borneo, Java, Sumatra)
17	46.5	<i>Birhamoides junctura</i> (Walker, 1865) ^q	ND03H(3)	SK, AR, JH, CT, AD	Myanmar, Thailand, Malaysia, Indonesia (Borneo)
18	46.6	<i>Cania bilinea</i> (Walker, 1855) ^q	GV01F(2); ND03H(1)	HP, UT, SK, AR, MN, BH, OD, S India	China, Taiwan, Hong Kong, Vietnam, Laos, Malaysia, Indonesia
19	46.7	<i>Chalcoscelides castaneipars</i> (Moore, 1865) ⁱ	GV02D(1); NV02D(1); ND05A(4), ND05B(4)	UT, SK, WB, AR, ME, NL	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Indonesia (Borneo)
20	46.8	<i>Cheromettia lohor</i> (Moore, 1859) ⁱ	AS01E(1)	UT, SK, AS	Sri Lanka, Indonesia (Java, Sumatra)



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
21	46.9	<i>Parasa lepida</i> (Cramer, 1777)	DD08A(1), DD10C(4), DD12A(1), DD18A(1), DD20A(1), DD22A(2)	HP, WB, AR, CT, MP, MH, KA	Nepal, Sri Lanka, China, Laos, Vietnam, Thailand, Indonesia (Java, Sumatra), Japan, Africa, Madagascar, USA
22	46.10	<i>Parasa pastoralis</i> Butler, 1885	NV08A(1)	SK, WB , AR, AS, MH	Pakistan, Nepal, Bhutan, China, Taiwan, Hong Kong, Vietnam, Indonesia
23	46.11	<i>Soteira ostia</i> Swinhoe, 1902 [*]	DD08B(6), DD12A(11), DD15A(2), DD18A(2), DD20A(2), DD22A(5)	AR , ME	Myanmar, China, Vietnam, Laos, Thailand, Australia
24	46.12	<i>Soteira grandis</i> (Hering, 1931) *	DD10B(3), DD15A(1)	AR	China, Thailand
25	46.13	<i>Phocoderma velutina</i> (Kollar, 1844) ^q	GV12A(2); AS01D(1); NV01C(1); ND03G(3), ND03H(3); DD23B(1)	JK, UT, SK, WB, AR , AS, MN, TR, BH, CT, MH, KL	Pakistan, Nepal, Bhutan, Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sumatra)
26	46.14	<i>Praesetora divergens</i> (Moore, 1879) ^q	NV01C(1); ND03H(1)	SK, WB, AR , AS, NL	Vietnam, Thailand, Malaysia, Indonesia (Borneo)
27	46.15	<i>Setora postornata</i> (Hampson, 1900) ⁱ	AS01D(1)	UT , AR	Nepal, Bhutan, China, Taiwan, Vietnam
28	46.16	<i>Squamosa ocellata</i> (Moore, 1879)	ND03G(2), ND03H(8)	SK, WB, AR, ME, NL	Nepal, Bhutan, Myanmar

Family: Zygaenidae Latreille, 1809

Subfamily: Chalcosiinae Walker, 1865

29	47.4	<i>Agalope eroniodes</i> (Moore, 1879) ^q	ND04A(1)	WB, AR	Vietnam
30	47.1	<i>Amesia sanguiflua</i> (Drury, 1773)	DD04B(1)	SK, WB, AR, AS, ME	Bangladesh, Myanmar, Taiwan, Indonesia (Sumatra, Java)
31	47.5	<i>Campylotes histrionicus</i> Westwood, 1839	AS12A(1)	JK, HP, UT, SK, AR, ME	Afghanistan, Nepal, China, Taiwan
32	47.8	<i>Chalcosia suffusa</i> Leech, 1898	GV01F(3); AS01C(1)	UT	China, Taiwan, Hong Kong
33	47.3	<i>Corma maculata</i> Hampson, 1892 ^d	NV02A(1)	WB , ME, NL	Bhutan, Myanmar
34	47.9	<i>Eterusia aedea</i> (Clerck, 1759) ⁱ	AS01D(1); NV02D(8)	UT , SK, WB , AS, ME, MN, NL, MH, KA, KL	Nepal, Bangladesh, Sri Lanka, China, Taiwan, Hong Kong, Thailand, Japan
35	47.10	<i>Gynautocera papilionaria</i> Guérin-Méneville, 1831 ^q	NV05A(1); DD04A(1)	JK, HP, UT, SK, WB , AR , AS, NL, JH, MH	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Hong Kong, Laos
36	47.11	<i>Histia flabellicornis</i> (Fabricius, 1775) ^q	ND13B(1)	UT, SK, WB, AR , AS, ME, NL	Bhutan, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Japan

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
37	47.7	<i>Pidorus glaucopsis</i> Drury, 1773 ^q	NV02A(2), NV08A(1); ND03H(1), ND05A(1)	SK, WB, AR , AS, ME, MN, NL	Nepal, Bangladesh, Myanmar, Taiwan, Hong Kong, Vietnam, Japan, Korea
38	47.2	<i>Pseudoscaptosyle circumdata</i> (Walker, 1864) ^q	ND03E(1)	SK, AR , AS	Indonesia
Subfamily: Procridinae Boisduval, 1828					
39	47.6	<i>Balatea walkeri</i> (Moore, 1859) ^q	ND03G(1)	HP, SK, AR , NL, PB	Myanmar, China, Malaysia, Indonesia
Superfamily: Thyridoidea Herrich-Schäffer, 1846					
Family: Thyrididae Herrich-Schäffer, 1846					
Subfamily: Siculodinae Meyrick, 1884					
40	48.1	<i>Mellea taeniata</i> (Warren, 1908) ⁱ	AS01D(1), AS05A(1)	UT , SK, AS, ME	Nepal, Vietnam, Thailand
Subfamily: Striglininae Whalley, 1964					
41	48.2	<i>Banisia fenestrifera</i> Walker, 1863 ^l	AS01D(1)	UT , SK, AN	Nepal, China, Vietnam, Thailand, Mayasia, Indonesia (Bali, Java, Sulawesi, Sabah, Sarawak, Sumatra), Papua New Guinea, Australia
Subfamily: Unassigned					
42	48.3	<i>Herdonia approximata</i> Inoue, 1993 [*]	ND03H(1)	AR	Thailand
43	48.4	<i>Herdonia gigantea</i> Inoue, 1993 [*]	NV02D(1)	WB	Nepal, Vietnam, Thailand
44	48.5	<i>Herdonia osacesalis</i> (Walker, 1859) ^q	NV02A(1), NV02F(1); ND03H(1)	WB, AR	Nepal, Bangladesh, Myanmar, China, Hong Kong, Thailand, Indonesia (Borneo)
45	48.6	<i>Telchines vialis</i> (Moore, 1883) [#]	AS01E(1); NV02A(1), NV10A(1); DD11A(1), DD20A(1)	UT, WB, AR, ME	Nepal, Bangladesh, China, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Java, Sabah, Sumatra)
Superfamily: Hyblaeoidea Hampson, 1903					
Family: Hyblaeidae Hampson, 1903					
Subfamily: Unassigned					
46	48.7	<i>Hyblaea puera</i> (Cramer, 1777)	NV02A(1)	HP, UT, WB, BH, UP, MP, MH, AD, KA, TN, KL, AN	Bangladesh, Sri Lanka, Myanmar, Thailand, Indonesia (Java), New Guinea, South Africa, Brazil, West Indies



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Superfamily: Calliduloidea Moore, 1877					
Family: Callidulidae Moore, 1877					
Subfamily: Callidulinae Moore, 1877					
47	48.8	<i>Pterodecta anchora</i> Pagenstecher, 1887	GH18A(1); GV10C(1); AS06B(1)	JK, HP, UT, SK	Nepal, Bhutan
Subfamily: Pterothysaninae Minet, 1991					
48	48.9	<i>Pterothysanus laticilia</i> Walker, 1854	ND03H(1)	SK, AR, AS, NL	Nepal, Bhutan, Bangladesh, China, Thailand, Japan
Subfamily: Unassigned					
49	48.10	<i>Petavia attenuata</i> (Moore, 1879) ^q	ND03F(1)	SK, WB, AR, AS, ME	Myanmar, Taiwan, Indonesia, Japan
Superfamily: Pyraloidea Latreille, 1809					
Family: Pyralidae Latreille, 1809					
Subfamily: Epipaschiinae Meyrick, 1884					
50	48.11	<i>Lista haraldusalis</i> (Walker, 1858) ^l	GV01A(1); AS06A(1); NV02A(1)	HP, UT, SK, WB	Nepal, China, Malaysia, Indonesia (Sarawak, Borneo), Japan
51	48.12	<i>Locastra muscosalis</i> (Walker, 1866) ^q	ND03G(3), ND03H(1)	SK, WB, AR, AS, MI, NL, TN, AN	Sri Lanka, Myanmar, China (Tibet), Taiwan, Hong Kong, Malaysia, Indonesia (Borneo)
52	48.13	<i>Orthaga euadrusalis</i> Walker, 1859 ^q	ND03G(1), ND05A(1)	SK, WB, AR, MH, AD, AN	Sri Lanka, Thailand, Malaysia, Indonesia (Borneo, Java), Japan, Korea
53	48.14	<i>Teliphasa similalbifusa</i> Li, 2016 *	AS01E(1); NV02A(2), NV02B(1), NV05B(1), NV10B(1); DD10C(1)	UT, WB, AR	China
Subfamily: Pyralinae Latreille, 1809					
54	48.15	<i>Diloxia fimbriata</i> Hampson, 1896	GV01E(2), GV02B(3)	UT, TN	
55	48.16	<i>Endotricha albicilia</i> Hampson, 1891	NV10C(4), NV11A(1)	SK, WB, TN, AN	Sri Lanka, Indonesia (Java)
56	48.17	<i>Endotricha olivacealis</i> (Bremer, 1864)	GV01A(2), GV01C(4)	UT, TN	Pakistan, China, Taiwan, Hong Kong, Malaysia, Indonesia (Java), Japan, Korea, Russia
57	48.18	<i>Epicrocis hilarella</i> Ragonot, 1888	GV01A(4), GV01C(4)	HP, UT	Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Cambodia, Japan
58	48.19	<i>Hypsopygia igniflualis</i> (Walker, 1859) ^q	GV01A(7), GV01F(2); ND03H(1)	UT, WB, AR, MH, TN	Pakistan, Nepal, Sri Lanka, Myanmar, China, Hong Kong, Indonesia (Borneo), Japan

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
59	48.20	<i>Orybina flaviplaga</i> Walker, 1863	GV03A(2); AS09A(2); NV05A(1)	HP, UT, SK, WB , AR	Nepal, Bhutan, Myanmar, China, Taiwan, Thailand, Malaysia, Brunei, Indonesia
60	48.21	<i>Orybina kobesi</i> Roesler, 1984	NV02A(1); ND05A(1)	WB, AR	Nepal, Myanmar, China, Thailand, Malaysia, Brunei, Indonesia (Sumatra)
61	48.22	<i>Orybina plangonalis</i> (Walker, 1866)	NV11A(1)	SK, WB	Bhutan, Myanmar, China, Taiwan, Thailand
62	49.1	<i>Sacada discinota</i> (Moore, 1866) ^q	GV07B(3), GV13B(2); AS06A(1), AS09A(1), AS13A(1); DD18A(1)	UT, SK, WB, AR , NL	Taiwan
63	49.2	<i>Sacada pallescens</i> Hampson, 1896	DD09A(1)	SK, AR	Bhutan, Nepal
64	48.23	<i>Vitessa suradeva suradeva</i> (Moore, 1860)	NV02B(1), NV02C(1); DD11A(2)	SK, WB, AR, AS, ME, NL, KL, TN, AN	Bangladesh, Bhutan, Sri Lanka, Myanmar, Thailand, Vietnam, Indonesia (Borneo)

Family: Crambidae Latreille, 1810**Subfamily: Acentropinae Stephens, 1836**

65	49.3	<i>Aulacodes peribocalis</i> (Walker, 1859)	GH01C(1); GV03A(3), GV03B(2), GV09B(6); AS03A(1)	HP, UT, SK, MN, CT, KL, TN	Nepal, Bhutan, Sri Lanka, Myanmar, China, Vietnam, Philippines, Yemen
66	49.4	<i>Paracymoriza rivularis</i> (Moore, 1888)	NV02A(7), NV10C(1)	WB, AR	Nepal, China, Indonesia (Borneo)
67	49.5	<i>Strepsinoma croesusalis</i> (Walker, 1859) ⁱ	AS03A(14)	UT , AS, ME, AN	Bhutan, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo), Australia

Subfamily: Crambinae Latreille, 1810

68	49.6	<i>Ancylolomia chrysographellus</i> Kollar, 1844	GV01G(2)	UT, MP	Pakistan, Nepal, Sri Lanka, Myanmar, China (Taiwan), Indonesia, Philippines, Japan, Korea, Kenya, Uganda, Yemen, Cyprus
69	49.7	<i>Euchromius ocella</i> (Haworth, 1811)	GV01D(2)	UT, MH	Japan, Algeria, Iran, England

Subfamily: Glaphyriinae Forbes, 1923

70	49.8	<i>Evergestis forficalis</i> (Linnaeus, 1758) ^p	GH07A(1)	HP , SK	China, Japan, Korea, Russia, USA
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Subfamily: Musotiminae Meyrick, 1884

71	49.9	<i>Oligostigma ustalis</i> Walker, 1866	GV03B(7), GV07A(7), GV07B(4)	HP, UT, SK, ME	Indonesia (Java)
72	49.10	<i>Neurophyseta irrectalis</i> (Guenée, 1854)	DD12A(1)	AR	Bhutan, Taiwan



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Odontiinae Guenée 1854					
73	49.11	<i>Heortia vitessoides</i> (Moore, 1885) ^q	NV02D(1); ND05A(1)	SK, WB, AR , AS, TR, ME, NL, AD, KL	Bhutan, Sri Lanka, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia, Australia
74	49.12	<i>Pitama hermesalis</i> (Walker, 1859) ^q	DD07A(1)	SK, AR , ME	Malaysia, Indonesia (Borneo)
Subfamily: Pyraustinae Meyrick, 1890					
75	49.13	<i>Charitoprepes lubricosa</i> (Warren, 1896)	NV11A(1)	SK, WB , AS, ME	China, Taiwan, Cambodia, Japan, Korea
76	49.14	<i>Hyalobathra coenostolalis</i> (Snellen, 1890)	NV11A(1)	SK, WB , ME, TN	China, Taiwan
77	49.15	<i>Hyalopлага pulchralis</i> Moore, 1867	GV01C(7), GV01F(8), GV07B(5), GV13B(11)	UT, SK	Nepal, Bhutan
78	49.16	<i>Neadeloides glaucoptera</i> (Hampson, 1896)	ND05A(1); DD29B(1), DD23C(3)	AR	Nepal, Bhutan, China, Taiwan, Hong Kong, Malaysia, Indonesia (Borneo), Japan
79	49.17	<i>Pagyda salvalis</i> Walker, 1859	NV10C(3), NV11A(5)	SK, WB	Bhutan, Sri Lanka, Myanmar, Cambodia, Thailand, Indonesia (Borneo), Papua New Guinea, Japan, Korea, South Africa, Zimbabwe
80	49.18	<i>Pyrausta signatalis</i> (Walker, 1866)	GV01B(7); AS06A(1)	HP, UT, TN	Sri Lanka, Indonesia (Java)
81	49.19	<i>Rhagoba octomaculalis</i> (Moore, 1867)	NV02A(1); ND03H(2), ND05A(1)	SK, WB, AR, AS, ME, MN	Nepal, Bhutan, China
Subfamily: Schoenobiinae Duponchel, 1846					
82	49.20	<i>Scirpophaga excerptalis</i> (Walker, 1863)	ND03H(1)	AR	Bangladesh, Pakistan, Bhutan, Nepal, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Borneo), Philippines, Australia, Japan
Subfamily: Spilomelinae Guenée, 1854					
83	49.21	<i>Agathodes ostentalis</i> Geyer, 1837	AS01D(1); NV10C(6), NV11A(2)	UT, WB, AN	Sri Lanka, Myanmar, Indonesia (Java, Sumbawa)
84	49.22	<i>Agrioglypta itysalis</i> (Walker, 1859)	ND03C(2)	SK, AR, AS, NL, MH, KL, TN, AN	Pakistan, Sri Lanka, Myanmar, Thailand, Malaysia, Indonesia, Australia, Japan, Russia, USA
85	49.23	<i>Agrioglypta zelimalis</i> (Walker, 1859) ^{qn}	NV11A(1); DD03A(1), DD03B(1).	WB , AR , NL, TN	Bhutan, Sri Lanka, China, Hong Kong, Vietnam, Malaysia, Indonesia (Borneo, Sumatra), Philippines, Australia
86	49.24	<i>Botyodes asialis</i> Guenée, 1854	NV02A(2), NV02C(1)	SK, WB	Pakistan, Sri Lanka, Myanmar, Indonesia (Borneo)

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
87	49.25	<i>Neobotyodes crocopteralis</i> (Hampson, 1898) ^q	ND05A(1); DD10C(1)	SK, AR	Nepal, Bhutan, Sri Lanka, Myanmar, Thailand, Fiji
88	49.26	<i>Bradina diagonalis</i> (Guenée, 1854)	GH01C(1); AS01D(1), AS02B(1); DD10C(1)	HP, UT, AR	Myanmar, Indonesia (Sumatra, Java, Sambawa)
89	49.27	<i>Cirrhochrista brizoalis</i> (Walker, 1859)	GV01B(6), GV02C(4), GV03B(1)	HP, UT, MH, TN	China, Taiwan, Indonesia (Borneo), New Guinea, Australia, Japan
90	49.28	<i>Cirrhochrista fumipalpis</i> Felder & Rogenhofer, 1875 ^q	AS03A(1); DD01A(1)	UT , SK, AR , NL	Myanmar, Indonesia (Maluku)
91	49.29	<i>Cnaphalocrocis medinalis</i> Guenée, 1854	GH01C(1); ND03E(1)	HP, SK, AR, ME, MH	Sri Lanka, Myanmar, China, Taiwan, Vietnam, Malaysia, Indonesia (Borneo, Java, Sumatra), New Guinea, Australia, Japan, Korea, Russia, USA
92	50.1	<i>Conogethes punctiferalis</i> (Guenée, 1854)	GV01A(3), GV09A(2), GV14D(5); ND03C(1), ND05A(1); DD01A(1)	UT, SK, AR, AS, ME	Sri Lanka, Myanmar, China, Hong Kong, Thailand, Malaysia, Indonesia, Australia, Japan, Korea
93	50.2	<i>Cotachena histricalis</i> (Walker, 1859) ^q	GH01A(1); GV07A(1), GV11A(2), GV14A(4); ND05A(1)	HP, UT, SK, AR , NL, TN	Sri Lanka, Myanmar, China, Hong Kong, Indonesia, New Guinea, Australia, Solomon Islands, Africa
94	50.3	<i>Cotachena pubescens</i> (Warren, 1892) ^q	DD10C(1)	HP, AR	China
95	50.4	<i>Cydalima laticostalis</i> (Guenée, 1854)	NV02A(1), NV02C(1), NV05B(1); ND03G(1), ND05A(2)	WB, AR	Sri Lanka, Myanmar, Malaysia, Thailand
96	50.5	<i>Cydalima perspectalis</i> (Walker, 1859)	NV11A(1)	SK, WB , AR, AS, KA	Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia
97	50.6	<i>Cydalima pfeifferae</i> (Lederer, 1863)	NV01C(1)	SK, WB , ME	Malaysia, Indonesia (Sumatra)
98	50.7	<i>Diaphania indica</i> (Saunders, 1854) ^d	NV02F(1)	WB , AN	Nepal, Bhutan, China, Hong Kong, Japan, Korea, Africa, Madagascar, Arabia, Central America
99	50.8	<i>Dichocrocis definita</i> (Butler, 1889)	GV01B(3), GV03A(7)	HP, UT, SK, AR, AS	Nepal, Bhutan
100	50.9	<i>Dysallacta negatalis</i> (Walker, 1859)	GV02B(3)	HP, UT, SK, ME, MH	Sri Lanka, Hong Kong, Australia, Japan, South Africa
101	50.11	<i>Endocrossis caldusalis</i> (Walker, 1859)	ND05B(1)	SK, WB, AR, AS, KA	Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia
102	50.12	<i>Endocrossis flavibasalis</i> (Moore, 1867)	GV01C(1); AS01C(3), AS03A(4); ND05A(1); DD04B(1)	UT, SK, WB, AR, AS, NL, MH	Nepal, Bhutan, Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia (Sumatra), Philippines, New Guinea



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
103	50.10	<i>Filodes fulvidorsalis</i> (Geyer, 1832)	ND03H(1), ND05A(1)	WB, AR, MH, KA	Sri Lanka, Myanmar, Malaysia, Indonesia (Java, Borneo), Philippines
104	50.13	<i>Glyphodes bicolor</i> (Swainson, 1821)	AS03A(1)	UT, WB, MH, KL, AN	Sri Lanka, Myanmar, China, Indonesia, Philippines, Australia, South Africa, Angola, Mozambique
105	50.14	<i>Glyphodes bivitalis</i> Guenée, 1854 ^a	GV13B(1); NV02A(2); ND03C(1)	HP, UT, SK, WB, AR , AS, CT, MP, MH, KA, TN, AN	Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo), Philippines, Australia, Hawaiian Island, Japan, USA
106	50.15	<i>Glyphodes caesalis</i> Walker, 1859 ^a	NV02A(1); ND05A(1); DD10C(1)	SK, WB, AR , AS, ME, TR, CT, MH, KA, AN	Nepal, Sri Lanka, Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia, Philippines
107	50.16	<i>Glyphodes canthusalis</i> Walker, 1859	NV02A(3); ND03E(1), ND05A(1), ND13C(1); DD23A(5)	SK, WB, AR, AS, JH, MH, KA, AN	Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Indonesia (Sumatra, Borneo), Australia, Nigeria
108	50.17	<i>Glyphodes crithealis</i> (Walker, 1859)	GV01C(4), GV01F(4), GV11A(11), GV13B(2), GV19A(3)	HP, UT, AR	Nepal, China, Taiwan, Hong Kong, Malaysia, Japan
109	50.18	<i>Glyphodes lacustralis</i> Moore, 1867 ¹	AS15B(1)	UT , SK, WB, ME	Nepal
110	50.19	<i>Glyphodes multilinealis</i> Kenrick, 1907 ^a	NV02F(1)	WB , AS	Taiwan, New Guinea, Australia, Fiji, Tonga, Samoa, Japan
111	50.20	<i>Glyphodes stolalis</i> Guenée, 1854	NV10C(3)	SK, WB , AS	Nepal, Sri Lanka, Taiwan, Thailand, Malaysia, Indonesia (Pulo Laut, Borneo), Philippines, Australia, Fiji, South Africa
112	50.21	<i>Haritalodes derogata</i> (Fabricius, 1775)	AS03A(1), AS04A(1); ND03G(1)	HP, UT, AR, MP, KL, AN	Nepal, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Bali), New Guinea, Australia, Samoa, Fiji, Japan, Russia, West Africa
113	50.22	<i>Hemopsis dissipatalis</i> (Lederer, 1863) ^a	ND03H(1)	SK, AR , AS, ME	China, Indonesia, Japan
114	50.23	<i>Herpetogramma luctuosalis</i> (Guenée, 1854)	GV01F(11), GV03A(5); AS01D(1), AS04A(2); NV02F(2), ND05A(1)	HP, UT, AR, MP, AN	China, Taiwan, Indonesia (Borneo), Japan, Korea, Russia
115	50.24	<i>Heterocnephys lymphatalis</i> Swinhoe, 1889	ND03E(1), ND03G(1), ND05A(2), ND13C(1); DD04B(1)	AR, AS, ME, NL, MN	Myanmar, China, Cambodia, Thailand, Malaysia, Japan
116	50.25	<i>Lamprosema commixta</i> (Butler, 1879)	GH01E(1); GV01A(8), GV01F(2)	HP, UT, AS, NL, ME, TN	Nepal, Sri Lanka, China, Hong Kong, Vietnam, Malaysia, Japan

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
117	50.26	<i>Leucinodes orbonalis</i> Guenée, 1854	AS15A(1)	HP, UT, AS, MH, AN	Pakistan, Sri Lanka, Myanmar, Indonesia (Java), Australia, Papua New Guinea, Russia, South Africa
118	50.27	<i>Maruca vitrata</i> (Fabricius, 1787) ^{bdq}	GH01C(2); AS01C(1); NV02A(1); ND03H(1); DD04B(1)	HP, UT, WB, AR, CT, AN	Nepal, Bhutan, Sri Lanka, China, Taiwan, Malaysia, Philippines, Laos, Australia, Japan, Korea, Africa, Tanzania, Madagascar, USA, Mexico, Brazil, Colombia, Costa Rica
119	51.15	<i>Nagiella quadrimaculalis</i> (Kollar & Redtenbacher, 1844)	GV01F(5), GV03A(2), GV13B(7), GV19A(9); DD07A(1)	UT, SK, WB, AR, AS, ME, NL	Nepal, Bhutan, China, Taiwan, Hong Kong, Indonesia (Borneo), Japan, Korea, Russia, Congo
120	50.28	<i>Nausinoe perspectata</i> (Faloricus, 1775) ^d	NV02A(1), NV02F(1)	UT, WB, AS, KA	Nepal, Sri Lanka, Myanmar, Taiwan, Thailand, Indonesia, Australia
121	50.29	<i>Nevrina procopia</i> (Cramer & Stoll, 1781)	ND05A(1)	WB, AR, AS, AN	Nepal, Bhutan, Sri Lanka, Myanmar, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Java, Sabah, Sarawak, Ambonia), Philippines, New Guinea, Japan
122	50.30	<i>Nomophila noctuella</i> (Denis & Schiffermüller, 1775)	GH01C(1), GH01D(9), GH01E(4), GH04A(3); GV01A(16), GV01C(2), GV04A(1), GV07B(2)	HP, UT	Pakistan, Nepal, China, Australia, Iran, Yemen, Turkey, UAE, Denmark, Netherlands, France, Finland, Portugal, Germany, Sweden, Norway, Austria, Bulgaria, Greece, Norway, Kenya, South Africa, USA, Canada, Argentina
123	50.31	<i>Nosophora althealis</i> (Walker, 1859)	DD15A(1)	SK, AR, AS, TR	Sri Lanka, Malaysia, Indonesia (Borneo, Pulo Laut), New Guinea
124	50.32	<i>Notarcha tigrina</i> (Moore, 1886)	ND03H(2)	HP, SK, ME, MH, TN	Bhutan, Sri Lanka, Myanmar, Taiwan, Cambodia, Indonesia (Borneo)
125	50.33	<i>Omiodes barcalis</i> (Walker, 1859) ^q	DD11A(1)	UT, WB, AR, ME, CT, MH, TN	Sri Lanka, Myanmar, Malaysia (Sarawak), Thailand (Borneo)
126	50.34	<i>Omiodes noctescens</i> (Moore, 1888)	GV01A(4)	UT, SK, AS, ME	Nepal, China, Indonesia, Philippines, Japan, Korea
127	51.1	<i>Omphisa anastomosalis</i> (Guenée, 1854)	ND03G(1), ND03H(1)	SK, AR, ME, MN, CT, MP, TN, KA, KL, AN	Sri Lanka, Myanmar, China, Hong Kong, Indonesia (Java), Malaysia, Thailand, Hawaii Islands



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
128	51.8	<i>Orthospila orissusalis</i> (Walker, 1859) ^a	DD07A(1)	SK, AR	Bhutan, Sri Lanka, China, Hong Kong, Cambodia, Thailand, Malaysia, Indonesia, Australia
129	51.2	<i>Pachynoa mineusalis</i> (Walker, 1859) ^a	NV11A(1)	WB	Myanmar
130	51.3	<i>Pachynoa spilosomoides</i> (Moore, 1886)	NV02A(1), NV02F(1), NV05B(1)	SK, WB, MH, TN, KA	Bhutan, Sri Lanka, Thailand, Philippines
131	51.4	<i>Palpita annulifer</i> Inoue, 1996 ^a	ND05A(1)	AR, CT, TN, KL	Nepal, Bhutan, China, Hong Kong, Taiwan, Japan, Vietnam, Thailand, Indonesia (Sulawesi, Sumatra, Borneo), Philippines
132	51.5	<i>Palpita warrenalis</i> (Swinhoe, 1894) ^a	DD03A(3), DD03B(3), DD04A(1), DD04B(5)	AR, ME, NL	Nepal, Bhutan, China, Hong Kong, Vietnam, Indonesia (Borneo, Sumatra)
133	51.7	<i>Parotis marginata</i> (Hampson, 1893)	NV02A(1)	SK, WB, AS, CT, MH, KL, OD, AN,	Bhutan, Bangladesh, Sri Lanka, China, Taiwan, Malaysia, Indonesia, Australia, Fiji, Papua New Guinea, Solomon Islands, Japan
134	51.6	<i>Parotis marinata</i> Fabricius, 1794	NV02A(1); ND05A(1)	WB, AR, CT, AN	Sri Lanka, Myanmar, Thailand, Malaysia, Indonesia (Borneo, Celebes), Fiji, Australia
135	51.9	<i>Patania balteata</i> Walker, 1859	GV01A(4), GV07B(4); AS03A(1); ND05A(2)	UT, AR, CT	Pakistan, Nepal, Myanmar, China (Taiwan), Hong Kong, Thailand, Malaysia, Indonesia (Borneo), Papua New Guinea, Australia, Solomon Islands, Fiji, Japan, Korea, Africa, Madagascar, USA, Canada, Costa Rica
136	51.10	<i>Patania caletoralis</i> Walker, 1859 ^a	DD04B(1)	SK, WB, AR, AS, ME	Nepal, Bhutan, China, Taiwan, Hong Kong, New Guinea, Australia
137	51.11	<i>Patania concatenalis</i> (Walker, 1866)	ND03G(1), ND03H(1)	UT, SK, WB, AR, AS, ME, MN, NL, CT, KA, TN	China, Australia, Africa, USA
138	51.12	<i>Patania deficiens</i> (Moore, 1887)	SL02A(1)	HP, UT, SK, WB	Nepal, Sri Lanka
139	51.13	<i>Patania ruralis</i> (Scopoli, 1763) ^{ba}	GH01C(6), GH04A(2), GH08A(1); GV01A(11), GV03A(8); ND13C(1)	HP, UT, SK, AR, ME, MH, TN	Pakistan, Indonesia (Borneo, Java), Fiji, New Guinea, Solomon Islands, Russia, Finland, Sweden, Germany, Estonia, United Kingdom, Italy, Denmark, Austria, Norway
140	51.14	<i>Patania verecunda</i> (Warren, 1896)	GH11A(4); GV13B(6), GV14B(4)	HP, UT, SK, WB, AR, ME, TN	Nepal, Sri Lanka

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
141	51.16	<i>Poliobotys ablactalis</i> (Walker, 1859) ^{ba}	GH01C(1); ND03G(1), ND05A(1); DD22A(1)	HP, SK, AR, ME, CT, MH, TN, AN	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Thailand, Malaysia, Indonesia (Borneo), Philippines, Australia, Russia, Africa
142	51.17	<i>Polygrammodes sabelialis</i> (Guenée, 1854)	GV01A(3), GV02D(1); AS01D(1); ND03F(1)	HP, UT, WB, AR, MH, AN	Nepal, Myanmar, China, Taiwan, Hong Kong, Japan, Africa
143	51.18	<i>Polythlipta cerealis</i> Lederer, 1863	NV02A(1); ND05A(1)	HP, UT, SK, WB, AR, AS, ME, MI	Nepal, Bhutan, Taiwan, Thailand, Malaysia, Indonesia (Borneo)
144	51.19	<i>Polythlipta peragrata</i> Moore, 1888	NV09A(1)	SK, WB	
145	51.20	<i>Prooedema inscissalis</i> (Walker, 1866) ^a	ND05A(1)	WB, AR	Nepal, Bhutan, Sri Lanka, Myanmar, China, Hong Kong, Vietnam, Thailand, Indonesia (Borneo), Philippines, Papua New Guinea, Australia, Solomon Islands
146	51.21	<i>Pycnarmon aeriferalis</i> (Moore, 1877) ^a	ND03D(1)	SK, AR, AS, AN	Taiwan, Hong Kong
147	51.22	<i>Pygospila tyres</i> (Cramer, 1779)	NV02B(1), NV10C(13), NV11A(4); ND03C(1), ND05A(2)	HP, UT, WB, AR, BH, JH, MP, MH, CT, RJ, TN	Pakistan, Nepal, Sri Lanka, Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia (Java, Borneo), Philippines, New Guinea, Australia, Africa
148	51.23	<i>Rhimphalea trogusalis</i> Walker, 1859 ^a	NV02C(2), NV02F(1); ND03C(1)	HP, SK, WB, AR, ME, AN	Nepal, Bhutan, Malaysia, Indonesia (Borneo, Sumatra, Java), Philippines
149	51.24	<i>Sameodes cancellalis</i> (Zeller, 1852)	GV01D(2)	UT, WB, DL, CT, MP, MH, TN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Java), Philippines, Fiji, New Guinea, Australia, South Africa, Nigeria, Kenya, Madagascar
150	51.25	<i>Sameodes pictalis</i> Swinhoe, 1895 ^a	ND03G(1), ND05B(2)	AR, AS, ME	Vietnam, Malaysia
151	51.26	<i>Spoladea recurvalis</i> (Fabricius, 1775) ^b	GH01C(2); GV01G(4), GV08A(4), GV10B(3); AS01D(1); NV10C(2)	HP, UT, SK, WB, AR, HR, CT, MP, MH, KA, TN, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Philippines, Fiji, Australia, Japan, Korea, Syria, UAE, Spain, Portugal, Greece, Germany, South Africa, Nigeria, Kenya, Madagascar, Canada, USA, Mexico, Cuba, Brazil, Costa Rica



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
152	51.30	<i>Syllepte cohaesalis</i> (Walker, 1866) ^a	ND03H(1)	AR, ME, TN, KL	Indonesia (Sula, Borneo, Sumatra), Malaysia, Fiji, Australia
153	51.31	<i>Syllepte gastralis</i> (Walker, 1866)	NV10C(1)	HP, SK, WB, ME	Bhutan, Nepal
154	51.27	<i>Synclera tibialis</i> Moore, 1888 ¹	AS01D(1)	UT, SK, WB, AS, ME, TN	Thailand
155	51.28	<i>Synclera traducalis</i> (Zeller, 1852)	NV10C(2); ND05A(2)	SK, WB, AR, AS, ME, PB, CT, MP, MH, AN	Sri Lanka, Myanmar, Thailand, Indonesia, Russia, Palestine, Syria, UAE, Yemen, South Africa, Nigeria, Namibia, Botswana, Tanzania, Mozambique, Madagascar, Mexico, Cuba, Colombia
156	51.29	<i>Synclera univocalis</i> (Walker, 1859) ^d	NV02F(1)	WB, PB, MP	Pakistan, Sri Lanka, Myanmar, Yemen, Palestine, Syria, South Africa
157	52.1	<i>Syngamia falsidicalis</i> (Walker, 1859)	GH01B(6), GH04A(1), GH22A(2); GV06B(3), GV07A(5), GV13B(3)	HP, UT, WB, AR, AS, ME, MI, TN, KL	Pakistan, Nepal, Sri Lanka, China, Taiwan, Hong Kong, Congo, Zimbabwe
158	52.2	<i>Talanga sexpunctalis</i> (Moore, 1877)	NV01D(1), NV02A(1), NV02D(1), NV02E(1); ND03H(1)	HP, SK, WB, AR, AS, ME, MH, CT, KA, TN, AN	Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Malaysia, Indonesia (Borneo, Sumatra, Celebes, Java, Sabah, Sulawesi), Philippines, Papua New Guinea, Australia, Japan
159	52.3	<i>Terastia egialealis</i> (Walker, 1859)	GV01C(2); NV02B(1); ND03H(1)	HP, UT, SK, WB, AR, AS, ME, MP, MH, KA, KL	Nepal, Bhutan, Thailand, Malaysia, Indonesia (Sumatra, Java, Borneo, Sulawesi), Australia
160	52.4	<i>Tyspanodes nigrolinealis</i> (Moore, 1867)	NV02A(1), NV11A(1)	SK, WB, ME	Nepal, Bhutan, Cambodia
161	52.5	<i>Udea ferrugalis</i> (Hübner, 1796)	GH01E(1); AS26A(1)	HP, UT, SK, TN	Afghanistan, Pakistan, Nepal, Sri Lanka, Myanmar, China, Japan, Denmark, Finland, Portugal, Spain, Greece, Italy, Austria, Norway, Germany, United Kingdom, Belgium, UAE, Kenya, South Africa
162	52.6	<i>Ulopeza idyalis</i> (Walker, 1859)	ND05A(2)	SK, WB, AR, ME, NL, CT, MH, TN	Sri Lanka, China, Taiwan, Vietnam, Indonesia (Borneo, Pulo Laut, Sulawesi)
163	52.7	<i>Uncobotyodes patulalis</i> (Walker, 1866)	NV11A(1)	HP, SK, WB, ME	Bhutan, China, Hong Kong

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Superfamily: Drepanoidea Boisduval, 1828					
Family: Drepanidae Boisduval, 1828					
Subfamily: Cyclidiinae Warren, 1922					
164	52.8	<i>Cyclidia rectificata</i> (Walker, 1862)	NV10B(1), NV10C(4), NV11A(1); DD23C(1)	HP, SK, WB, AR, NL	Nepal, Bhutan, Myanmar, China (Tibet)
165	52.9	<i>Cyclidia substigmata</i> (Hübner, 1825)	GV01A(2), GV01F(2); AS01D(1); NV02D(1)	JK, HP, UT, SK, WB, AR, AS, NL	Nepal, Bangladesh, Myanmar, China (Tibet), Taiwan, Vietnam, Thailand, Japan, Korea
Subfamily: Drepaninae Boisduval, 1828					
166	52.10	<i>Agnidra discipilaria</i> (Moore, 1867)	GV01F(1); AS06A(1)	HP, UT, SK, WB, AR	Nepal, Bhutan, Thailand, Japan
167	52.11	<i>Agnidra specularia</i> (Walker, 1860)	DD24A(1)	SK, WB, AR, AS	Nepal, Bhutan, Sri Lanka, Myanmar, China, Vietnam
168	52.12	<i>Agnidra vinacea</i> (Moore, 1879)	SL02A(1); DD21A(1)	UT, SK, WB, AR, ME, NL	Nepal, Myanmar, Thailand
169	52.13	<i>Auzata semipavonaria</i> Walker, 1862	GH01F(1); GV01C(1)	JK, HP, UT, SK	Nepal, China, Ghana, Cameroon
170	52.14	<i>Callidrepana argenteola</i> (Moore, 1858)	NV02F(1)	UT, SK, WB, AR, TR, OD	Bhutan, Sri Lanka, Myanmar, Taiwan, Thailand, Malaysia, Indonesia (Java, Borneo, Sumatra, Sulawesi), Philippines, Timor, Japan, Korea, Russia
171	52.15	<i>Canucha duplexa</i> (Moore, 1865) ⁱ	GV08B(2), GV16A(1), GV21A(2)	UT, WB	Nepal, Bhutan, Myanmar
172	53.1	<i>Ditrigona triangularia</i> (Moore, 1867) ^q	AS13A(1), AS15B(3); DD10A(1), DD19A(1)	HP, UT, SK, WB, AR, ME	Nepal, China, Taiwan, Vietnam
173	53.2	<i>Drapetodes fratercula</i> Moore, 1887	NV02F(1)	SK, WB, NL	Bangladesh, Sri Lanka, Malaysia, Indonesia (Borneo, Bali, Sulawesi), Japan
174	53.3	<i>Drepana dispilata</i> Warren, 1922 ⁱ	AS10C(1); SL02A(1); DD14A(1), DD16A(3), DD16B(1), DD21A(1), DD22A(1)	UT, SK, AR	Nepal, Bhutan, Myanmar, China
175	53.4	<i>Drepana pallida</i> Moore, 1879 ^b	GH01E(4), GH02A(1), GH03A(1), GH12A(2); GV01C(1), GV03B(3), GV05B(2), GV21A(5); AS10C(1); NV02A(1); DD07A(1), DD11B(1), DD17A(1)	HP, UT, SK, WB, AR, NL, MN	Nepal, Bhutan, Myanmar, China, Taiwan
176	53.5	<i>Macrauzata fenestraria</i> Moore, 1867	DD18A(1)	HP, UT, SK, WB, AR	Pakistan, Nepal, Taiwan, Vietnam, Thailand, Malaysia, Japan
177	53.6	<i>Macrocilix mysticata</i> (Walker, [1863])	GH04A(1); GV15A(4); AS10C(1); DD13A(1)	HP, UT, SK, WB, AR	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Japan, Korea



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
178	53.7	<i>Microblepsis leucosticta</i> (Hampson, 1895)	DD18A(1)	AR, ME	Nepal, China, Thailand, Malaysia, Indonesia (Sumatra, Borneo)
179	53.8	<i>Microblepsis violacea</i> (Butler, 1889)	GH01C(2)	HP, UT, NL	Nepal, China, Taiwan
180	53.9	<i>Nordstromia bicostata</i> (Hampson, 1912)	SL01A(1)	SK, WB , AR	Nepal, Myanmar, China
181	53.10	<i>Nordstromia duplicata</i> (Warren, 1922) ^{bd}	GV11A(3); NV02A(1), NV10C(1)	UT, WB , ME, NL	China, Malaysia, Indonesia (Borneo, Sumatra), Japan
182	53.11	<i>Nordstromia vira</i> (Moore, 1855)	DD07A(1), DD19A(1)	WB, AR, AS, ME	Nepal, Myanmar, China
183	53.12	<i>Oreta pavaca</i> Moore, 1865 ⁱ	GV11A(3), GV13B(1), GV19B(2); AS10C(1), AS15B(3), AS19A(1); NV02A(1)	UT , SK, WB, ME	Nepal, China (Tibet)
184	53.13	<i>Oreta sanguinea</i> Moore, 1879	AS19A(3); DD18A(1)	HP, UT, SK, WB, AR	Nepal, Bhutan, China (Tibet)
185	53.14	<i>Oreta vatama</i> Moore, 1866	GH06B(1), GH07A(2), GH12A(4), GH16A(2); AS06A(1); DD12A(1), DD15A(1)	JK, HP, UT, SK, WB, AR, MN	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China
186	53.18	<i>Teldenia vestigiata</i> (Butler, 1880)	GV03A(1)	UT, SK, AS, NL, ME	Nepal, Sri Lanka, Myanmar, Indonesia (Java)
187	53.19	<i>Thymistida tripunctata</i> Walker, 1865	DD24A(1)	SK, WB, AR	Nepal, Myanmar, China
188	53.15	<i>Tridrepana albonotata</i> (Moore, 1879) ^r	DD27A(1)	UT, SK, WB, AR , JH, TN, AN	Nepal, Sri Lanka, Vietnam, Malaysia, Indonesia (Sumatra, Borneo, Java, Bali, Sulawesi)
189	53.16	<i>Tridrepana flava</i> (Moore, 1879)	AS01C(2); NV02A(1)	UT, SK, WB, AS, ME	China, Taiwan, Malaysia, Indonesia (Sumatra, Sulawesi)
190	53.17	<i>Tridrepana sadana</i> (Moore, 1865)	AS15B(3)	UT, SK, WB, AR	Nepal, Bhutan, Myanmar
Subfamily: Thyatirinae Smith, 1893					
191	54.1	<i>Gaurena argentisparsa</i> Hampson, 1896	SL03A(6), SL05A(2)	SK, WB	Nepal, Bhutan, China (Tibet)
192	54.2	<i>Gaurena aurofasciata</i> Hampson, 1893	DD14A(2), DD22A(1)	SK, AR	Nepal, Myanmar, China
193	54.3	<i>Gaurena florens</i> Walker, 1864 ^p	GH16A(2); GV24A(1); AS10C(1); SL02A(1), SL03A(1); DD13A(1), DD14A(2), DD16A(1), DD20A(1), DD22A(1)	HP , UT, SK, WB, AR, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Thailand
194	54.4	<i>Gaurena florescens</i> Walker, 1865	GV11A(1), GV16A(1); SL05A(1); DD15A(1), DD18A(1), DD20A(3), DD21A(1), DD23B(2), DD28A(2)	HP, SK, WB, AR, NL	Nepal, Bangladesh, Myanmar, China, Cambodia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
195	54.5	<i>Gaurena nigrescens</i> Werny, 1966 *	DD19A(2), DD24A(1), DD25A(3), DD27A(5), DD28A(5)	AR	Nepal, China
196	54.6	<i>Gaurena pretiosa</i> Werny, 1966 *	DD18A(1), DD25A(4), DD26A(3), DD27A(2), DD29A(1)	AR	China
197	54.7	<i>Gaurena sinuata dierli</i> Werny, 1966 *	GV11A(1), GV16A(3), GV17A(2), GV18B(3), GV19A(1), GV21A(1), GV21B(1), GV24A(2), GV24B(1); SL03A(1); DD16A(1); DD24A(1), DD25A(1), DD27A(2), DD29A(1)	UT, WB, AR	China (Tibet), Nepal
198	54.8	<i>Habrosyne indica</i> (Moore, 1867) ^{bq}	GH01C(1); ND05B(1); DD11A(1)	JK, HP, SK, WB, AR	Nepal, Myanmar, China (Tibet), Taiwan, Vietnam, Thailand, Japan
199	54.9	<i>Habrosyne intermedia conscripta</i> Warren, 1912 ⁱ	GH15A(1), GH17B(1); GV14A(2); VF01A(12)	HP, UT	Nepal, China (Tibet)
200	54.10	<i>Habrosyne plagiosa</i> Moore, 1882	SL02A(5)	SK, WB	Nepal
201	54.11	<i>Hiroshia albinigra</i> Ronkay & Ronkay, 2001*	DD27A(1)	AR	China, Vietnam
202	54.13	<i>Hyalospectra hyalinata</i> Moore, 1867	AS15B(1)	HP, UT, SK, WB	Nepal, Bhutan, Sri Lanka, Myanmar, China, Thailand
203	54.16	<i>Isopsestis cuprina</i> Moore, 1881 ^{bi}	GH09A(3), GH16A(1); GV13B(1)	HP, UT, SK, WB	Nepal, China
204	54.14	<i>Macrothyatira danieli</i> Werney, 1966 *	DD29B(1)	AR	Nepal
205	54.17	<i>Stenopsestis alternata</i> (Moore, 1881) ^q	DD13A(1)	SK, WB, AR	Nepal, Myanmar, China (Tibet), Thailand
206	54.15	<i>Parapsestis lichenea</i> (Hampson, 1893) ^q	DD10C(1), DD29B(1)	SK, AR	Nepal, Myanmar, China, Thailand
207	54.18	<i>Tethea consimilis</i> (Warren, 1912) ⁱ	GV03A(1)	HP, UT	Nepal, Myanmar, China, Taiwan, Malaysia, Indonesia (Sumatra), Japan, Korea, Russia
208	54.19	<i>Tethea oberthueri</i> (Houlbert, 1921) ^q	AS09A(1); NV11A(3); DD10C(2), DD8B(1), DD23A(1)	UT, SK, WB, AR	Nepal, Myanmar, China, Taiwan, Malaysia, Indonesia (Borneo, Sumatra)
209	54.12	<i>Toxoides undulata</i> Moore, 1867	NV11A(1)	SK, WB	
210	54.20	<i>Thyatira batis</i> (Linnaeus, 1758) ^q	GV11A(2); AS01E(1); NV11A(1); DD11A(1)	HP, UT, SK, AR	Nepal, China, Taiwan, Malaysia, Indonesia (Sumatra, Java), Japan, Korea, Russia, Mongolia, Turkey, Iran, Germany, Portugal, United Kingdom, Finland, Norway, Austria, Italy, France, Netherlands, Algeria



Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Superfamily: Lasiocampoidea Harris, 1841					
Family: Lasiocampidae Harris, 1841					
Subfamily: Gastropachinae Neumoegen & Dyar, 1894					
211	55.4	<i>Pyrosis rotundipennis</i> (De Joannis, 1929) ^q	DD07A(3)	AR	Myanmar, China, Laos, Vietnam, Thailand
212	55.5	<i>Pyrosis undulosa</i> (Walker, 1855) ^d	GV02D(1); NV11A(1)	HP, UT, WB , ME, MN	Pakistan, Nepal, Sri Lanka, China, Indonesia, Korea, Russia
Subfamily: Lasiocampinae Harris, 1841					
213	55.6	<i>Eteinopla signata</i> Moore, 1879	NV11A(1)	HP, SK, WB	Nepal, Bhutan, Myanmar, China, Taiwan, Thailand, Malaysia, Vietnam, Laos, Cameroon
214	56.1	<i>Euthrix imitatrix</i> (de Lajonqui�re, 1978)*	AS06A(4)	UT	Myanmar, China
215	56.2	<i>Euthrix inobtrusa</i> (Walker, 1862) ^q	ND05A(1)	SK, AR , MI	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Malaysia, Indonesia (Sumatra)
216	56.3	<i>Euthrix isocyma</i> (Hampson, 1892) ^q	ND05A(1)	JK, AR , AS, NL	Nepal, Bhutan, Myanmar, China, Hong Kong, Vietnam, Laos, Cambodia, Thailand
217	56.4	<i>Euthrix laeta</i> Walker, 1855	GV02C(1); AS01E(1), AS12A(1); NV02F(1); ND03C(1), ND05A(2), ND05B(1)	HP, UT, SK, WB, AR, AS, MH, TN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Java), Philippines, Japan, Korea, Russia
218	56.5	<i>Euthrix vulpes</i> Zolotuhin, 2001 ⁱ	AS11A(2)	UT , SK	Nepal, Bhutan
219	55.1	<i>Gastropacha leopoldi</i> Tams, 1935 ^q	NV02A(1); ND05A(6), ND05B(2)	UT, WB, AR , ME, JH, AN	Myanmar, Hong Kong, Thailand, Malaysia, Indonesia (Borneo), Philippines
220	55.2	<i>Gastropacha pardale</i> (Walker, 1855)	GV01A(1); AS07C(1); NV02C(1), NV10C(1)	UT, WB, ME, JH, MH, KA, AN	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Java, Sumatra)
221	56.6	<i>Kunugia latipennis</i> (Walker, 1855) ⁱ	AS01C(2), AS01D(2), AS01E(1)	UT , SK, WB, AS, ME	Nepal, Sri Lanka, Myanmar, China, Cambodia, Laos, Vietnam, Malaysia, Thailand, Indonesia (Sumatra, Borneo), Philippines

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
222	56.7	<i>Kunugia lineata</i> (Moore, 1879)	NV05B(1); DD10C(1), DD11A(1)	JK, HP, UT, SK, WB, AR	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand
223	56.8	<i>Kunugia sinjaevi</i> Zolotuhin & Witt, 2000*	SL02A(2)	WB	Vietnam
224	55.8	<i>Metanastria hyrtaca</i> (Cramer, [1779])	NV11A(1)	UT, WB, AS, MH, MP, OD, TN	Sri Lanka, Nepal, Myanmar, China, Taiwan, Hong Kong, Laos, Cambodia, Thailand, Vietnam, Malaysia, Indonesia (Sumatra, Borneo)
225	55.3	<i>Odonestis bheroba</i> Moore, 1859 ^q	ND05A(1)	SK, WB, AR, AS	Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand
226	55.7	<i>Trabala vishnou</i> (Lefèbvre, 1827)	GH02A(3), GH04A(1); GV01A(3), GV04B(1), GV22A(1); AS01D(1); NV02A(2); ND05A(1); DD05A(2), DD10C(1)	HP, UT, SK, WB, AR, AS, ME, MN, BH, DL, JH, MH, KA, TN, AN	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China (Tibet), Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java, Sumatra), Japan
Subfamily: Malacosminae Tutt, 1902					
227	57.1	<i>Malacosoma indica</i> (Walker, 1855)	GV04A(2), GV13B(7), GV19A(1), GV24A(1), GV24B(1)	HP, UT	Nepal
Subfamily: Unassigned					
228	57.2	<i>Argonestis flammans</i> (Hampson, 1892) ^d	NV11A(1); DD10C(4), DD13A(2), DD22A(6)	WB, AR, MN	Nepal, Bhutan, China, Vietnam, Laos, Thailand
229	57.3	<i>Baodera khasiana</i> (Moore, 1879) ^q	DD23A(3)	SK, WB, AR, AS, ME	Nepal, Bhutan, Myanmar, Vietnam
230	57.4	<i>Lebeda nobilis</i> Walker, 1855	NV02A(3)	JK, UT, SK, WB, ME, NL, MH	Nepal, Bhutan, Bangladesh, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Java)
231	57.5	<i>Paralebeda plagifera</i> (Walker, 1855)	GV03A(5), GV11A(1), GV13B(2); AS10C(1); NV02A(4), NV02C(1)	HP, UT, SK, WB, AS, ME	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand, Indonesia (Java), Philippines, Korea
Superfamily: Bombycoidea Latreille, 1802					
Family: Eupterotidae Swinhoe, 1892					
Subfamily: Eupterotinae Forbes, 1955					
232	58.1	<i>Eupterote pandya</i> Moore, 1865	NV02A(1)	SK, WB, AS, ME	Bhutan, Bangladesh
233	58.2	<i>Eupterote undata</i> Blanchard, 1844 ^q	AS01D(2); DD11A(1), DD16A(1)	HP, UT, WB, AR, PB, JH, CT, AD, MP, MH, KA, TN, KL	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, Malaysia, Indonesia (Sumatra, Java), Philippines



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
234	58.3	<i>Eupterote bifasciata</i> Kishida, 1994	AS01D(1)	UT, GJ, CT	Nepal
235	58.4	<i>Palirisa cervina</i> Moore, 1865 ^q	DD12A(1), DD20A(3)	HP, SK, WB, AR	Nepal, Myanmar, China, Taiwan, Vietnam, Thailand
236	59.1	<i>Pseudojana incandescens</i> Walker, 1855	DD10C(1), DD13A(1)	SK, AR	Nepal, Myanmar, China, Vietnam, Laos, Indonesia, Philippines
Subfamily: Unassigned					
237	59.2	<i>Apha horishana</i> Matsumura, 1927 *	DD07A(1)	AR	Taiwan
238	59.3	<i>Apona caschmirensis</i> (Kollar, [1844]) ^q	GV01A(4); GT03A(3); AS18A(1); DD19A(1)	JK, UT, SK, AR , ME, NL	Pakistan, Nepal
239	59.4	<i>Ganisa postica</i> Walker, 1855 ^q	AS01D(1); DD10C(1)	HP, UT, SK, AR	Pakistan, Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Malaysia, Indonesia, Philippines
Family: Brahmaeidae Swinhoe, 1892					
Subfamily: Unassigned					
240	60.1	<i>Brahmaea hearseyi</i> (White, 1862)	AS01D(1); ND03G(1), ND03H(2)	HP, UT, SK, WB, AR, AS, JH	Nepal, Bangladesh, Myanmar, China, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Kalimantan), Philippines
241	60.2	<i>Brahmaea wallichii</i> (Gray, 1831)	GH16A(2); GV14D(1), GV17A(2); AS15A(1); NV12A(1)	JK, HP, UT, SK, WB, AR, AS, ME	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Philippines, Japan
Family: Endromidae Boisduval, 1828					
242	61.1	<i>Comparmustilia gerontica</i> (West, 1932) *	NV02C(3); SL02A(1); DD10C(2)	WB, AR	Taiwan
243	61.2	<i>Comparmustilia sphingiformis</i> (Moore, 1879) ^q	NV02B(1), NV02C(3), NV02E(1), NV05B(1); DD10C(1)	HP, UT, SK, WB, AR	Nepal, Bhutan, Myanmar, China, Vietnam, Thailand, Malaysia
244	61.3	<i>Mustilia castanea</i> Moore, 1879 ⁱ	GV16A(4), GV17A(1); AS13A(1), AS19A(4); NV11A(1)	UT, WB	Nepal, Bhutan, China, Taiwan
245	61.4	<i>Mustilia falcipennis</i> Walker, 1865 ^q	AS09A(1), AS13A(1); SL03A(1); NV11A(1); DD20A(1), DD13A(1)	UT, WB, AR	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Thailand
246	61.5	<i>Mustilia hepatica</i> Moore, 1879 ^b	GH04A(1); NV02B(1); ND03H(1); DD07A(2), DD10C(2)	HP, UT, SK, WB, AR	Pakistan, Nepal, Bhutan, China, Taiwan, Vietnam, Laos, Malaysia, Indonesia (Borneo, Sumatra)
Family: Bombycidae Latreille, 1802					
Subfamily: Bombycinae Latreille, 1802					
247	61.6	<i>Bombyx huttoni</i> Westwood, 1847	GV01F(1); NV02A(7), NV02C(1), NV02E(1), NV02F(1)	JK, HP, UT, SK, WB, AR, AS	Pakistan, Nepal, Bhutan, Taiwan, Vietnam

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
248	61.7	<i>Gunda sesostris</i> (Vuillot, 1893) ^a	ND03G(1)	AR, AS	China, Thailand, Indonesia (Java), Philippines
249	61.8	<i>Penicillifera apicalis</i> (Walker, 1862) ^d	AS01E(1); NV02A(6)	UT, WB, AS, KL	Bhutan, Myanmar, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Java), Brunei, Philippines
250	61.9	<i>Trilocha varians</i> Walker, 1855 ^d	NV02A(1), NV02F(1)	WB, AR, AS, HR, PB, MH, KA, TN, KL, AN	Nepal, Sri Lanka, China, Hong Kong, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Sulawesi, Java), Philippines, Japan, Brazil
Family: Saturniidae Boisduval, 1837					
Subfamily: Salassinae Michener, 1949					
251	62.1	<i>Salassa lola</i> (Westwood, 1847) ^a	DD10E(1), DD16A(1), DD17A(1), DD21A(2), DD25A(1), DD27A(1), DD28A(1)	HP, SK, WB, AR, AS, ME	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Thailand, Malaysia
252	62.2	<i>Salassa royi</i> Elwes, 1887 ^a	DD11B(1), DD29B(1)	SK, WB, AR	Nepal, Bhutan, China
253	62.3	<i>Sinobirma bouyeri</i> Nauman, Nassig & Rougerie, 2012	DD12A(1), DD15A(7), DD18A(1), DD24A(1)	AR	China (Tibet), Thailand
Subfamily: Saturniinae Boisduval, 1837					
254	63.1	<i>Actias maenas</i> (Doubleday, 1847)	NV02B(3)	SK, WB, AR, AS, ME, MI, MN, NL, KL, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand, Malaysia, Indonesia (Amboina, Borneo, Java, Sumatra, Sulawesi, Sumba, Flores)
255	63.2	<i>Actias selene</i> (Hübner, 1806)	AS01A(1), AS10C(1); NV02B(1); DD16A(1)	JK, HP, UT, SK, WB, AR, AS, ME, MI, MN, NL, BH, UP, MP, CT, MH, OD, GA, KA, TN, KL, AN	Afghanistan, Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Laos, Cambodia, Malaysia, Indonesia (Borneo, Java, Sumatra), Philippines, Japan, Korea, Russia
256	64.3	<i>Antheraea assamensis</i> (Helfer, 1837) ⁱ	AS01A(1)	UT, AS, ME, MN, MI, NL, GJ, UP, PY	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java, Borneo, Sumatra)
257	63.3	<i>Antheraea mylitta</i> (Drury, 1773) ⁱ	GV02D(2)	UT, SK, WB, AR, AS, MI, NL, BH, UP, MP, MH, JH, CT, TS, OD, KA, TN	Nepal, Bangladesh, Sri Lanka, China, Indonesia (Borneo), Philippines, Armenia
258	64.1	<i>Archaeoattacus edwardsii</i> White, 1859	NV10C(1)	SK, WB, AR, AS, ME, MI, MN, NL	Nepal, Bhutan, Myanmar, China (Tibet), Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo)



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
259	64.2	<i>Attacus atlas</i> (Linnaeus, 1758)	NV02E(1)	UT, SK, WB, AR, AS, ME, MI, MN, NL, BH, UP, GJ, MH, KA, TN, AN	Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Malaysia, Thailand, Indonesia (Borneo, Java, Sumatra, Maluku), Philippines, New Guinea, Australia, Netherlands, Germany
260	65.1	<i>Caligula anna</i> (Moore, 1865) ^b	GH02A(1), GH12A(1); DD08A(1), DD09A(1), DD10A(1), DD11B(1), DD15A(1), DD17A(2), DD21A(3)	HP, SK, WB, AR, AS, ME, MN, MI, NL	Nepal, Bhutan, Myanmar, China (Tibet), Vietnam, Thailand
261	65.2	<i>Caligula cachara</i> Moore, 1872 ^a	DD17A(1), DD22A(1)	UT, SK, AR, AS, ME	Nepal, Vietnam, Laos, Thailand
262	66.1	<i>Caligula lindia</i> Moore, 1865	LD04A(2), LD04C(10), LD12A(2), LD22B(2), LD27A(3)	JK, HP, UT, SK, WB	Afghanistan, Pakistan, Nepal, Bhutan, China (Tibet), Russia, Africa
263	66.2	<i>Caligula thibeta</i> (Westwood, 1853)	GV01G(1); GT03A(1)	HP, UT, SK, WB, AR, AS, UP	Nepal, Bhutan, China (Tibet), Taiwan, Vietnam, Thailand, Malaysia
264	66.3	<i>Cricula andrei</i> Jordan, 1909	NV02C(1)	SK, WB, AR, AS, ME, MN	Nepal, Bhutan, Myanmar, China, Laos, Thailand, Indonesia (Java)
265	66.4	<i>Cricula trifenestrata</i> (Helfer, 1837)	NV02B(2), NV05B(1); DD09A(1)	HP, SK, WB, AR, AS, ME, MI, MN, BH, UP, MH, KA, TN, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sulawesi, Java), Philippines, Iran
266	67.1	<i>Loepa katinka</i> (Westwood, 1848)	SL02A(1); NV02A(1), NV02B(1), NV02E(1), NV05B(1)	HP, UT, SK, WB, AR, AS, ME, MI, MN, NL, UP, TN	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Malaysia, Indonesia, Japan
267	67.2	<i>Loepa miranda</i> Moore, 1865	KA01A(1); NV10C(1)	SK, WB	Nepal, Myanmar, China, Vietnam, Laos, Thailand
268	67.3	<i>Loepa sikkima</i> (Moore, 1865) ⁱ	AS01A(1); DD07A(1)	UT, SK, WB, AR	Bhutan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra)
269	68.1	<i>Neoris codyi</i> (Pieglar, 1996)*	LD26B(1), LD31A(1)	JK	Pakistan
270	68.2	<i>Neoris huttoni</i> Moore, 1862	LD26B(1); GV24B(1)	JK, HP, UT, WB, AS, UP	Afghanistan, China, Tajikistan, Uzbekistan, Kyrgyzstan, Kazakhstan, Turkestan, Russia, Mongolia, Iran, Europe, Africa
271	68.3	<i>Neoris stoliczkana</i> Felder, 1868 ⁱ	GV24B(1)	JK, HP, UT	Pakistan

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
272	69.1	<i>Rhodinia newara</i> (Moore, 1872) ⁱ	GV04C(2)	JK, UT , SK, WB, AR, AS, ME, MI, MN	Nepal, Bhutan, Myanmar, China, Vietnam, Thailand
273	69.2	<i>Samia canningi</i> (Hutton, 1860)	DD12A(1), DD16A(2)	JK, HP, UT, SK, WB, AR, AS, ME, MI, MN, NL, TR, MH, KL	Pakistan, Nepal, Bhutan, Myanmar, China (Tibet), Vietnam, Laos, Cambodia, Thailand, Malaysia, France, Ethiopia
Family: Sphingidae Latreille, 1802					
Subfamily: Langiinae Tutt, 1904					
274	70.1	<i>Langia zenzeroides</i> Moore, 1879 ^q	DD09A(2), DD10A(2)	HP, UT, SK, AR , AS, ME, NL	Pakistan, Nepal, Bhutan, China, Taiwan, Vietnam, Thailand, Japan, Korea
Subfamily: Macroglossinae Harris, 1839					
275	70.2	<i>Acosmeryx anceus subdentata</i> Rothschild & Jordan, 1903	GV09A(1); AS01E(1); ND03G(3), ND03H(2)	HP, UT, SK, WB, AR, ME, JH, TN, KA, KL	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java, Borneo, Sumatra, Kalimantan, Sumbawa), New Guinea, Philippines, Australia, Japan
276	70.3	<i>Acosmeryx omissa</i> Rothschild & Jordan, 1903	ND03G(2), ND03H(3); DD10C(2)	HP, UT, SK, WB, AR	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra), Japan, Korea
277	70.4	<i>Acosmeryx socrates</i> Boisduval, 1875	ND03G(3), ND03H(4), ND05B(1)	UT, SK, AR, AS, KA	Sri Lanka, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java), Philippines
278	71.1	<i>Cechenena helops</i> Walker, 1856	ND03H(1)	SK, AR, AS, ME	Thailand, Malaysia, Vietnam, Indonesia (Borneo, Sumatra), New Guinea, South Africa
279	71.2	<i>Cechenena lineosa</i> (Walker, 1856)	DD07A(1)	HP, UT, SK, WB, AR, AS, ME	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Java, Kalimantan)
280	71.3	<i>Cephonodes hylas</i> (Linnaeus, 1771)	AS01A(1)	HP, UT, SK, WB, AS, ME, JH, BH, UP, PB, MP, MH, AD, KA, TN, KL, OD, AN	Pakistan, Nepal, Bhutan, Sri Lanka, China, Taiwan, Vietnam, Thailand, Indonesia, Australia, Japan, Korea, Russia, Tanzania, South Africa, Congo, Zimbabwe, Zambia, Kenya, Madagascar



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
281	72.1	<i>Daphnis hypothous</i> (Cramer, 1780)	NV02B(1)	UT, SK, WB, AR, AS, ME, TR, MP, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java), Philippines, Papua New Guinea, Australia
282	72.2	<i>Daphnis nerii</i> (Linnaeus, 1758)	GV06A(1), GV13B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, UP, DL, GJ, MP, MH, KA, TN, OD	Afghanistan, Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Japan, Russia, Iran, Turkey, UAE, Germany, Austria, Netherlands, Switzerland, Finland, United Kingdom, Italy, Congo, Tanzania, Gabon, Nigeria, Zambia, South Africa, USA
283	71.4	<i>Deilephila rivularis</i> (Boisduval, [1875])	GH04A(1)	HP, UT, SK, WB, ME, PB	Afghanistan, Pakistan, Nepal, Turkey
284	71.6	<i>Elibia dolichus</i> (Westwood, 1848)	ND03C(1)	UT, SK, WB, AR, AS, ME	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Malaysia, Indonesia (Sumatra, Kalimantan, Java, Borneo), Philippines (Palawan)
285	71.5	<i>Eupanacra sinuata</i> (Rothschild & Jordan, 1903)	NV02A(1)	HP, UT, SK, WB , AR, AS, ME	Nepal, Myanmar, China, Vietnam, Laos, Thailand, Philippines, Australia
286	72.3	<i>Hippotion boerhaviae</i> (Fabricius, 1775)	GV02D(2), GV10C(1); NV02A(1)	JK, HP, UT, SK, WB, AR, AS, AD, JH, PB, GJ, MP, CT, MH, KA, TN, OD, AN	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Java, Borneo), Papua New Guinea, Philippines, Fiji, Australia, New Zealand, Japan
287	72.4	<i>Hippotion celerio</i> (Linnaeus, 1758)	SL03A(1)	HP, UT, SK, WB, AR, UP, GJ, RJ, PB, MP, MH, KA, TN	Pakistan, Nepal, China, Taiwan, Thailand, Malaysia, Indonesia, Papua New Guinea, Australia, Turkey, Portugal, Spain, Germany, Algeria, Iran, Netherlands, Gabon, Tanzania, Kenya, Zambia, South Africa, Nigeria
288	72.5	<i>Hippotion rosetta</i> (Swinhoe, 1892)	GV14B(2), GV15A(2); AS01C(1); NV02A(1), NV02F(1), NV02G(1)	HP, UT, SK, WB, AR, AS, ME, BH, JH, UP, GJ, HR, AD, MP, MH, GA, KL, KA, TN, OD, LD, AN	Pakistan, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Java), Philippines, Papua New Guinea, Australia, Japan, USA

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
289	73.1	<i>Hyles gallii</i> (Rottemburg, 1775)	LD04A(7), LD09A(1)	JK	Afghanistan, Pakistan, Nepal, China, Russia, Mongolia, Turkey, Kazakhstan, United Kingdom, Germany, Ireland, Denmark, Finland, Spain, Netherlands, Austria, Sweden, Norway, Italy, Portugal, Canada, USA, Mexico
290	73.2	<i>Hyles hippophaes</i> (Esper, 1789)	LD02B(4), LD04A(14), LD09A(8), LD21B(3), LD22B(8)	JK, HP, SK	Pakistan, China, Russia, Mongolia, France, Romania, Switzerland, Austria, Iran, Turkey, Ukraine, Uzbekistan, Kyrgyzstan, Kazakhstan, Italy
291	73.3	<i>Hyles nervosa</i> (Rothschild & Jordan, 1903)	LD04A(1), LD04C(1)	JK, HP	Afghanistan, Pakistan, China (Tibet)
292	73.8	<i>Macroglossum pyrhosticta</i> (Butler, 1875)	ND03G(1), ND03H(3)	UT, SK, WB, AR, AS, ME, TN	Nepal, Bhutan, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia, Philippines, Japan, Korea, Russia, USA
293	73.7	<i>Macroglossum bombylans</i> (Boisduval, 1875)	GV01A(2)	HP, UT, SK, WB, AR, AS, ME, KA	Nepal, Bhutan, Bangladesh, China, Taiwan, Hong Kong, Vietnam, Thailand, Indonesia (Sumatra, Borneo), Philippines, Japan, Korea, Russia
294	73.10	<i>Nephele hespera</i> (Fabricius, 1775)	AS01B(6)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, PB, GJ, JH, MP, AD, MH, KA, TN, PY, KL, AN	Afghanistan, Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Sumatra), Papua New Guinea, Australia, Iran, Ecuador
295	74.1	<i>Pergesa acteus</i> (Cramer, 1779)	AS01E(2)	JK, HP, UT, SK, WB, AR, AS, ME, TR, NL, MN, MI, JH, PB, MH, KA, TN, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Java), Philippines, Japan
296	73.6	<i>Rhagastis albomarginatus</i> (Rothschild, 1894)	NV10C(1), NV10D(1), NV11A(6),	SK, WB, AR, AS, ME	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra, Java, Borneo)
297	73.5	<i>Rhagastis confusa</i> Rothschild & Jordan, 1903	GH04A(1); AS07C(1); NV10C(1)	HP, UT, SK, WB, AR, AS, ME	Nepal, Bangladesh, China, Vietnam, Thailand



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
298	73.4	<i>Rhagastis olivacea</i> (Moore, 1872)	GH02A(1); AS07C(1)	HP, UT, SK, WB, AR, AS, ME	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo), Korea
299	73.9	<i>Rhopalopsyche nycteris</i> (Kollar, 1844)	GH18A(2); GT01A(1)	JK, HP, UT, SK, ME	Afghanistan, Pakistan, Nepal, Myanmar, China, Japan
300	74.2	<i>Theretra alecto</i> (Linnaeus, 1758)	GV14A(1); AS01A(3); NV02A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, PB, JH, CT, MP, MH, TN, AN	Afghanistan, Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java, Borneo), Philippines, Japan, Turkey, Lebanon, Azerbaijan, Ujbekeistan, Kyrgyzstan, Tajikistan, Cyprus, UAE, Iran, Greece, Egypt
301	74.3	<i>Theretra boisduvalii</i> (Bugnion, 1839)	GH01A(1); NV05B(1), NV10C(1), NV11A(4); ND03H(1), ND05A(1); DD10C(3), DD22A(1)	HP, UT, SK, WB , AR, AS, ME, GJ, MH, CT, TN	Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines, Japan, Russia, Iran, Turkey, Greece
302	74.4	<i>Theretra clotho</i> (Drury, 1773)	AS01A(1), AS01C(1); NV02A(2), NV02B(3), NV02C(2), NV02F(6), NV02F(5); ND03G(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, JH, PB, GJ, CT, MH, TN, KA, KL, AN	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo), Philippines, Papua New Guinea, Australia, Japan, Korea
303	74.5	<i>Theretra gnoma</i> (Fabricius, 1775)	NV02A(1), NV02E(2), NV02F(1)	UT, WB , JH, CT, MH, KA, TN, KL	Nepal, Sri Lanka, Myanmar, China, Thailand, Australia, Russia
304	75.6	<i>Theretra lycetus</i> (Cramer, 1775)	AS01A(2), AS01D(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, BH, GJ, MH, KA, TN	Nepal, Bhutan, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand, Malaysia, Indonesia
305	75.1	<i>Theretra nessus</i> (Drury, 1773)	GV09B(2); AS01C(1); NV02A(8), NV02C(9), NV10C(2), NV11A(5); ND03G(5), ND03H(7), ND05A(3)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, TR, JH, PB, GJ, MP, MH, GA, CT, AD, KA, TN, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo), Philippines, Papua New Guinea, Australia, Fiji, Japan, Korea, USA

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
306	75.4	<i>Theretra oldenlandiae</i> (Fabricius, 1775)	GV03A(1); AS01A(3), AS01E(2)	JK, HP, UT, SK, WB, AR, AS, ME, MN, MI, NL, JH, UP, GJ, PB, MP, MH, CT, KA, KL, TN, AN	Afghanistan, Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java), Philippines, Papua New Guinea, Australia, Fiji, Japan, Korea, Russia
307	75.3	<i>Theretra pallicosta</i> (Walker, 1856) ^d	SL03A(1)	UT, WB , AR, AS, ME, KA, TN	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Java), Philippines
308	75.2	<i>Theretra silhetensis</i> (Walker, 1856) ⁱ	AS01A(1)	HP, UT , WB, AR, AS, ME, TR, MP, KA, TN, AN	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Sulawesi, Ambon), Papua New Guinea, Australia, Fiji, Japan
309	75.5	<i>Theretra suffusa</i> (Walker, 1856) ^d	NV02F(1)	WB , AR, AS, TR, AN	Nepal, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java), Philippines, Japan, Cameroon
Subfamily: Smerinthinae Grote & Robinson, 1865					
310	76.1	<i>Ambulyx liturata</i> Butler, 1875	NV02B(1), NV02C(1), NV05B(1)	UT, SK, WB, AR, AS, ME, JH, CT	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines
311	76.2	<i>Ambulyx ochracea</i> (Butler, 1885)	ND03G(5), ND03H(13)	UT, SK, AR, AS, ME, NL, MN	Nepal, Bhutan, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Japan, Korea
312	76.3	<i>Ambulyx subtrigiliis</i> (Westwood, 1848)	ND03H(2)	UT, SK, WB, AR, AS, ME, JH, MH, KA, TN, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java), Philippines
313	76.4	<i>Amplipterus panopus</i> (Cramer, 1779)	GV01B(2); AS01B(1); NV02A(1), NV02C(1), NV05B(1)	HP, UT, SK, WB, AR, AS, MH, AD, KA, TN, KL, AN	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia, Philippines



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
314	77.1	<i>Anambulyx elwesi</i> (Druce, 1882)	GH02A(2); AS01D(1)	HP, UT, SK, WB, AS, ME	Pakistan, Nepal, Bhutan, Myanmar, China, Vietnam, Thailand
315	77.2	<i>Callambulyx poecilus</i> (Rothschild, 1898)	ND03H(1)	UT, SK, AR, ME, NL	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Indonesia (Borneo, Java, Sumatra)
316	77.3	<i>Callambulyx rubricosa</i> (Walker, 1856)	ND03H(2)	UT, SK, WB, AR, AS, ME	Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Java)
317	77.5	<i>Clanidopsis exusta</i> (Butler, 1875)	AS01D(1)	HP, UT, PB	Pakistan, Nepal, Bhutan, China
318	78.4	<i>Clanis bilineata</i> (Walker, 1866)	AS01A(2)	UT, SK, WB, AS, ME, NL, UP, KA	Nepal, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Indonesia (Borneo, Sumatra), Japan, Korea, Russia
319	78.5	<i>Clanis deucalion</i> (Walker, 1856)	GH04A(1)	HP, UT, AR, ME, PB, GJ	Pakistan, China (Tibet), Laos, Thailand, Japan, Korea
320	78.3	<i>Clanis phalaris</i> (Cramer, 1777)	AS01A(2)	HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, UP, DL, PB, MP, AD, MH, KA, TN, PY, AN	Pakistan, Sri Lanka, Myanmar, Thailand
321	77.4	<i>Craspedortha porphyria</i> (Butler, 1876)	ND03H(2)	UT, SK, WB, AR, ME	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Indonesia (Java)
322	77.6	<i>Dolbina inexacta</i> Walker, 1856	ND03G(1), ND03H(4)	HP, UT, SK, AR, AS, ME, JH, PB, MH, AD, KA, TN	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Japan, Russia
323	77.7	<i>Leucophlebia lineata</i> Westwood, 1848 ^a	GV03B(2), GV09B(1); AS09A(5); ND03G(1)	HP, UT, WB, AR, AS, ME, MH, KA, TN, KL	Pakistan, Nepal, Bhutan, Sri Lanka, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Java, Borneo), Philippines, Papua New Guinea
324	79.2	<i>Marumba cristata</i> (Butler, 1875)	AS07C(3)	HP, UT, SK, WB, AR, PB	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo)
325	79.3	<i>Marumba dyras</i> (Walker, 1856)	AS01A(2); ND03H(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, TR, PB, GJ, MP, CT, MH, KA, TN, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Laos, Thailand, Malaysia, Indonesia (Borneo, Java), Philippines, Australia
326	79.4	<i>Marumba irata</i> Joicey & Kaye, 1917 ^a	DD10C(4)	AR, NL, MN	Nepal, Myanmar, China (Tibet), Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo), Mongolia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
327	78.1	<i>Parum colligata</i> (Walker, 1856)	DD10C(1)	AR, MN	Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Japan, Korea, Russia
328	79.1	<i>Polyptychus trilineatus</i> Moore, 1888	AS01A(1)	HP, UT, SK, AR, AS, ME, NL, PB, CT, KA, AN	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java), Philippines
329	78.6	<i>Rhodoprasina floralis</i> (Butler, 1876) ^a	DD10E(1)	SK, WB, AR	Nepal, Bhutan, Myanmar
330	78.2	<i>Smerinthus kindermannii</i> Lederer, 1853	LD02B(2), LD04A(3), LD04C(2), LD12A(1), LD15A(1), LD21B(1), LD22B(6), LD30A(3)	JK, HP, SK	Afghanistan, Pakistan, China, Mongolia, Turkey, Iran, Iraq, Azerbaijan, Kazakhstan, Armenia, Cyprus, Lebanon, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Israel, Kuwait
Subfamily: Sphinginae Latreille, 1802					
331	80.1	<i>Acherontia lachesis</i> (Fabricius, 1798)	AS01A(1); NV10C(1), NV11A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, JH, GJ, AD, MP, MH, GA, CT, KA, TN, KL, OD, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java, Maluku), Philippines, Papua New Guinea, Australia, Japan, Russia
332	80.2	<i>Acherontia styx</i> (Westwood, 1847)	NV08A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, DL, GJ, RJ, JH, OD, AD, MP, MH, CT, KA, TN, KL, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Maluku), Philippines, Japan, Korea, Russia, Iraq, Iran, Israel, UAE
333	80.3	<i>Agrius convolvuli</i> (Linnaeus, 1758)	GV05A(3); AS01A(1); NV02A(4), NV08A(1); DD15A(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, TR, UP, JH, GJ, CT, MP, MH, KA, TN, OD, AN	Pakistan, Sri Lanka, Myanmar, China, Taiwan, Thailand, Malaysia, Indonesia, Papua New Guinea, Australia, New Zealand, Japan, Korea, Russia, Mongolia, Germany, France, Finland, Netherlands, United Kingdom, Ireland, Norway, Sweden, Portugal, South Africa, Tanzania, Zambia, Kenya
334	81.1	<i>Apocalypsis velox</i> Butler, 1876	ND03G(1); DD24A(1)	SK, WB, AR, AS, ME	Nepal, Bhutan, China, Vietnam, Laos



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
335	81.2	<i>Psilogramma increta</i> (Walker, [1865])	GV10C(2), GV14D(1); NV02C(1); ND03G(1)	JK, UT, AR, AS, NL, CT, MP, MH, TN, AN	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia, Australia, Japan, Korea, USA
336	81.3	<i>Psilogramma menephron</i> (Cramer, [1780])	AS01E(1); NV02A(11), NV02B(3), NV02C(6), NV02F(1), NV05B(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN, MI, JH, DL, GJ, CT, MP, MH, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra), Philippines, Papua New Guinea, Australia
Superfamily: Geometroidea Leach, 1815					
Family: Epicopeiidae Swinhoe, 1892					
337	82.1	<i>Burmeia leesi</i> Minet, 2002 *	DD25A(1)	AR	Myanmar, China
Family: Uraniidae Leach, 1815					
Subfamily: Auzeinae Minet, 1994					
338	82.2	<i>Auzea rufifrontata</i> Walker, 1862	NV02A(1)	SK, WB, AR, ME, NL, MN	Nepal, Bhutan
Subfamily: Epipleminae Hampson, 1892					
339	82.3	<i>Epiplema adamantina</i> Inoue, 1998 *	GH01E(1)	HP	Nepal
340	82.4	<i>Epiplema bicaudata</i> Moore, 1867	GH17B(1); GV03A(2), GV10A(4), GV11A(2), GV19A(8); AS03A(5)	JK, HP, UT, SK, WB, AR, ME	Nepal, Bhutan, China, Japan, Korea
341	82.5	<i>Epiplema himala</i> (Butler, 1880)	DD27A(1)	SK, WB, AR, ME	Nepal, Bhutan, China
342	82.6	<i>Epiplema restricta</i> Hampson, 1895 ^o	ND03I(1)	UT, SK, AR, NL	Bhutan
343	82.7	<i>Orudiza protheclaria</i> Walker, 1861	GV02B(1)	UT, SK, AR, AS, ME, TR, MH, KA, KL	Nepal, Bhutan, Bangladesh, Myanmar, Hong Kong, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Java, Borneo, Sumatra, Sulawesi), Philippines
Subfamily: Microniinae Guenée, 1857					
344	82.8	<i>Acropteris ciniferaria</i> (Walker, 1866) ^o	ND03I(1)	WB, AR, AS, AN	Sri Lanka, Myanmar, China, Hong Kong, Thailand, Malaysia, Indonesia (Java, Sulawesi), Philippines
345	82.9	<i>Micronia aculeata</i> Guenée, 1857	GV01D(1)	HP, UT, SK, WB, AR, AS, ME, TR, UP, JH, CT, MP, MH, KA, TN, KL, AN	Nepal, Myanmar, Sri Lanka, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Java, Borneo, Sulawesi), Australia
346	82.10	<i>Pseudomicronia advocataria</i> Walker, 1861 ¹	GV01F(1)	UT, AR, AS, MH, AN	Sri Lanka, China, Taiwan, Malaysia, Indonesia (Sumatra, Java), Philippines

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Uraniinae Blanchard, 1845					
347	82.11	<i>Lyssa zampa</i> (Butler, 1869)	NV05C(1), NV10C(1); ND03G(1)	UT, WB, AR, AS, TR, ME, NL, PY, AN	Nepal, Bhutan, Bangladesh, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sulawesi), Philippines, Japan, Korea
Family: Geometridae Leach, 1815					
Subfamily: Desmobathrinae Meyrick, 1886					
348	83.1	<i>Eumelea rosalia</i> (Stoll, 1781)	GV01E(1); NV02A(1)	UT, SK, WB, AS, MH, KL, AN	Sri Lanka, Bangladesh, Myanmar, China, Taiwan, Thailand, Malaysia, Cambodia, Indonesia (Java, Borneo), Philippines, Papua New Guinea, Australia
349	83.2	<i>Ozola picaria</i> (Swinhoe, 1892)	NV02A(3), NV02C(1), NV02F(1), NV13A(1)	SK, WB , ME	
Subfamily: Ennominae Duponchel, 1845					
350	84.1	<i>Abraxas illuminata</i> Warren, 1894	NV02A(1), NV11A(1)	SK, WB	Nepal, Bhutan, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Japan
351	84.6	<i>Abraxas irrorata</i> Moore, 1867 ⁱ	GV24B(3)	UT , SK, WB	Nepal
352	84.2	<i>Abraxas martaria</i> Guenée, 1857	NV9A(1), NV10B(3), NV10C(2), NV11A(18); DD03B(1), DD04B(2)	HP, SK, WB, AR, AS, ME	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Japan
353	84.7	<i>Abraxas nigrivena</i> Warren, 1893 ⁱ	AS16A(5), AS19A(4), AS13A(1), AS15B(1), AS22B(1), AS24A(1)	UT , SK, AS	Nepal
354	84.3	<i>Abraxas peregrina</i> Inoue, 1995 ^b	GH05A(1); GV01A(5)	HP , UT	Nepal, Bhutan, Vietnam
355	84.5	<i>Abraxas picaria</i> Moore, 1868	GH21B(1); GV14D(2), GV19A(3)	HP, UT, SK, WB	Nepal, Bhutan, China
356	84.4	<i>Abraxas sylvata</i> (Scopoli, 1763) ^b	GH01D(2); GV16B(21), GV20A(15), GV24B(7)	HP , UT, SK, AS, TN	Nepal, Myanmar, China, Japan, Thailand, Malaysia, Turkey, Iran, United Kingdom, Finland, Netherlands, Sweden, Denmark, Austria, Estonia, Germany, France, Norway
357	84.8	<i>Achrosis costimaculata</i> (Moore, 1868)	NV02A(5), NV02C(1)	SK, WB, ME, NL	Indonesia (Borneo)
358	84.9	<i>Achrosis incitata</i> (Walker, 1862) ^a	NV02A(1), NV02C(1), NV05B(1); ND05A(1)	SK, WB, AR , AS, MI, ME, MH	Nepal, Bhutan, China, Thailand
359	84.10	<i>Achrosis lithosiaria</i> (Walker, 1862) ^a	NV02A(2); ND03E(1)	SK, AR , NL, ME	Nepal, Thailand, Malaysia, Indonesia (Borneo, Sumatra)



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
360	84.11	<i>Achrosis rufescens</i> (Butler, 1880)	DD18A(2)	SK, WB, AR	Nepal, Malaysia
361	84.12	<i>Alcis admissaria</i> Guenée, [1858] ^a	LD19A(3), LD27A(1), LD32A(1)	JK , HP, UT, ME	Afghanistan, Bhutan, Taiwan, Japan, Kyrgyzstan
362	84.13	<i>Alcis albifera</i> (Moore, 1888) ^q	DD10C(3), DD11A(1)	UT, SK, WB, AR	Nepal, Japan, Korea
363	84.14	<i>Alcis arisema</i> Prout, 1934	DD15A(1)	AR	Nepal, China, Japan
364	84.15	<i>Alcis decussata</i> (Moore, 1867) ^q	DD12A(3), DD18A(1)	UT, SK, WB, AR	Nepal, Myanmar, Thailand, Japan
365	84.16	<i>Alcis periphracta</i> (Prout, 1926)*	ND03E(1)	AR	Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia, Brunei
366	84.17	<i>Alcis quadrifera</i> (Walker, 1866) ^b	GH01E(2), GH01F(1)	HP , SK, WB	Nepal, Bhutan
367	84.18	<i>Alcis semialba</i> (Moore, 1888)	AS06A(1), AS10A(1)	HP, UT, SK	
368	84.19	<i>Alcis trikotaria</i> Felder & Rogenhofer, 1875	LD04A(1), LD08A(1), LD19A(2), LD26A(3)	JK	Pakistan, Kyrgyzstan, Tajikistan
369	84.20	<i>Amblychia angeronaria</i> Guenée, 1858	ND03E(1), ND03H(1)	UT, SK, WB, AR, AS, BH, AN	Nepal, Sri Lanka, China, Taiwan, Thailand, Malaysia, Indonesia (Borneo), Brunei, Philippines, Papua New Guinea, Australia, Japan
370	84.21	<i>Amblychia pardicelata</i> Walker, 1862	GV03B(2), GV09A(1), GV07B(3), GV11A(3); AS10C(2); NV11A(1)	UT, SK, WB, AR, ME	Nepal, Bhutan, Bangladesh, Myanmar, Vietnam, Laos
371	85.1	<i>Amraica recursaria</i> (Walker, 1860) ^q	AS01A(1); DD15A(1)	UT , WB, AR , ME, MP, MH, TN	Pakistan, Nepal, Myanmar, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra), Japan
372	85.2	<i>Anonychia grisea</i> (Butler, 1893) ^q	GV02B(3), GV14A(1); AS06A(2), AS08A(1), AS15B(1); DD24A(1)	HP, UT, SK, AR , ME	Nepal, Myanmar, China
373	85.3	<i>Anonychia lativitta</i> (Moore, 1888)	GH06A(1), GH11A(1), GH17B(1), GH21B(5), GH23A(3); GV18B(1); VF01A(1); AS11A(2), AS14A(2), AS26A(1), AS27A(3); NV02A(2)	HP, UT, SK, WB	Nepal
374	85.4	<i>Anonychia violacea</i> Warren, 1893	GV04A(7), GV12A(4), GV13A(12), GV14A(11), GV14B(3), GV16A(2), GV17A(9), GV18B(12), GV21B(2); VF01A(1); AS11A(1), AS14A(1)	UT, SK, WB	Bhutan
375	85.7	<i>Antipercnia belluaria</i> (Guenée, 1858)	DS01A(1); GH01C(1); GV01A(1); AS03A(1), AS06A(1); NV02A(13), NV02C(1), NV02E(1), NV11A(2); ND05A(3), ND05B(1); DD10C(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MI	Nepal, Bhutan, China, Thailand, Malaysia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
376	85.8	<i>Percnia felinaria</i> Guenée, 1858	SL03A(1); NV02A(2), NV02B(5), NV02C(2), NV02E(2), NV10C(1), NV10D(1), NV11A(1); DD03C(2), DD10C(4)	HP, SK, WB, AR, AS, ME, NL	Nepal, Bangladesh, Vietnam
377	85.10	<i>Metabraxas tincta</i> (Hampson, 1895) ^a	DD10E(1)	SK, WB, AR	Bhutan
378	85.9	<i>Metabraxas coryneta</i> (Swinhoe, 1894)	NV11A(1)	SK, WB , ME, NL	Nepal, Bhutan, Myanmar, Laos
379	85.11	<i>Metapercnia ductaria</i> (Walker, 1862)	ND03H(1)	SK, WB, AR, AS, NL	Nepal, China, Vietnam, Laos, Thailand
380	85.5	<i>Xenoplia foraria</i> (Guenée, 1858)	GV01F(1), GV07A(1), GV07B(1); AS09A(1); SL01A(1)	HP, UT, SK, WB , ME	Nepal, China, Hong Kong, Thailand, Japan
381	85.6	<i>Xenoplia maculata</i> (Moore, 1868) ^b	GH01F(1); GV12B(1); AS09A(3), AS10C(1), AS013A(1); SL01A(2), SL02A(2)	HP , UT, SK, WB, AR, ME	Nepal
382	85.12	<i>Aplochloa dentisignata</i> (Moore, 1867)	AS09A(2), AS13A(2), AS15B(1); KA01A(1)	HP, UT, SK, WB, AR	Nepal, Bhutan, Myanmar, Vietnam
383	85.13	<i>Apoheterolocha patalata</i> (Felder & Rogenhofer, 1875)	GH01C(1), GH21B(1); AS26A(1)	HP, UT, SK, AR, ME	Nepal, Bhutan, Myanmar, China, Taiwan, Indonesia (Borneo)
384	85.14	<i>Apophyga sericea</i> Warren, 1893 ^a	SL04A(5); DD12A(1), DD14A(1), DD15A(8), DD17A(2), DD20A(1), DD21A(1), DD25A(5), DD26A(1), DD27A(2), DD28A(2)	SK, WB , AR	Bhutan, Myanmar, Indonesia (Borneo)
385	86.1	<i>Arichanna flavinigra</i> Hampson, 1907	GH23A(11); AS12A(1), AS17A(2)	JK, HP, UT, SK, PB	Nepal, Bhutan, Myanmar, China (Tibet)
386	86.3	<i>Arichanna tenebraria</i> Moore, 1867 ^b	GH23A(2); GV19A(1), GV24A(12), GV24B(5)	HP , UT, SK, ME	Nepal, China, Taiwan
387	86.2	<i>Arichanna interplagata</i> (Guenée, 1858) ^a	DD28A(1)	SK, AR	Nepal, China
388	86.4	<i>Arichanna jaguarinaria</i> Oberthur, 1881	DD18A(1)	AR, NL	China, Japan
389	86.5	<i>Arichanna subaenescens</i> Warren, 1893 ^a	DD27A(1), DD29B(1)	SK, AR	Nepal, Bhutan
390	86.6	<i>Arichanna transfasciata</i> Warren, 1893	NV08A(1)	UT, SK, WB, AR, ME, NL	Nepal, Bhutan, Myanmar, China, Laos, Thailand
391	85.15	<i>Artemidora disistaria</i> (Walker, 1862) ^b	GH04A(3), GH06B(1)	HP , UT	Nepal
392	86.7	<i>Biston bengaliaria</i> (Guenée, 1858)	GV10B(2); NV05C(1)	UT, SK, WB, AR, AS, ME	Nepal, China (Tibet), Thailand
393	86.8	<i>Biston betularia</i> (Linnaeus, 1758) ^a	LD02B(3), LD04A(7); GH01F(1)	JK , HP	Nepal, China, Japan, Korea, Mongolia, Russia, Kazakhstan, Kirgystan, Turkmenistan, Georgia, Azarbaizan, Armenia, United Kingdom, Netherlands, Finland, Denmark, Sweden, Austria, France, Norway, Germany, USA



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
394	86.9	<i>Biston falcata</i> (Warren, 1893) ^b	GH12A(1), GH16A(1); GV18A(2), GV20A(2); AS09A(3), AS19A(1), AS27A(1)	HP, UT, SK, AR	Nepal, Bhutan, China (Tibet)
395	86.10	<i>Biston panterinaria</i> Bremer & Grey, 1853	DD10E(1), DD11A(1)	SK, AR	Nepal, Bhutan, China (Tibet), Vietnam, Thailand, Japan, Korea
396	86.11	<i>Biston pustulata</i> Moore, 1868 ^a	DD18A(2)	AR, CT	China, Thailand, Malaysia, Indonesia (Borneo), Philippines
397	86.12	<i>Biston regalis</i> (Moore, 1888) ^a	GH02A(1); AS07C(1), AS09A(1); NV02B(1); DD11A(1)	JK, HP, UT, SK, WB, AR, ME	Pakistan, Nepal, Myanmar, China, Taiwan, Thailand, Malaysia, Philippines, Japan, Korea, Russia, USA
398	86.13	<i>Biston sinuata</i> (Hampson, 1895)	SL02A(2)	SK, WB	Bhutan
399	86.14	<i>Biston suppressaria</i> (Guenée, 1858)	GV08A(1), GV14D(1); AS01C(4), AS01D(5); NV02A(1), NV02C(3), NV02F(2); ND03H(1)	HP, UT, SK, WB, AR, AS, TR, NL, JH, CT, MP, MH, KA, TN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Japan
400	85.16	<i>Celenna festiviaria</i> (Fabricius, 1794)	NV05C(1); DD04B(1)	SK, WB, AR, AS, ME, NL, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Java), Philippines, Japan
401	85.17	<i>Chiasmia pseudonora</i> Singh, Goyal & Mandeep, 2012 ^a	ND05A(2)	AR, MH, KA	
402	92.1	<i>Chlorodontopera discospilata</i> (Moore, 1867)	AS10B(2); NV11A(2); DD07A(1)	UT, SK, WB, AR, ME, TR	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos
403	87.1	<i>Chorodna creataria</i> (Guenée, 1858)	NV02A(2), NV02G(1)	SK, WB, AR, AS, ME	Nepal, Bangladesh, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand
404	87.2	<i>Chorodna erebusaria</i> Walker, 1860	NV11A(1)	SK, WB, AR, ME	Nepal, Bhutan, Vietnam, Laos, Thailand
405	87.3	<i>Chorodna fulgurita</i> (Walker, 1860)	NV02A(1); ND03H(1); DD10C(1), DD11A(1)	UT, SK, WB, AR, AS, ME, MN	Nepal, China
406	87.5	<i>Chorodna metaphaeria</i> Walker, 1862 ^a	ND05A(1), ND05B(1); DD18A(2)	SK, WB, AR, AS	Nepal, Bhutan, Vietnam, Thailand
407	87.6	<i>Chorodna moorei</i> Thierry-Mieg, 1899	ND05B(1)	SK, WB, AR, AS, NL	Nepal, Bhutan, Taiwan, Vietnam
408	87.4	<i>Chorodna oblitterata</i> (Moore, 1868) ^a	DD07A(1), DD08B(3), DD10D(3), DD12A(1), DD20A(1), DD22B(1)	SK, WB, AR	Nepal
409	88.1	<i>Chorodna ochreimacula</i> (Prout, 1914)	SL01A(1)	WB	Taiwan, Hong Kong, Thailand
410	87.7	<i>Chorodna reticulata</i> (Hampson, 1895) ^a	DD08B(3), DD12A(1)	SK, AR	Malaysia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
411	88.2	<i>Chorodna similis</i> (Moore, 1888) ^p	GH06A(1); NV11A(3)	HP, SK, WB, ME	Nepal
412	88.3	<i>Chorodna testaceata</i> Moore, 1867 ^q	ND05A(1)	SK, WB, AR, ME	Vietnam, Thailand
413	88.8	<i>Cleora determinata</i> (Walker, 1860) *	SL01A(1); NV08A(1); ND03H(1)	WB, AR	Bhutan, Myanmar, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Borneo), Australia
414	88.9	<i>Cleora propulsaria</i> (Walker, 1860) ^q	NV02A(1); ND05A(2)	SK, WB, AR, ME, NL, TN	Bhutan, Myanmar, China, Taiwan, Thailand, Malaysia, Indonesia (Borneo), Philippines
415	88.4	<i>Corymica arnearia</i> Walker, 1860	AS01E(1), AS10A(2); NV02F(1)	HP, UT, SK, WB, AS, ME, KA	Bhutan, Sri Lanka, Myanmar, China (Tibet), Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo), Japan, Korea
416	88.5	<i>Corymica pryeri</i> (Butler, 1878) ^p	GH01C(1)	HP, AR, AS	Taiwan, Thailand, Indonesia (Sumatra, Borneo), Papua New Guinea, Australia, Japan, Korea
417	88.6	<i>Corymica specularia</i> (Moore, 1888)	AS13A(1)	HP, UT, SK, WB, AS, TN	Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Thailand, Japan, Korea
418	88.7	<i>Ctenognophos eolaria</i> Guenée, 1858	GH11A(2); AS10A(6)	JK, HP, UT, SK, WB, ME, PB	China (Tibet), Tajikistan, Kyrgyzstan
419	89.1	<i>Dalima apicata</i> (Moore, 1868) ^l	AS10C(1); KA01A(1); DD11A(1)	HP, UT, SK, WB, AR, NL	Nepal, Bhutan, Vietnam
420	89.3	<i>Dalima calamina</i> (Butler, 1880) ^q	ND05A(1)	SK, WB, AR, ME	Nepal
421	89.4	<i>Dalima latitans</i> (Warren, 1893) ^q	DD02A(1), DD18A(1), DD20A(1), DD23C(1)	HP, SK, AR	
422	89.2	<i>Dalima lucens</i> Warren, 1893	DD18A(1)	SK, AR	Nepal
423	89.5	<i>Dalima metachromata</i> (Walker, 1862)	AS14A(1); DD11C(2)	HP, UT, SK, WB, AR	Nepal, Vietnam
424	89.6	<i>Dalima schistacearia</i> Moore, 1868	NV02A(1); DD22A(1)	HP, SK, WB, AR, ME, NL	Nepal, Bhutan, Japan
425	89.7	<i>Dalima truncataria</i> (Moore, 1868) ^l	AS10C(1); DD18A(1)	UT, SK, WB, AR, ME	Nepal, Bhutan, Vietnam
426	88.10	<i>Darisa firmilinea</i> (Prout, 1926) ^q	DD08B(3), DD20A(1)	AR, ME	Nepal
427	88.11	<i>Darisa lampasaria</i> (Hampson, 1895) ^d	ND05A(1)	WB, ME	Nepal, China, Taiwan, Thailand
428	88.12	<i>Darisa mucidaria</i> (Walker, 1866) ^l ^q	GV14B(1); AS06A(2), AS15A(3); DD08B(3), DD12A(1), DD18A(1), DD20A(1), DD22B(1), DD26A(1)	UT, SK, WB, AR, ME	Nepal, Thailand
429	88.13	<i>Dilophodes elegans</i> (Butler, 1878) ^p	DD10C(2)	AR, ME	Myanmar, China, Taiwan, Vietnam, Malaysia, Indonesia (Borneo), Japan
430	88.14	<i>Dissoplaga flava</i> (Moore, 1888) ^q	DD10E(1)	AR, ME	Nepal, Myanmar, China, Taiwan



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
431	88.15	<i>Doroptera nicevillei</i> (Hampson, 1895)	DD10A(1)	SK, WB, AR	Nepal, Japan, Korea
432	85.18	<i>Eilicrinia cordiaria</i> (Hübner, 1790) ^a	LD09A(1); GH03B(2)	JK , HP	Japan, Russia, Tajikistan, Kyrgyzstan, Kazakhstan, Iran, Turkey, Azerbaijan, Armenia, Bulgaria, Georgia, Romania, Syria, Hungary, Austria
433	88.19	<i>Entomopteryx obliquilinea</i> (Moore, 1888)	NV10C(1)	UT, SK, WB, AR, AS, ME	Bhutan, Myanmar, China, Hong Kong, Vietnam
434	88.16	<i>Fascellina inornata</i> (Warren, 1893) ^q	DD12A(1)	SK, AR , ME	Nepal, Myanmar, China, Thailand
435	88.17	<i>Fascellina plagiata</i> (Walker, 1866)	GV01F(1); AS01A(2); NV02A(1); ND05B(1); DD15A(1), DD18A(1)	HP, UT, SK, WB, AR, AS, ME, KA, TN	Nepal, Bhutan, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo)
436	88.18	<i>Fascellina porphyreofusa</i> Hampson, 1895	AS03A(1); NV06A(1)	UT, SK, AR, NL	Nepal, China
437	89.8	<i>Garaeus absona</i> (Swinhoe, 1890) ^q	DD29B(1)	HP, SK, AR , AS, NL, MN	Nepal, Myanmar
438	89.9	<i>Garaeus apicata</i> (Moore, 1868)	AS15B(1)	HP, UT, SK	Nepal, Myanmar, Taiwan, Malaysia, Indonesia (Sumatra, Borneo), Philippines
439	89.10	<i>Garaeus specularis</i> Moore, 1868 ^q	DD10C(1)	HP, UT, SK, WB, AR	Nepal, Myanmar, China, Taiwan, Japan, Korea
440	89.11	<i>Gasterocome pannosaria</i> (Moore, 1868)	GH01C(1); NV02A(1), NV02F(1)	HP, UT, SK, WB, AR, ME	Nepal, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Java, Borneo), Philippines
441	89.19	<i>Gnophos albidior</i> (Hampson, 1895) ^{bq}	GH10A(1); GV02D(3), GV22B(3); DD10C(1)	HP , UT, AR , NL	Nepal, Bhutan
442	89.12	<i>Heterolocha phoenicotaeniata</i> (Kollar, 1844) ^q	GH01D(2), GH01E(6), GH03B(2), GH04A(3), GH07A(2), GH09A(2), GH12A(8), GH14A(2), GH16A(1); GV03A(7), GV08A(14), GV12B(4), GV14A(4), GV14B(11), GV14D(7), GV15A(2), GV16A(4), GV16B(2); AS13A(1); NV11A(1); DD10D(1), DD10E(1), DD11C(2), DD24A(1), DD25A(1), DD29B(1)	JK , HP, UT, SK, WB, AR	Pakistan, Nepal, Bhutan, Vietnam
443	89.13	<i>Heterostegane subtessellata</i> (Walker, 1863)	GV01A(1), GV09A(1); NV02F(1)	HP, UT, SK, WB , AR, AS, ME, MH, KA, TN, KL, AN	Nepal, Bhutan, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Java, Borneo, Sumatra, Bali), Australia
444	89.14	<i>Hirasa aereus</i> (Butler, 1880)	SL01A(1)	SK, WB, ME	

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
445	89.15	<i>Hirasa muscosaria</i> (Walker, 1866) ^{ba}	GH02A(1); GV01C(4), GV02D(3), GV10C(3), GV14B(2), GV16A(1); AS11A(7), AS12A(3), AS14A(3); DD08B(1), DD18A(1), DD22A(1)	HP, UT, SK, WB, AR	Nepal
446	89.16	<i>Hirasa scripturaria</i> (Walker, 1866)	SL02A(1)	HP, SK, WB, ME	Nepal, Bhutan, Myanmar, Indonesia (Java)
447	89.17	<i>Hyalinetta circumflexa</i> (Kollar, 1844) ^d	SL03A(3); DD18A(1)	HP, UT, WB, AR, ME	Nepal, Bhutan, China, Thailand
448	89.18	<i>Hydatocapnia gemina</i> (Yazaki, 1990)*	GV01A(1), GV01C(1), GV01D(1); NV02A(1)	UT, WB	Pakistan, Nepal, Taiwan, Hong Kong, Thailand
449	90.1	<i>Hypephyra terrosa</i> (Butler, 1889)	GH01C(1); GV01F(1); AS07B(1)	HP, UT	Nepal, Bhutan, China, Malaysia, Japan, Korea
450	90.5	<i>Hyperythra lutea</i> (Stoll, 1781)	GV13A(1); AS01D(4)	HP, UT, SK, WB, AR, ME, AS, BH, JH, PB, CT, MH, KA, TN, KL, AN	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Hong Kong, Laos, Cambodia, Thailand, Malaysia, Indonesia (Java, Sumatra, Borneo), Philippines, Papua New Guinea, Australia, Africa
451	90.2	<i>Hypochrosis abstractaria</i> (Walker, 1862) ⁱ	AS07A(1)	HP, UT, ME, KL	Nepal, Bhutan, Myanmar, China, Thailand
452	90.3	<i>Hypochrosis binexata</i> (Walker, 1863) ^q	ND05A(1); DD09A(1)	AR, AS	Myanmar, Thailand, Malaysia, Indonesia (Borneo, Sumatra)
453	90.4	<i>Hypochrosis hyadaria</i> (Guenée, 1858)	NV02A(6); ND03H(1); DD10C(1)	UT, SK, WB, AR, AS, MI, NL, MH, TN, KL	Nepal, Bhutan, Sri Lanka, China, Thailand, Indonesia (Borneo, Java, Sulawesi, Sumatra, Bali), Philippines
454	90.6	<i>Hypomecis cineracea</i> (Moore, 1888) ^a	LD20A(2), LD25A(2), LD32A(1), LD32B(1)	JK, UT, SK, WB	China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines
455	90.7	<i>Hypomecis costaria</i> (Guenée, 1858)*	ND05A(1), ND13C(1)	AR	Thailand, Malaysia, Indonesia (Borneo)
456	90.8	<i>Hypomecis fasciata</i> (Swinhoe, 1894) ^q	DD10C(1)	WB, SK, AR, ME	Nepal, Thailand
457	90.9	<i>Hypomecis infixaria</i> (Walker, 1860)	GH01A(1); GV01C(1); AS01D(6), AS01E(6); NV02A(1)	HP, UT, SK, WB, MH	Myanmar, Taiwan, Thailand
458	90.10	<i>Hypomecis lioptilaria</i> (Swinhoe, 1903)	ND05A(1), ND05B(2)	AR	Nepal, China, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra)
459	90.11	<i>Hypomecis rotatoria</i> (Swinhoe, 1894) ⁱ	GV01A(11), GV05A(6), GV09A(1), GV22A(1)	HP, UT, SK, AS, ME, TN	Nepal, Bhutan, Sri Lanka, Myanmar, Indonesia (Java)
460	90.12	<i>Hypomecis transcissa</i> (Walker, 1860)	ND03H(1)	HP, UT, SK, WB, AR, AS, TR, ME, MI, MH, TN, KL	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo)



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
461	90.13	<i>Hyposidra talaca</i> (Walker, 1860)	NV02F(21)	HP, UT, SK, WB, ME, AS, CT, MP, MH, GA, KA, TN, KL, OD, AN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo, Java), Philippines, Papua New Guinea, Australia, Japan
462	90.14	<i>Hyposidra violescens</i> (Hampson, 1895)	NV02F(1); ND05A(1)	UT, SK, WB , AR, AS, ME, AN	Nepal, Vietnam, Thailand, Malaysia, Indonesia (Borneo)
463	90.19	<i>Iridoplecta ferrifera</i> (Moore, 1888) ^q	DD01A(1); ND03G(1)	SK, WB, AR	Vietnam, Malaysia, Indonesia (Borneo, Java)
464	90.17	<i>Krananda fulva</i> (Yazaki, 1994)*	NV02A(5)	WB	Nepal
465	90.15	<i>Krananda latimarginaria</i> Leech, 1891 *	ND03G(3), ND03H(2)	AR	China, Taiwan, Hong Kong, Malaysia, Indonesia (Borneo), Japan, Korea
466	90.16	<i>Krananda lucidaria</i> Leech, 1897 ^q	ND05A(3)	WB, AR , NL	China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sumatra)
467	90.18	<i>Krananda semihyalina</i> Moore, 1868	NV02A(8), NV02B(2), NV02C(1), NV05B(2), NV10C(1), NV11A(5); ND05A(1), ND05B(1); DD07A(1)	HP, UT, SK, WB, AR, AS, ME, TR	Nepal, Bhutan, China, Taiwan, Thailand, Malaysia, Vietnam, Indonesia (Borneo), Philippines, Japan, Korea
468	91.1	<i>Lassaba albidaria</i> (Walker, 1866) ^q	GH01D(1), GH02A(1); GV01A(7), GV01C(9), GV02D(2), GV03A(3), GV03B(9), GV06B(7), GV10C(2), GV12B(11), GV14A(7), GV16A(5), GV17A(1), GV21B(5), GV22B(3); AS10A(2); NV02A(3), NV11A(2); ND05B(1); DD13A(1), DD16A(2)	HP, UT, SK, WB, AR , ME	Pakistan, Nepal, Myanmar, China, Taiwan, Vietnam, Thailand
469	91.2	<i>Lassaba cervina</i> (Warren, 1893) ^q	GV06B(1), GV04A(3), GV10C(7), GV16A(6), GV19A(1), GV24A(7), GV24B(2); AS27A(1); DD29A(1), DD29B(1)	JK, UT, SK, AR	Nepal, Bhutan
470	91.3	<i>Lassaba dissimilis</i> (Moore, 1888) ^b	GH03B(1)	HP , SK, WB	Nepal
471	91.4	<i>Lassaba interruptaria</i> (Moore, 1867) ^b	GH05A(2), GH06A(2); GV11A(5), GV13B(2), GV19A(4)	HP , UT, SK, WB	Nepal
472	90.20	<i>Leptomiza calcearia</i> (Walker, 1860)	GH01C(2); GV12B(1)	HP, UT, SK, WB, AR, AS	Nepal, Bhutan, Myanmar, China, Taiwan, USA
473	90.21	<i>Ligdia coctata</i> Guenée, 1858 ^r	GH03A(1); AS06A(1)	HP, UT , PB, MP	Pakistan, Nepal, Kyrgyzstan, Kazakhstan, Uzbekistan, Tajikistan, Bulgaria
474	90.22	<i>Lomographa platyleucata</i> (Walker, 1866) ^p	GH06B(1), GH11B(1)	JK, HP , SK, WB, ME	Nepal, Bhutan, China, Taiwan

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				India	Global
475	91.5	<i>Loxaspilates hastigera</i> (Butler, 1889)	GH15A(1), GH19A(1); GV02C(4); AS22B(1), AS24A(5), AS26A(19), AS27A(19)	JK, HP, UT, SK	Afghanistan, Nepal, China (Tibet)
476	90.23	<i>Luxiaria acutaria</i> (Snellen, 1877) ^a	AS10C(1); NV02A(1), NV02D(1); DD10C(1); ND05A(1)	UT, SK, WB, AR , NL, ME	China (Tibet), Malaysia, Indonesia (Borneo, Sumatra, Java), Philippines
477	90.24	<i>Luxiaria amasa</i> (Butler, 1878)	DS01A(1); GH04A(3); GV01A(1), GV01B(1), GV01C(2), GV01F(1); AS06A(1), AS10C(1); SL04A(1); NV02A(2); DD10C(1)	HP, UT, WB, AR, MI	Nepal, Bhutan, China (Tibet), Taiwan, Vietnam, Malaysia, Indonesia (Sumatra, Borneo, Java), Japan, Korea, Russia
478	90.25	<i>Luxiaria mitorrhaphes</i> Prout, 1925 ^a	NV02A(18), NV02C(1), NV02D(1), NV02E(1), NV08A(1); DD10E(1)	SK, WB , AR , AS, NL	Nepal, Bhutan, Myanmar, China (Tibet), Taiwan, Hong Kong, Vietnam, Malaysia, Indonesia (Java, Borneo, Sumatra), Japan
479	90.26	<i>Luxiaria tephrosaria</i> (Moore, 1868)	NV02A(1), NV02C(1), NV02E(1), NV11A(1)	HP, SK, WB, AS, ME	Bhutan, Myanmar, China (Tibet), Malaysia, Indonesia (Borneo)
480	91.11	<i>Menophra subplagiata</i> (Walker, 1860)	GH01D(4), GH02A(2), GH04A(7); GV01A(5), GV01C(4), GV08B(11), GV09A(5), GV11A(1), GV22B(2)	HP, UT, SK, WB, ME	Pakistan, Nepal, Bhutan, Taiwan, Vietnam, Japan, Korea
481	91.10	<i>Menophra serpentinaria</i> (Warren, 1896) ^a	SL02A(1)	WB , AR, ME	Nepal, Thailand
482	87.8	<i>Mesastrape fulguraria</i> Walker, 1860 ⁱ	GV14B(1), GV16A(1); SL03A(2), SL04A(1)	HP, UT , SK, WB, ME	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Laos, Japan, Korea, Russia
483	91.6	<i>Micrabraxas melanodonta</i> (Hampson, 1907) ^{bi}	GH04A(1), GH16A(4), GH19A(1), GH20A(1); GV14B(2)	HP , UT , SK	Nepal
484	91.12	<i>Micronidia simpliciatata</i> (Moore, 1868) ⁱ	AS15B(1)	UT , SK, WB, AR, ME	Nepal
485	91.13	<i>Micronidia subpunctata</i> (Warren, 1893) ^a	DD29B(2)	SK, WB, AR	Nepal
486	91.9	<i>Milionia basalis</i> Walker, 1854	ND05B(1), ND11B(1)	SK, AR, AS, MI	Bhutan, Myanmar, China, Taiwan, Hong Kong, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Borneo), Philippines, Japan
487	91.7	<i>Mimochroa angulifascia</i> (Moore, 1879) ^{da}	NV02A(1); ND03G(1), ND03H(2)	WB , AR , ME	Myanmar, Thailand, Indonesia (Java)
488	93.13	<i>Mimomiza cruentaria</i> (Moore, 1867)	GH01A(2); GV01A(3), GV01F(1), GV07A(2); AS07C(1), AS10C(1); SL04A(1); NV11A(2)	HP, UT, WB, AR, ME	Bhutan, Myanmar, China, Vietnam, Thailand



Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
489	91.8	<i>Myrioblephara duplexodes</i> (Sato, 1994) ^q	DD15A(1), DD16A(2), DD16B(1), DD18A(1), DD22A(2)	SK, AR	Nepal
490	91.14	<i>Myrteta planaria</i> (Walker, 1861) ^q	DD10E(1), DD21A(1), DD24A(1)	SK, WB, AR, ME	Nepal, Vietnam
491	91.15	<i>Nothomiza costinotata</i> (Warren, 1893)*	AS12A(1), AS15A(5)	UT	Nepal, Bhutan
492	92.2	<i>Odontopera cervinaria</i> (Moore, 1868) ^q	DD18A(1), DD20A(1), DD27A(1)	SK, WB, AR, NL	Nepal
493	92.3	<i>Odontopera heydena</i> (Swinhoe, 1894) ⁱ	GV02B(1), GV06A(1), GV17A(2)	UT, AR, ME	Nepal, Bhutan
494	92.4	<i>Odontopera kametaria</i> Felder, 1873	GH01A(1), GH01B(3), GH01C(2), GH03B(1), GH05A(3); GV04B(3), GV12B(2)	HP, UT	Pakistan, Nepal
495	92.5	<i>Odontopera lentiginosaria</i> (Moore, 1868)	GH15A(1), GH22A(1); GV10C(3), GV14D(2), GV15A(3), GV16A(5), GV18B(1), GV21A(2)	HP, UT, SK, WB, ME	
496	92.6	<i>Odontopera muscularia</i> (Staudinger, 1892) *	LD04C(1)	JK	Pakistan, Kazakhstan, Tajikistan, Kyrgyzstan, Uzbekistan
497	92.7	<i>Odontopera obliquaria</i> (Moore, 1868)	GH04A(1); GV24B(1); DD21A(1)	HP, UT, WB, AR, ME	Nepal, Japan
498	92.8	<i>Odontopera similaria</i> (Moore, 1888)	SL02A(1); DD10E(2)	WB, AR	Nepal, Bhutan
499	91.16	<i>Omiza pachiararia</i> (Walker, 1860)	NV02A(1)	HP, UT, SK, WB, TN, AN	Nepal, China, Hong Kong, Thailand, Indonesia (Sumatra)
500	91.17	<i>Ophthalmitis pertusaria</i> Felder & Rogenhofer, 1875 ^q	GV01F(1), GV22B(1); AS01A(1), AS05A(1), AS07C(1); DD10C(2)	HP, UT, SK, WB, AR	Nepal, China, Thailand, Malaysia
501	92.10	<i>Opisthograptis luteolata</i> (Linnaeus, 1758) ^a	LD04A(2), LD04C(2), LD26A(1); GH11B(1), GH14A(1); VF01A(1)	JK, HP, UT	Pakistan, Kyrgyzstan, Russia, Iran, Turkey, Syria, Georgia, United Kingdom, Germany, Italy, France, Spain, Norway, Netherlands, Austria, Poland, Finland, Lebanon
502	92.11	<i>Opisthograptis moelleri</i> Warren, 1893	GH01C(1); NV02F(1)	HP, UT, SK, WB, AR	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam
503	92.12	<i>Opisthograptis sulphurea</i> (Butler, 1880) ^q	GV13B(1), GV16A(3), GV17A(5), GV24A(2), GV24B(1); AS26A(1); DD29A(1)	UT, SK, WB, AR	Nepal, Bhutan, China
504	92.13	<i>Opisthograptis tridentifera</i> (Moore, 1888) ^{bq}	GH23A(1); GV05A(1), GV17A(11), GV19A(5), GV24B(2); VF01A(1); AS27A(1); DD28A(1)	HP, UT, SK, AR, WB	Nepal, Bhutan, China (Tibet)
505	92.14	<i>Ourapteryx convergens</i> Warren 1897 ⁱ	GV14A(1), GV14B(1)	HP, UT	Pakistan, Nepal

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
506	92.15	<i>Ourapteryx ebuleata</i> Guenée, 1859	GH01C(8), GH06A(1), GH17A(2), GH23A(1); GV01A(5); GT01A(2), GT03A(3)	JK, HP, UT, SK, WB, AR, ME, MH, TN	Pakistan, Nepal, Bhutan, Myanmar, China, Kyrgyzstan
507	92.16	<i>Ourapteryx margaritata</i> (Moore, 1868)	SL02A(1)	SK, WB	Nepal, China, Thailand
508	92.17	<i>Ourapteryx primularis</i> Butler, 1886	NV11A(2)	WB, SK, AR, ME	Nepal, Bhutan, Vietnam
509	92.18	<i>Ourapteryx sciticaudaria</i> Walker, 1863	GV13B(1); NV02A(1), NV10C(2)	UT, SK, WB , AR, ME	Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand
510	91.18	<i>Oxymacaria maculosata</i> (Warren, 1896) ^b	GH04A(1)	HP , ME	Nepal, Africa
511	91.19	<i>Oxymacaria oliva</i> (Swinhoe, 1894) ^b	GH04A(1)	HP , ME	Indonesia (Java, Borneo)
512	91.20	<i>Oxymacaria penumbra</i> (Warren, 1896) ^a	AS01C(1); DD22A(1)	UT, AR , NL, ME	Nepal, Bhutan
513	91.21	<i>Oxymacaria temeraria</i> (Swinhoe, 1891)	GH01D(1), GH02A(1); GV01C(4), GV04A(3)	JK, HP, UT, AR, ME, NL, AN	Pakistan, Bhutan, China, Hong Kong, Taiwan, Thailand, Malaysia, Indonesia (Borneo, Java), Japan
514	91.22	<i>Parasynegia lidderdalii</i> (Butler, 1880)	DD06A(1), DD10E(2), DD11A(1)	HP, SK, WB, AR	Nepal
515	91.23	<i>Parasynegia pluristriaria</i> (Walker, 1863) ^a	DD02A(1)	HP, SK, AR , ME, NL	Nepal, China, Thailand
516	92.9	<i>Peetula exanthemata</i> (Moore, 1888)	DD21A(1)	SK, WB, AR, PB	Pakistan, Nepal, Myanmar, Thailand, Vietnam
517	93.16	<i>Peratophyga hyalinata</i> (Kollar, 1844)	GH01E(1), GH03B(1), GH07A(1); GV05A(4), GV21A(6)	HP, UT, WB, ME	Afghanistan, Nepal, Bhutan, China (Tibet), Myanmar, Vietnam, Japan
518	93.2	<i>Peratostega deletaria</i> (Moore, 1888) ^b	DS01A(1); AS01C(1)	HP, UT , WB, ME	Nepal, China, Taiwan, Japan, Korea
519	93.3	<i>Petelia medardaria</i> (Herrich-Schaffer, 1856) ^a	ND05A(1); DD10C(1)	HP, WB, AR , PB, MP, MH, KA, TN, GA, AN	Nepal, Sri Lanka, Myanmar, Thailand, Malaysia, Indonesia (Borneo), Philippines, Papua New Guinea, Australia
520	93.4	<i>Phthonandria atrilineata</i> (Butler 1881)	GH04A(1); GV05B(3); AS01C(1)	HP, UT, SK	Nepal, Bhutan, China, Japan, Korea
521	93.8	<i>Polyscia argentilinea</i> (Moore, 1868)	NV02A(2)	WB	Nepal, Myanmar, China, Taiwan
522	93.5	<i>Plagodis inustaria</i> (Moore, 1867)	GV15A(3); DD14A(1), DD21A(1)	HP, UT, SK, WB, AR, ME	Nepal
523	93.6	<i>Plagodis reticulata</i> Warren, 1893 ^a	GH09A(1); GV14A(3), GV14B(5), GV16A(1), GV18B(6); DD13A(1), DD16A(1)	HP, UT, SK, AR	Pakistan, Nepal, Bhutan, China, Taiwan, Indonesia (Borneo)
524	93.7	<i>Platycerota homoema</i> Prout, 1926 *	DD25A(1), DD27A(1)	AR	Nepal, Taiwan
525	93.9	<i>Plutodes costatus</i> (Butler, 1886)	KA01A(1)	HP, UT, SK, WB, AR, AS, ME, NL	Nepal, Bhutan, Myanmar, China, Hong Kong, Thailand, Malaysia, Indonesia (Sumatra)



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
526	93.11	<i>Plutodes flavescens</i> Butler, 1880	NV02C(1)	SK, WB , AR, ME, AS	Bhutan, Myanmar, China, Hong Kong, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java)
527	93.12	<i>Plutodes subcaudata</i> Butler, 1880 ^a	DD04B(1)	HP, SK, WB, AR , ME, NL	Nepal, Bhutan, Myanmar, Thailand
528	93.10	<i>Plutodes warreni</i> (Prout, 1923)	GH01A(1)	HP, SK, AR, ME	Myanmar, China, Vietnam, Laos, Thailand
529	94.14	<i>Pristostegania trilineata</i> (Moore, 1868) ^a	NV06A(1); DD18A(1), DD29B(1)	SK, WB, AR	Nepal, Bhutan
530	93.14	<i>Pseudomiza aurata</i> (Wileman, 1915)*	DD13A(1), DD14A(4), DD15A(4), DD20A(6), DD26A(1)	AR	China, Taiwan
531	93.15	<i>Pseudomiza obliquaria</i> (Leech, 1897) ⁱ	GV01A(1)	UT , WB, AS	Bhutan, China, Taiwan, Vietnam
532	93.1	<i>Pseudopanthera himaleyica</i> (Kollar, 1844)	GV03A(1), GV07A(4), GV07B(5), GV11A(2), GV13B(6); AS09A(1)	HP, UT, SK, WB	Nepal
533	94.1	<i>Psilalcis albibasis</i> (Hampson, 1895) ^{bn}	GH01C(1); DD08B(2), DD10E(1)	HP , UT, SK, WB, AR , AS	Nepal, Taiwan
534	93.17	<i>Psyra angulifera</i> Walker, 1866	GH09A(1); GV02B(3), GV06B(1), GV13B(1), GV16B(3); AS11A(1); NV12A(1); DD05A(1), DD11C(1), DD18A(1)	HP, UT, SK, WB, AR, AS	Nepal, China (Tibet)
535	93.20	<i>Psyra crypta</i> Yazaki, 1994 ^a	AS10A(1), AS15B(1); DD21A(1)	UT, WB, AR	Nepal
536	93.18	<i>Psyra cuneata</i> Walker, 1860	DD07A(1)	UT, SK, WB, AR, MN, ME	Nepal, Bhutan, China (Tibet), Taiwan, Japan
537	93.19	<i>Psyra similaria</i> Moore, 1868 ^{bi}	GH03B(1), GH16A(1); GV10C(2), GV11A(7), GV14D(6), GV16A(4), GV21A(2); AS15B(1), AS16A(3)	HP , UT , SK, WB, ME	Nepal, China (Tibet), Vietnam
538	93.21	<i>Psyra spurcataria</i> (Walker, 1863)	GH16A(1); AS09A(1), AS10C(2); NV02F(1), NV12A(1); DD18A(1)	HP, UT, SK, WB, AR, AS, ME	Nepal, Bhutan, China (Tibet), Taiwan, Thailand
539	94.2	<i>Racotis inconclusa</i> (Walker, 1860)	ND05B(1)	SK, WB, AR, AS, NL	Bangladesh, Sri Lanka, China, Taiwan, Vietnam, Malaysia, Indonesia (Java, Sulawesi), Japan, Korea
540	94.3	<i>Ruttellerona cessaria</i> (Walker, 1860) ^a	NV01C(1); ND03H(1)	SK, WB , AR , ME, MH, KA, TN	Sri Lanka, Taiwan, Malaysia, Indonesia (Borneo), Papua New Guinea
541	94.4	<i>Sinamedia basistrigaria</i> (Moore, 1868) ⁱ	AS12A(1), AS23A(1); NV11A(2)	UT , SK, WB, ME	Nepal, Myanmar, Thailand
542	94.7	<i>Sirinopteryx duplilinea</i> (Hampson, 1895)	GH01E(4), GH06B(1)	HP, UT	
543	94.8	<i>Sirinopteryx harutai</i> Yazaki, 1998 ^b	GH01E(1); AS26A(2), AS27A(1)	HP , UT	Nepal

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
544	94.9	<i>Sirinopteryx longipennis</i> (Warren, 1893) ^{h1}	GH19A(2); AS24A(1), AS26A(2), AS27A(1)	HP, UT, SK	
545	94.11	<i>Sirinopteryx quadripunctata</i> (Moore, 1888) ^q	NV02A(1); DD06A(7), DD08A(1), DD21A(1)	SK, WB, AR, NL, ME	
546	94.10	<i>Sirinopteryx rufivinctata</i> (Walker, 1863) ⁱ	GV02D(6), GV03A(6), GV04B(5); NV11A(1); DD10B(1), DD10C(2), DD11A(2)	HP, UT, SK, WB, AR, ME, NL	Nepal, Bhutan, Myanmar, China, Vietnam
547	94.12	<i>Sirinopteryx undulifera</i> Warren, 1893 ⁱ	AS09A(2); SL01A(1)	UT, SK, WB	Nepal
548	94.5	<i>Tanaoctenia haliaria</i> Walker, 1861	GV01F(2), GV08A(2), GV11A(6), GV13B(2), GV14B(4), GV16B(8); AS10A(2), AS10C(2); DD10C(1)	UT, SK, WB, AR, ME	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Japan
549	94.15	<i>Thinopteryx crocoptera</i> (Kollar, 1844)	GV09B(1); AS07C(1); NV02A(1); DD19A(1)	JK, HP, UT, SK, WB, AR, AS, ME, AN	Pakistan, Nepal, Bhutan, Bangladesh, China, Taiwan, Hong Kong, Vietnam, Malaysia, Indonesia (Java, Sumatra), Japan, Korea, Russia
550	95.1	<i>Xandrames albofasciata</i> (Moore, 1868)	GH01D(1); NV11A(2); DD15A(2)	HP, SK, WB, AR	Nepal, Myanmar, China, Vietnam, Thailand
551	95.2	<i>Xandrames dholaria</i> (Moore, 1868) ^b	GH01C(1); AS10C(4)	HP, UT, SK, WB, AS, NL	Nepal, China, Taiwan, Thailand, Japan, Korea
552	95.3	<i>Xandrames latiferaria</i> Walker, 1860	GV01F(4), GV03A(5), GV03B(2); NV02A(1)	UT, SK, WB, AR, MI, ME	Nepal, China, Taiwan, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra), Japan
553	94.6	<i>Xerodes ypsaria</i> Guenée, 1857	NV02E(1); ND05B(2)	WB, AR, NL, MI	Nepal, Bhutan, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sulawesi), Philippines
554	94.13	<i>Zeheba aureata</i> (Moore, 1887) ^{ba}	DS01A(1); GV01A(1); GV01E(2); ND03G(1), ND03H(3)	HP, UT, SK, WB, AR, AS, ME, TR, JH, CT, MP, MH, TN	Nepal, Sri Lanka, Hong Kong, Thailand, Indonesia (Borneo), Australia
Subfamily: Geometrinae Leach, 1815					
555	96.1	<i>Agathia hemithearia</i> Guenée, 1857	GV01G(2), GV02B(1)	HP, UT, SK, AS, TN	Bangladesh, Sri Lanka, Taiwan, Thailand, Malaysia
556	96.2	<i>Agathia laetata</i> (Fabricius, 1794)	NV02F(1)	WB, AR, AS, ME, MH, KA	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Borneo), Papua New Guinea, Australia, Japan, Russia
557	96.3	<i>Agathia lycaenaria</i> (Kollar, 1848)	AS01B(1)	JK, HP, UT, SK, WB, AR, AS, KL, OD, AN	Pakistan, Nepal, China, Taiwan, Hong Kong, Japan, Cambodia, Malaysia, Indonesia, Australia



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
558	96.4	<i>Agathia succedanea</i> Warren, 1897 *	DD11A(1)	AR	Malaysia, Indonesia
559	96.7	<i>Aporandria specularia</i> (Guenée, 1858)	GV01A(2); AS01A(1); NV02B(1)	UT, AS, CT, MP, TN, KL, AN	Sri Lanka, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Borneo)
560	96.8	<i>Argyrocosma inductaria</i> (Guenée, 1857) ^{i d}	GV01A(2); NV10A(1), NV10C(1)	HP, UT, WB , AR, NL, TN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Thailand, Malaysia, Indonesia (Borneo), Philippines
561	96.5	<i>Berta chrysolineata</i> Walker, 1863	ND03I(1)	SK, WB, AR, AS, ME, KA, KL, AN	Bhutan, Sri Lanka, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Sumatra, Borneo), Papua New Guinea, Australia
562	96.6	<i>Chlororithra fea</i> (Butler, 1889)	DD07A(2), DD10C(1)	HP, UT, SK, WB, AR, ME	Pakistan, Nepal, Bhutan, Myanmar, China (Tibet)
563	96.9	<i>Comibaena pictipennis</i> (Butler, 1880) ⁱ	GH01E(1), GH11B(1); GV12A(1); SL01A(2), SL03A(1); DD14A(1)	JK, HP, UT , SK, WB, AR, AS, ME	Pakistan, Nepal, Bhutan, China (Tibet), Taiwan, Vietnam
564	96.10	<i>Comibaena quadrinotata</i> Butler, 1889 ^{da}	GV01A(2); GT02A(2); NV02A(1); DD10C(1)	JK, HP, UT, WB, AR , AS, ME	Nepal, Sri Lanka, China, Taiwan, Japan, Thailand, Malaysia, Indonesia (Borneo, Sumatra)
565	96.11	<i>Comibaena subhyalina</i> (Warren, 1899)	AS10C(1)	HP, UT, AR, NL	Pakistan, Nepal, Bhutan, China (Tibet)
566	96.14	<i>Comostola chlorargyra</i> (Walker, 1886) ^d	NV02A(1)	WB , MH, AN	Bhutan, Sri Lanka, Malaysia, Indonesia (Borneo, Java, Sulawesi), Philippines, Papua New Guinea, Australia
567	96.13	<i>Comostola pyrrhogona</i> (Walker, 1866) ^d	NV02A(1), NV02F(1)	WB , AR, AS, ME, CT, MH, GA, KA, TN, AN	Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia, Fiji, Tonga, Australia, Japan
568	96.12	<i>Comostola subtiliaria</i> (Bremer, 1864)	GV01C(10), GV09A(2); DD01E(1)	HP, UT, SK, AR, TN	Nepal, Bangladesh, Sri Lanka, China, Taiwan, Malaysia, Indonesia, Australia, Japan, Korea, Russia
569	96.18	<i>Dindica polyphaenaria</i> (Guenée, 1858) ^g	NV02A(1), NV11A(1); DD10C(2), DD16B(2)	HP, UT, SK, WB, AR , ME	Nepal, Bhutan, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia, Japan
570	96.20	<i>Dindicodes crocina</i> (Butler, 1880)	DD11A(1)	SK, WB, AR, MN	China, Vietnam, Thailand
571	96.19	<i>Dysphania militaris</i> (Linnaeus, 1758)	ND05B(1)	UT, SK, WB, AR, AS, ME, MI, MN, NL, TR, CT, MH, AN	Bangladesh, Myanmar, China, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia
572	96.16	<i>Eucyclodes albisparsa</i> (Walker, 1861) *	AS01B(1)	UT	Thailand, Malaysia, Indonesia, Philippines

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
573	96.15	<i>Eucyclodes gavissima</i> (Walker, 1861)	GV01F(1)	HP, UT, SK, AR, AS, MH	Nepal, Bhutan, Sri Lanka, China, Taiwan, Malaysia, Indonesia (Borneo)
574	96.17	<i>Eucyclodes sanguilineata</i> (Moore, 1868)	NV02A(2)	UT, SK, WB, AR, AS, ME, NL	Bhutan, China
575	96.21	<i>Herochroma cristata</i> (Warren, 1894)	GV01A(1), GV09B(2); SL02A(1)	HP, UT, SK, WB , AS, ME	Bhutan, Bangladesh, Sri Lanka, Taiwan, Hong Kong, Thailand, Indonesia (Borneo)
576	96.22	<i>lotaphora iridicolor</i> (Butler, 1880)	DD27A(1)	UT, SK, WB, AR, ME, MN	Nepal, Bhutan, China (Tibet), Vietnam
577	97.1	<i>Lophophelma erionoma</i> (Swinhoe, 1893)	NV02A(2), NV02F(1), NV11A(2); ND05B(1)	SK, WB , AR, ME	Nepal, China, Malaysia, Indonesia (Borneo)
578	97.2	<i>Lophophelma loncheres</i> (Prout, 1931) ^q	ND05A(1)	AR	Indonesia
579	97.3	<i>Lophophelma vigens</i> (Butler, 1880)	ND05A(1)	SK, WB, AR, ME, MI	China, Thailand, Malaysia, Indonesia (Java, Sumatra, Borneo)
580	97.4	<i>Maxates macariata</i> (Walker, 1863)	ND03G(1)	SK, AR, AS, ME, NL	Bangladesh
581	97.5	<i>Maxates thetydaria</i> (Guenée, 1858) ^{pd}	GH01E(1); AS10A(1); NV02A(2), NV11A(2); DD10C(2), DD10E(1), DD22A(1), DD23B(1)	HP , UT, WB , AR	Nepal, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia
582	97.6	<i>Mixochlora vittata</i> (Moore, 1867)	GV01F(1), GV24B(1); AS01C(1), AS03A(1); NV02A(1)	HP, UT, SK, WB, AR, AS, ME, MN, NL	Nepal, Bhutan, Myanmar, China, Taiwan, Thailand, Malaysia, Indonesia, Philippines, Japan, Korea
583	97.7	<i>Neohipparchus vallata</i> (Butler, 1878) ^q	DD10E(1)	UT, SK, AR , AS	Bhutan, China, Taiwan, Japan, Korea
584	97.8	<i>Ornithospila avicularia</i> (Guenée, 1857)	GV14A(1); ND03F(1)	HP, UT, SK, AR, AS, ME, JH, PB, MH	Nepal, Bhutan, Laos, Malaysia, Indonesia (Borneo, Sumatra), Philippines
585	97.9	<i>Pachyodes haemataria</i> (Herrich-Schäffer, 1854) ^q	ND03H(1)	SK, AR , AS, ME	Nepal, Thailand
586	97.10	<i>Pachyodes pictaria</i> Moore, 1888	NV10C(1), NV11A(1)	HP, SK, WB, AS	Nepal, China, Vietnam
587	97.11	<i>Pelagodes bellula</i> Han & Xeu, 2011*	ND05A(1), ND05B(1)	AR	Myanmar, China
588	97.12	<i>Pelagodes veraria</i> (Guenée, 1857) ^q	GV07B(2), GV13B(1), GV16A(2); DD10E(1)	HP, UT, AR , ME, NL, DL, TN	Nepal, Sri Lanka, Vietnam, Malaysia, Indonesia (Java), Australia
589	98.1	<i>Pingasa chlora</i> (Stoll, 1782) ⁱ	GV01G(2); NV02F(1)	UT , SK, WB , ME, JH, MP, CT	Sri Lanka, Myanmar, China, Taiwan, Thailand, Malaysia, Indonesia (Borneo, Java, Maluku, Sulawesi), Philippines, Papua New Guinea, Australia, USA
590	98.2	<i>Pingasa crenaria</i> (Guenée, 1858) ^q	DD11A(1)	AR , ME, MH	Nepal, Sri Lanka, Myanmar, China, Taiwan, Malaysia, Indonesia, Papua New Guinea



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
591	98.3	<i>Pingasa pseudoterpnaria</i> (Guenée, 1858)	GH04A(1); AS01D(1)	HP, UT, ME, NL	Nepal, China, Japan, Korea
592	98.4	<i>Pingasa rubicunda</i> Warren, 1894 ¹	GV06A(2)	UT , AS, ME	Bangladesh, Hong Kong, Thailand, Malaysia, Indonesia, Africa
593	98.5	<i>Pingasa ruginaria</i> (Guenée, 1857) ^q	GV01G(2), GV03B(2), GV06A(3); NV02A(3); ND03E(1)	HP, UT, SK, WB, AR , AS, ME, MN, TR, CT, MH, AN	Nepal, China, Taiwan, Hong Kong, Laos, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra), Philippines, Japan, South Africa, Ghana, Ethiopia, Tanzania
594	98.6	<i>Tanaorhinus kina</i> Swinhoe, 1893 ¹	AS07C(1); SL02A(1); DD07A(1), DD11A(1)	HP, UT , SK, WB , AR, ME, NL	Nepal, Bhutan, China, Taiwan, Laos
595	98.7	<i>Tanaorhinus reciprocata</i> (Walker, 1861)	GV12A(1); AS07C(1), AS10C(1); KA01A(1); SL01A(1); ND05B(1)	HP, UT, SK, WB , AR, ME	Nepal, Bhutan, China, Taiwan, Thailand, Japan, Korea
596	98.8	<i>Tanaorhinus viridiluteata</i> (Walker, 1861) ^q	SL02A(1); NV02A(1), NV11A(2); ND13B(1); DD07A(1), DD21A(1)	SK, WB, AR , AS, ME	Nepal, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Java, Borneo, Sarawak)
597	97.13	<i>Thalassodes opalina</i> Butler, 1880 ¹	ND05A(1)	WB, AR , ME, NL, PB, TN	Sri Lanka, China, Taiwan, Thailand, Indonesia
598	98.9	<i>Thetidia radiata</i> (Walker, [1863])	LD04A(2), LD04C(1)	JK, HP	China
599	98.10	<i>Timandromorpha enervata</i> Inoue, 1944 *	DD15A(1), DD22A(2)	AR	China, Taiwan, Japan, Korea
Subfamily: Larentiinae Duponchel, 1845					
600	99.1	<i>Agnibesa pictaria</i> Moore, 1868	SL03A(3)	SK, WB, AR	Nepal, Bhutan, China
601	99.2	<i>Agnibesa recurvilineata</i> Moore, 1888 ^q	AS15B(1); GH06B(1); DD15A(1), DD25A(1), DD27A(2), DD28A(3)	HP, UT, SK, WB, AR	Nepal, China
602	99.3	<i>Agnibesa venusta</i> Warren, 1897 ^q	DD15A(1)	SK, AR	Nepal, China
603	101.1	<i>Amnesicoma bicolor</i> (Moore, 1888) ¹	AS27A(5)	HP, UT , SK	Nepal, China (Tibet)
604	101.2	<i>Amnesicoma simplex</i> Warren, 1895 ¹	GH08A(1); GV15A(1)	JK, HP, UT	Pakistan, China (Tibet)
605	99.4	<i>Anticlea canaliculata</i> Warren, 1896 ^q	DD13A(1), DD16A(1)	SK, AR	Taiwan, New Zealand
606	101.1	<i>Callabraxas amanda</i> Butler, 1880	NV02A(1)	HP, SK, WB, AR	Nepal, Thailand
607	99.5	<i>Cidaria distinctata</i> Staudinger, 1892*	LD02A(1), LD04A(5), LD19A(2), LD25A(1), LD26A(2), LD29A(1), LD31A(7)	JK	Afghanistan, Pakistan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan, Iran
608	99.6	<i>Cidaria multistriata</i> Rothschild, 1914	GH07A(1)	HP, UT, SK	China, Japan, Korea, Algeria
609	99.7	<i>Colostygia albigirata</i> (Kollar, 1844)	GH03A(1); GV11A(9), GV12A(7), GV14D(2), GV15B(11), GV16B(6), GV19A(6), GV21A(4), GV24B(3)	JK, HP, UT, SK	Afghanistan, Nepal, Myanmar, China, Japan, Mongolia, Russia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
610	99.8	<i>Docirava aequilineata</i> Walker, 1863	GH03B(1), GH10A(1); GV12B(3)	HP, UT	Nepal
611	99.9	<i>Docirava affinis</i> (Walker, 1894) ^a	DD15A(1), DD20A(1)	NW Himalayas, SK, AR	Nepal, China
612	99.10	<i>Docirava fulgurata</i> (Guenée, 1858) ⁱ	GV12A(1); SL05A(1)	HP, UT , SK, WB , AS	Nepal, Bhutan, China
613	99.11	<i>Docirava postochrea</i> (Hampson, 1893) ⁱ	AS06A(1), AS21A(1)	HP, UT	
614	99.12	<i>Docirava pudicata</i> (Guenée, 1858)	GV04A(2), GV12A(2); AS06A(1), AS14A(1)	HP, UT, SK, AR	Afghanistan, Nepal, Vietnam
615	99.13	<i>Dysstroma planifasciata</i> (Prout, 1914) *	GH20A(1)	HP	Nepal
616	99.15	<i>Ecliptopera muscicolor</i> (Moore, 1888)	SL02A(1)	SK, WB, ME, TN	Nepal, Sri Lanka, Taiwan
617	99.16	<i>Ecliptopera postpallida</i> (Prout, 1938) ^b	GH01E(1), GH15A(1), GH12A(2), GH16A(1), GH20A(1); GV10C(7), GV11A(5), GV14D(11), GV15B(4), GV18B(2), GV21A(1), GV22A(1), GV24A(6), GV24B(1)	HP , UT	Nepal, Bhutan, China
618	99.17	<i>Ecliptopera rectilinea</i> Warren, 1894 ⁱ	AS14A(1); ND03H(1)	UT , SK, AR, AS, ME, TN	Sri Lanka, Taiwan, Vietnam, Thailand, Malaysia, Indonesia, Philippines
619	99.18	<i>Ecliptopera relata</i> (Butler, 1880) ^b	GH11A(1)	HP , UT, SK, ME	Nepal, Bhutan
620	99.19	<i>Ecliptopera silaceata</i> (Dennis & Schiffermüller, 1775) ^a	DD25A(1); ND05A(1)	NW Himalayas, SK, AR , ME	China, Japan, Russia, Turkey, Georgia, United Kingdom, Finland, Sweden, Denmark, Norway, Netherlands, France, Italy, Austria, Germany, USA, Canada
621	99.20	<i>Ecliptopera substituta</i> (Walker, 1866) ^b	GH15A(1), GH16A(4)	HP , UT, SK	Nepal, Vietnam
622	99.27	<i>Electrophaes aliena</i> (Butler, 1880) ^{bq}	GH01E(2), GH03A(1), GH04A(1), GH06B(1); GV08A(1); AS11A(2); DD03C(1)	HP , UT, SK, WB, AR	Nepal, Bhutan
623	99.28	<i>Electrophaes marginata</i> Yazaki, 1994 ^a	GV14D(1), GV15B(1); SL04A(1); DD16A(2), DD28A(1)	UT, SK, WB , AR	Nepal
624	99.29	<i>Electrophaes niveonotata</i> (Warren, 1901) ^a	GV01E(1); VF01A(1); AS11A(1); SL03A(1), SL05A(1); DD04B(1), DD25A(1), DD26A(1), DD27A(2), DD28A(1)	UT, SK, WB , AR	Bhutan
625	99.30	<i>Electrophaes niveopicta</i> (Warren, 1893) ^a	DD12A(1), DD15A(1), DD18A(1), DD24A(1), DD25A(1), DD26A(1), DD27A(1), DD28A(1), DD29B(1)	SK, AR	Nepal
626	99.31	<i>Electrophaes recta</i> Yazaki, 1994 ^{bq}	GH04A(1); GV02D(4), GV07B(3), GV11A(3), GV16A(2), GV16B(6), GV24B(4); SL03A(2); DD09A(1)	HP , UT, WB , AR	Nepal



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
627	99.32	<i>Electrophaes tsermosaria</i> (Oberthur, 1893) *	GH01F(1); DD28A(2)	HP, AR	Nepal
628	99.33	<i>Electrophaes zaphenges</i> Prout, 1940 ^a	GV02D(4), GV07B(3), GV11A(4), GV16A(2), GV16B(6); DD03C(1), DD15A(2), DD18A(1), DD20A(1), DD21A(1), DD26A(1)	UT, AR, ME	Nepal, China, Taiwan
629	99.14	<i>Euphyia subangulata</i> (Kollar, 1844)	LD04A(5), LD04C(4), LD25A(1), LD31A(1); GH16A(2), GH19A(2); GV02D(2), GV04A(8), GV05B(2), GV07B(2), GV14B(7), GV16B(7), GV21A(1), GV24B(3); AS01D(1)	JK, HP, UT	Afghanistan, Pakistan, Nepal, Bhutan
630	99.22	<i>Eustroma chalcoptera</i> (Hampson, 1895) ⁱ	GV07B(5), GV16A(3), GV21B(2), GV24B(2)	UT, SK	Nepal
631	99.23	<i>Eustroma inextricata</i> (Walker, 1866) ^{bd}	GH08A(1); SL03A(6), SL04A(7); DD15A(1), DD16A(1), DD21A(1), DD24A(1), DD25A(3), DD27A(1), DD28A(2)	HP, WB, AR, AS, MN	Nepal, Bhutan, China, Japan, Korea, Russia
632	99.24	<i>Eustroma mixtilineata</i> Hampson, 1895 ^a	DD09A(1)	SK, AR	
633	100.1	<i>Heterophleps bicommata</i> (Warren, 1893) ^a	DD15A(1)	SK, AR, NL	
634	100.2	<i>Heterophleps ocyptaria</i> (Swinhoe, 1893) ⁱ	AS01D(1); DD22A(1)	HP, UT, SK, AR, ME, NL	Nepal
635	100.3	<i>Heterophleps quadripuncta</i> (Warren, 1898) ^a	DD12A(3), DD14A(1), DD15A(1), DD16A(1), DD16B(1), DD20A(2), DD24A(1)	SK, AR, ME	
636	100.4	<i>Heterothera consimilis</i> (Warren, 1888)	GH01D(1), GH01E(1), GH03B(3), GH07A(1), GH12A(1)	JK, HP	Afghanistan, Pakistan, Nepal
637	100.5	<i>Heterothera dentifasciata</i> (Hampson, 1895) ^a	GV02C(6); DD15A(2)	HP, UT, AR	Pakistan, Nepal
638	99.26	<i>Horisme plurilineata</i> (Moore, 1888)	GH01F(1), GH03A(1)	HP, UT, ME	
639	99.34	<i>Hydrelia bicolorata</i> (Moore, 1868)	GV05A(1), GV07A(4), GV07B(4), GV11A(3); DD27A(1)	HP, UT, SK, WB, AR, AS, ME, NL	Myanmar, China, Taiwan
640	99.21	<i>Hysterura multifaria</i> (Swinhoe, 1890) ^a	GH03A(1), GH03B(1), GH12A(1), GH16A(2); SL01A(1); DD06A(1), DD22A(1)	HP, UT, WB, AR, AS	Nepal, China, Vietnam, Russia
641	99.35	<i>Laciniodes plurilinearia</i> (Moore, 1868)	GH12A(1); GV01F(4), GV07A(2), GV11A(3), GV21A(2), GV24B(7); AS15B(1); SL01A(1)	HP, UT, SK, WB, ME	Nepal, Myanmar, China, Japan, Korea, Russia
642	100.6	<i>Martania plumbeata</i> (Moore, 1888) ^{bq}	GH12A(1); DD28A(2)	HP, SK, AR	Nepal

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
643	100.7	<i>Martania seriata</i> (Moore, 1888)	GV07A(5), GV10C(7), GV15B(5), GV17A(9), GV18B(2), GV20A(4), GV24B(5)	UT, WB	Pakistan, Nepal, Myanmar, China, Taiwan, Kyrgyzstan, Uzbekistan, Tajikistan, Ecuador
644	100.10	<i>Melanthia catenaria</i> (Moore, 1868) ^q	GH20A(1); AS06A(1), AS12A(1); DD27A(1), DD22A(1)	HP, UT, SK, WB, AR , ME	Nepal, Bhutan, China, Taiwan, Japan
645	99.36	<i>Neotephria ramalaria</i> (Felder & Rogenhofer, 1875)	LD19B(4), LD25A(1), LD26B(1), LD27A(1); GH16A(3), GH20A(3)	JK, HP	
646	100.11	<i>Parentephria stellata</i> (Warren, 1893) ⁱ	GV02D(2), GV07A(6), GV19A(2), GV22A(4)	UT , SK	Nepal, China (Tibet)
647	99.25	<i>Pareustroma fisisignis</i> (Butler, 1880) ^q	SL04A(1); DD25A(1)	SK, WB, AR	Nepal, Bhutan
648	100.8	<i>Perizoma albofasciata</i> (Moore, 1888)	GV01A(5), GV04A(3), GV04C(1), GV07B(50), GV10C(4), GV14A(1), GV21A(2); AS20A(1)	HP, UT, SK, WB	Nepal, Myanmar, Taiwan
649	100.9	<i>Perizoma peculiare</i> (Inoue, 2000) ^{ab}	LD25A(4); GH07A(1)	JK , HP , WB	Nepal, Thailand
650	101.3	<i>Photoscotosia amplicata</i> (Walker, 1862) ^q	GH01A(1), GH17A(1), GH21A(3), GH21B(1), GH23A(28); GV04B(2), GV10C(11), GV18B(2), GV21A(4), GV24A(3), GV24B(4); AS01A(1), AS22A(1); SK33A(1); DD29A(1)	JK, HP, UT, SK, WB, AR , AS, ME	Pakistan, Nepal, Bhutan, Myanmar, China (Tibet)
651	101.4	<i>Photoscotosia dejuta</i> Prout, 1937 ^{bi, q}	GH06A(1), GH23A(1); AS27A(1); DD29B(1)	HP , UT , SK, AR	Nepal, Bhutan
652	101.5	<i>Photoscotosia fulguritis</i> Warren, 1893 ⁱ	AS24A(4), AS26A(1), AS27A(4)	UT , SK	Nepal
653	101.6	<i>Photoscotosia funebris</i> Warren, 1895 *	GV18B(1), GV24A(1), GV24B(2)	UT	China, Vietnam
654	101.7	<i>Photoscotosia isosticta</i> Prout, 1940 ⁱ	GV18B(1), GV24A(1), GV24B(1); AS22B(1), AS24A(1)	UT	China (Tibet)
655	101.8	<i>Photoscotosia metachryseis</i> Hampson, 1896 ⁱ	GV19A(1)	UT , SK	Nepal, China
656	101.10	<i>Photoscotosia miniosata</i> (Walker, 1862)	GH01E(1), GH01F(1), GH03B(1), GH07A(1), GH12A(2), GH23A(1); GV01A(1), GV01G(1), GV02B(1), GV02C(3), GV06B(1), GV13A(1), GV14A(1), GV18B(1), GV20A(2); TW01A(1); DD09A(1), DD10C(1)	HP, UT, SK, WB, AR, PB	Pakistan, Nepal, Bhutan, Bangladesh, China, Taiwan, Philippines
657	101.9	<i>Photoscotosia multilinea</i> Warren, 1893 ⁱ	GV24A(1), GV24B(4)	UT , SK	Nepal, Bhutan, China (Tibet)
658	101.11	<i>Photoscotosia pallidimaculata</i> Yazaki, 1995 *	GH17B(1); GV01E(2), GV10C(1); AS22B(1)	HP , UT	Nepal
659	101.12	<i>Photoscotosia polysticha</i> Prout, 1940	KA01A(1)	SK	Nepal, Bhutan, China (Tibet)



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
660	100.12	<i>Physetobasis dentifascia</i> Hampson, 1895 ¹	VF01A(7)	HP, UT, ME, TN	Nepal, Sri Lanka, Taiwan, Hong Kong, Vietnam, Indonesia, Australia, Fiji, Japan
661	100.14	<i>Polynesia sunandava</i> (Walker, 1861)	NV02F(1), NV04A(1)	SK, WB, MI, KL, AN	Sri Lanka, China, Malaysia, Indonesia, Papua New Guinea
662	100.13	<i>Scotopteryx nasifera</i> Warren, 1888 ^a	LD02B(1)	JK, HP, PB	Pakistan
663	100.16	<i>Stamnodes pauperaria pamphilata</i> (Felder & Rogenhofer, 1875) ^{a1}	LD04A(2), LD04C(11), LD29A(5); GV02D(1), GV14A(2), GV16A(2), GV17A(1), GV24B(4)	JK, HP, UT, SK	Nepal, Mongolia, Russia, Kyrgyzstan, Kazakhstan
664	100.17	<i>Trichopterigia rufinotata</i> (Butler, 1889) ^{1 q}	GV01E(2); DD21A(1)	HP, UT, AR	Nepal, Bhutan, Taiwan
665	101.14	<i>Triphosa dubiosata</i> (Walker, 1862)	GH01E(36), GH01F(10), GH03A(5), GH06B(1)	HP, UT, SK, PB, TN	Afghanistan, Nepal
666	101.15	<i>Triphosa rubrodotata</i> (Walker, 1862) ^{pi q}	GH06B(1), GH07A(1); GV03A(7), GV16A(2), GV18B(6), GV21A(2), GV21B(2); AS14A(1); DD12A(1), DD14A(2), DD16A(1)	HP, UT, SK, WB, AR, PB	Nepal, Taiwan
667	100.18	<i>Tristeirometa decussata</i> (Moore, 1868) ^q	NV02C(1); DD02A(1)	HP, UT, SK, WB, AR, AS, TN	Taiwan, Malaysia, Indonesia (Borneo, Sarawak)
668	100.19	<i>Venusia crassisigna</i> Inoue, 1987 ^{bq}	GH03B(1); GV24A(9), GV24B(13); DD29B(1)	HP, UT, AR	Nepal, China
669	100.20	<i>Venusia lilacina</i> (Warren, 1893) ^q	DD29B(1)	SK, WB, AR	Nepal
670	100.21	<i>Venusia roseicosta</i> Yazaki, 1994 *	GH17B(1), GH21B(1); GV24A(5), GV24B(3); AS10C(1)	HP, UT	Nepal
671	100.22	<i>Xanthorhoe hamptoni</i> Prout, 1925 ¹	GH12A(4); GV20A(2)	HP, UT	Nepal
672	100.23	<i>Xenortholitha falcata</i> Yazaki, 1993 *	GH01E(1), GH01F(1)	HP	Nepal
673	100.24	<i>Xenortholitha latifusata</i> (Walker, 1862)	GH11A(1)	HP, UT	Pakistan, Taiwan
674	100.25	<i>Xenortholitha propinguata</i> Kollar, 1844 ^b	GH16A(1), GH20A(1)	HP, UT	Nepal, China, Japan, Korea, Mongolia, Russia, Tajikistan
Subfamily: Oenochrominae Guenée, 1858					
675	83.5	<i>Sarcinodes carnearia</i> Guenee, 1857	NV05B(10)	HP, SK, WB, ME	Nepal, Myanmar, China, Taiwan, Vietnam, Thailand, Japan
676	83.4	<i>Sarcinodes restitutaria</i> (Walker, 1863)	NV02B(3), NV11A(1)	HP, SK, WB, ME	Nepal, Bhutan, Myanmar, China, Taiwan, Hong Kong, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Borneo), Philippines, Japan

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Orthostixinae Meyrick, 1892					
677	83.3	<i>Naxa obliterata</i> (Warren, 1893) ^q	DD12A(1)	AR, ME, NL, KA, TN, KL	Nepal, Bhutan, Japan
Subfamily: Sterrhinae Meyrick, 1892					
678	83.6	<i>Chrysocraspeda olearia</i> Guenée, 1858	GV08A(1)	JK, HP, UT, SK, MH	Sri Lanka, China, Hong Kong, Thailand
679	83.7	<i>Craspediopsis bimaculata</i> Warren, 1895 ^q	DD24A(2)	UT, AR, ME	Nepal
680	83.8	<i>Problepsis albidior</i> Warren, 1899 ^d	GV03A(2), GV03B(1); AS01C(1), AS15A(1); NV02F(2); ND05A(1)	HP, UT, WB, AR, MI	Nepal, China (Tibet), Taiwan, Thailand, Indonesia, New Guinea, Japan, Korea
681	83.9	<i>Problepsis vulgaris</i> Butler, 1889	GV01A(1); AS01C(1)	HP, UT, SK, WB, AR, AS, MN, MH, GA, KA, KL	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Hong Kong, Vietnam, Thailand, Malaysia
682	83.10	<i>Rhodometra sacraria</i> (Linnaeus, 1767)	GV15B(2); AS01C(1)	HP, UT, WB, ME, PB, MP, MH	Afghanistan, Pakistan, Australia, Norway, Greece, United Kingdom, Denmark, France, Spain, Portugal, Italy, Netherland, Poland, Ireland, UAE, Libya, South Africa, Algeria, Botswana, Congo, Ethiopia, Kenya, Morocco, Mozambique, Namibia, Nigeria, Sudan, Tanzania, Tunisia, Uganda, Zambia, Zimbabwe, Madagascar, Chile
683	83.11	<i>Rhodostrophia pellonaria</i> (Guenée, 1858) ⁱ	GV05B(1), GV14A(6), GV16A(8)	HP, UT, ME	Pakistan, China (Tibet)
684	83.14	<i>Scopula pulchellata</i> Fabricius, 1794	GV01A(2), GV01C(1), GV05B(2), GV09A(2)	HP, UT, SK, WB, AS, GJ, CT, MH, GA, KA, TN, OD	Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Malaysia, Indonesia, Namibia, Botswana, Ethiopia, Kenya, Somalia, South Africa, Zimbabwe, Tanzania, Uganda, Madagascar
685	83.12	<i>Synegiodes hyriaria</i> (Walker, 1866)	NV10C(1)	SK, WB, AR, ME	Nepal, Myanmar, China (Tibet)
686	83.13	<i>Synegiodes sanguinaria</i> (Moore, 1868)	NV11A(1); DD17A(1)	SK, WB, AR	Nepal, Bhutan, China (Tibet)
687	83.15	<i>Timandra convectoria</i> Walker, 1861	NV02D(1)	SK, WB, AS, MH, TN	Bangladesh, China (Tibet), Taiwan, Hong Kong, Vietnam, Indonesia, Philippines, Japan, Korea, Russia
688	83.16	<i>Timandra correspondens</i> Hampson, 1895	GH04A(1), GH14A(1); GV01A(1), GV01C(2), GV05B(1)	HP, UT, WB, AR, ME, NL, MN, KL	Nepal, Bhutan, Myanmar, China (Tibet), Vietnam



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
689	83.17	<i>Zythos avellanea</i> (Prout, 1932) ¹	DD03A(1)	HP, AR, AS, ME	Nepal, Bhutan, China, Taiwan, Vietnam, Cambodia, Malaysia, Indonesia (Sumatra, Borneo)
Superfamily: Noctuoidea Latreille, 1809					
Family: Notodontidae Stephens, 1829					
Subfamily: Dudusiinae Matsumura, 1929					
690	102.1	<i>Dudusa nobilis</i> Walker, 1865	ND03G(1)	AR, ME, MH, KA, TN	Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra)
691	102.2	<i>Tarsolepis japonica</i> Wileman & South, 1917 ^a	AS01A(2); ND03H(1)	UT, AR	Myanmar, China, Taiwan, Laos, Japan, Korea
Subfamily: Heterocampinae Neumoegen & Dyer, 1894					
692	102.3	<i>Fentonia excurvata excurvata</i> (Hampson, 1892)	NV02A(1)	UT, SK, WB	Myanmar, China, Taiwan, Vietnam, Laos, Thailand
693	102.4	<i>Fentonia excurvata altitudinis</i> Kiriakoff, 1974 ¹	AS01E(1)	UT	Nepal
694	102.5	<i>Neopheosia fasciata fasciata</i> (Moore, 1888) ¹	GH01E(1), GH01F(1), GH04A(2); GV01C(1), GV03B(2); DD11A(4)	HP, UT, SK, AR	Pakistan, Nepal, Myanmar, China, Taiwan, Vietnam, Indonesia (Sulawesi, Java), Philippines, Japan
Subfamily: Notodontinae Stephens, 1829					
695	102.6	<i>Acmeshachia albifascia</i> (Moore, 1879)	AS09A(2); NV10C(1), NV11A(2); DD11A(4), DD16A(1)	UT, SK, WB, AR	Nepal, Myanmar, China (Tibet), Taiwan, Vietnam, Japan
696	102.7	<i>Acmeshachia gigantea</i> (Elwes, 1890)	NV10C(2), NV11A(1)	HP, UT, SK, WB, AR, AS, ME	Pakistan, Nepal, Myanmar, China, Taiwan, Vietnam, Thailand
697	102.8	<i>Cerura himalayana</i> Moore, 1888	LD02B(2), LD04A(17), LD04C(12), LD09A(3), LD12A(4), LD22B(6)	JK, HP, WB	Afghanistan, Pakistan
698	102.9	<i>Cerura roesleri</i> de Lattin, Becker & Bender, 1974	VF01A(1)	HP, UT	Afghanistan, Pakistan
699	103.1	<i>Chlorostauropus alternus alternus</i> (Walker, 1855)	AS01E(2); NV02A(1), NV02B(2), NV02C(1)	HP, UT, WB, AR, AS, ME, JH, CT, MH, KA, OD, AN	Bangladesh, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Indonesia (Borneo), Japan
700	103.2	<i>Cleapa latifascia</i> Walker, 1855	GV01A(2), GV01F(1), GV03B(2); AS01D(1), AS05A(3), AS07B(2)	JK, UT, CT, MH	Pakistan, Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Indonesia
701	103.3	<i>Euhampsonia niveiceps</i> (Walker, 1865)	GH04A(1)	HP, UT, SK, AS	Nepal, China

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
702	103.4	<i>Formofentonia orbifer orbifer</i> (Hampson, 1892) ^{ca}	GH01A(1); GV03B(1); NV02F(1); DD15A(2)	HP, UT, SK, WB, AR	Nepal, Myanmar, China, Taiwan, Indonesia (Borneo, Sulawesi)
703	103.5	<i>Harpyia longipennis</i> (Walker, 1855)	GV16A(5); AS13A(1); NV12A(1)	HP, UT, SK, WB, AR, S India	Pakistan, Nepal, China, Taiwan, Japan
704	103.6	<i>Hexafrenum collaris</i> (Swinhoe, 1904) ^{1 ca}	GV16A(1); NV11A(1); DD10D(1), DD15A(1)	UT, WB, AR, AS, ME	Nepal, Myanmar, China, Thailand
705	103.7	<i>Hexafrenum rufa</i> (Hampson, 1892) ^a	DD10C(1), DD15A(1)	SK, WB, AR, ME, NL	
706	103.8	<i>Hexafrenum unicolor</i> (Kiriakoff, 1974)	GV01F(1), DD15A(1)	UT, AR	Pakistan, Nepal, Bhutan, Myanmar, China (Tibet)
707	103.9	<i>Hiradonta hannemanni</i> Schintlmeister, 1989 *	GV03B(2)	UT	China
708	103.10	<i>Homocentridia picta picta</i> (Hampson, 1900)	GV03B(2)	UT, ME	Nepal, Vietnam
709	104.1	<i>Kamalia tattakana</i> (Matsumura, 1927) *	DD10C(2)	AR	Myanmar, China, Taiwan, Vietnam, Japan
710	104.2	<i>Miostauropus mioides</i> (Hampson, 1904)	NV11A(1)	WB, SK, AS, ME	Nepal, Myanmar, China, Taiwan, Vietnam, Laos, Thailand
711	104.3	<i>Nerice pictibasis</i> (Hampson, 1897) ^{1 a}	AS10C(1); DD15A(1)	UT, AR, AS, ME	Nepal, Myanmar, China, Vietnam, Thailand
712	104.4	<i>Netria multispinae multispinae</i> Schintlmeister, 2006	NV02F(1)	SK, WB, AR, MH	Nepal, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia
713	104.5	<i>Netria viridescens continentalis</i> Schintlmeister, 2006	NV02A(1), NV02B(1), NV02E(1)	UT, SK, WB, AR, AS, NL, CT, MH	Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Java, Borneo, Sumatra), Papua New Guinea
714	104.6	<i>Peridea moorei moorei</i> (Hampson, 1892) ⁱ	AS07B(1), AS10C(2), AS13A(5), AS15B(3)	UT, WB	Nepal, China (Tibet), Taiwan
715	104.7	<i>Peridea swata</i> Kiriakoff, 1974	AS10C(1), AS13A(1)	UT	Pakistan, Nepal
716	104.8	<i>Pheosia albivertex</i> (Hampson, 1892) ^b	GH01E(1), GH01F(1)	JK, HP	Pakistan, Nepal, Bhutan, China (Tibet), Taiwan
717	104.9	<i>Pheosiopsis niteria</i> (Schaus, 1928) [#]	AS10C(1); NV11A(2); DD07A(2), DD10A(1)	UT, WB, AR, AS	Thailand
718	104.10	<i>Pseudofentonia argentifera</i> (Moore, 1866)	NV11A(1)	SK, WB	Nepal, Myanmar, China, Taiwan, Vietnam, Thailand, Indonesia (Sumatra)
719	105.1	<i>Ptilodon flavistigma</i> (Moore, 1879)	GV16A(1), GV19A(1)	UT, SK, WB	China, Taiwan
720	105.2	<i>Semidonta basalís</i> (Moore, 1866) ^a	GV11A(9); DD10C(1), DD15A(7)	UT, WB, AR	China, Taiwan
721	105.3	<i>Stauropplitis apicalis</i> (Moore, 1879) ^a	ND03H(1)	WB, AR, AS	Myanmar, China, Laos, Thailand
722	105.4	<i>Stauropus sikkimensis</i> Moore, 1866 ⁱ	GV14A(1), GV16A(1)	UT, SK, WB, AS, ME	Nepal, Myanmar, China, Taiwan, Vietnam, Thailand



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
723	105.5	<i>Syntypistis comatus comatus</i> (Leech, 1898) ^a	DD11B(1)	UT, AR , MH	Nepal, Bhutan, Myanmar, China, Taiwan, Malaysia, Indonesia (Borneo, Sumatra), Philippines, Papua, New Guinea
724	105.6	<i>Syntypistis umbrosa</i> (Matsumura, 1927) ^d	SL02A(1)	UT, WB , NL, UP	Pakistan, Nepal, Myanmar, China, Taiwan, Malaysia, Indonesia, Philippines
725	105.7	<i>Syntypistis nigribasalis tropica</i> (Kiriakoff, 1974)*	DD08B(1)	AR	China, Thailand, Malaysia, Indonesia (Bali, Java, Sulawesi, Borneo, Sumatra), Philippines
726	105.8	<i>Teleclita centrictica</i> (Hampson, 1897)	NV02A(3)	SK, WB, AR, AS, ME, CT	Nepal, Sri Lanka, Myanmar, China, Thailand
727	105.9	<i>Teleclita strigata</i> (Moore, 1879) ^a	ND03H(2)	UT, WB, AR , KA, KL	China, Vietnam, Thailand, Indonesia (Borneo)
728	105.10	<i>Viridifentonia plagiviridis plagiviridis</i> (Moore, 1879) ^a	DD15A(1)	SK, WB, AR	Nepal
Subfamily: Periergosinae Kobayashi, 2016					
729	106.1	<i>Chadisra bipars</i> Walker, 1862 ^a	GV02B(1); AS01E(4); DD23A(1)	UT, AR , ME, MH	Nepal, Myanmar, China, Taiwan, Laos, Vietnam, Thailand, Malaysia
730	106.2	<i>Chadisra bipartita</i> (Matsumura, 1925) ^b	DS01A(1)	HP , NE India, MH	Pakistan, Nepal, Myanmar, China, Taiwan, Malaysia, Indonesia (Sumatra), Japan
731	106.3	<i>Gangarides dharma</i> Moore, 1866 ^a	DD07A(1)	WB, AR	Myanmar, China, Vietnam, Laos, Thailand
732	106.4	<i>Periergos genitale</i> Schintlmeister, 2002 *	DD01A(2)	AR	Myanmar, China, Thailand
733	106.5	<i>Periergos harutai</i> Sugi, 1994 ^a	DD09A(1), DD11A(1)	SK, AR	Nepal, China (Tibet), Laos, Thailand
734	106.6	<i>Periergos kamadena</i> (Moore, 1866) ^{bi}	GH01D(1); GV12A(1); AS12A(2)	HP, UT , NE India	Nepal, Myanmar, China (Tibet), Taiwan, Vietnam, Laos, Thailand
735	106.7	<i>Rachia plumosa</i> Moore, 1879	GV10C(4), GV14A(2), GV19A(7), GV19B(5), GV24A(2), GV24B(1)	UT, SK, WB	Nepal, China (Tibet), Taiwan
736	106.8	<i>Rachia striata</i> Hampson, 1892	SL02A(2)	NW India, SK, WB, AR, ME	Nepal, Myanmar, China, Taiwan, Vietnam, Thailand
Subfamily: Phalerinae Butler, 1886					
737	107.1	<i>Antheua servula</i> (Drury, 1773)	AS01A(2); ND03G(2)	HP, UT, AR, JH, CT, MP, MH, TN	Pakistan, Nepal, Sri Lanka, Myanmar, Thailand, Indonesia (Java, Sumatra)
738	107.2	<i>Phalera torpida torpida</i> Walker, 1865 ⁱ	AS01D(2), AS02B(1)	UT , SK	Pakistan, Nepal, Bangladesh, Myanmar, China, Taiwan, Vietnam, Cambodia, Thailand

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
739	107.3	<i>Phalera birmicola</i> Bryk, 1949 *	AS01C(1)	UT	Myanmar, Malaysia, Indonesia (Borneo)
740	107.4	<i>Phalera goniophora</i> Hampson, 1910	DD12A(1), DD22B(1)	UT, SK, AR, AS, ME, PB	Nepal, Myanmar, China, Taiwan, Laos, Vietnam, Thailand, Indonesia (Borneo)
741	107.5	<i>Phalera grotei</i> Moore, 1860	GV01F(2); ND03H(1)	HP, UT, SK, WB, AR, AS, NL, CT, MH, KA, TN, KL, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Malaysia, Indonesia (Sumatra, Borneo), Philippines, Korea
742	107.8	<i>Phalera raya</i> Moore, 1860	NV08A(1)	HP, UT, SK, WB, NL, JH, CT, MP, MH, TN	Nepal, Sri Lanka, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Indonesia (Borneo)
743	107.7	<i>Phalera parivala</i> Moore, 1860 ^a	DD12A(1)	UT, SK, WB, AR	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan
744	107.6	<i>Phalera sangana</i> Moore, 1860 ^a	GV03A(5); ND03H(2)	UT, SK, WB, AR, MH	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Cambodia
Subfamily: Platychasmatinae Nakamura, 1956					
745	108.1	<i>Cyphanta chortochroa</i> Hampson, 1893 ^a	DD08B(1), DD11A(2)	UT, SK, AR, NL	Nepal, Myanmar, China, Vietnam, Thailand
746	108.2	<i>Cyphanta xanthochlora</i> Walker, 1865	GV16A(1); DD15A(1)	UT, SK, AR	Bhutan, Myanmar, China, Vietnam
Subfamily: Pygaerinae Duponchel, 1845					
747	108.3	<i>Clostera anachoreta anachoreta</i> ([Denis & Schiffermüller], 1775) ^{a1}	LD27A(1); GH01B(2), GH01E(2), GH04A(1); VF01A(1); AS12A(1)	JK, HP, UT	China, Taiwan, Japan, Korea, Russia, Turkey, Austria, Bulgaria, England, Finland, Sweden, Spain
748	108.4	<i>Clostera fulgurita fulgurita</i> (Walker, 1865)	GH01E(2), GH04A(1); GV01G(1); VF01A(1)	HP, UT, UP, S India	Nepal, Sri Lanka, Myanmar, China, Indonesia (Borneo, Java, Sulawesi), Papua New Guinea
749	108.5	<i>Clostera mahatma</i> (Bryk, 1949)	GH01B(2)	HP, NE India	Nepal, Bhutan, Myanmar, China
750	108.6	<i>Clostera pallida</i> (Walker, 1855) ^{da}	NV10C(1); DD10C(8)	UT, WB, AR	Nepal, Myanmar, China, Taiwan
751	108.7	<i>Micromelalopha undulata</i> (Hampson, 1891)	GH01E(3), GH02A(1), GH03B(1), GH12A(2), GH17B(1)	HP, UT, TN	Afghanistan, Pakistan, Nepal
Subfamily: Spataliinae Matsumura, 1929					
752	108.8	<i>Antiphalaria bilineata</i> (Hampson, 1896) ^d	NV02A(1)	WB, ME	Nepal, Bhutan, China, Taiwan, Laos, Vietnam, Thailand
753	108.9	<i>Baradesa lithosioides lithosioides</i> Moore, 1883 ^e	VF01A(1)	UT, SK, WB	Nepal, China, Taiwan, Thailand



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
754	108.10	<i>Besaia rubiginea</i> Walker, 1865	SL01A(1), SL02A(1); DD10C(1), DD15A(2), DD23B(1)	NW India, SK, WB , AR	Nepal, Myanmar, China, Taiwan
755	108.11	<i>Bireta longivitta longivitta</i> Walker, 1856	GV03A(2), GV03B(5)	HP, UT, SK, NL, MH	Pakistan, Nepal, Myanmar, China, Taiwan
756	108.12	<i>Curuzza caii nepalensis</i> Kobayashi & Kishida, 2008 ^a	DD13A(1), DD15A(1)	SK, AR	Nepal
757	108.13	<i>Ginshachia baenzigeri</i> Schintlmeister, 2007 ⁱ	AS01E(1)	UT , SK	Nepal, Myanmar, China, Laos, Vietnam, Thailand
758	108.14	<i>Ginshachia gemmifera</i> Moore, 1879	GV16A(1); NV11A(1)	UT, SK, WB, AN	Sri Lanka, Myanmar, China, Taiwan, Indonesia (Borneo, Bali, Java, Sumatra)
759	109.1	<i>Honveda fasciata</i> (Moore, 1879) ^a	ND03H(1); DD10C(1)	NW India, WB, AR	Myanmar, China, Laos, Vietnam
760	109.2	<i>Honveda nepalina</i> Nakamura, 1976*	GV03B(1)	UT	Nepal
761	109.3	<i>Metaschalis disrupta</i> (Moore, 1879) ^a	ND03H(1)	SK, WB, AR , AS	Nepal, Myanmar, China, Taiwan, Vietnam
762	109.4	<i>Mimopydna sikkima sikkima</i> (Moore, 1879)	KA01A(2)	SK, WB, AS, ME	Nepal, Myanmar, China, Taiwan, Laos, Cambodia, Malaysia, Indonesia (Java)
763	109.5	<i>Pseudallata laticostalis</i> (Hampson, 1900) ^a	GV14B(1), GV16A(1); DD14C(1)	UT , AR , ME	Afghanistan, Pakistan, Myanmar, China, Vietnam, Laos, Thailand
764	109.6	<i>Saliocleta acyptera acyptera</i> (Hampson, 1896) ^a	DD15A(1)	AR , ME	China, Vietnam
765	109.7	<i>Saliocleta ochracea</i> (Moore, 1879)	GH01B(1)	HP, SK, WB	Myanmar, China, Vietnam, Laos, Thailand, Indonesia (Sumatra)
766	109.8	<i>Spatalia sikkima</i> (Moore, 1879)	AS01D(1), AS01E(1), AS23A(1), AS27A(1); ND03G(1)	UT, SK, AR, KA	Nepal, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Sulawesi), Philippines
767	109.9	<i>Spatalina desiccata stolidata</i> Schintlmeister, 2007 *	ND05A(2), ND05B(1)	AR	Vietnam, Laos
Subfamily: Thaumetopoeinae Aurivillius, 1889					
768	109.10	<i>Gazalina apsara</i> (Moore, 1859) ^{ba}	GH04A(3), GH09A(1), GH11B(2); GV01A(3), GV01F(2), GV03A(3), GV07A(1), GV16A(1), GV17A(4), GV19A(1); AS04A(1), AS07A(1), AS07B(12), AS13A(3), AS15A(11), AS16A(1); NV02A(2); ND03E(1); DD12A(1), DD11A(1), DD17A(1)	HP , UT, SK, WB, AR	Pakistan, Nepal, China

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
769	109.11	<i>Gazalina chrysolopha</i> (Kollar, 1844)	GH05A(2), GH11B(4), GH13A(2), GH17B(7); GV01F(3), GV03A(1), GV07B(2), GV11A(7), GV13B(1), GV19A(2); AS05A(1), AS07B(2), AS12A(1), AS13A(4), AS15A(3), AS15B(2), AS18A(1), AS19A(2), AS22B(1), AS21A(1); ND03E(1); DD23B(1), DD24A(2)	JK, HP, UT, SK, WB, AR	Pakistan, Nepal, Myanmar, China, Taiwan, Thailand
770	109.12	<i>Gazalina transversa</i> Moore, 1879 ^q	NV02F(1); ND05B(1); DD19A(1)	SK, WB, AR , NL	Nepal, Thailand, France
Family: Erebiidae Leach, 1815					
Subfamily: Aganainae Lafontaine & Fibiger, 2006					
771	110.1	<i>Asota caricae</i> Fabricius, 1775	GH01C(1); AS01D(2), AS02B(1); NV02A(1), NV02C(2), NV05B(5), NV10D(1); ND03G(1), ND03H(1)	JK, HP, UT, WB, AS, NL, TR, RJ, MP, CT, MH, GA, KA, TN, KL, AN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra), Philippines, Timor, Australia, Japan
772	110.2	<i>Asota egens</i> Walker, 1854	NV02A(1)	HP, SK, WB, AR, AS, ME, NL, TR, TN, AN	Nepal, Bhutan, China, Taiwan, Cambodia, Thailand, Malaysia, Indonesia (Borneo), Philippines, New Guinea, Japan, USA, Canada
773	110.3	<i>Asota ficus</i> (Fabricius, 1775)	AS01D(2)	HP, UT, WB, AS, ME, JH, PB, CT, MP, MH, OD, TN	Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Japan
774	110.4	<i>Asota heliconia</i> (Linnaeus, 1758)	ND03G(1)	AR, AS, ME, TN, AN	China, Taiwan, Hong Kong, Thailand, Indonesia, Philippines, Australia, Japan
775	110.5	<i>Asota plana</i> Walker, 1854	NV02C(1), NV05B(1)	JK, SK, WB , AR, AS, ME, NL, TR, JH, CT, MH, GA, KL, TN, OD	Nepal, Sri Lanka, China, Vietnam, Thailand, Malaysia, Indonesia, New Guinea, Japan
776	110.6	<i>Asota producta</i> (Butler, 1875)	AS01D(4); NV02B(1), NV10C(2); ND03E(1)	UT, SK, WB, AR, AS, TR, MH, TN	Nepal, Sri Lanka, Myanmar, China, Thailand, Malaysia, Indonesia
777	110.7	<i>Asota tortuosa</i> Moore, 1872 ^d	NV10C(1), NV11A(2); DD10D(1)	HP, WB , AR, AS, NL	Nepal, China, Taiwan, Thailand
778	110.8	<i>Mecodina diastriga</i> (Hampson, 1926) ^q	ND05B(1)	AR	China, Hong Kong, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra)



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
779	110.9	<i>Neochera marmorea</i> (Walker, 1856)	DD10C(1), DD11A(1)	AR, AS, MN	Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra)
Subfamily: Arctiinae Leach, 1815					
780	111.1	<i>Aglaomorpha plagiata</i> (Walker, 1855) ^q	AS01D(1); NV02A(1), NV02C(2), NV05B(4); DD03B(1), DD10C(1)	JK, HP, UT, SK, WB , AR , AS, ME, NL, BH	Afghanistan, Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Laos, Philippines, Korea
781	111.2	<i>Aloa lactinea</i> (Cramer, 1777)	GV23A(4)	JK, UT, AR, AS, ME, NL, MN, MP, MH, AD, OD	Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Indonesia (Java, Sumatra), Philippines, Japan
782	111.3	<i>Alphaea fulvohirta</i> Walker, 1855 ^q	DD20A(2)	HP, SK, WB, AR , AS	Nepal, Indonesia (Java)
783	111.4	<i>Alphaea imbuta</i> (Walker, 1855) ⁱ	GV03B(2)	JK, HP, UT , SK, WB, AS	Pakistan, Nepal, Bhutan
784	111.5	<i>Alphaea impleta</i> (Walker, 1864) ⁱ	GH05A(1); AS09A(3), AS10C(1)	JK, HP, UT , SK, WB, AR, AS, ME, NL	Nepal, China (Tibet)
785	111.6	<i>Amerila astreus</i> (Drury, 1773)	NV02A(1), NV02B(1), NV02C(4), NV11B(8)	JK, HP, UT, SK, AR, AS, NL, KA, MH, KL, TN, PY	Pakistan, Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Sumatra, Borneo), Philippines, New Guinea
786	111.7	<i>Amerila omissa</i> (Rothschild, 1910)	NV05B(1); ND03H(4)	SK, WB , AR, AS, ME, KA	China, Malaysia, Indonesia (Borneo, Sumatra)
787	111.8	<i>Areas galactina</i> (Hoeven, 1840)	GV01F(6); AS09A(2), AS10C(1)	JK, HP, UT, SK, AR, AS, ME, NL, MN, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java), Philippines
788	111.9	<i>Areas imperialis</i> (Kollar, 1844)	GV01F(1); AS13A(1)	JK, HP, UT, SK, AS, NL	Pakistan, Nepal, Myanmar, China, Indonesia (Java)
789	111.10	<i>Argina astrea</i> (Drury, 1773)	GV01A(4), GV01F(2); AS01E(1); NV02A(1)	JK, HP, UT, SK, WB, AR, AS, CT, JH, MH, KA, TN, AN	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Indonesia, Philippines, New Guinea, Australia, Japan, Ghana, Madagascar, Brazil, Mexico, Peru
790	112.1	<i>Barsine euprepioides</i> Walker, 1862	NV02A(1); ND03H(1)	UT, SK, WB , AR, AS, ME, MI, NL	Myanmar, China, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java), Philippines
791	112.2	<i>Barsine flammealís</i> (Moore, 1865)	NV10C(2), NV11A(2)	HP, SK, WB, ME	Nepal, Bhutan, Thailand

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
792	112.3	<i>Barsine linga</i> Moore, 1859	GH01B(1); GV01A(1), GV01F(1), GV02C(2); AS01D(1), AS02B(1)	JK, HP, UT, SK, WB, AR, AS, ME, MI	Nepal, Bhutan, China, Laos, Thailand
793	112.4	<i>Barsine orientalis bigamica</i> Cerny, 2009 ^a	GH01D(17), GH04A(5); AS04A(1); ND05A(2), ND05B(1)	UT, WB, SK, AR, AS, CT	Nepal, China, Cambodia, Thailand
794	112.5	<i>Barsine pretiosa</i> Moore, 1879	NV11A(3); ND02E(1)	HP, UT, SK, WB, AR, AS, MN, TN, AN	Nepal, Sri Lanka, Myanmar, China, Indonesia (Borneo), Japan
795	112.6	<i>Barsine punicea</i> Moore, 1878 ⁱ	AS01D(1); ND03G(1)	UT, SK, WB, AR, AS, ME, MI	Nepal, Bhutan, Myanmar, China, Thailand
796	112.7	<i>Barsine roseata</i> (Walker, 1864)	KA01A(1)	HP, SK, WB, AR, AS	Nepal, Bhutan, China, Vietnam, Thailand
797	112.8	<i>Callindra equitalis</i> (Kollar, [1844])	KA01A(1); DD11A(2)	JK, HP, UT, SK, WB, AR, AS, ME, MH	Nepal, Myanmar, China (Tibet), Vietnam, Laos, Indonesia (Sumatra)
798	112.9	<i>Callindra principalis</i> (Kollar, [1844])	LD04A(84), LD04C(10); GV03A(2), GV07B(1), GV19A(1); AS09A(1)	JK, HP, UT, SK, WB, AR	Afghanistan, Pakistan, Nepal, Bhutan, Myanmar, China
799	112.10	<i>Callindra similis</i> (Moore, 1879)	GH02A(4), GH03B(1), GH05A(6); GV01F(6), GV03B(2), GV11A(2), GV14A(7), GV14B(5), GV16A(1); AS15B(2)	HP, UT, SK, WB	Nepal, Bhutan, China (Tibet), Costa Rica
800	112.11	<i>Carcinopyga lichenigera</i> Felder, 1874	LD04A(1), LD08A(2), LD14A(2), LD26A(2), LD31A(4)	JK	Afghanistan, Pakistan
801	112.12	<i>Chrysaeglia magnifica</i> (Walker, 1862)	NV02A(15), NV02C(2), NV02F(1), NV05B(2); ND05A(4), ND05B(4)	HP, SK, WB, AR, AS, ME, NL	Bhutan, China, Taiwan, Vietnam, Laos, Thailand, Indonesia (Borneo, Sarawak, Sulawesi), Japan
802	113.1	<i>Chrysorabdia bivitta</i> (Walker, 1856)	GH01B(3), GH02A(1); GV01A(1), GV03A(5); AS01C(1)	JK, HP, UT, SK, WB, AR, AS, ME, MN	Pakistan, Nepal, Bhutan, Myanmar
803	113.2	<i>Chrysorabdia viridata</i> (Walker, [1865])	GH05A(4), GH06A(1), GH06B(1); GV14B(5), GV16A(3), GV17A(1); AS02A(1); NV10C(1), NV11A(2); DD08B(3), DD15A(1), DD18A(1), DD20A(3), DD22A(3), DD26A(7)	HP, UT, SK, WB, AR, AS, ME	Pakistan, Bhutan, Bangladesh, Myanmar, China
804	113.3	<i>Churinga beema</i> (Moore, 1865)	GV03A(5), GV04A(4), GV10C(2), GV11A(4), GV14B(8), GV16B(2), GV18B(3); AS13A(1), AS15B(1)	UT, SK, WB	Nepal
805	113.4	<i>Churinga rufifrons</i> (Moore, 1878)	AS10C(1); KA01A(1)	HP, UT, SK, WB	Nepal, Bhutan
806	113.5	<i>Cladarctia hansraji</i> Kaleka, 2005 ⁱ	GV03B(1)	HP, UT	
807	113.6	<i>Cladarctia quadriramosa</i> (Kollar, 1844)	GV01F(2), GV03B(6), GV22B(4); AS02B(1), AS10B(1)	JK, HP, UT, SK, AR, AS, ME, MH	Pakistan, Nepal, Bhutan, China (Tibet)



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
808	113.7	<i>Coleta coleta</i> (Stoll, 1781) ^q	ND05A(1)	AR, AS, ME, NL, KA, TN, KL, AN	Sri Lanka, Myanmar, Taiwan, Thailand, Malaysia, Indonesia (Amboina, Seram), Philippines, New Guinea, Japan
809	113.8	<i>Conilepia hunliensis</i> Kirti, Singh & Joshi, 2013	ND05B(1)	AR	
810	113.9	<i>Cretonotos gangis</i> (Linnaeus, 1763)	GV03A(7)	UT, SK, WB, AR, AS, ME, DL, GJ, CT, MP, AD, MH, TN, KL	Pakistan, Nepal, Bhutan, Sri Lanka, China, Taiwan, Indonesia (Java, Sumatra), Philippines, Australia
811	113.1	<i>Cretonotos transiens</i> (Walker, 1855)	GH01C(2), GH01F(2); GV01E(3), GV01F(9), GV05B(2); AS01D(9); NV01A(1), NV02A(18), NV02B(1), NV02C(4), NV02F(11), NV05B(5), NV08A(1); ND03H(2)	HP, UT, SK, WB, AR, AS, CT, MP	Afghanistan, Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Sulawesi, Borneo, Lombok), Philippines, Australia, Japan
812	114.1	<i>Cyana adita</i> Moore, 1859	GH01A(1), GH01B(2), GH01D(1), GH02A(7), GH03B(3), GH04A(20), GH11A(1), GH12A(1); AS06A(2), AS07A(1), AS10C(2), AS13A(3); NV02A(2), NV10A(1), NV10B(1), NV11A(4); DD10E(2)	HP, UT, SK, WB, AR, AS, ME	Nepal, Bhutan, China, Vietnam, Thailand
813	114.2	<i>Cyana arama</i> (Moore, 1859)	GH01C(1)	HP, UT, SK, WB, AR, AS, ME, NL, MI	
814	114.3	<i>Cyana bellissima</i> (Moore, 1878)	DD10E(1)	JK, HP, UT, SK, WB, AR, AS, ME, NL, MN	Nepal
815	114.4	<i>Cyana bianca</i> (Walker, 1856)	ND03G(1)	HP, UT, SK, AR, AS, JH, CT, AN	Nepal, Bhutan, Bangladesh, Myanmar, China, Vietnam, Cambodia, Thailand
816	114.5	<i>Cyana candida</i> (Felder, 1874)	GH06A(2)	JK, HP, UT, SK, WB, AR, ME	China (Tibet)
817	114.6	<i>Cyana detrita</i> Walker, 1854	GH01D(1), GH02A(2); AS05A(2)	JK, HP, UT, SK, WB, AR, AS, ME, NL	Afghanistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Indonesia (Java, Sumatra), Madagascar
818	114.7	<i>Cyana dohertyi</i> (Elwes, 1890)	GH01B(1); DD10C(2)	HP, UT, SK, AR, AS, ME, NL, MN	Nepal, China, Thailand
819	114.8	<i>Cyana dudgeoni</i> (Hampson, 1895)	NV02A(2); ND03F(1)	HP, SK, WB, AR, AS, ME, NL, MN, MI	Nepal, China, Vietnam, Laos, Cambodia, Thailand, Malaysia
820	114.9	<i>Cyana flavicincta</i> (Hampson, 1903) ^q	ND03H(1)	AR, AS, ME	
821	114.10	<i>Cyana gelida</i> (Walker, 1854)	DS01A(1)	HP, UT, SK, AR, AS, ME, NL, UP	Nepal, Bangladesh, Thailand

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
822	114.11	<i>Cyana guttifera</i> (Walker, 1856)	AS06A(3); NV02F(1)	HP, UT, SK, WB, AS, NL, BH, JH, MH, KL, AN	Nepal, China, Thailand
823	114.12	<i>Cyana intercomma</i> Cerný, 2009 ⁱ	GV01A(1); AS01E(1)	JK, UT , SK, AS	Laos, Cambodia, Thailand, Malaysia
824	114.13	<i>Cyana mollerii</i> (Elwes, 1890)	AS06A(2), AS08A(1)	UT, SK, AR, AS, ME	Bhutan, Myanmar
825	114.14	<i>Cyana peregrina</i> (Walker, 1854)	GV05A(1), GV05B(2), GV12A(1); AS02B(1), AS05A(1)	JK, HP, UT, SK, ME, JH, MH, TN, KL, OD, PY	Pakistan, Nepal, Bangladesh, Sri Lanka, Hong Kong, Cambodia, Thailand
826	114.15	<i>Cyana peromata</i> (Walker, 1854) ^q	ND03E(1)	JK, HP, SK, AR , AS, ME, MI, TN	Nepal, Bangladesh, China, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Java, Borneo, Sumatra)
827	114.16	<i>Cyana puer</i> (Elwes, 1890)	NV11A(2)	SK, WB, AR, AS, ME, NL, MN	Nepal
828	114.17	<i>Cyana puella</i> (Drury, 1773)	DS01A(1)	JK, HP, UT, SK, PB, JH, CT, MP, MH, KA, TN, OD	Pakistan, Nepal, Sri Lanka, Myanmar, China, Indonesia (Java), Madagascar, Kenya
829	114.18	<i>Cyana signa</i> Walker, 1854	GH06A(1); GV10C(3), GV11A(2), GV13A(1), GV16A(1); AS06A(1), AS09A(1), AS10C(1); NV11A(11); DD07A(1), DD10C(1), DD10E(1)	JK, HP, UT, SK, WB , AR, AS, ME, MN, CT	Nepal, Bangladesh, Myanmar, China (Tibet), Vietnam, Thailand
830	114.19	<i>Cyana sikkimensis</i> (Elwes, 1890)	NV02A(1)	HP, SK, WB	Nepal, Bhutan, China (Tibet)
831	113.11	<i>Eilema basinota</i> (Moore, 1865) ⁱ	GV10C(1), GV12B(1), GV14D(3); AS15A(1)	HP, UT , SK, WB	
832	113.12	<i>Eressa confinis</i> (Walker, 1854)	ND03E(1)	HP, UT, SK, WB, AR, AS, ME, NL, BH, UP, PB, KA	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Laos, Cambodia, Thailand, Malaysia, Indonesia
833	113.13	<i>Euchromia polymena</i> (Linnaeus, 1758) ^q	ND03G(1)	UT, WB, AR , AS, NL, MH, GA, KA, TN, KL, AN	Bangladesh, Sri Lanka, Myanmar, Taiwan, Malaysia, Indonesia (Sulawesi, Borneo), Philippines, Australia
834	113.14	<i>Gandhara serva</i> (Walker, 1854) ^d	NV02A(4), NV11A(1)	UT, WB	Nepal, Japan
835	113.15	<i>Ghoria postfusca</i> (Hampson, 1894) ^q	GH12A(1), GH16A(4), GH17B(3); AS15B(3); DD27A(1), DD29B(1)	HP, UT , SK, AR	China (Tibet), Japan
836	113.16	<i>Hesudra divisa</i> Moore, 1878	NV02A(4)	SK, WB, AR, AS, ME, NL, MN	Nepal, Bhutan, Taiwan, Indonesia (Borneo)
837	113.17	<i>Juxtartia multiguttata</i> (Walker, 1855)	AS01A(1)	HP, UT, SK, WB, AS, ME	Nepal, Bhutan, Bangladesh, Myanmar, China (Tibet), Cambodia
838	114.20	<i>Katha conformis</i> (Walker, 1854)	GV05B(1)	JK, HP, UT, SK, WB, ME	Bhutan, China, Thailand, Japan
839	114.21	<i>Katha spinoapex</i> Singh & Kirti, 2015	NV02A(3)	SK, WB	



Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
840	115.1	<i>Lemyra multivittata</i> (Moore, 1865) ⁱ	GH01D(1); GV14D(1); AS06A(1); DD04A(1); DD19A(1); ND05A(1)	JK, HP, UT , SK, WB, AR, AS, ME, NL, UP	Nepal, Myanmar, China, Vietnam, Thailand
841	115.2	<i>Lemyra melli</i> (Daniel, 1943)*	GV13B(2), GV19A(1), GV21A(1), GV24B(2); AS19A(1)	UT	Nepal, China (Tibet)
842	115.3	<i>Lemyra stigmata</i> (Moore, 1865)	DD28A(1)	JK, HP, UT, SK, WB, AR, AS	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Thailand
843	114.22	<i>Lyclene calamaria</i> (Moore, 1888) ⁱ	GV03A(3), GV03B(4), GV11A(11); AS01C(1)	JK, HP, UT , SK, AR, AS, ME, NL, BH, UP, PB, MH, TN	Nepal, China, Malaysia, Indonesia (Sumatra, Java, Borneo)
844	114.23	<i>Macotasa nubecula</i> (Moore, 1879) ^a	ND03H(1)	HP, AR , NL, MN, KA, TN, AN	Nepal, Myanmar, Indonesia (Borneo)
845	115.4	<i>Macrobrochis gigas</i> (Walker, 1854)	AS02B(1)	HP, UT, SK, WB, AS, ME, JH, MP, MH, KA	Nepal, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia
846	115.5	<i>Macrobrochis pallens</i> Hampson, 1894	GV01A(5), GV03A(2), GV11A(2), GV14B(4)	HP, UT	Nepal, Myanmar, China
847	115.6	<i>Macrobrochis prasena</i> (Moore, 1859)	GV01A(6); ND03G(1)	HP, UT, SK, AR, AS, ME, NL	Nepal, Bhutan, Thailand
848	115.7	<i>Mangina argus</i> (Kollar, 1844)	AS01B(1); NV02C(3)	JK, HP, UT, SK, WB, AR, ME, MN, JH, MH, KA, KL	Nepal, Bhutan, Sri Lanka, China, Taiwan, Hong Kong, Thailand, Philippines
849	115.8	<i>Nannoarctia obliquifascia</i> (Hampson, 1894)	AS01A(1)	JK, HP, UT, SK, AS	Nepal, Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia (Java)
850	115.9	<i>Nyctemera adversata</i> (Schaller, 1788) ^b	GH04A(1); AS12A(1); NV02C(1), NV02F(1), NV05B(2); ND03G(1); DD11A(2)	HP , UT, SK, WB, AR, AS, ME, NL, MN, TR	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Borneo), Philippines, Japan, Korea
851	115.10	<i>Nyctemera arctata</i> Walker, 1856	NV02A(1); DD10C(1), DD11A(1)	SK, WB , AR, AS, ME, MN, NL	Nepal, Bhutan, Sri Lanka, China, Taiwan, Indonesia
852	115.11	<i>Nyctemera carissima</i> (Swinhoe, 1891)	NV02A(1); ND05B(1)	WB , SK, AR, AS, ME, NL	Nepal, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Sumatra)
853	115.12	<i>Olepa ricini</i> (Fabricius, 1775)	AS01D(1)	UT, WB, AR, AS, PB, CT, MH, KA, TN, KL	Pakistan, Nepal, Bangladesh, Sri Lanka, Hong Kong, Thailand, Malaysia, Philippines
854	116.1	<i>Preparctia hannyingtoni</i> Hampson, 1910	AS26A(2), AS27A(3)	UT	Nepal
855	116.2	<i>Sidyra albifinis</i> Walker, 1856	GV07A(2), GV11A(2), GV17A(2), GV19A(6), GV24B(4); AS09A(1), AS13A(1); KA01A(1); DD11C(1)	HP, UT, SK, AR, AS, NL	Nepal, Vietnam
856	116.3	<i>Sidyra apicalis</i> Moore, 1878	NV10A(1), NV10C(2), NV11A(2)	HP, SK, WB, AR	Nepal

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
857	116.4	<i>Spilarctia casigneta</i> (Kollar, [1844])	GH01A(1), GH02A(1); GV01A(2); NV02A(2), NV02E(1), NV09A(1), NV11A(9); DD10C(1), DD13A(1), DD14A(1), DD15A(1)	HP, UT, SK, WB, AR, AS, ME, MN, NL, PB, MH, TN, KL	Pakistan, Nepal, Bhutan, China (Tibet)
858	116.5	<i>Spilarctia comma</i> (Walker, 1856)	GH01F(4)	JK, HP, UT, SK, AR	Nepal, Bhutan, China
859	116.6	<i>Spilarctia inayatullahi</i> Dubatolov & Gurko, 2004*	LD02B(9), LD04A(32), LD04C(2), LD09A(2), LD12A(1), LD19B(1), LD22B(5), LD27A(2)	JK	Pakistan
860	116.7	<i>Spilarctia leopardina</i> (Kollar, [1844])	GH16A(3); GV07A(9), GV14B(7), GV16A(3), GV17A(2), GV21A(4)	JK, HP, UT, SK, AR, AS, ME, MN	Nepal, China (Tibet)
861	116.8	<i>Spilarctia melanostigma</i> (Erschoff, 1872) ^b	GH16A(5); GV11A(3), GV13B(4), GV16A(4), GV19A(3)	JK, HP, UT, SK, AS, NL	Afghanistan, Pakistan, Uzbekistan, Kyrgyzstan, Tajikistan
862	116.9	<i>Spilarctia obliqua</i> (Walker, 1855)	GV03B(1); NV11A(3); DD08B(1); DD10C(1)	UT, SK, WB, AR, AS, BH, PB, CT, KA, TN, KL	Afghanistan, Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Australia, Russia
863	116.11	<i>Spilosoma erythrozona</i> (Kollar, 1844) ^{bi}	GH03B(1), GH07A(1), GH12A(4), GH15A(6), GH18C(3); GV01A(3), GV05A(3), GV07B(1), GV12A(2), GV14B(4), GV14D(2), GV17A(4), GV22A(4)	JK, HP, UT, ME	Afghanistan, Pakistan, China
864	116.12	<i>Spilosoma punctaria</i> (Stoll, 1782) ⁱ	GV01A(12), GV01F(1), GV10C(3), GV11A(2), GV22A(2)	UT, SK, NL	Nepal, Myanmar, China, Taiwan, Japan, Korea, Russia
865	116.10	<i>Spilarctia sagittifera</i> Moore, 1888	GV01A(2); NV02A(7), NV02B(1), NV02C(1), NV02E(1), NV06A(1), NV11A(1); DD08B(3), DD11A(1), DD12A(1), DD13A(1), DD10C(3), DD14A(2), DD15A(2), DD20A(2), DD21A(1), DD22A(1), DD22B(6), DD23B(2); ND03E(8), ND03F(2), ND05A(1)	HP, UT, SK, WB, AR	Afghanistan, Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Hong Kong
866	116.13	<i>Spilosoma unifascia</i> (Walker, 1855)	GV01A(1)	HP, UT	Indonesia
867	116.14	<i>Stigmatophora palmata</i> (Moore, 1878)	AS01D(1), AS02B(1)	HP, UT, SK, AR, AS, ME	Nepal, China, Vietnam
868	116.15	<i>Syntomoides imacon</i> (Cramer, 1779)	GV02B(2); NV02A(4); ND03E(3), ND03F(1), ND03G(1), ND03H(2)	SK, ME, AS, JH, TN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo), Maldives
869	116.16	<i>Thysanoptyx tetragona</i> (Walker, 1854)	ND03H(1)	SK, WB, AR, AS, ME, NL, MN, TR, CT, TN, KL	Nepal, Bangladesh, China, Vietnam, Thailand



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
870	117.1	<i>Utetheisa lotrix</i> (Cramer, 1779)	GV01F(1); AS01C(1)	UT, CT	Pakistan, Nepal, Taiwan, Hong Kong, Japan, Thailand, Malaysia, Indonesia, Australia, Fiji, Nigeria
871	117.2	<i>Utetheisa pulchelloides</i> Hampson, 1907 ^a	ND03H(2)	SK, WB, AR , AS, JH, RJ, CT, MP, TN, KL, OD, AN	Hong Kong, Indonesia (Borneo), Papua New Guinea, Australia, New Zealand
872	117.3	<i>Utetheisa varians</i> Walker, 1854	NV02A(1), NV02F(1)	HP, SK, WB, AR, ME, NL, MN	Bhutan, Bangladesh, Myanmar, China
873	117.4	<i>Vamuna alboluteola</i> Rothschild, 1912	ND05A(1), ND05B(2)	SK, AR, AS, ME, MN, MI	China, Taiwan, Vietnam, Thailand, Malaysia
874	117.5	<i>Vamuna maculata</i> (Moore, 1878)	NV02A(3); ND05A(1)	SK, WB, AR, NL	China, Thailand, Malaysia, Indonesia (Sumatra, Borneo)
875	117.6	<i>Vamuna remelana</i> (Moore, 1865)	AS06A(2), AS10A(1), AS14A(1); NV02A(9), NV10C(3), NV11A(6); DD10C(6), DD11A(1)	HP, UT, SK, WB, AR, ME, NL, MI, TR	Nepal, Bhutan, Bangladesh, China, Malaysia, Indonesia (Borneo, Java)
Subfamily: Calpinae Boisduval, 1840					
876	117.7	<i>Baorisa hieroglyphica</i> Moore, 1882	NV02A(1)	UT, SK, WB, AR	Nepal, Bhutan, Malaysia, Indonesia (Java, Sumatra, Sulawesi), Philippines
877	117.10	<i>Calyptra bicolor</i> (Moore, 1883)	GH09A(1); NV10C(1)	JK, HP, UT, SK, WB	Nepal, China
878	117.11	<i>Calyptra fasciata</i> (Moore, 1882) ^a	ND03F(1)	HP, UT, SK, WB, AR , ME, MH	Nepal, Myanmar, China, Vietnam, Thailand
879	117.12	<i>Calyptra minuticornis</i> (Guenée, 1852) ⁱ	AS01E(1); NV02A(1)	UT , SK, WB, AR, AS, MH, TN, AN	Nepal, Bhutan, Sri Lanka, China, Taiwan, Hong Kong, Malaysia, Indonesia (Java, Flores, Sumbawa, Sulawesi, Borneo), Timor, Australia, Japan, Mexico
880	117.13	<i>Calyptra ophideroides</i> (Guenée, 1852)	AS04A(4)	HP, UT	Nepal, Singapore
881	117.8	<i>Cymatophoropsis sinuata</i> (Moore, 1879) ^a	GV18B(2), GV24A(2), GV24B(2); DD10B(1)	HP, UT, SK, WB, AR , UP	Nepal, Bangladesh, China, Thailand
882	118.1	<i>Episparis costistriga</i> (Walker, 1864)	NV02A(2); ND03F(1), ND03G(1)	WB, AR, AS	Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra), Philippines
883	118.2	<i>Episparis liturata</i> Fabricius, 1787 ^a	ND03G(1)	HP, UT, AR , AS, PB, JH, CT, MP, MH, KL, AN	Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, Hong Kong, Laos, Vietnam, Cambodia, Thailand, Indonesia (Borneo), Philippines
884	118.3	<i>Episparis tortuosalis</i> Moore, 1867	NV02A(2); ND03G(1)	SK, WB, AR, AS, ME, TN, AN	Nepal, Bangladesh, Sri Lanka, China, Vietnam, Laos, Cambodia, Thailand
885	118.4	<i>Eurogramma obliquilineata</i> (Leech, 1900)*	DD08B(1), DD15A(1)	AR	Nepal, China

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
886	117.9	<i>Lopharthrum comprimens</i> (Walker, 1858)	ND03H(1)	SK, AR, AS, TR, TN, KL, AN	Bangladesh, China, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia, Philippines, New Guinea, Honduras, Mexico
887	118.7	<i>Oraesia emarginata</i> (Fabricius, 1794) ¹	GV01A(3), GV01C(4), GV01F(2), GV09B(3); AS01A(1), AS01B(1), AS01C(1), AS02A(1); NV02A(2), NV02F(1), NV05B(5)	JK, HP, UT , WB, AR, AS, ME, PB, CT, MP, MH, KA, TN, KL	Pakistan, Nepal, Sri Lanka, Myanmar, China, Hong Kong, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sulawesi), Philippines, New Guinea, Australia, Japan, Korea, Africa
888	118.8	<i>Oraesia provocans</i> Walker, [1858] [#]	NV02A(2), NV02F(1), NV05B(5)	WB , TN, KL	Bangladesh, Sri Lanka, South Africa, Madagascar
889	118.9	<i>Oraesia rectistria</i> Guenée, 1852 ¹	AS01E(1); NV02A(9), NV02C(2), NV05B(3)	JK, HP, UT , SK, WB , AR	Nepal, Bangladesh, Thailand
890	118.5	<i>Oxyodes scrobiculata</i> (Fabricius, 1775) ^{2a}	NV02A(3), NV02B(1), NV02F(1), NV10C(2); DD11A(1)	UT, WB , AR , AS, ME, NL, TN, KL, AN	Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Java, Borneo), Australia, Fiji
891	118.13	<i>Pleurona falcata</i> Walker, 1877 ^d	NV02A(4)	UT, WB , TN, AN	Nepal, Myanmar, Thailand, Indonesia (Borneo, Bali, Sulawesi)
892	118.6	<i>Psimada quadripennis</i> (Walker, 1858)	AS01A(1)	HP, UT, NL, PB, CT, MP, MH, KA, TN, AN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia, Japan, Europe
893	118.10	<i>Rema costimacula</i> (Guenée, 1852)	NV02A(4)	SK, WB	Bhutan, Bangladesh, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Sumatra, Borneo), Australia
894	118.11	<i>Rema tetraspila</i> (Walker, 1865)	AS01D(1)	HP, UT	Pakistan, Nepal, Sri Lanka, Myanmar, Thailand, Europe, South Africa
895	118.16	<i>Scoliopteryx libatrix</i> (Linnaeus, 1758)*	LD04C(1)	JK	China, Taiwan, Indonesia, Russia, Finland, United Kingdom, Italy, Netherlands, Austria, Denmark, Sweden, France, Spain, Norway, Germany, Canada, USA
896	118.12	<i>Thyrostipa sphaeriphora</i> Moore, 1867	NV11A(2)	WB	Nepal, Thailand, Malaysia
897	118.15	<i>Tinolius eburneigutta</i> Walker, 1855 ¹	AS01E(1); NV02F(1)	UT , WB, TN, KL, AN	Nepal, Bangladesh, Sri Lanka, China, Hong Kong, Thailand, Malaysia, Indonesia



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
898	118.14	<i>Tiruvaca subcostalis</i> (Walker, 1865)	ND05A(1)	AR, AS	China, Taiwan, Thailand, Malaysia, Indonesia (Borneo), Philippines, Papua New Guinea, Solomon Islands
Subfamily: Erebininae Leach, 1815					
899	119.1	<i>Achaea janata</i> (Linnaeus, 1758)	NV02A(1), NV02C(1)	HP, UT, WB, AS, JH, PB, CT, MH, KA, TN, KL	Nepal, Bhutan, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia, Philippines, Australia, New Guinea, Japan, Ethiopia
900	119.2	<i>Achaea serva</i> (Fabricius, 1775) ^d	NV10C(2)	WB , ME, NL, MN, JH, CT, MH, TN, KL, AN	Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Java, Borneo, Sumatra, Sumbawa, Sulawesi), Philippines, Australia, Fiji, Melanesia, Japan, Yemen
901	119.3	<i>Anisoneura aluco</i> (Fabricius, 1775)	NV05B(1)	UT, SK, WB, AS, ME, CT, MP, MH, TN	Nepal, Bangladesh, Myanmar, China, Taiwan, Hong Kong, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra), Philippines, Australia, Japan
902	119.4	<i>Anisoneura salebrosa</i> Guenée, 1852	ND05A(2)	SK, AR, AS, MH, OD	Nepal, Bangladesh, Myanmar, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines, Japan
903	119.5	<i>Anoba pectinata</i> (Hampson, 1896) ^d	NV02A(1), NV02F(1)	WB , AS, ME, NL, MH, KL	Sri Lanka, China, Thailand, Malaysia, Indonesia
904	119.6	<i>Anticarsia irrorata</i> (Fabricius, 1781) ^d	AS23A(1); NV02C(1); DD01A(1)	UT, WB , AR, AS, ME, NL, JH, UP, GJ, MP, MH, GA, CT, KA, TN, OD	Nepal, Bangladesh, Sri Lanka, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Sulawesi, Amboina), New Guinea, Australia, Japan, Saudi Arabia, Yemen, Cameroon, Kenya, Madagascar, Peru, Brazil
905	120.1	<i>Arcte coerulea</i> (Guenée, 1852) ^d	GV01C(1), GV01F(1); NV02B(1); DD11A(1)	JK, HP, UT, WB , AR, TN, KL	Pakistan, Nepal, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia, Philippines, New Guinea, Japan, Korea, Russia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
906	120.2	<i>Arcte modesta</i> (Hoeven, 1840) ^d	NV02B(1), NV02F(1), NV05A(1), NV05B(1), NV08A(1), NV10A(1)	WB, AR, AS, KL	Thailand, Malaysia, Indonesia (Java, Bali, Sumatra, Flores, Borneo), Philippines, Timor
907	120.3	<i>Arcte polygrapha</i> Kollar, [1844]	VF01A(1)	HP, UT, AR	Nepal
908	119.7	<i>Artena dotata</i> (Fabricius, 1794)	AS01D(1); NV02A(1), NV05B(1), NV08A(1), NV10A(1), NV10C(2); DD11A(1)	JK, HP, UT, WB, AR, AS, ME, NL, MN, JH, CT, MH, GA, TN, KL, OD	Pakistan, Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Sumatra), Philippines, Papua New Guinea, Japan, Korea, Russia
909	119.8	<i>Arytrurides inornata</i> (Walker, 1865) ^q	DD07A(1)	HP, UT, AR	Nepal, Taiwan
910	119.9	<i>Bamra albicola</i> (Walker, 1858)	NV04A(1)	HP, SK, WB, AS, PB, AN	Sri Lanka, China, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Sulawesi)
911	119.1	<i>Bamra lepida</i> (Moore, 1867) ^p	GH02A(1); GV01F(1); AS01E(1)	HP, UT, SK, WB	Nepal, Taiwan, Hong Kong
912	121.1	<i>Bastilla absentimacula</i> (Guenée, 1852) ^d	NV02A(2)	WB, AS, TN, KL, AN	Taiwan, Hong Kong, Thailand, Indonesia (Java), New Guinea, Australia
913	121.2	<i>Bastilla analis</i> (Guenée, 1852)	AS02B(1)	HP, UT, SK, NL, CT, KA, TN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Indonesia (Java), Europe
914	121.3	<i>Bastilla arctotaenia</i> (Guenée, 1852)	AS01D(2)	HP, UT, AS, JH, CT, MP, MH	Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, Taiwan, Indonesia (Java, Borneo), Fiji, New Guinea, Australia, Japan, Korea
915	121.4	<i>Bastilla arcuata</i> (Moore, 1887)	NV02A(1)	UT, WB, AS, ME, JH, MH, GA, TN, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Malaysia, Indonesia (Borneo, Java), New Guinea, Korea
916	121.5	<i>Bastilla crameri</i> (Moore, 1885)	GV03A(1), GV03B(1)	HP, UT, WB, AS, NL, CT, MP, MH, KA, TN, KL, OD, AN	Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, China, Vietnam, Cambodia, Thailand, Indonesia (Borneo, Sumatra), Tanzania
917	121.6	<i>Bastilla latifascia</i> Warren, 1888	GV01C(1), GV08B(1)	HP, UT, PB	Pakistan, Sri Lanka, Myanmar, China, Japan, Europe, Africa
918	121.7	<i>Bastilla maturata</i> (Walker, 1858) ^d	NV02A(1); DD10E(1)	HP, WB, AR, AS, ME, MH, TN	Nepal, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Japan, Korea, Europe



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
919	121.8	<i>Bastilla maturescens</i> (Walker, 1858)	NV02A(2)	UT, SK, WB , AS, ME, NL, PB	Bangladesh, Hong Kong, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java), Europe
920	121.9	<i>Bastilla praetermissa</i> (Warren, 1913) ^d	NV02F(1)	UT, WB , AR	Nepal, Bhutan, China, Taiwan, Hong Kong, Thailand
921	121.10	<i>Bastilla stuposa</i> (Fabricius, 1794) ^d	NV10C(1)	UT, WB , JH, CT, MP, MH, TN, KL	Pakistan, Nepal, Sri Lanka, Bangladesh, China, Taiwan, Thailand, Indonesia, Philippines, Japan, Korea
922	121.11	<i>Buzara luteipalpis</i> (Walker, 1865) ^d	NV05B(1)	WB , AS, ME, PB, JH, MH, TN, KL	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Sulawesi), Philippines, Japan
923	122.1	<i>Catocala concubia</i> Walker, 1858 ^a	LD04B(4), LD25A(1)	JK	China
924	122.2	<i>Catocala macula</i> (Hampson, 1891) ^d	NV02A(1), NV02C(1)	UT, WB , AR, AS, ME, TN	Nepal, Bhutan, Sri Lanka, Taiwan, Japan, Thailand, Malaysia, Indonesia (Sulawesi)
925	122.3	<i>Catocala orientalis</i> Staudinger, 1877	LD02A(2), LD04B(3), LD25A(1), LD26A(1)	JK	Russia, Ukraine, Kazakhstan, Uzbekistan, Tajikistan, France, Austria, Hungary, Switzerland, Spain, Italy, Armenia, Syria, Iran
926	122.4	<i>Catocala patala</i> Felder, 1874 ^{bi}	GH23A(3); GV02C(1), GV07A(1), GV16A(2); AS26A(1), AS27A(2)	JK, HP , UT , AR, PB	China, Japan, Korea
927	122.5	<i>Catocala tapestrina</i> Moore, 1882	VF01A(1)	HP, UT, SK, WB	Nepal, Bhutan, Myanmar, China
928	120.4	<i>Chalciope mygdon</i> (Cramer, 1777)	NV02A(1), NV05B(1)	HP, SK, WB , AR, AS, NL, MN, JH, CT, MP, MH, KA, TN, KL, OD, AN	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra), Philippines, Japan
929	120.5	<i>Daddala brevicauda</i> (Wileman & South, 1921) ^d	SL01A(1)	WB , AR	Nepal, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Sulawesi, Seram), Philippines
930	120.6	<i>Daddala lucilla</i> (Butler, 1881)	NV01C(1), NV02F(2), NV04A(1)	UT, SK, WB , AR, AS, ME, PB	Nepal, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo, Java, Bali, Sumatra, Sulawesi), Papua New Guinea, Japan, Korea
931	120.7	<i>Daddala quadrisignata</i> Walker, 1865	NV02A(2)	SK, WB , ME, JH	Bhutan, China, Thailand, Malaysia, Indonesia (Sumatra, Borneo)

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
932	123.1	<i>Drasteria cailino</i> (Lefebvre, 1827)*	LD02B(2), LD04A(17), LD04C(4), LD09A(5), LD21B(1), LD22B(1)	JK	Iran, Tajikistan, France, Spain, Portugal, Bulgaria, Georgia, Italy, Algeria, Greece
933	123.2	<i>Drasteria caucasica</i> (Kolenati, 1846)*	LD02B(3), LD04A(4), LD04C(1), LD09A(28), LD14A(1), LD22B(7), LD26B(1), LD27A(2)	JK	Afghanistan, Pakistan, China, Mongolia, Armenia, Iraq, Iran, Tajikistan, Kazakhstan, Kyrgyzstan, Turkmenistan, Turkey, Ukraine, Uzbekistan
934	120.8	<i>Dysgonia palumba</i> (Guenée, 1852) ^d	NV02A(1)	UT, WB , ME, MH, TN	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Java, Sulawesi), Philippines, New Guinea, Australia, Micronesia, Japan
935	123.3	<i>Ercheia cyllaria</i> (Cramer, 1779)	NV02A(3)	UT, SK, WB , AS, JH, MP, MH, TN, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Amboina, Borneo, Maluku), Philippines, Papua New Guinea, Australia, Japan, Ethiopia
936	123.4	<i>Ercheia pulchrivenula</i> Gaede, 1938*	NV02E(1); ND03F(2)	WB, AR	Laos, Thailand, Malaysia, Singapore, Indonesia (Borneo, Sumatra)
937	123.5	<i>Erebus caprimulgus</i> (Fabricius, 1781)	AS01A(1)	HP, UT, WB , AR, AS, NL, MN, MH, KA, TN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines
938	123.6	<i>Erebus ephesperis</i> (Hübner, 1827) ^g	AS01B(1); DD03A(1)	HP, UT, SK, AR , AS, ME, NL, TR, JH, PB, CT, MH, GA, KA, TN, KL, OD, AN	Sri Lanka, Myanmar, China, Taiwan, Malaysia, Indonesia (Borneo, Sumatra, Java), Philippines, Timor, Australia, New Guinea, Japan
939	123.7	<i>Erebus gemmans</i> (Guenée, 1852) ^d	NV11A(1); DD19A(1)	WB , AR, ME, NL	Pakistan, Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines, Papua New Guinea, Australia, Cameroon, Gabon, Tanzania, Madagascar, Ghana



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
940	124.1	<i>Erebus hieroglyphica</i> (Drury, 1773) ^d	SL02A(1)	HP, UT, WB , AR, AS, NL, TR, JH, PB, MP, MH, GA, KA, TN, KL, OD	Bangladesh, Sri Lanka, Myanmar, China, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Sulawesi, Java), Philippines, Timor, Korea, Madagascar
941	124.2	<i>Erebus macrops</i> (Linnaeus, 1768)	ND03G(1)	UT, WB, AR, AS, NL, MN, JH, DL, GJ, CT, MP, MH, GA, KA, TN, KL	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Malaysia, Thailand, Indonesia, Philippines, Japan, Korea, Madagascar
942	124.3	<i>Ericeia eriophora</i> (Guenée, 1852) ^d	SL01A(1)	WB , AR, AS, NL, TN, AN	Sri Lanka, China, Taiwan, Hong Kong, Thailand, Malaysia
943	124.4	<i>Ericeia inangulata</i> (Guenée, 1852)	GH01E(1); AS01E(1); NV04A(1); ND05B(1)	HP, UT, WB, AR, JH, MH, TN, KL	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo), Fiji, New Guinea, Australia, Africa, Brazil
944	124.5	<i>Ericeia pertendens</i> (Walker, 1858) ^d	GV01C(4), GV01F(4), GV09A(7); NV02B(1); DD11A(1)	UT, WB , AR, MH, KA, AN	Nepal, Sri Lanka, Myanmar, China, Thailand, Malaysia, Indonesia (Borneo), Korea, Australia
945	125.1	<i>Fodina contigua</i> Wileman, 1914 ¹	AS01A(1)	UT , WB, JH, MH	Bhutan, Bangladesh, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Indonesia, Philippines, Japan, Africa
946	125.2	<i>Fodina pallula</i> Guenée, 1852	AS01D(1), AS02B(1)	HP, UT, WB, AR, AS, PB, MP	Nepal, Bhutan, Bangladesh, Sri Lanka, China, Thailand
947	125.3	<i>Hamodes pendleburyi</i> Prout, 1932 ^d	NV02A(1)	WB , AR, NL	Bhutan, China, Taiwan, Thailand, Malaysia, Indonesia (Sumatra, Borneo)
948	125.4	<i>Hamodes propitia</i> (Boisduval, 1832)	ND05A(1)	UT, AR, AS, TR, WB, JH, MH, GA, TN, KL	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Laos, Thailand, Malaysia, Indonesia (Borneo), Philippines, Papua New Guinea, Australia
949	125.5	<i>Hulodes caranea</i> (Cramer, [1780]) ^d	NV08A(1)	WB , AR, AS, ME, NL, JH, MH, GA, KA, TN, KL, OD, AN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia, Philippines, Timor, Australia, Japan

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
950	125.6	<i>Hulodes drylla</i> Guenée, 1852 ^a	DD19A(1)	AR, MH	Bangladesh, Myanmar, China, Thailand, Vietnam, Malaysia, Indonesia (Borneo, Sumatra, Java, Sulawesi), Philippines, Australia, United Kingdom, Cameroon
951	125.7	<i>Hypersynoides constellata</i> (Moore, 1883) ^a	AS01A(1); DD16A(1)	UT, AR	Nepal, China
952	125.8	<i>Hypersynoides submarginata</i> (Walker, 1865) ^{ca}	AS06A(1); KA01A(1); DD10C(1), DD16A(1), DD19A(1)	JK, HP, UT, SK, AR	China, Taiwan, Malaysia, Indonesia, Japan, Korea, Iran
953	125.9	<i>Hypopyra feniseca</i> Guenée, 1854 ^l	AS02B(1)	HP, UT, WB, AS	Nepal, Bangladesh, China, Vietnam, Thailand
954	125.10	<i>Hypopyra vespertilio</i> (Fabricius, 1787) ^a	GV01F(1); DD10C(1), DD22A(1)	HP, UT, AR, AS, PB, MH, TN, AN	Nepal, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Cambodia, Thailand, Malaysia, Indonesia, Philippines, Japan, Korea
955	126.1	<i>Ischyja inferna</i> Swinhoe, 1902 ^d	NV02A(1), NV10A(1)	UT, WB, AS, NL, TN	Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sulawesi, Sumatra, Java, Lombok), Philippines
956	126.2	<i>Ischyja manlia</i> (Cramer, 1776) ^d	NV10C(3); ND03I(1)	UT, WB, AR, AS, ME, JH, CT, MP, MH, TN, AN	Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Cambodia, Thailand, Malaysia, Indonesia, Philippines, Australia, Japan, Korea, Russia
957	126.3	<i>Ischyja marapok</i> Holloway, 2005 ^d	NV02A(1)	WB, KL, AN	Thailand, Malaysia, Indonesia, Philippines
958	126.4	<i>Lacera procellosa</i> Butler, 1879 ^l	GV01C(1), GV01F(4); AS01C(2), AS01E(1); NV02B(1), NV10C(1)	HP, UT, SK, WB, AS, ME, MH, MP, KA, TN, AN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Cambodia, Thailand, Indonesia, Philippines, Japan, Korea, Africa, Madagascar
959	126.5	<i>Lygephila dorsigera</i> (Walker, 1865)	GH01C(1), GH06A(1), GH08A(2), GH11A(1)	HP, SK, TN	Afghanistan, Pakistan, Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Australia, Japan, Korea, Russia
960	127.1	<i>Lygniodes endoleucus</i> (Guérin-Meneville, [1844]) ^d	NV02C(2)	WB, AS	Myanmar, China, Vietnam, Malaysia, Thailand, Indonesia (Java, Sumatra, Sulawesi)
961	127.2	<i>Lygniodes hypoleuca</i> Guenée, 1852	NV02F(1); ND03H(1)	UT, WB, SK, AR, AS, NL, MN, TN, KL, OD	Nepal, Bhutan, Bangladesh, China, Taiwan, Vietnam, Cambodia, Thailand
962	127.3	<i>Mocis discios</i> (Kollar, 1848)	GV01C(3), GV05B(1), GV08B(1)	JK, HP, UT	Nepal



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
963	127.4	<i>Mocis frugalis</i> (Fabricius, 1775)	AS06A(1); NV01B(1)	HP, UT, SK, WB, AR, AS, ME, MN, TR, JH, UP, PB, CT, MH, KA, TN, KL, OD, AN	Pakistan, Nepal, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Malaysia, Thailand, Indonesia, Philippines, Australia, Fiji, Japan, Egypt, South Africa
964	127.5	<i>Mocis undata</i> (Fabricius, 1775)	AS01D(3), AS02B(1); NV02A(3), NV02F(1); ND03G(1)	HP, UT, WB, AR, AS, ME, TR, BH, UP, PB, MP, CT, MH, KA, KL, TN, OD, AN	Nepal, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia, Philippines, Japan, Korea, Africa
965	127.6	<i>Ophiusa indistincta</i> (Moore, 1882) ^d	NV02C(2)	HP, WB , ME, MH	Laos, Thailand, Indonesia
966	127.7	<i>Ophiusa tirhaca</i> (Cramer, 1777)	GV01F(1); AS01A(3)	JK, HP, UT, AR, ME, MN, JH, MH, KA, TN, KL	Pakistan, Nepal, Bhutan, China, Taiwan, Vietnam, Thailand, Indonesia, Philippines, Australia, Japan, Korea, Russia, Turkey, Iran, France, Italy, Sardinia, Sicily, Spain, Portugal, Egypt, Madagascar, Costa Rica
967	127.8	<i>Ophiusa trapezium</i> (Guenée, 1852) ^d	NV05B(1)	JK, WB , AS, ME, MH, TN, KL, AN	Nepal, Bangladesh, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia, Philippines, Australia, Japan
968	127.9	<i>Ophiusa triphaenoides</i> (Walker, 1858)	AS01A(2)	HP, UT, SK, WB, AR, AS, JH, DL, CT, MP, MH, TN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia, Australia, Japan, Korea
969	127.10	<i>Othresypna ochreicillia</i> (Hampson, 1891) ^d	NV01C(1)	WB , TN	Thailand, Indonesia, Philippines
970	128.1	<i>Pericyma cruegeri</i> (Butler, 1886) ^q	ND03G(1)	HP, AR , NL, JH, CT, MP, MH, AN	Nepal, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines, New Guinea, Australia, Japan, Colombia
971	128.2	<i>Pericyma glaucinans</i> (Guenée, 1853) ^q	ND05B(1)	HP, UT, AR , AS, PB, MH, KA, TN, OD	Nepal, Bangladesh, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Java, Sumatra, Bali, Sulawesi), Philippines, Iran, Oman, Saudi Arabia, Yemen
972	128.3	<i>Pericyma umbrina</i> (Guenée, 1852)	GH01F(1); NV05B(1)	JK, HP, UT, SK, WB, AS, TR, MN, JH, UP, PB, MP, MH	Afghanistan, Nepal, Laos, Thailand, Indonesia, Malawi

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
973	128.4	<i>Phyllodes eyndhovii</i> Vollenhoven, 1858	SL01A(1)	SK, WB, AR, AS, NL, ME	Bhutan, Bangladesh, China, Taiwan, Vietnam, Laos, Malaysia, Indonesia, Kenya, Namibia, Somalia, South Africa
974	128.5	<i>Phyllodes verhuelli</i> Vollenhoven, 1857*	ND03F(1)	AR	Myanmar, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Java), Philippines
975	127.11	<i>Pindara illibata</i> Fabricius, 1775	NV11A(1)	SK, WB, AR, AS, ME, MH, TN, KL	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia, Philippines, Australia, Japan
976	128.6	<i>Serrododes campana</i> Guenée, 1852	NV10C(2)	HP, UT, SK, WB, AR, AS, UP, PB, MP, MH, TN, KL, AN	Nepal, Bhutan, Bangladesh, Sri Lanka, China, Taiwan, Thailand, Malaysia, Indonesia, Philippines, Australia, Fiji, Japan, Korea, Russia
977	129.1	<i>Spirama helicina</i> (Hübner, 1827)	AS01B(1)	HP, UT, SK, AS, ME, NL, JH, DL, MP, MH, TN	Pakistan, Nepal, Myanmar, China, Taiwan, Laos, Thailand, Malaysia, Indonesia, Japan, Korea, Russia
978	129.2	<i>Spirama retorta</i> (Clerck, 1764)	GH01E(1), GH04A(1); GV01C(3), GV01D(1), GV09B(2); AS01D(1)	JK, HP, UT, SK, WB, AS, ME, NL, DL, CT, AD, MH, GA, KA, TN, KL	Nepal, Bhutan, Bangladesh, Myanmar, China, Taiwan, Hong Kong, Cambodia, Thailand, Malaysia, Indonesia (Java), Philippines, Japan, Korea
979	129.3	<i>Supersynoides kirbyi</i> (Butler, 1881) ^b	GH02A(3)	HP, SK, WB	China, Thailand
980	129.4	<i>Supersynoides malaisei</i> (Berio, 1973)*	DD22A(2)	AR	Myanmar
981	128.7	<i>Sympis rufibasis</i> Guenée, 1852	NV02F(1)	SK, WB, AR, AS, ME, MN, MH, KA, TN, KL, AN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sarawak, Java, Sumatra), Philippines, Australia, Papua New Guinea
982	129.5	<i>Sypna dubitaria</i> (Walker, 1865)	ND05A(1); DD10A(1)	HP, SK, WB, AR, AS	Nepal, Bhutan, China, Taiwan, Thailand, Philippines
983	129.6	<i>Sypna omicronigera</i> Guenée, 1852	SL02A(1)	UT, SK, WB, AS, ME	China (Tibet)
984	129.7	<i>Sypnoides cyanivitta</i> (Moore, 1867) ^q	DD10A(1)	UT, SK, WB, AR	Nepal, Bangladesh, China, Thailand
985	129.8	<i>Sypnoides pannosa</i> (Moore, 1882)	TW01A(1)	HP, SK, WB, AR, AS, ME, UP, PB	Nepal, Taiwan, Malaysia



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
986	130.1	<i>Thyas coronata</i> (Fabricius, 1775)	NV10C(1), NV11A(2)	HP, UT, SK, WB, AS, NL, JH, DL, CT, MP, MH, GA, KA, TN, KL, AN	Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia, Philippines, Australia, Fiji, Japan, USA
987	130.2	<i>Thyas honesta</i> Hübner, 1824	NV02A(1), NV10C(1)	JK, UT, SK, WB, AR, AS, CT, MP, MH, TN, OD, AN	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Cambodia, Vietnam, Thailand, Malaysia, Indonesia, Philippines, New Guinea, Japan, Korea
988	130.3	<i>Thyas juno</i> (Dalman, 1823) ^d	GV04A(1); NV10C(1)	JK, HP, UT, WB , AR, AS, ME, TN	Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo, Java, Sulawesi, Maluku), Philippines, Maldives, Japan, Korea, Russia
989	129.9	<i>Trigonodes hyppasia</i> (Cramer, [1779])	GV02B(1); AS01D(2), AS02B(1); NV02A(1), NV02C(1)	HP, UT, WB, AR, AS, ME, NL, JH, UP, DL, CT, MP, MH, GA, KA, TN, KL, AN	Pakistan, Nepal, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Cambodia, Thailand, Malaysia, Indonesia, Philippines, Australia, Papua New Guinea, Japan, Iran, Madagascar, Kenya, Mozambique, South Africa, Honduras, Mexico, USA
Subfamily: Herminiinae Leach, 1815					
990	131.1	<i>Bertula abjudicalis</i> Walker, 1859	ND03D(1)	AR, TN	Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia, Philippines, Australia, Mexico
991	131.2	<i>Simplicia bimarginata</i> (Walker, 1854) ^a	ND03E(1), ND03G(1)	SK, WB, AR , AS, MI, JH, MH, TN, KL	Sri Lanka, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo, Sumatra), New Guinea
992	131.3	<i>Simplicia schaldusalis</i> (Walker, 1858) ^a	ND03G(1), ND05B(1)	AR	Sri Lanka, China, Thailand, Malaysia, Indonesia (Sumatra, Sarawak, Solomons, Borneo, Brunei, Java, Maluku, Buru, Sulawesi), Australia, Papua New Guinea, France, Madagascar, USA
993	131.4	<i>Simplicia xanthoma</i> Prout, 1928 ^b	GH01B(1), GH01C(1)	HP , CT	Nepal, China, Taiwan, Thailand, Malaysia, Indonesia, Japan, Korea

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Hypeninae Herrich-Schäffer, 1851					
994	131.5	<i>Anoratha paritalis</i> (Walker, 1859) ⁱ	AS10A(1)	UT, SK, TN	Sri Lanka, Hong Kong, Malaysia, Japan
995	131.6	<i>Dichromia quadralis</i> (Walker, 1858)	AS06A(3); NV02A(7), NV06A(1), NV09A(1), NV10A(1), NV10C(17), NV11A(3); SK01A(3),	HP, UT, SK, WB, ME, AN	Afghanistan, Nepal, Bhutan, Myanmar, China, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines
996	131.7	<i>Dichromia sagitta</i> (Fabricius, 1775) ⁱ	AS06A(1)	HP, UT, WB, AS, MH, KA, TN, KL, OD	Pakistan, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Thailand, Japan, Korea
997	131.8	<i>Dichromia trigonalis</i> Guenée, 1854	AS01D(1)	JK, HP, UT, SK, WB, ME, MP	Pakistan, Nepal, Thailand, China, Taiwan, Japan, Korea, Iran
998	131.9	<i>Dichromia triplicalis</i> Walker, [1859]	SL03A(2)	UT, SK, WB, ME	Bhutan, Australia
999	131.10	<i>Hypena albisigna</i> Moore, 1882 [#]	AS01E(1)	UT, ME	Hong Kong
1000	131.11	<i>Hypena conscitalis</i> Walker, [1866] ⁱ	AS02A(1)	UT, WB, ME	Sri Lanka, Taiwan, Vietnam, Cambodia, Thailand, Indonesia (Sumatra, Java), Australia, Papua New Guinea, Fiji, Japan, South Africa, Tanzania, Madagascar
1001	131.12	<i>Hypena labatalis</i> Walker, 1858 ^b	GH07A(1), GH12A(1)	HP, SK, ME, TN	Sri Lanka, Thailand, China, Hong Kong, Australia
1002	131.13	<i>Hypena laceratalis</i> (Walker, 1859) ^a	LD25A(1), ND03E(1)	JK, HP, UT, WB, AR, AS, ME, MP, MH, KA, TN, OD	Pakistan, Sri Lanka, Myanmar, Taiwan, Hong Kong, Thailand, Malaysia, Fiji, Australia, South Africa, USA, Mexico
1003	131.14	<i>Hypena longipennis</i> Walker, 1865 ⁱ	GV10B(1)	HP, UT, SK, WB, ME, TN	Bangladesh, China, Taiwan, Thailand
1004	131.15	<i>Hypena nocturnalis</i> Swinhoe, 1896 ^a	DD03A(1)	AR, ME, NL	Hong Kong, Brazil
1005	131.16	<i>Hypena obductalis</i> Walker, 1859	GH03B(4), GH05A(25), GH06B(3), GH09A(3), GH12A(82)	HP, SK, WB, ME, MH	China, Japan
1006	131.17	<i>Hypena strigatus</i> (Fabricius, 1798) ^{bi}	GH04A(1), GH14A(1); AS10B(1)	HP, UT, WB, MH	Bangladesh, China, Taiwan, Vietnam, Malaysia, Indonesia (Borneo, Java, Sumatra, Maluku, Tanimber), Japan, Korea, Africa, Mauritius
1007	131.18	<i>Hypena vestita</i> (Moore, [1885])	GH01D(1); NV02A(2)	HP, WB, ME	Sri Lanka, China (Tibet), Thailand, Malaysia, Indonesia (Borneo, Maluku, Seram), Philippines



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Hypocalinae Guenée, 1852					
1008	132.1	<i>Eudocima aurantia</i> (Moore, 1877) ^d	NV02A(1), NV02C(1)	WB , TN, AN	Nepal, Sri Lanka, Vietnam, Malaysia, Indonesia (Sumatra, Java, Bali, Borneo, Sulawesi, Seram), Philippines, Australia, Papua New Guinea
1009	132.2	<i>Eudocima discrepans</i> (Walker, 1858)	ND05B(1)	SK, AR, AS, KL	Nepal, China, Vietnam, Thailand, Malaysia, Indonesia, Philippines
1010	132.3	<i>Eudocima homaena</i> (Hübner, [1823]) ^d	NV02A(2), NV10C(1)	UT, WB , AS, NL, GJ, CT, MH, GA, KA, TN, KL, OD	Nepal, Bangladesh, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Borneo), Philippines, Timor, Japan
1011	133.1	<i>Eudocima hypermnestra</i> (Stoll, 1780)	ND03E(1), ND05A(1)	SK, AR, AS, MH, GA, KA, TN, KL	Nepal, China, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia, Philippines
1012	132.4	<i>Eudocima materna</i> (Linnaeus, 1767)	SL01A(1)	UT, WB, AS, UP, DL, PB, GJ, CT, MH, KA, AD, TN, KL	Pakistan, Nepal, Australia, South Africa, Ethiopia, Kenya, Tanzania, Ghana, Costa Rica
1013	133.2	<i>Eudocima okurai</i> (Okano, 1964)*	DD10B(1)	AR	Nepal, Bhutan, Myanmar, Taiwan, Malaysia, Philippines
1014	133.3	<i>Eudocima phalonia</i> (Linnaeus, 1763)	GV01A(1); AS01D(1); NV10A(1), NV10C(5)	UT, WB, AR, AS, ME, JH, CT, MH, KA, TN, KL	Nepal, Bangladesh, Myanmar, China, Taiwan, Vietnam, Thailand, Indonesia, Philippines, Australia, New Guinea, New Zealand, Japan, Korea, Russia, Africa
1015	134.1	<i>Eudocima salaminia</i> (Cramer, [1777])	NV10A(1)	UT, SK, WB , AR, AS, ME, MH, KA, TN, KL	Nepal, Bhutan, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Java, Sumatra), Philippines, Australia, New Guinea, Fiji, Japan, Korea, Africa, Brazil
1016	134.2	<i>Eudocima sikhimensis</i> (Butler, 1895)	NV02A(1); ND05A(1)	SK, WB, AR, ME, TN, KL	Nepal, Bhutan, Myanmar, China, Thailand, Malaysia, Indonesia
1017	134.3	<i>Hypocala deflorata</i> (Fabricius, 1794)	NV02F(1)	HP, SK, WB, AR, AS, ME, JH, CT, MP, MH, KA, TN, KL	Pakistan, Nepal, Sri Lanka, Laos, Thailand, Indonesia, China, Taiwan, Papua New Guinea, Australia, New Zealand, Fiji, Japan, Korea, Russia, South Africa, Kenya, Madagascar, USA

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1018	134.4	<i>Hypocala subsatura</i> Moore, 1878	VF01A(3); NV02A(3), NV10A(15), NV11A(4)	HP, UT, WB, AR, AS, MP, MH, KA, TN, KL, OD	Pakistan, Nepal, Bangladesh, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Java), Philippines, Australia, Japan, Korea, Russia, Africa
Subfamily: incertae sedis					
1019	134.5	<i>Asta quadrilinea</i> (Walker, [1863]) ^q	DD10B(1)	SK, WB, AR, AS, ME, MH, TN, KL	Nepal, Sri Lanka, China, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Sarawak), Philippines, Timor, Australia, New Guinea
1020	134.6	<i>Batracharta irrorata</i> Hampson, 1894 ⁱ	AS13A(1)	JK, HP, UT, MN	Nepal, China, Thailand, Indonesia (Sumatra)
1021	134.7	<i>Blasticorhinus varius</i> Yoshimoto, 1993 ^{ai}	KA01A(1); ND05B(1); DD11A(1)	SK, AR	Nepal, Laos, Thailand
1022	134.8	<i>Carsina flavibrunnea</i> (Hampson, 1895) ^q	ND05A(1)	AR	Myanmar, Thailand
Subfamily: Lymantriinae Hampson, 1893					
1023	135.1	<i>Arctornis comma</i> (Hutton, 1865)	GH04A(2); GV03B(5); AS01D(1); ND03G(1)	HP, UT, AR, TN	Nepal, Myanmar, China
1024	135.2	<i>Arctornis submarginata</i> Walker, 1855 ^q	ND05A(1)	UT, SK, WB, AR, AS	Bangladesh, Sri Lanka, Myanmar, China, Malaysia, Indonesia (Borneo, Sarawak, Java), Australia
1025	135.3	<i>Artaxa vitellina</i> (Kollar, 1848)	GV01A(5), GV03B(2), GV07B(9), GV12B(7), GV16B(1), GV21B(2)	JK, HP, UT, SK, MH	Pakistan, Sri Lanka
1026	135.4	<i>Birnara bicolor</i> (Walker, 1865) ^q	DD15A(3), DD25A(3)	HP, UT, SK, WB, AR, ME, NL	Bhutan, Bangladesh, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java)
1027	135.5	<i>Calliteara horsfieldi</i> (Saunders, 1851) ^p	GH16A(6); NV02A(4), NV02B(3), NV05B(3); ND03E(1)	HP, UT, WB, AR, AS, NL, TN	Laos, Thailand, Malaysia, Indonesia (Java, Sarawak, Celebs, Sulawesi), Papua New Guinea, Australia
1028	135.6	<i>Calliteara strigata</i> (Moore, 1879)	GH01E(1)	HP, UT, SK, WB, ME	Nepal, China, Thailand, Malaysia, Indonesia (Borneo, Java, Sumatra)
1029	135.7	<i>Cariola ecnomoda</i> (Swinhoe, 1907)	ND03I(1)	AR, AS, TR, AN	Bhutan, China, Hong Kong, Laos, Vietnam, Thailand, Malaysia, Indonesia (Java), Philippines
1030	135.8	<i>Cispia alba</i> (Moore, 1879)	ND05B(1)	SK, WB, AR	Sri Lanka, Taiwan



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1031	135.9	<i>Cispia punctifascia</i> Walker, 1855	NV02A(9); DD02A(1), DD04A(1)	HP, SK, WB, AR, AS, ME, NL	Nepal, Bhutan, Bangladesh, Sri Lanka, Thailand, Indonesia (Borneo, Java, Sumatra)
1032	136.1	<i>Dasychira cerebosa</i> (Swinhoe, 1903)	GH01E(1), GH01F(1); GV01A(3), GV05B(1), GV09A(3), GV12A(2)	HP, UT, SK	Nepal, Sri Lanka, Myanmar, China, Hong Kong, Indonesia (Java)
1033	136.2	<i>Dasychira complicata</i> (Walker, 1865)	AS15A(1); NV10C(1), NV11A(1); DD13A(3), DD14A(1), DD16A(4), DD16B(3), DD22A(1)	HP, UT, SK, WB, AR	Nepal, Bhutan, China
1034	136.3	<i>Euproctis divisa</i> Walker, 1855	DD09A(1)	UT, SK, WB, AR, NL, PB	Pakistan, Nepal, Bhutan, Bangladesh, China, Malaysia, Indonesia (Sumatra, Borneo), Japan, Africa
1035	136.4	<i>Euproctis marginata</i> (Moore, 1879) ^a	DD10C(1)	HP, SK, WB, AR, NL, MN	Nepal, Bhutan, China, Taiwan
1036	136.5	<i>Lymantriades varia</i> (Walker, 1855)	GV01F(1)	HP, UT, SK, NL, ME, GJ	Nepal, Bhutan, Myanmar, China, Indonesia (Sumatra)
1037	136.6	<i>Heracula discivitta</i> Moore, 1866	SL03A(1)	SK, WB, AS	Nepal, China
1038	136.7	<i>Himala argentea</i> (Walker, 1855)	GV03A(3), GV04A(1), GV09A(1), GV22B(1); DD07A(1)	HP, UT, SK, WB, AR, AS, AN	Nepal, China
1039	136.8	<i>Ilema chloroptera</i> (Hampson, 1892)	NV02A(1)	WB, ME	Nepal, Malaysia
1040	136.9	<i>Imaus munda</i> Walker, 1855	NV02A(3), NV02C(1)	SK, WB, AS, ME	Nepal, Bhutan, Bangladesh, Myanmar, China, Malaysia, Indonesia (Borneo, Java, Sumatra), Africa
1041	138.9	<i>Laelia exclamtionis</i> (Kollar, 1848)	GH01F(1); GV01C(1), GV09B(2), GV04A(4), GV11A(3)	HP, UT, SK, PB, MH	Nepal, Sri Lanka, Taiwan
1042	138.10	<i>Laelia umbrina</i> (Moore, 1888)	GH01F(1)	HP	Nepal, Hong Kong, Laos
1043	138.11	<i>Leucoma clara</i> (Walker, 1865) ⁱ	GV10A(1)	UT, SK	Taiwan, Hong Kong
1044	138.12	<i>Locharna limbata</i> (Collenette, 1932) ^a	NV02A(1); ND03H(1)	SK, WB, AR, AS, ME	Myanmar, China, Taiwan, Malaysia, Indonesia (Borneo)
1045	137.1	<i>Lymantria bivittata bivittata</i> (Moore, 1879) ^a	NV02A(3), NV02C(2); ND05B(1)	SK, WB, AR, AS, NL, AN	Nepal, Bhutan, Bangladesh, China, Vietnam
1046	137.2	<i>Lymantria brotea lepcha</i> (Moore, 1879)	NV08A(1); ND03E(1), ND05A(1); DD01A(2)	UT, SK, WB, AR	Nepal, Malaysia, Thailand, Indonesia (Brunei)
1047	137.3	<i>Lymantria concolor concolor</i> Walker, 1855	GH01C(3), GH01D(1), GH02A(3), GH04A(2); GV01A(9), GV22B(1); AS06A(1), AS10A(1); NV02C(1)	HP, UT, SK, WB, AR, AS, ME, NL, MN, KA, KL	Pakistan, Nepal, Bangladesh, Myanmar, China, Taiwan, Vietnam, Thailand, Australia, Brazil
1048	137.4	<i>Lymantria incerta</i> Walker, 1855 ⁱ	AS01D(2)	HP, UT, MP, CT, MH, KA, TN	Sri Lanka

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1049	137.5	<i>Lymantria marginata</i> Walker, 1855	AS01D(1)	HP, UT, WB, JH, MP, AD, AN	Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Thailand
1050	137.6	<i>Lymantria mathura</i> Moore, 1866	GV01A(1); AS01A(1); NV02A(1); ND05B(1)	HP, UT, WB, SK, AR, AS, ME, NL, TR	Nepal, Taiwan, Hong Kong, Thailand, Indonesia (Borneo), Japan, Korea, Russia, USA, Canada
1051	137.7	<i>Lymantria obfuscata</i> Walker, 1865	LD31A(1)	JK, HP, UT	Afghanistan, Pakistan
1052	137.8	<i>Lymantria semicincta</i> (Walker, 1855)	AS01E(1), AS02B(1)	HP, UT, SK, WB, ME, JH, MP, OD	Nepal, Taiwan, Thailand
1053	137.9	<i>Lymantria serva</i> (Fabricius, 1793)	AS01D(2), AS20A(1); ND03H(1)	HP, UT, SK, WB, AR, AS, ME, JH, MP, OD	Nepal, Sri Lanka, Myanmar, China, Taiwan, Malaysia, Philippines
1054	138.1	<i>Mardara calligramma</i> Walker, 1865 ¹	AS01E(1), AS06A(3), AS14A(1); SL02A(1); DD08A(1), DD15A(1), DD22A(1)	HP, UT, SK, WB, AR	Nepal, China
1055	138.2	<i>Numenes patrana</i> Moore, 1859	AS06A(1), AS10A(1), AS10B(1), AS14A(1), AS15A(1); NV01C(1), NV02F(2); DD15A(1), DD22A(1)	HP, UT, SK, WB, AR, ME, JH, MP, OD	Nepal, Bhutan, Myanmar, China, Taiwan
1056	138.3	<i>Numenes siletti</i> Walker, 1855	NV02A(3), NV05B(1); ND03G(1), ND03H(1)	HP, UT, SK, WB, AR, AS, ME, MN, TR, JH, MP, OD	Nepal, Bhutan, Bangladesh, Thailand, Malaysia, Indonesia (Sumatra, Java)
1057	138.4	<i>Nygmia epirotica</i> (Collenetta, 1932)*	ND03E(1)	AR	Thailand, Malaysia, Indonesia (Borneo, Sumatra)
1058	138.5	<i>Pantana albifascia</i> (Walker, 1865) ⁹	DD10A(1)	SK, WB, AR, ME	Bhutan
1059	138.6	<i>Perina nuda</i> (Fabricius, 1787)	NV02F(1)	WB, AR, AS, MN, CT, MP, MH, KA, TN	Nepal, Sri Lanka, China, Hong Kong, Thailand, Malaysia, Indonesia, Japan
1060	138.7	<i>Pida apicalis</i> Walker, 1865	ND03I(1)	SK, WB, AR, ME	Nepal, Bangladesh, China, Japan
1061	138.8	<i>Somena scintillans</i> Walker, 1856 ^{ba}	GH01B(1), GH01C(4), GH01D(1), GH02A(1), GH04A(1); GV01A(3), GV01C(2), GV08B(2), GV13B(4), GV11A(5); AS04A(1), AS15A(1); DD15A(1)	JK, HP, UT, WB, AR, AS, RJ, MH, KA, KL, AN	Pakistan, Nepal, Sri Lanka, Myanmar, China, Taiwan, Japan, Korea
Subfamily: Rivulinae Grote, 1895					
1062	139.1	<i>Bocula bifaria</i> (Walker, 1858) ¹⁹	AS01E(2); ND05B(1)	UT, AR	China, Thailand, Malaysia, Indonesia (Borneo, Sarawak, Sumatra), Philippines, Australia



Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Scoliopteryginae Herrich-Schäffer, 1852					
1063	139.2	<i>Anomis flava</i> (Fabricius, 1775)	GH01B(1); NV02A(5), NV02C(1)	HP, UT, WB, TR, CT, MH, TN	Pakistan, Nepal, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia, Philippines, Papua New Guinea, Australia, Micronesia, New Zealand, Japan, Korea, Russia, Saudi Arabia, Oman, Morocco, South Africa, Kenya, Zimbabwe, Ethiopia, Ghana, Nigeria, Cameroon, Madagascar, Mauritius, Hawaii, USA, Costa Rica
1064	139.3	<i>Gonitis mesogona</i> Walker, 1858	GH01E(4), GH01F(2); GV03B(2), GV05B(1)	HP, UT, SK, WB, ME, MP, MH, TN	Pakistan, Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra, Java, Bali, Sulawesi, Sumbawa), Philippines, New Guinea, Japan, Korea, Russia, Africa
1065	139.4	<i>Rusicada revocans</i> (Walker, 1858)	NV02A(3), NV08A(1)	WB, JH, TN	Nepal, Sri Lanka, China, Vietnam, Thailand, Indonesia (Sulawesi, Sumbawa, Flores, Maluku, Ambon, Seram, Borneo), Philippines, Timor, Fiji, Australia, New Guinea, Vanuatu, Japan
Subfamily: Tinoliinae Moore, [1885]					
1066	139.5	<i>Calesia dasyptera</i> (Kollar, 1844)	AS01C(1); NV08A(1)	HP, UT, SK, WB, JH, MH	Nepal, Bhutan, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand
1067	139.6	<i>Calesia haemorrhoea</i> Guenée, 1852	GV01A(1), GV01F(1); AS01E(1)	UT, JH, MH	Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, Laos, Thailand
Family: Euteliidae Grote, 1882					
Subfamily: Euteliinae Grote, 1882					
1068	139.8	<i>Anuga insuffusa</i> Warren, 1914*	ND03H(1)	AR	Myanmar, Thailand, Malaysia, Indonesia (Borneo, Sumatra)
1069	139.9	<i>Anuga japonica</i> (Leech, 1889)*	GH01A(1)	HP	China, Japan, Korea
1070	139.10	<i>Eutelia adulatrix</i> Hübner, 1813	GH01A(1), GH01B(1); GV01C(2); NV02B(1), NV02C(1)	HP, UT, WB	Afghanistan, Sri Lanka, Iran, Kazakhstan, Turkey, Italy, France, Spain, Portugal, Greece, Bulgaria, Croatia, Austria, Syria, Russia, South Africa, Algeria, Botswana, Egypt, Ethiopia, Kenya, Morocco, Namibia, South Africa, Tanzania, Tunisia, Zimbabwe

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1071	139.11	<i>Lophoptera squammigera</i> Guenée, 1852	NV02A(1)	JK, HP, UT, SK, WB, JH, MH, TN, KL	Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Cambodia, Thailand, Indonesia (Sumatra, Borneo, Bali, Sulawesi, Maluku), Timor, Philippines, Australia, Papua New Guinea, Japan, Korea
1072	139.12	<i>Penicillaria jocosatrix</i> Guenée, 1852	AS01E(1)	JK, UT, WB, BH, JH, PB, MH, TN, KL, AN	Nepal, Sri Lanka, China, Taiwan, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Java, Borneo, Fiji, Sulawesi), Philippines, Australia, Japan, Turkey, Tanzania, Hawaii, USA
1073	139.13	<i>Penicillaria maculata</i> Butler, 1889	NV02B(1), NV02F(1)	HP, UT, SK, WB, TN	Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Thailand, Indonesia (Borneo), Papua New Guinea, Philippines, Vanuatu, Japan
1074	139.14	<i>Targalla subocellata</i> (Walker, 1863)	NV05B(1)	WB, AS, NL	Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sulawesi, Maluku), Philippines, Australia, Papua New Guinea
Subfamily: Stictopterinae Hampson, 1894					
1075	139.7	<i>Odontodes aleuca</i> Guenée, 1852	SL02A(1)	HP, UT, SK, WB, AS, ME, BH, JH, MH, KA, KL	Afghanistan, Pakistan, Nepal, Sri Lanka, Myanmar, China (Tibet), Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra, Borneo), Japan, South Africa, Congo
Family: Nolidae Bruand, 1847					
Subfamily: Beaninae Zahiri & Holloway, 2013					
1076	140.7	<i>Beana nitida</i> Tams, 1924 ^a	ND03H(1)	SK, WB, AR	Nepal, Thailand
Subfamily: Chloephorinae Stainton, 1859					
1077	140.1	<i>Aiteta truncata</i> (Walker, 1858)	GV02C(1)	UT, SK, JH, CT, MH, TN, KL	Nepal, Sri Lanka
1078	140.2	<i>Ariolica pulchella</i> (Elwes, 1890) ^a	SL03A(1); DD02A(1)	SK, WB, AR , AS, ME	Nepal, Bhutan, Myanmar, Vietnam, Laos, Thailand
1079	140.6	<i>Blenina quinaria</i> Moore, 1882	NV10C(2)	UT, SK, WB, ME	Nepal, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra, Bali, Sulawesi, Sumbawa, Flores, Borneo), Brunei, Philippines, New Guinea, Japan



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1080	140.8	<i>Blenina senex</i> (Butler, 1878) ^d	SL03A(1)	WB, AR	China, Taiwan, Hong Kong, Vietnam, Thailand, Japan, Korea
1081	140.3	<i>Calymera picta</i> Moore, 1882	NV05B(1)	SK, WB, AS, ME	Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Sumatra, Borneo)
1082	140.4	<i>Calymera sabulosa</i> (Warren, 1916)	NV02A(1)	SK, WB, AS	Myanmar, China, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Sabah)
1083	140.10	<i>Carea angulata</i> (Fabricius, 1793)	AS01E(2); NV04A(1)	JK, HP, UT, WB, AS, ME, TR, JH, CT, MH, GA, AN	Nepal, Sri Lanka, China, Hong Kong, Vietnam, Thailand, Indonesia (Sumatra, Java, Maluku, Sulawesi)
1084	140.11	<i>Carea internifusca</i> Hampson, 1912 ^d	SL01A(1)	WB, AS, ME, TN	China, Taiwan, Vietnam, Japan
1085	140.9	<i>Chandica quadripennis</i> Moore, 1888	NV02F(1)	SK, WB, TR, JH, OD	China, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines
1086	140.20	<i>Gabala argentata</i> Butler, 1878	GV01A(1)	HP, UT , AR, AS	Nepal, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Japan, Korea
1087	140.12	<i>Gelastocera castanea</i> (Moore, 1879) ^{ba}	GH01E(2), GH01F(1), GH03A(1); DD16B(1), DD08A(1)	HP, SK, WB, AR	Nepal, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Bali), Brunei
1088	140.5	<i>Negritothripa orbifera</i> (Hampson, 1894)	AS01E(1)	UT, SK	Nepal, Myanmar, Thailand, China
1089	140.13	<i>Siglophora sanguinolenta</i> (Moore, 1888)	DD15A(1)	UT, WB, AR	Nepal, China (Tibet), Taiwan, Vietnam, Philippines, Korea
1090	140.14	<i>Topadesa sanguinea</i> Moore, 1888 ^a	DD15A(3), DD23B(1)	WB, AR	Thailand
1091	140.15	<i>Tyana callichlora</i> Walker, 1886	AS13A(2); SL02A(3); DD08B(1), DD25A(1)	UT, SK, WB, AR	Nepal, Bhutan, China, Vietnam, Thailand
1092	140.16	<i>Tyana chloroleuca</i> Walker, 1866	SL02A(2); NV11A(1); DD02A(1), DD04B(1), DD08B(1), DD11A(1), DD15A(1), DD20A(1), DD21A(2), DD23B(2), DD29B(1)	UT, SK, WB, AR	Nepal, Bhutan
1093	140.17	<i>Tyana elongata</i> Warren, 1866 ^a	DD10C(1), DD25A(1), DD26A(1), DD27A(1)	SK, AR	
1094	140.19	<i>Tyana falcata</i> (Walker, 1866) ⁱ	AS10A(1), AS10C(3), AS13A(3); SL02A(1); DD08B(1), DD11C(1), DD12A(1), DD20A(1)	UT, SK, WB, AR	Nepal, China, Taiwan, Laos, Thailand
1095	140.18	<i>Tyana magniplaga</i> Warren, 1916 ^a	DD02A(1)	SK, AR	Indonesia (Borneo)
1096	140.21	<i>Xenochroa xanthia</i> (Hampson, 1902)	NV02F(1)	SK, WB	Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines (Palawan)

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Eariadinae Hampson, 1912					
1097	140.22	<i>Earias roseoviridis</i> Sugi, 1982 ⁱ	AS01E(1)	UT	Taiwan, Vietnam, Thailand, Japan, Korea, Russia
Subfamily: Nolinae Hampson, 1894					
1098	140.24	<i>Meganola scripta</i> (Moore, 1888) ^q	DD25A(1)	HP, AR	Pakistan, Nepal, Vietnam, Thailand
1099	140.23	<i>Meganola scriptoides</i> Holloway, 2003*	DD15A(1), DD22B(1)	AR	China, Thailand, Malaysia, Indonesia (Borneo)
1100	140.25	<i>Tympanistes testacea</i> Moore, 1867 ^{ba}	GH02A(1); DD10C(1), DD22B(1)	HP, UT, SK, WB, AR	Nepal, Vietnam, Taiwan, China
Subfamily: Risobinae Mell, 1943					
1101	140.27	<i>Risoba obscurivialis</i> Holloway, 2003 ^d	SL02A(1)	WB, ME	Taiwan, Thailand, Malaysia, Indonesia (Sumatra, Bali, Sulawesi, Borneo), Brunei, Philippines, Papua New Guinea
1102	140.26	<i>Risoba prominens</i> Moore, 1881 ^q	GV01C(1), GV02D(1); AS01C(1); ND05A(1)	UT, SK, AR, AS, ME, AN	Pakistan, Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java), Philippines, Papua New Guinea, Japan, Korea
1103	140.28	<i>Risoba repugnans</i> (Walker, 1856) ^d	NV02B(1), NV05B(2)	WB, PB, MH, TN, KL, OD	Sri Lanka, China, Vietnam, Thailand, Indonesia (Borneo, Bali, Flores, Molucas, Ambon), Philippines, Timor, Papua New Guinea
Subfamily: Westermanniinae Hübner, 1821					
1104	140.29	<i>Gadirtha pulchra</i> Butler, 1886 ^d	NV02A(9), NV02C(1), NV05A(4), NV05B(1)	WB, KL	Nepal, Sri Lanka, China, Taiwan, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines, Australia, Japan, Korea
1105	140.30	<i>Miaromima cornucopia</i> (Hampson, 1891) ^d	NV02B(1)	WB, AR, AS, ME, TN	Nepal, Sri Lanka, Malaysia, Thailand, Indonesia (Sumatra, Borneo), Philippines
1106	140.31	<i>Miaromima pangolina</i> (Holloway, 1982) ^d	NV05B(1)	WB, MH, AN	Thailand, Malaysia, Indonesia (Sumatra, Sulawesi, Buru, Borneo), Philippines, New Guinea
1107	140.32	<i>Pterogonia cardinalis</i> Holloway, 1976 ^q	ND05B(1)	AR, CT, KL	Nepal, Bhutan, China, Hong Kong, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Java), Philippines, New Guinea, Australia



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1108	140.34	<i>Westermannia elliptica</i> Bryk, 1913 ²⁴	NV02A(4), NV02B(4), NV02C(10), NV05B(5); DD10C(5)	HP, WB , AR	Nepal, Myanmar, China, Taiwan, Laos, Thailand, Malaysia, Indonesia (Borneo, Sumatra), Philippines, New Guinea
1109	140.35	<i>Westermannia superba</i> Hübner, 1823	DD10C(1)	UT, SK, WB, AR, JH, CT, MH, TN, KL, AN	Pakistan, Nepal, Bhutan, Sri Lanka, China, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Java), Timor, Philippines, New Guinea, Australia, South Africa
1110	140.33	<i>Westermannia triangularis</i> Moore, 1887	AS01E(1)	UT, AR, AS, JH, TN, KL, AN	Nepal, China, Thailand, Malaysia, Indonesia (Sumatra, Borneo, Sulawesi), Philippines

Family: Noctuidae Latreille, 1809

Subfamily: Acontiinae Guenée, 1841

1111	141.1	<i>Acontia marmoralis</i> (Fabricius, 1799) ⁹	DD03B(1)	AR , JH, KA, TN, KL	Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Cambodia, Thailand, Indonesia (Java), Australia, Japan, Oman, UAE
1112	141.2	<i>Micardia pulcherrima</i> (Moore, 1867) ¹	AS13A(1); NV08A(1); DD29B(1)	HP, UT , SK, WB, AR , NL, KA, TN, KL	Bhutan, China (Tibet)

Subfamily: Acronictinae Smith & Dyar, 1898

1113	141.6	<i>Arcilasisa sobria</i> Walker, 1865	SL01A(1)	HP, UT, SK, WB, AR, S India	Nepal
1114	141.3	<i>Acronicta bicolor</i> (Moore, 1881)	GH04A(1)	HP	
1115	141.4	<i>Acronicta megacephala</i> Denis & Schiffermüller, 1775 *	LD04C(2), LD12A(2)	JK	Russia, Iran, Kazakhstan, Turkey, Norway, Italy, Austria, Sweden, Finland, France, Netherlands, Denmark, Portugal, Spain, Germany, United Kingdom
1116	141.9	<i>Auchmis indica</i> (Walker, 1865)	GV01C(3), GV03B(4), GV05A(1), GV09A(2)	HP, UT, UP, PB	Pakistan, Afghanistan, Iran
1117	141.5	<i>Craniophora harmandi</i> (Poujade, 1898)	VF01A(1)	SK, WB, ME	Nepal, China, Taiwan, Thailand, Malaysia, Indonesia, Japan
1118	141.7	<i>Nacna malachitis</i> (Oberthür, 1881)	GV08A(2), GV16A(4); NV10C(1); DD11A(1)	HP, UT, SK, WB, AR, MI, PB	Nepal, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia, Japan, Korea, Russia
1119	141.8	<i>Nacna prasinaria</i> Walker, 1865 ¹	AS10C(1)	UT , SK, WB	Nepal, China, Thailand

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Aediinae Beck, 1960					
1120	141.10	<i>Aedia leucomelas</i> (Linnaeus, 1758) ¹	AS02B(1)	HP, UT , JH, CT, KA, AN	Pakistan, Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia (Borneo, Java, Sulawesi), Philippines, Fiji, Papua New Guinea, Australia, Japan, Korea, Russia, Ukraine, Turkey, Israel, Jordan, Italy, France, Greece, Germany, Portugal, Poland, Austria, Romania, Africa
Subfamily: Agaristinae Boisduval, 1833					
1121	141.11	<i>Aegocera bimacula</i> Walker, 1854	GV01E(1); AS01A(1), AS01D(2); KA01A(1)	UT, SK, AS, JH, CT, MP, MH	Nepal, Sri Lanka, Myanmar, Cambodia, Thailand
1122	141.14	<i>Episteme aduatrix</i> (Kollar, 1844)	GV01D(1)	JK, HP, UT, AS, PB, CT, MH, KA, TN, KL	Nepal, Bhutan, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand
1123	141.13	<i>Exsula dentatrix</i> (Westwood, 1848)	ND13B(1)	SK, WB, AR, AS, ME	Nepal, Bhutan, Bangladesh, China, Taiwan, Hong Kong, Vietnam, Cambodia, Thailand
1124	141.12	<i>Mimeusemia peshwa</i> (Moore, 1858)	GV03A(1)	HP, UT, SK	Nepal
1125	141.15	<i>Sarbanissa dissimilis</i> (Swinhoe, 1890) ¹	AS07A(1)	UT , SK, WB, AS, ME, NL	Nepal, Myanmar, Vietnam, Thailand, Indonesia (Java, Borneo)
1126	141.16	<i>Sarbanissa insocia</i> Walker, 1865 ^a	DD15A(1), DD20A(3)	HP, SK, WB, AR , NL	Nepal, China, Thailand
1127	141.17	<i>Sarbanissa transiens</i> (Walker, 1856) ^a	AS01A(1); NV02A(4), NV02C(1); ND05A(1)	HP, UT, SK, WB, AR , AS, NL, ME, CT	Nepal, Bhutan, Myanmar, China, Vietnam, Malaysia, Thailand, Indonesia (Sumatra, Java, Borneo, Bali)
Subfamily: Amphipyrinae Guenée, 1838					
1128	142.1	<i>Amphipyra cupreipennis</i> Moore, 1888	GV02D(1); AS26A(2)	HP, UT, SK, WB, AR, NL	Nepal, Bhutan
1129	142.2	<i>Amphipyra monolitha</i> Guenée, 1852	GV11A(5), GV24B(3)	JK, HP, UT, SK, WB	Bhutan, Bangladesh, China, Taiwan, Japan, Korea, Russia
1130	142.3	<i>Amphipyra pyramidea</i> (Linnaeus, 1758) ¹	AS10A(1)	JK, UT	China, Taiwan, Japan, Korea, Russia, Finland, Poland, Turkey, Lebanon, Syria, Israel, Iraq, Iran, Kazakhstan, Germany, United Kingdom, Norway, Italy, Austria, Finland, Netherlands, France, Portugal, Sweden, Denmark, USA



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1131	142.4	<i>Callyna monoleuca</i> Walker, 1858	AS01E(2); DD10C(6), DD11A(1)	HP, UT, SK, WB, AR, AS, JH, MH, KA, TN, KL, AN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Indonesia (Java, Celebes), Philippines, Papua New Guinea, Australia, Japan
1132	142.5	<i>Callyna semivitta</i> Moore, 1882	NV10C(1); DD10C(4)	HP, SK, WB, AR, NL, JH	Nepal, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Bali, Sulawesi), Philippines, Japan
1133	142.7	<i>Diphtherocome bryochlora</i> Hreblay, Peregovitis & Ronkay, 1999*	DD11C(1)	AR	Nepal, Vietnam, Thailand
1134	142.11	<i>Diphtherocome chloronympha</i> Hreblay, Peregovitis & Ronkay, 1999 *	DD11C(1)	AR	Nepal
1135	142.13	<i>Diphtherocome chrysochlora</i> (Hampson, 1897) ^q	DD11C(1)	AR , AS, ME	Nepal
1136	142.14	<i>Diphtherocome discibrunnea</i> (Moore, 1867)	GV16A(1); AS10C(1), AS15B(2)	HP, UT, SK, WB, ME, NL	Pakistan, Nepal, Thailand
1137	142.6	<i>Diphtherocome fasciata</i> (Moore, 1888) ^q	GV14B(1), GV16A(2), GV16B(2), GV17A(4), GV21A(3), GV23A(6); AS26A(1); DD29B(1)	HP, UT, SK, AR	Nepal, China
1138	142.10	<i>Diphtherocome pallida</i> (Moore, 1867) ^q	GH16A(1), GH17B(1), GH18C(1), GH20A(1), GH21B(2), GH23A(2); GV14D(4), GV14B(6), GV16A(2), GV16B(4), GV17A(6), GV19A(2), GV24A(1), GV24B(3); AS01C(1), AS19A(4), AS22B(1), AS24A(1), AS26A(1); DD29A(1), DD29B(1)	HP, UT, SK, WB, AR , NL	Pakistan, Nepal, China (Tibet)
1139	142.12	<i>Diphtherocome thainympha</i> Hreblay & Ronkay, 1999*	SL02A(1)	WB	Thailand
1140	142.9	<i>Diphtherocome vicens</i> (Walker, 1865) ^q	DD28A(1)	HP, SK, AR , ME, NL	Nepal
1141	142.8	<i>Diphtherocome viridissima</i> Hreblay & Ronkay, 1999*	NV11A(9)	WB	Vietnam, Thailand
Subfamily: Bagisarinae Crumb, 1956					
1142	142.15	<i>Chasmina candida</i> (Walker, 1865) ^q	AS01C(1); ND03H(1)	HP, UT, AR , MH, AD, TN, KL, AN	Nepal, Sri Lanka, Taiwan, Hong Kong, Vietnam, Cambodia, Laos, Thailand, Indonesia (Borneo), Fiji, New Guinea, Australia, Melanesia, Vanuatu, Japan, Africa, Comoros, Madagascar

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1143	142.16	<i>Xanthodes intersepta</i> Guenée, 1852	AS01C(1), AS17A(1)	HP, UT, SK, WB, AR, AS, TR, CT, MP, MH, AN	Nepal, Sri Lanka, Bangladesh, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Indonesia (Java, Sulawesi, Sumatra, Celebes), Philippines, Japan, Africa
1144	142.17	<i>Xanthodes transversa</i> Guenée, 1852	GV01F(3), GV22B(2); AS01B(1); NV02C(1)	HP, UT, SK, WB, AS, MP, MH, KA, TN, KL, AN	Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java), Philippines, Timor, Papua New Guinea, Australia, Japan, Korea
Subfamily: Bryophilinae Guenée, 1852					
1145	142.23	<i>Bryophila literata</i> Moore, 1881	GH03B(1), GH15A(1)	JK, HP	
Subfamily: Condicinae Poole, 1995					
1146	142.18	<i>Perigea albomaculata</i> (Moore, 1867)	NV11A(1)	SK, WB	Nepal, China, Vietnam, Thailand, Philippines
1147	142.19	<i>Prospalta leucospila</i> Walker, 1857	GV03B(4), GV11A(1)	UT, SK	Nepal, Myanmar, China, Laos, Thailand
Subfamily: Cuculliinae Herrich-Schäffer, 1850					
1148	142.20	<i>Cucullia pullata</i> (Moore, 1881) ^a	LD04A(1), LD05A(1); GV17A(1); AS26A(1), AS27A(4)	JK, HP, UT, SK	Nepal, China
1149	142.21	<i>Cucullia thomasi</i> Hacker, Ronkay & Ronkay, 1990*	LD04C(1)	JK	Afghanistan, Pakistan, Nepal, Uzbekistan
1150	142.22	<i>Shargacucullia verbasci</i> Linnaeus, 1758*	LD12A(1)	JK	Russia, Kazakhstan, Algeria, Iran, Turkey, Germany, Israel, Greece, France, Austria, Netherlands, Switzerland, Italy, United Kingdom
Subfamily: Eriopinae Herrich-Schäffer, 1851					
1151	143.1	<i>Callopietria placodoides</i> (Guenée, 1852) ¹	GV01C(4), GV24A(2)	UT, SK, AS, ME, KA, TN, KL	Nepal, Bangladesh, Myanmar, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java, Borneo, Sumbawa, Ambon), Philippines, Australia, Japan, Korea
1152	143.2	<i>Callopietria repleta</i> Walker, 1858	GV01C(3); NV10A(1)	HP, UT, AS, ME, TN, KA	Pakistan, Nepal, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Sumatra, Borneo), Japan, Korea, Russia



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1153	143.3	<i>Callopietria rivularis</i> Walker, 1858	GV01A(1), GV01C(2)	HP, UT, MP, KA, TN, KL, AN	Nepal, Sri Lanka, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Sulawesi, Borneo), New Guinea, Fiji, Australia, Melanesia, Japan, Korea
Subfamily: Eustrotiinae Grote, 1882					
1154	143.4	<i>Maliattha vialis</i> (Moore, 1882)	GH03B(1)	HP, UT, SK, WB, ME	Pakistan, Nepal, China, Taiwan, Vietnam, Thailand, Japan, Korea, Russia
Subfamily: Hadeninae Guenée, 1837					
1155	143.5	<i>Anarta farnhami</i> (Grote, 1873)*	LD04A(1)	JK	Afghanistan, Pakistan, Tajikistan, Kyrgyzstan, Finland, Russia, USA, Canada
1156	143.6	<i>Hadena albimacula</i> (Borkhausen, 1792) ^a	LD04A(1), LD22B(1)	JK	Iran, Turkey, Algeria, Yemen, Lebanon, Kazakhstan, Mongolia, Germany, Italy, Austria, Denmark, Finland, Sweden, United Kingdom, Italy, Netherlands, Norway, Switzerland, France, Spain, Portugal, Bulgaria, Morocco
1157	143.7	<i>Heliophobus bulcsui</i> Simonyi, 2015*	LD04A(1), LD04C(3), LD30A(7)	JK	Pakistan, China (Tibet)
1158	143.8	<i>Heliophobus texturata</i> (Alphéraky, 1892)*	GV18B(4), GV21A(6), GV21B(2)	UT	Nepal, China (Tibet), Japan, Russia, Mongolia, Czech Republic, Austria, Italy
1159	143.9	<i>Hypobarathra repetita</i> (Butler, 1889) ⁱ	GV11A(3), GV14B(2), GV14D(1), GV16A(1), GV24A(2)	HP, UT, SK	Nepal, China (Tibet)
1160	143.10	<i>Melanchnra dierli</i> Behounek, 1995*	VF01A(1)	UT	Nepal
1161	143.12	<i>Polia culta</i> (Moore, 1881) ⁱ	GH09A(2), GH12A(1), GH17B(2), GH18C(2), GH23A(2); GV10C(5), GV14D(3), GV16A(4), GV21A(7), GV19A(1), GV24A(2), GV24B(1); AS27A(1)	JK, HP, UT, SK	Pakistan, Nepal, China (Tibet)
1162	143.11	<i>Polia scotochlora</i> Kollar, 1844	GV03A(3), GV20A(3), GV23A(1); VF01A(1)	JK, UT, SK	Pakistan, Nepal, Sri Lanka, China (Tibet)
Subfamily: Heliothinae Boisduval, 1829					
1163	143.13	<i>Helicoverpa armigera</i> (Hübner, [1805])	GH01D(3), GH01E(2), GH01F(1), GH04A(4); GV01D(1), GV01E(2), GV01F(4), GV03A(2), GV12B(3); AS11A(3), AS18A(6), AS25A(4); NV02B(2), NV02C(5), NV05B(9), NV08A(1), NV10C(1)	JK, HP, UT, HP, WB, AR, AS, BH, PB, CT, MP, MH, KA, TN	Afghanistan, Pakistan, Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Indonesia (Borneo, Java), Philippines, Papua New Guinea, Australia, New Zealand, Japan, Korea, Turkey, Germany, Denmark, Portugal, Italy, France, Spain, Norway, Finland, Austria, Netherlands, United Kingdom, UAE, South Africa, Kenya, Tanzania, Uruguay, Peru

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1164	143.14	<i>Heliothis maritima</i> Graslin, 1855*	LD02B(3), LD04A(16), LD04C(10), LD09A(1)	JK	Japan, Korea, Russia, Mongolia, Kazakhstan, Turkey, Germany, Austria, Netherlands, Estonia, United Kingdom, Denmark, France
1165	143.15	<i>Heliothis peltigera</i> (Denis & Schiffermüller, 1775)	GV01B(1), GV01D(1)	UT, WB, GJ, MP, CT, MH, TN	Afghanistan, Pakistan, Nepal, Bangladesh, China (Tibet), Laos, Thailand, New Zealand, Russia, Kazakhstan, Iran, Turkey, UAE, Austria, Denmark, Italy, Spain, Germany, Portugal, France, United Kingdom, South Africa
1166	143.16	<i>Pyrrhia umbra</i> (Hüfnagel, 1766)	GV04B(4)	HP, UT, NL, PB	Pakistan, Nepal, China, Japan, Iran, Germany, Italy, Denmark, Sweden, Netherlands, Norway, France, Austria, Finland, England, Spain, Kazakhstan, Russia
Subfamily: Noctuidae Latreille, 1809					
1167	143.17	<i>Agrotis exclamationis</i> (Linnaeus, 1758)*	LD04A(2)	JK	Afghanistan, Japan, Morocco, Iran, Iraq, Turkey, Mongolia, Russia, England, France, Germany, Finland, Austria, Italy, Netherlands, Norway, Portugal, Bulgaria, Spain, France, Finland, Sweden, Denmark, Norway, Africa
1168	143.18	<i>Agrotis ipsilon</i> (Hufnagel, 1766) ^a	LD02A(1), LD04A(1), LD04C(1), LD22B(1); GH01D(2), GH01E(1), GH02A(1), GH04A(1); GV01A(4), GV01C(2), GV05B(5); AS27A(2); NV10C(1); DD10C(2), DD11A(3)	JK, HP, UT, WB, AR, AS, ME, BH, JH, UP, PB, RJ	Pakistan, Nepal, Myanmar, China, Taiwan, Thailand, Australia, New Zealand, Japan, Korea, Russia, Iran, Turkey, Tajikistan, United Kingdom, Romania, Denmark, Portugal, Ireland, Israel, Poland, Malta, Jordan, Cyprus, Austria, Galapagos, Egypt, Namibia, United States, Canada, Mexico, Ecuador, Brazil, Argentina, Costa Rica, Ecuador
1169	143.19	<i>Agrotis segetum</i> (Denis & Schiffermüller, 1775)	GH01C(1); GV06B(2); AS18A(1)	HP, UT, SK, WB, AS, NL, PB, JH, CT, MP, MH	Pakistan, Nepal, Sri Lanka, China, Taiwan, Thailand, Indonesia (Java), Philippines, New Guinea, Japan, Korea, Iran, Turkey, United Kingdom, Austria, Italy, France, Norway, Spain, Netherlands, Germany, Portugal, Bulgaria, UAE, Africa, Kenya, Madagascar



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1170	143.20	<i>Anaplectoides inexpectata</i> Dierl, 1983 ⁱ	GV11A(1), GV13B(1), GV14D(1), GV19A(3), GV24B(1); AS27A(1); SL05A(1)	UT, WB	Nepal
1171	143.21	<i>Anaplectoides tamsi</i> Boursin, 1955 ^o	GH23A(1); VF01A(3); SL03A(3), SL05A(4)	HP, UT, WB	Nepal, China (Tibet)
1172	143.22	<i>Anapoma albicosta</i> (Moore, 1881)	GV01A(1)	JK, HP, UT, SK, WB, ME, NL	Bhutan, Sri Lanka, China (Tibet), Japan
1173	144.1	<i>Apamea chhiringi</i> Hreblay, 1998*	AS27A(1)	UT	Nepal
1174	144.2	<i>Apamea gratissima</i> Herblay & Ronkay, 1999 *	AS27A(1)	UT	Nepal
1175	144.3	<i>Apamea purpurina</i> (Hampson, 1902) ⁱ	AS27A(2)	UT, SK	Nepal, China (Tibet)
1176	144.4	<i>Apamea schawerdae</i> (Draeseke, 1928)*	AS27A(1)	UT	Nepal, China
1177	143.23	<i>Apsarasa radians</i> Westwood, 1848	NV05B(1); ND03G(1)	SK, WB, AR, AS, ME, TR, AN	Nepal, Bhutan, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia (Sumatra, Borneo), Philippines, Japan
1178	143.24	<i>Athetis delecta</i> (Moore, 1881)	GH01E(4), GH01F(1)	HP, SK, WB, UP, HR, MH	Nepal, Myanmar, China, Hong Kong, Vietnam, Thailand, Mexico
1179	143.25	<i>Athetis lineosa</i> (Moore, 1881)	GH01A(1), GH01B(2), GH01E(19), GH01F(5)	HP, UT, AR	Nepal, Myanmar, China, Taiwan, Japan, Korea, Russia
1180	144.5	<i>Axylia putris</i> (Linnaeus, 1761)	GH01A(1)	HP, UT	Pakistan, Nepal, Taiwan, Indonesia (Java), Japan, Korea, Russia, Mongolia, Kazakhstan, Armenia, Sweden, Ukraine, United Kingdom, Netherlands, Austria, Finland, Denmark, France, Spain, Norway, Germany
1181	144.6	<i>Axylia renalis</i> (Moore, 1867)	GV01A(7); AS19A(1)	JK, HP, UT, SK, WB, NL, PB, MH	Pakistan, Nepal, China, Thailand, South Africa
1182	144.7	<i>Bryopolia centralasiae</i> (Staudinger, 1882) ⁱ	LD26A(1); GT03A(2)	JK, UT	Afghanistan, Pakistan, Nepal, Kazakhstan, Turkmenistan, Tajikistan, Uzbekistan, Kyrgyzstan, Mongolia
1183	144.12	<i>Conservula indica</i> (Moore, 1867)	GH01B(1)	JK, HP, UT, SK, WB, AR, NL, TN	Pakistan, Nepal, Bangladesh, Sri Lanka, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Philippines
1184	144.8	<i>Diarsia albipennis</i> (Butler, 1889) ^{i d}	GT01A(1); SL02A(1)	JK, HP, UT, WB	Nepal, China, Thailand, Malaysia, Indonesia (Sumatra), Japan, Korea

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1185	144.9	<i>Diarsia nigrosigna</i> (Moore, 1881)	GH01E(3), GH06B(1); GV18B(1); AS10B(2); ND03F(4); DD28A(2)	JK, HP, UT, SK, WB, AR, TN	Pakistan, Nepal, Bhutan, Myanmar, China, Taiwan, Hong Kong, Vietnam, Thailand, Indonesia (Sulawesi), Philippines
1186	144.10	<i>Diarsia postpallida</i> (Prout, 1928) ^q	DD28A(1)	SK, AR , TN	Malaysia, Thailand, Indonesia (Borneo, Sumatra, Java, Sulawesi), Philippines
1187	144.11	<i>Diarsia tincta</i> (Leech, 1900)*	SL02A(1)	WB	Nepal, China, Thailand
1188	144.13	<i>Dichagyris flammatra</i> (Denis & Schiffermüller, 1775)	GV01A(1), GV02C(3); AS01D(1)	JK, HP, UT, SK, WB, AS, BH, UP, DL, PB, RJ, GJ, MP, AD, MH, KA, TN, KL	Afghanistan, Pakistan, Bhutan, China (Tibet), Iraq, Iran, Jordan, Kazakhstan, Russia, Turkey, Spain, France, Germany, Italy, Switzerland, Austria, United Kingdom, Syria, Lebanon, Armenia, Morocco, Algeria, Egypt, Brazil
1189	144.14	<i>Dichagyris himalayensis</i> Turati, 1933	LD02A(5), LD04A(4), LD08A(3), LD16A(1), LD19A(10), LD25A(2), LD26A(2), LD27A(1), LD29A(2), LD31A(9), LD32A(2)	JK	Nepal, Russia, Tajikistan, Kyrgyzstan
1190	144.15	<i>Dichagyris triangularis</i> (Moore, 1867)	LD04A(1), LD12A(1); GH23A(1); GV13B(7), GV17A(2), GV21A(5), GV24A(2), GV24B(1)	JK, HP, UT, SK, AS, NL, MH	Afghanistan, Pakistan, Nepal, Bhutan, Myanmar, China (Tibet), Taiwan, Thailand, Japan, Korea, Russia, Mongolia, Iran
1191	144.16	<i>Dictyestra dissectus</i> (Walker, 1865) ⁱ	AS11A(1); NV10C(1)	UT , SK, WB, AR	Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Indonesia (Borneo, Maluku, Sulawesi), Philippines, New Guinea, Japan, Korea
1192	144.17	<i>Ebertidia haderonides</i> Boursin, 1968*	GH19A(1); GV22A(3)	HP, UT	Nepal, China
1193	144.19	<i>Elaphria conjugata</i> (Moore, 1881)	GH02A(1), GH04A(1)	HP, UT, SK, WB	Nepal
1194	144.18	<i>Estagrotis cuprea</i> (Moore, 1867) ⁱ	AS14A(2), AS23A(1)	HP, UT , WB	Nepal
1195	144.20	<i>Estimata clavata</i> (Hampson, 1907) ⁱ	GV08A(5)	HP, UT	Nepal
1196	144.22	<i>Euxoa adumbrata</i> Eversmann, 1842	LD30A(1)	JK	China (Tibet), Japan, Russia, Mongolia, Turkey, Iran, Tajikistan, Kazakhstan, Sweden, Finland, Greenland, Norway, Denmark, Canada, USA



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1197	144.23	<i>Euxoa aquilina</i> (Denis & Schiffermüller, 1775)*	LD25A(1)	JK	China (Tibet), Austria, Germany, Iran, Turkey, Spain, Romania, Czech Republic, Hungary, France, Switzerland, Russia, Kazakhstan, Jordan
1198	144.24	<i>Euxoa hypochlora</i> Boursin, 1964*	GT03A(1)	UT	Afghanistan, Nepal, Tazikistan
1199	144.25	<i>Euxoa ochrogaster</i> Guenée, 1852*	LD27A(1)	JK	Japan, Russia, Mongolia, Tazikistan, Krgyzstan, Kazakhstan, Iceland, Finland, Denmark, USA, Canada
1200	144.21	<i>Feliniopsis leucostigma</i> (Moore, 1867)	NV10C(1)	HP, SK, WB, NL	Bangladesh, Nepal, China
1201	145.1	<i>Hermonassa consignata</i> Walker, 1865	GV21A(5), GV24A(4), GV24B(5); AS27A(1)	JK, HP, UT, SK, WB, NL, TN	Pakistan, Nepal, Bhutan, China (Tibet), Thailand
1202	145.2	<i>Hermonassa incisa</i> Moore, 1881	GV17A(5), GV19A(2), GV24A(1), GV24B(5); AS24A(1), AS26A(1)	JK, HP, UT, SK, WB, NL	Nepal, Bhutan, China (Tibet), Thailand
1203	145.3	<i>Hermonassa marginata</i> Hreblay & Ronkay, 1998*	AS27A(1)	UT	Nepal, China
1204	145.4	<i>Hermonassa oxyspila</i> Boursin, 1968*	GH23A(3); AS22A(3)	HP, UT	Nepal
1205	145.5	<i>Hermonassa sinuata</i> Moore, 1881	GH23B(2); GV17A(4), GV18B(5), GV21A(2), GV24A(3), GV24B(2)	HP, UT, SK, WB	
1206	145.6	<i>Isochlora viridis</i> Stadinger, 1882	LD32B(1)	JK	China (Tibet), Russia, Kazakhstan, Mongolia, France, Netherlands
1207	145.7	<i>Karana gemmifera</i> (Walker, [1858])	DD07A(1), DD10D(1)	HP, UT, SK, AR, MH, TN	Pakistan, Nepal, Myanmar, China, Taiwan, Malaysia, Thailand, Papua New Guinea
1208	145.8	<i>Leucania yu</i> Guenée, 1852	NV02B(2)	HP, WB, JH, MH, KA, TN, KL, AN	Nepal, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Thailand, Malaysia, Indonesia (Borneo), Philippines, New Guinea, Fiji, Australia, Japan
1209	145.9	<i>Lophotyna albosignata</i> (Moore, 1881) ¹	GV01G(3)	JK, HP, UT	Nepal, Japan, Korea, Iran, Armenia, Turkey
1210	145.10	<i>Mythimna conigera</i> (Denis & Schiffermüller, 1775)	LD08A(1)	JK, HP	Japan, Korea, Russia, Mongolia, Lithuania, Ukraine, Austria, Germany, Italy, United Kingdom, Norway, Finland, Sweden, Denmark, Netherlands, Spain
1211	145.11	<i>Mythimna consimilis</i> (Moore, 1881) ^{1q}	GH04A(1); AS01D(3), AS02B(1); ND03F(1)	JK, HP, UT, SK, WB, AR, MP, MH, TN	Pakistan, Nepal, China, Taiwan, Thailand, Indonesia (Java), Australia, New Zealand, Japan, Korea, Canada, USA, Mexico, Costa Rica, Panama, Jamaica, Brazil, Paraguay, Argentina, Chile, Cuba

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1212	145.15	<i>Mythimna hamifera</i> (Walker, 1862) ^b	GH07A(1)	HP, WB	Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sarawak), Philippines, New Guinea, Japan
1213	145.13	<i>Mythimna intertexta</i> (Chang, 1991) ^d	SL02A(1)	UT, WB	Nepal, Taiwan, Thailand, Indonesia
1214	145.14	<i>Mythimna renimaculata</i> Hreblay & Legrain, 1996 ^a	LD04A(10), LD04C(3)	JK, HP, UT	Nepal
1215	145.12	<i>Mythimna separata</i> (Walker, 1865)	GH01E(1)	JK, HP, UT, SK, PB, MP, MH	Afghanistan, Pakistan, Nepal, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo), Philippines, Fiji, Australia, New Zealand, Japan, Korea, Russia
1216	145.16	<i>Mythimna sinuosa</i> (Moore, 1882)	GH01B(1), GH01C(1), GH01D(2), GH02A(3)	HP, UT, SK, WB, TN	Pakistan, Nepal, Myanmar, China, Taiwan, Vietnam, Thailand
1217	145.17	<i>Mythimna vitellina</i> (Hubner, 1808)*	LD04A(1), LD04C(1)	JK	Pakistan, Uzbekistan, Kyrgyzstan, Armenia, Italy, Spain, Portugal, Germany, Austria, United Kingdom, France, Greece, Turkey, Iran, Denmark, Romania, Netherlands, Russia, Algeria, Morocco
1218	145.19	<i>Orthosia reticulata</i> Yoshimoto, 1994 ^q	DD11A(1)	WB, AR	Nepal, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia, Philippines
1219	145.21	<i>Paraxestia flavicaudata</i> (Warren, 1888) ^{bi}	GH23A(1); GV02D(1), GV24A(1); AS27A(1)	JK, HP, UT	Pakistan, Nepal
1220	145.22	<i>Perissandria sikkima</i> (Moore, 1867) ^{bi q}	GH23B(2); AS27A(1); DD29A(1)	HP, UT, SK, WB, AR	Nepal, China (Tibet)
1221	145.18	<i>Polytela gloriosae</i> Fabricius, 1781	AS01A(1)	HP, UT, WB, AS, UP, GJ, MP, MH, KA, KL, TN, OD	Sri Lanka, Indonesia
1222	145.20	<i>Pseudeustrotia dimera</i> (Hampson, 1910) ⁱ	GV11A(2), GV14A(1)	HP, UT, SK, AS, ME	Nepal, Thailand
1223	145.23	<i>Spodoptera litura</i> (Fabricius, 1775) ^q	GH01B(1); GV01C(6), GV01F(11); AS01D(1), AS02B(1); NV10C(1); ND03G(1)	HP, UT, WB, AR, AS, NL, TR, DL, PB, CT, MH, AD, KA, TN, KL, OD, GA	Pakistan, Nepal, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Laos, Thailand, Malaysia, Indonesia (Borneo, Sarawak), Philippines, Timor, Australia, New Zealand, Papua New Guinea, Fiji, Melanesia, Tonga, Vanuatu, Japan, Korea, Russia, UAE



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1224	145.26	<i>Sydiva nigrogrisea</i> Moore, 1882 ^g	DD15A(1), DD20A(1)	HP, SK, WB, AR , NL	Nepal, Bhutan
1225	145.25	<i>Tiracola plagiata</i> (Walker, 1857)	GH01A(1), GH01D(5), GH02A(1); AS01E(1); NV02A(6), NV02B(2), NV02C(3), NV02F(3), NV05B(1), NV10C(4), NV11A(3); DD08B(1)	HP, UT, SK, WB, AR, AS, ME, NL, TR, DL, MH, KA, TN, KL, OD, GA	Nepal, Sri Lanka, Myanmar, China, Taiwan, Vietnam, Laos, Thailand, Malaysia, Indonesia (Java, Sulawesi), Philippines, Papua New Guinea, Australia, Mexico, Paraguay, Cuba
1226	146.1	<i>Trachea auriplena</i> (Walker, 1857)	GH01D(1), GH01E(6)	JK, HP, UT, SK, TN, KL	Pakistan, Nepal, Bhutan, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Japan
1227	146.4	<i>Trachea guttata</i> (Warren, 1913) ^{bi}	GH20A(1); GV15B(1), GV21A(1), GV21B(1); AS15A(1), AS15B(4), AS22B(2), AS24A(2), AS26A(7), AS27A(3)	HP, UT, SK	Nepal, Bhutan, China (Tibet), Thailand
1228	146.3	<i>Trachea melanospila</i> Kollar, 1844	AS07A(1)	JK, HP, UT	Sri Lanka, China, Japan, Korea, Russia
1229	146.2	<i>Trachea olivacea</i> (Moore, 1881) ^g	KA01A(1); DD10C(1), DD15A(1)	HP, SK, WB, AR , NL	Nepal, China, Vietnam, Thailand
1230	145.24	<i>Xenotrachea albidisca</i> (Moore, 1867)	AS09A(1)	HP, UT, SK, WB, AS, ME, NL, TN, KL	Nepal, Bangladesh, Myanmar, China, Taiwan, Vietnam, Thailand, Malaysia, Indonesia (Borneo, Sumatra, Flores), Timor
1231	146.5	<i>Xestia angara</i> Hacker & Peks, 1990*	GV14A(2)	UT	Nepal
1232	146.6	<i>Xestia bdelygma</i> (Boursin, 1963) *	GV24A(8), GV24B(11)	UT	Nepal, China
1233	146.7	<i>Xestia c-nigrum</i> (Linnaeus, 1758)	LD04A(1), LD04C(1); GH01E(23), GH01F(7), GH03A(1), GH06B(13), GH09A(1), GH15A(2), GH18B(1)	JK, HP, PY	Pakistan, China, Japan, Korea, Russia, Turkey, Germany, United Kingdom, Italy, Austria, Norway, Portugal, France, Netherlands, Spain, Finland, Canada, USA Mexico
1234	146.9	<i>Xestia curviplena</i> (Walker, 1865)	SL02A(2)	SK, WB	Nepal, Bhutan
1235	146.12	<i>Xestia gandakiensis</i> Yoshimoto, 1995*	GV21B(1), GV24B(1)	UT	Nepal
1236	146.13	<i>Xestia isochroma</i> (Hampson, 1903)*	AS26A(2)	UT	Nepal, China (Tibet)
1237	146.11	<i>Xestia junctura</i> Moore, 1881 ⁱ	GV08A(1), GV12B(1), GV21B(3), GV24B(2); VF01A(1)	HP, UT	Nepal
1238	146.10	<i>Xestia lobbichleri</i> Boursin, 1964 *	VF01A(2)	UT	Nepal
1239	146.8	<i>Xestia semiherbida</i> (Walker, 1857) ^g	GH01B(1), GH01C(1); SL03A(2), SL04A(2); DD04B(1), DD10E(1)	HP, UT, SK, WB , AR , AS, MH, KA	Nepal, Taiwan, Japan, Korea, Russia

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
Subfamily: Pantheinae Smith, 1898					
1240	146.14	<i>Antitrisuloides catocalina</i> (Moore, 1883) ^a	DD01E(1)	SK, WB, AR, ME	Nepal, China, Thailand, Malaysia, Indonesia
1241	146.19	<i>Disepholcia caerulea</i> (Butler, 1889)	GH08A(1)	HP, UT, AR	Nepal, Taiwan
1242	146.16	<i>Tambana albiplaga</i> (Warren, 1912)	DD07A(1), DD08B(2)	WB, AR, AS, ME	China, Vietnam, Thailand
1243	146.17	<i>Tambana subflava</i> Wileman, 1911	DD22A(1)	SK, WB, AR, AS, NL, ME	Nepal, China, Taiwan, Vietnam, Thailand, Japan
1244	146.18	<i>Trisuloides sericea</i> Butler, 1881	GV07B(1); AS10C(1)	HP, UT, SK, WB, ME	Pakistan, Nepal, Myanmar, China, Taiwan, Vietnam, Thailand, Japan
Subfamily: Plusiinae Boisduval, 1829					
1245	146.19	<i>Autographa nigrisigna</i> (Walker, 1857)	GH01F(1); GV01C(2), GV22B(2)	JK, HP, UT, SK, WB, HR, PB	Pakistan, Nepal, China (Tibet), Japan, Korea
1246	146.20	<i>Autographa purpureofusa</i> (Hampson, 1894)	GV18B(1); AS27A(1)	UT, SK	Nepal, Myanmar, China
1247	146.21	<i>Chrysodeixis acuta</i> (Walker, 1857)	GV14B(1); SL01A(1)	HP, UT, WB, MH, KA	Pakistan, Nepal, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Thailand, Indonesia (Sumatra, Borneo, Bali, Flores), Philippines, Timor, Papua New Guinea, Australia, Japan, Europe, UAE, Cameroon, Namibia, Zimbabwe, Congo, Kenya, Nigeria, Ethiopia, Ghana, South Africa, Uganda
1248	146.22	<i>Chrysodeixis eriosoma</i> (Doubleday, 1843)	NV02A(10), NV09A(1), NV10C(5); SK01A(2)	SK, WB, TR, RJ, CT, MP, MH, KA, KL	Pakistan, Nepal, Myanmar, China, Hong Kong, Taiwan, Vietnam, Cambodia, Thailand, Malaysia, Indonesia (Java, Sumatra, Timor, Flores, Sumbawa, Borneo), Philippines, Papua New Guinea, Australia, Fiji, New Zealand, Polynesia, Japan, Korea, Russia, Germany, Oman, Syria, Egypt, USA, Hawaii
1249	147.1	<i>Cornutiplusia circumflexa</i> (Linnaeus, 1767) ^b	GH01F(1), GH14A(1)	HP, WB, MP, TN	Afghanistan, Nepal, China, Thailand, Russia, Mongolia, Portugal, Spain, Finland, Yemen, UAE, Cyprus, Iran, Turkmenistan, Tajikistan, Turkey, Egypt, South Africa, Ethiopia
1250	147.5	<i>Ctenoplusia placida</i> (Moore, 1884)	GH01F(2)	HP, ME, KA, TN	Pakistan, Nepal, Sri Lanka, China, Taiwan, Thailand, Indonesia (Sumatra), Australia, Japan



SI. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1251	147.2	<i>Erythroplusia pyropia</i> (Butler, 1879)	GV14B(1), GV16A(1); VF01A(1)	HP, UT, SK, NL, ME	Pakistan, Nepal, China, Taiwan, Vietnam, Thailand, Japan, Korea, Russia
1252	147.3	<i>Panchrysia deaurata</i> (Esper, 1787)*	LD04A(1)	JK	Austria, Italy, Romania, Switzerland, France, Germany, Greece
1253	147.4	<i>Scriptoplusia nigriluna</i> (Walker, 1858) ^q	ND05A(1)	HP, SK, AR , TN, KL	Nepal, Sri Lanka, China, Taiwan, Hong Kong, Vietnam, Thailand, Malaysia, Indonesia, Philippines, Papua New Guinea, Japan
1254	147.6	<i>Thysanoplusia lectula</i> (Walker, 1879)	SL02A(1)	WB, JH, KA	Nepal, Bangladesh, Sri Lanka, China, Vietnam, Malaysia, Indonesia (Borneo, Sumatra), Papua New Guinea, Australia, Japan
1255	147.7	<i>Thysanoplusia orichalcea</i> (Fabricius, 1775)	GH01D(7), GH01E(5), GH01F(8), GH02A(1), GH04A(6); GV06A(2); NV02B(1), NV02C(1), NV05B(3); DD11A(7)	HP, UT, WB, AR, AS, ME, MN, NL, BH, UP, RJ, MP, MH, KA, TN	Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Indonesia, Philippines, Papua New Guinea, Australia, New Zealand, Japan, Russia, Iran, Switzerland, United Kingdom, Netherlands, Portugal, Israel, Spain, Ethiopia, South Africa, Zimbabwe, Hawaii, Brazil
Subfamily: Xyleninae Guenée, 1852					
1256	147.26	<i>Dasypolia atrox</i> Hacker & Peks, 1993 ^r	GT03A(2)	HP, UT	Nepal, China
1257	147.8	<i>Euplexia literata</i> (Moore, 1882)	NV02A(1)	HP, WB, NL	Nepal, China (Tibet), Thailand, Indonesia (Sumatra)
1258	147.9	<i>Euplexia semifascia</i> (Walker, 1865) ^r	GV14A(4), GV14B(5), GV16A(3), GV16B(3); VF01A(1)	HP, UT , SK, MH, KA, TN	Pakistan, Nepal, China (Tibet)
1259	147.10	<i>Oroplexia decorata</i> (Moore, 1882) ^q	GV20A(1); AS10C(1), AS13A(3), AS15B(6), AS19A(3), AS22B(2), AS24A(1), AS27A(1); SL03A(1), SL05A(4); DD29B (5)	UT, SK, WB, AR	Nepal, China (Tibet)
1260	147.11	<i>Oroplexia luteifrons</i> (Walker, 1857) ^p	GH21B(2)	JK, HP , UT, ME, PB	
1261	147.13	<i>Phlogophora albovittata</i> (Moore, 1867)	SL01A(1), SL02A(1), SL03A(2), SL04A(2), SL05A(2)	HP, UT, SK, WB , AR, ME, NL, TN	Pakistan, Nepal, Bhutan, China, Taiwan, Vietnam, Thailand, Indonesia (Sumatra, Java), Japan, Korea

Sl. No.	Plate No.	Scientific Name	Material Examined with Location Code	Distribution	
				India	Global
1262	147.12	<i>Phlogophora calamistrata</i> (Moore, 1882)	SL01A(1), SL02A(1), SL03A(1), SL05A(1)	SK, WB	Bhutan
1263	147.21	<i>Phlogophora conservuloides</i> (Hampson, 1898)	GH07A(1), GH17A(1); AS10C(1), AS13A(3), AS15B(2); SL02A(1), SL03A(1), SL04A(1), SL05A(1)	HP, UT, SK, WB , AR	Nepal, China, Taiwan
1264	147.16	<i>Phlogophora costalis</i> (Moore, 1882) ⁱ	AS15B(1); SL03A(9); NV11A(4); DD27A(1)	UT , SK, WB, AR	Nepal, China
1265	147.19	<i>Phlogophora discisignata</i> (Moore, 1867) ⁱ	AS06A(1); SL01A(1), SL02A(2)	UT , SK, WB, NL	Nepal, Bhutan, Thailand, Vietnam
1266	147.20	<i>Phlogophora distorta</i> (Moore, 1881)	AS10C(1); SL01A(2), SL02A(1), SL03A(1), SL04A(1)	UT, SK, WB, AR	Nepal, Thailand
1267	147.22	<i>Phlogophora meticolodina</i> (Draudt, 1950)*	GV21B(1), GV23A(1); VF01A(1)	UT	Nepal, China
1268	147.17	<i>Phlogophora nobilis</i> Hreblay & Ronkay, 1998*	SL02A(3)	WB	Nepal
1269	147.14	<i>Phlogophora pectinata</i> (Warren, 1888)	GH23A(1); VF01A(1); DD23A(1), DD23C(1)	HP, UT, AR, HR, TN	Pakistan, Nepal
1270	147.15	<i>Phlogophora plumbeola</i> (Hampson, 1894) ⁱ	GV16A(1), GV20A(2); AS10C(2), AS13A(5), AS15B(1), AS19A(4)	UT , SK	Nepal
1271	147.18	<i>Phlogophora striatovirens</i> (Moore, 1867)	SL03A(1); DD16A(1), DD22A(1)	SK, WB, AR, NL	Nepal, China, Korea, Mongolia, Russia
1272	147.23	<i>Phlogophora subpurpurea</i> Leech, 1900	GH06A(1); GV24A(1); AS19A(3)	HP, UT	Nepal, China
1273	147.24	<i>Trichoridia endroma</i> (Swinhoe, 1893) ⁱ	AS26A(1)	UT , SK	Nepal, Bhutan, China (Tibet)
1274	147.25	<i>Valeriodes heterocampa</i> (Moore, 1882) ^q	GH23B(3); GV24A(4), GV24B(8); AS26A(1); DD29A(1)	HP, UT, SK, WB, AR , NL	Nepal, China (Tibet)



6

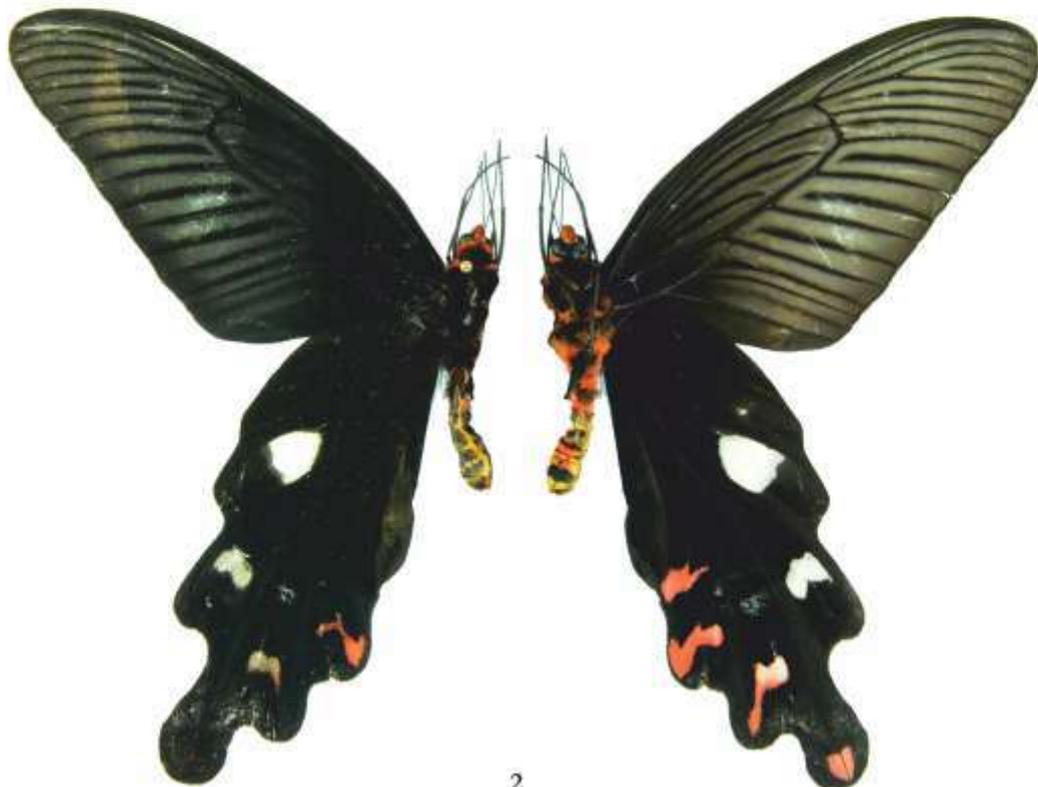


SPECIES PLATES: **BUTTERFLY**

The specimen photographs consist of the left half being dorsal and right half ventral. All the specimen photographs are given in exact life size. Live photographs are only representative, not in life-size.



1



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1 cm

Plate 1 : Papilionidae

1. *Atrophaneura aidoneus* 2. *Byasa dasarada dasarada*



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1 cm

Plate 2 : Papilionidae

1. *Byasa polla* 2. *B. polyenctes polyenctes*



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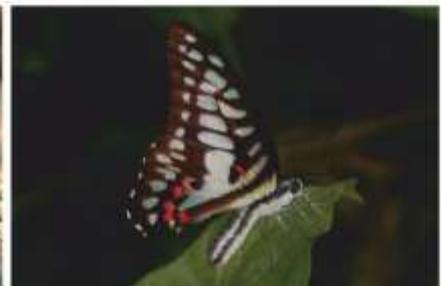
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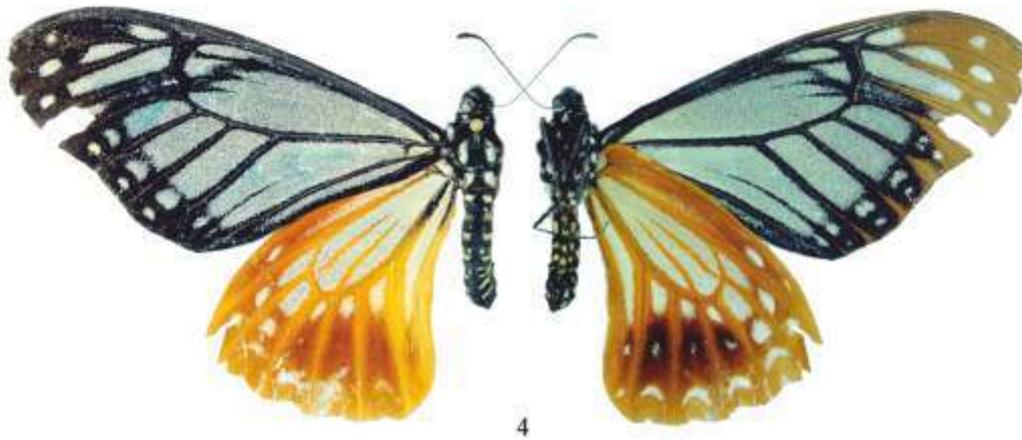
13b



14

Plate 3 : Papilionidae

1. *Graphtium agamemnon agamemnon* 2. *G. agetes agetes* 3. *G. antipbates pompilius* 4. *G. chironides chironides* 5. *G. cloanthus cloanthus*
6. *G. doson axionides* 7. *G. eurous sikkimica* 8. *G. eurypylus acberon* 9. *G. macareus indicus* 10. *G. mandarinus papbus*
11. *G. nomius nomius* 12. *G. sarpedon sarpedon* 13 a,b. *Lamproptera curius curius* 14. *L. meges virescens*



1 cm

Plate 4 : Papilionidae

1. *Meandrusa lachinus lachinus* 2. *M. payeni evan* 3. *Pachliopta aristolochiae aristolochiae*
4. *Papilio agestor agestor* 5. *P. alcmenor alcmenor*



1



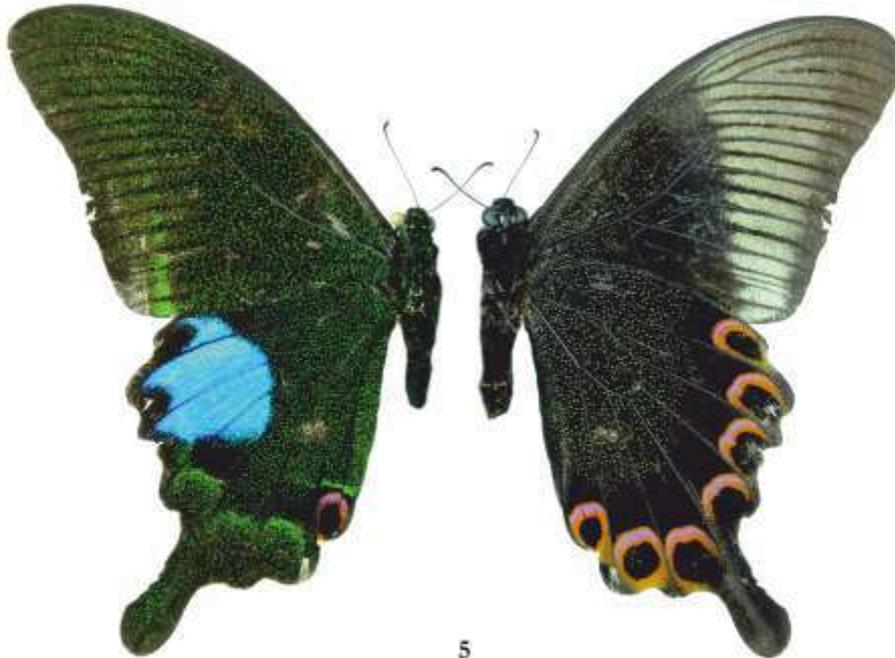
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5

1 cm

Plate 5 : Papilionidae

1. *Papilio arcturus arcturus* 2. *P. bianor gladiator* 3. *P. bianor polystor* 4. *P. krisbna krisbna* 5. *P. paris paris*



1 cm

Plate 6 : Papilionidae

1. *Papilio bootes janaka* 2. *P. demoleus demoleus* 3. *P. nephelus chaon* 4. *P. epycides epycides* 5. *P. belenus belenus*
6. *P. machaon asiatica* 7. *P. machaon ladakensis*



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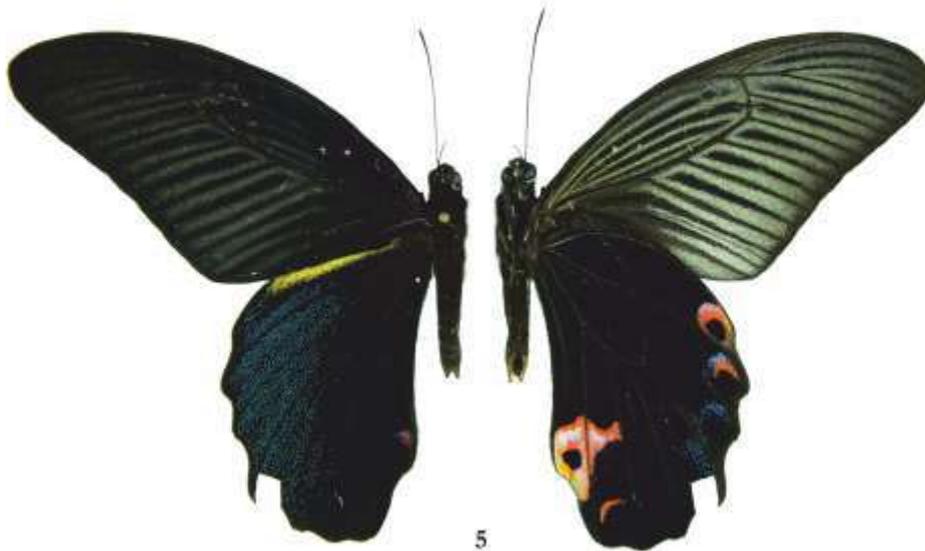
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6



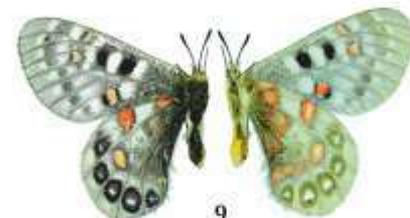
7



5



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9

1 cm

Plate 7 : Papilionidae

1. *Papilio memnon agenor* 2. *P. polytes romulus* 3. *P. paradoxa telearchus* 4. *P. protenor protenor* 5. *P. p. euprotenor* 6. *Troides aeacus aeacus*
7. *Troides belena cerberus* 8. *Parnassius charltonius* 9. *P. hardwickii hardwickii*



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Plate 8 : Hesperiiidae

1. *Bibasis sena sena* 2. *Burara jaina jaina* 3. *B. oedipodea belesis* 4. *B. vasutana* 5. *Choaspes benjaminii japonica*
 6. *C. xanthopogon xanthopogon* 7. *Hasora anura anura* 8. *H. badra badra* 9. *H. vitta indica* 10. *Lobocla liliana ignatius*
 11. *Capila jayadeva* 12. *C. zennara* 13. *Celaenorrbinus aurivittatus aurivittatus* 14. *C. dhanada dhanada* 15. *C. leucocera*



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Plate 9 : HesperIIDae

1. *Celaenorrhinus nigricans nigricans* 2. *C. patula* 3. *C. zea* 4. *Coladenia agni agni* 5. *C. indrani indrani* 6. *Ctenoptilum vasava vasava*
7. *Darpa banria* 8. *Gerosis phisara phisara* 9. *G. sinica narada* 10. *Mooreana trichoneura pralaya* 11. *Odontoptilum angulata angulata*
12. *Pseudocoladenia dan fabia* 13. *P. fatih* 14. *P. festa* 15. *Pyrgus cashmirensis cashmirensis*



Plate 10 : Hesperiidae

1. *Sarangesa dasabara dasabara* 2. *Seseria sambara sambara* 3. *Spialia galba galba* 4. *Tagiades litigiosa litigiosa*
 5. *T. menaka menaka* 6. *T. parra gala* 7. *Carterocephalus avanti avanti* 8. *Aeromachus jhora creta* 9. *Aeromachus kali* 10. *A. pygmaeus*
 11. *Ampittia dioscorides dioscorides* 12. *Astictopterus jama olivascens* 13. *Borbo bevani* 14. *Cepbrenes acalle oceanica* 15. *Creteus cyrina*



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Plate 11 : Hesperiiidae

1. *Cupitha purvea* 2. *Halpe filda* 3. *H. zema zema* 4. *H. zola zola* 5. *Hyarotis adrastus praba* 6. *Iambrix salsala salsala*
7. *Iton semamora semamora* 8. *Korsibaialos butleri* 9. *Matapa-aria* 10. *Notocrypta curvifascia curvifascia* 11. *N. feisthamelii alysos*
12. *N. paralyos asava* 13. *Oebus subvittatus subvittatus* 14. *Oriens goloides* 15. *Parnara guttatus*



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Plate 12 : Hesperiiidae

1. *Pedesta masuriensis masuriensis* 2. *Polytrems eltola eltola* 3. *P. lubricans lubricans* 4. *Potantbus mara*
 5. *Pyroneura margherita margherita* 6. *Scobura cephalo* 7. *Sebastonyma dolopia dolopia* 8. *Telicota bambusae*
 9. *Thoressa cerata* 10. *T. hyrie* 11. *Udaspes folus* 12. *Zographetus satwa*



1a

2

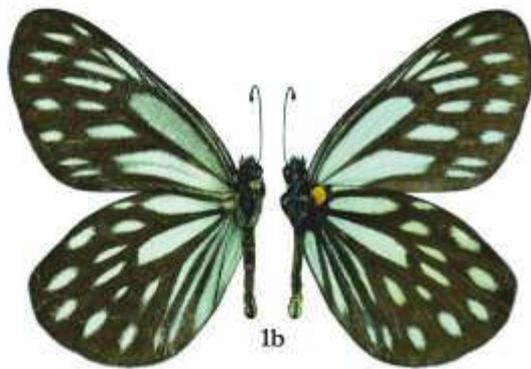
3



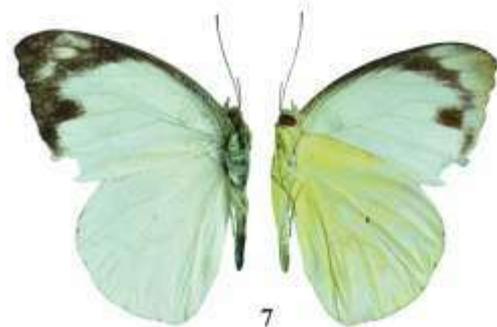
4

5

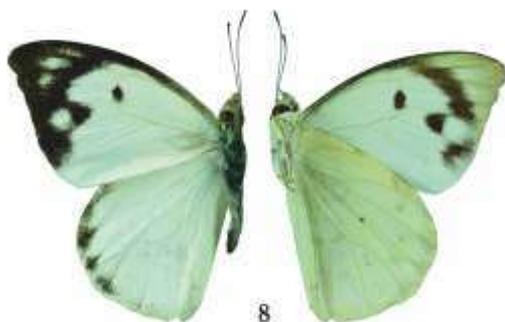
6



1b



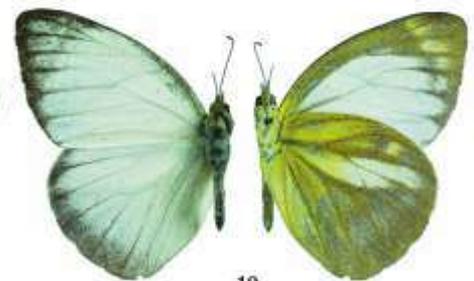
7



8



9



10

1 cm

Plate 13 : Pieridae

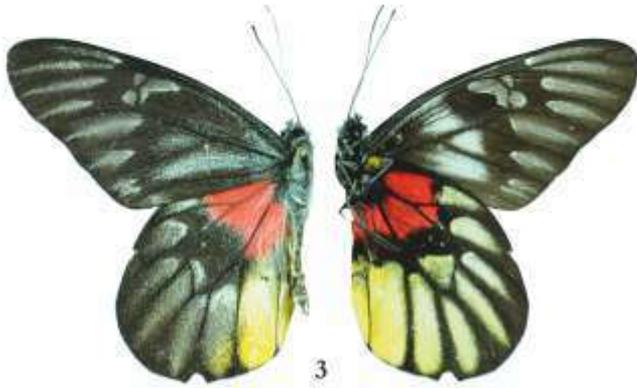
1 a,b. *Aporia agathon agathon* 2. *A. agathon capbusa* 3. *A. a. phryxe* 4. *Appias galba* 5. *A. libythea* 6. *A. lyncida eleonora*
7. *A. indra indra* 8. *A. lalage lalage* 9. *Baltia butleri butleri* 10. *Cepora nadina nadina*



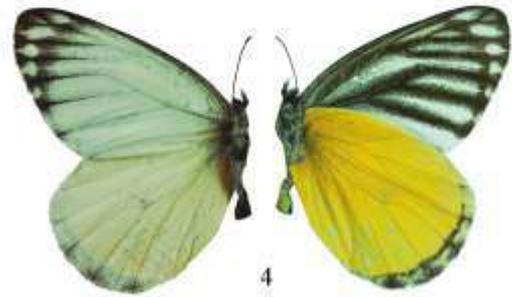
1a

1b

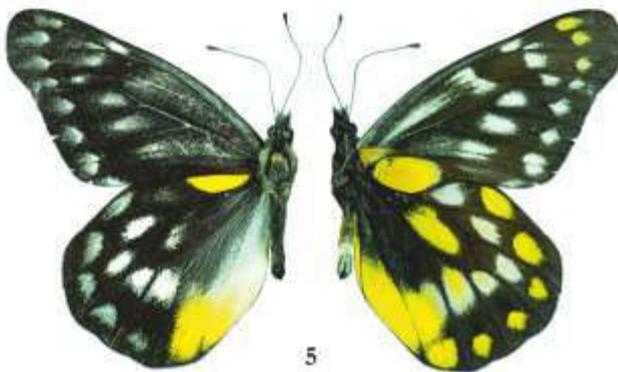
2



3



4



5



6



7



8

1 cm

Plate 14 : Pieridae

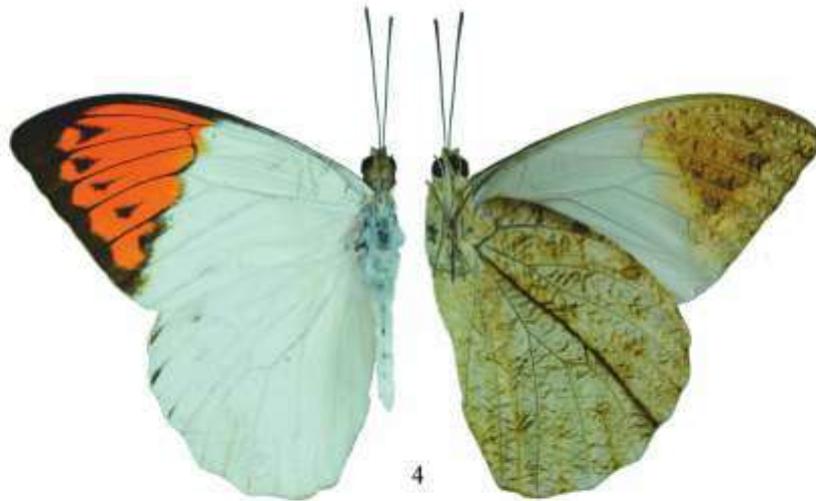
1 a,b. *Belenois aurota aurota* 2. *Delias hyparete indica* 3. *D. acalis pyramus* 4. *D. agostina agostina*
5. *D. belladonna horsfieldii* 6. *D. b. legens* 7. *D. pasitboe pasitboe* 8. *D. sanaca bhutya*



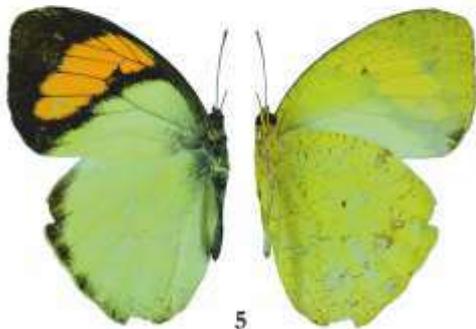
1

2

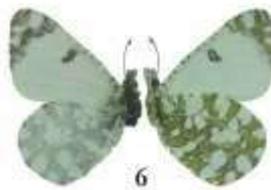
3



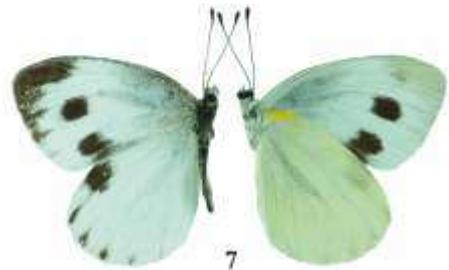
4



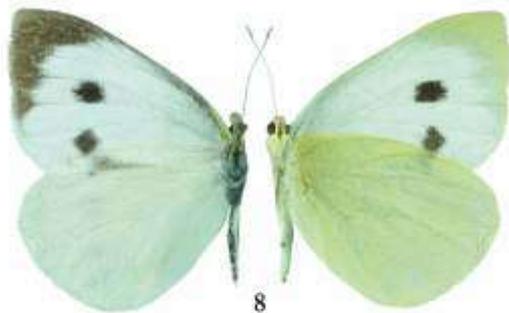
5



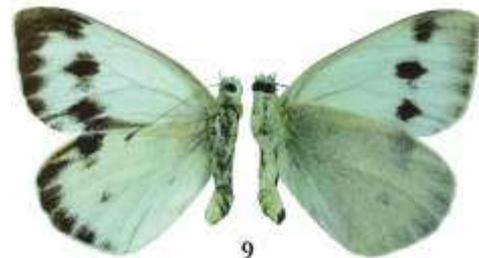
6



7



8

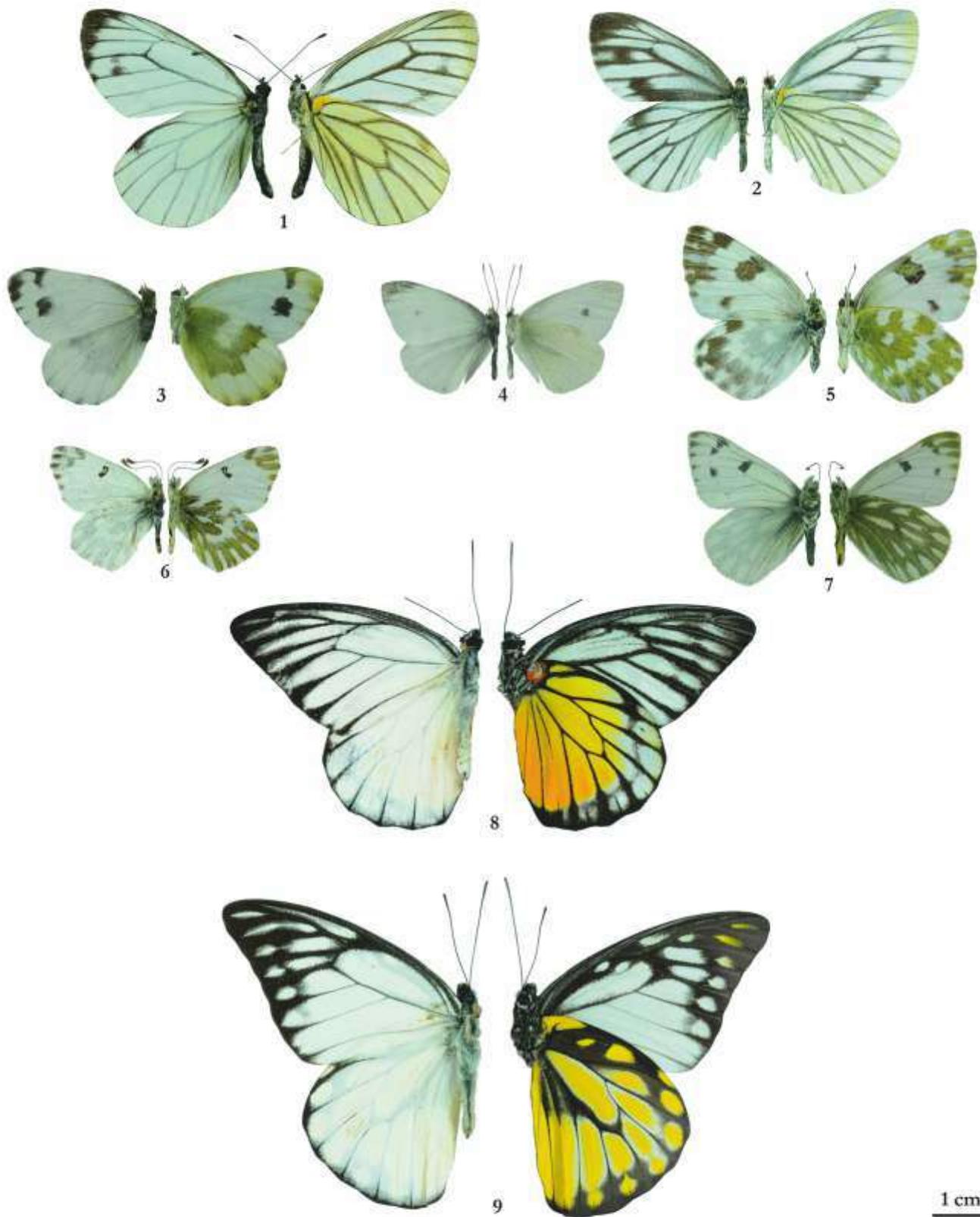


9

1 cm

Plate 15 : Pieridae

1. *Leptosia nina* 2. *Pareronia avatar avatar* 3. *P. lippia* 4. *Hebomoia glaucippe glaucippe* 5. *Isias pyrene familiaris*
6. *Euchloe daphalis* 7. *Pieris canidia indica* 8. *P. brassicae nepalensis* 9. *P. deota*



1. *Pieris extensa bhutya* 2. *P. ajaka* 3. *P. krueperi devta* 4. *P. rapae* 5. *Pontia daphidice moorei*
 6. *P. chloridice alpina* 7. *P. callidice kalora* 8. *Prioneris philonome clemanthe* 9. *P. thestylis thestylis*



1a



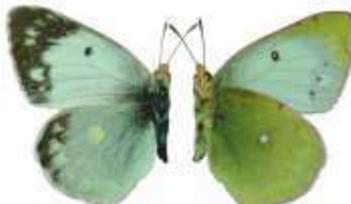
1b



2



3



4



5



6



7



8



9

1 cm

Plate 17 : Pieridae

1 a,b. *Catopsilia pomona* 2. *C. pyranthe pyranthe* 3. *Colias eogene eogene* 4. *C. erate* 5. *C. fieldii fieldii* 6. *C. ladakensis*
7. *C. stoliczkanana stoliczkanana* 8. *Dercas lycorias lycorias* 9. *D. verbuelli doubledayi*



1a

1b

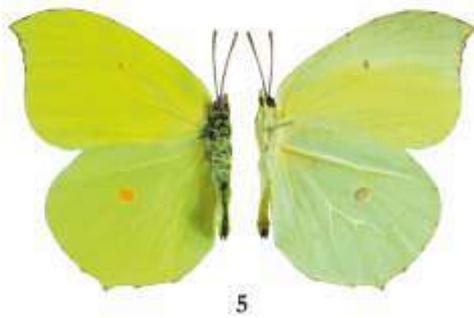
2



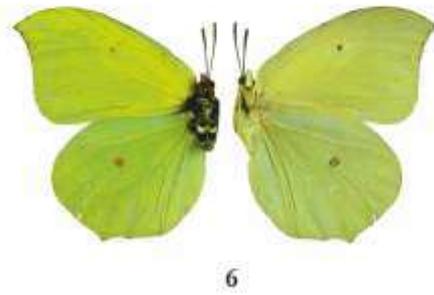
3

4a

4b



5



6

1 cm

Plate 18 : Pieridae

1. *Eurema blanda silbetana* (a. Wet season form, b. Dry season form) 2. *E. brigitta rubella* 3. *E. hecabe hecabe*
 4. *E. laeta laeta* (a. Dry season form, b. Wet season form) 5. *Gonepteryx amintha tibetana* 6. *G. nepalensis*



1



2



3



4a



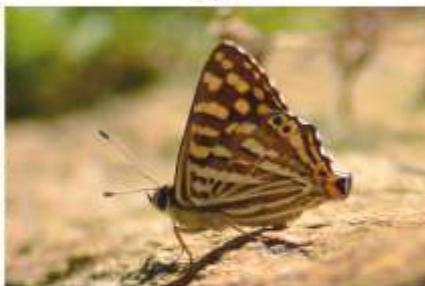
4b



5a



5b



6



7a



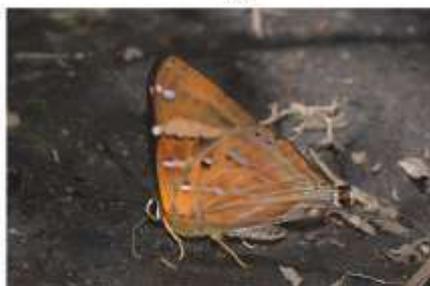
7b



8a



8b



9



10



11

Plate 19 : Riodinidae

1. *Abisara cbela cbela* 2. *A. neopbron neopbron* 3. *A. fylla* 4 a,b. *Dodona adonira adonira* 5 a,b. *D. dipoea dipoea* 6. *D. durga durga*
7 a,b. *D. egeon egeon* 8 a,b. *D. eugenes* 9. *D. ouida ouida* 10. *Stiboges nymphidia nymphidia* 11. *Zemeros flegyas flegyas*



Plate 20 : Lycaenidae

1. *Poritia bewitsoni bewitsoni* 2. *Miletus chinensis longana* 3. *Curetis acuta dentata* 4. *Acytolepis puspa gisca* 5. *Anthene emolus emolus*
 6. *Anthene lycanina lycambes* 7. *Agriades jaloka* 8. *A. leela* 9. *Alpberakya devanica* 10. *Caleta elna noliteia* 11. *C. roxus roxana*
 12. *Castalius rosimon rosimon* 13. *Catochrysops panormus exiguus* 14. *Celastrina argiolus kollari* 15. *Celastrina gigas*



1



2



3



4



5



6



7



8



9



10



11



12



13



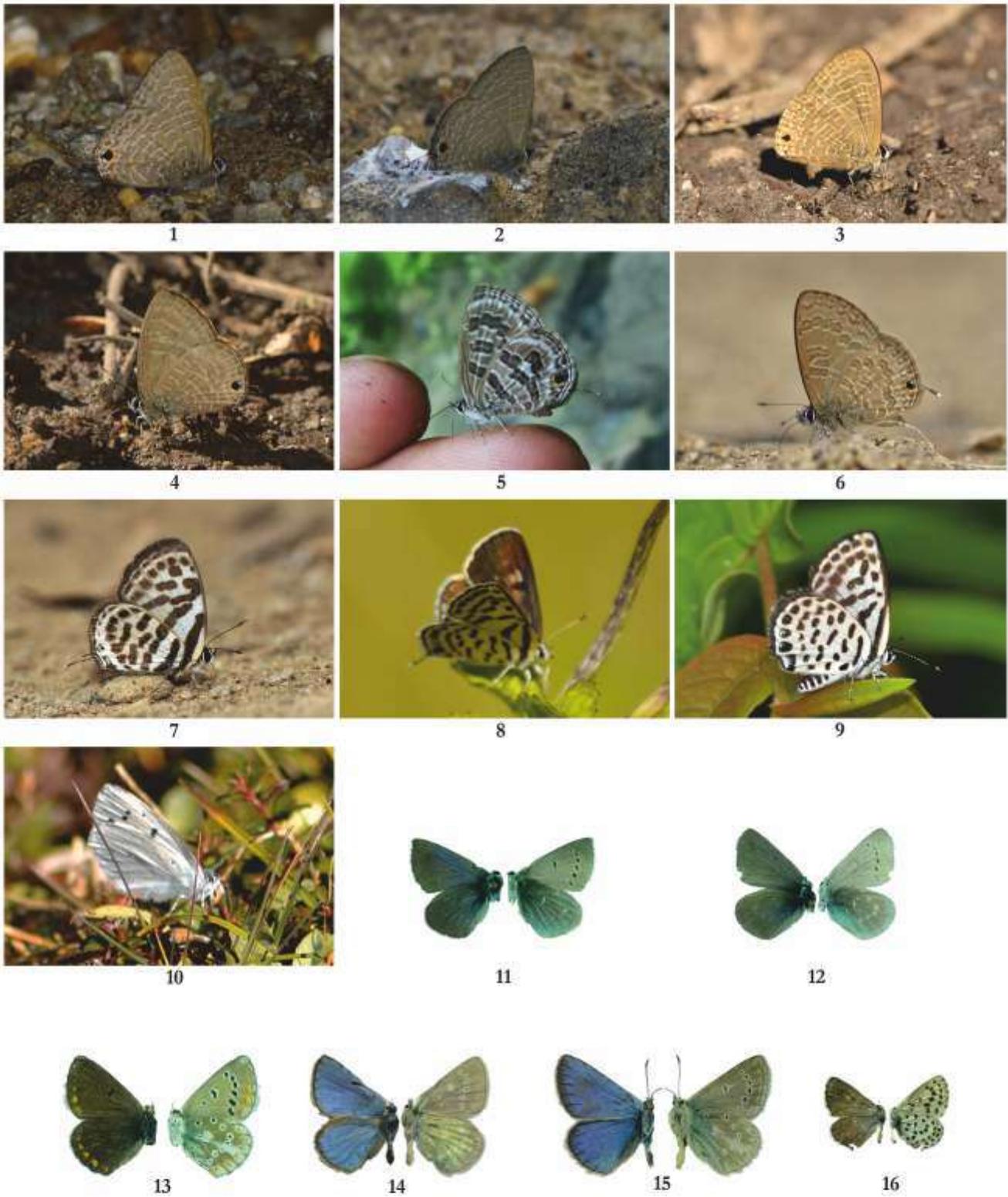
14



15

Plate 21 : Lycaenidae

1. *Celastrina huegeli huegeli* 2. *C. lavendularis limbata* 3. *Celatoxia marginata marginata* 4. *Chilades pandava pandava*
5. *Euchrysops cnejus cnejus* 6. *Everes argiades diporides* 7. *Freyeria trochylus orientalis* 8. *Lampides boeticus*
9. *Leptotes plinius plinius* 10. *Jamides alecto eurysaces* 11. *J. boebus boebus* 12. *J. celeno celeno*
13. *Megisba malaya sikkima* 14. *Orthomiella pontis pontis* 15. *Pithecops fulgens fulgens*



1 cm

Plate 22 : Lycaenidae

1. *Ionolyce helicon merguiana* 2. *Nacaduba beroe gythion* 3. *N. kurava esplea* 4. *N. pactolus continentalis* 5. *Prosotas aluta coelestis*
 6. *P. nora ardates* 7. *Tarucus ananda* 8. *T. indicus* 9. *T. venosus* 10. *Oreolyce vardhana vardhana* 11. *Pamiria metallica*
 12. *P. ompisa* 13. *Polyommatus ariana* 14. *P. dux dux* 15. *P. stoliczkaiana* 16. *Pseudophilotes vicrama cashmirensis*



1



2



3



4



5



6



7



8



9



10



11



12



13



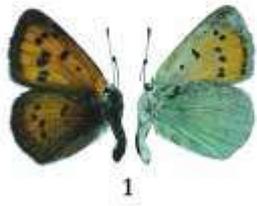
14



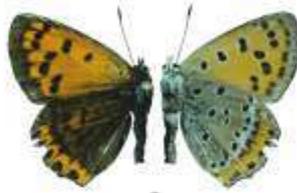
15

Plate 23 : Lycaenidae

1. *Pseudozizeeria maba maba* 2. *Zizeeria karsandra* 3. *Zizina otis* 4. *Shijimia moorei moorei* 5. *Udara albocaerulea albocaerulea*
6. *U. dilecta dilecta* 7. *Una usta* 8. *Heliophorus sena* 9. *H. brahma brahma* 10. *H. bakeri* 11. *H. epicles latilimbata*
12. *H. indicus indicus* 13. *H. moorei corniscans* 14. *H. m. moorei* 15. *H. tamu tamu*



1



2



3

1 cm



4



5



6



7



8



9



10



11



12



13



14



15

Plate 24 : Lycaenidae

1. *Lycaena kasyapa* 2. *L. panava* 3. *L. phlaeas baralacha* 4. *Spindasis elima elima* 5. *S. lobita bimalayanus* 6. *S. nipalicus*
 7. *Ancema ctesia ctesia* 8. *Arhopala ammonides elira* 9. *A. bazalus teesta* 10. *A. centaurus piritibous* 11. *A. ganesa ganesa*
 12. *A. paraganesa paraganesa* 13. *A. paramuta paramuta* 14. *A. rama rama* 15. *Bindabara phocides phocides*



1



2



3



4



5



6



7



8



9



10



11



12

1 cm



13



14



15

Plate 25 : Lycaenidae

1. *Catapaecilma major major* 2. *Chaetoprocta odata peilei* 3. *Cberitra freja evansi* 4. *Cberitrella truncipennis* 5. *Chliaria kina kina*
6. *C. othona* 7. *Dendorix epijarbas* 8. *Drupadia scaeva cyara* 9. *Esakiozephyrus icana* 10. *Eneaspa mikamii* 11. *E. motokii*
12. *Flos areste* 13. *Hypolycaena erylus himavantus* 14. *H. narada* 15. *Mota masyyla*



Plate 26 : Lycaenidae

1. *Pratapa icetas* 2. *Rapala nissa nissa* 3. *R. n. ranta* 4. *R. pberetima petosiris* 5. *R. selira* 6. *R. varuna* 7. *Remelana jangala ravata*
8. *Sinthusa chandrana grotei* 9. *Tajuria diaeus* 10. *Ticherra acte acte* 11. *Yasoda tripunctata* 12. *Zeltus amasa amasa*



1



2



3



4 ♂



4 ♀



5



6



7a



8



7b

1 cm

Plate 27 : Nymphalidae

1. *Danaus chrysippus chrysippus* 2. *D. genutia genutia* 3. *Euploea core core* 4. *E. mulciber mulciber* 5. *Euploea radamanthus radamanthus*
6. *Parantica aglea melanoides* 7 a,b. *P. sita sita* 8. *Tirumala septentrionis septentrionis*



Plate 28 : Nymphalidae

1. *Charaxes aristogiton aristogiton* 2. *C. bernardus hierax* 3. *C. kabruha* 4. *C. marmax marmax* 5 a,b. *Polyura bharata*
 6. *P. dolon carolus* 7. *P. endanippus endanippus* 8. *Polyura narcaeus* 9. *Anlocera brahminus brahminus*
 10. *A. b. dokwana* 11. *A. padma padma* 12. *A. saraswati saraswati* 13. *A. swaba swaba*



1



2



3



4



5



6



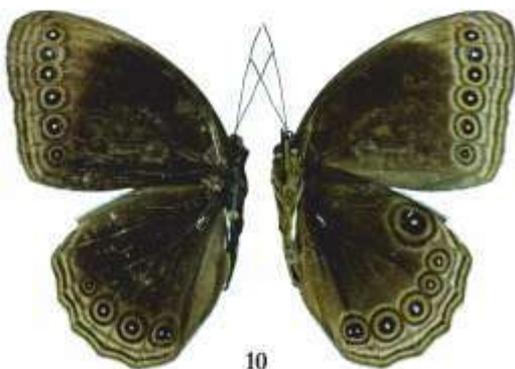
7



8



9



10



11

1 cm

Plate 29 : Nymphalidae

1. *Callerebia hybrida* 2. *C. scanda scanda* 3. *Discophora timora timora* 4. *Elymnias hypermnestra undularis*
5. *E. malelas malelas* 6. *E. patna patna* 7. *E. peali* 8. *E. vasudeva deva* 9. *Enispe enthyminus enthyminus*
10. *Ethope bimachala* 11. *Faunis canens arcesilas*

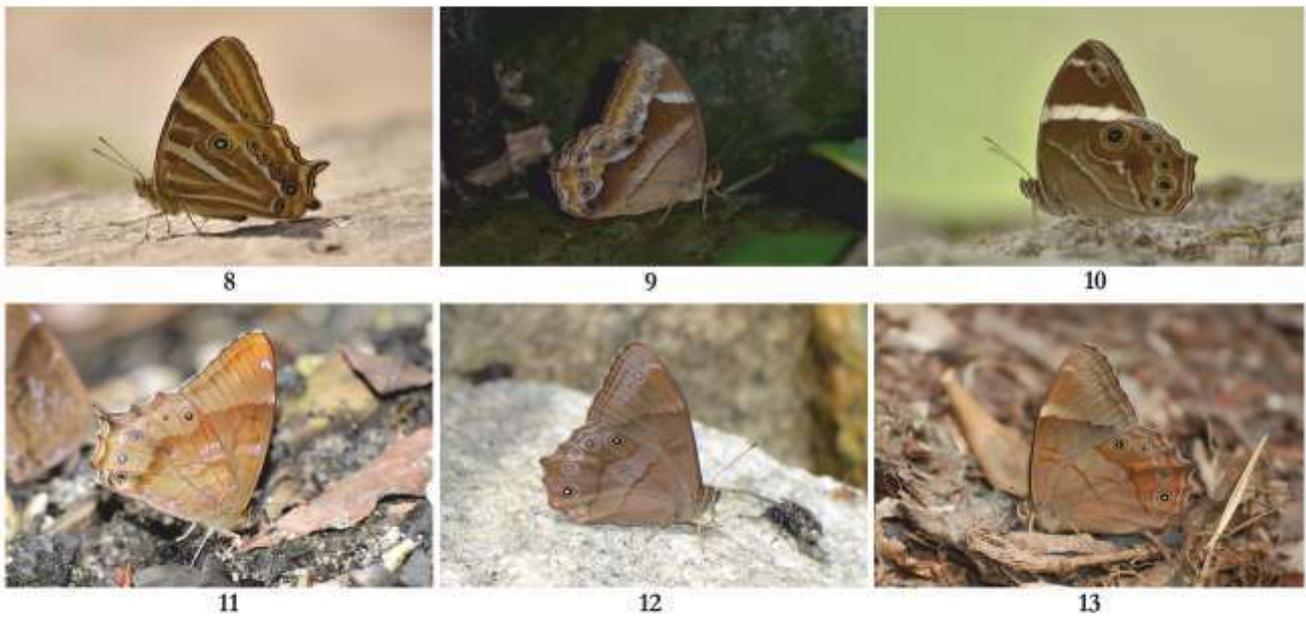
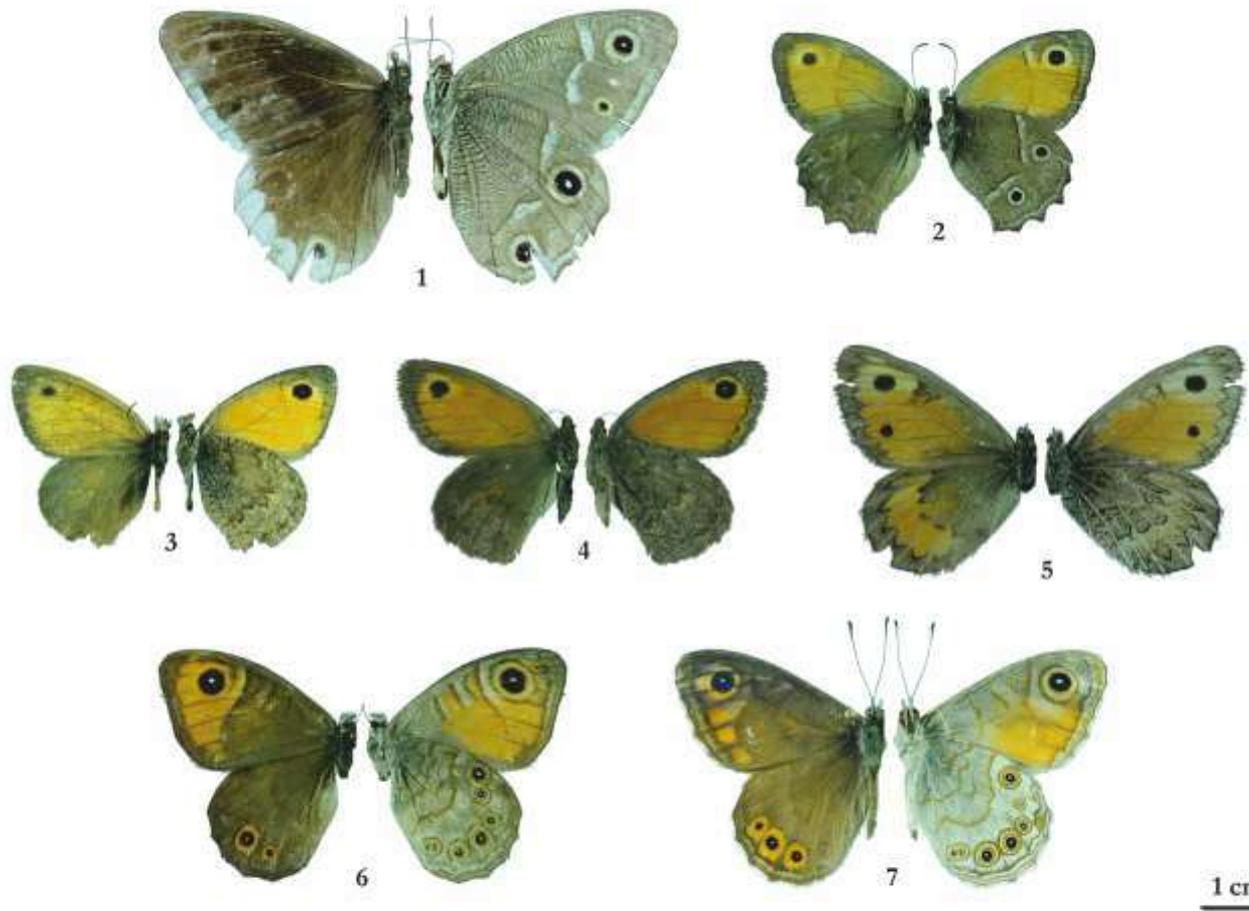


Plate 30 : Nymphalidae

1. *Hipparchia parisatis shiva* 2. *Hyponephele brevistigma* 3. *H. pulchella* 4. *H. pulchra* 5. *Karanasa astorica*
 6. *Lasiommata menava* 7. *L. schakra schakra* 8. *Lethe baladeva aisa* 9. *L. chandica chandica*
 10. *L. confusa confusa* 11. *L. dura gammiei* 12. *L. isana dinarbas* 13. *L. i. isana*



1



2



3



4



5



6



7



8a



8b



9



10



11



12



13



14

Plate 31 : Nymphalidae

1. *Lethe kansa* 2. *L. mekara zuchara* 3. *L. naga* 4. *L. nicetas* 5. *L. robria robria* 6. *L. sidonis* 7. *L. sinorix sinorix* 8 a,b. *L. sura*
9. *L. verma sintica* 10. *L. v. verma* 11. *L. vindhya vindhya* 12. *Melanitis leda leda* 13. *M. phedima bela* 14. *M. zitenius zitenius*



Plate 32 : Nymphalidae

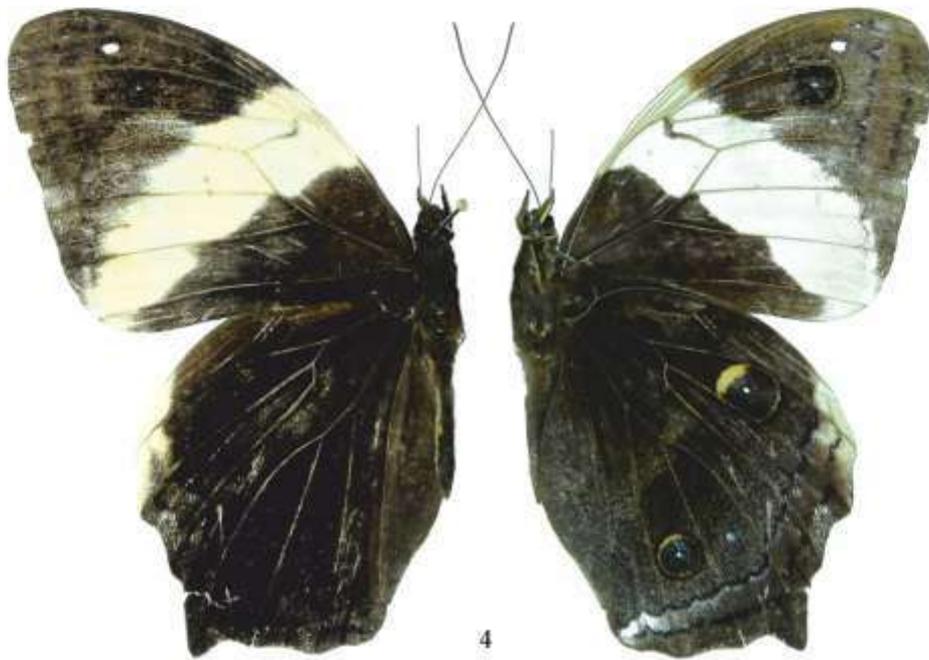
1. *Mycalesis adamsoni* 2. *M. francisca sanatana* 3. *M. gotama charaka* 4. *M. beri* 5. *M. lepcha lepcha* 6. *M. malsarida* 7. *M. mestra*
 8. *M. mineus mineus* 9. *M. misenus misenus* 10. *M. perseus blasius* 11. *M. suaveolens suaveolens* 12. *M. visala visala*
 13. *Neope armandii khasiana* 14. *N. bbadra* 15. *N. pilaba pandyia*



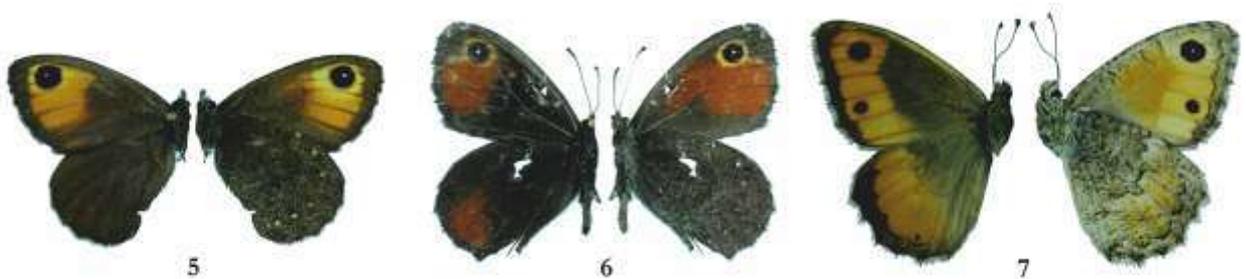
1

2

3



4



5

6

7

1 cm

Plate 33 : Nymphalidae

1. *Neope pulaha pulaboides* 2. *N. yama yama* 3. *Orinoma damaris damaris* 4. *Neorina patria westwoodi*
5. *Paralasa mani* 6. *P. sballada sballada* 7. *Pseudobazara lehana*

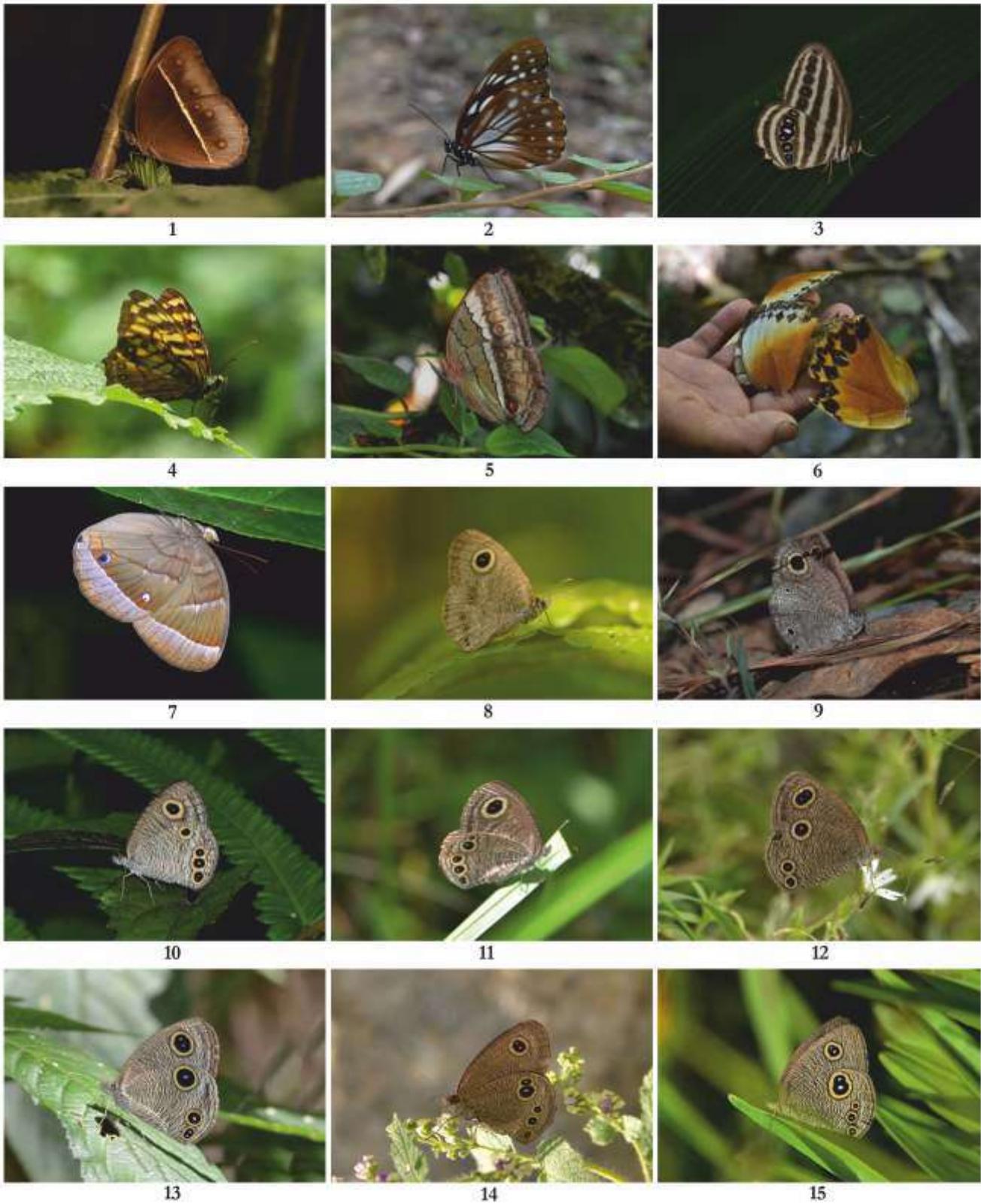


Plate 34 : Nymphalidae

1. *Orsotriaena medus medus* 2. *Penibema lisarda lisarda* 3. *Ragadia crisilda crisilda* 4. *Rhabdicera moorei moorei*
 5. *Stichopthalma camadeva camadeva* 6. *S. sparta tytleri* 7. *Thaumantis diores diores* 8. *Ypthima baldus baldus*
 9. *Y. asterope* 10. *Y. buebneri* 11. *Y. indecora* 12. *Y. nareda* 13. *Y. newara* 14. *Y. nikaea* 15. *Y. sakra sakra*



1

2

4



3

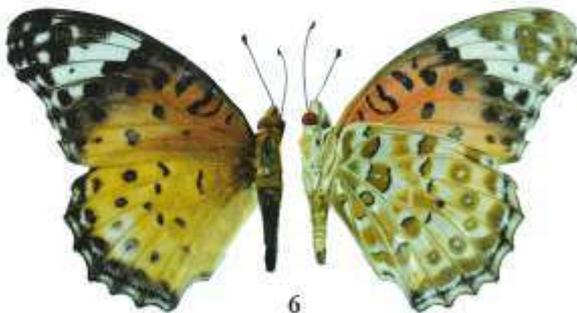


5

6



8



7



1 cm

Plate 35 : Nymphalidae

1. *Zipetis scylax scylax* 2. *Ariadne merione tapestrina* 3. *Calinaga aborica* 4. *Argynnis childreni sakontala*
5. *A. c. childreni* 6. *A. hyperbins hyperbins* 7. *A. jainadeva persephone* 8. *Acraea issoria issoria*

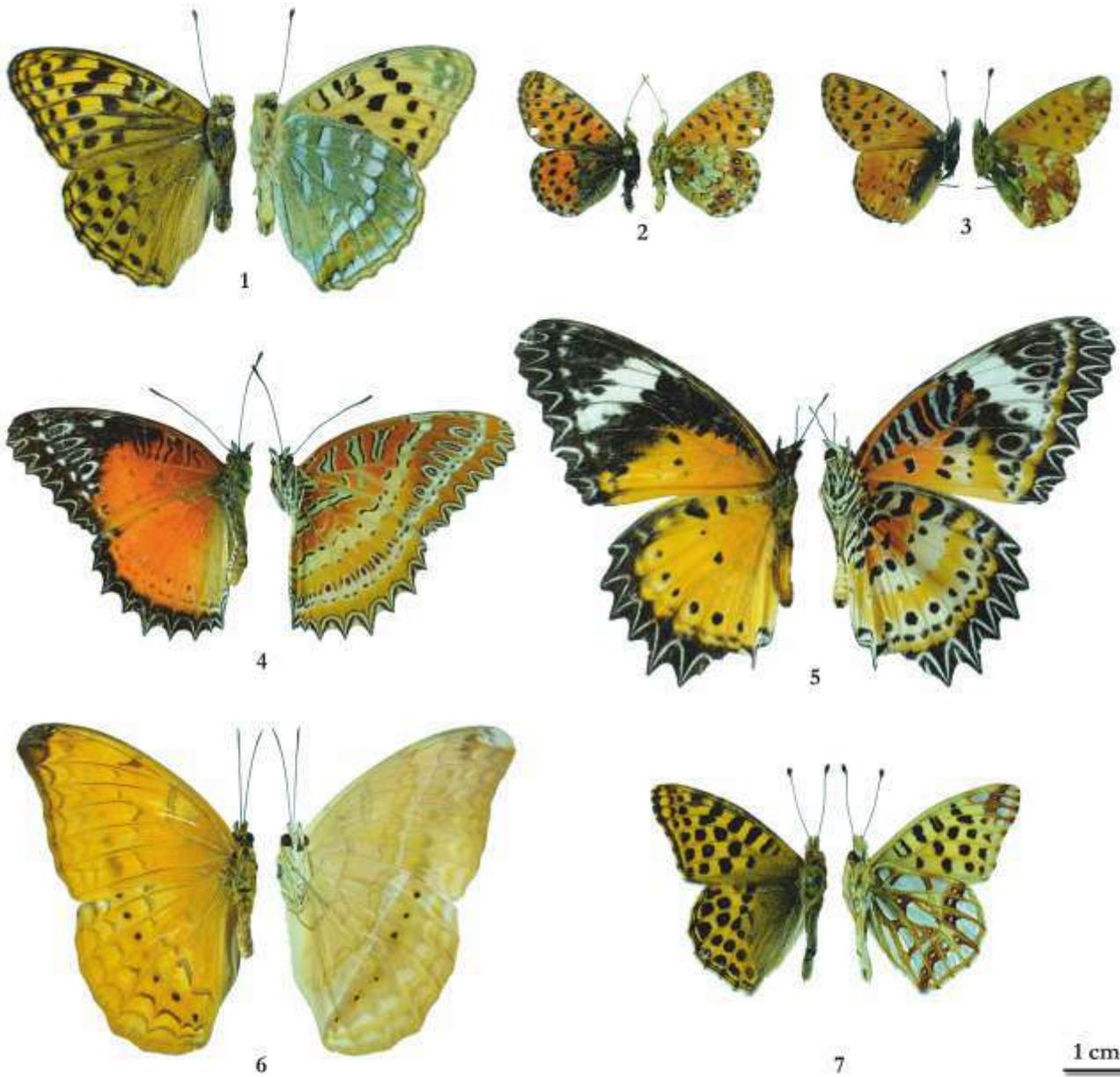


Plate 36 : Nymphalidae

1. *Argynnis kamala* 2. *Boloria jerdoni* 3. *B. sipora nitida* 4. *Cetbosia biblis tisamena* 5. *C. cyane cyane*
 6. *Cirrochroa aoris aoris* 7. *Issoria issaea* 8. *Phalanta pbalantha pbalantha* 9. *Vagrans egista sinha* 10. *Vindula erota erota*



1



2



3



4



5



6



7



8



9



10



11



12



13



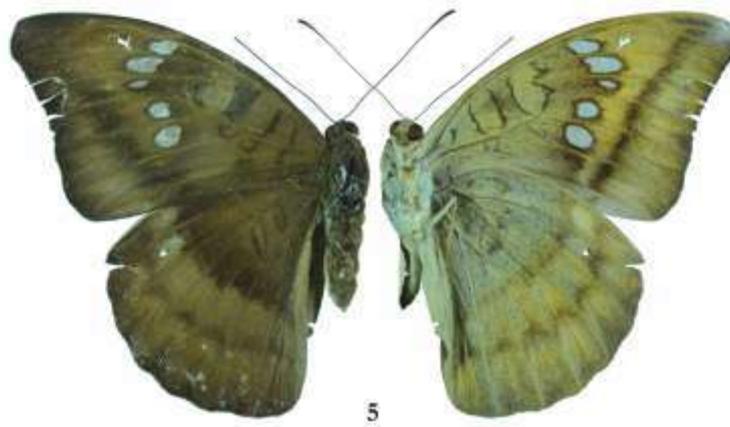
14



15

Plate 37 : Nymphalidae

1. *Abrota ganga ganga* 2. *Athyma cama cama* 3. *A. inara inara* 4. *A. jina jina* 5. *A. kanwa pborkeys* 6. *A. opalina opalina*
7. *A. orientalis* 8. *A. perius perius* 9. *A. pravara acutipennis* 10. *A. ranga ranga* 11. *A. selenophora babula*
12. *A. zeroa zeroa* 13. *Entbalia acontbea garuda* 14. *E. alpbada jama* 15. *E. anosia anosia*



1 cm

Plate 38 : Nymphalidae

1. *Euthalia eriphylae delmana* 2. *E. franciae franciae* 3. *E. monina kesava* 4. *E. pbemius pbemius* 5. *E. telbinia*
 6. *Lexias dirtea kbasiana* 7. *L. cyanipardus cyanipardus* 8. *Limnitis trivena trivena* 9. *Moduza procris procris*



1



2



3



4



5



6



7



8



9



10



11



12



13



14



15

Plate 39 : Nymphalidae

1. *Lasippa viraja viraja* 2. *Neptis clinia praedicta* 3. *N. c. susruta* 4. *N. hylas kamarupa* 5. *N. mabendra mabendra* 6. *N. manasa manasa*
7. *N. miab miab* 8. *N. nata adipala* 9. *N. nata yerburii* 10. *N. pseudovikasi* 11. *N. sankara sankara* 12. *N. sappho astola*
13. *N. soma butleri* 14. *N. s. soma* 15. *Pantoporia bordonia bordonia*



Plate 40 : Nymphalidae

1. *Neurostigma siva siva* 2. *Parasarpa dudu dudu* 3. *P. zayla zayla* 4 a,b. *Sumalia daraxa daraxa* 5. *S. zulema*
 6. *Tanaecia jabnu jabnu* 7. *T. julii appiades* 8. *T. lepidea lepidea* 9. *Dicborragia nesimachus nesimachus*
 10. *Pseudergolis wedah wedah* 11. *Stibochiona nicea nicea* 12. *Mimathyma ambica ambica*



1



2



3



4



5



6



7



8



9



10a



10b



11



12



13

1 cm

Plate 41 : Nymphalidae

1. *Dilipa morgiana* 2. *Euripus nyctelius nyctelius* 3. *Hestinalis nama nama* 4. *Robana parisatis parisatis* 5. *Sepsis chandra chandra*
6. *S. dicbroa* 7. *Chersonesia risa risa* 8. *Cyrestis thyodamas ganescha* 9. *C. t. thyodamas* 10 a,b. *Aglais caschmirensis aesis*
11. *A. c. caschmirensis* 12. *A. ladakensis* 13. *Dolesballia bisaltide indica*



1 cm

Plate 42 : Nymphalidae

- 1 a,b. *Hypolimnas bolina jacintha* 2. *H. misippus* 3. *Junonia almana almana* 4. *J. atlites atlites*
 5. *J. hierta hierta* 6. *J. ipbita ipbita* 7. *J. lemonias lemonias* 8. *J. orithya ocyale* 9. *Kallima inachus inachus*
 10. *K. knyveti* 11. *Polygonia c-album cognata* 12. *P. c-album agnicula* 13. *P. c-album kashmira*



1



2



3



4



5

1 cm

Plate 43 : Nymphalidae

1. *Kaniska canace canace* 2. *Nymphalis xanthomelas ferveescens* 3. *Vanessa cardui* 4. *V. indica indica* 5. *Rhinopalpa polynice birmana*



Plate 44 : Nymphalidae

1 a,b. *Symbrentbia brabira brabira* 2 a,b. *S. hypselis cotanda* 3 a,b. *S. lilaea khasiana* 4. *S. nipbanda hysudra* 5 a,b. *S. silana*
 6. *Libythea lepita lepita* 7. *L. myrrha sanguinalis*



6



SPECIES PLATES:
MOTH

The specimen photographs consist of the left half being dorsal and right half ventral. All the specimen and live photographs are given in exact life size. In each plate , a 1 cm scale is provided for measurement of the wing expanse



1



2



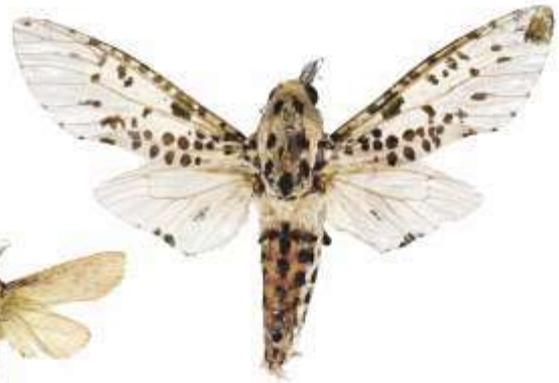
4



3



6



8



5



7



9



10



11



12

1 cm

Plate 45 : Hepialidae (1), Cossidae (2-10), Limacodidae (11-13)

1. *Hepialiscus nepalensis* 2. *Catopta cashmirensis* 3. *Chalcidia minea* 4. *Neurozerra conferta* 5. *Phragmataecia impura* 6. *P. parvipuncta*
7. *Polyphagozerra coffeae* 8. *Zeurrora indica* 9. *Zenzera multistrigata* 10. *Z. nepalense* 11. *Scopelodes venasa* 12. *S. testacea*

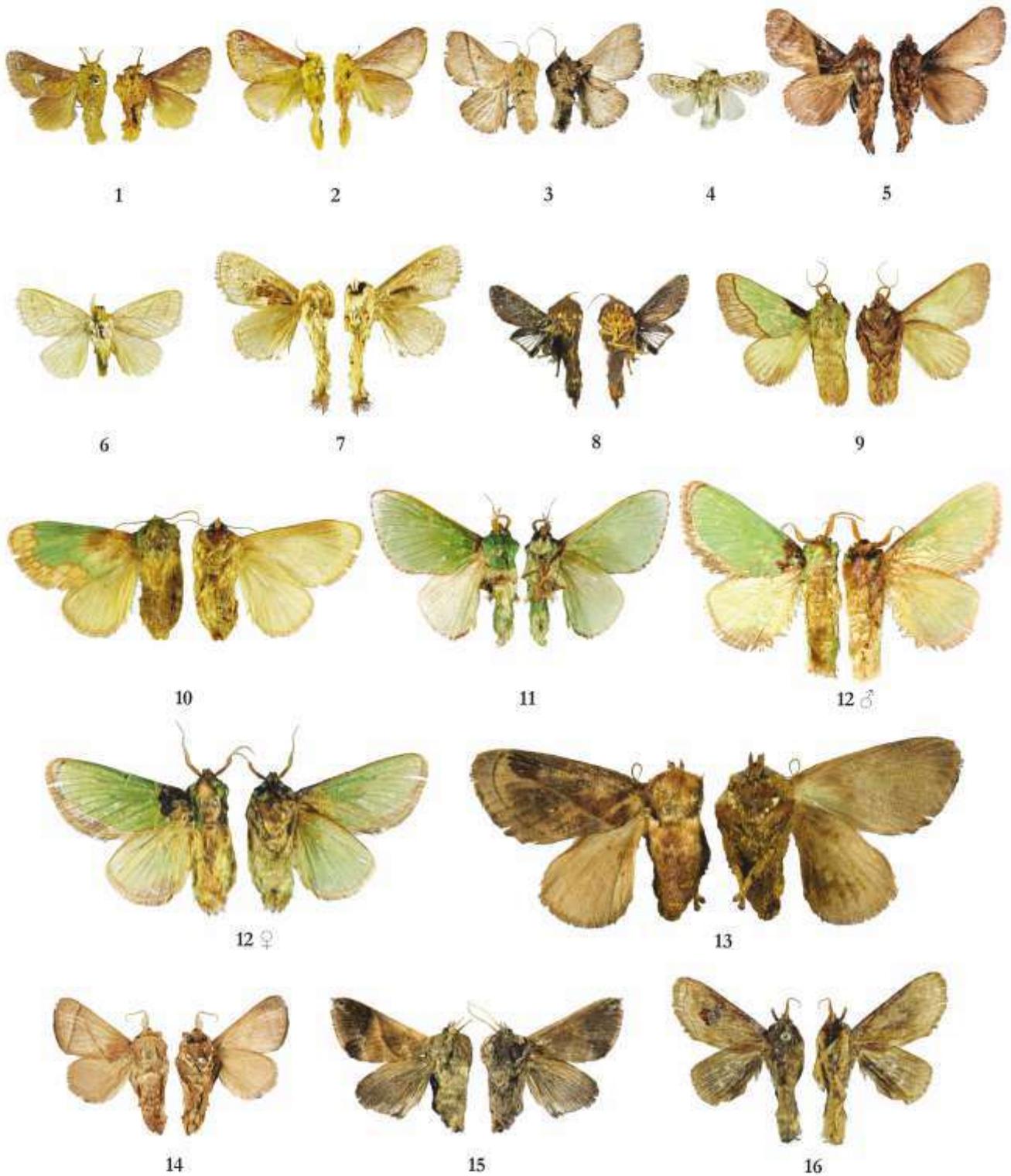


Plate 46 : Limacodidae

1. *Miresa albipuncta* 2. *M. bracteata* 3. *Tbosea sinensis* 4. *Altha nivea* 5. *Biribamoides junctura* 6. *Cania bilinea* 7. *Chalcoscelides castaneipars*
 8. *Cheromettia lobor* 9. *Parasa lepida* 10. *P. pastrorolis* 11. *Soteira ostia* 12. *S. grandis* 13. *Phocoderma velutina* 14. *Praesetora divergens*
 15. *Setora postornata* 16. *Squamosa ocellata*

1 cm

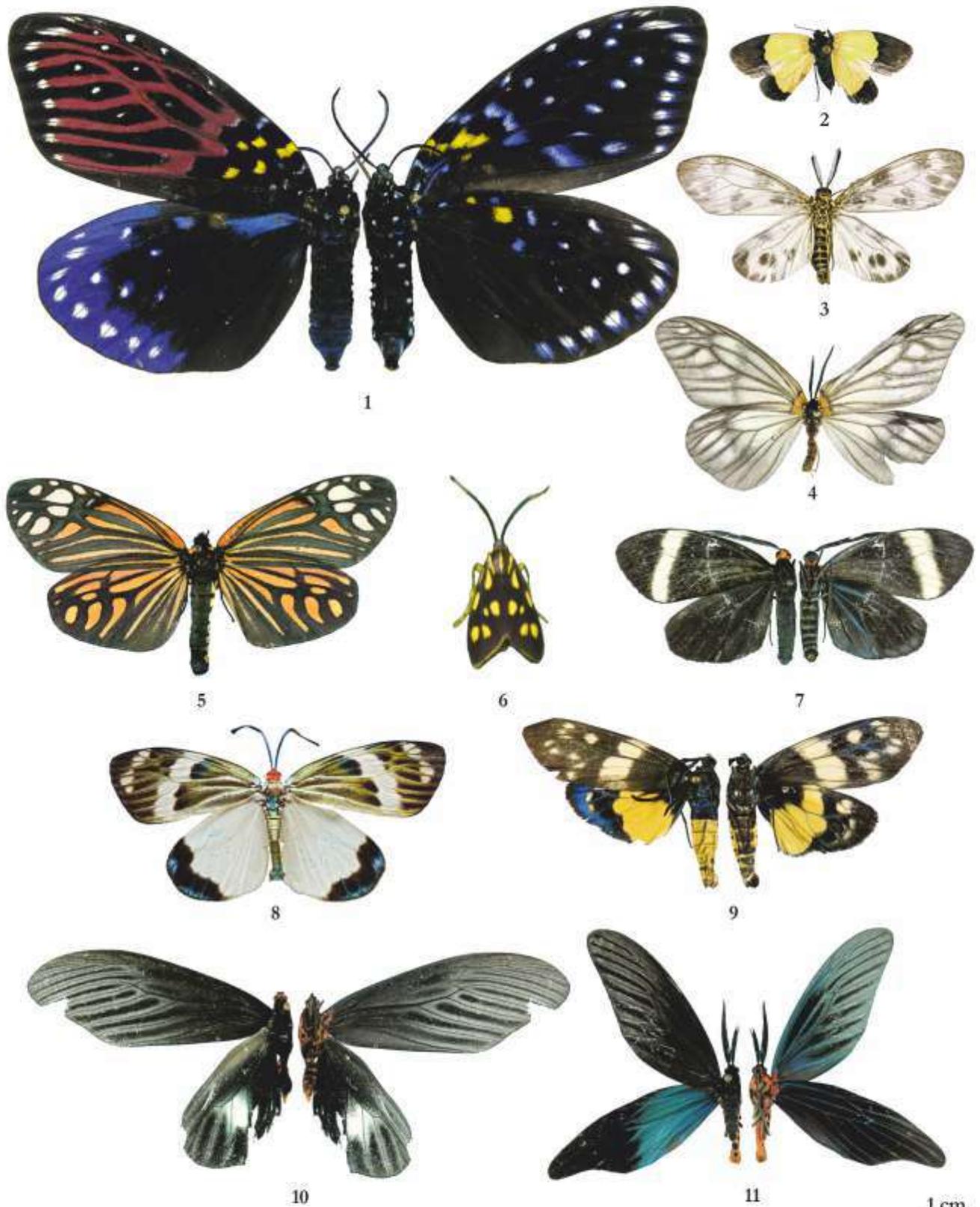


Plate 47 : Zygaenidae

1. *Amesia sanguiflua* 2. *Pseudoscaptosyle circumdata* 3. *Corma maculata* 4. *Agalope eroniodes*
5. *Campylotes bistrionicus* 6. *Balatea walkeri* 7. *Pidorus glaucopsis* 8. *Chalcosia suffusa* 9. *Eterusia aedea*
10. *Gynantocera papilionaria* 11. *Histia flabellicornis*

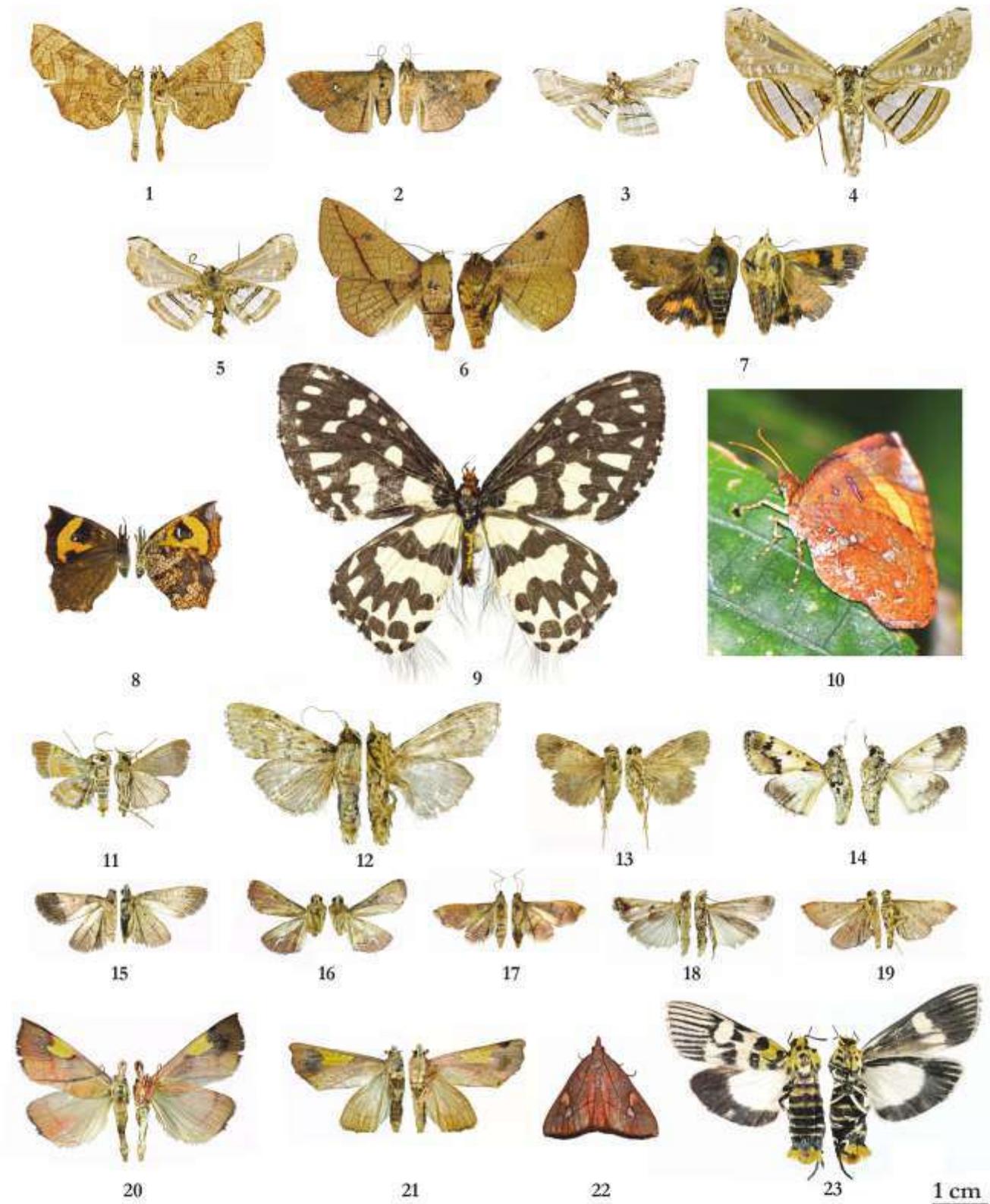


Plate 48 : Thyrididae (1-6), Hyblaeidae (7), Callidulidae (8-10), Pyralidae (11-23)

1. *Mellea taeniata* 2. *Banisia fenestrifera* 3. *Herdonia approximata* 4. *H. gigantea* 5. *H. osacesalis* 6. *Telchines vialis*
 7. *Hyblaea puera* 8. *Pterodecta anchora* 9. *Pterothysanus laticilia* 10. *Petavia attenuata* 11. *Lista baraldusalis*
 12. *Locastra muscosalis* 13. *Orthaga euadrusalis* 14. *Teliphasa similalbifusa* 15. *Diloxia fimbriata*
 16. *Endotricha albicilia* 17. *E. olivacealis* 18. *Epicrocis bilarella* 19. *Hypsopygia igniflualis*
 20. *Orybinia flaviplaga* 21. *O. kobesi* 22. *O. plangonalis* 23. *Vitessa suradeva suradeva*

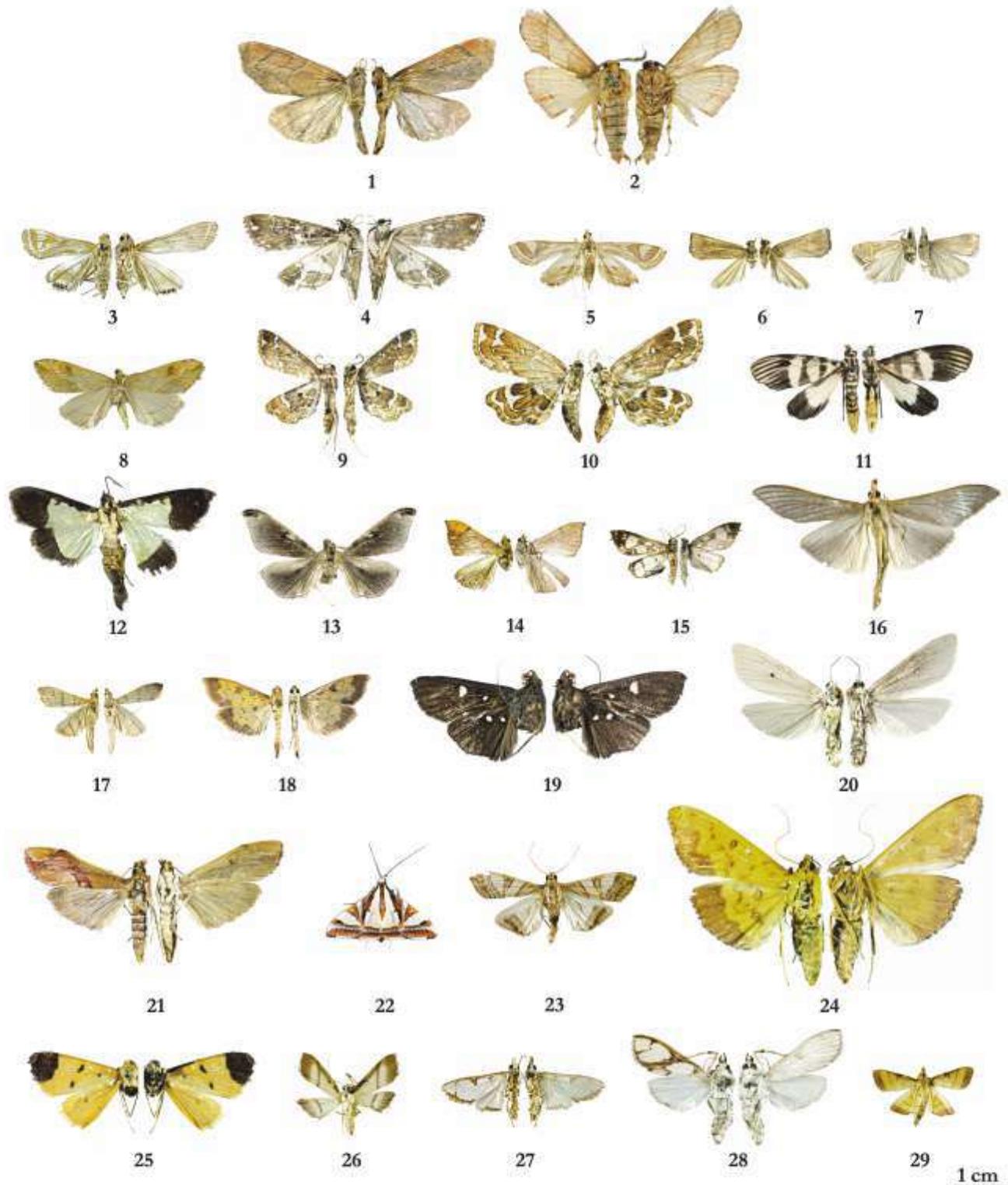


Plate 49 : Pyralidae (1-2), Crambidae (3-29)

1. *Sacada discinota* 2. *S. pallescens* 3. *Aulacodes peribocalis* 4. *Paracymoriza rivularis* 5. *Strepsinoma croesusalis*
6. *Ancylolomia chrysographellus* 7. *Euchromius ocella* 8. *Evergestis forficalis* 9. *Oligostigma ustalis*
10. *Neurophyseta irrectalis* 11. *Heortia vitessoides* 12. *Pitama bermesalis* 13. *Cbaritoprepes lubricosa*
14. *Hyalobathra coenostolalis* 15. *Hyaloplaga pulchralis* 16. *Neadeloides glaucoptera* 17. *Pagyda salvalis*
18. *Pyrusta signatalis* 19. *Rhagoa octomaculalis* 20. *Scirpophaga excerptalis* 21. *Agathodes ostentalis*
22. *Agrioghypsa itysalis* 23. *A. zelimalis* 24. *Botyodes asialis* 25. *Neobotyodes crocopteralis*
26. *Bradina diagonalis* 27. *Cirrhochrista brizoalis* 28. *C. fumipalpis* 29. *Cnaphalocrocis medinalis*

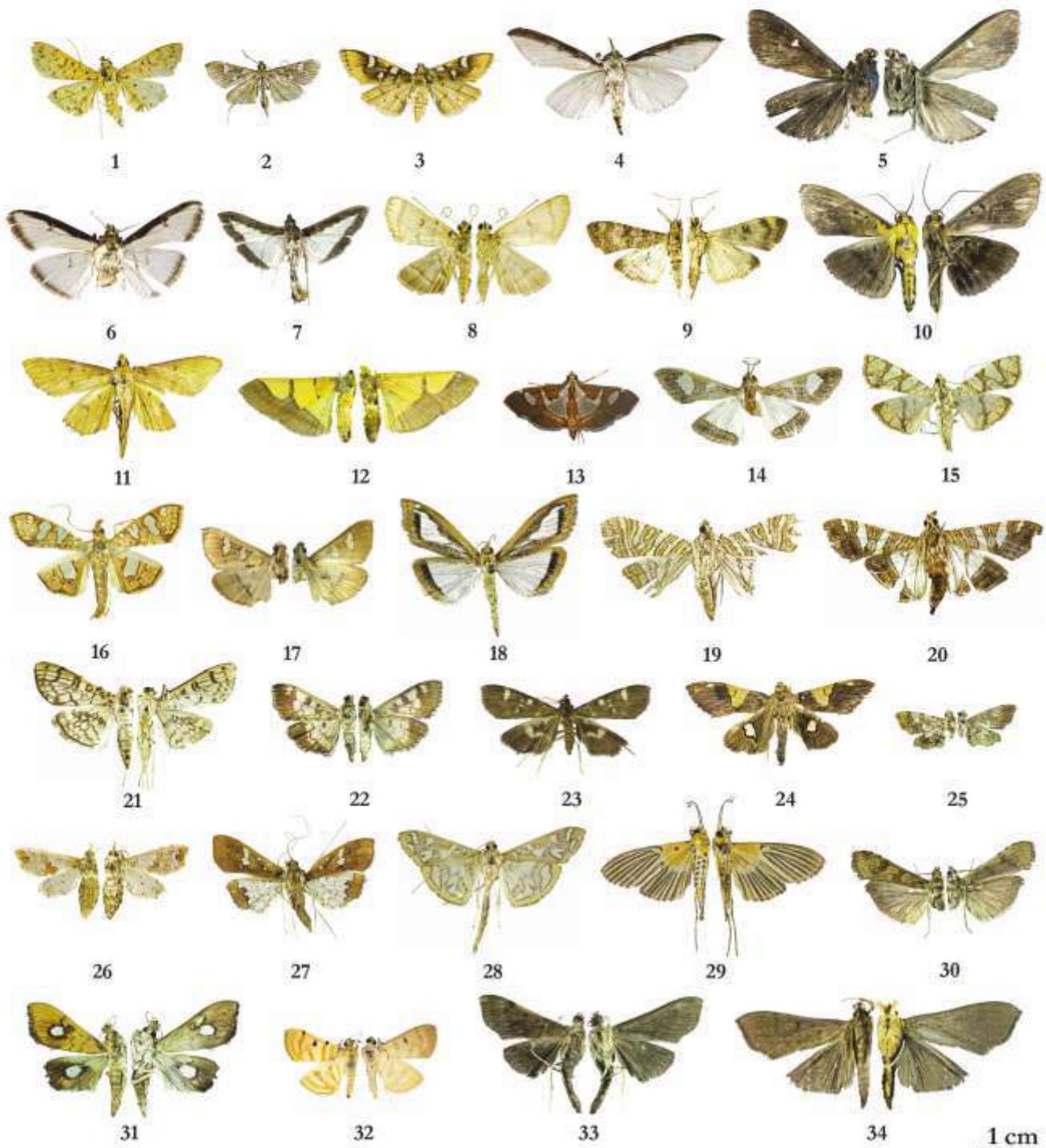


Plate 50 : Crambidae

1. *Conogethes punctiferalis* 2. *Cotachena histricalis* 3. *C. pubescens* 4. *Cydalima laticostalis* 5. *C. perspectalis*
 6. *C. pfeifferae* 7. *Diaphania indica* 8. *Dichocrocis definita* 9. *Dysallacta negatalis* 10. *Filodes fulvidorsalis*
 11. *Endocrossis caldusalis* 12. *E. flavibasalis* 13. *Glyphodes bicolor* 14. *G. bivitalis* 15. *G. caesalis* 16. *G. canthusalis*
 17. *G. critbealis* 18. *G. lacustralis* 19. *G. multilinealis* 20. *G. stotalis* 21. *Haritalodes derogata* 22. *Hemopsis dissipatalis*
 23. *Herpetogramma luctuosalis* 24. *Heterocnephes lymphatalis* 25. *Lamprosema commixta* 26. *Leucinodes orbonalis*
 27. *Maruca vitrata* 28. *Nausinoe perspectata* 29. *Nevrina procopia* 30. *Nomophila noctuella* 31. *Nosophora althealis*
 32. *Notarcha tigrina* 33. *Omiodes barcalis* 34. *O. noctescens*

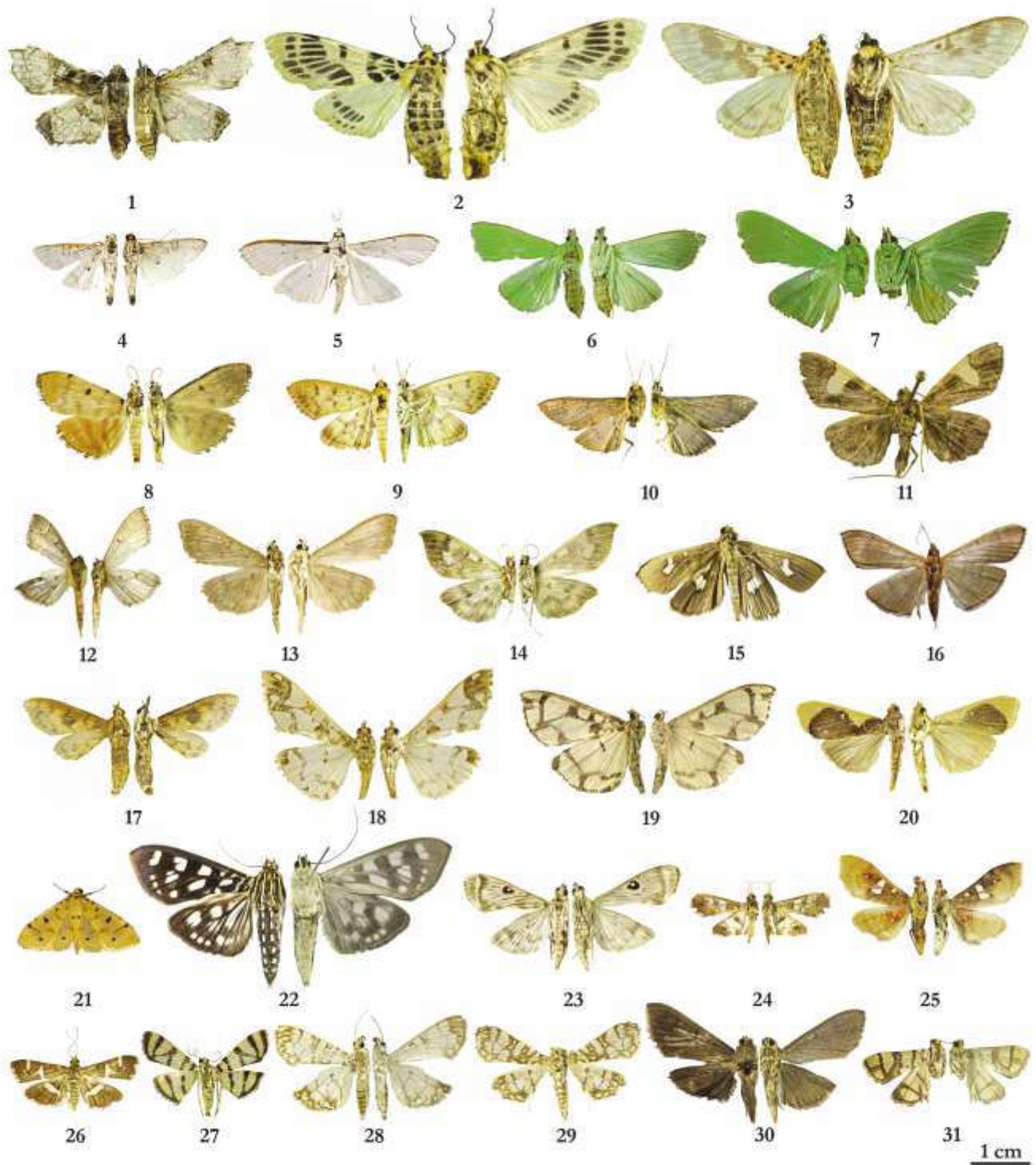


Plate 51 : Crambidae

1. *Omphisa anastomosalis* 2. *Pachynoa mineusalis* 3. *P. spilosomoides* 4. *Palpita annulifer* 5. *P. warrenalis*
6. *Parotis marinata* 7. *P. marginata* 8. *Orthospila orissusalis* 9. *Patania balteata* 10. *P. caletoralis*
11. *P. concatenalis* 12. *P. deficiens* 13. *P. ruralis* 14. *P. verecunda* 15. *Nagiella quadrimaculalis*
16. *Poliobotys ablactalis* 17. *Polygrammodes sabelialis* 18. *Polythlipta cerealis* 19. *P. peragrata*
20. *Prooedema inscisalis* 21. *Pycnarmon aeriferalis* 22. *Pygospila tyres* 23. *Rhimphalea trogusalis*
24. *Sameodes cancellalis* 25. *S. pictalis* 26. *Spoladea recurvalis* 27. *Synclera tibialis*
28. *S. traducalis* 29. *S. univocalis* 30. *Syllepte cohaesalis* 31. *S. gastralis*

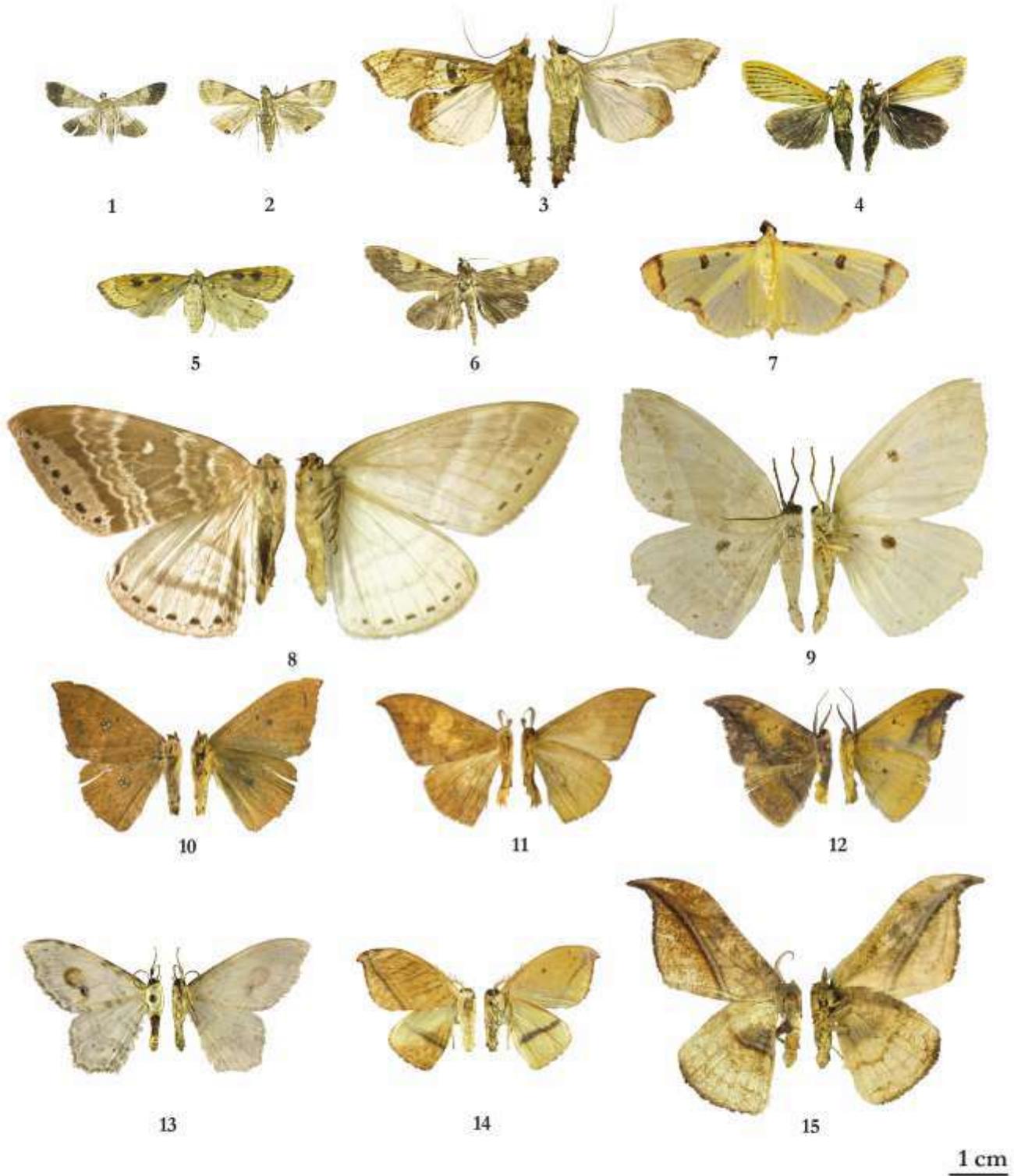


Plate 52 : Crambidae (1-7), Drepanidae (8-15)

1. *Syngamia falsidicalis* 2. *Talanga sexpunctalis* 3. *Terastia egialealis* 4. *Tyspanodes nigrolinealis* 5. *Udea ferrugalis*
 6. *Ulopeza idyalis* 7. *Uncobotyodes patulalis* 8. *Cyclidia rectificata* 9. *C. substigmata* 10. *Agnidra discipilaria*
 11. *A. specularia* 12. *A. vinacea* 13. *Anzata semipavonaria* 14. *Callidrepana argenteola* 15. *Canucha duplexa*

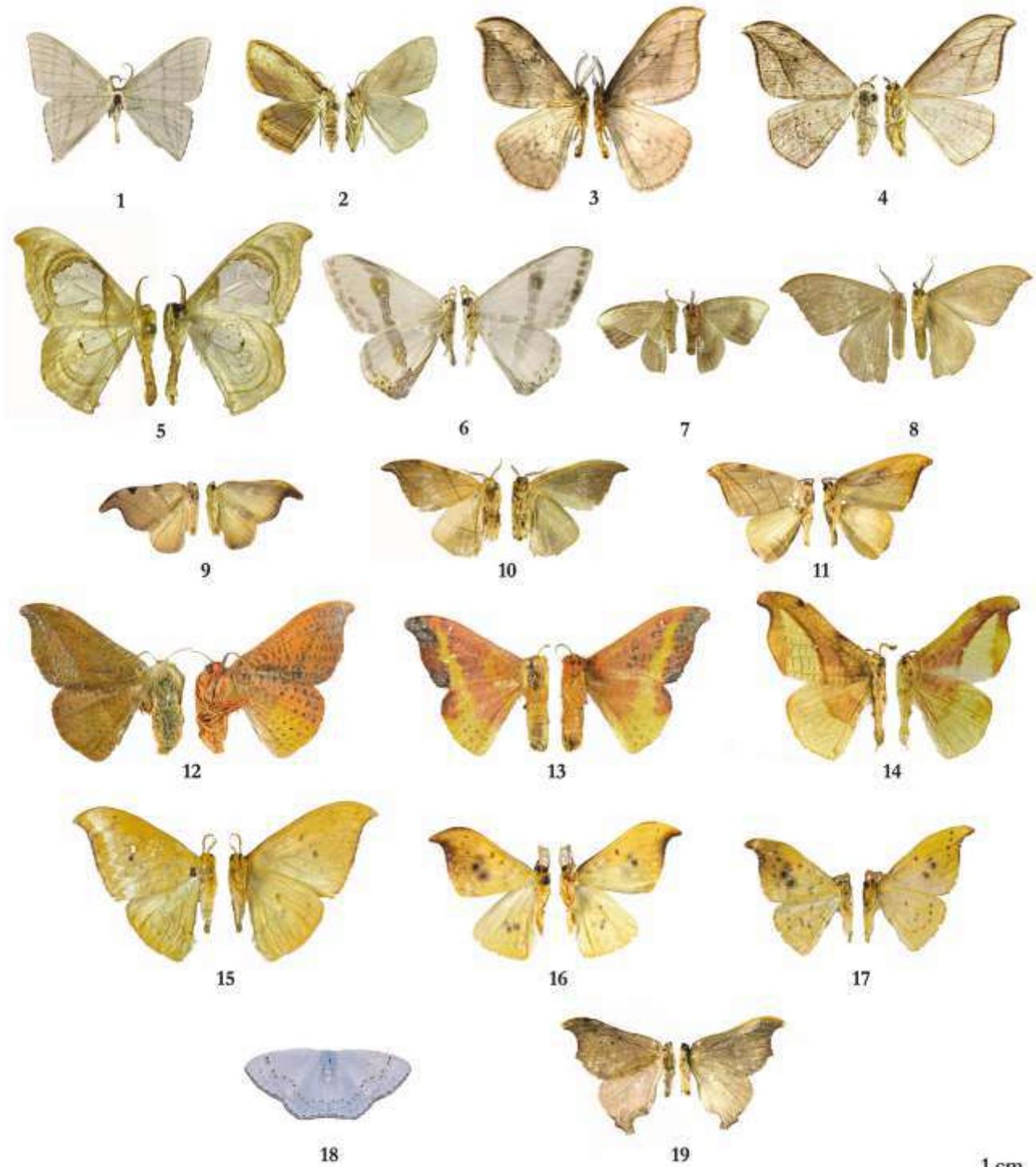


Plate 53 : Drepanidae

1. *Ditrigona triangularia* 2. *Drapetodes fratercula* 3. *Drepana dispilata* 4. *D. pallida* 5. *Macrauzata fenestraria*
6. *Macroclix mysticata* 7. *Microblepsis leucosticta* 8. *M. violacea* 9. *Nordstromia bicostata* 10. *N. duplicata*
11. *N. vira* 12. *Oreta pavaca* 13. *O. sanguinea* 14. *O. vatama* 15. *Tridrepana albonotata* 16. *T. flava*
17. *T. sadana* 18. *Teldenia vestigiata* 19. *Thymistida tripunctata*

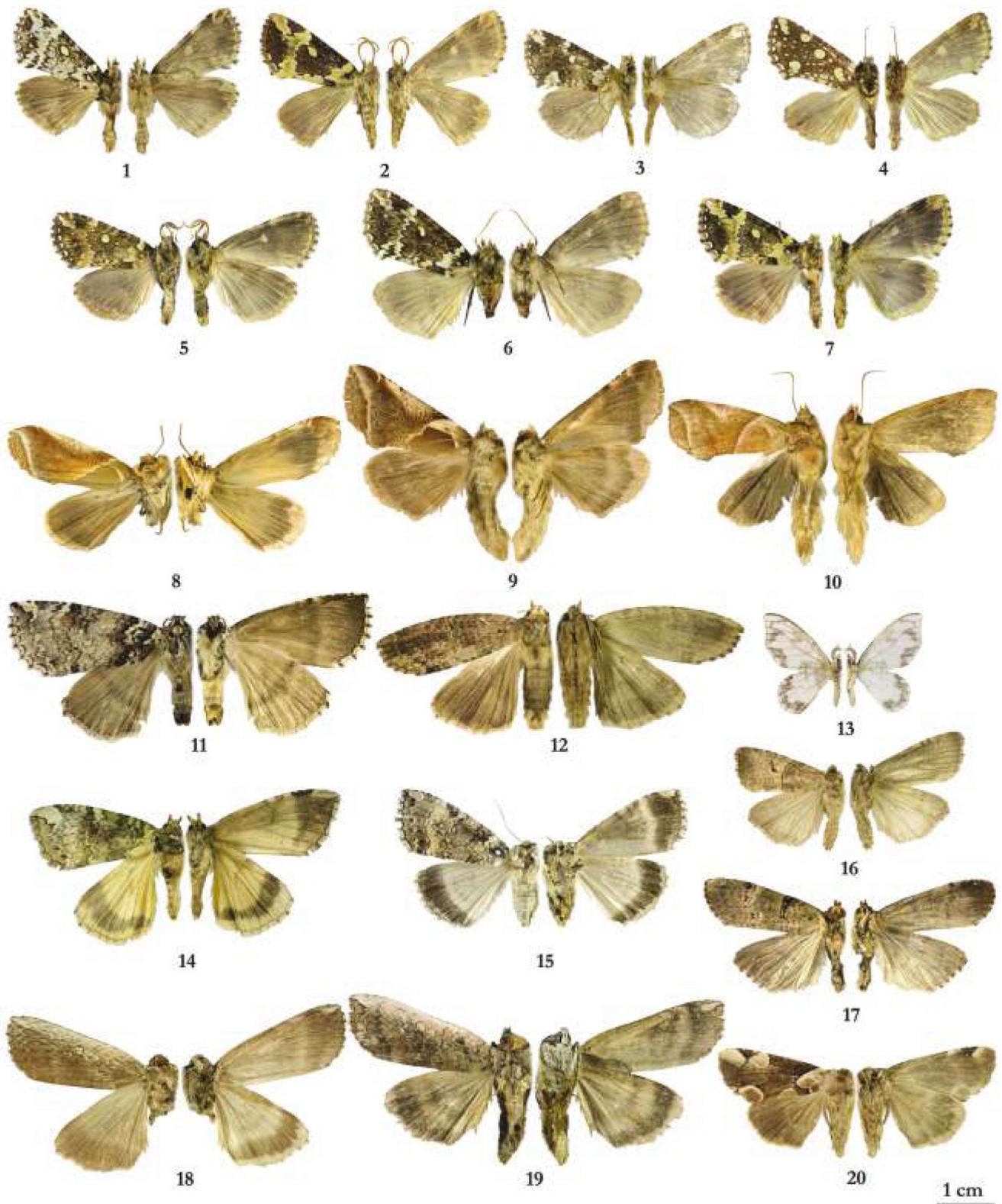


Plate 54 : Drepanidae

1. *Gaurena argentsparsa* 2. *G. aurofasciata* 3. *G. florens* 4. *G. florescens* 5. *G. nigrescens* 6. *G. pretiosa*
 7. *G. sinuata dierli* 8. *Habrosyne indica* 9. *H. intermedia conscripta* 10. *H. plagiosa* 11. *Hiroshia albinigra*
 12. *Toxoides undulata* 13. *Hyalospectra hyalinata* 14. *Macrothyatira danieli* 15. *Parapsestis lichenea*
 16. *Isopsestis cuprina* 17. *Stenopsestis alternata* 18. *Tetbea oberthuri* 19. *T. consimilis* 20. *Thyatira batis*



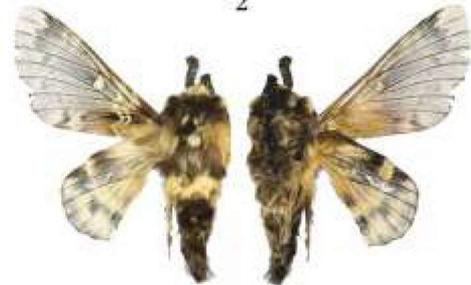
1



2



3



5



6



4



7 ♂



8



7 ♀

Plate 55 : Lasiocampidae

1 cm

1. *Gastropacha leopoldi* 2. *G. pardale* 3. *Odonestis bheroba* 4. *Pyrosis rotundipennis* 5. *P. undulosa* 6. *Eteinopla signata* 7. *Trabala visbnon*
8. *Metanastria byrtaca*

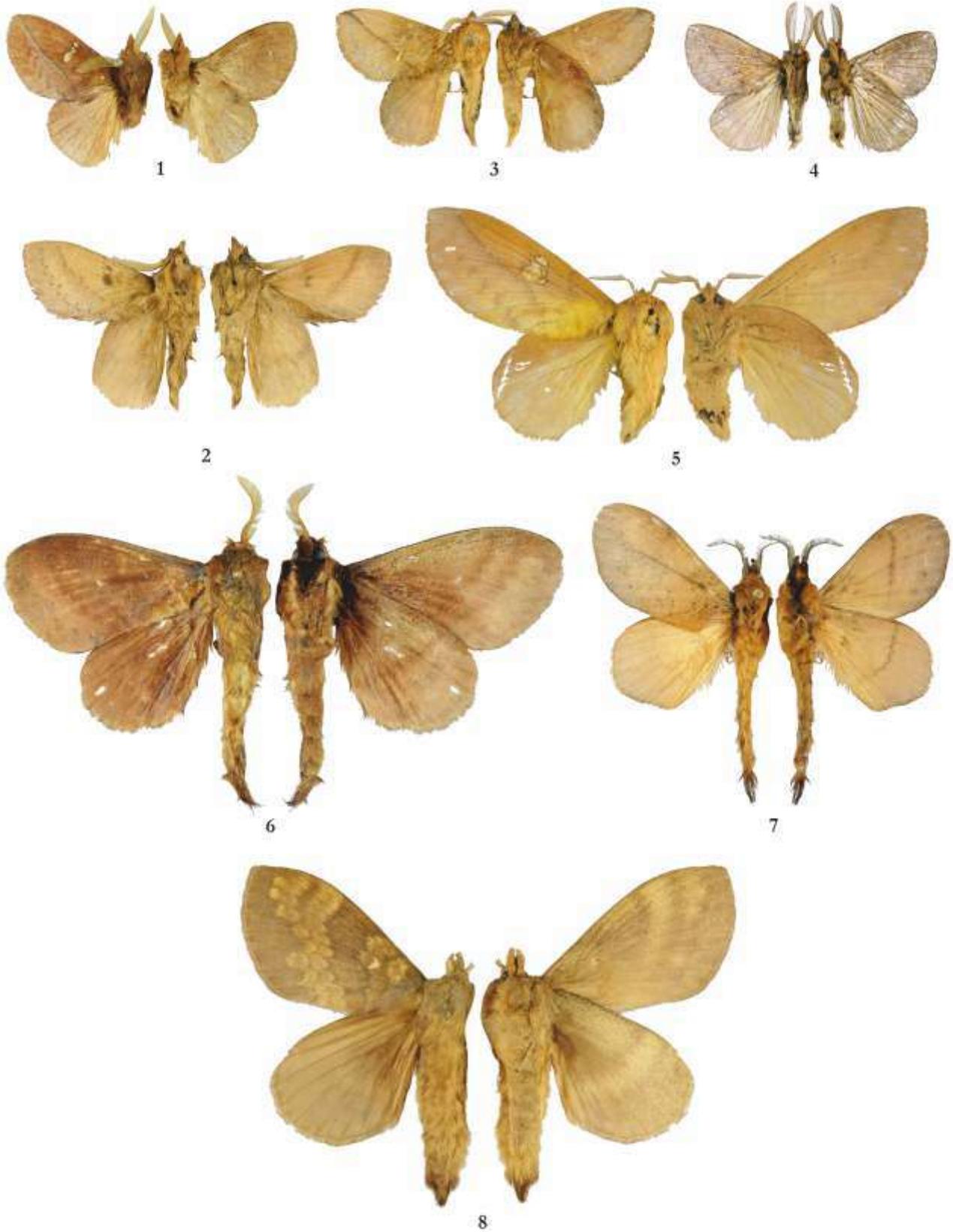


Plate 56 : Lasiocampidae

1. *Euthrix imitatrix* 2. *E. inobtrusa* 3. *E. isocyma* 4. *E. laeta* 5. *E. vulpes* 6. *Kunugia latipennis* 7. *K. lineata* 8. *K. sinjaevi*

1 cm



1



2



3



4



5

1 cm

Plate 57 : Lasiocampidae

1. *Malacosoma indisa* 2. *Argonestis flammanis* 3. *Baodera kbasiana* 4. *Lebeda nobilis* 5. *Paralebeda plagifera*

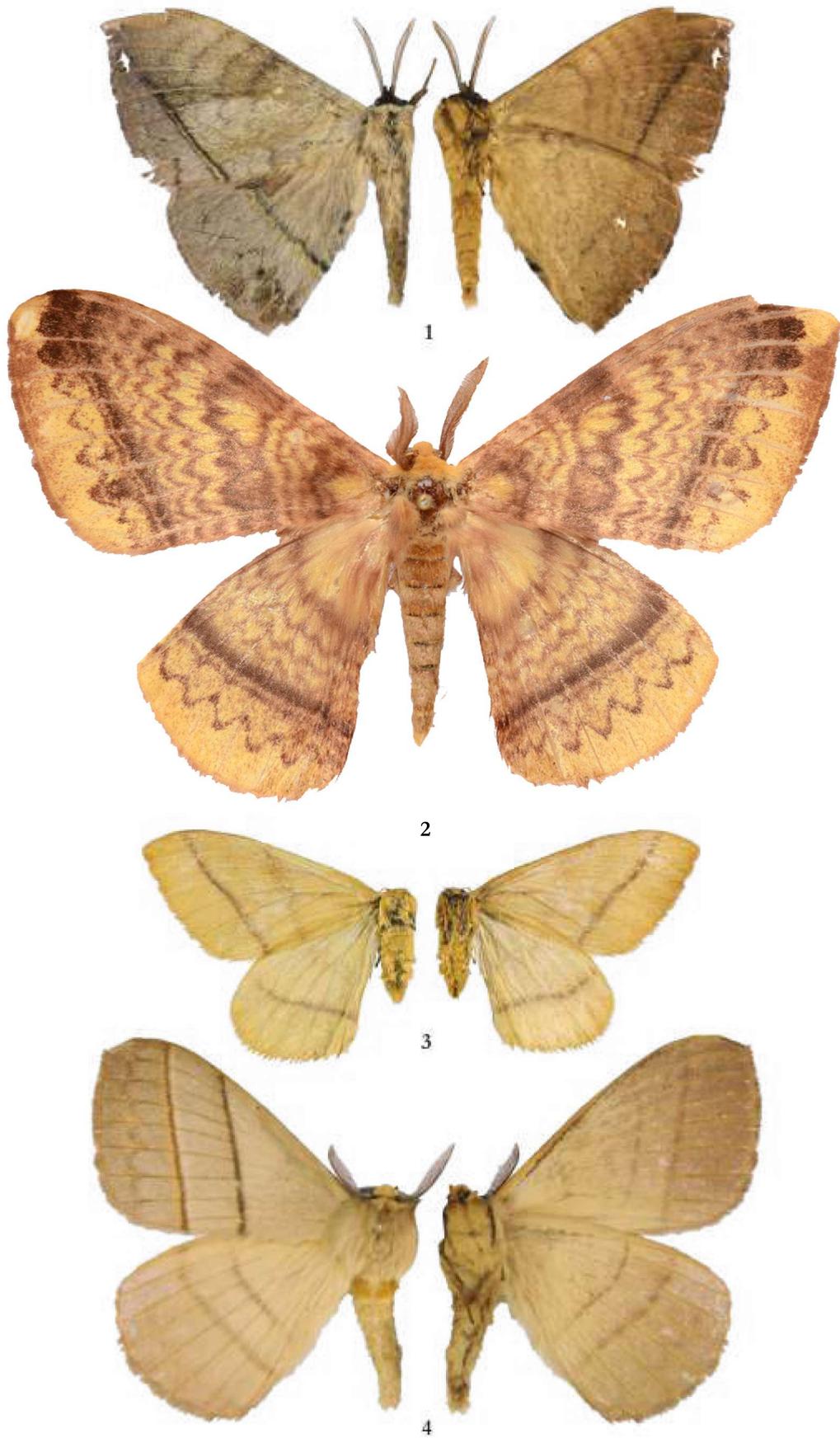


Plate 58 : Eupterotidae

1. *Eupterote pandya* 2. *E. undata* 3. *E. bifasciata* 4. *Palirisa cervina*



1



3



4



2

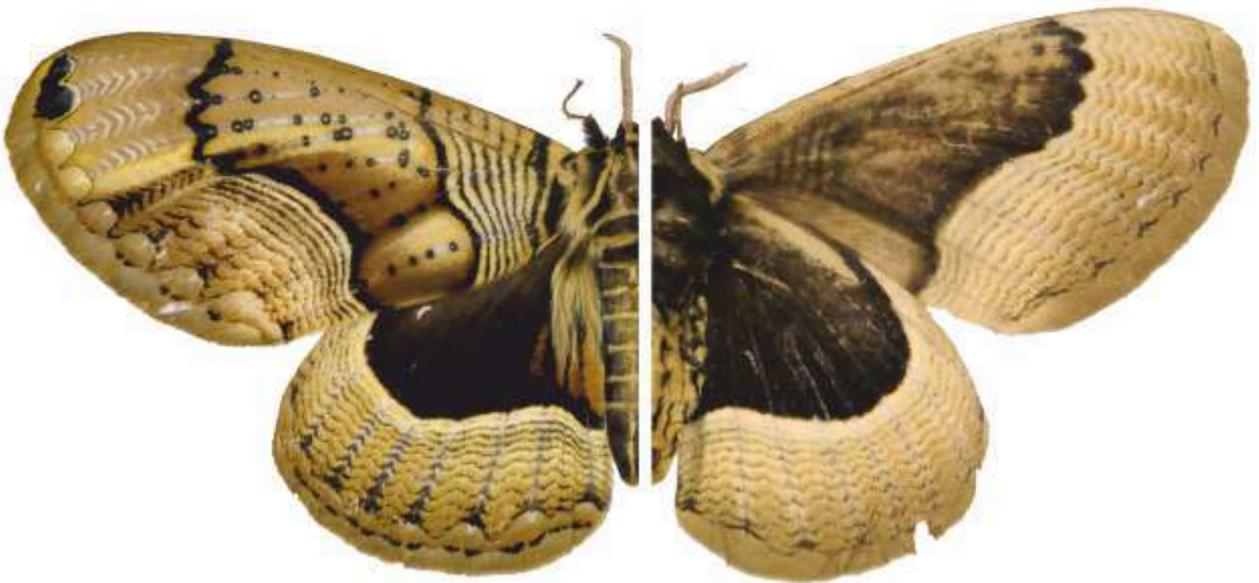
Plate 59 : Eupterotidae

1. *Pseudojana incandescens* 2. *Apha borishana* 3. *Apona caschmirensis* 4. *Ganisa postica*

1 cm



1



2

1 cm

Plate 60 : Brahmaeidae

1. *Brahmaea bearseyi* 2. *B. wallichii*



1



2



3



4



5



6



7



8



9

1 cm

Plate 61 : Endromidae (1-5), Bombycidae (6-9)

1. *Comparmustilia gerontica* 2. *C. sphingiformis* 3. *Mustilia castanea* 4. *M. falcipennis* 5. *M. hepatica* 6. *Bombyx buttoni*
7. *Gunda sesostris* 8. *Penicillifera apicalis* 9. *Trilocha varians*



1 cm

Plate 62 : Saturniidae

1. *Salassa lola* 2. *S. royi* 3. *Sinobirma botyeri*

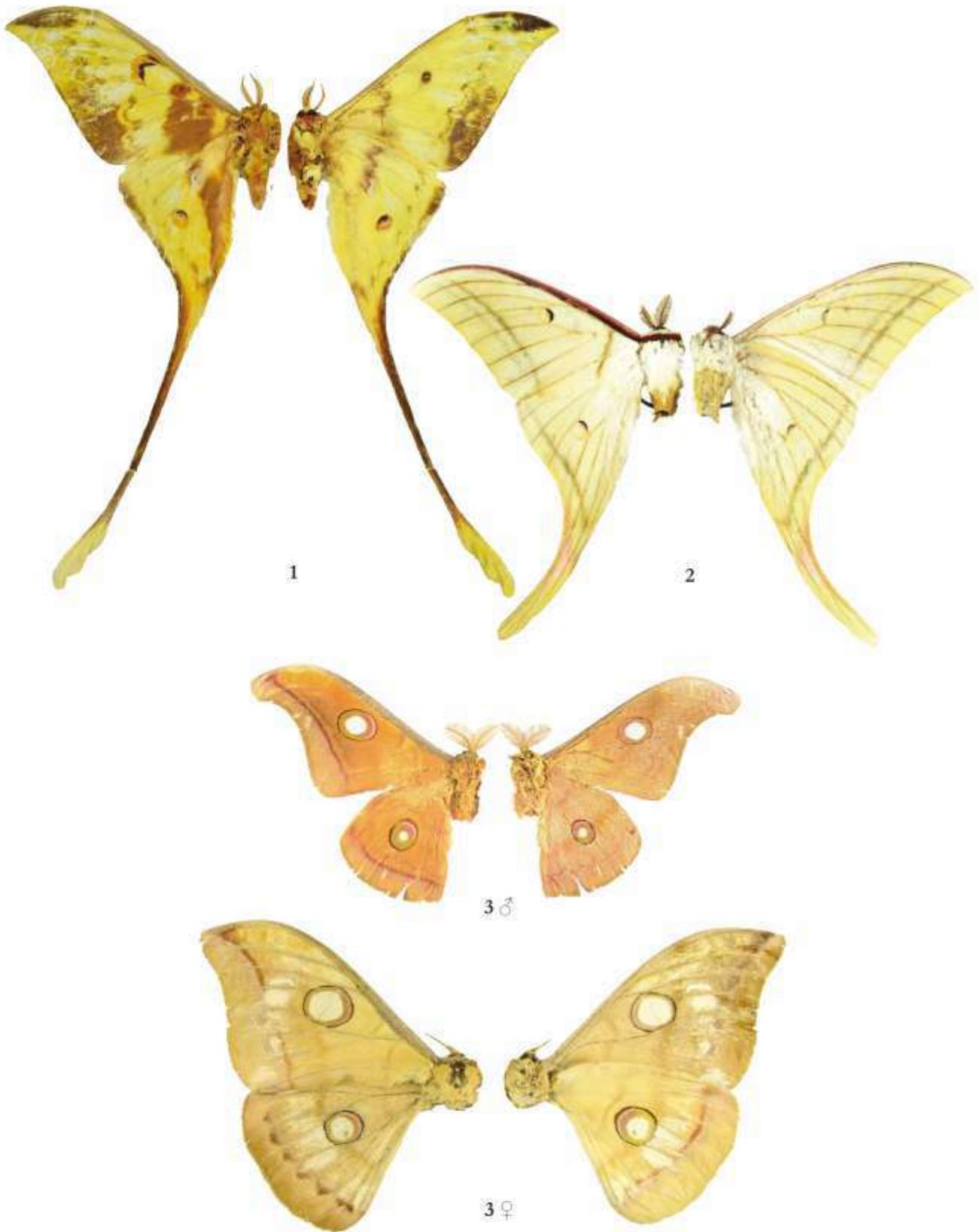


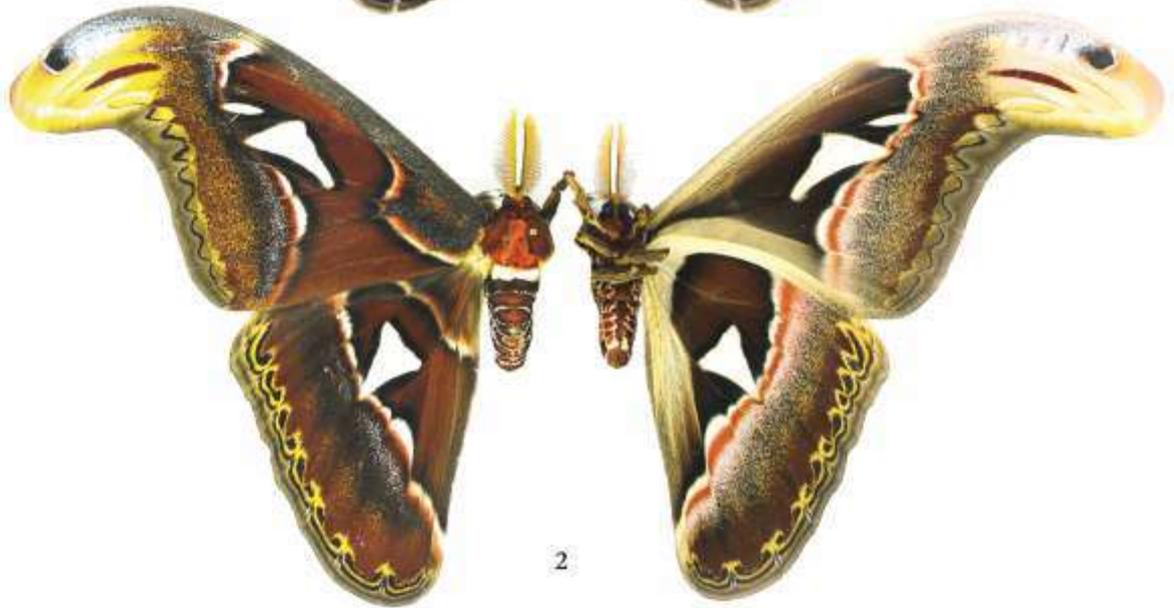
Plate 63 : Saturniidae

1. *Actias maenas* 2. *A. selene* 3. *Anthberaea mylitta*

1 cm



1



2



3

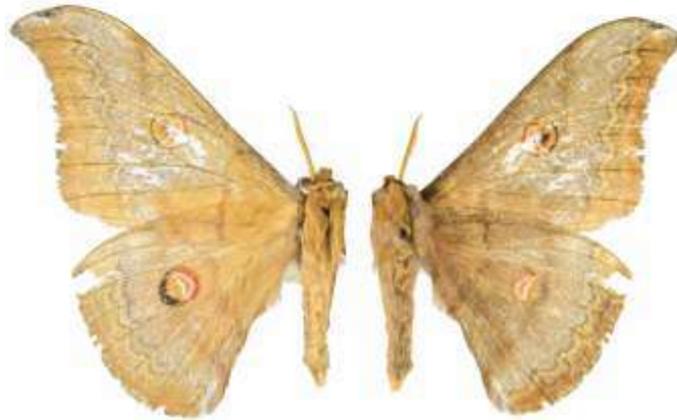
1 cm

Plate 64 : Saturniidae

1. *Archaeoattacus edwardsi* 2. *Attacus atlas* 3. *Antheraea assamensis*



1



2♂



2♀

Plate 65 : Saturniidae
1. *Caligula anno* 2. *C. cachara*

1 cm



1



2



3



4

1 cm

Plate 66 : Saturniidae

1. *Caligula lindia* 2. *C. tibeta* 3. *Cricula andrei* 4. *C. trifenestrata*



1



2

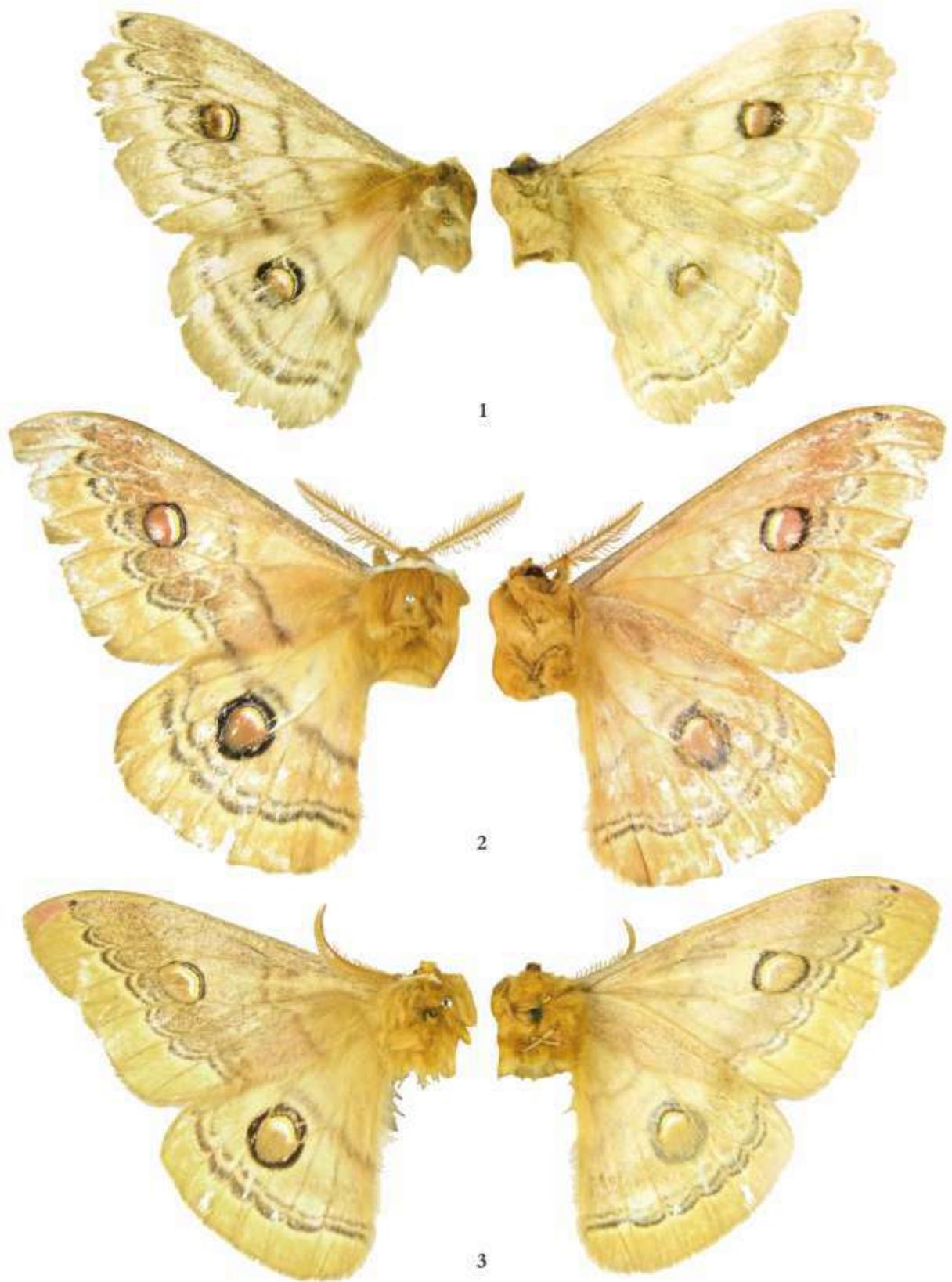


3

1 cm

Plate 67 : Saturniidae

1. *Loepa katinka* 2. *L. miranda* 3. *L. sikkima*



1

2

3

1 cm

Plate 68 : Saturniidae
1. *Neoris codyi* 2. *N. buttoni* 3. *N. stoliczkaana*

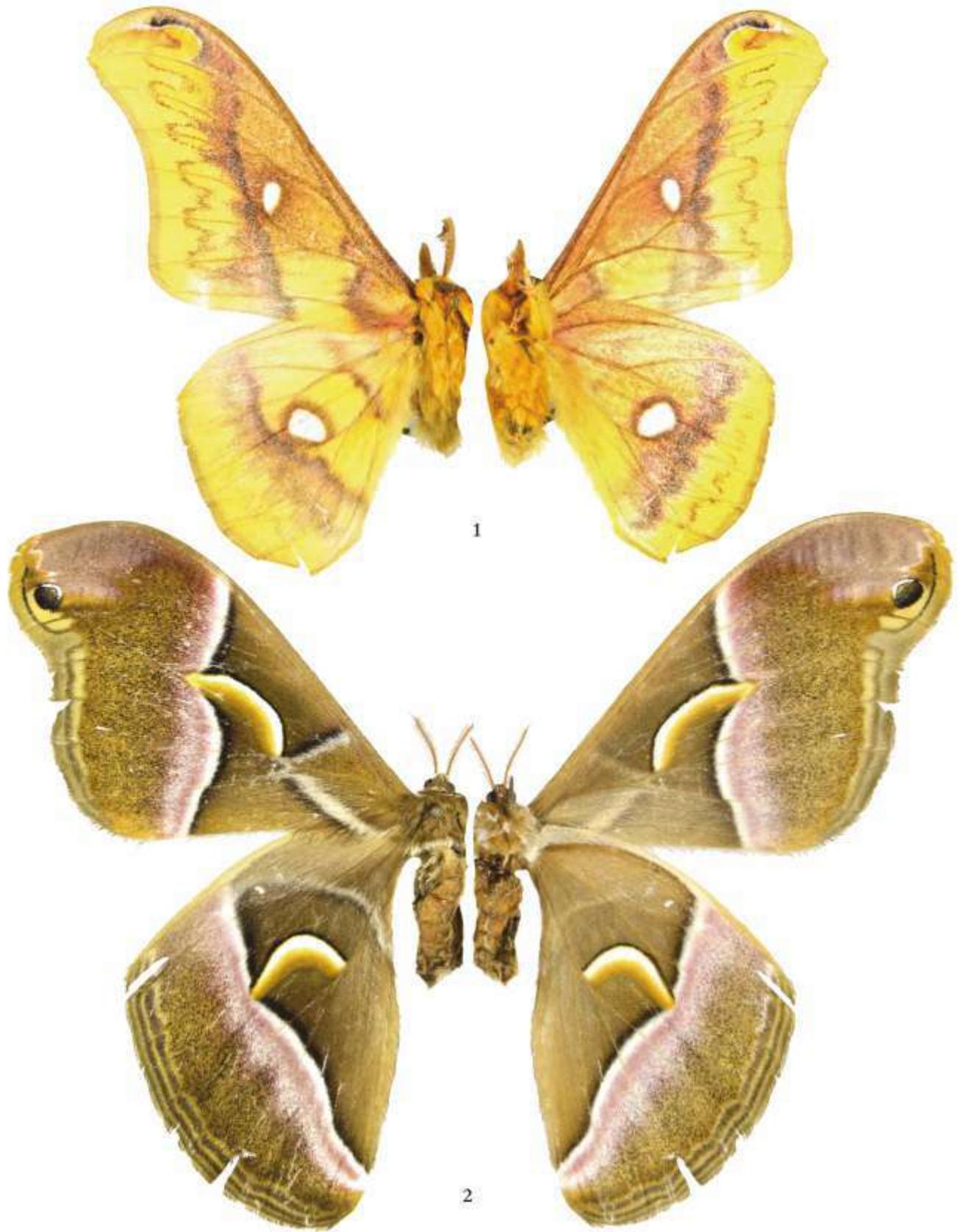


Plate 69 : Saturniidae

1. *Rhodinia nevara* 2. *Samia canningii*

1 cm



1



2



3



4

1 cm

Plate 70 : Sphingidae

1. *Langia zenzernoides* 2. *Acosmeryx anceus subdentata* 3. *A. omissa* 4. *A. socrates*

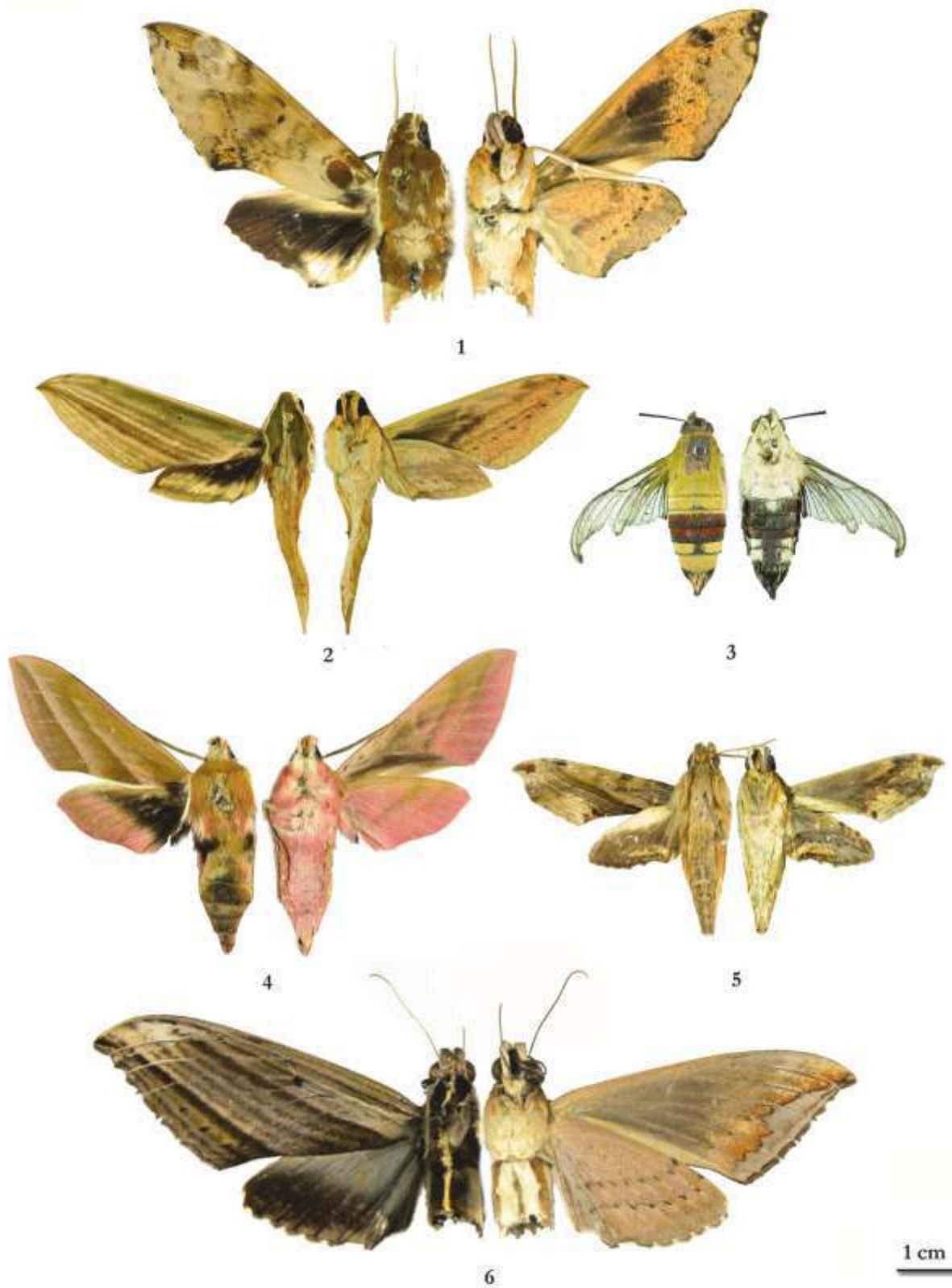


Plate 71 : Sphingidae

1. *Cechenena belops* 2. *C. lineosa* 3. *Cepbonodes bylas* 4. *Deilephila rivularis* 5. *Eupanacra sinuata* 6. *Elibia dolichus*



Plate 72 : Sphingidae

1. *Daphnis hypothous* 2. *D. nerii* 3. *Hippotion boerbaviae* 4. *H. celerio* 5. *H. rosetta*

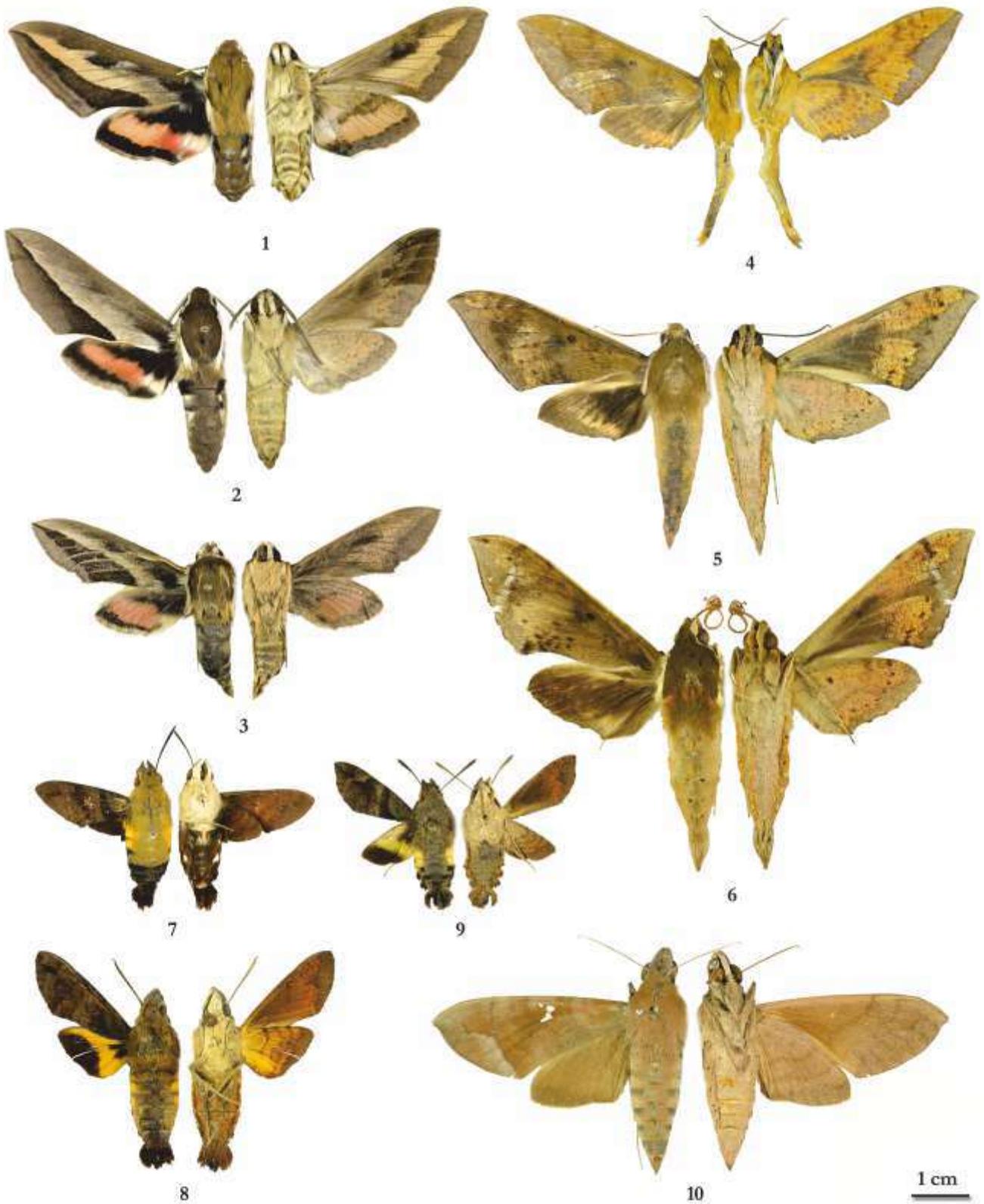


Plate 73 : SpHINGIDAE

1. *Hyles gallii* 2. *H. hippophaes* 3. *H. nervosa* 4. *Rhagastis olivacea* 5. *R. confusa* 6. *R. albomarginatus* 7. *Macroglossum bombylans*
8. *M. pyrrohosticta* 9. *Rhopalopsycbe nycteris* 10. *Nephele hespera*



1 cm

Plate 74 : Sphingidae

1. *Pergesa acteus* 2. *Tberetra alecto* 3. *T. boisduvalii* 4. *T. clotho* 5. *T. gnoma*

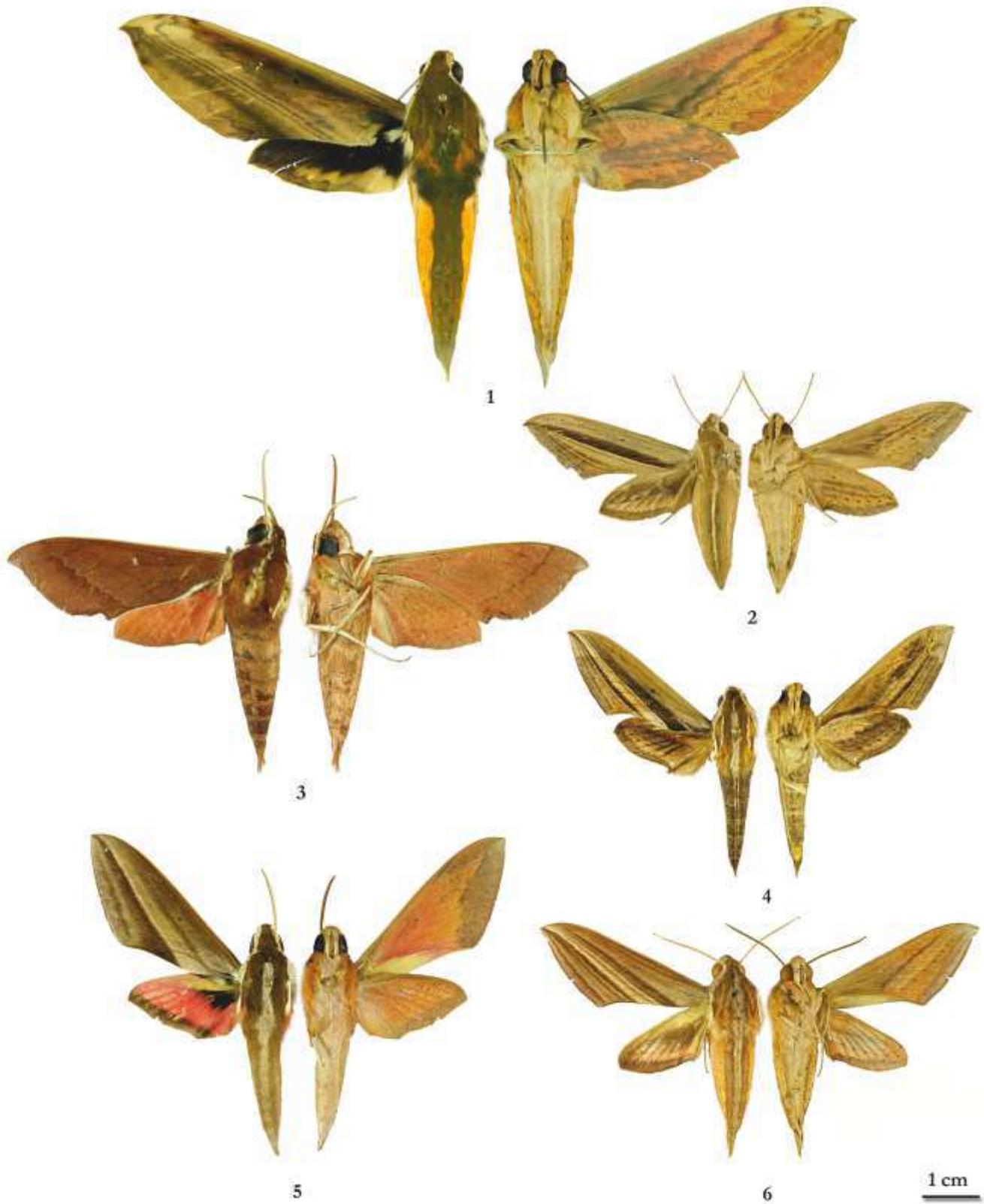
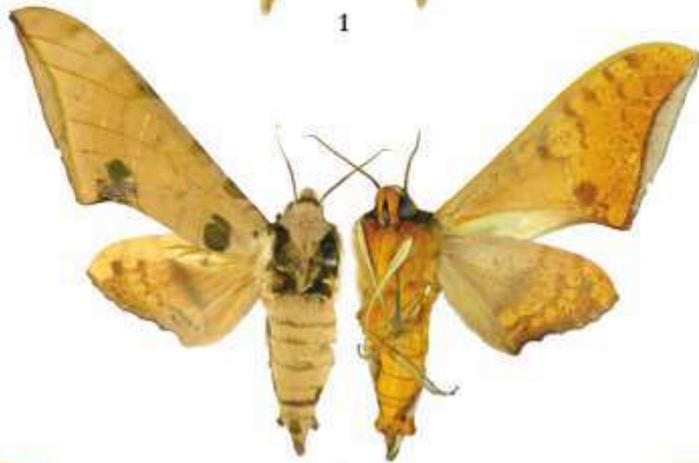


Plate 75 : Sphingidae

1. *Theretra nessus* 2. *T. silbetensis* 3. *T. palliosta* 4. *T. oldenlandiae* 5. *T. suffusa* 6. *T. lycetus*



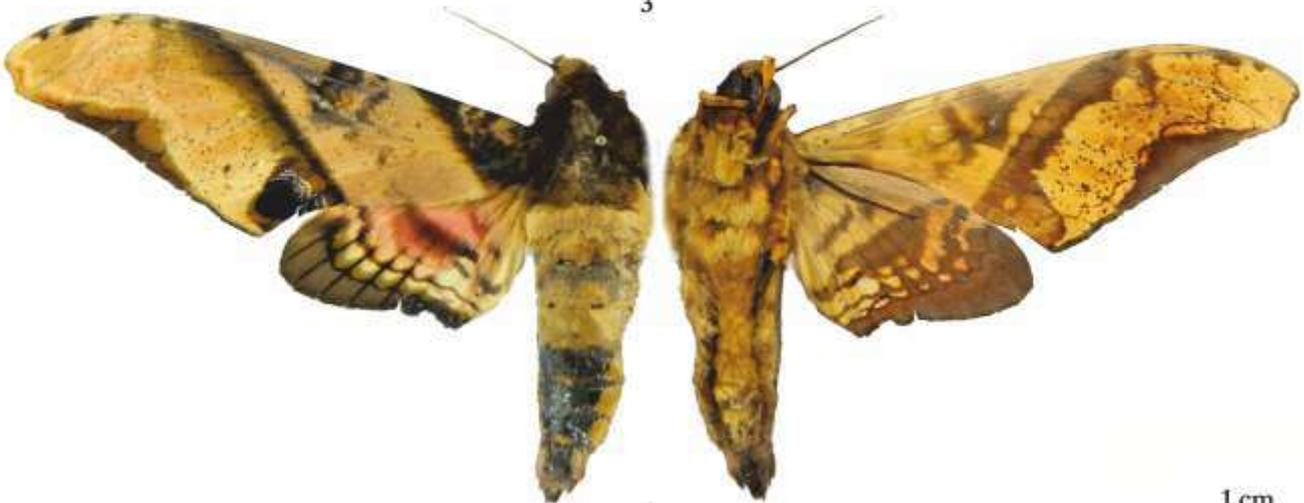
1



2



3



4

1 cm

Plate 76 : Sphingidae

1. *Ambulyx liturata* 2. *A. ochracea* 3. *A. substrigilis* 4. *Amphipterus panopus*



1



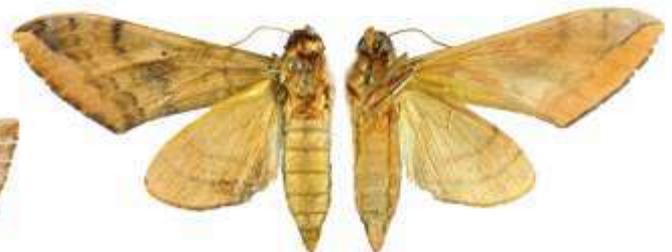
2



3



4



5



6



7

1 cm

Plate 77 : Sphingidae

1. *Anambulyx elvosi* 2. *Callambulyx poecilus* 3. *C. rubricosa* 4. *Craspedortha porphyria* 5. *Claniopsis escusa*
6. *Dolbina inexacta* 7. *Leucoplebia lineata*

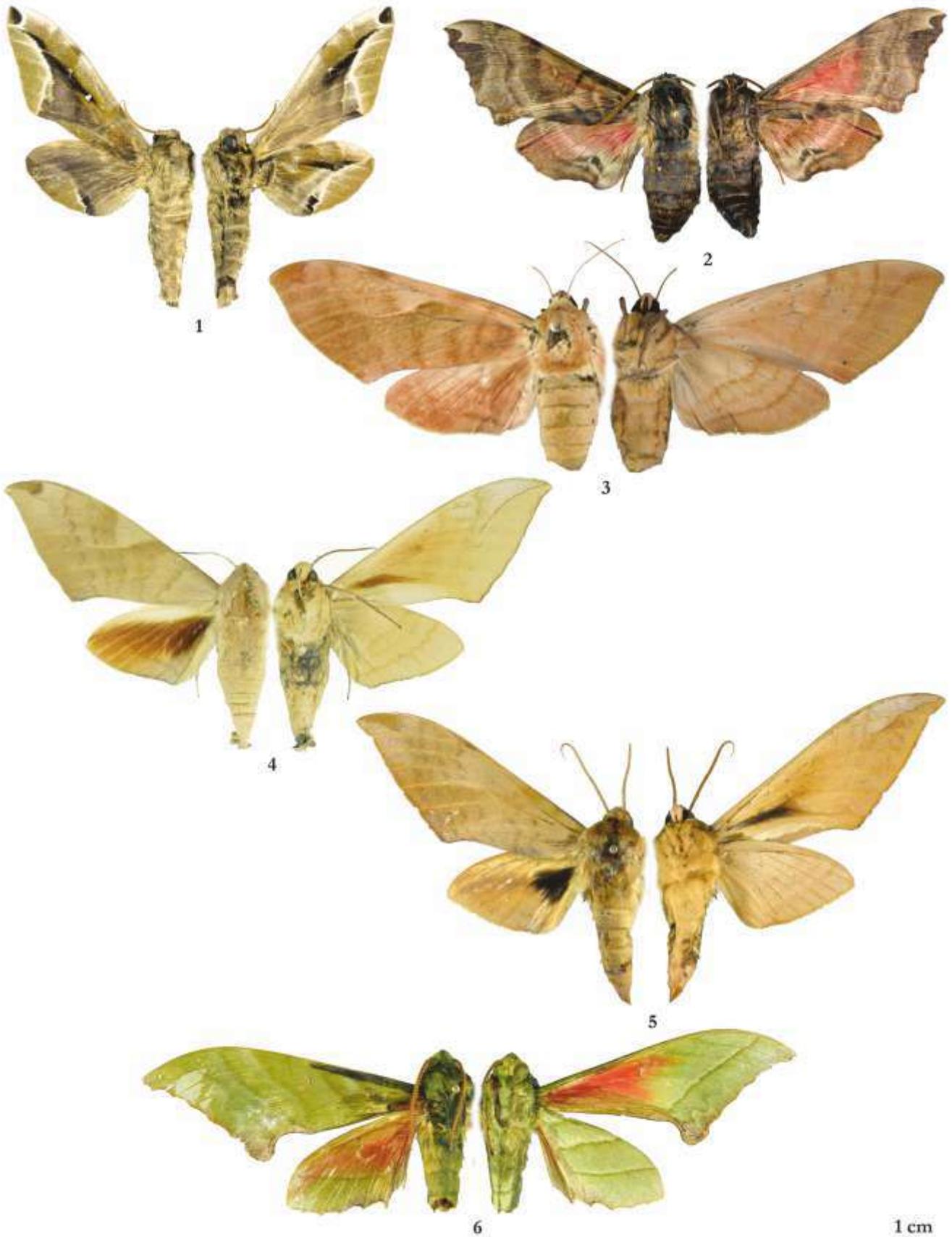


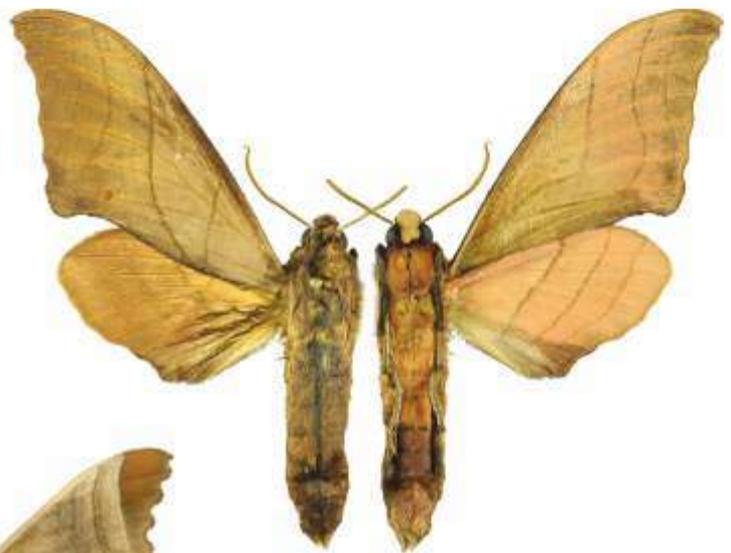
Plate 78 : Sphingidae

1. *Parum colligata* 2. *Smerinthus kindermannii* 3. *Clanis phalaris* 4. *C. bilineata* 5. *C. deucalion* 6. *Rhodoprasina floralis*

1 cm



1



2



3



4

1 cm

Plate 79 : Sphingidae

1. *Polyptychus trilineatus* 2. *Marumba cristata* 3. *M. dyras* 4. *M. irata*



1



2



3

1 cm

Plate 80 : Sphingidae
1. *Acherontia lachesis* 2. *A. styx* 3. *Agrilus convolvuli*



1



2



3

1 cm

Plate 81 : Sphingidae

1. *Apocalypsis velox* 2. *Psilogramma increta* 3. *P. menephron*

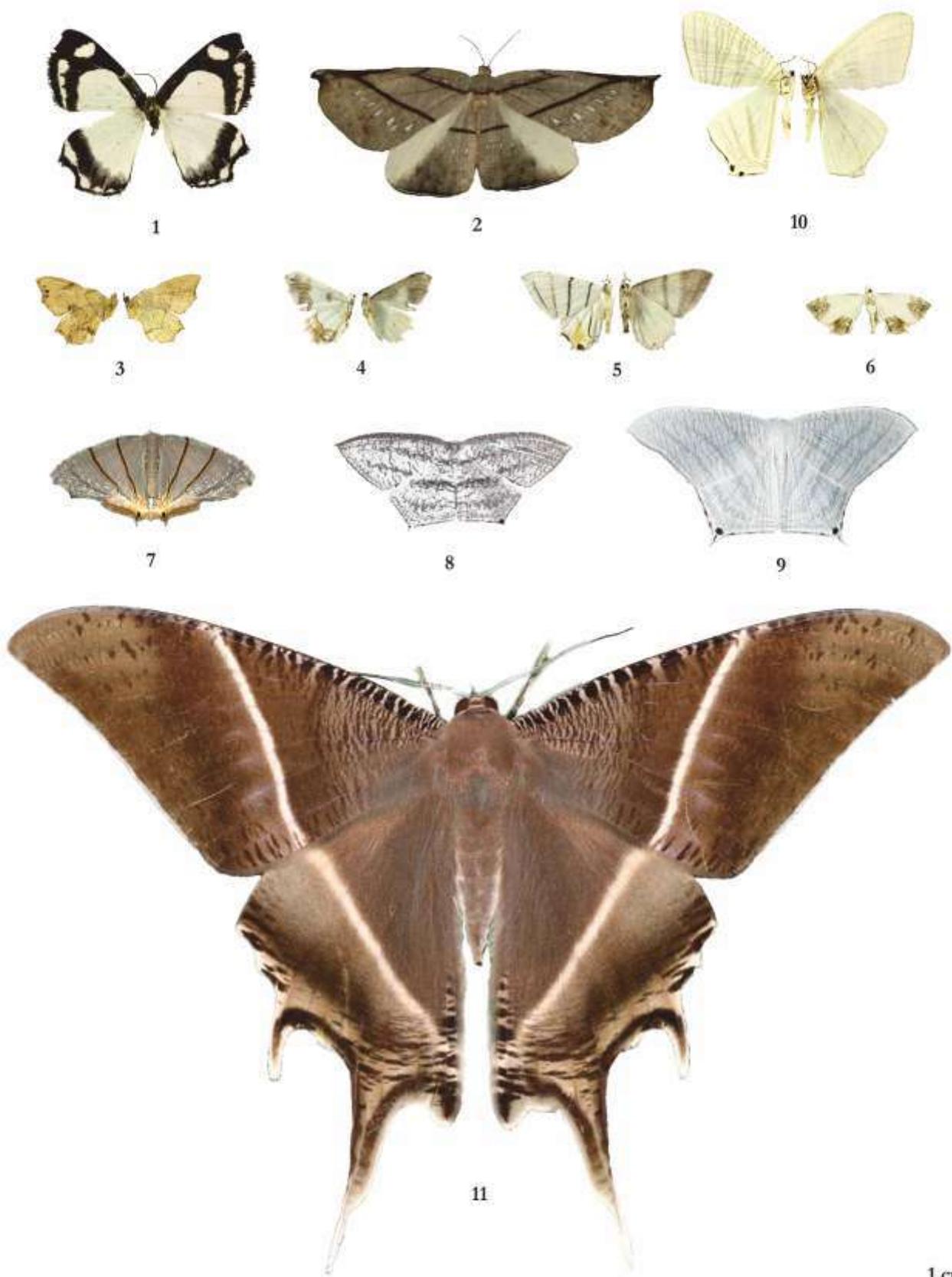


Plate 82 : Epicopeiidae (1), Uraniidae (2-11)

1. *Burmeia leesi* 2. *Auzea rufifrontata* 3. *Epiplema adamantina* 4. *E. bicandata* 5. *E. himala* 6. *E. restricta* 7. *Orudiza protheclaria*
8. *Acropteris ciniferaria* 9. *Micronia aculeata* 10. *Pseudomicronia advocataria* 11. *Lyssa zampa*

1 cm

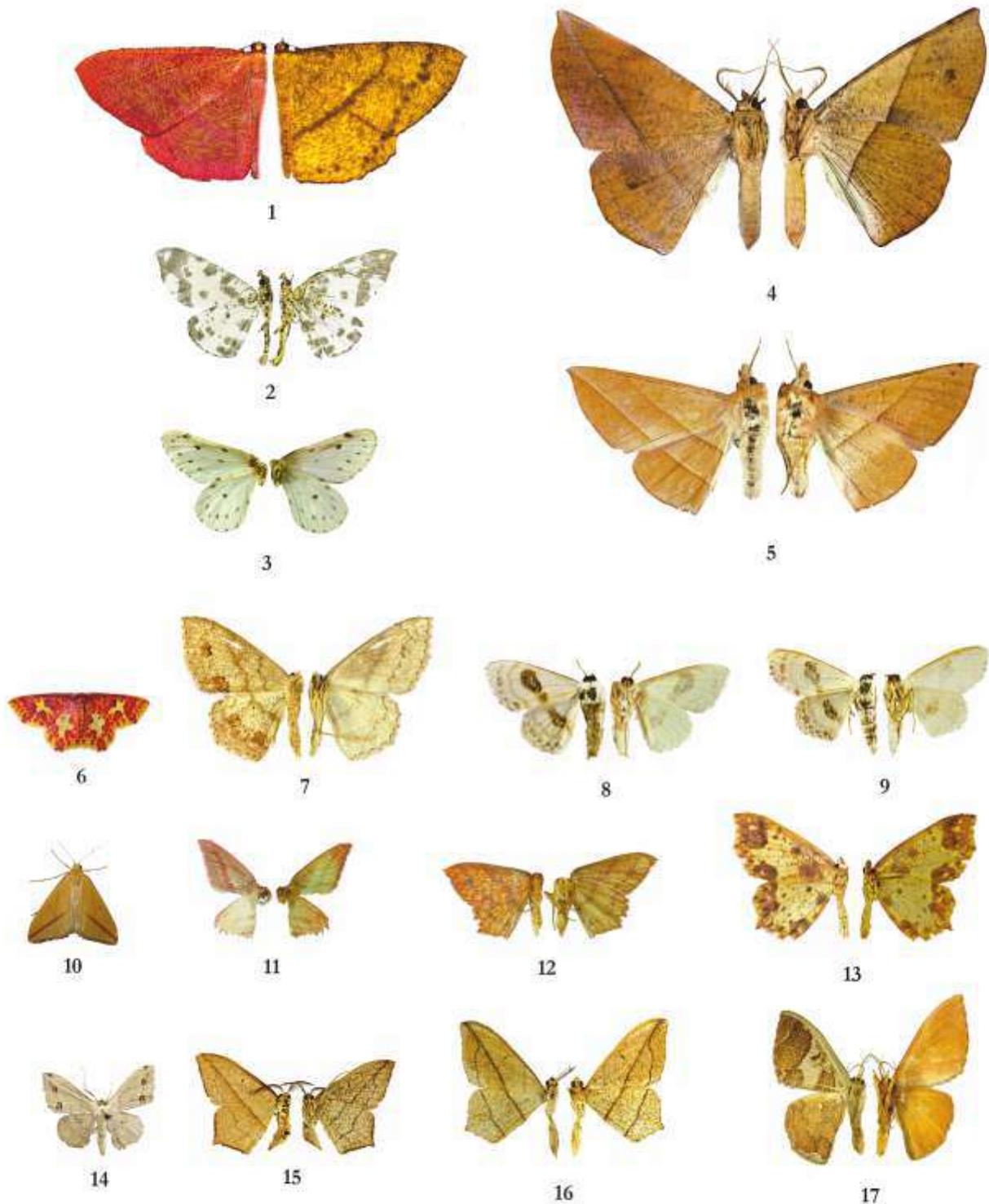


Plate 83 : Geometridae

1 cm

1. *Eumelea rosalia* (Dorsal view of two different morphs) 2. *Oxola picaria* 3. *Naxa obliterata* 4. *Sarcinodes resitutaria* 5. *S. carnearia*
6. *Chrysocraspeda olearia* 7. *Craspediopsis bimaculata* 8. *Problepsis albidior* 9. *P. vulgaris* 10. *Rhodometra saccharia*
11. *Rhodostropbia pelloniaria* 12. *Synegiodes hyriaria* 13. *S. sanguinaria* 14. *Scopula pulchellata* 15. *Timandra convectaria* 16. *T. correspondens*
17. *Zytbos avellanea*

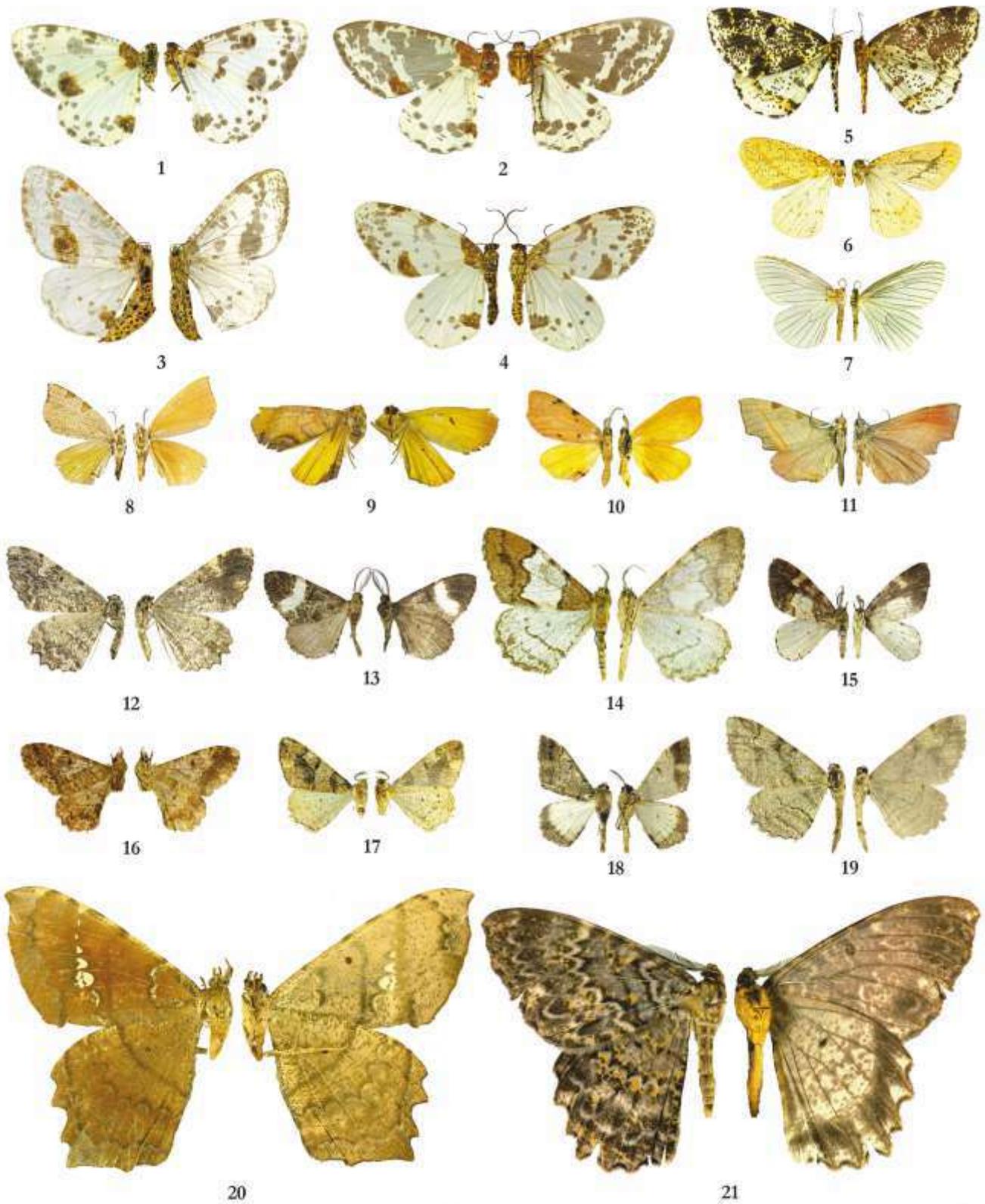


Plate 84 : Geometridae

1 cm

1. *Abnaxas illuminata* 2. *A. martaria* 3. *A. peregrina* 4. *A. sylvata* 5. *A. picaria* 6. *A. irrorata* 7. *A. nigrivena* 8. *Achrosis costimaculata*
 9. *A. incitata* 10. *A. litbosiaris* 11. *A. rufescens* 12. *Alcis admissaria* 13. *A. albifera* 14. *A. arisema* 15. *A. decussata* 16. *A. periphraeta*
 17. *A. quadrifera* 18. *A. semialba* 19. *A. trikotaria* 20. *Amblychia angeronaria* 21. *A. pardicelata*



Plate 85 : Geometridae

1 cm

1. *Amraica recursaria* 2. *Anonychia grisea* 3. *A. lativitta* 4. *A. violacea* 5. *Xenoplia foraria* 6. *X. maculata* 7. *Antiperchia belluaria*
8. *Pernia felinaria* 9. *Metabraxias coryneta* 10. *M. tincta* 11. *Metaperchia ductaria* 12. *Aplochloa dentisignata* 13. *Apobeterolocha patalata*
14. *Apophya sericea* 15. *Artemidora disistaria* 16. *Celenna festiviaria* 17. *Chiasmia pseudonora* 18. *Eilicrinia cordiaria*

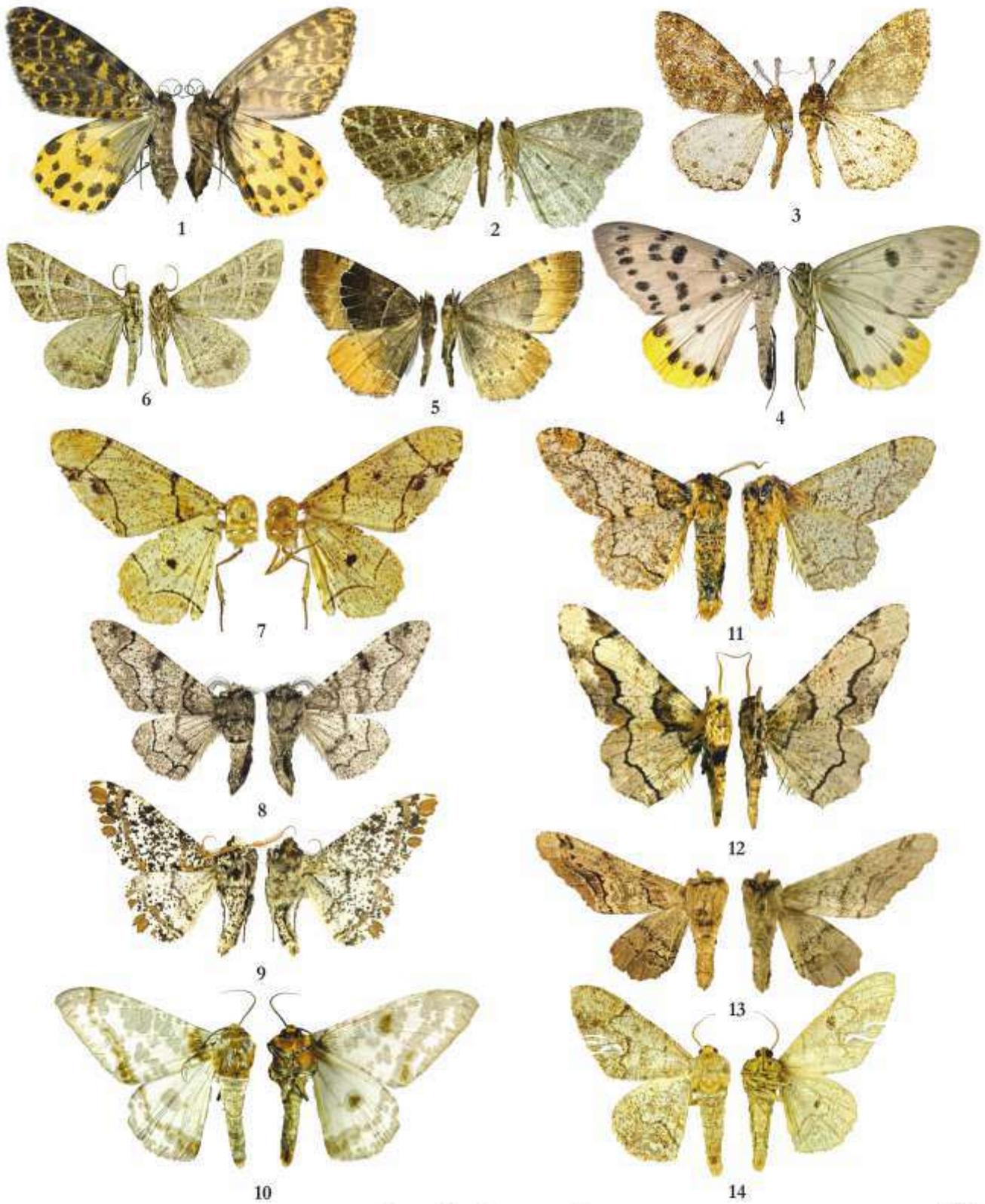


Plate 86 : Geometridae

1 cm

1. *Arichanna flavinigra* 2. *A. interplagata* 3. *A. tenebraria* 4. *A. jaguarinaria* 5. *A. subaenescens* 6. *A. transfasciata* 7. *Biston bengaltaria*
 8. *B. betularia* 9. *B. falcata* 10. *B. panterinaria* 11. *B. pustulata* 12. *B. regalis* 13. *B. sinuata* 14. *B. suppressaria*

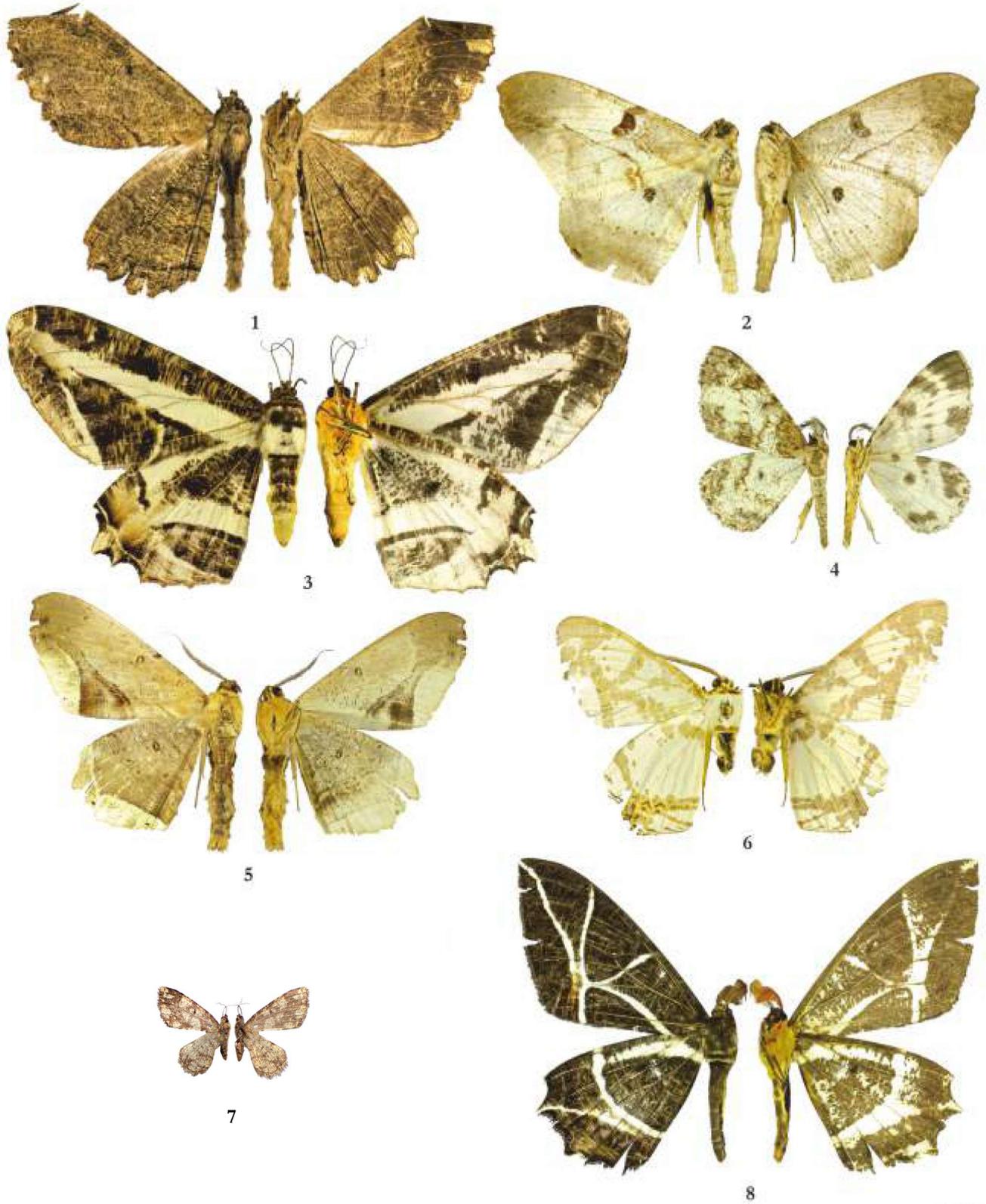


Plate 87 : Geometridae

1 cm

1. *Cborodna creataria* 2. *C. erebusaria* 3. *C. fulgurita* 4. *C. obliterata* 5. *C. metapbaeria* 6. *C. moorei* 7. *C. reticulata* 8. *Mesastrape fulguraria*

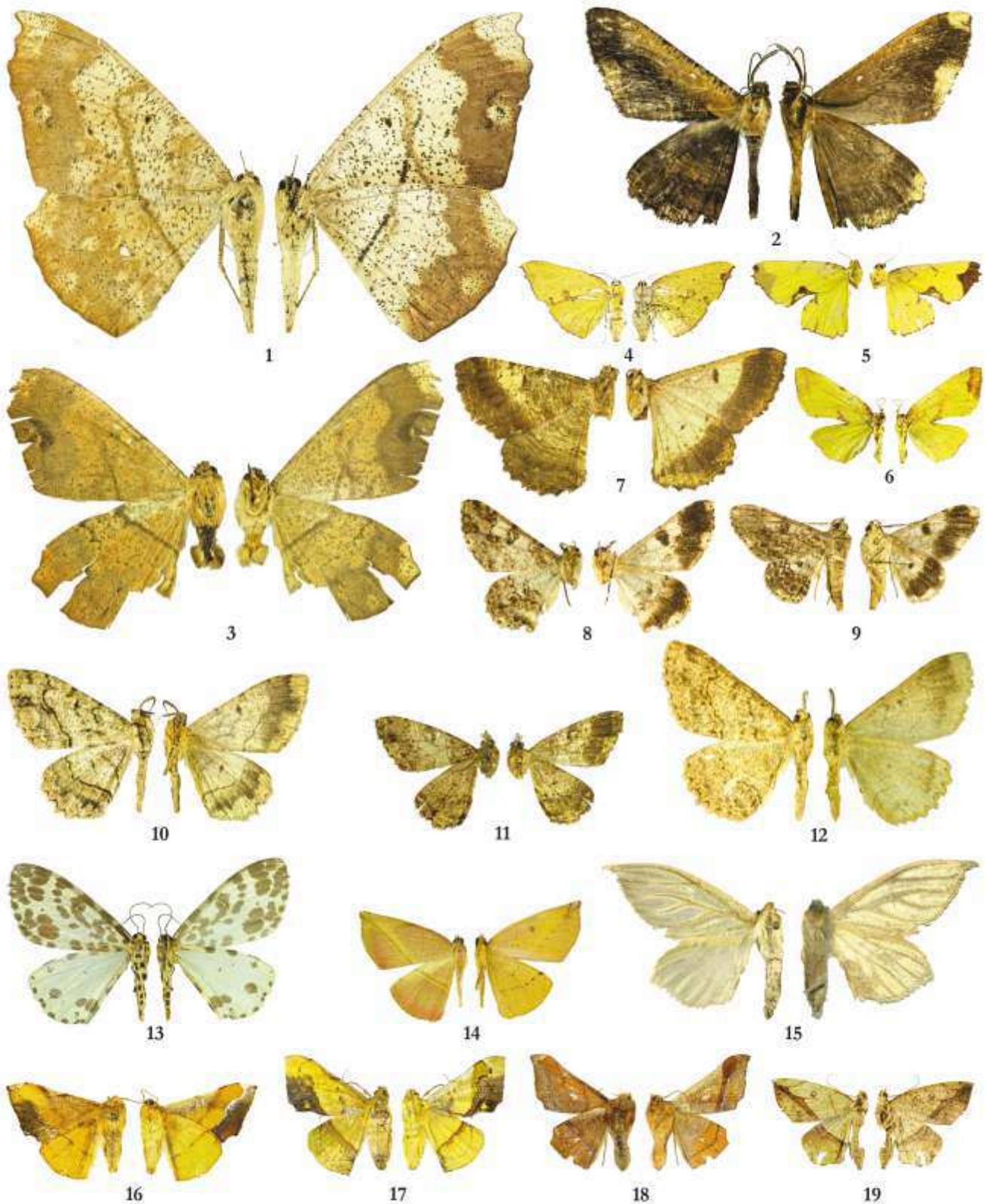


Plate 88 : Geometridae

1 cm

1. *Chorodna ochreimaculata* 2. *C. similis* 3. *C. testacea* 4. *Corymica arnearia* 5. *C. pryeri* 6. *C. specularia* 7. *Ctenognophos eolaria*
 8. *Cleora determinata* 9. *C. propulsaria* 10. *Darisa firmilinea* 11. *D. lampasaria* 12. *D. mucidaria* 13. *Dilophodes elegans*
 14. *Dissoplaga flava* 15. *Doratoptera nicevillii* 16. *Fascellina inornata* 17. *F. plagiata* 18. *F. porphyreofusa* 19. *Entomopteryx obliquilinea*

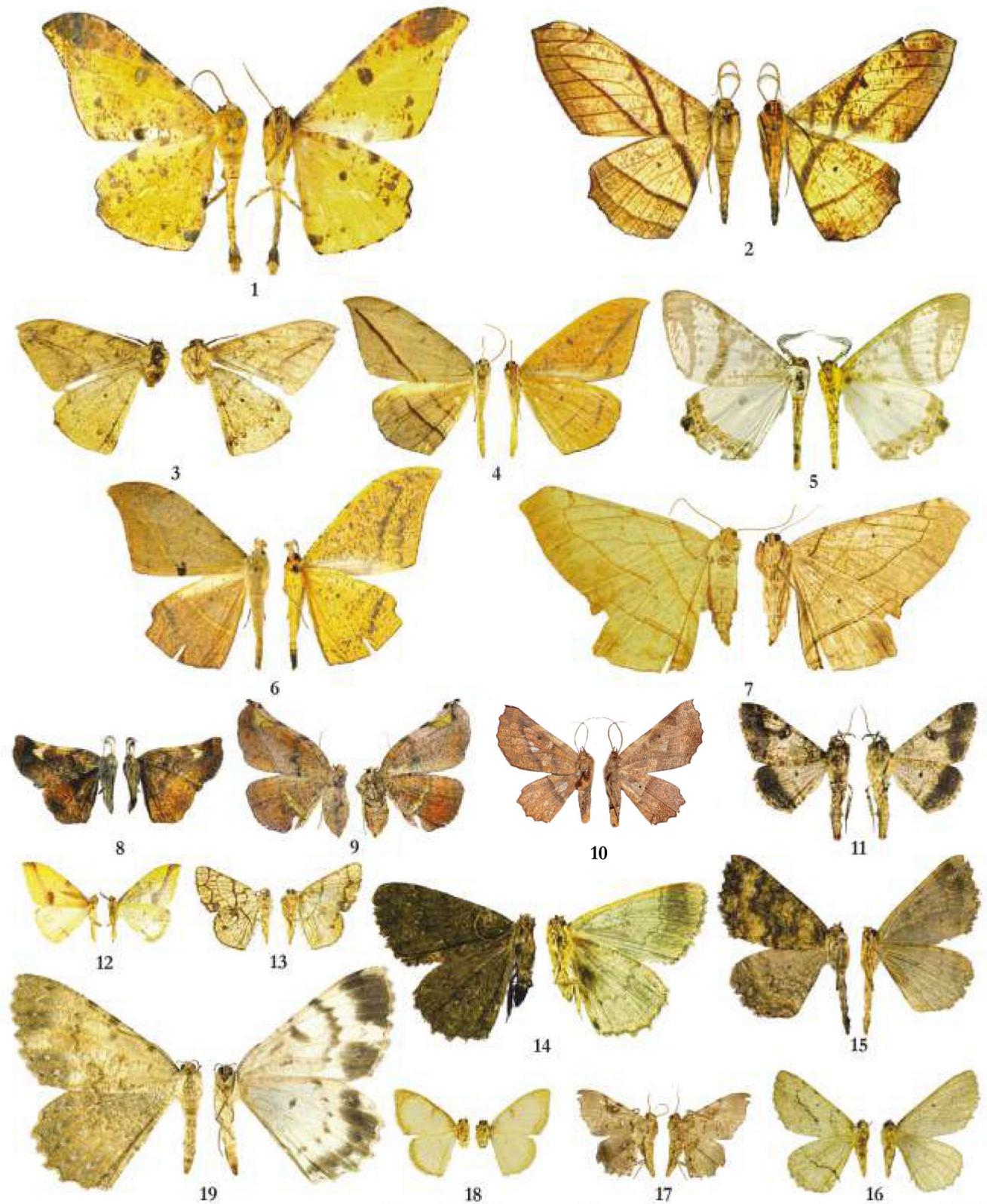


Plate 89 : Geometridae

1 cm

1. *Dalima apicata* 2. *D. lucens* 3. *D. calamina* 4. *D. latitans* 5. *D. metachromata* 6. *D. sebastacearia* 7. *D. truncataria* 8. *Garaeus absona*
9. *G. apicata* 10. *G. specularis* 11. *Gasterocone pannosaria* 12. *Heterolocha phoenicotaeniata* 13. *Heterostegane subtessellata*
14. *Hirasa aereus* 15. *H. muscosaria* 16. *H. scripturaria* 17. *Hyalinetta circumflexa* 18. *Hydatocapnia gemina* 19. *Gnophos albidior*

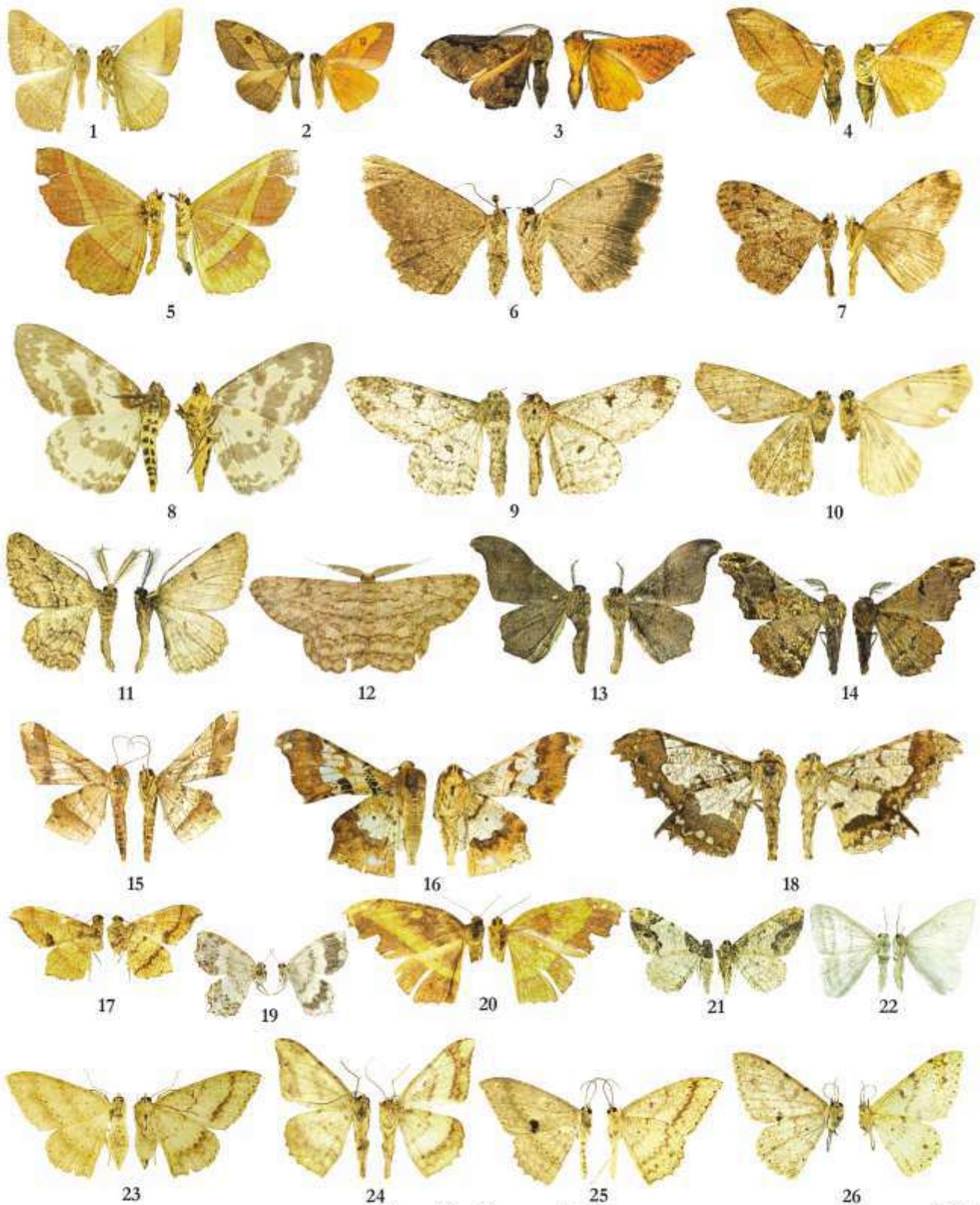


Plate 90 : Geometridae

1 cm

1. *Hypephyra terrasa* 2. *Hypochrosis abstractaria* 3. *H. binexata* 4. *H. hyadaria* 5. *Hyperythra lutea* 6. *Hypomecis cineracea* 7. *H. costaria*
 8. *H. fasciata* 9. *H. infexaria* 10. *H. lioptilaria* 11. *H. rotatoria* 12. *H. transissa* 13. *Hyposidra talaca* 14. *H. violescens*
 15. *Krananda latimarginaria* 16. *K. lucidaria* 17. *K. fulva* 18. *K. semibyalina* 19. *Iridoplecta ferrifera* 20. *Leptomiza calcearia*
 21. *Ligdia coctata* 22. *Lomographa platyleucata* 23. *Lusciaria acutaria* 24. *L. amasa* 25. *L. mitorrbabbes* 26. *L. tephrosaria*

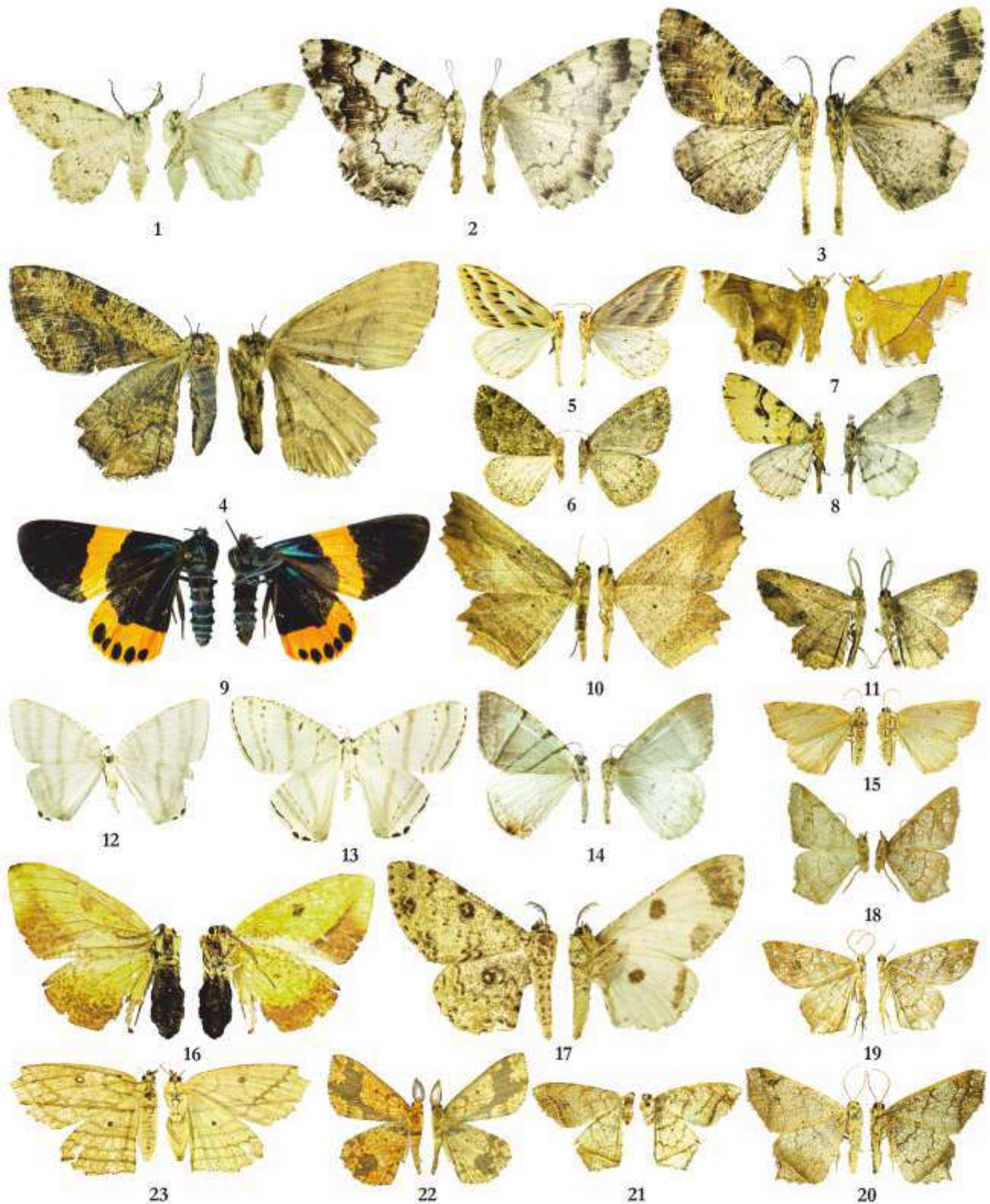


Plate 91 : Geometridae

1 cm

1. *Lassaba albidaria* 2. *L. cervina* 3. *L. dissimilis* 4. *L. interruptaria* 5. *Loxaspilates bastigera* 6. *Micrabraxas melanodonta*
7. *Mimochroa angulifascia* 8. *Myrioblephara duplexcodes* 9. *Milonia basalis* 10. *Menoptra serpentaria* 11. *M. subplagiata*
12. *Micronidia simplicata* 13. *M. subpunctata* 14. *Myrteta planaria* 15. *Notbomiza costinotata* 16. *Omiza pachiaris*
17. *Ophthalmitis pertusaria* 18. *Oxymacaria maculosata* 19. *O. oliva* 20. *O. penumbrata* 21. *O. temeraria* 22. *Parasyngia lidderdalii*
23. *P. pluristriaria*

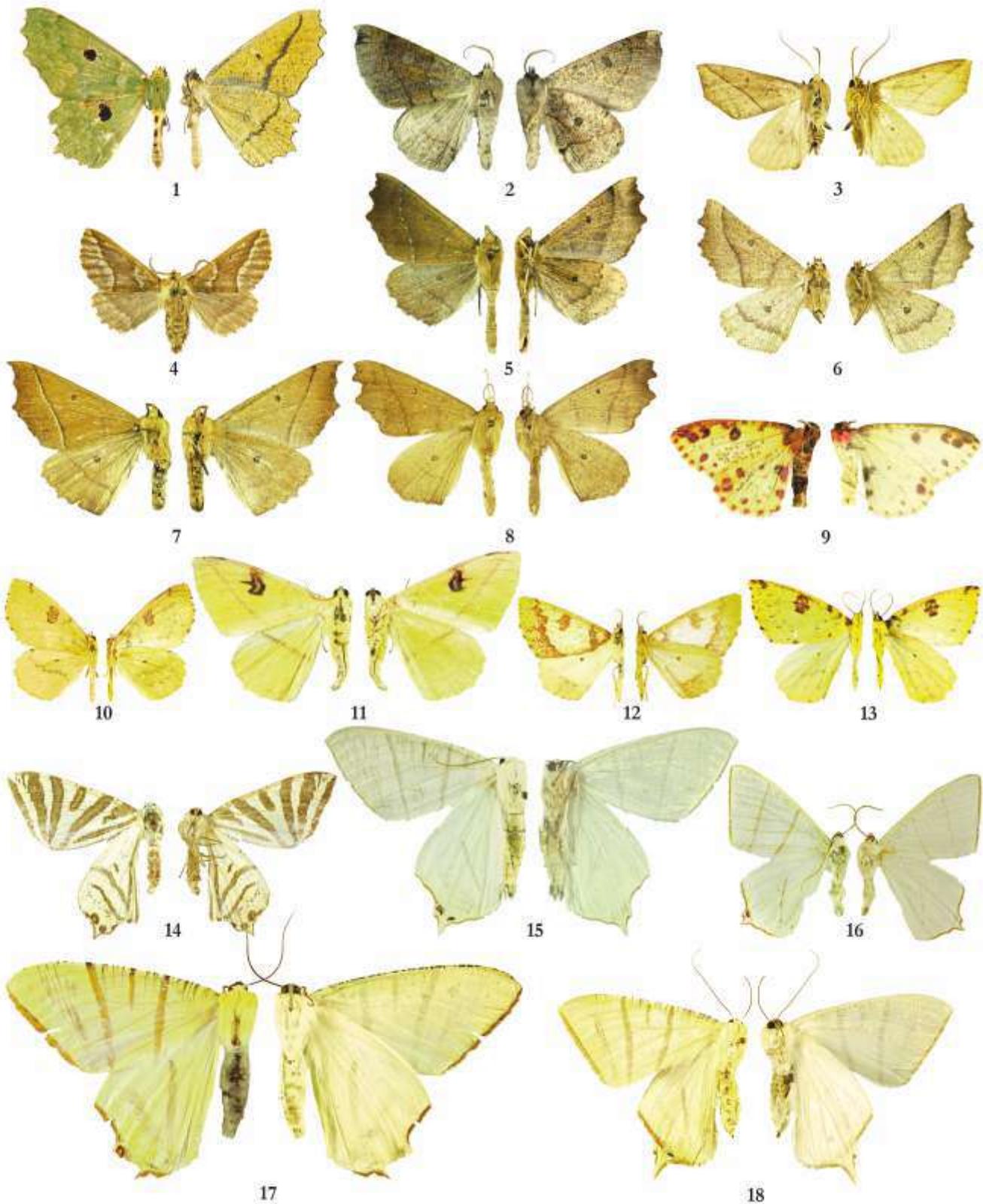


Plate 92 : Geometridae

1 cm

1. *Chlorodontopera discospilata* 2. *Odontopera cervinaria* 3. *O. beydena* 4. *O. kametaria* 5. *O. lentiginosaria* 6. *O. muscularia* 7. *O. obliquaria*
 8. *O. similaria* 9. *Pectula exanthemata* 10. *Opisthograptis luteolata* 11. *O. moelleri* 12. *O. sulphurea* 13. *O. tridentifera*
 14. *Ourapteryx convergens* 15. *O. ebuleata* 16. *O. margaritata* 17. *O. primularis* 18. *O. sciticaudaria*

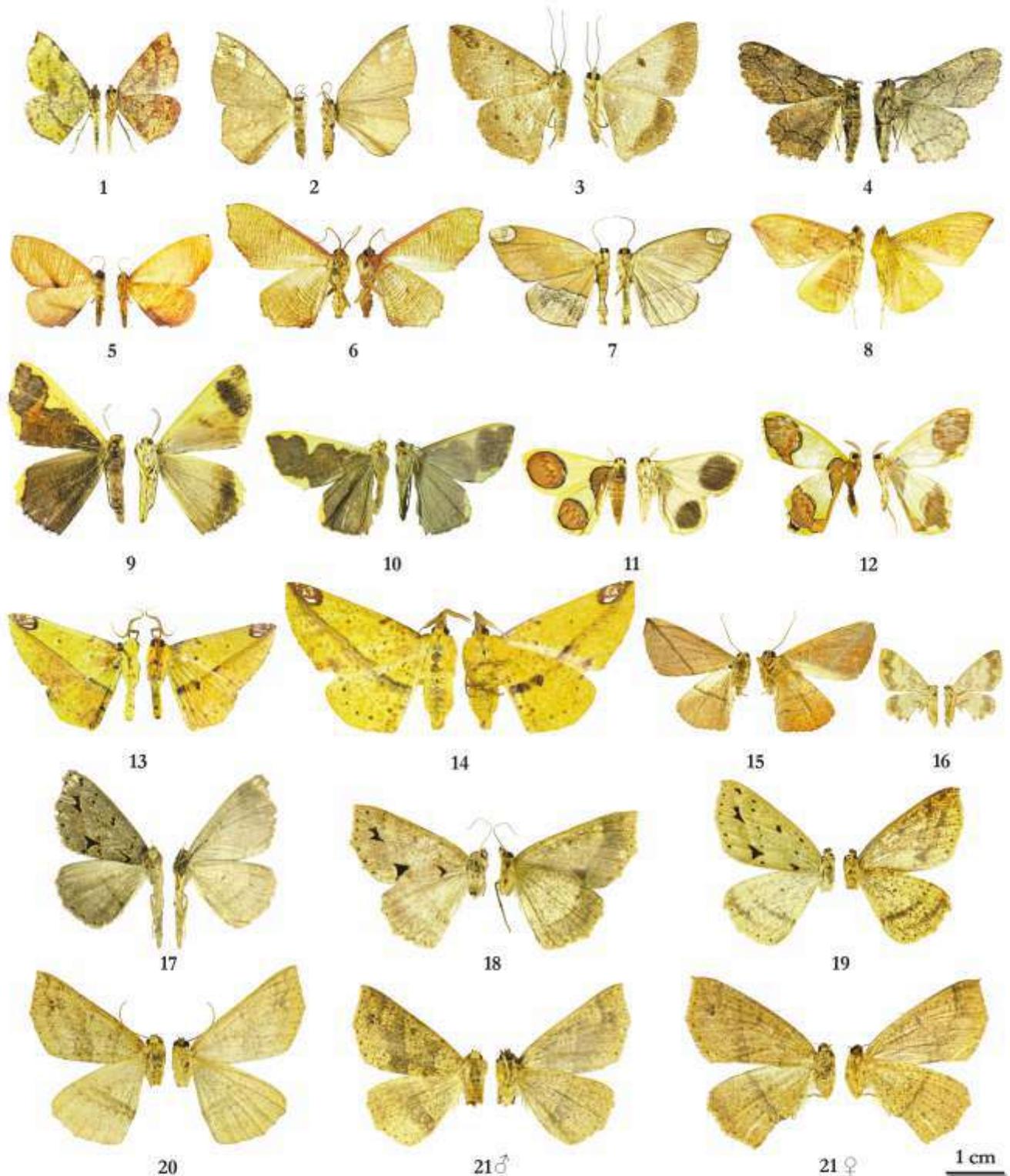


Plate 93 : Geometridae

1. *Pseudopanthera bimalefica* 2. *Peratostega deletaria* 3. *Petelia medardaria* 4. *Phibonandria atrilineata* 5. *Plagodis inustaria* 6. *P. reticulata*
7. *Platycerota homoema* 8. *Polyscia argentilinea* 9. *Plutodes costatus* 10. *P. warreni* 11. *P. flavescens* 12. *P. subcandata*
13. *Mimomiza cruentaria* 14. *Pseudomiza aurata* 15. *P. obliquaria* 16. *Peratophyga hyalinata* 17. *Psyrta angulifera* 18. *P. cuneata*
19. *P. similaria* 20. *P. crypta* 21. *P. spurcatoria*

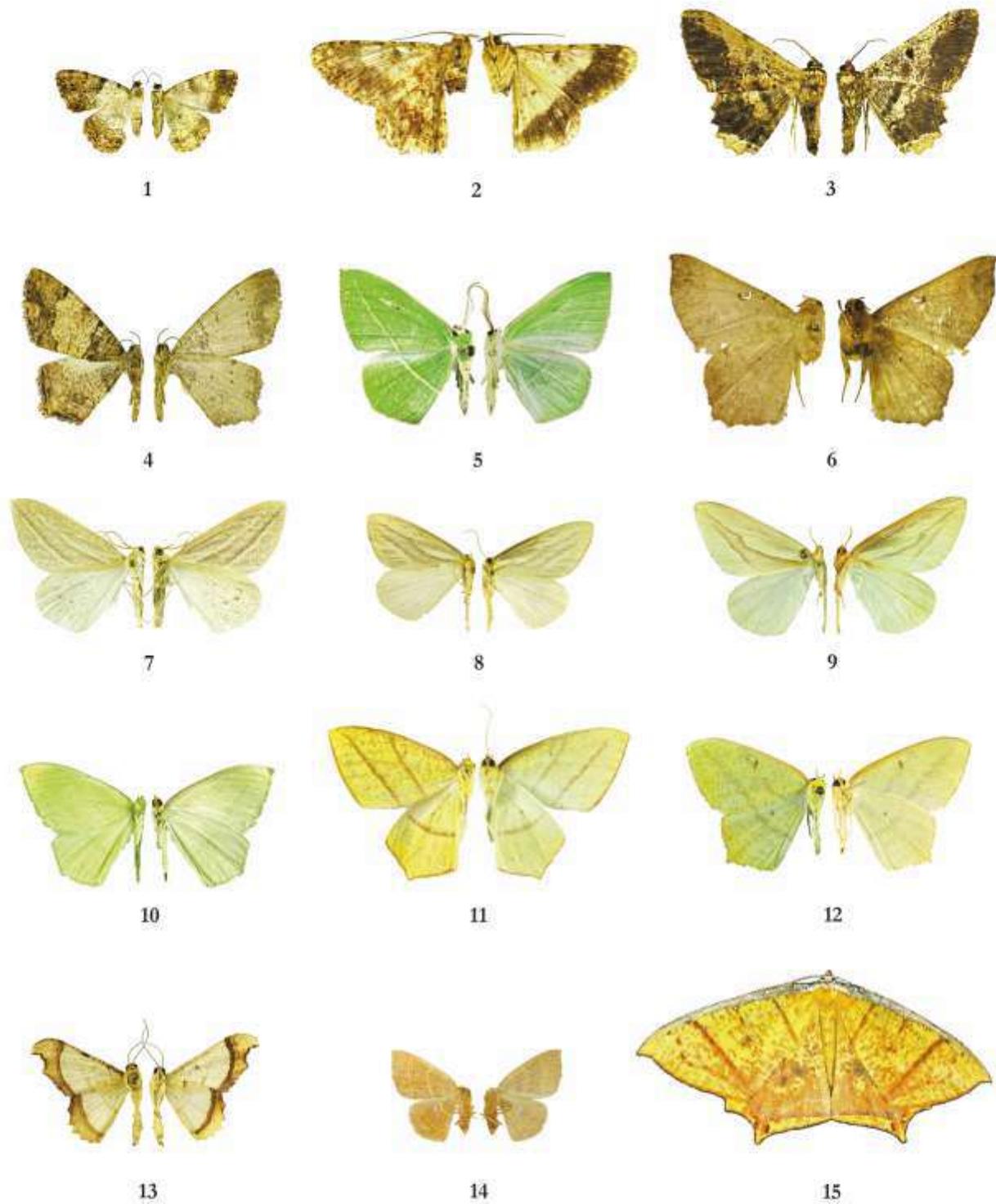


Plate 94 : Geometridae

1 cm

1. *Psilalis albibasis* 2. *Racotis inconclusa* 3. *Ruttellerona cossaria* 4. *Sinamedia basistrigaria* 5. *Tanaoctenia baliaria* 6. *Xerodes ypsaria*
 7. *Sirinopteryx duplicilinea* 8. *S. harutai* 9. *S. longipennis* 10. *S. rufivinctata* 11. *S. quadripunctata* 12. *S. undulifera* 13. *Zebeba aureata*
 14. *Pristostegania trilineata* 15. *Thinopteryx croceoptera*



1



2



3

Plate 95 : Geometridae

1, *Xandrames albofasciata* 2, *X. dbolaria* 3, *X. latiferaria*

1 cm

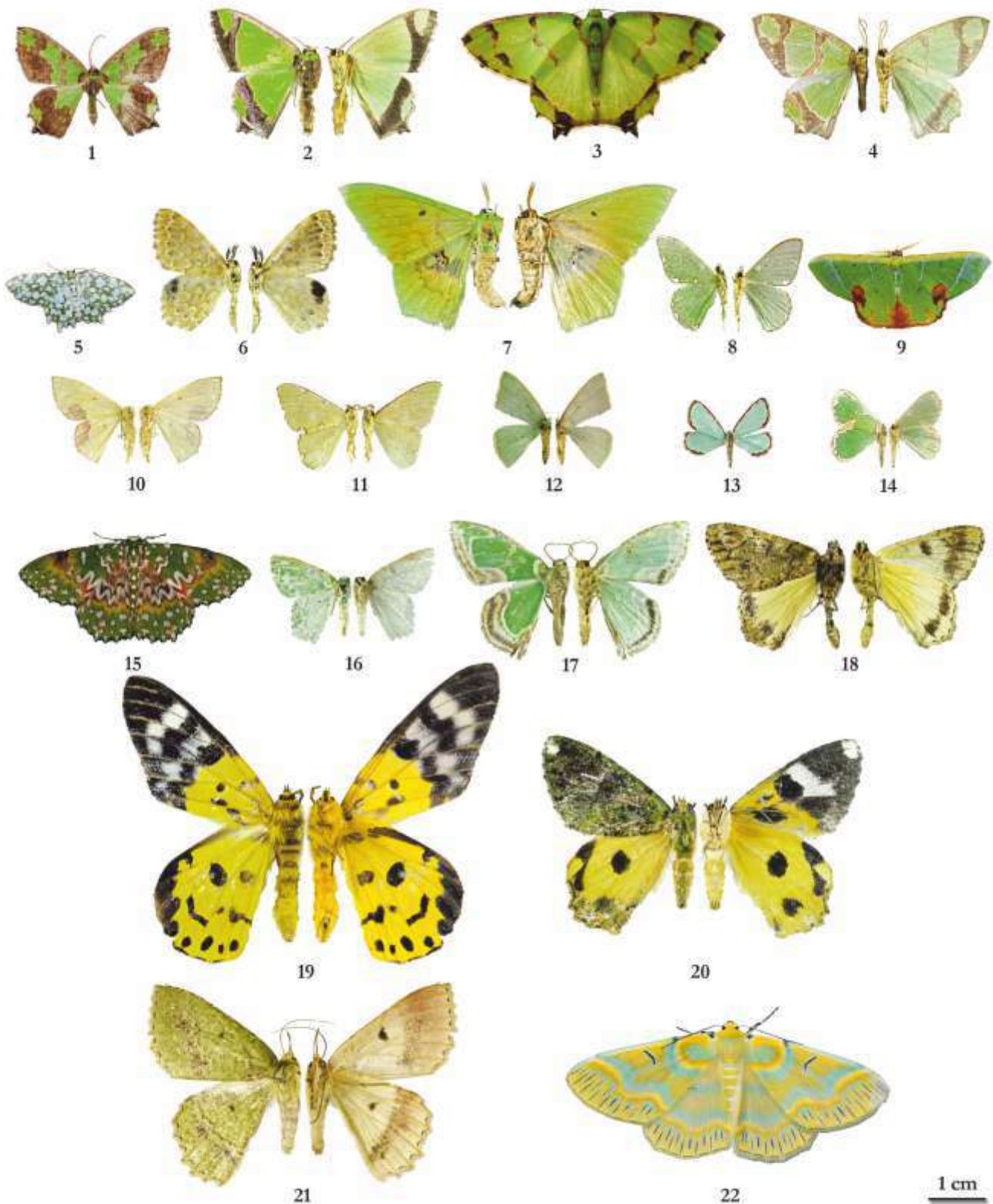


Plate 96 : Geometridae

1. *Agathia hemithearia* 2. *A. laetata* 3. *A. lycanaria* 4. *A. succedanea* 5. *Berta chrysolineata* 6. *Chlororithra fea*
 7. *Aporandria specularia* 8. *Argyrocossma inductaria* 9. *Comibaena pictipennis* 10. *C. quadrinotata* 11. *C. subhyalina*
 12. *Comostola subtilaria* 13. *C. pyrrogona* 14. *C. chlorargyra* 15. *Eucyclodes gavisima* 16. *E. albisparsa* 17. *E. sanguilineata*
 18. *Dindica polyphaenaria* 19. *Dysphania militaris* 20. *Dindicodes crocina* 21. *Herochroma cristata* 22. *Iotaphora iridicolor*

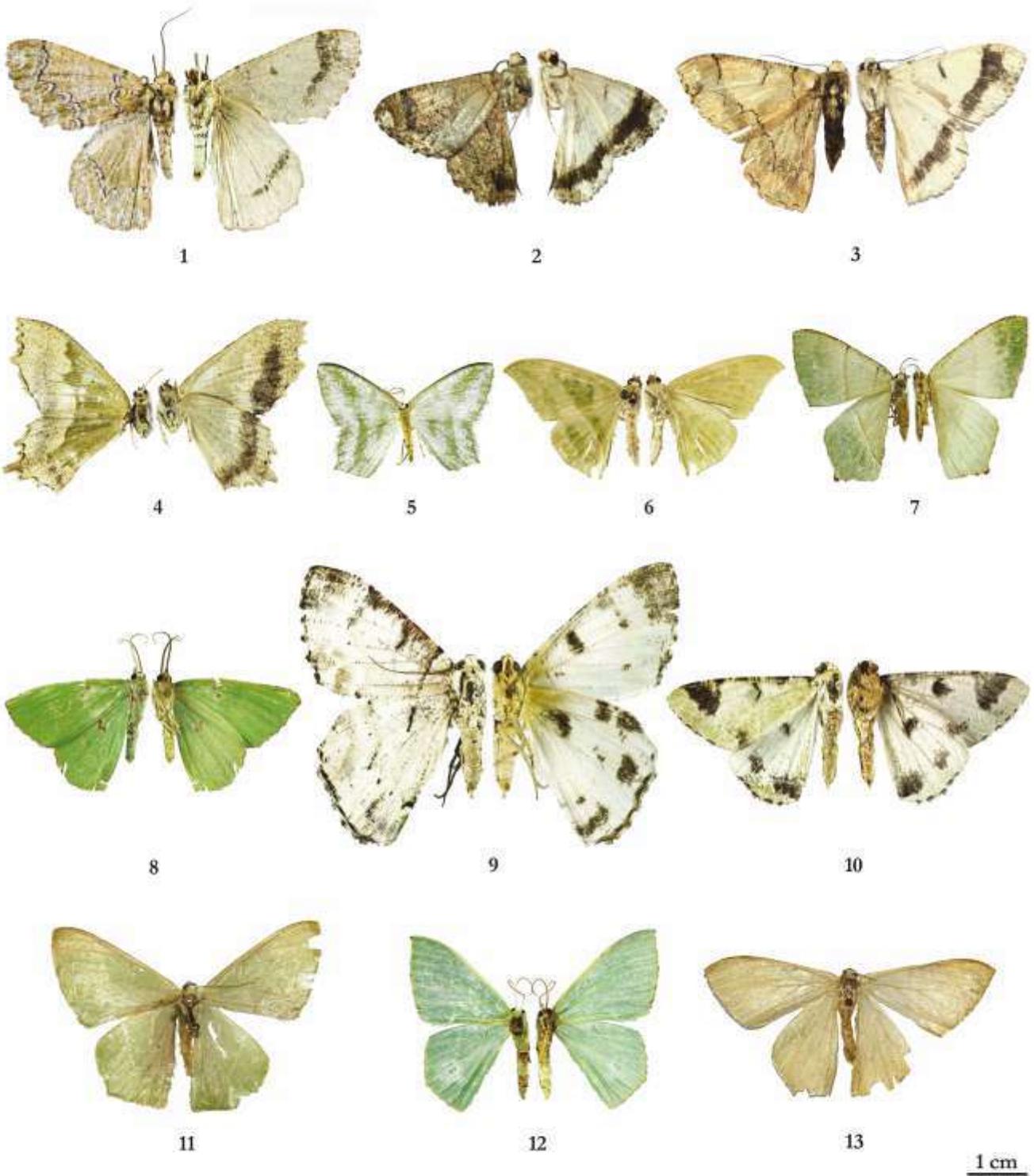


Plate 97 : Geometridae

1. *Lophobelma erionoma* 2. *L. loncheres* 3. *L. vigens* 4. *Maxates macariata* 5. *M. thetydaria* 6. *Mixochlova vittata*
7. *Neohipparchus vallata* 8. *Ornithospila avicularia* 9. *Pachyodes haemataria* 10. *P. pictaria* 11. *Pelagodes bellula*
12. *P. veraria* 13. *Thalassodes opalina*



1

2

3



4



5



6



7



8



9



10

1 cm

Plate 98 : Geomteridae

1. *Pingasa chlora* 2. *P. crenaria* 3. *P. pseudoterpnaria* 4. *P. rubicunda* 5. *P. ruginaria* 6. *Tanaorhinus kina*
7. *T. reciprocata* 8. *T. viridiluteata* 9. *Timandromorpha enervata* 10. *Tbetidia radiata*

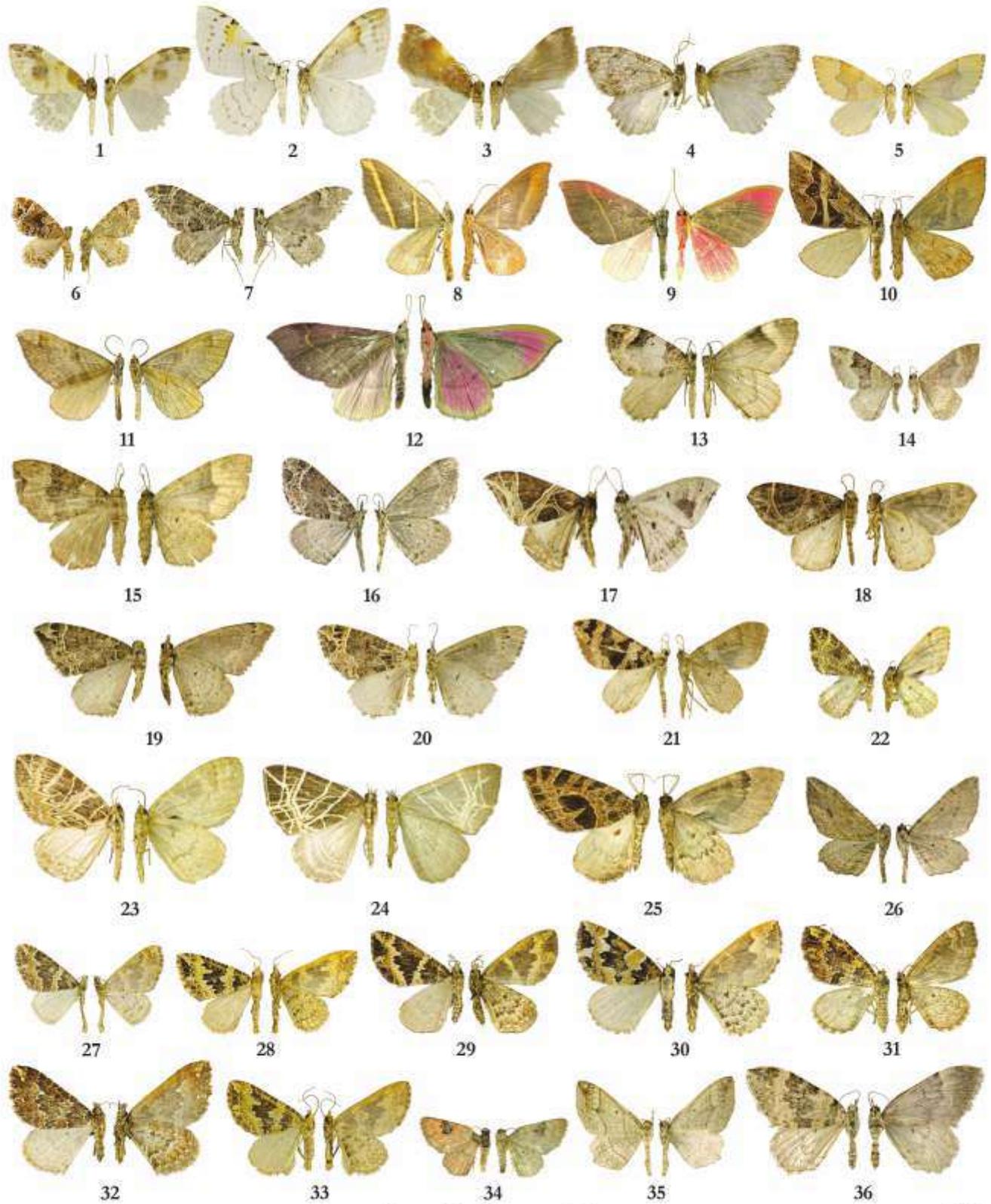


Plate 99 : Geometridae

1 cm

1. *Agnibesa pictaria* 2. *A. recurvilineata* 3. *A. venusta* 4. *Antidea canaliculata* 5. *Cidaria distinctata* 6. *C. multistriata*
7. *Colostygia albigrata* 8. *Docirava aequilineata* 9. *D. affinis* 10. *D. fulgurata* 11. *D. postocbrea* 12. *D. pudicata* 13. *Dysstroma planifasciata*
14. *Euphyia subangulata* 15. *Ecliptopera muscicolor* 16. *E. postpallida* 17. *E. rectilinea* 18. *E. relata* 19. *E. silaceata* 20. *E. substituta*
21. *Hysterura multijaria* 22. *Enstroma chalcoptera* 23. *E. inextricata* 24. *E. mixtilineata* 25. *Paranstroma fissisignis* 26. *Horisme plurilineata*
27. *Electrophaes aliena* 28. *E. marginata* 29. *E. niveonotata* 30. *E. niveopicta* 31. *E. recta* 32. *E. tsermosaria* 33. *E. zaphenges*
34. *Hydrelia bicolorata* 35. *Laciniodes plurilinearia* 36. *Neotephria ramalaria*

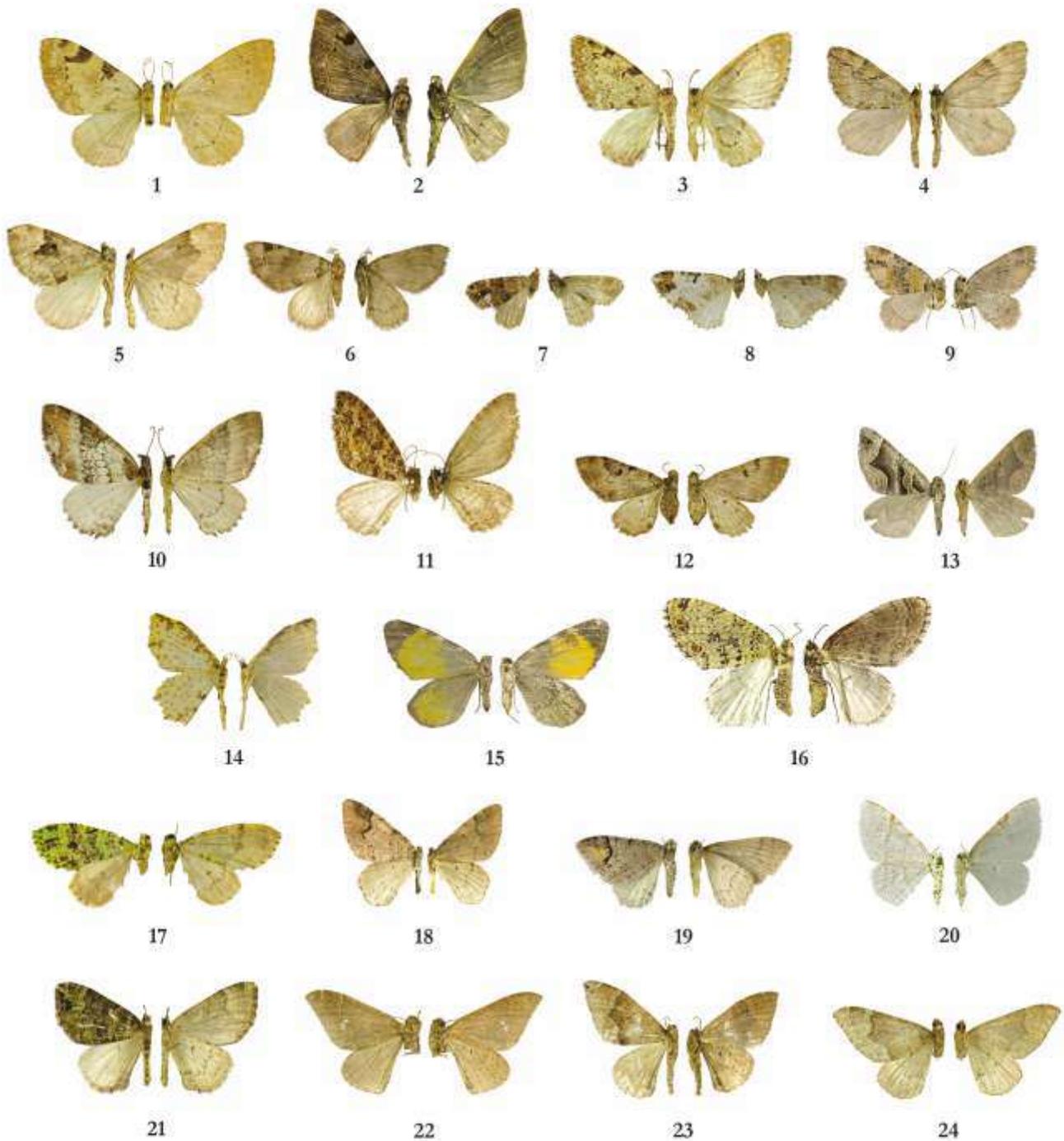


Plate 100 : Geometridae

1 cm

1. *Heterophleps bicommata* 2. *H. oxyptaria* 3. *H. quadripuncta* 4. *Heterothera consimilis* 5. *H. dentifasciata* 6. *Martania plumbeata*
 7. *M. seriata* 8. *Perizoma albofasciata* 9. *P. peculiare* 10. *Melanthia catenaria* 11. *Parentephria stellata* 12. *Physetobasis dentifascia*
 13. *Scotopteryx nasifera* 14. *Polynesia sunandava* 15. *Stannodes pauperaria pampbilata* 16. *Trichopterygia rufinotata*
 17. *Tristeirometa decussata* 18. *Venusia crassisigna* 19. *V. lilacina* 20. *V. roseicosta* 21. *Xanthorhoe bampsoni* 22. *Xenortholitha falcata*
 23. *X. latifusata* 24. *X. propinguata*

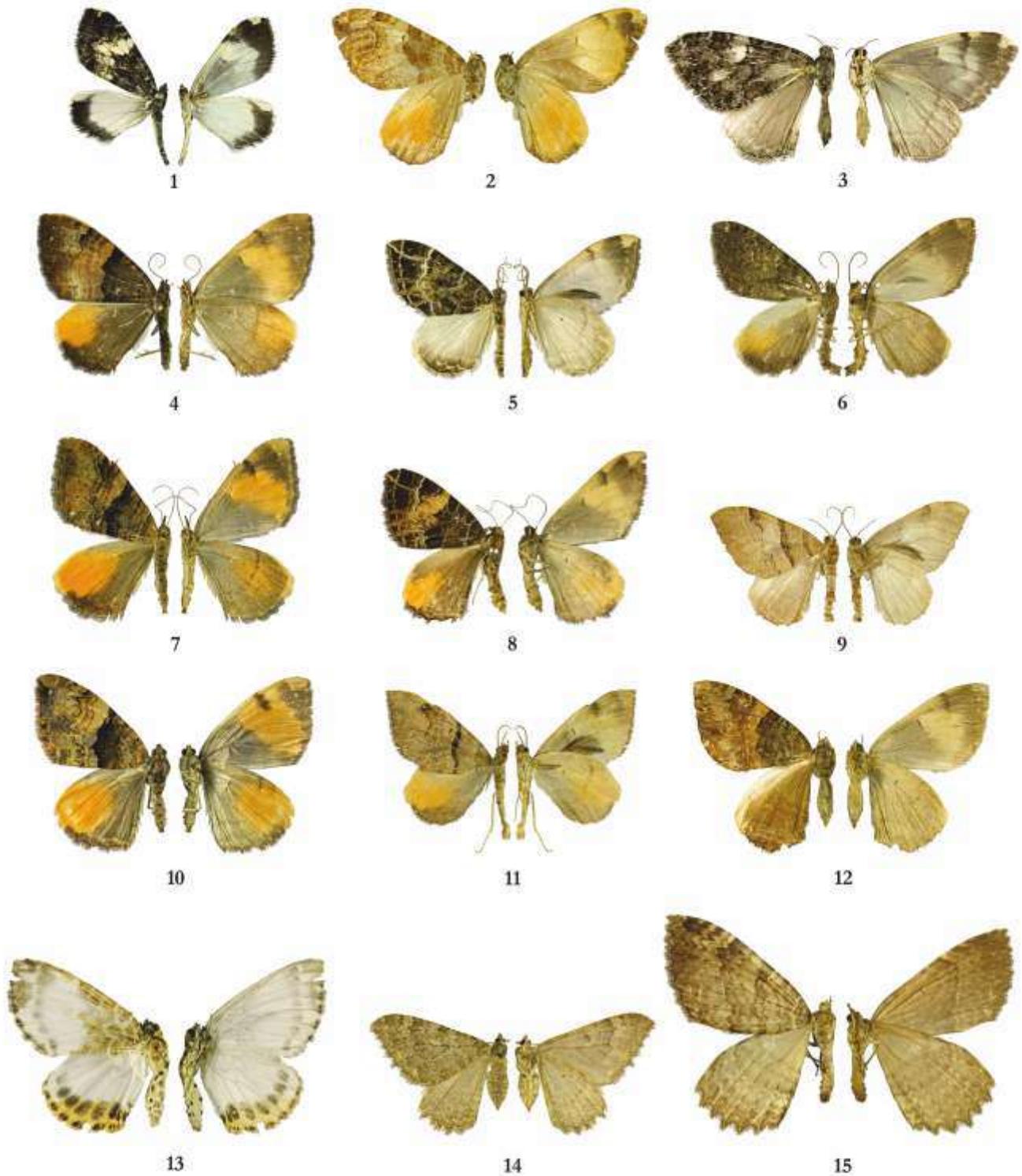


Plate 101 : Geometridae

1 cm

1. *Ammesicoma bicolor* 2. *A. simplex* 3. *Pbotoscotosia amplicata* 4. *P. dejuta* 5. *P. fulguritis* 6. *P. funebris* 7. *P. isosticta* 8. *P. metabryseis*
9. *P. multilinea* 10. *P. miniosata* 11. *P. pallidimaculata* 12. *P. polysticta* 13. *Callabraxas amanda* 14. *Triphosa dubiosata* 15. *T. rubrodotata*



1



3



2



4



5



6



8



7



9

1 cm

Plate 102 : Notodontidae

- 1, *Dudusa nobilis* 2, *Tarsolepis japonica* 3, *Fentonia excurvata excurvata* 4, *F. e. altitudinis* 5, *Neopbeosia fasciata fasciata*
6, *Acmesbachia albifascia* 7, *A. gigantea* 8, *Cerura himalayana* 9, *C. roesleri*

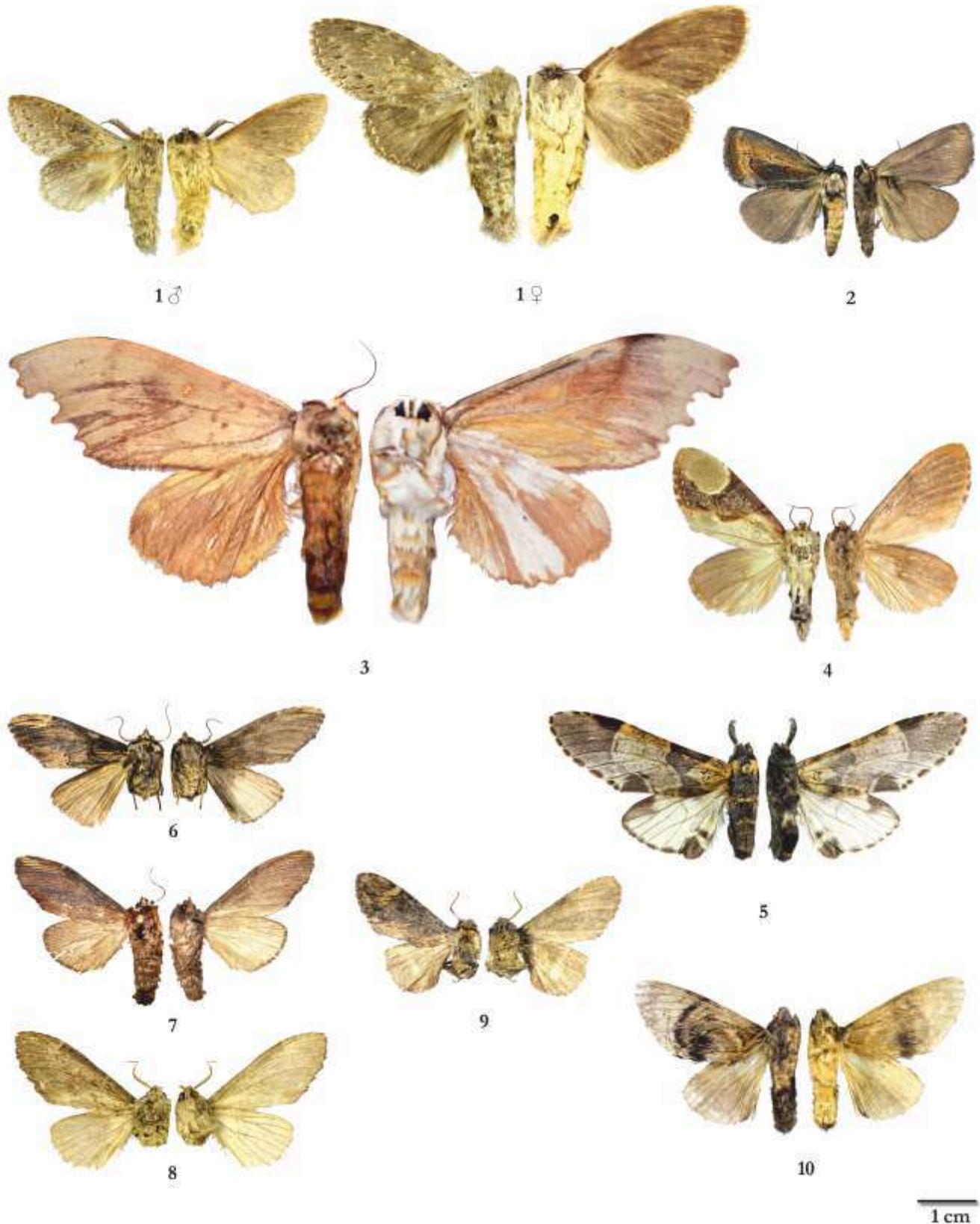


Plate 103 : Notodontidae

1. *Chlorostauropus alternus alternus* 2. *Cleapa latifascia* 3. *Eubampsonia niveiceps* 4. *Formofentonia orbifer orbifer* 5. *Harpyia longipennis*
6. *Hexafrenum collaris* 7. *H. rufa* 8. *H. unicolor* 9. *Hiradonta bannemanni* 10. *Homocentridia picta picta*



1



2



4



3



6



5



7



8



9



10

1 cm

Plate 104 : Notodontidae

1. *Kamalia tattakana* 2. *Miostauropus mioides* 3. *Nerice pictibasis* 4. *Netria multispinae multispinae* 5. *N. viridescens continentalis*
6. *Peridea moorei moorei* 7. *P. swata* 8. *Pbeosia albivertex* 9. *Pbeosia niteria* 10. *Pseudofentonia argentifera*

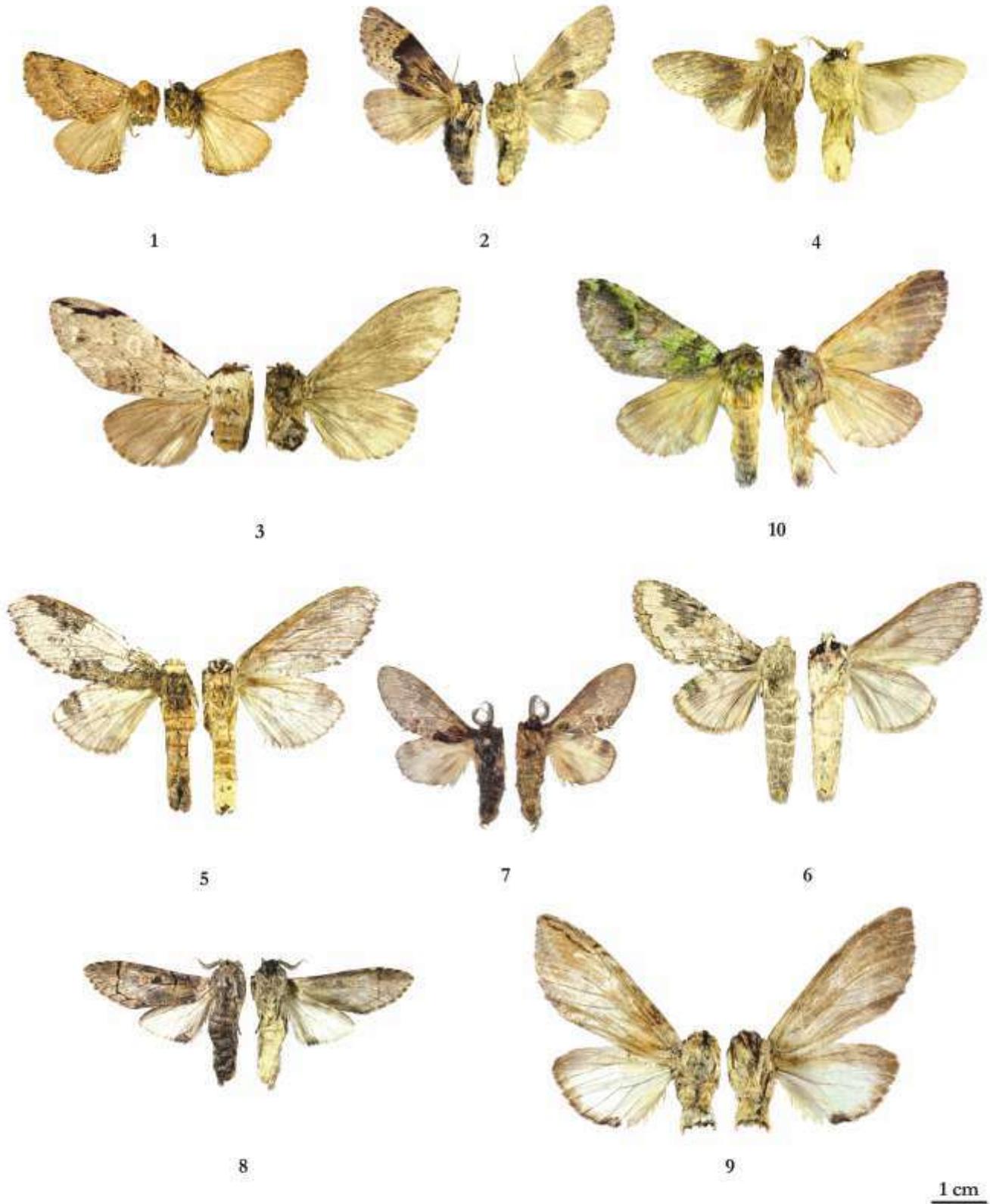


Plate 105 : Notodontidae

1. *Ptilodon flavistigma* 2. *Semidonta basalis* 3. *Stauropplitis apicalis* 4. *Stauropus sikkimensis* 5. *Synypistis comatus comatus*
6. *S. umbrosa* 7. *S. nigribasalis tropica* 8. *Teleclita centrictica* 9. *T. strigata* 10. *Viridifentonia plagiviridis plagiviridis*

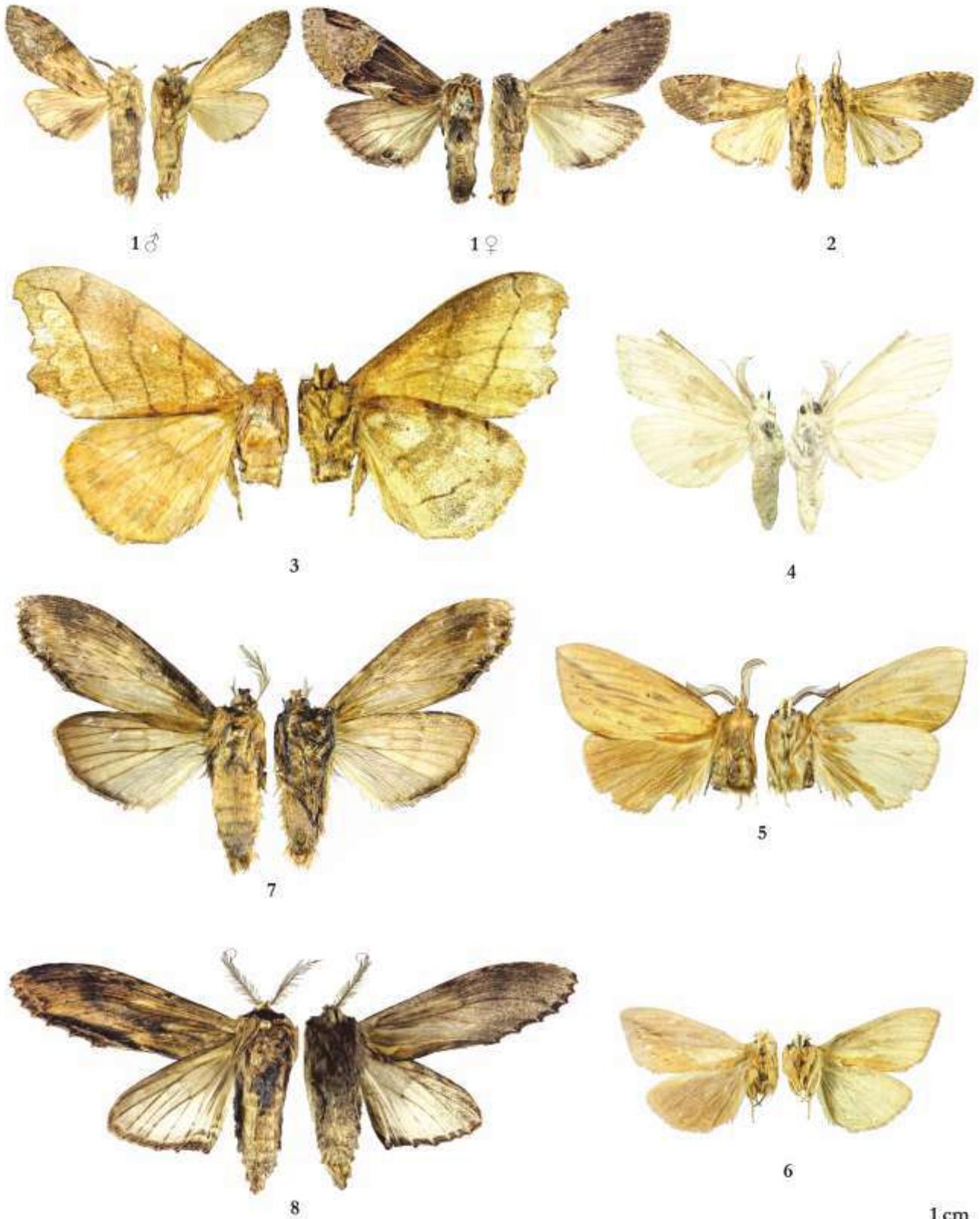


Plate 106 : Notodontidae

1. *Chadisra bipars* 2. *C. bipartita* 3. *Gangarides dharma* 4. *Periergos genitale* 5. *P. harutai* 6. *P. kamadena*
7. *Rachia plumosa* 8. *R. striata*



1



2



3



4



5



6



7



8

1 cm

Plate 107 : Notodontidae

1. *Antheua servula* 2. *Phalera torpida torpida* 3. *P. birmicola* 4. *P. goniophora* 5. *P. grotei* 6. *P. sangana* 7. *P. parivala* 8. *P. raya*

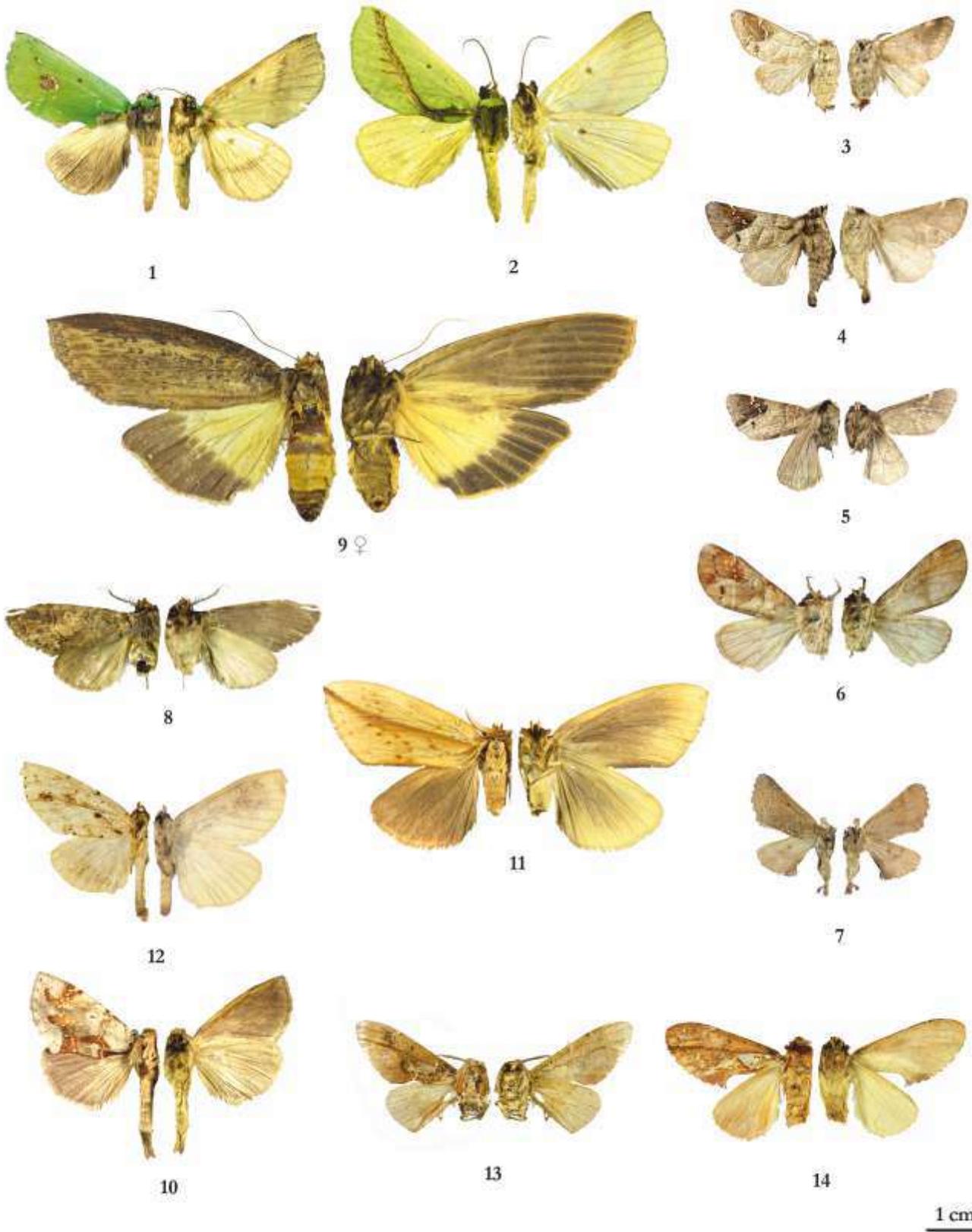
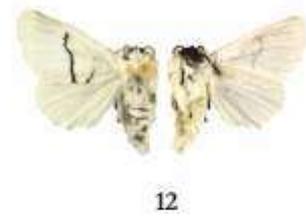
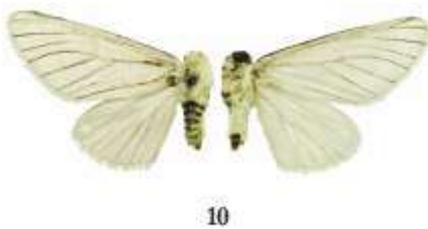


Plate 108 : Notodontidae

1. *Cyphanta chortochlora* 2. *C. xanthochlora* 3. *Clostera anachoreta anachoreta* 4. *C. fulgurita fulgurita* 5. *C. mabatma* 6. *C. pallida*
 7. *Micromelalopha undulata* 8. *Antiphalera bilineata* 9. *Baradesa litbosioides litbosioides* 10. *Besaia rubiginosa*
 11. *Bireta longivitta longivitta* 12. *Curuzza caii nepalensis* 13. *Ginsbachia baenzigeri* 14. *G. gemmifera*



1 cm

Plate 109 : Notodontidae

1. *Honveda fasciata* 2. *H. nepalina* 3. *Metaschalis disrupta* 4. *Mimopydna sikkima sikkima* 5. *Pseudallata lativostalis*
6. *Saliolela acyptera acyptera* 7. *S. ochracea* 8. *Spatalia sikkima* 9. *Spatalina desiccata stolidia*
10. *Gazalina apsara* 11. *G. chrysolopha* 12. *G. transversa*

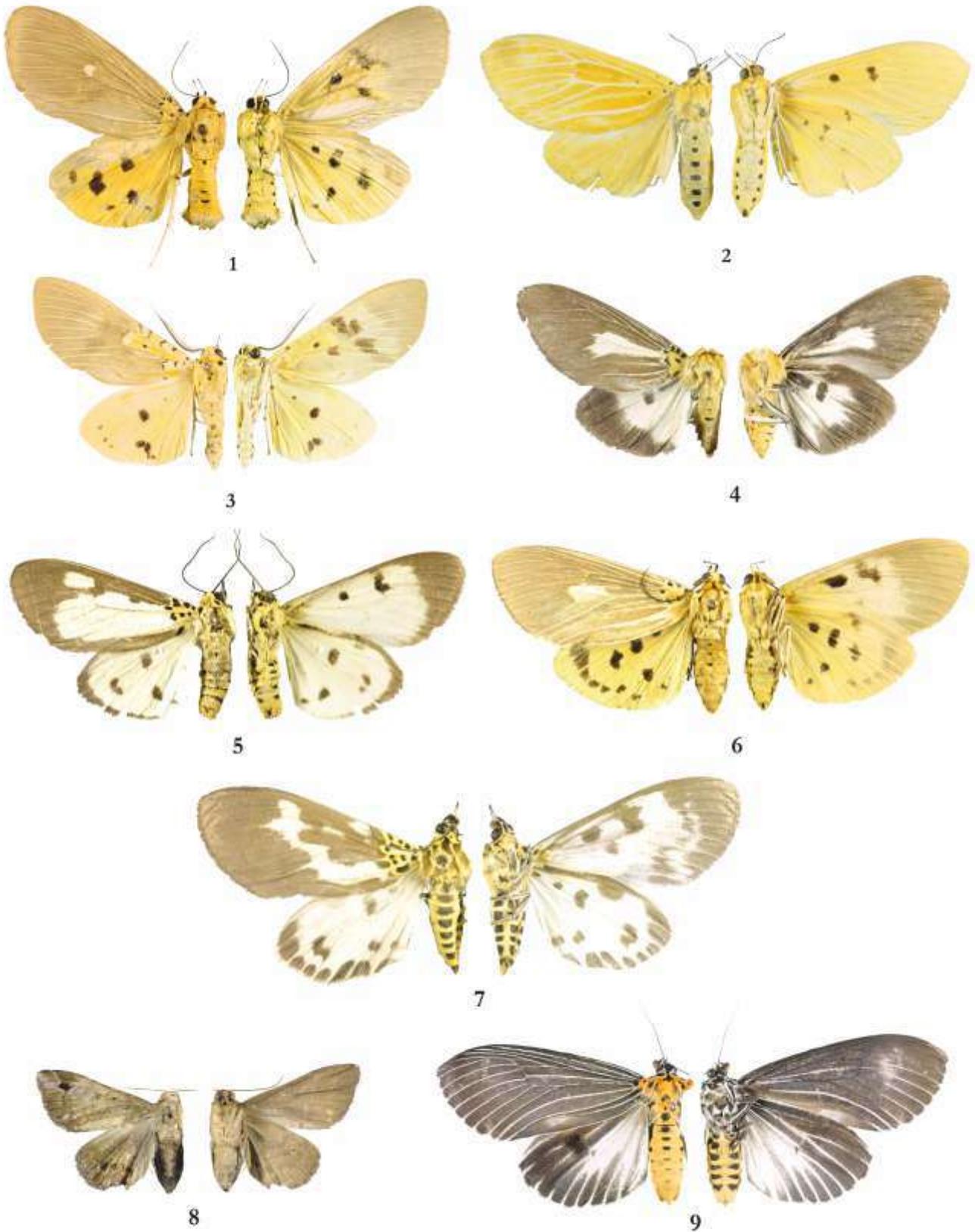


Plate 110 : Erebidae

1. *Asota caricae* 2. *Asota egens* 3. *Asota ficus* 4. *Asota heliconia* 5. *Asota plana* 6. *Asota producta* 7. *Asota tortuosa*
8. *Mecodina diastriga* 9. *Neochera marmorea*

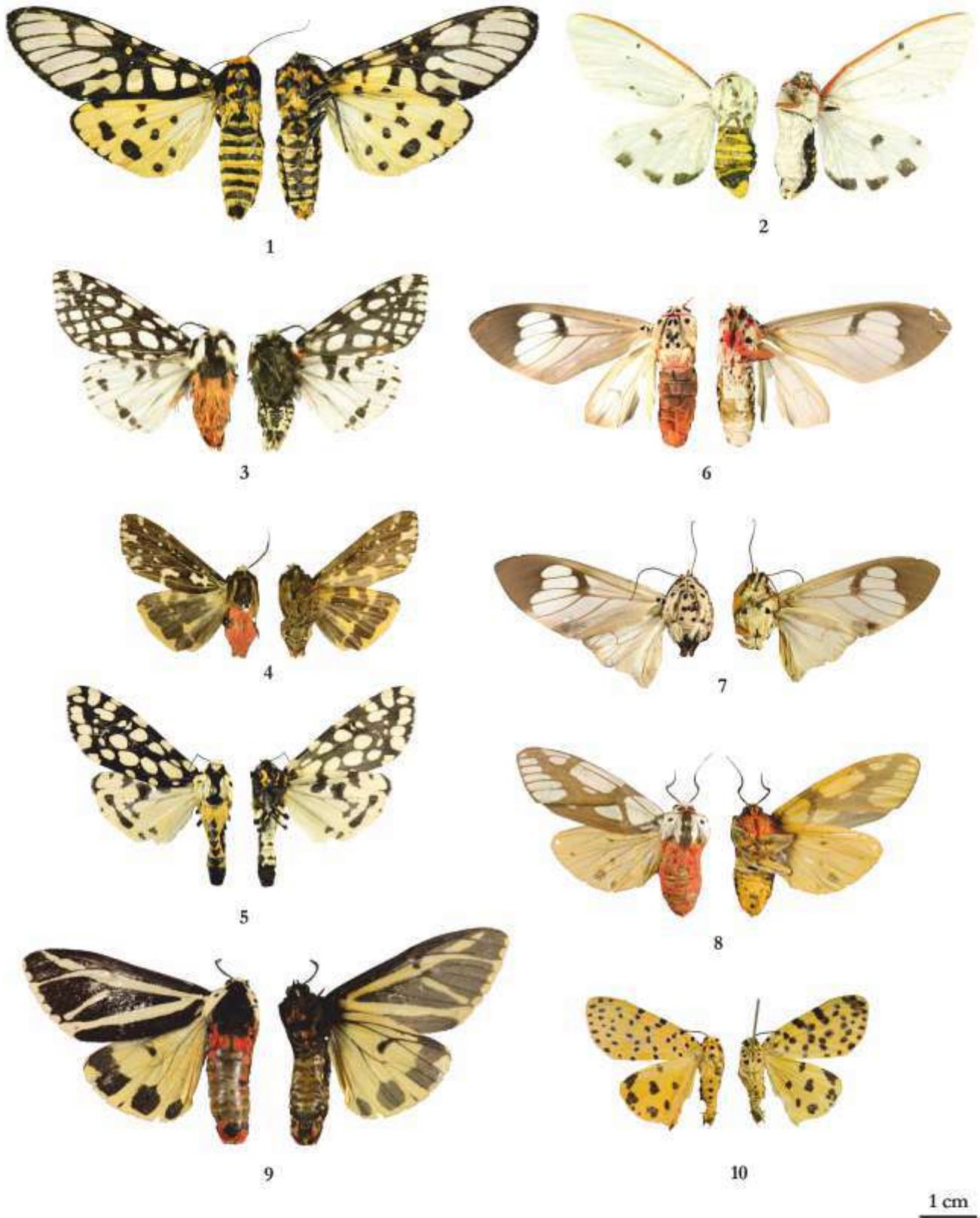


Plate 111 : Erebidae

1. *Aglaomorpha plagiata* 2. *Aloa lactinea* 3. *Alphaea fulvobirta* 4. *Alphaea imbuta* 5. *Alphaea impleta* 6. *Amerila astreus*
7. *Amerila omissa* 8. *Areas galactina* 9. *Areas imperialis* 10. *Argina astrea*

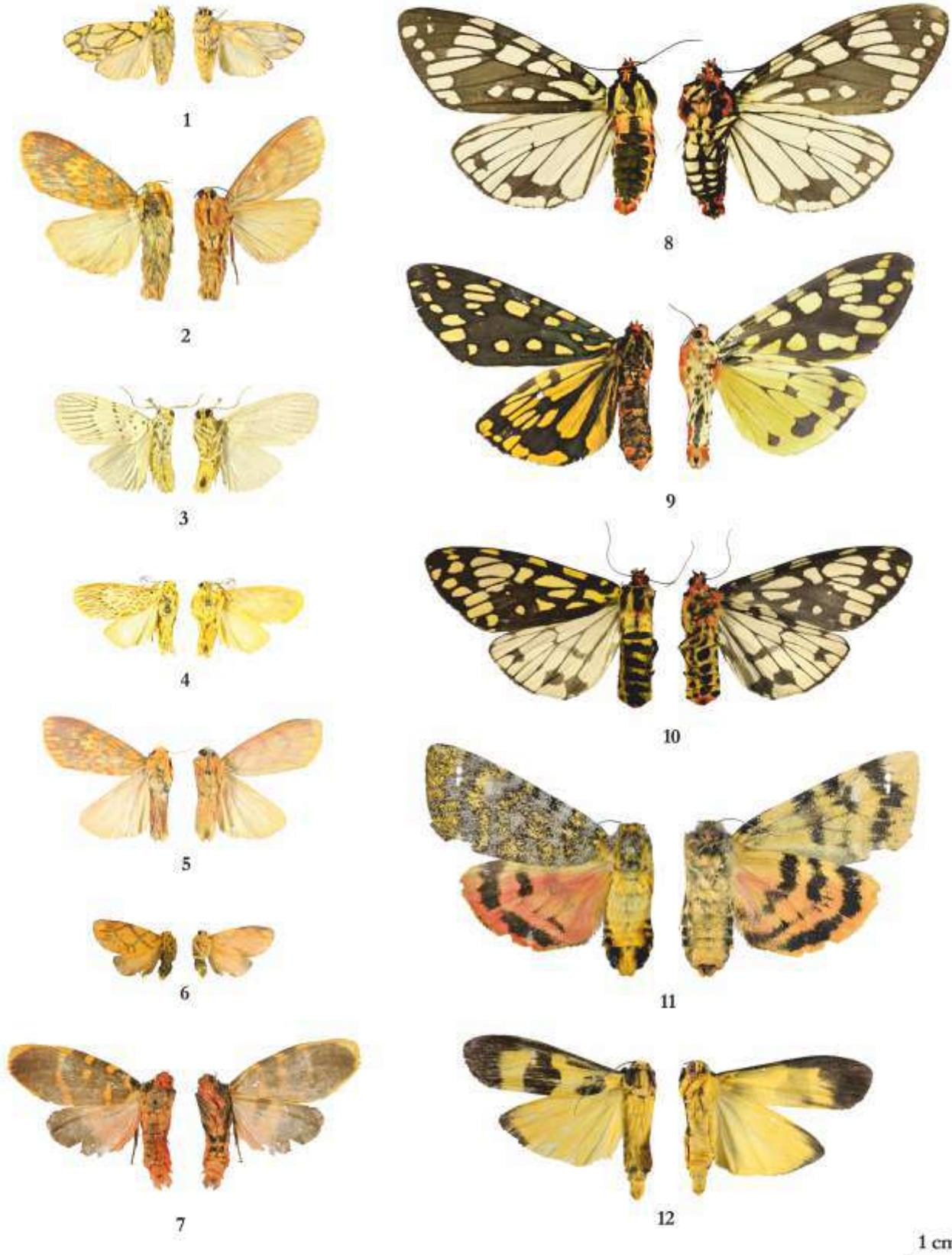


Plate 112 : Erebidae

1. *Barsine euprepioides* 2. *Barsine flammealis* 3. *Barsine linga* 4. *Barsine orientalis bigamica* 5. *Barsine pretiosa* 6. *Barsine punicea*
 7. *Barsine roseata* 8. *Callindra equitalis* 9. *Callindra principalis* 10. *Callindra similis* 11. *Carcinopyga lichenigera* 12. *Chrysaeglia magnifica*

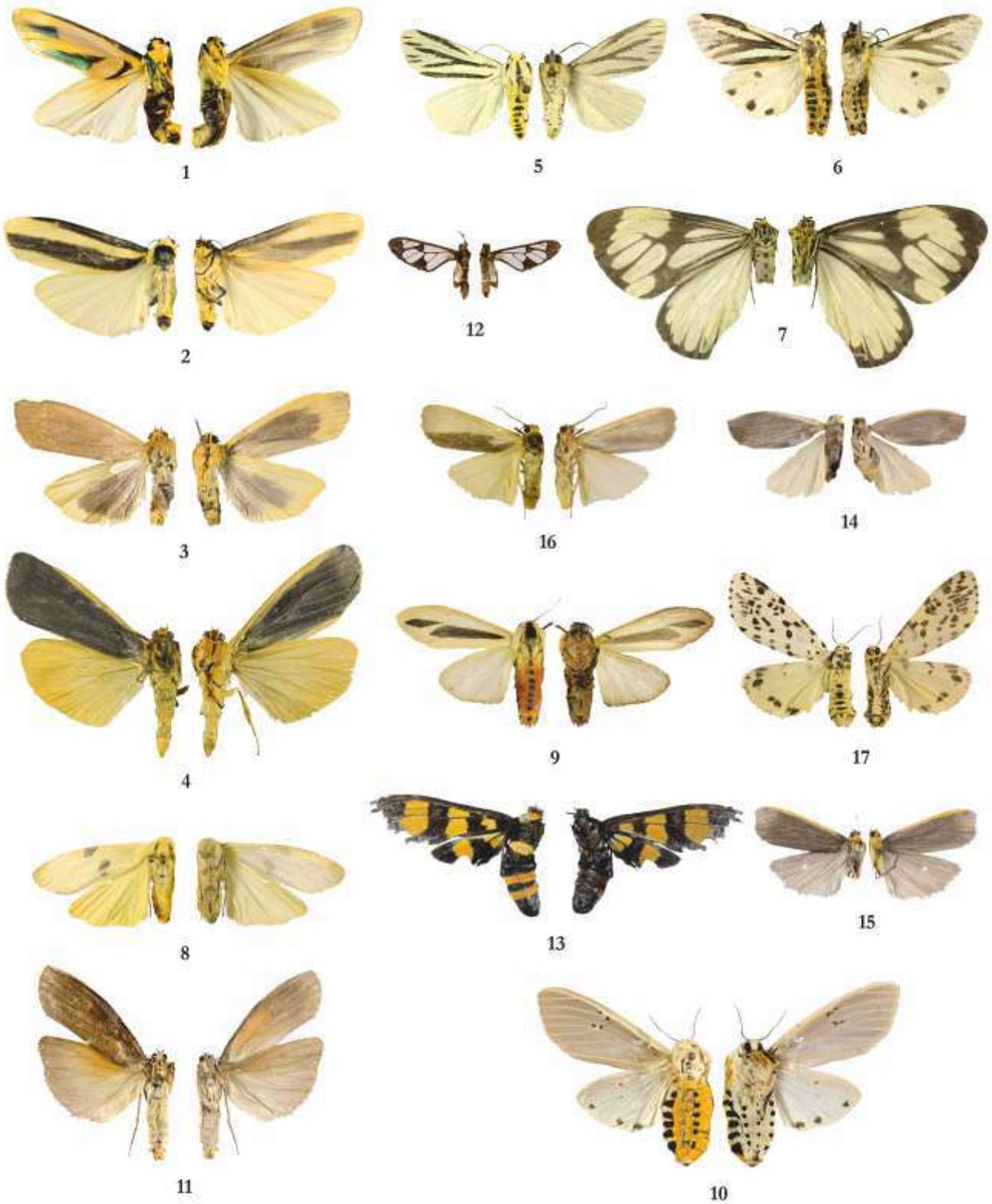
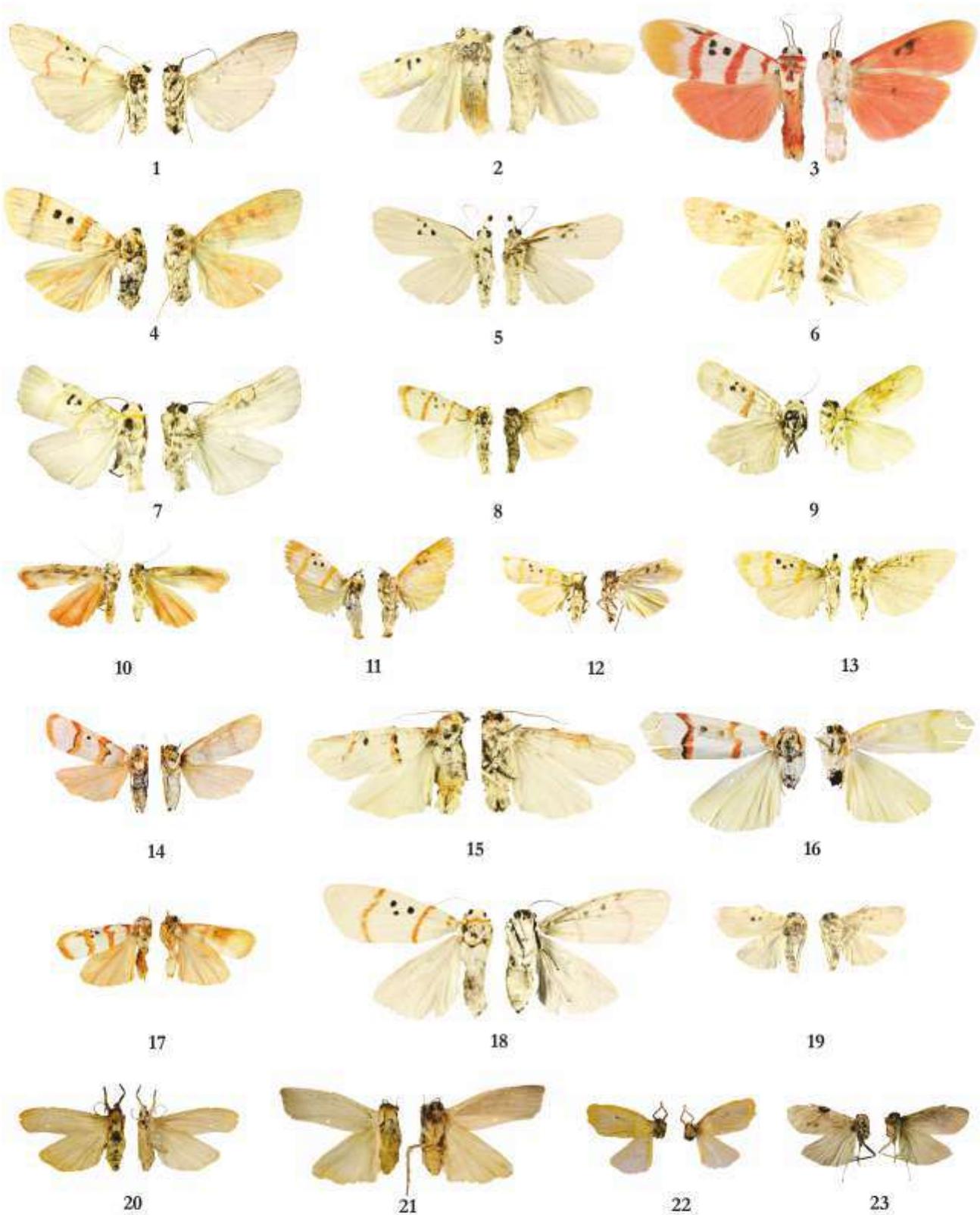


Plate 113 : Erebidae

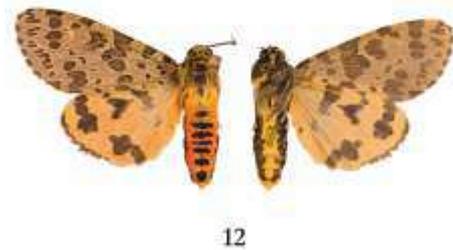
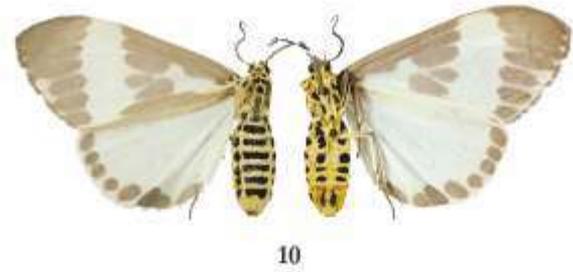
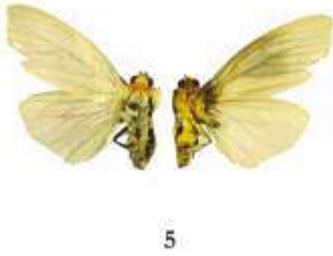
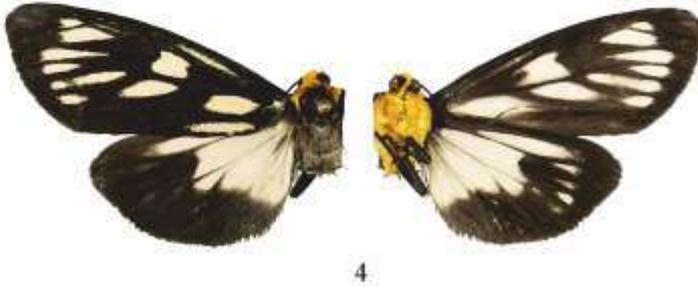
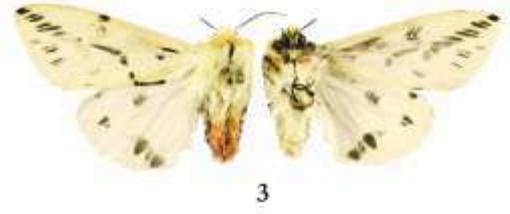
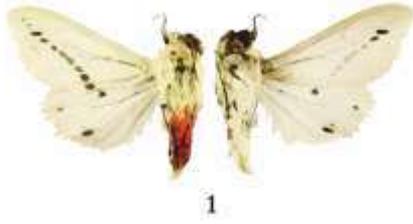
1. *Chrysorabdia bivitta* 2. *Chrysorabdia viridata* 3. *Churinga beema* 4. *Churinga rufifrons* 5. *Cladartia hansraji* 6. *Cladartia quadriramosa*
7. *Coleta coleta* 8. *Conilepia hunliensis* 9. *Cretonotos gangis* 10. *Cretonotos transiens* 11. *Eilema basinota* 12. *Eressa confinis*
13. *Eucbromia polymena* 14. *Gandhara serva* 15. *Gboria postfusca* 16. *Hesudra divisa* 17. *Juxtarctia multiguttata*



1 cm

Plate 114 : Erebidæ

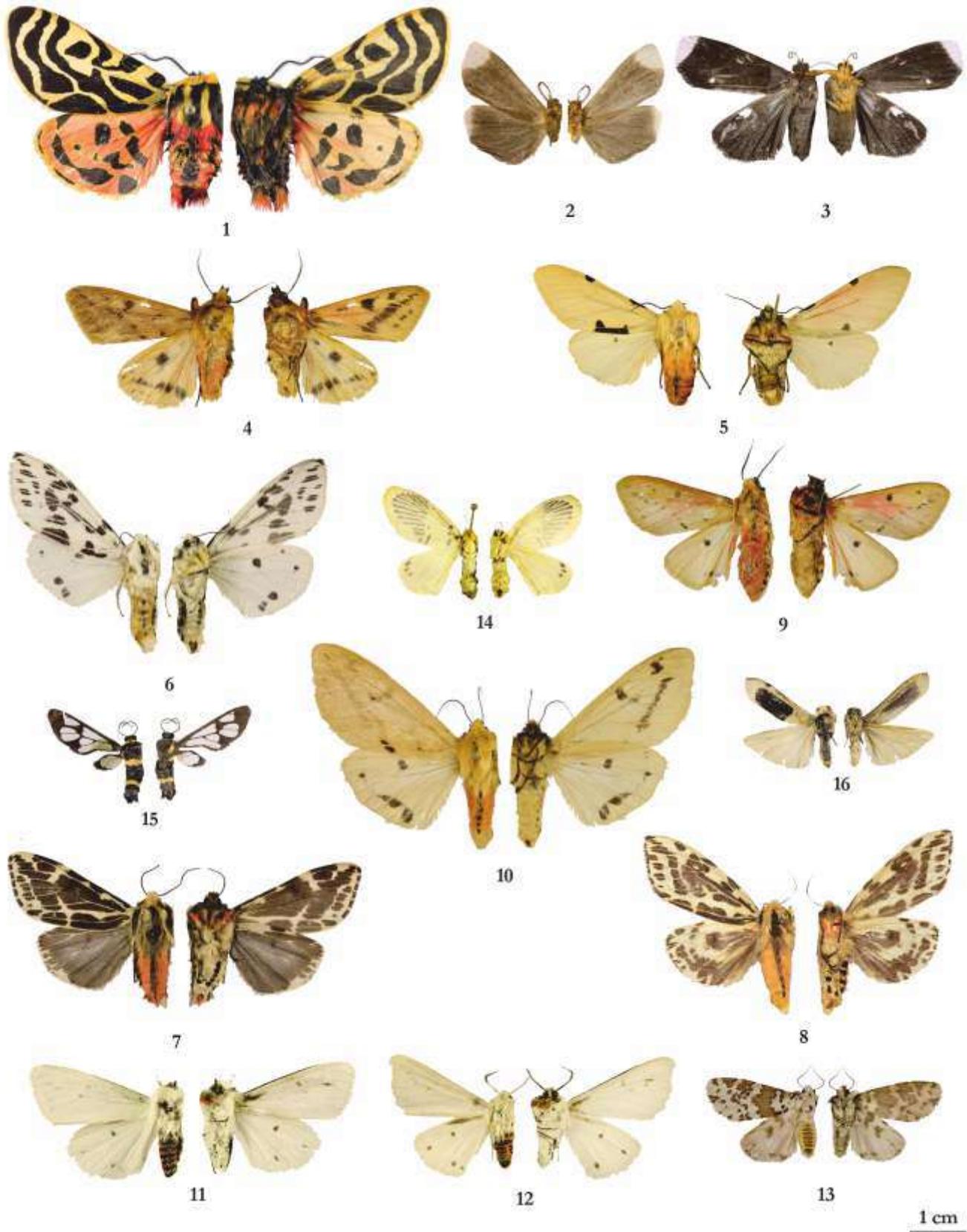
1. *Cyana adita* 2. *C. arama* 3. *C. bellissima* 4. *C. bianca* 5. *C. candida* 6. *C. detrita* 7. *C. dobertyi* 8. *C. dudgeoni* 9. *C. flavicincta*
 10. *C. gelida* 11. *C. guttifera* 12. *C. intercomma* 13. *C. molleri* 14. *C. peregrina* 15. *C. perornata* 16. *C. puer* 17. *C. puella*
 18. *C. signa* 19. *C. sikkimensis* 20. *Katba conformis* 21. *K. spinoapex* 22. *Lyclene calamaria* 23. *Macotasa nubecula*



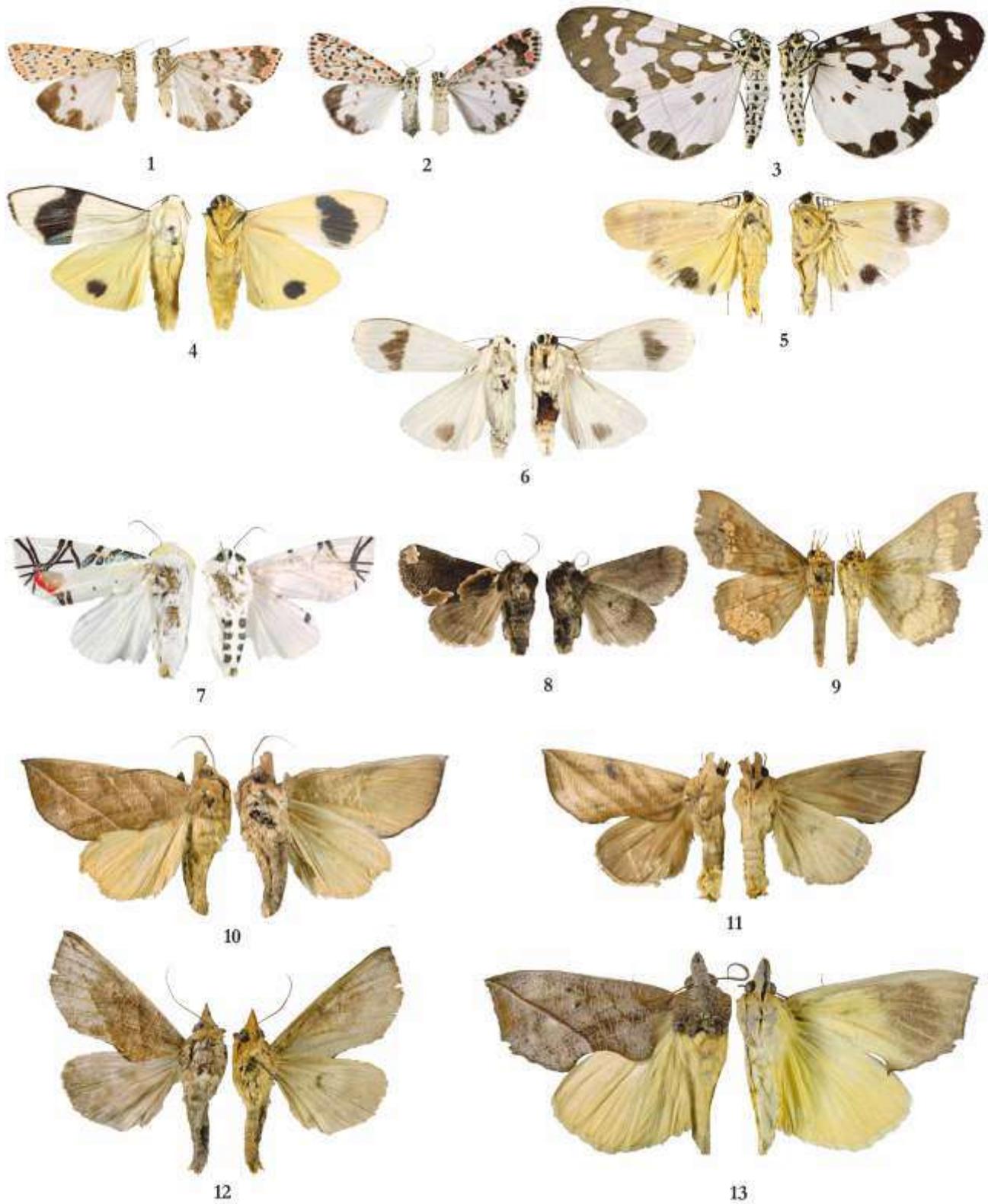
1 cm

Plate 115 : Erebidae

1. *Lemyra multivittata* 2. *L. mellis* 3. *L. stigmata* 4. *Macrobrochis gigas* 5. *M. pallens* 6. *M. prasena* 7. *Mangina argus*
8. *Nannoarctia obliquifascia* 9. *Nyctemera adversata* 10. *N. arctata* 11. *N. carissima* 12. *Olepa ricini*



1. *Preparctia hanningtoni* 2. *Sidyra albifinis* 3. *S. apicalis* 4. *Spilarctia casigneta* 5. *S. comma* 6. *S. inayatullahi*
 7. *S. leopardina* 8. *S. melanostigma* 9. *S. obliqua* 10. *S. sagittifera* 11. *Spilosoma erythrozona* 12. *S. punctaria* 13. *S. unifascia*
 14. *Stigmatophora palmata* 15. *Syntomoides imaon* 16. *Thysanoptyx tetragona*



1 cm

Plate 117 : Erebidae

1. *Uetobeisa lotrix* 2. *U. pulchelloides* 3. *U. varians* 4. *Vamuna alboluteola* 5. *V. maculata* 6. *V. remelana*
7. *Baorisa hieroglyphica* 8. *Cymatophoropsis sinuata* 9. *Lopharthrum comprimens*
10. *Calyptra bicolor* 11. *C. fasciata* 12. *C. minuticornis* 13. *C. ophideroides*

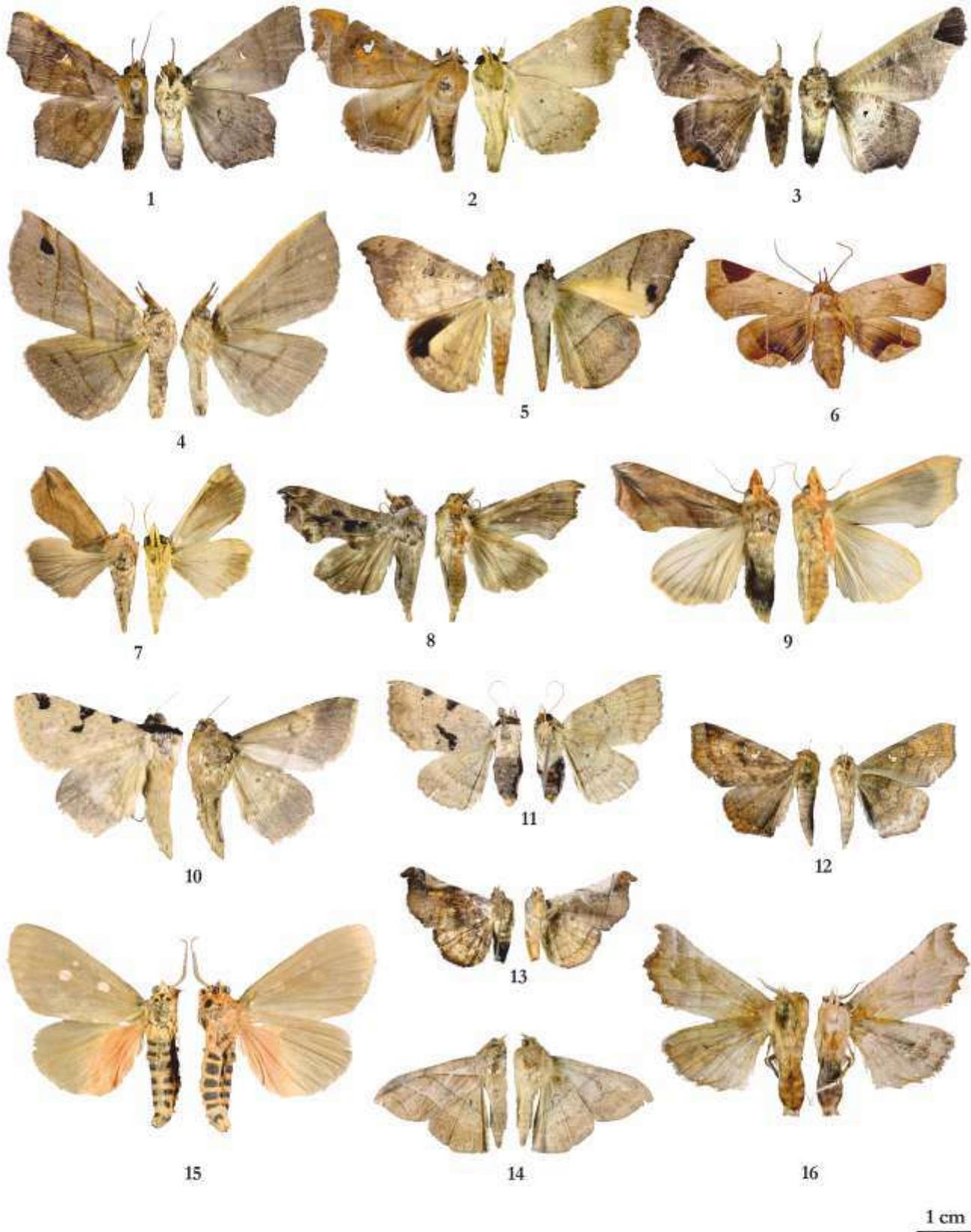


Plate 118 : Erebidae

1. *Episparis costistriga* 2. *E. liturata* 3. *E. tortuosalis* 4. *Eurogramma obliquilineata* 5. *Oxyodes scrobiculata* 6. *Psimada quadripennis*
 7. *Oraesia emarginata* 8. *O. provocans* 9. *O. rectistria* 10. *Rema costimacula* 11. *R. tetraspila* 12. *Thyrostipa sphaeriphora*
 13. *Pleurota falcata* 14. *Tiruvaca subcostalis* 15. *Tinotus eburneigutta* 16. *Scoliopteryx libatrix*



1 cm

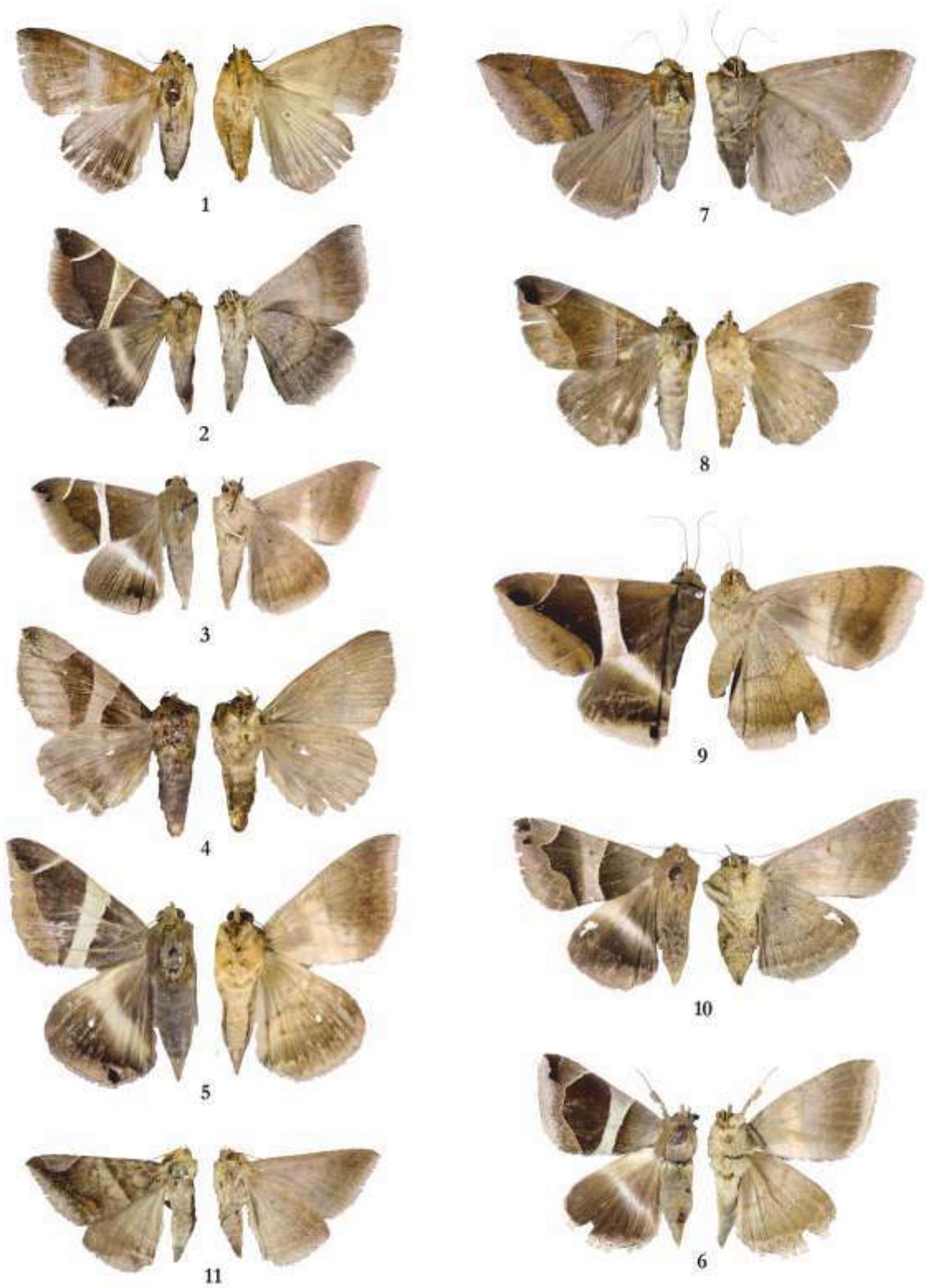
Plate 119 : Erebidae

1. *Acbaea serva* 2. *A. janata* 3. *Anisoneura aluco* 4. *A. salebrosa* 5. *Anoba pectinata* 6. *Anticarsia irrorata* 7. *Artena dotata*
8. *Arytrurides inornata* 9. *Bamra albicola* 10. *B. lepida*



Plate 120 : Erebidae

1. *Arcte coerulea* 2. *A. modesta* 3. *A. polygrapha* 4. *Chalciops mygdon* 5. *Daddala brevicauda* 6. *D. lucilla* 7. *D. quadrisignata*
8. *Dysgonia palumba*



1 cm

Plate 121 : Erebidae

1. *Bastilla absentimacula* 2. *B. analis* 3. *B. arctotaenia* 4. *B. arcuata* 5. *crameri* 6. *B. latifascia* 7. *B. maturata*
8. *B. maturescens* 9. *B. praetermissa* 10. *B. stuposa* 11. *Buzara luteipalpis*

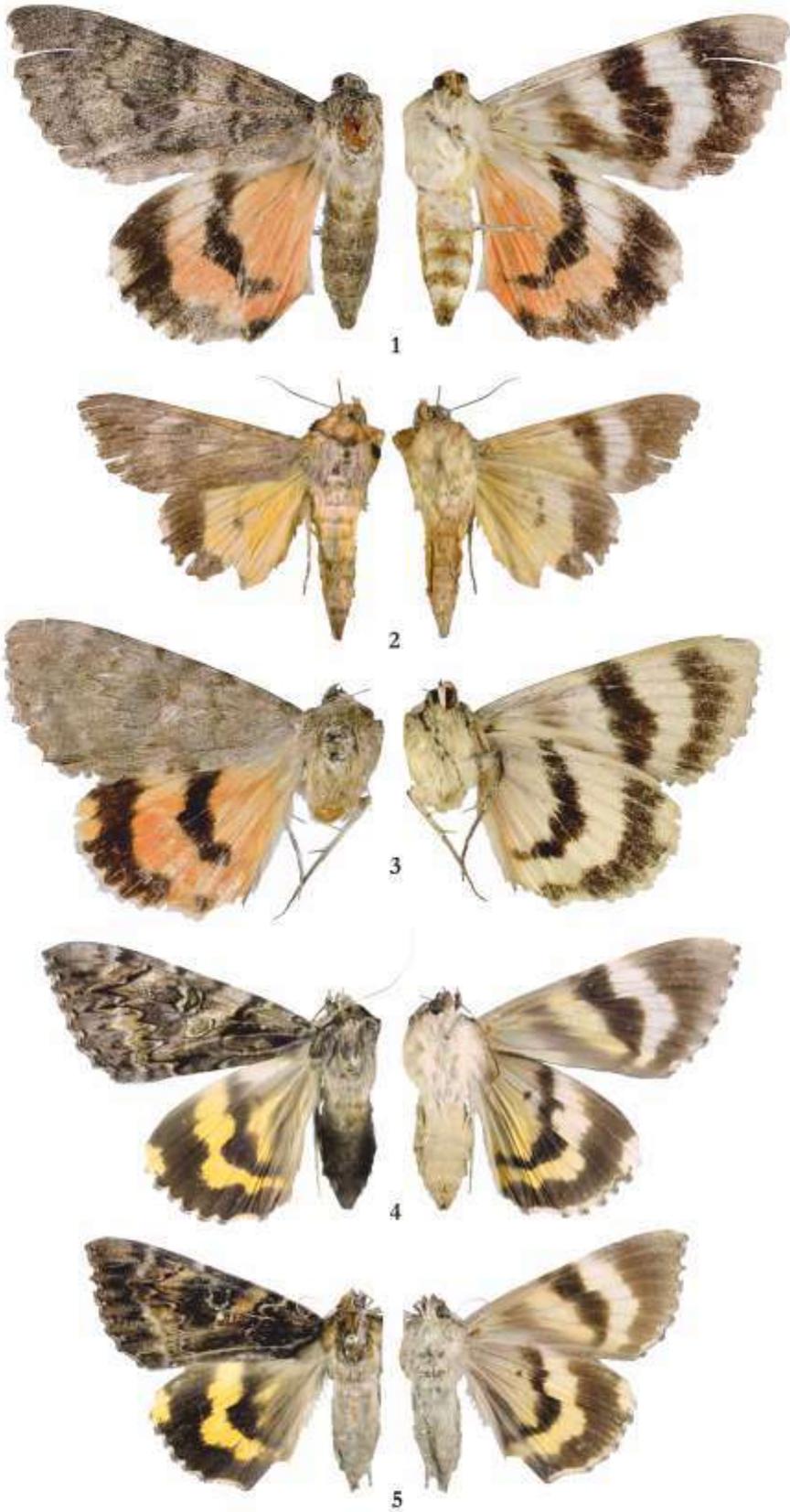


Plate 122 : Erebidae

1. *Catocala concubia* 2. *C. macula* 3. *C. orientalis* 4. *C. patala* 5. *C. tapestrina*

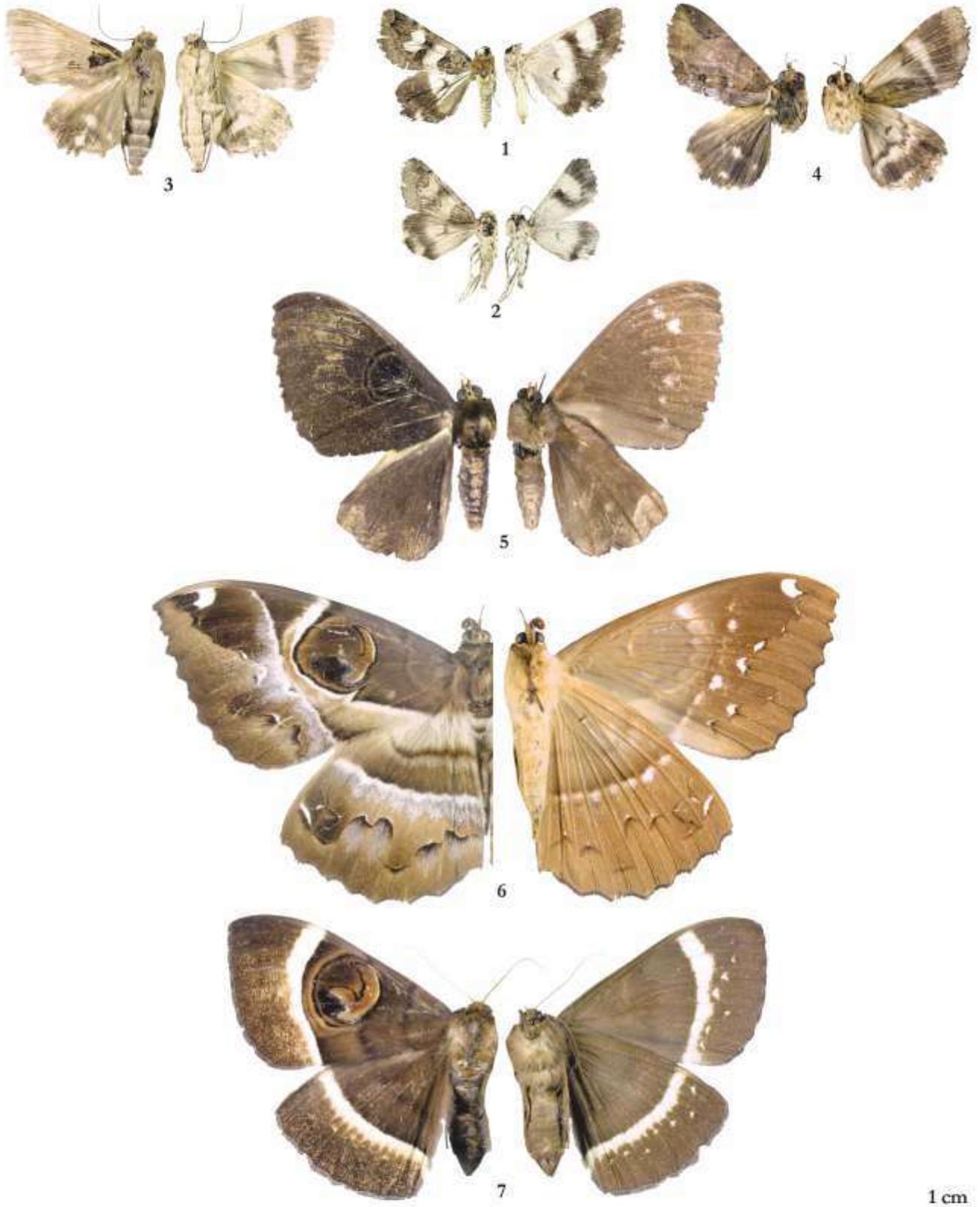


Plate 123 : Erebidae

1. *Drasteria cailino* 2. *D. caucasica* 3. *Erebeia cyllaria* 4. *E. pulchrivenula* 5. *Erebus caprimulgus* 6. *E. ephesperis* 7. *E. gemmans*



1 cm

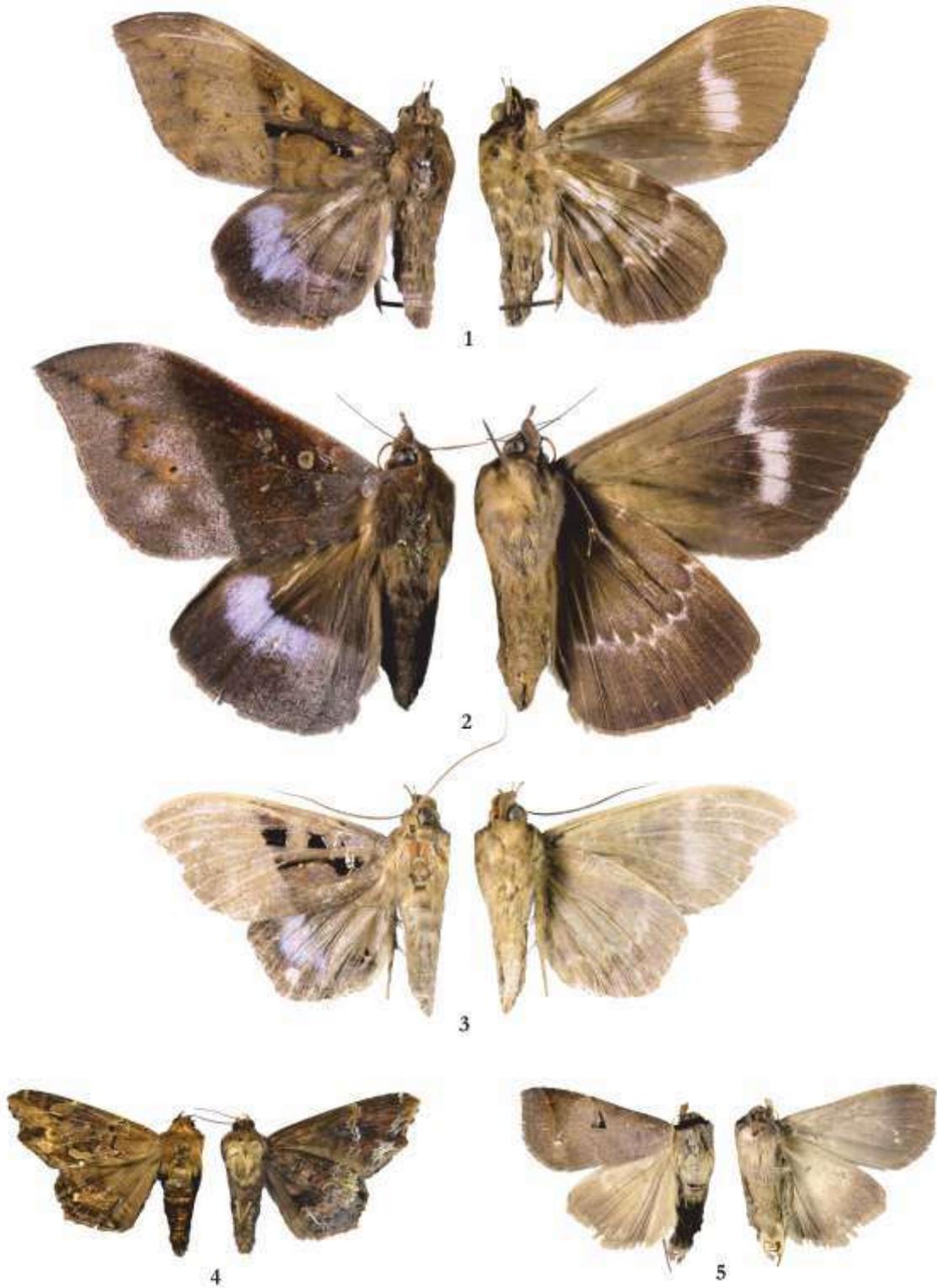
Plate 124 : Erebidae

1. *Erebus hieroglyphica* 2. *E. macrops* 3. *Ericeia eriophora* 4. *E. inangulata* 5. *E. pertendens*



Plate 125 : Erebidae

1. *Fodina contigua* 2. *F. pallula* 3. *Hamodes pendleburyi* 4. *H. propitia* 5. *Hulodes caranea* 6. *H. drylla* 7. *Hypersypnoides constellata*
8. *H. submarginata* 9. *Hypopyra feniseca* 10. *H. vespertilio*



1 cm

Plate 126 : Erebidae

1. *Ischyja inferna* 2. *I. manlia* 3. *I. marapok* 4. *Lacera procellosa* 5. *Lygephila dorsigera*

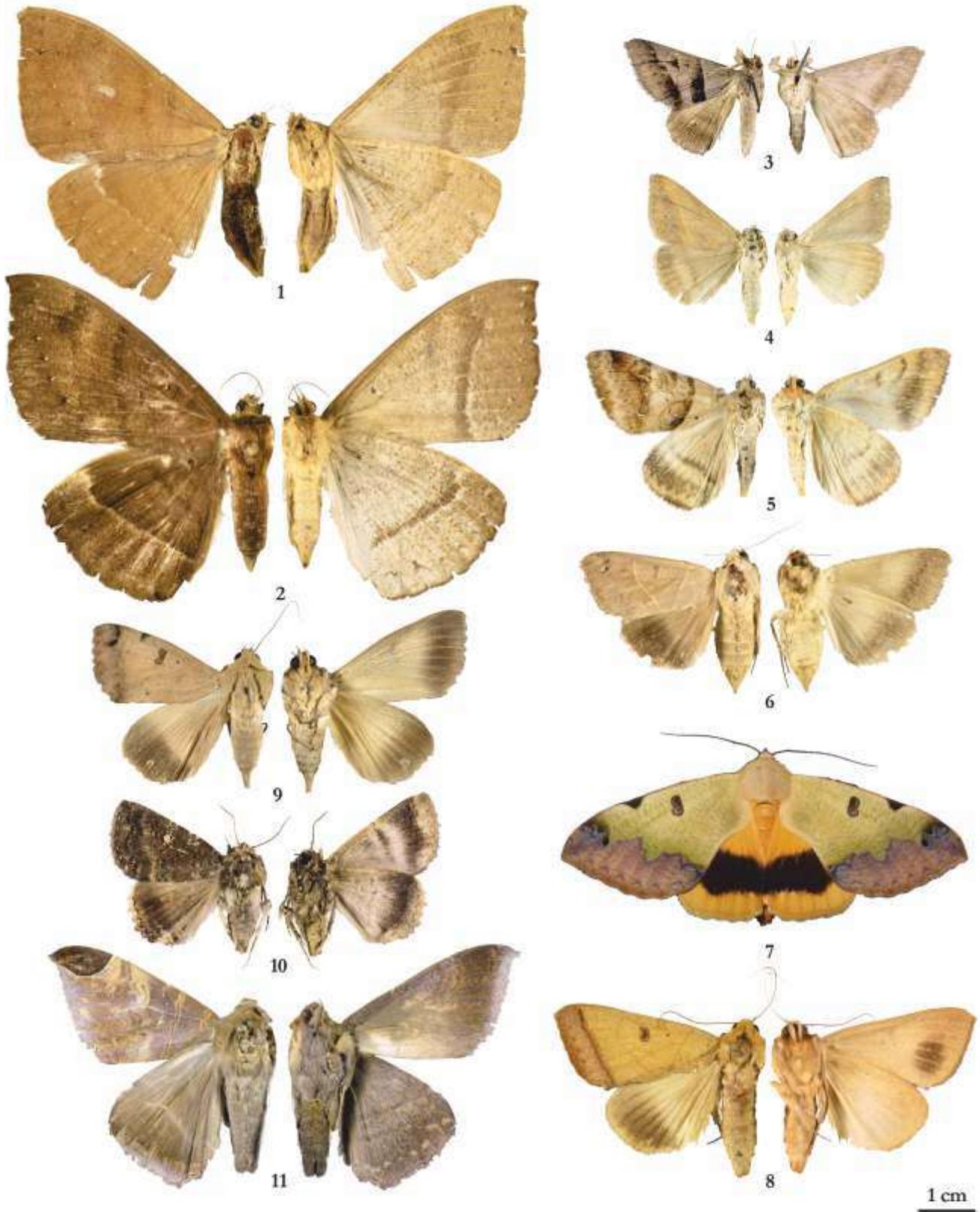


Plate 127 : Erebidae

1. *Lygniodes endoleucus* 2. *L. hypoleuca* 3. *Mocis discios* 4. *M. frugalis* 5. *M. undata* 6. *Ophiusa indistincta* 7. *O. irbhaca* 8. *O. trapezium*
9. *O. triphaenoides* 10. *Otbresypna ochreicallia* 11. *Pindara illibata*

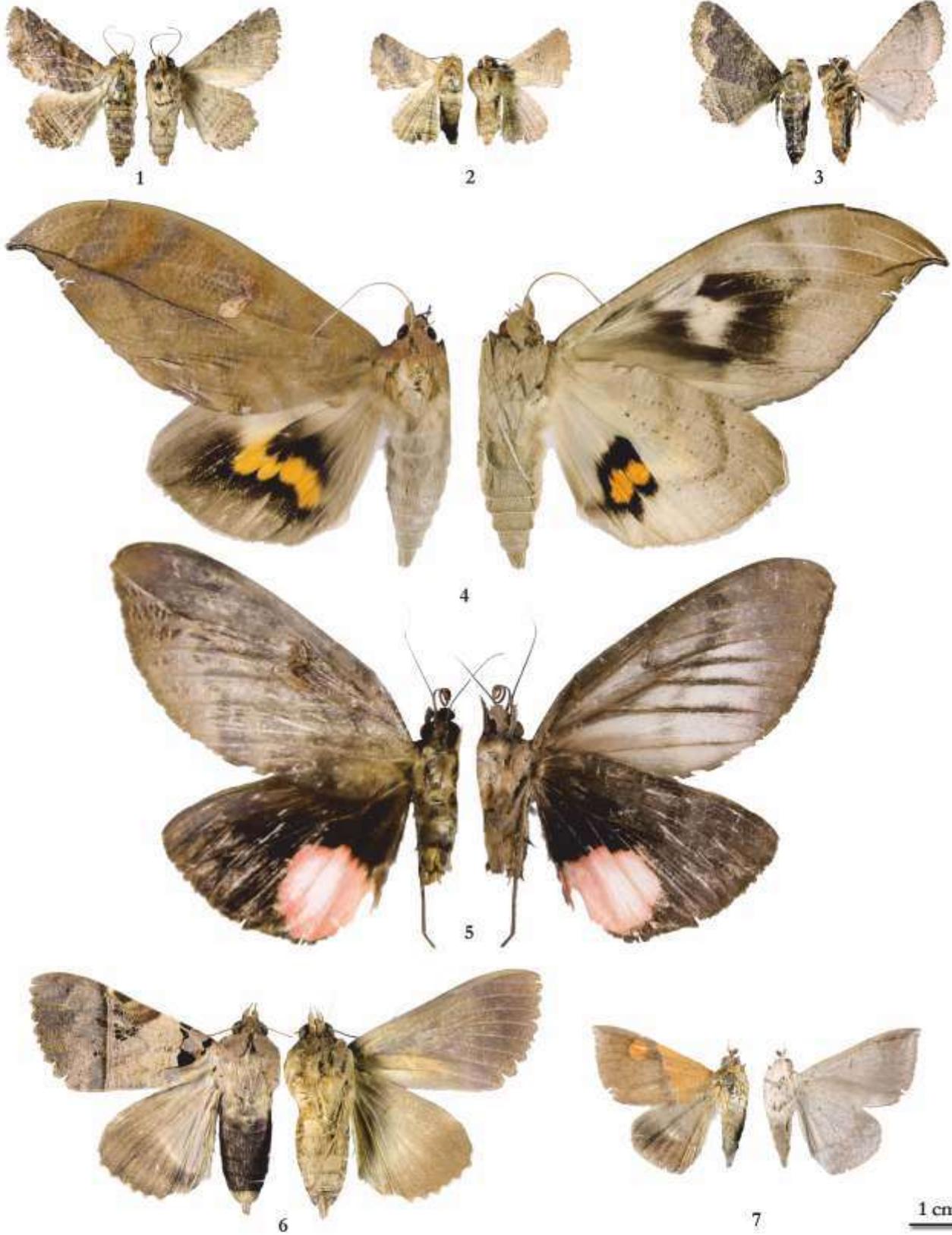
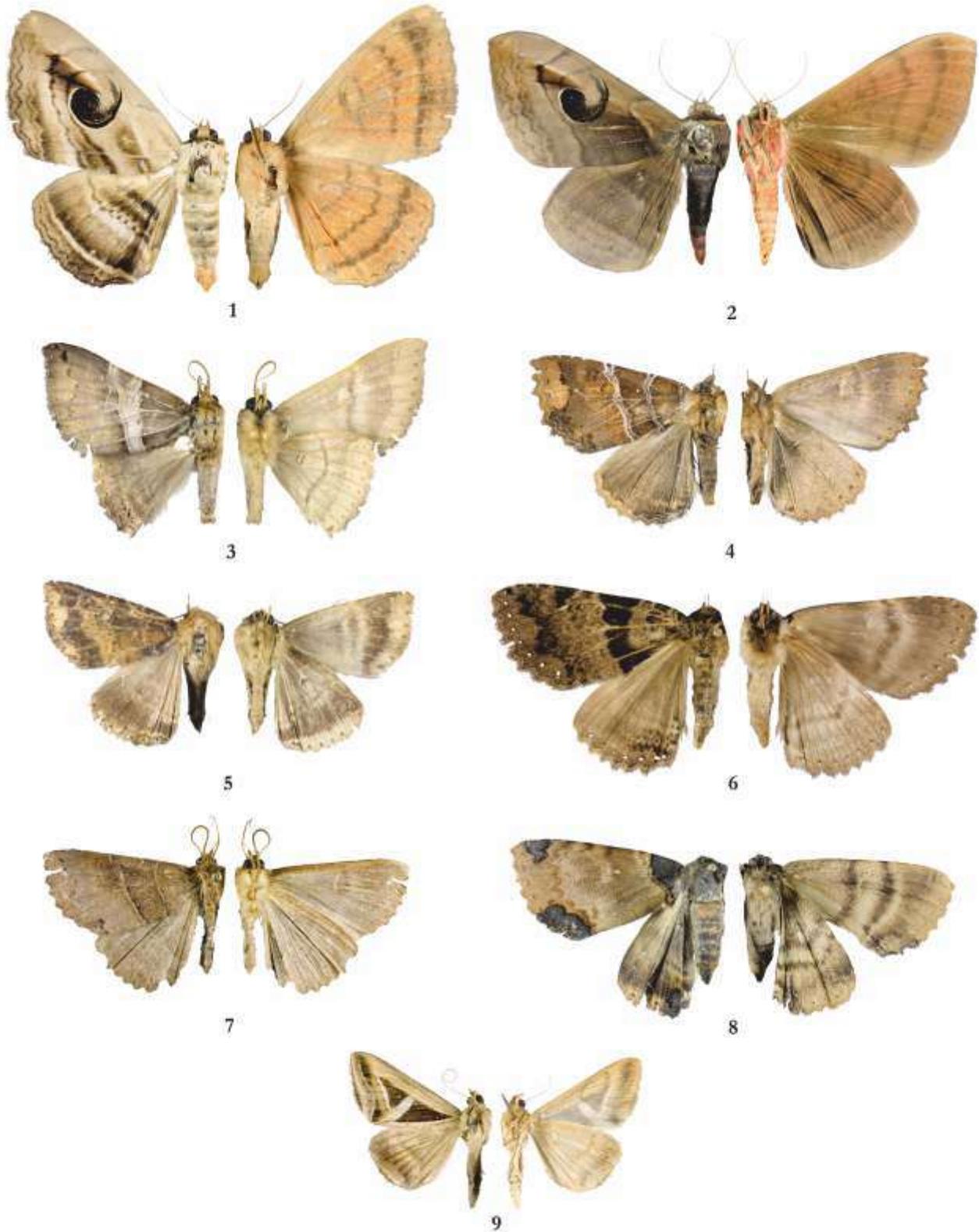


Plate 128 : Erebidae

1. *Pericyma cruegeri* 2. *P. glaucinans* 3. *P. umbrina* 4. *Phyllodes eyndhovii* 5. *Phyllodes verbuelli* 6. *Serrodes campana* 7. *Sympis rufibasis*



1 cm

Plate 129 : Erebidae

1. *Spirama belicina* 2. *S. retorta* 3. *Supersynpnoides kirbyi* 4. *S. malaisei* 5. *Sypna dubitaria* 6. *S. omicronigera*
7. *Sypnoides cyanivitta* 8. *S. pannosa* 9. *Trigonodes hypypasia*



1 cm

Plate 130 : Erebidae
1. *Thyas coronata* 2. *T. bonesta* 3. *T. junno*



2



3



4



5



1



9



6



7



8



10



11



12



13



14



15



16



17



18

1 cm

Plate 131 : Erebidae

1. *Bertula abjudicalis* 2. *Simplicia bimarginata* 3. *S. schaldusalis* 4. *S. xantboma* 5. *Anoratha paritalis*
6. *Dichromia quadralis* 7. *D. sagitta* 8. *D. trigonalis* 9. *D. tripicalis* 10. *Hypena albisigna* 11. *H. conscialis* 12. *H. labatalis*
13. *H. laceratalis* 14. *H. longipennis* 15. *H. nocturnalis* 16. *H. obductalis* 17. *H. strigatus* 18. *H. vestita*

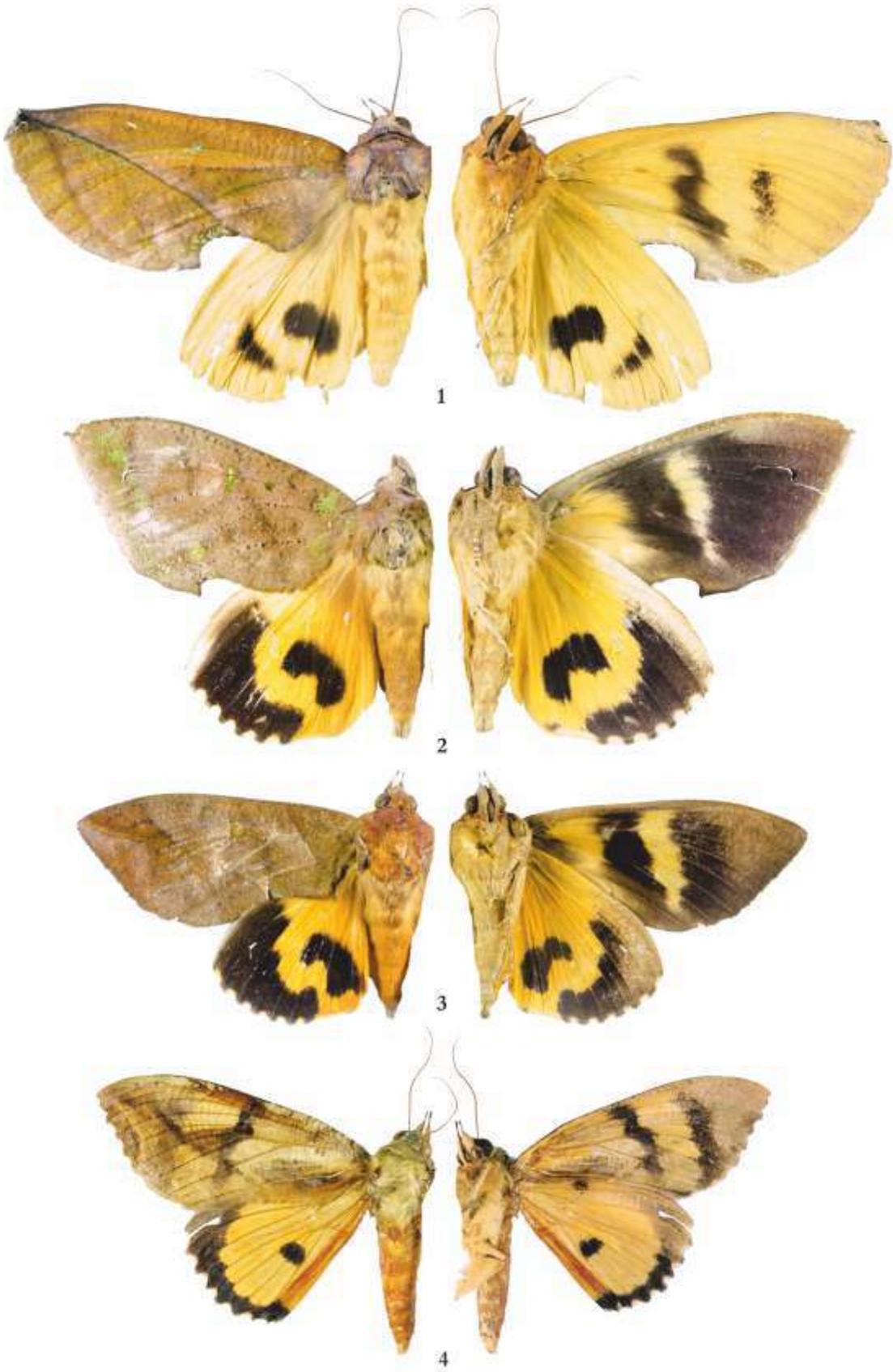


Plate 132 : Erebidae

1. *Eudocima aurantia* 2. *E. discrepans* 3. *E. bomaena* 4. *E. materna*

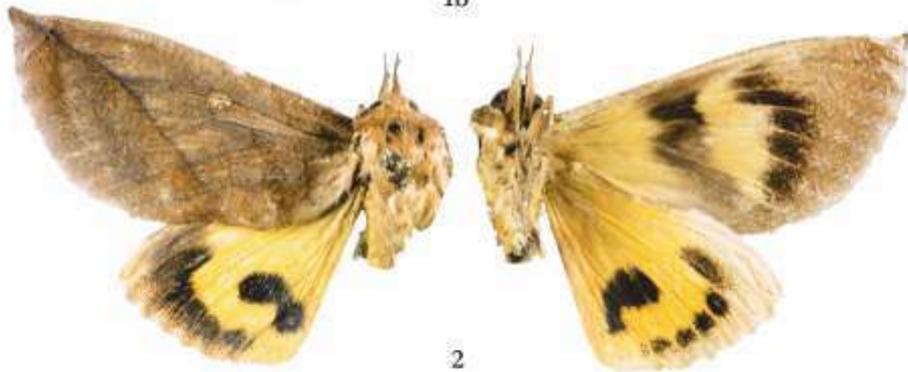
1 cm



1a



1b



2



3

1 cm

Plate 133 : Erebidae

1 a,b. *Endocima hypermnestra* 2. *E. okurai* 3. *E. phalonia*

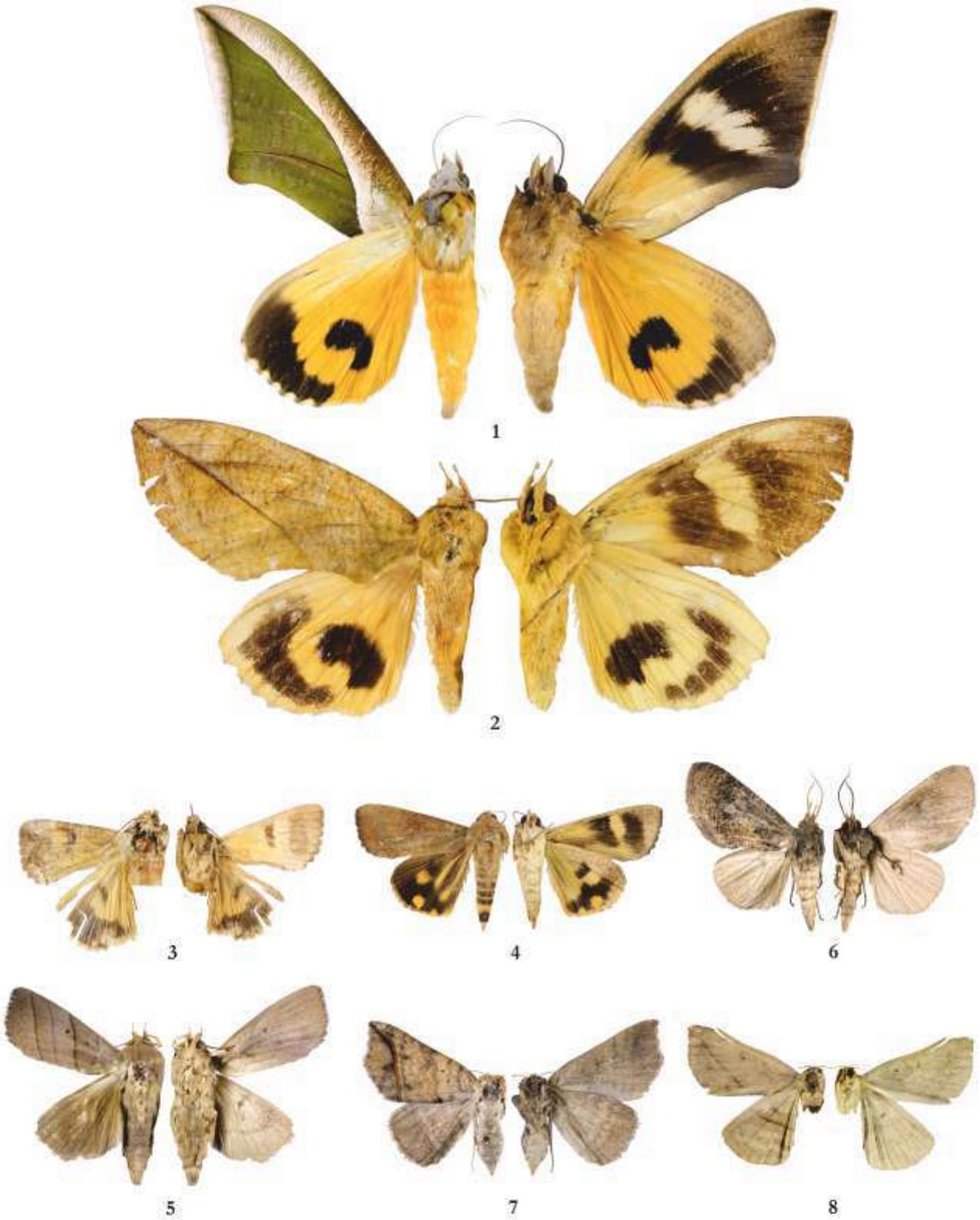
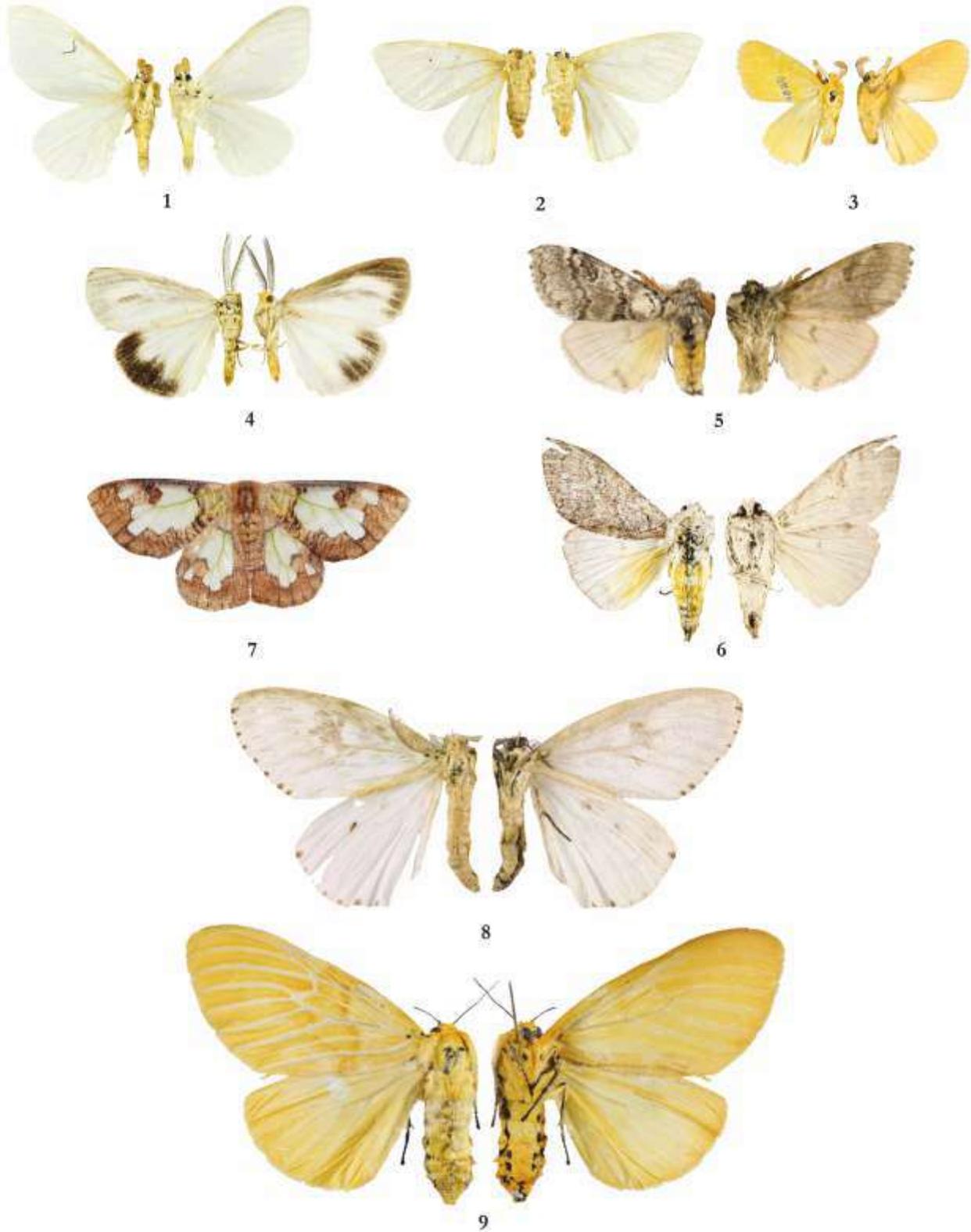


Plate 134 : Erebidae

1. *Eudocima salamina* 2. *E. sikhimensis* 3. *Hypocala deflorata* 4. *H. subsatura* 5. *Asta quadrilinea* 6. *Batracharta irrorata*
7. *Blasticoberinus varius* 8. *Carsina flavibrunnea*



1 cm

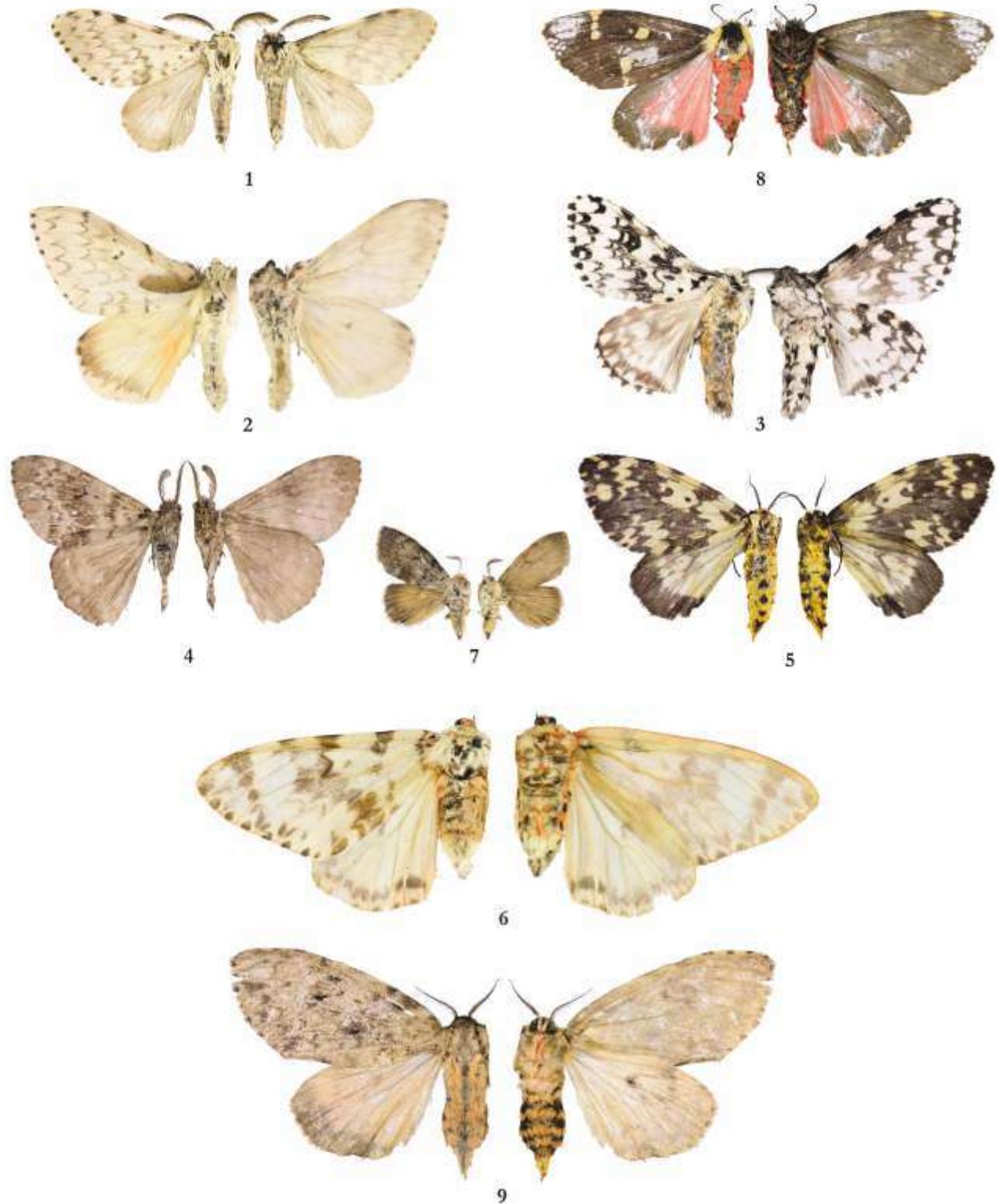
Plate 135 : Erebidae

1. *Arcionis comma* 2. *A. submarginata* 3. *Artaxia vitellina* 4. *Birnara bicolor* 5. *Calliteara borsfieldi* 6. *C. strigata* 7. *Carriola ecomoda*
8. *Cispia alba* 9. *C. punctifascia*



Plate 136 : Erebidae

1. *Dasychira cerebosa* 2. *D. complicata* 3. *Euproctis divisa* 4. *E. marginata* 5. *Lymantriades varia* 6. *Heracula discivitta* 7. *Himala argentea*
8. *Ilema chloroptera* 9. *Imaus munda*



1 cm

Plate 137 : Erebidae

1. *Lymantria bivittata bivittata* 2. *L. brotea lepcha* 3. *L. concolor concolor* 4. *L. incerta* 5. *L. marginata* 6. *L. mathura* 7. *L. obfuscata*
8. *L. semicincta* 9. *L. serva*

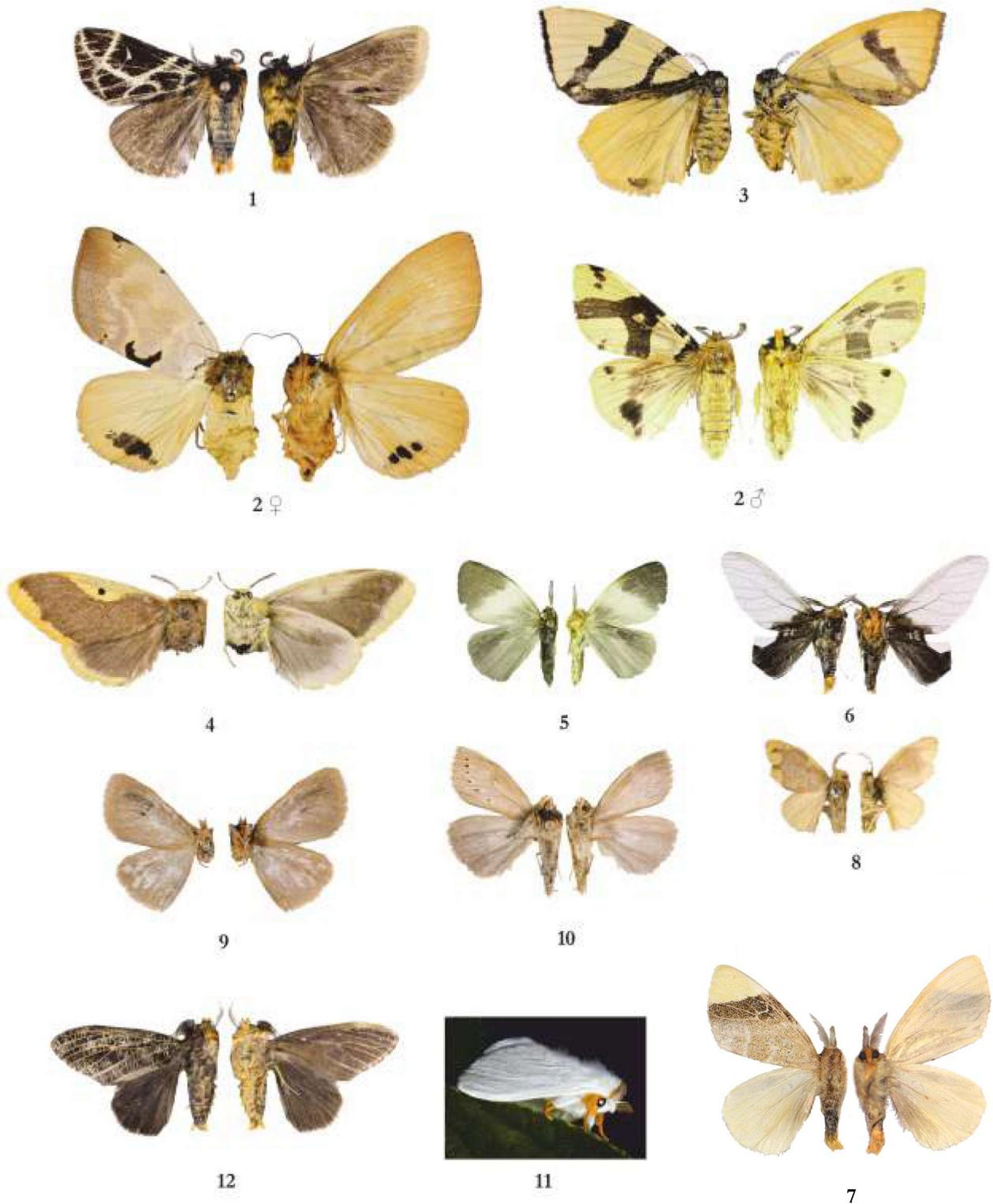
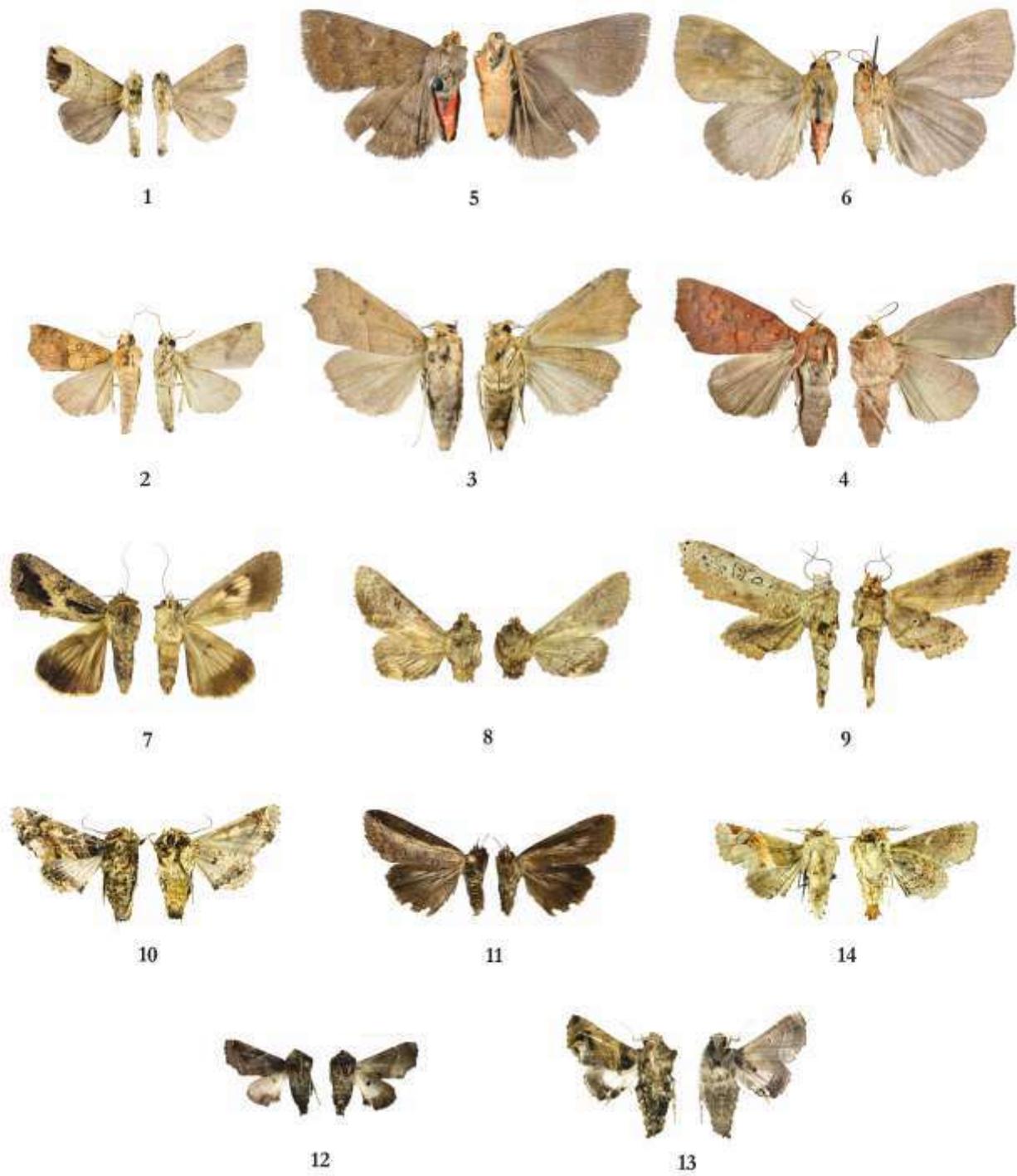


Plate 138 : Erebidae

1. *Mardara calligramma* 2. *Numenes patrana* 3. *N. siletti* 4. *Nygmia epirotica* 5. *Pantana albifascia* 6. *Perina nuda* 7. *Pida apicalis*
 8. *Somena scintillans* 9. *Laelia exclamations* 10. *L. umbrina* 11. *Leucoma clara* 12. *Loebarna limbata*



1 cm

Plate 139 : Erebidae, Eutelidae

1. *Bocula bifaria* 2. *Anomis flava* 3. *Gonitis mesogona* 4. *Rusicada revocans* 5. *Calesia dasyptera* 6. *C. baemorrhoa*
7. *Odontodes aleuca* 8. *Anuga insuffusa* 9. *A. japonica* 10. *Eutelius adulatrix* 11. *Lophoptera squammigera*
12. *Penicillaria jocosatrix* 13. *P. maculata* 14. *Targalla subocellata*

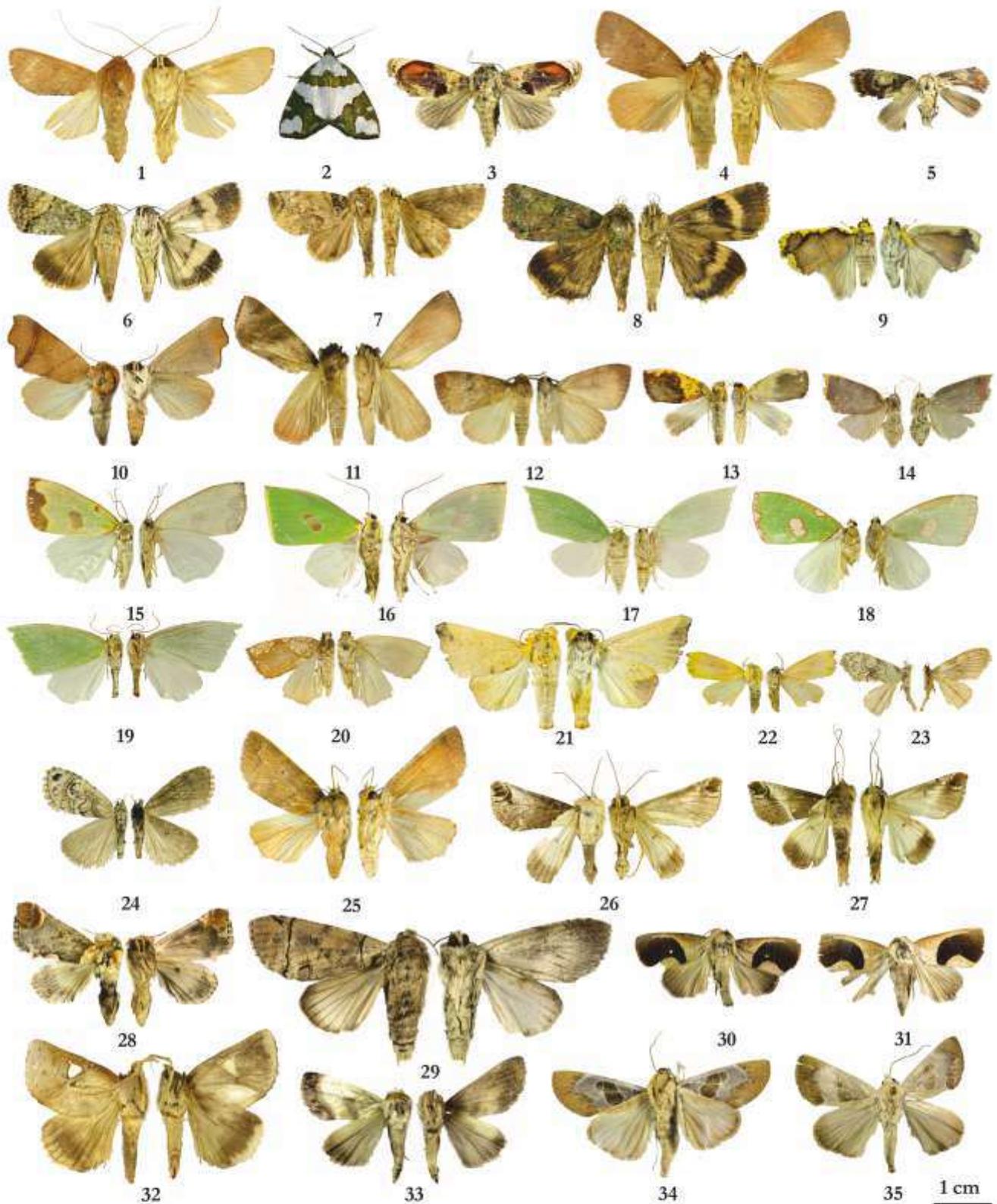


Plate 140 : Nolidae

1. *Aiteta truncata* 2. *Ariolica pulchella* 3. *Calymene picta* 4. *C. sabulosa* 5. *Negritotripta orbifera* 6. *Blenina quinaria* 7. *B. nitida*
 8. *B. senex* 9. *Cbandica quadripennis* 10. *Carea angulata* 11. *C. internifusca* 12. *Gelastocera castanea* 13. *Siglophora sanguinolenta*
 14. *Topadesa sanguinea* 15. *Tyana calliclora* 16. *T. chloroleuca* 17. *T. elongata* 18. *T. magniplaga* 19. *T. falcata* 20. *Gabala argentata*
 21. *Xenochroa xanthia* 22. *Earias roseoviridis* 23. *Meganola scriptoides* 24. *M. scripta* 25. *Tympanistes testacea* 26. *Risoba prominens*
 27. *R. obscurivialis* 28. *R. repugnans* 29. *Gadirtha pulchra* 30. *Miaromima cornucopia* 31. *M. pangolina* 32. *Pterogonia cardinalis*
 33. *Westermannia triangularis* 34. *W. elliptica* 35. *W. superba*

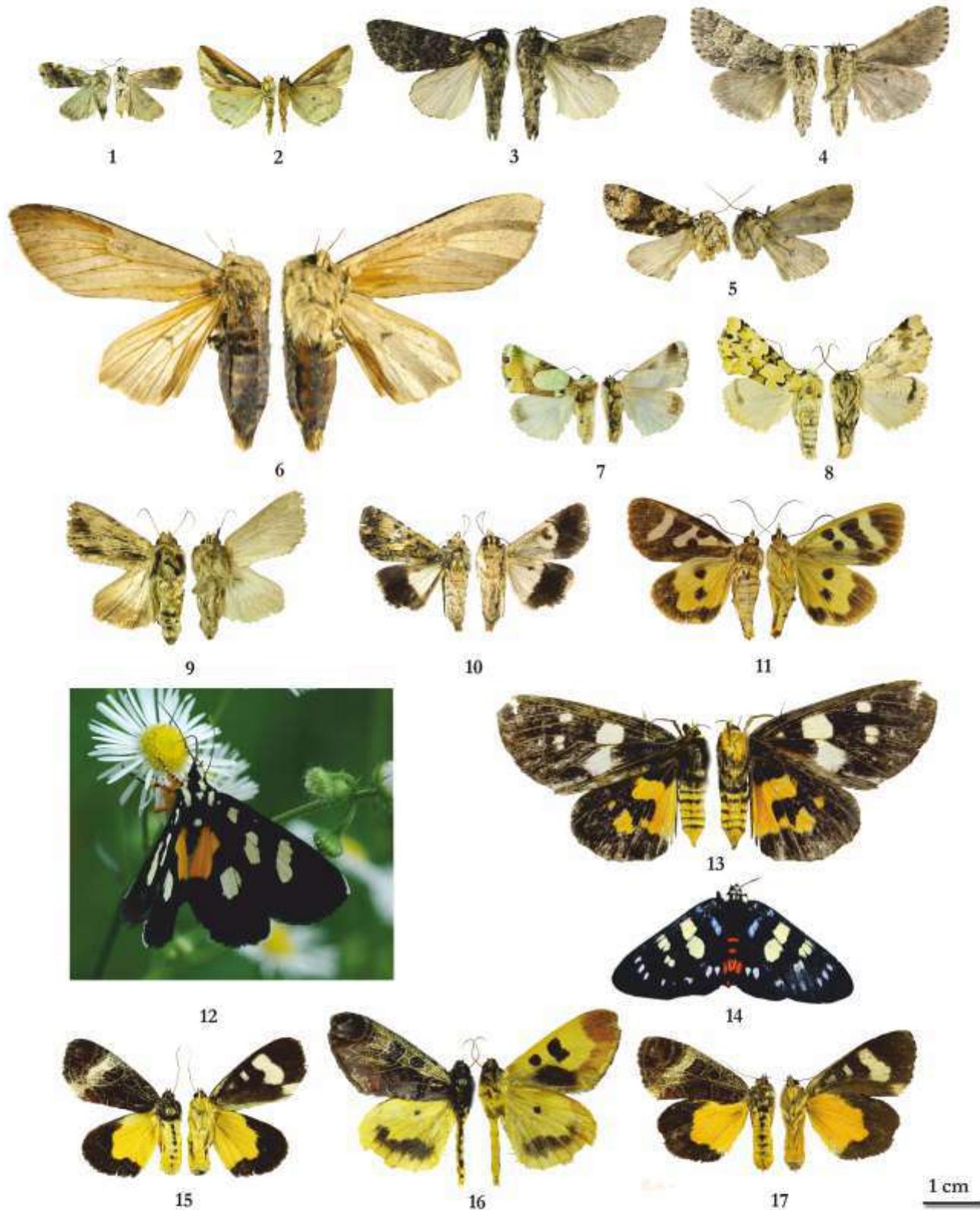


Plate 141 : Noctuidae

1. *Acontia marmoralis* 2. *Micardia pulcherrima* 3. *Acronicta bicolor* 4. *A. megacephala* 5. *Craniophora barmandi* 6. *Arcilasisa sobria*
7. *Nacna malachitis* 8. *N. prasinaria* 9. *Auchmis indica* 10. *Aedia leucomelas* 11. *Aegocera bimacula* 12. *Mimensemia peshwa*
13. *Exsula dentatrix* 14. *Episteme lectrix* 15. *Sarbanissa dissimilis* 16. *S. insocia* 17. *S. transiens*

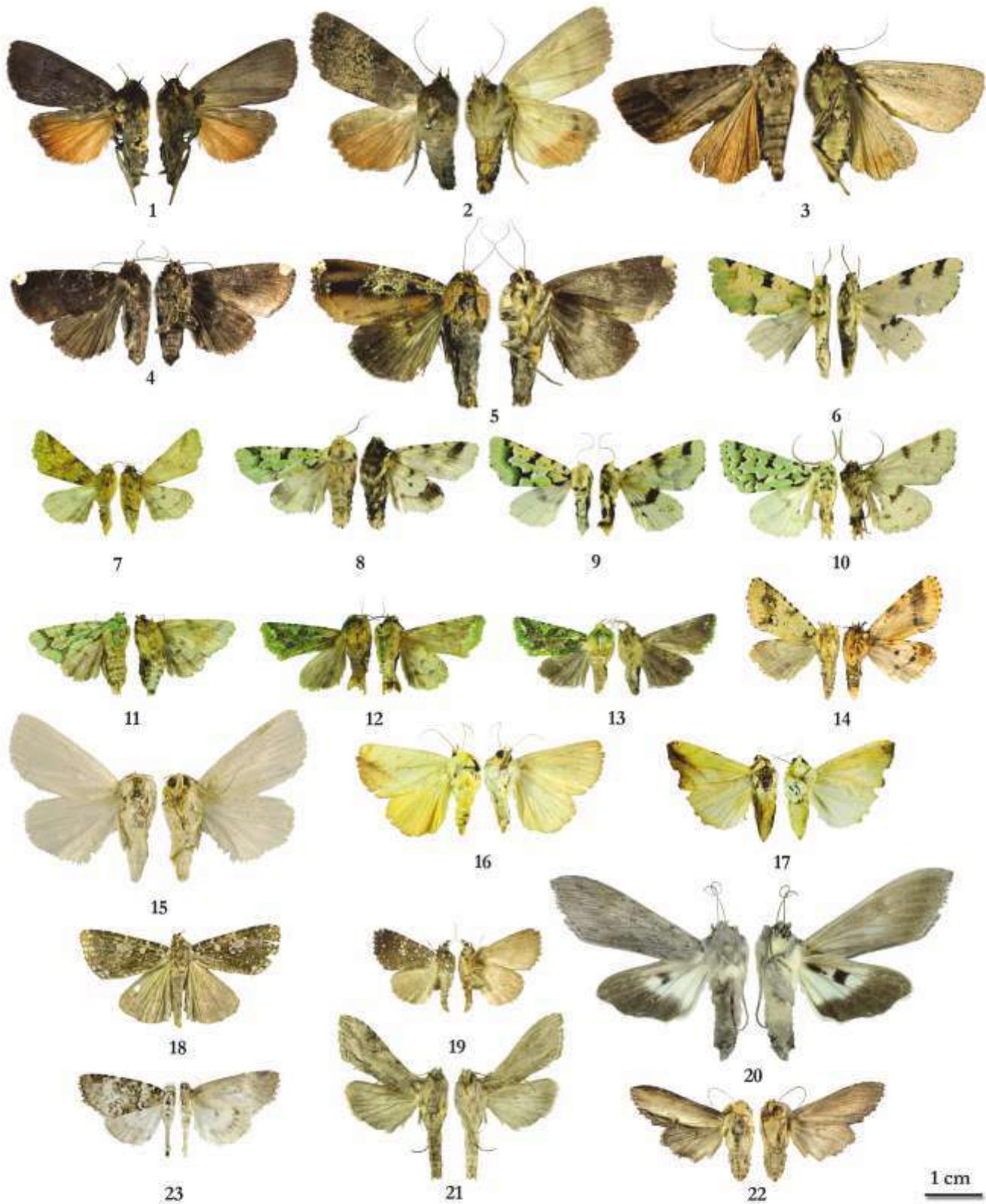


Plate 142 : Noctuidae

1. *Amphipyra cupreipennis* 2. *A. monolitha* 3. *A. pyramidea* 4. *Callyna monoleuca* 5. *C. semivitta* 6. *Diphtherocome fasciata*
 7. *D. bryochlora* 8. *D. viridissima* 9. *D. vicens* 10. *D. pallida* 11. *D. chloronympha* 12. *D. thainympha* 13. *D. chrysochlora*
 14. *D. discibrunnea* 15. *Chasmina candida* 16. *Xanthodes intersepta* 17. *X. transversa* 18. *Perigea albomaculata*
 19. *Prospalta leucospila* 20. *Cucullia pullata* 21. *C. thomasi* 22. *Sbargacucullia verbasci* 23. *Bryophila literata*

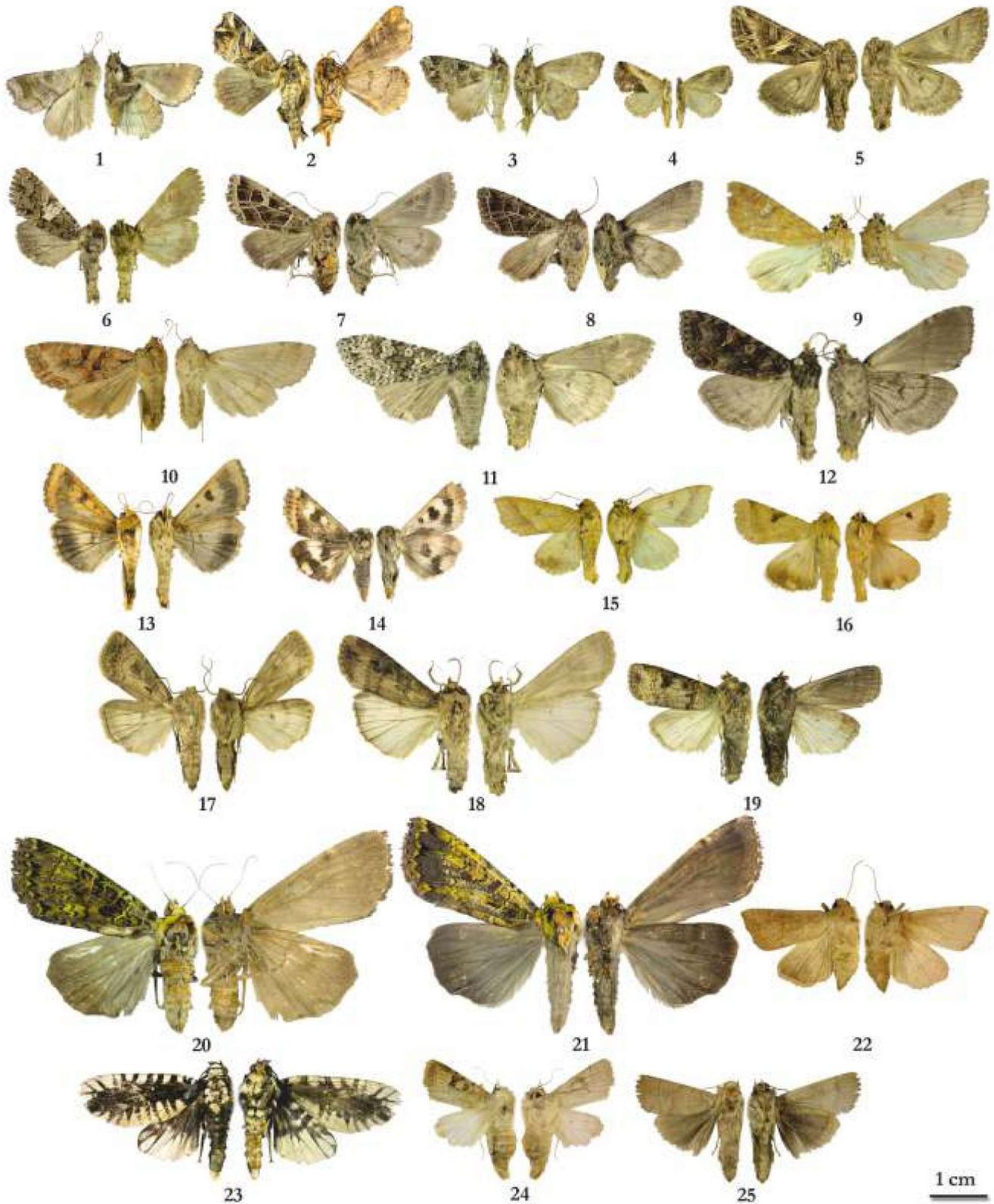


Plate 143 : Noctuidae

1. *Callopietria placodoides* 2. *C. repleta* 3. *C. rivularis* 4. *Maliattha vialis* 5. *Anarta farnbami* 6. *Hadena albimacula*
7. *Heliophobus bulcsui* 8. *H. texturata* 9. *Hypobarathra repetita* 10. *Melanbra dierli* 11. *Polia scotochlora* 12. *P. culta*
13. *Helicoverpa armigera* 14. *Heliobis maritima* 15. *Pyrrhia umbra* 16. *Heliobis peltigera* 17. *Agrotis exclamationis* 18. *A. ipsilon*
19. *A. segetum* 20. *Anaplectoides inexpectata* 21. *A. tamsi* 22. *Anapoma albicosta* 23. *Apsarasa radians* 24. *Athetis delecta* 25. *A. lineosa*



Plate 144 : Noctuidae

1. *Apamea cbbiringi* 2. *A. gratissima* 3. *A. purpurina* 4. *A. schaverdae* 5. *Axyليا putris* 6. *A. renalis* 7. *Bryopolia centralasiae*
 8. *Diarsia albipennis* 9. *D. nigrosigna* 10. *D. postpallida* 11. *D. tincta* 12. *Conservula indica* 13. *Dichagyris flammatrix* 14. *D. himalayensis*
 15. *D. triangularis* 16. *Dichystra dissectus* 17. *Ebertidia baderonides* 18. *Estagrotis cuprea* 19. *Elaphria conjugata* 20. *Estimata clavata*
 21. *Feliniopsis leucostigma* 22. *Eiccoea adumbrata* 23. *E. aquilina* 24. *E. hypochlora* 25. *E. ocbrogaster*

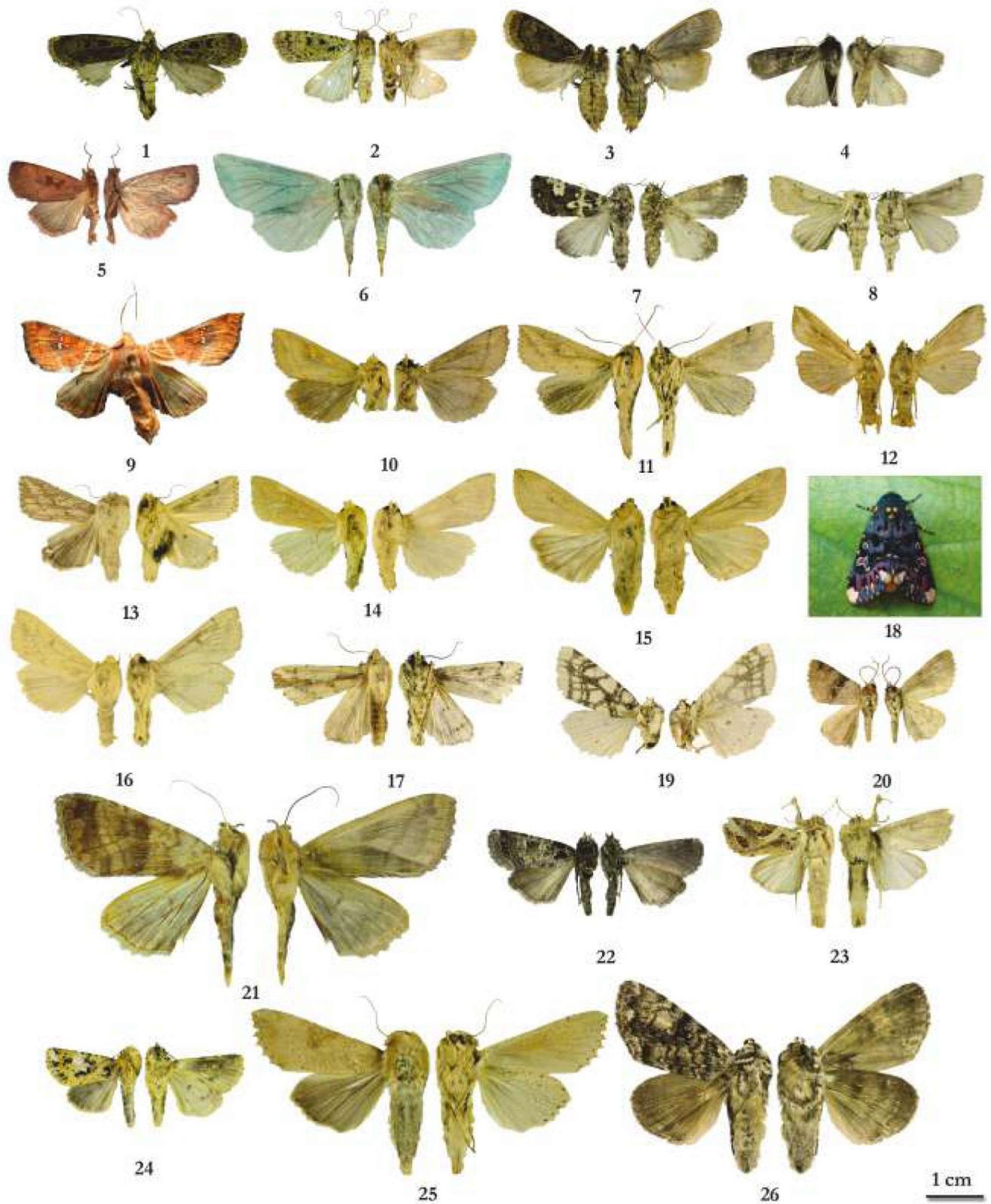


Plate 145 : Noctuidae

1. *Hermonassa consignata* 2. *H. incisa* 3. *H. marginata* 4. *H. oxypila* 5. *H. sinuata* 6. *Isocblora viridis* 7. *Karana gemmifera* 8. *Leucania yu*
9. *Lophotyna albosignata* 10. *Mythimna conigera* 11. *M. consimilis* 12. *M. separata* 13. *M. intertexta* 14. *M. renimaculata* 15. *M. hamifera*
16. *M. vitellina* 17. *M. sinuosa* 18. *Polytela gloriosae* 19. *Orthosia reticulata* 20. *Pseudeustrotia dimera* 21. *Paraxestia flavicaudata*
22. *Perissandria sikkima* 23. *Spodoptera litura* 24. *Xenotrachea albidisca* 25. *Tiracola plagiata* 26. *Sydiva nigrogrisea*



Plate 146 : Noctuidae

1. *Trachea auriplena* 2. *T. olivacea* 3. *T. melanospila* 4. *T. guttata* 5. *Xestia angara* 6. *X. bdelyma* 7. *X. c-nigrum* 8. *X. semiberbida*
 9. *X. curviplena* 10. *X. lobbichleri* 11. *X. junctura* 12. *X. gandakiensis* 13. *X. isochroma* 14. *Antitrisuloides catocalina*
 15. *Tambana subflava* 16. *T. albiplaga* 17. *Trisuloides sericea* 18. *Disepbolcia caerulea* 19. *Autographa nigrisigna*
 20. *A. purpureofusa* 21. *Chrysodeixis acuta* 22. *C. eriosoma*

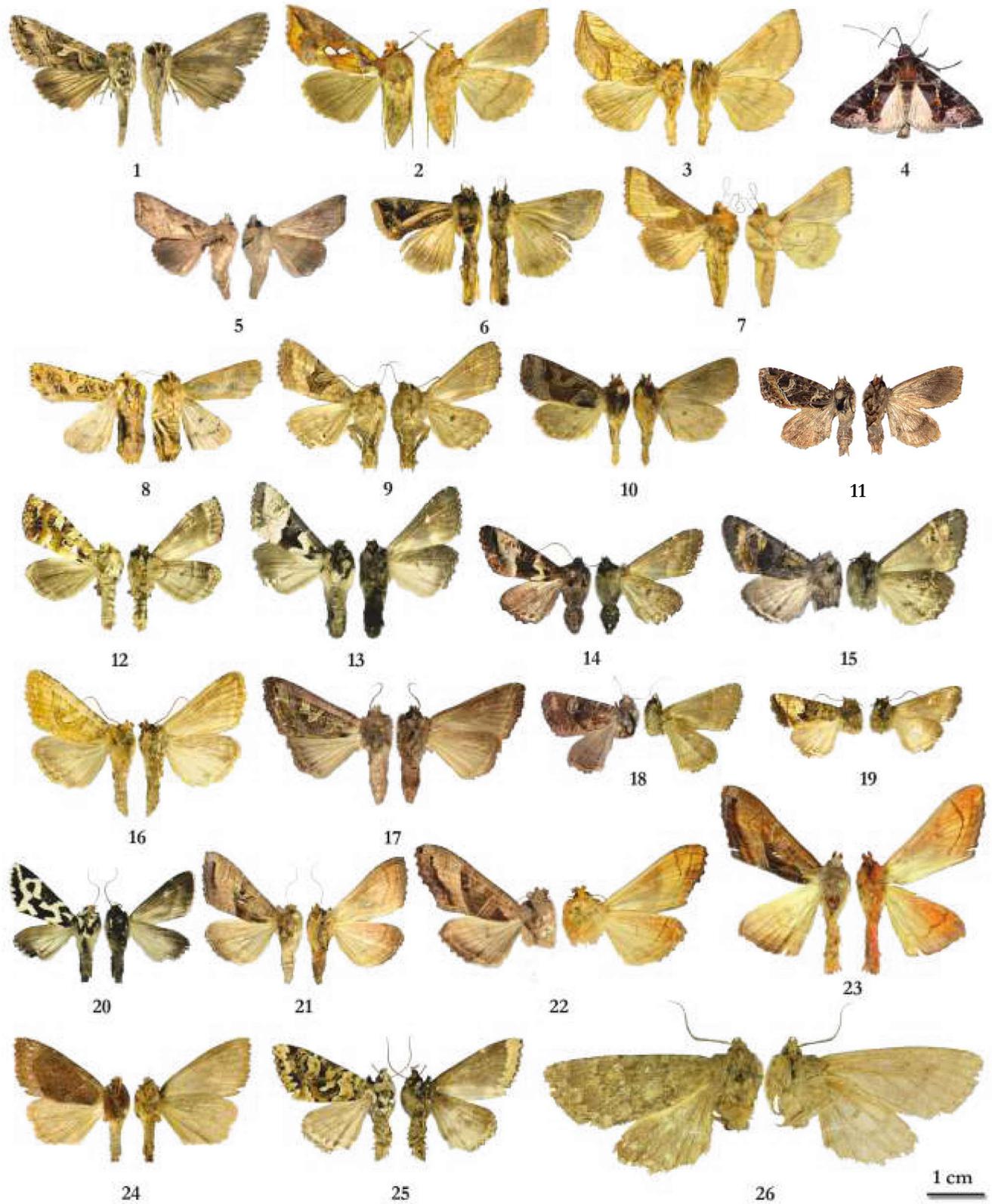


Plate 147 : Noctuidae

1. *Cornutiplusia circumflexa* 2. *Erythroplusia pyropia* 3. *Panchrysis deaurata* 4. *Scriptoplusia nigriluna* 5. *Ctenoplusia placida*
6. *Thysanoplusia lectula* 7. *T. orichalcea* 8. *Euplexia literata* 9. *E. semifascia* 10. *Oroplexia decorata* 11. *O. luteifrons*
12. *Phlogophora calamistrata* 13. *P. albovittata* 14. *P. pectinata* 15. *P. plumbeola* 16. *P. costalis* 17. *P. nobilis*
18. *P. striatovirens* 19. *P. discisignata* 20. *P. distorta* 21. *P. conservaloides* 22. *P. reticulodina*
23. *P. subpurpurea* 24. *Trichoridia endroma* 25. *Valeriodes heterocampa* 26. *Dasyptilia atrax*



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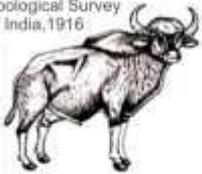


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ASSEMBLAGES OF LEPIDOPTERA IN INDIAN HIMALAYA

THROUGH LONG TERM MONITORING PLOTS

The book is the outcome of the National Mission on Himalayan Studies (NMHS) funded research project titled "**Lepidoptera (Insecta) as a Potential Indicator Taxa for tracking Climate Change in Indian Himalayan Landscape**" assessing the **assemblages of butterflies and moths** of **8 Himalayan landscapes** falling in **6 states** ranging from Cold Deserts of Ladakh to **Tropical Evergreen forests** in the foothills of Eastern Himalaya in Arunachal Pradesh. The aim of the book is to create a **database on Himalayan Lepidoptera**, including their **detailed distribution** globally and within India as state records, **altitude-habitat** and **microclimatic regimes**, so that in future, monitoring program can be targeted to look for any alternation in the **species ecology** in response to **Global Climate Change**. In the current book every species' information is arranged in such a way, that any reader can know about a species' **distribution range**, their **time and place of activity**, the **temperature-humidity range** in which they remain active etc., all in just a single turn of a page. The book also includes 147 colour plates depicting 1758 species of **butterflies and moths** provided in the **exact life-size**, meaning the size you see them flying in nature, depicting both the **patterns of upper side and under side of the wings** of every species. In separate chapters devoted for every landscape sampled, the book includes discussion on butterfly and moth **species composition of each landscape**, with notes on the abundant and restricted-range species, their **biogeographic affinity** and habitat, altitude-wise richness pattern. Altogether the book will be a "must read" for anyone dealing with the **Lepidopteran diversity of Himalaya and entire South-East Asia**.

Ladakh

Great Himalayan NP

Govind WLS

Askot WLS

Singalila & Neora Valley NP

Dihang Dibang BR

Namdapha NP



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