

The Genus *Capparis* L. in India



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Agharkar Research Institute
An Autonomous Institute under
Department of Science and Technology (DST), Govt. of India



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Capparis grandiflora Wall. ex Hook.f. & Thomson

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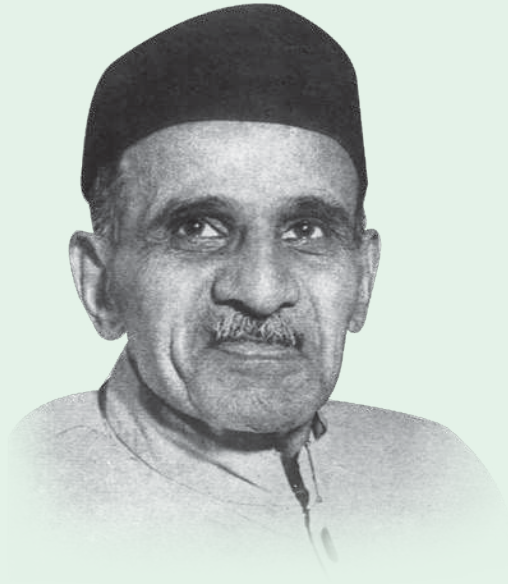
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Prof. Shankar Purushottam Agharkar
(1884-1960)

The book is humbly dedicated to
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Director's Message

Documentation of biodiversity is of immense importance in Taxonomy studies. In the era of Biotechnology, Biodiversity also needs to be explored for the production of valuable biomolecules and other industrial applications. India is a megadiverse country blessed with myriads of ecosystems that shelter an enormous number of unique organisms. Documentation of such natural resources has become vital in the light of declining forest areas and waning natural resources. MACS-Agharkar Research Institute has documented biodiversity of extreme, pristine and other precious habitats for a period exceeding six decades since its inception. The present book “The Genus *Capparis* L. in India” has been compiled continuing with the rich tradition of the institute. *Capparis*, one of the most spectacular plant groups of India, is spread throughout the country with the highest diversity in the Western Ghats and Northeastern states. With this book, the authors have not only unfolded the beauty of its flowers but have also made efforts to resolve the taxonomic complexities. The book gives a detailed description of each species, colour photo-plates, distribution maps, and other essential details like phenology, ecology, and etymology to facilitate easy identification of the species. This user-friendly book can be easily used as a field guide considering its compact size. I congratulate the authors for this timely publication. I am confident that taxonomists, nature lovers, foresters, and students all over the country will embrace this book as a ready reference in the modern trend of illustrative generic revisions.

Dr. P. K. Dhakephalkar

Director

Agharkar Research Institute, Pune, India.



Foreword

The genus *Capparis* L., popularly called ‘Capers’ are well known for their medicinal properties and economic importance in the world. *Capparis spinosa* L. is one of the major ingredients of the popular medicine Liv-52. Fruits of some species are eaten as pickles whereas many of them are used as herbal medicines by the indigenous communities. It is believed that *Capparis* possess properties against cancer, tuberculosis, liver infection and many more diseases. However, they exhibit overlapping morphological characters which make them difficult to identify at the species level. Thus it is vitally important to understand the taxonomy of the genus which will help the researchers and drug companies to explore their medicinal and other economically important properties. “The Genus *Capparis* L. in India” is a great effort that fulfills this need not only for India but also for the world.

Capers are also thought to be originated in the Old World and have a restricted distribution in the tropical and subtropical regions. In the Indian subcontinent, India possesses ~50% endemism in terms of their distribution. Out of the 34 species and one subspecies of *Capparis* known from India, 14 are narrowly endemic to South and two to North East India. Based on the presence of many narrowly endemic species in India, Jacobs (1965) proposed that the Indian Subcontinent could be the centre of radiation for the genus.

The authors have put immense effort into exploring the Indian *Capparis* after conducting extensive field surveys in different parts of India. The taxonomic description with diagnostic characters, the distribution pattern of each species with point location maps, field images with key characters, and their medicinal and economic importance make this work immensely valuable.

I believe this book will serve as an excellent reference source for the plant taxonomists, conservationists, researchers, forest officials and nature enthusiasts. I congratulate the authors for this excellent contribution.

Dr. Arun K. Pandey

Former Professor of Botany
University of Delhi, Delhi, India.





Capparis multiflora Hook.f. & Thomson

Introduction

The family Capparaceae (Order: Brassicales) consists of 16 genera and about 480 species distributed throughout the tropical regions of the World (Stevens 2001). *Capparis* is the largest genus of the family, established by Carl Linnaeus in Species Plantarum (1753), who reported three species under this genus. It is distributed throughout the old world (OW) and has references in taxonomic as well as folk texts (Moldenke et al. 1952, Nadkarni 1976, Lansky et al. 2013). On the one hand, the genus is admired for its beautiful flowers while for its utilities in food and medicines on the other. The genus has an interesting distribution in India as some species are widely spread occurring in almost all states, while some are narrow endemics. The distribution ranges from the dry deciduous forests of the Eastern Ghats to wet evergreen forests of the Western Ghats, and from the snow-clad hills of the Himalayas to river deltas of the east coast. The floral arrangement, size, colour, aroma, etc. exhibit an enormous diversity making this genus interesting for a researcher. *Capparis* species are distributed in a wide range of habitats in the subtropical and tropical zones of the world. They are either evergreen or deciduous herbs, shrubs, or trees, which can be easily distinguished from the rest of the Capparaceae by the presence of thorns on the branches and stems, excluding a few exceptions. The flowers are mostly nocturnal, with diverse inflorescence types ranging from the simplest solitary–axillary inflorescence to the complex umbel and corymb types. Variations in the shape, size, and margins of sepal and petals are considered key characters to differentiate them at the species level. The number of stamens in species varies from 8 to many, while the presence of gynophore is also a distinctive character. Fruits are often berries, with leathery to corky, smooth to sculptured pericarp, globose to elongate in shape with a beaked apex present on the thick stipe. The reniform seeds are embedded in pulp, with the circinate embryo with their number ranging from one to many across various species.

Review of literature

Following Linnaeus, many new species were described under the genus *Capparis*. De Condole (1824) divided it into six different sections. The OW species were grouped under Sect. Eucapparis, whereas the New World (NW) species, were placed under five sections, namely Capparidastrum, Cynophalla, Calanthea, Breyniastrum, and Quadrella. The first-ever study on Indian *Capparis* appeared in the Flora of British India by Joseph Dalton Hooker (1872), who reported a total of 31 species of *Capparis* in the jurisdiction of British India. He divided the genus into three sections based on inflorescence patterns: **Sect. I** - having flowers in solitary, axillary (sometimes fascicled in three flowers as in *C. zeylanica* L., and four flowers as in *C. heyneana* Wall.). A total of five species represented this section viz. *C. spinosa* L., *C. grandiflora* Wall. ex Hook.f. & Thomson, *C. zeylanica*, *C. heyneana*, and *C. divaricata* Lam. **Sect. II** - having flowers in umbels, racemes, corymbs or panicles and further divided into three subgroups with a

total of 15 species based on different forms of the inflorescence. **Sect. III** - represented by a total of nine species characterized by seriate flowers in vertical lines on the branches. The remaining two species *C. flavicans* Kurz, *C. glauca* Wall. ex Hook.f. & Thomson were left untreated due to the unknown Inflorescence type. Following Hooker, many regional floras in India recorded *Capparis* with the varied number of species viz. 12 from the Upper Gangetic Plains (Duthie 1905), 12 from the Presidency of Bombay (Cooke 1908); six from Bihar and Orissa (Haines 1921); eight from Assam (Kanjilal et al. 1934); and 18 species in the Presidency of Madras (Gamble 1957).

Jacobs' study



Marius Jacobs
(1929-1983)

Photo: PV Welzen (www.naturalis.nl)

One of the remarkable works on *Capparis* is by Marius Jacobs (1965), who revised the genus *Capparis* in South and Southeast Asia, Malesia, Australia, and the Pacific. This work reported a total of 79 species grouped under four formal sections, namely *Capparis*, *Sodada*, *Monostichocalyx*, and *Busbeckea*. The sectional treatment was largely based on morphological characters like well-developed leaves (Sects. *Capparis*, *Monostichocalyx* and *Busbeckea*) vs. leaves soon becoming caducous (Sect. *Sodada*); all sepals free in buds (Sects. *Capparis* and *Monostichocalyx*) vs. outer pair of sepals connate in bud (Sect. *Busbeckea*); one sepal of outer pair saccate (Sect. *Capparis*) vs. both sepals of a pair equal (Sect. *Monostichocalyx*). Further, he divided Sect. *Monostichocalyx* into seven groups viz. I – *Brevispina*, II – *Moonii*, III – *Trinervia*, IV – *Subumbellates*, V – *Grandis*, VI – *Cataphyllosa*, and VII – *Seriales*. Sections *Capparis* and *Sodada* are mostly distributed in Mediterranean regions but extended till the central part of India. *Monostichocalyx* is distributed throughout the OW, while *Busbeckea* is restricted only to Australia except for *C. divaricata*, the sole representative of the section found in peninsular India. Based on the endemism and distribution pattern of the selected species, Jacobs proposed five main centres of speciation viz. a) The lowlands of South India/Sri Lanka, b) Southern Queensland, c) Lowland of Indo-Chinese peninsula, particularly South East, d) Eastern Himalaya and hills of upper Burma and Yunnan, and e) Central Malaya. Jacobs also hypothesized that South India and Ceylon could be the centre of radiation for the genus *Capparis* based on the presence of some narrowly endemic species in South India (Peninsular India) and Ceylon (Sri Lanka). His sectional treatment and hypothesis on species radiation formed the central pillars of our understanding of Indian *Capparis* today.

Current scenario



R. Sundararaghavan
(1930-1991)

Many investigations reporting novelties, regional revisions, and other taxonomic accounts appeared for Indo-Pacific regions in due course of time. *Capparis* of the Mediterranean and nearby areas were studied by Zohary (1960), whereas Jafri (1965) studied the genus in West Pakistan, Afghanistan, and northwest Himalaya. Jacobs's study was followed by a revision of *Capparaceae* in India by Sundararaghavan (1993). This study reported 29 species three subspecies and two varieties of *Capparis* in India. Lately, there has been an addition of *Capparis kollimalayana* M.B.Viswan. described from Kolli hills of Tamil Nadu. A few novelties in *Capparis* species

were further published in the following years from various parts of the OW (Srisanga & Chayamarit 2004, Inocencio et al. 2006, Fici 2012, 2020, Huang et al. 2013, Thuong et al. 2013, 2015, 2017, 2017a, and 2018). Our field observations, the study of the type specimens, and review of literature give us an estimate of the occurrence of 34 species and one subspecies in present-day India, which is central for the enumeration of species in this book.

Distribution of *Capparis* in the world

While describing the genus *Capparis*, Linnaeus (1753) reported it from both the old and new worlds. De Candolle (1824), in the subsequent treatment, grouped the genus under six sections. The OW species were grouped under Sect. Eucapparis, whereas the NW species were placed in the remaining five sections. Further, studies by Hall et al. (2002 & 2004), Kers (2003), Srisanga & Chayamarit (2004), Inocencio et al. (2006), Iltis & Cornejo (2007), Hall (2008), Cornejo & Iltis (2008a, 2008b, 2008c), Iltis et al. (2011), Cardinal et al. (2016), Fici (2012 & 2017), Cornejo (2018) and POWO (2020) reported *Capparis* to be restricted only to the tropical and subtropical regions of the OW. The NW *Capparis* species were transferred to various genera viz. *Boscia* Lam., *Buchholzia* Engl., *Cadaba* Forssk., *Maerua* Forssk., *Morisonia* L., *Capparidastrum* Hutch., *Quadrella* (DC.) J.Presl, *Anisocapparis* Cornejo & Iltis, *Calanthea* (DC.) Miers, *Capparicordis* Iltis & Cornejo *Colicodendron* Mart., and *Cynophalla* J.Presl, etc. (Cornejo 2018) of Capparaceae based on their distinct morphological and molecular characters. As a result, only about 140 species remained within the generic boundary of *Capparis* (POWO 2020) out of the earlier known ~200 globally distributed species (Hall et al. 2002). The present-day global distribution of the true *Capparis* is provided in Fig. 1.

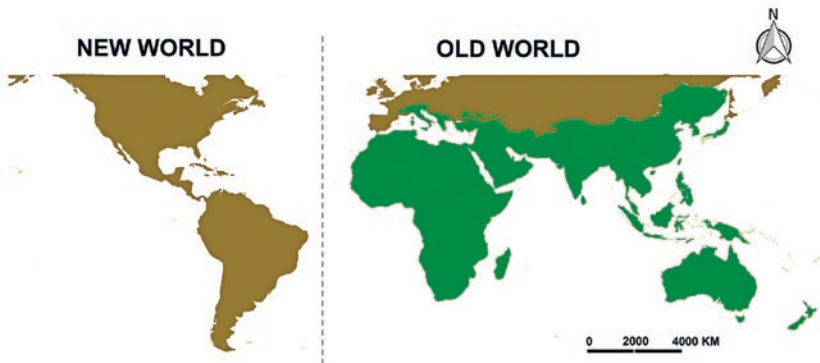


Fig.1. Distribution of *Capparis* in the World shown in green colour.

Capparis in the Indian Subcontinent

The Indian subcontinent includes all or part of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. *Capparis* in the subcontinent is represented by a total of 34 species and one subspecies (Fig. 2). In Bangladesh, only four *Capparis* species are distributed whereas in Bhutan- five, India -34 species and one subspecies, Maldives -three, Sri Lanka -ten, Nepal -six, and Pakistan -six species are recorded (Jacobs 1965,

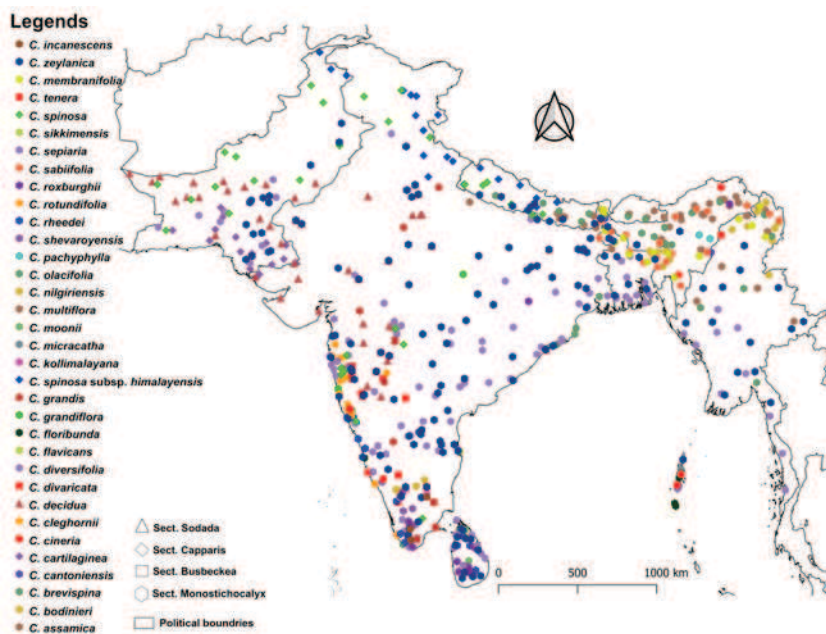


Fig. 2. Map representing the distribution of *Capparis* species in the Indian subcontinent.

Grierson & Long 1983, Senaratna 2001, Tropicos 2020).

India harbours 16 endemic *Capparis* species and shelters the most number of endemic species of the genus in the subcontinent. Peninsular India itself harbours 14 endemic species namely *Capparis nilgiriensis*, *C. kollimalayana*, *C. fusifera*, *C. shevaroyensis*, *C. incanescens*, *C. diversifolia*, *C. grandiflora*, *C. rheedei*, *C. roxburghii*, *C. cleghornii*, *C. brevispina*, *C. moonii*, *C. divaricata*, and *C. rotundifolia* majority of them with a narrow distribution. The remaining two species i.e., *C. pachyphylla* and *C. cinerea* are endemic to North East India, of which *C. cinerea* is presumably extinct (Sundararaghavan 1993). Nomenclature of the taxa in the present work follows the most recent treatments (Govaerts 2003, Zhang & Tucker 2008, Fici 2015, IPNI 2020, Tropicos 2020, & POWO 2020). Accordingly, four Indian *Capparis* taxa, earlier given an infra-specific rank (Jacobs 1965, Sundararaghavan 1993) have been elevated to species level, namely *Capparis cartilaginea* Decne., *C. bodinieri* H.Lév., *Capparis sabiifolia* Hook.f. & Thomson, and *C. membranifolia* Kurz. Moreover, *C. incanescens* DC. has been reinstated based on our morphological and molecular studies. The overall distribution of Indian *Capparis* is provided in Fig. 3. The map is based on the data pooled from our own sampling, herbarium studies, and literature records.

Capparis for human welfare

Capparis, since ancient times is valued for its medicinal properties and economic potential throughout the world. Its unique chemical compounds in the form of

Legends



Fig. 3. Map showing the distribution of *Capparis* species in India. Sections and species are represented in different shapes and colours respectively.

met- glucosinolates and various types of secondary metabolites (Lansky et al. 2013, Edger et al. 2018) are essential for many herbal formulations. The type species, *Capparis spinosa* L., is used in many herbal preparations and some popular drugs like Liv.52 and others (Arena et al. 2008, Sher & Alyemeni 2010) (Fig. 4). Many of the *Capparis* species are believed to cure liver disorders, arteriosclerosis, and also work as a diuretic, kidney disinfectant, vermifuge, and tonic (Dange et al. 1989, Kolhapure & Mitra 2004). The flower buds and fruits of *C. spinosa* are the primary sources of many drugs. They are also pickled (Fig. 5) in various parts of Europe (Rivera et al. 2003, Sher & Alyemeni 2010) and have become a popular ingredient of the daily diet. Fruits of *C. decidua*, which are rich in macro-nutrients, are pickled and consumed in Northern Western Ghats of India (Datar & Upadhye 2016), the Mediterranean, and the European regions. The leaves, stem, root, bark, and fruits have documented uses in herbalism and folk medicines against the liver problem, headache, boils, inflammation, rheumatism and fever (Broun & Massey 1929, Jafri 1956, El Ghazali 1986, Bebawi & Neugebohrn 1991, GRIN 2003, Lansky et al. 2013).

C. zeylanica, one of the widespread species, is used as a vegetable and various herbal preparations in Maharashtra and Madhya Pradesh (Chopra et al. 1950, GRIN 2003,



Fig. 4. Herbal drug Liv-52, used to cure liver disorders

Ashton et al. 1997, Patil et al. 2011, Datar & Upadhye 2016) (Table 1). Similarly, *C. incanescens* is believed to possess an antitumor property by tribal communities of Sivagiri hills in Tamil Nadu. *C. cartilaginea* in Gujarat and *C. grandis* in various parts of the Western Ghats are used by the tribal communities for herbal preparation and as a source of edible fruits. In addition to these utilities, a list of various other uses of 23 *Capparis* species from different parts of India is provided in Table 1.



Fig. 5. *Capparis spinosa* fruits as pickle in the brine solution.

Sr.No.	Name	Food			Medicine																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29												
1	<i>Capparis assamica</i> Hook.f. & Thomson	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
2	<i>Capparis bodinieri</i> H.Lév.	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
3	<i>Capparis brevispina</i> DC.	-	-	+	-	+	-	-	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+				
4	<i>Capparis cartilaginea</i> Decne.	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
5	<i>Capparis decidua</i> (Forsk) Edgew.	-	-	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+			
6	<i>Capparis divaricata</i> Lam.	-	-	-	-	-	-	-	-	-	+	-	+	+	+	-	-	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
7	<i>Capparis flavicans</i> Kurz.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
8	<i>Capparis fusifera</i> Dunn.	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
9	<i>Capparis grandiflora</i> Wall. ex Hook.f. & Thomson	-	-	+	-	-	+	-	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
10	<i>Capparis grandis</i> L.f.	-	-	+	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+			
11	<i>Capparis incanescens</i> DC.	-	-	+	-	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
12	<i>Capparis membranifolia</i> kurz	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
13	<i>Capparis micracantha</i> DC.	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+		
14	<i>Capparis moonii</i> Wight	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
15	<i>Capparis rheedei</i> DC.	-	-	-	-	+	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
16	<i>Capparis rotundifolia</i> Rottler	-	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
17	<i>Capparis sabijolia</i> Hook.f. & Thomson	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
18	<i>Capparis sepiaria</i> L.	+	-	+	-	+	-	+	-	-	-	+	+	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
19	<i>Capparis sikkimensis</i> Kurz	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
20	<i>Capparis spinosa</i> L.	+	+	+	+	+	+	+	+	+	+	-	-	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+
21	<i>Capparis spinosa</i> subsp. <i>himalayensis</i> (Jafri) Fici	-	+	+	+	+	+	+	+	-	-	-	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22	<i>Capparis tenera</i> Dalzell	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
23	<i>Capparis zeylanica</i> L.	-	+	+	+	-	-	-	+	-	-	-	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	

Table1. Food (vegetable and pickle) (1-3): 1. Leaves, 2. Flower buds, 3. Fruits; Medicine (4-29): 4. Liver disorders, 5. Skin diseases, 6. Antitumor, 7. Vermifuge, 8. Eruptions, 9. Cough, 10. Asthma, 11. Malaria, 12. Antidote, 13. Diuretic, 14. Poison, 15. Sedative, 16. Rheumatism, 17. Analgesic, 18. Ulcer, 19. Genital stimulants, 20. Cardiac problems, 21. Inflammation, 22. Galactagogue, 23. Tuberculosis, 24. Diabetes, 25. Cholera, 26. Swelling of testicles, 27. Neurological problems, 28. Kidney problems, 29. Piles

Materials & Methods

The work on revising Indian *Capparis* was initiated with an extensive literature survey covering the national, state, and local Floras (Balakrishnan 1981, Grierson & Long 1983, Nair & Henry 1983, Singh 1983, Naithani 1984, Śēsagirirāvu 1985, Verma 1985, Nair & Nayar 1986, Shetty & Singh 1987, Singh et al. 1987, Kamble & Pradhan 1988, Ramachandran & Nair 1988, Panigrahi & Murti 1989, Pal 1990, Vajravelu 1990, Roy 1992, Sharma & Dhakre 1995, Sharma & Balakrishnan 1996, Sharma et al. 1996, Bhattacharyya & Sarkar 1998, Naik 1998, Pullaiah et al. 1998, Sinha et al. 1999, Diwakar & Sharma 2000, Paria & Chattopadhyay 2000, Singh et al. 2000, Khanna 2001, Sarma & Sarkar 2001, Singh 2001, Singh et al. 2002, Patil 2003, Pradhan et al. 2005, Datar & Lakshminarasimhan 2013, Singh 2014, Deb 2016, Dash & Singh 2017). Also, the Floras of neighbouring countries viz. Bhutan, China, Malesia, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam, etc. were consulted (Oliver 1868, Kurz 1877, Jacobs 1960 & 1965, Grierson & Long 1983, Pham 1999, Ban & Dorofeev 2003, Senaratna 2001, Tropicos 2020). Flora of British India (Hooker 1875), Flora of India (Sundararaghavan 1993), and Jacobs's treatment (1965) were considered as a baseline for this work. Various national and international herbaria (AHMA, ASSAM, BM, BSI, CAL, GU, GUH, HHBG, HZU, KRIB, K, MH, SUK, ZMNH) were consulted, and the herbarium specimens and/ or images were critically examined. An excel database for the information of herbarium specimens was created, which included details of locality, date of collection, phenology, utilities, etc. This database was used to understand and map the distribution of *Capparis* species in India.

Extensive field surveys were carried out in different parts of India, and samples were collected. The following protocol for the collection of specimens was followed in the field.

1. The size of the twigs collected was around 40 cm long, which represented thorns, leaves, flowers, and fruits. Twigs devoid of any fungal or bacterial infection were preferred.
2. The twigs were kept in blotting papers for drying and were pressed.
3. The blotters were frequently changed to avoid any further infection, moisture accumulation, and discolouring of the twigs, till the specimens are dried thoroughly.
4. The specimens were poisoned to avoid any infection using 0.5% HgCl₂ and 1: 2 parts of Formaldehyde and 70% Alcohol.
5. For molecular studies, the young and infection-free leaves were collected and stored in silica gel for rapid dehydration and to prevent the degradation of DNA.
6. Additionally, flowers and fruits were preserved in FAA (10: 5: 50) (Formaldehyde (37%), Glacial Acetic Acid, Alcohol (95%)).

Field photographs were captured using Canon EOS 600D digital SLR camera. Dissection of flower parts and critical morphological studies were carried out under a Leica Stereo Microscope (M205). After complete drying, the specimens were processed as per standard herbarium techniques following Jain and Rao (1977). Specimens were identified by comparing them with type specimens/images and using regional and national Floras, original protologue of each species, and relevant literature. The voucher specimens are deposited in the Herbarium of Agharkar Research Institute, Pune (AHMA), and their field/accession numbers are mentioned in the enumeration part of this book.

Data presentation in the Book

The present book is the first of its kind exclusively dedicated to the genus *Capparis* in India and provides illustrated photo-plates and/ or herbaria image of 34 species and one subspecies belonging to this genus. It also provides a key for identification, detailed description, distribution maps, bibliography, and other relevant material.

The taxa in the book are arranged as per the widely accepted sectional treatment (Fig. 6) proposed by Jacobs (1965) as follows:

1. Sect. Sodada: Monotypic section, represented by only one species i.e. *Capparis decidua*, distributed in Central and western India.
2. Sect. Capparis: Represented by two species and one subspecies in India, distributed in the northern, central, and western part of the country.
3. Sect. Busbeckea: Represented by only one species in India, i.e., *Capparis divaricata*, distributed in the peninsular region.
4. Sect. Monostichocalyx: Represented by a total of 30 species and distributed throughout the country.

Species under each section are arranged alphabetically. Accepted names for each of the 34 species and one subspecies are provided, along with important synonyms that connect the taxa to regional and local floras. In addition, basionyms are also provided wherever applicable. A key for identification of species based on morphological characters is provided at the beginning. Enumeration of the species contains description, and relevant notes, type information, the etymology of the scientific name of the species, Information for type specimens of each species is based on literature and our scrutiny of types. Wherever type specimen could not be verified, it is indicated by *n.v.* (*non vidi* = not verified). The species description is based on our critical studies of the specimen and their comparisons with voucher specimens and descriptions available in the literature. The terminologies used follow previous works by De Candolle (1824), Hooker (1872), Jacobs (1965), and Sundararaghavan (1993). Measurements are represented in standard metric scale, i.e., m: meter, cm: centimeter, mm: millimeter, and compound measurements, i.e., 5–12 × 4–8, represents 5–12 cm range of length and 4–8 cm range of breadth. Measurements within brackets, i.e., 3–6 (–18) cm, refer to exceptional limits. The abbreviations for each author's names or literature are as per the 'International Plant Index Names' (IPNI 2019).

The book provides photo-plates containing images of habit, habitat, flowers, dissected floral parts, and fruits, which will help in better identification of species. The dissected flowers from preserved samples sometimes do not represent its original colour as it may change after preservation. Phenology (flowering and fruiting seasons) is also mentioned based on the field observation and literature records. Distribution and endemism of each species is based on the current understanding of the spread of the species in India and outside. The distribution map for each species is based on the geographical coordinates recorded during field collection, and literature and herbarium records. The point locations are marked with red dots, and the overall distribution is highlighted with a green background for the states or regions where the species is distributed. The book also provides important, though not exhaustive, list of specimens examined under each species. Specimens examined are arranged as per country name in capital letters followed by precise location, names of district or town, collector names, collection-number, and herbarium acronym where the specimen is housed. In case of missing locations (*s. loc.*) and collector's numbers (*s. n.*), the specimens are provided with barcode numbers of the sheets of respective herbaria. The economic and medicinal usages of each species are also provided in the end to make the information of each species as detailed as possible.

Key to the sections in genus *Capparis*

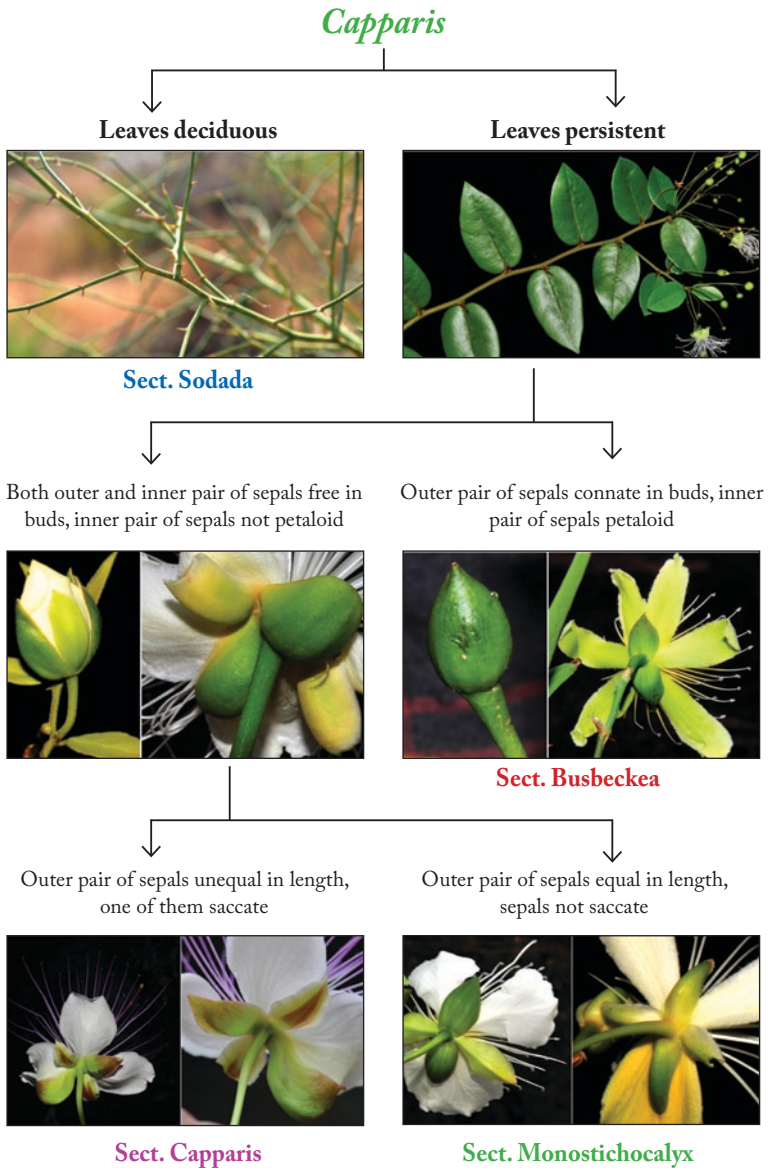


Fig. 6. Illustrated key to the sections in the genus *Capparis* (After Jacobs 1965)

Key to the *Capparis* species in India

- 1a. Leaves deciduous; inflorescence raceme on lateral rachis; flower orange to red in colour *C. decidua*
- 1b. Leaves persistent; inflorescence axillary, solitary, umbels, subumbels, corymb or panicle, flower never orange or red in colour 2
- 2a. Both outer and inner pair of sepals free in buds 3
- 2b. Outer pair of sepals connate in buds, inner pair of sepals petaloid *C. divaricata*
- 3a. Outer pair of sepals unequal in length, one of them saccate 4
- 3b. Outer pair of sepals equal in length, sepals not saccate 6
- 4a. Erect shrubs; leaves fleshy, cartilaginous *C. cartilaginea*
- 4b. Prostrate-spreading shrubs; leaves not fleshy 5
- 5a. Flowers slightly actinomorphic; posterior sepal shallowly saccate; petals not hooded *C. spinosa*
- 5b. Flowers strongly zygomorphic; posterior sepal deeply saccate; petals hooded *C. spinosa* subsp. *himalayensis*
- 6a. Flowers solitary, axillary, rarely 2–5 conferted together on lateral axis 7
- 6b. Flowers generally supra-axillary or in umbels or subumbels or corymbs or panicles, rarely axillary if inflorescence is a corymb or in a supra-axillary series 11
- 7a. Leaves with basal two pairs of nerves conferted towards base; lateral twigs without terminal flowers 8
- 7b. Leaves with arching nerves, never conferted towards base; flowers solitary and sometimes lateral twigs with 2–4 terminal flowers 9
- 8a. Base of the shoots with many cataphylls; leaves with prominent reticulation and acute apex; petals blue or white, upper pair with yellowish blotches; stamens more than 80; gynophores glabrous during anthesis *C. rheedei*
- 8b. Base of the shoots without cataphylls; leaves with obscure reticulation and obtuse apex; petals yellow, upper pair with a golden yellow or brownish blotches; stamens 6–12; gynophores hairy during anthesis *C. flavicans*
- 9a. Filaments with yellow to red blotch at the base; stamens 70–110 *C. grandiflora*

- 9b. Filaments without yellow to red blotch at the base; stamens 16–35 10
- 10a. Shrubs or trees up to 15 m tall; innovations with densely stellate hairs; leaf base surrounded by many cataphylls; leaf apex mucronate; stamens 25–35; fruits beaked *C. brevispina*
- 10b. Shrubs or trees up to 4 m tall; innovations glabrous; leaf base surrounded by few cataphylls; leaf apex acute to obtuse; stamens 16–24; fruits not beaked *C. nilgiriensis*
- 11a. Flowers in supra-axillary vertical rows 12
- 11b. Flowers in racemose or panicle, umbels, subumbels or corymbs 19
- 12a. Young flowering shoots leafless, inflorescence supra-axillary of 2–10 or more flowers on young twigs 13
- 12b. Flowering shoots always leafy, inflorescence supra-axillary of up to 7 flowers on mature twigs 14
- 13a. Innovations and flowering twigs with white to greyish tomentum; leaves 15–30 cm; flowers many, supra-axillary in 2–4 rows, 4–6 mm across, white; stamens 10–12 *C. multiflora*
- 13b. Innovations and flowering twigs with brown stellate hairs; leaves up to 15 cm; supra-axillary in a single row, 2.5–4 cm across, white to dark purple and red; stamens 30–70 *C. zeylanica*
- 14a. Shrubs or trees; cataphylls present at least at base of leaf; gynophores mesomorphic 15
- 14b. Shrubs or rarely climbers; cataphylls absent at base of leaf; gynophores filiform 16
- 15a. Leaves glaucous, prominently reticulate; petals white, turning to dark red or brown; ovary up to 3 mm long, glabrous; fruits exceeding 3 cm in diameter; many-seeded *C. micracantha*
- 15b. Leaves drying brown, indistinctly reticulate; inner petals with purple to yellow blotch at base; ovary 4–6 mm long, densely tomentose; fruits below 1 cm in diameter; 1-seeded *C. olacifolia*
- 16a. Shrubs or climbers; shoots with strong and persistent recurved thorns; leaves with distinct secondary reticulation; stamens 16–20 *C. tenera*
- 16b. Shrubs; shoots generally unarmed, if armed, thorns straight or sometimes wanting; leaves with more or less distinct or sometimes obscure reticulation; stamens exceeding 20 17
- 17a. Twigs without thorns; leaf base rounded, veins obscure on both surfaces *C. sabiifolia*
- 17b. Twigs with thorns or rarely wanting; leaf base acute to cuneate or sometimes rounded, veins more or less distinct 18

- 18a. Thorns small or sometimes wanting; branchlets with rust-coloured trichomes; leaf blade elliptic, base broadly cuneate and decurrent on petiole; inner petals with purple blotches *C. membranifolia*
- 18b. Thorns present; branchlets with reddish-brown to grey trichomes; leaf blade ovate, base rounded to cuneate but never decurrent on petiole; inner petals with greenish striations *C. bodinieri*
- 19a. Inflorescence racemose or panicle, if umbellate, the umbels arranged to form a panicle 20
- 19b. Flowers either in solitary umbels, subumbels or in corymbs 24
- 20a. Inflorescence terminal or subterminal raceme, each flower with subulate bracts at the base *C. assamica*
- 20b. Inflorescence variously paniculate; each flower without subulate bracts at the base 21
- 21a. Thorns slightly recurved and persistent; cataphylls prominent at base of leaf; flowers in axillary racemose bundles *C. pachyphylla*
- 21b. Thorns recurved or mostly wanting; cataphylls absent at base of leaf; flowers in axillary subumbels or corymbs 22
- 22a. Trees, shrubs or rarely climbers up to 8 m high; flowers up to 4 cm across; gynophores exceeding 3 cm in length; fruits exceeding 2.5 cm in diameter *C. sikkimensis*
- 22b. Woody climbers up to 20 m high; flowers below 1.5 cm across; gynophores below 1.5 cm in length; fruits under 2.5 cm in diameter 23
- 23a. Leaf base rounded to subcordate; midrib of leaves flattish or raised at basal part; panicles dense-flowered; stamens 7–12; placentas 4 *C. floribunda*
- 23b. Leaf base cuneate; midrib of leaves sunken at basal part; panicles lax-flowered; stamens 20–25; placentas 2 *C. cantoniensis*
- 24a. Flowers in corymbs 25
- 24b. Flowers umbellate or subumbellate 28
- 25a. Trees; leaves olive or pale green, adaxial surface with velvety indumentum, veins close, more or less parallel *C. grandis*
- 25b. Shrubs, woody climber or trailing shrubs; leaves glabrous and shiny, neither velvety pubescent nor with close parallel nerves 26
- 26a. Flowers 10–12 cm across; stamens 100–140; gynophores 6–9 cm long; mature fruits 10 cm or more in diameter *C. moonii*
- 26b. Flowers 3–6 cm across; stamens under 60; gynophores 2–6 cm long; mature fruits up to 6 cm in diameter 27

- 27a. Stem purple to brown; leaves with distinct reticulation; sepals and petals glabrous; gynophores 3.5–5.5 cm long; fruits orange-yellow, globose, 5–6 cm diameter; many-seeded *C. roxburghii*
- 27b. Stem dark green; leaves with obscure reticulation; sepals and petals pubescent; gynophores 2.5–3.5 cm long; fruits deep purple, umbonate, 2.5–3 cm diameter; 1–4 seeded *C. cleghornii*
- 28a. Cataphylls conspicuous at least at base of innovations 29
- 28b. Cataphylls absent at base of innovations 31
- 29a. Gynophores 20–25 mm long *C. cinerea*
- 29b. Gynophores less than 18 mm in length 30
- 30a. Thorns up to 6 mm long, persistent; leaves linear to oblong-lanceolate, variable in shape and size; flowers purple, violet or pink; fruits ellipsoid; 6 or more seeded *C. diversifolia*
- 30b. Thorns minute up to 3 mm long or wanting; leaves elliptic to oblong, uniform in shape and size; flowers greenish-white; fruits fusiform; 1–2 seeded *C. fusifera*
- 31a. Mostly unarmed, if armed thorns very few, straight and short *C. shevaroyensis*
- 31b. Densely armed, thorns recurved or straight and long 32
- 32a. Lateral nerves 12–16 pairs *C. kollimalayana*
- 32b. Lateral nerves 3–6 pairs 33
- 33a. Erect shrubs rarely climbers; thorns dimorphic, either straight or sharply recurved; leaf base cordate or sometimes subcordate *C. rotundifolia*
- 33b. Scandent or rarely erect shrubs; thorns uniform, recurved; leaf base cuneate or rounded 34
- 34a. Innovations puberulous or glabrous after maturity; leaf base cuneate or rounded, apex retuse or emarginated; stamens 30–45; gynophores base puberulous *C. sepiaria*
- 34b. Innovations tomentose and pubescent after maturity; leaf base cuneate or rounded, apex with mucro; stamens 20–24; gynophores base glabrous *C. incanescens*

Section: Sodada

1. *Capparis decidua* (Forssk.) Edgew., J. Proc. Linn. Soc., Bot. 6: 184. 1862.
Sodada decidua Forssk., Fl. Aegypt.-Arab. 81 (1775); Delile, Fl. Egypt. 74. t. 26.
Capparis aphylla Roth, sp. pl. Nov. 238.



Habit: Shrubs to small trees up to 10 m. Innovations pale-puberulous with small simple hairs but very soon glabrescent, or completely glabrous. Twigs slender, often zigzag, light greenish when dried. Cataphylls only at the base of arrested twigs, otherwise wanting. Thorns straight, rather vigorous, pointing upwards, sometimes patent, 2–8 mm, occasionally wanting. **Leaves:** only on the young twigs, soon caducous. Blades linear, apex ending in a short, stiff, pale, mucro like prickle; 1–2 cm × 1–3 mm; petiole more or less obscure. **Inflorescence:** racemes lateral,

often with a twig serially inserted above them, rachis slender, 0.3–10 cm long, whitish puberulous but soon glabrescent, up to 20 flowers, thorns and bracts none or vestigial, or sometimes the flowers scattered at the basal part of a normally developed twig, pedicels 1–1.5 cm, densely white or fulvous tomentose to glabrous. **Flowers:** mostly brick-red, sometimes pink, rarely yellow, sepals 8–13 mm long, margin floccose-ciliate, surfaces densely tomentose to glabrous, mucronulate. The adaxial sepal saccate and about half as deep as long, the others linear-lanceolate, 2–3 mm wide; the abaxial one slightly keeled, narrowed at the base, the inner pair petaloid. Petals about as long as the sepals, puberulous, the upper pair 4–6 mm wide, more or less obdeltoid, largely hidden in the saccate sepal, lower pair lanceolate to subrhombic, 3–6 mm wide. Stamens 8–18, 13–16 mm long. Gynophores 11–19 mm long, glabrous; ovary globose, 2 mm diameter with a beak 1 mm long, glabrous, placentas 4, stigma small, flattish. **Fruits:** on thin stalk, globose, with a small point of the old style, 1–1.5 cm diameter, pericarp thin, firmly herbaceous, smooth, deep red when ripe. Seeds 2–5 × 2–4 × 2 mm.

Diagnostic characters: Leaves deciduous; inflorescence on small rachis; flowers red coloured with saccate calyx.

Type: Forskål (*n.v.*), Arabia, Yemen, 'Arab. Sodad'.

Etymology: The specific epithet refers to its deciduous leaves. It is the only species of *Capparis* having deciduous leaves.

Phenology: Fls.: February–May; Frts.: September–January.

Common English/ Vernacular names:

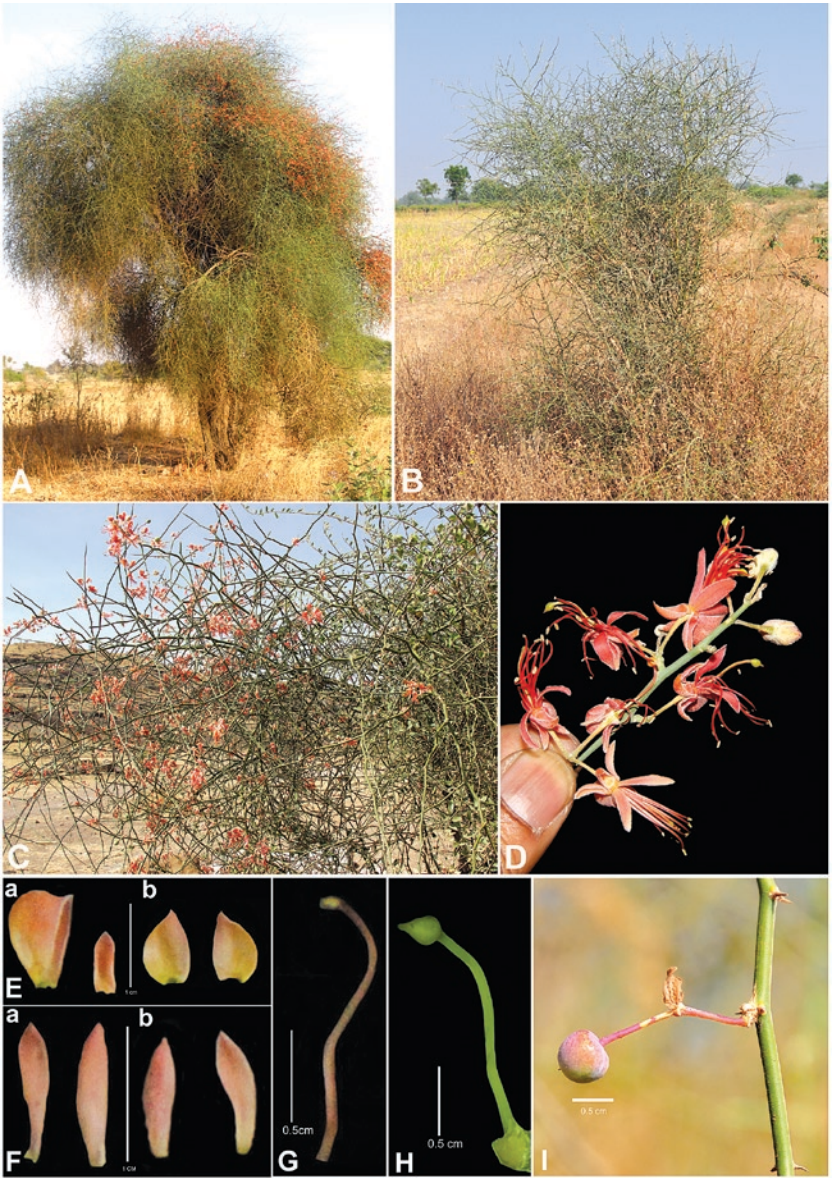
English: *Karira*, Leafless caper bush;

Hindi: *Kair*, *Karer*, *Kureel*; **Marathi:** *Kereel*, *Nepati*;

Sanskrit: *Karir*, *Karira*;

Tamil: *Sengam*; **Telugu:** *Kariramu*.





Capparis decidua (Forssk.) Edgew.:— A & B. habit; C. flowering branches; D. inflorescence; E. sepals (a. outer sepal, b. inner sepals); F. petals (a. outer petals, b. inner petals); G. androphore; H. gynophore; I. fruit.

Distribution: INDIA: Bihar, Chhattisgarh, Delhi, Goa, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana and Uttar Pradesh. [AFGHANISTAN, AFRICA, IRAN, IRAQ, ITALY, PAKISTAN, SAUDI ARABIA, TURKEY].

Specimens examined: INDIA. Gujarat: Bhavnagar Road, *A.S. Rao* 63628 (BSI!), Jamnagar, *Sesbagiri Rao* 102928 (BSI!), *GSP* 31509 (BSI!), Narayan Sarovar, *Sundararaghavan* 114930A, 114687 (BSI!); Karnataka: Bijapur Road, *N.P. Singh* 142914 (BSI!); Maharashtra: Atpadi, *M.N. Datar* 401 (AHMA!); Kupwad, Wadebolhai Road, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 458, 449, 460, 461, 462, 476, 477, 478 (AHMA!); Dhule, Wadel, *Akash Hire* 719 (AHMA!).

Economic/ Medicinal Usage: Fruits are pickled. Also used as medicine against skin problems, boils, eruptions, swelling, arthritis, rheumatism, toothache, cough, asthma, biliousness, and malaria; and as laxative and vermifuge.

Section: Capparis

2. *Capparis cartilaginea* Decne., Ann. Sci. Nat., Bot. sér. 2, 3: 273. 1835. *C. spinosa* var. *galeata* (Fresen.) Hook.f. & Thomson in Hook. f., Fl. Brit. India 1:173. 1872; *C. galeata* Fresen. in Mus. Senck. 2: 111. 1837.

Photo: Pravin Kawale



Habit: Shrubs, spreading or scrambling, 0.5–4 m high. Young twigs densely appressed–white–pubescent, glabrescent, thorns straight or slightly recurved.

Leaves: blade broadly elliptic, ovate or orbicular 2–5.5 cm × 1.8–6 cm; with midrib ending in a small recurved mucro, broadly cuneate, rounded or cordate at the base, apex acute, rounded; chartaceous, glabrous, petioles 1–2.5 cm.

Inflorescence: axillary, solitary.

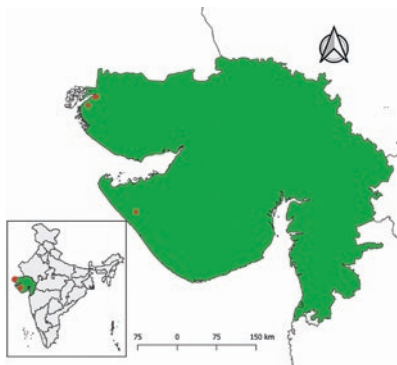
Flowers: solitary in the upper leaf–axils, pedicels stout, 3.5–12 cm long. Sepals unequal, 3, oblong–obovate, shallowly boat–shaped, 1.5–2 cm long; the other sepal up to 4 cm long, strongly hooded

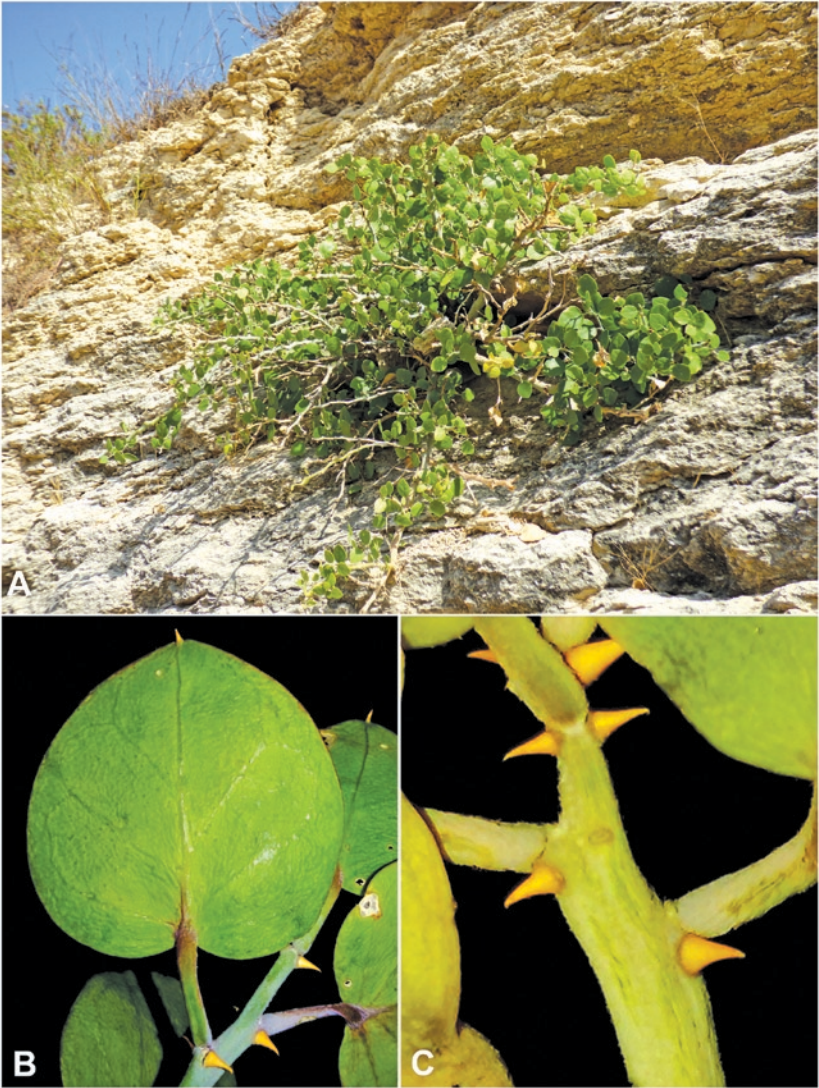
at the apex. Petals unequal, anterior pair oblong–obovate, up to 1.5 cm long, posterior pair apparently fused, about 3.5 cm long, 2.5 cm. wide, hooded and enclosed in the hooded sepal, the base clawed and with 2 elongate calluses; all petals white, at maturity petals turn pink to purple, glabrous or thinly pubescent. Stamens many, about 3 cm long. Gynophores 3–4 cm long in flower, up to 6 cm, stout in fruits. **Fruits:** ovoid or ellipsoid, up to 5 cm long, 3 cm in diameter, ribbed, red.

Diagnostic characters: Branches spreading or erect; leaves ovate or orbicular, acute, apex with small yellow coloured mucro; flowers solitary axil.

Type: Lectotype - designated by Rivera et al. (2003): Kew, Bove 148 (K000076943!), Desert du Sinai, 'Lassaf', Arabia.

Etymology: The specific epithet refers to the presence of cartilaginous (=leathery/ thick) leaves of the plant.





Capparis cartilaginea Decne.:— A. habit; B. leaves (adaxial view of a leaf showing cordate base & apex with a mucro); C. stem showing presence of thorns. (Photo A: Rajiv Pandit)

Phenology: Fls.: July–September; Frts.: August–November.

Vernacular name: Hindi: *Karat*

Distribution: INDIA: Gujarat. [AFGHANISTAN, AFRICA, IRAN, IRAQ, ITALY, PAKISTAN, SAUDI ARABIA, TURKEY].

Specimens examined: INDIA: Gujarat: Kutch, *Rajiv Pandit* 721 (AHMA!); ARABIA: Desert du Sinai, 'Lassaf', *Bove* 148 (000076943–K1).

Economic/ Medicinal Usage: **Roots:** dermatitis, skin ulcers, wounds etc. **Stems:** skin inflammation, bruises, swellings, rheumatism, joint inflammation, knee problems, tendinitis, sprains, muscular contractions, paralysis, headache, earache, snakebites (pain, inflammation), veterinary medicine (parasites and ticks in livestock, cattle fevers). **Leaf:** Edible, also used against skin inflammation, bruises, rheumatism, joint inflammation, knee problems, tendinitis, sprains, muscular contractions, paralysis, headache, earache, for eye diseases, cough, indigestion. **Fruits:** Edible. Also used against rheumatism, and veterinary fevers.

3. *Capparis spinosa* L., Sp. Pl. 1: 503. 1753.



slightly exceeding the sepals. Stamens numerous, 50–190, up to 5.5 cm long; anthers violet, 2–3 mm long. Gynophores 1.2–5 cm long, glabrous or pubescent at base; ovary ovate–ellipsoid, 3–5 × 1.2–1.8 mm; stigma sessile or capitate. **Fruits:** pyriform, ovoid or ellipsoid 2–4.5 cm long.



Habit: Prostrate shrubs. Innovations with white hairs, glabrescent. Thorns recurved, divaricate, pale yellowish. **Leaves:** blades ovate, 2.4–6 × 2–5 cm; ovate–orbicular or obovate with base truncate, rounded or cordate, apex obtuse, rounded, sometimes acute, with mucro 0.1–0.7 mm; subcoriaceous, glabrous or glabrescent; petiole 0.5–1.5 cm.

Inflorescence: solitary–axillary. **Flowers:** slightly zygomorphic. Sepals 1.5–3.0 cm long, calyx almost symmetrical to strongly zygomorphic, the posterior sepal then being exceedingly saccate. Petals 2–4 cm long,

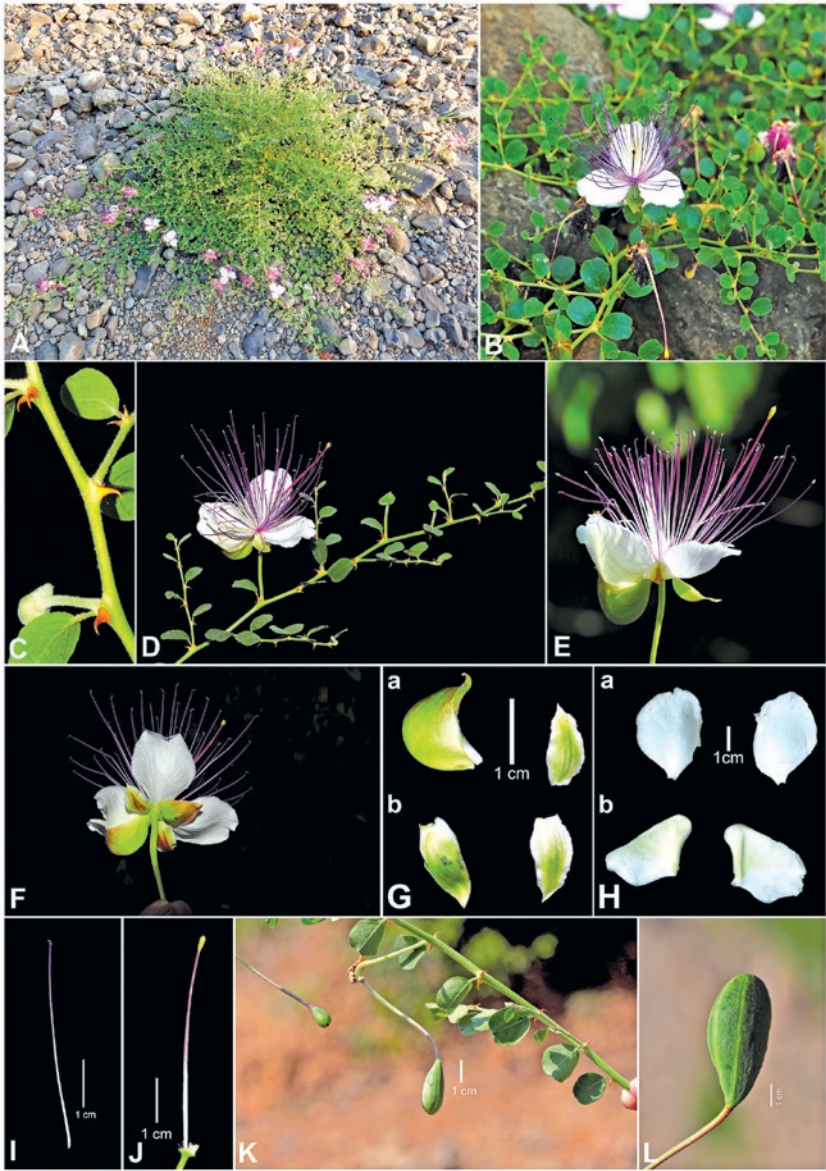
slightly exceeding the sepals. Stamens numerous, 50–190, up to 5.5 cm long; anthers violet, 2–3 mm long. Gynophores 1.2–5 cm long, glabrous or pubescent at base; ovary ovate–ellipsoid, 3–5 × 1.2–1.8 mm; stigma sessile or capitate. **Fruits:** pyriform, ovoid or ellipsoid 2–4.5 cm long.

Diagnostic characters: Prostrate shrubs with erect or spreading branches; stipules conspicuous and thorny, mostly recurved, decurrent at the base, outer sepals deeply saccate.

Type: Lectotype (designated by Burt & Lewis 1949): “Habitat in Europae australis arenosis, ruderatis” Herb. Clifford: 203, *Capparis* I (BM).

Etymology: The specific refers to the presence of many thorns in the plant. This was the first species described under genus *Capparis*, and commonly known as Caper Bush.

Phenology: Fls.: November–July; Frts.: February–November.



Capparis spinosa L.:— A. habitat; B. habit; C. stem with recurved thorns; D. twig showing solitary inflorescence; E. front view of an open flower; F. dorsal view of flower; G. sepals (a. outer sepals, b. inner sepals); H. petals (a. outer petals, b. inner petals); I. androphore; J. gynophore; K. twig with fruits; L. mature fruit.

Common English/Vernacular names: **English:** Common caperbush, Fabagelle, Flinders-rose, Mediterranean caperbush, Spiny caperbush; **Hindi:** *Ber*, *Bhotiyas-kabara*, *Kabra*, *Kabar*, *Kiari*, *Kobra*; **Bengali:** *Kabra*, **Marathi:** *Kabar*.

Distribution: INDIA: Bihar, Chhattisgarh, Delhi, Goa, Gujarat, Jammu & Kashmir, Jharkhand, Karnataka, Ladakh, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and Uttarakhand. [One of the most wide spread species of genus]

Specimens examined: INDIA. Maharashtra: Tamhini, *R.K. Choudbary*, *M.N. Datar*, & *Sneha Joshi* 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429 (AHMA!).

Economic/ Medicinal Usage: **Roots:** cosmetic. **Branch tips:** condiment (pickled). **Leaf:** food (condiment), against skin diseases (wet and dry eczema). **Flower buds:** pickle, sauces, condiments, spices, stimulants, tonic for arteriosclerosis, scurvy, skin diseases (wet and dry eczema), sciatica, headache, eye infections, prevention of cataract, chills, colds, cough, respiratory problems, kidney stone, diuretic, renal disinfectant, against diminishing of urine, diabetes, stomach pain, gastrointestinal infections, diarrhoea, dysentery, and as laxative. **Fruits:** condiment (pickled), cooling; tranquilizing, stimulant, antiscorbutic, rheumatism. **Seeds:** ulcers, scrofula, ganglions, female sterility, dysmenorrhea. Stem: anti-diarrheic, febrifuge. Stem bark: bitter, diuretic, increases appetite.

4. *Capparis spinosa* subsp. *himalayensis* (Jafri) Fici, Phytotaxa 203 (1): 32. 2015.

C. himalayensis Jafri, Pakistan J. Forest. 6(3): 197. 1956.



Habit: Shrubs, prostrate-spreading with young twigs soft-pubescent, glabrescent at maturity. Thorns recurved, orange-yellow, 2–6 mm long, decurrent at the base. **Leaves:** blades ovate, ovate-elliptic or ovate-suborbicular; 2–4 × 1.5–3.5 cm; rounded or attenuate at base, acute at apex, with a mucro up to 1 mm long; glabrescent when mature, subcoriaceous; petiole 2–8 mm long. **Inflorescence:** axillary, solitary. **Flowers:** pedicels 3–9 cm long, more or less hairy. Sepals zygomorphic, the posterior sepal deeply saccate, broadest

towards the apex, narrowed at the base, 1.5–4.0 cm long, 0.8–1.6 cm deep, the other sepals 1.5–3.5 cm long, 0.6–1.8 cm wide, hairy or glabrescent. Petals ovate to obovate, white with green blotch at inner petal, 2–5 × 1.4–3.0 cm. Stamens several with filaments up to 6.5 cm long and anthers 1–3 mm long. Gynophores up to 7 cm long, usually hairy at the base; ovary obovoid 5–9 × 4 mm. **Fruit:** obovoid, 2–2.5 × 1–1.5 cm, with smooth pericarp. Seeds many, embedded in pulp.

Diagnostic characters: Twigs late glabrescent; fruits with smooth pericarp.

Type: INDIA. Himachal Pradesh: Rampur on the Sutlej, Alt. 3000 ft, May 1890, Watt *s. n.* (holotype E).

Etymology: The specific epithet refers to the Himalayas, where it was located for the first time.

Phenology: Fls.: April–August; Frts.: May–September.



Capparis spinosa subsp. *himalayensis* (Jafri) Fici.— A. habitat (inset images: i-stem with thorns, ii- abaxial surface of leaf); B. open flowers in solitary axillary inflorescence; C. an open flower with green blotch on inner petals; D. branch with mature fruits; E. ripen dehiscent fruit. (Photos B, C, D & E: Rajiv Pandit)



Vernacular names: **Hindi:** *Kabra*;
Punjabi: *Kakri, Kander, Kabra*;
Sanskrit: *Kakadani*.

Distribution: INDIA: Bihar, Jammu & Kashmir, Ladakh, Punjab, Uttar Pradesh and Uttarakhand. [CHINA, NEPAL, PAKISTAN, TAJIKISTAN].

Specimens examined: INDIA. Ladakh: Leh- Laddakh Road, *Yogini Soman* 712 (AHMA!); Leh- Laddakh Road, *Rajiv Pandit* 714, 716 (AHMA!).

Economic/ Medicinal Usage: **Flower buds:** condiment. **Fruits:** condiment, rheumatism, earache, snakebites. **Leaf:** antirheumatic; **Root:** against sores; **Root bark:** tonic, analgesic, diuretic,

rheumatism, paralysis, kills worms in the ear, toothache, tubercular lymphadenitis, expectorant, splenomegaly, laxative, antihelminthic, emmenagogue.

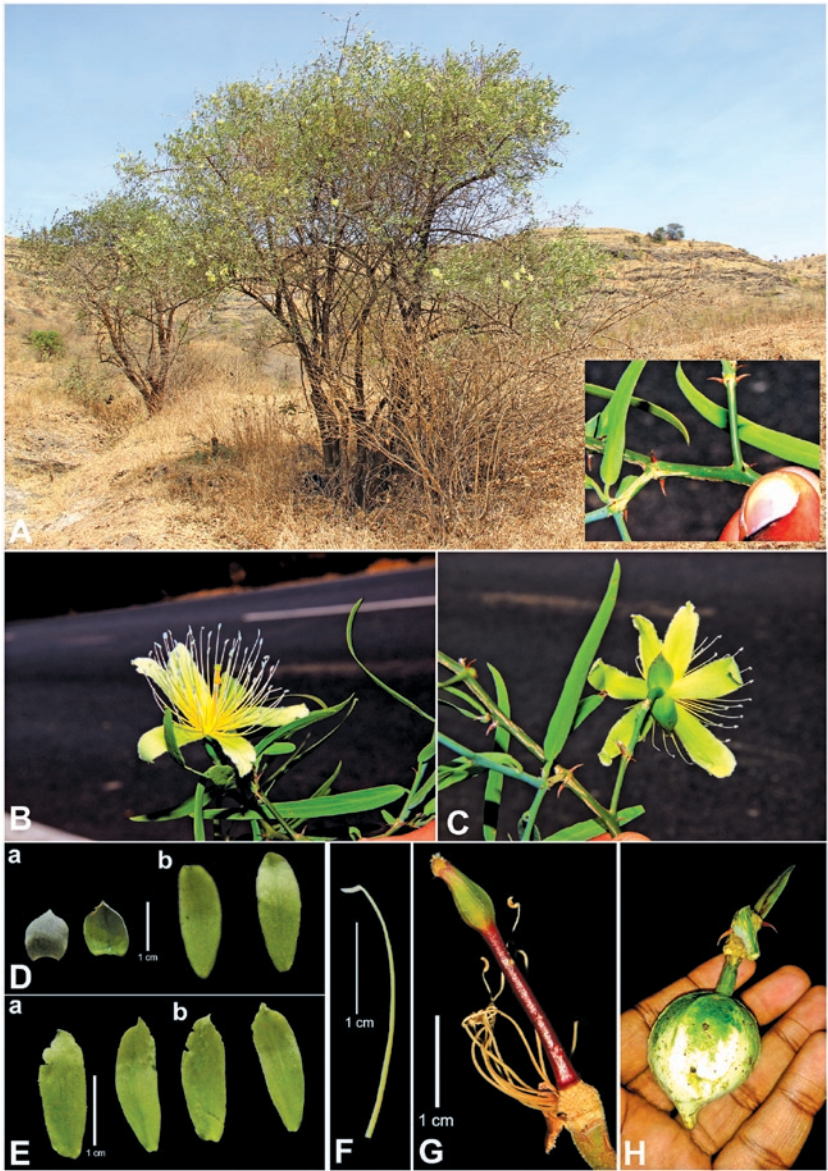
Section: Busbeckea

5. *Capparis divaricata* Lam., Encycl. [J. Lamarck & al.] 1(2): 606. 1785.



Habit: Shrubs or small trees. Innovations whitish or fulvous tomentose with small stellate hairs, early glabrescent. Twigs slender, greenish when dry, more or less zig-zag. Thorns variable, straight or curved upwards or downwards, or patent, 3–7 mm, often 180° diverging, seldom wanting. **Leaves:** blades dimorphic, linear, linear oblong, either widest near the base, or elliptic, or lanceolate, sometimes narrower, up to 3 mm, 2–6 × 0.5–2.5

cm; base obtuse to acute, apex in the linear leaves acute to blunt, in the wider leaves narrowed and obtuse to blunt, mucronulate; midrib somewhat raised, nerves 3–5 pairs, more or less confluent towards the base, thin, reticulation obscure, surfaces dull; petiole 3–7 mm. **Inflorescence:** solitary, axillary or with 2–3 flowers at the top of a twig. **Flowers:** yellowish-green or red at the base of petals, pedicels 1–2.5 cm, tomentose to glabrous. Young buds dull greyish tomentellous, glabrescent. Outer sepals in bud connate with only their narrow tips free, at anthesis splitting irregularly, elliptic, boat-shaped, 10–16 × 3–8 mm, 1–2 mm acuminate, tip densely hairy inside, otherwise more or less sparsely tomentose outside, inner pair 15–30 × 3–10 mm, or longer, petaloid. Petals variable, linear, 15–40 × 3–12 mm, acuminate to rounded, tomentose towards the top. Stamens 55–65; filaments yellowish, reddish at base; anthers white. Gynophores 1.5–2.5 cm, vigorous, glabrous; ovary ovoid, 5–7 mm long, 2 mm wide, 5–6 ribbed, glabrous, beak 2–4 mm, stigma cushion-shaped,



Capparis divaricata Lam.:— A. habit (inset: stem with thorns); B. front view of an open flower; C. back view of the flower showing petaloid inner sepals; D. sepals (a. outer sepal, b. inner sepals); E. petals (a. outer petals, b. inner petals); F. androphore; G. gynophore; H. fruit.



tomentellous. **Fruits:** pedicel often twisted, fruits on a 4–6 mm long woody stipe, globose to sub-ellipsoid, 3.5–4.5 × 4.5 cm, apex with cylindrical point 4–6 mm long, pericarp 2–3 mm thick, red when ripe, with some 10 longitudinal ribs and a multitude of small knobs scattered. Seeds in white pulp, 8 × 6 × 4 mm.

Diagnostic characters: Divaricated stem (spreading at wide angle); flowers yellowish green, inner sepals petaloid; filaments yellowish-reddish at base.

Type: Anonymous *s.n.* (P-JU, cat. 11,259), India, Coromandel côte, st.

Etymology: The specific epithet refers to the divaricated branching of the stem.

Phenology: Fls.: March–April; Frts.: June–September.

Vernacular names: **Marathi:** *Pachúnda*; **Tamil:** *Toaratti*; **Telugu:** *Badreni*.

Distribution: INDIA: Endemic to peninsular India (Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu and Telangana).

Specimens examined: INDIA. Karnataka: *G.S. Puri* 41530, 53047 (BSI!); Jagalur, *N.P. Singh* 128629, 146963 (BSI!); Maharashtra: Khambatki Ghat, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 430, 431 (AHMA!); Kesnand, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 470, 471, 472 (AHMA!); Saswad, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 480 (AHMA!); Diveghat, *S. Maurya* 1414 (AHMA!); Tasgaon, Sangli, *AN Lendhe* 170617 (BSI!); Solapur, Nannaj, *J. Jayanthi & S.C. Yadav* 199251, 199276, (BSI!); Tamil Nadu: Gudamalai RF, *S. Maurya* 740, 741 (AHMA!); Namakkal, *S. Maurya* 742, 743, 744 (AHMA!); Sathyamangalam RF, *S. Maurya* 1453, 1454 (AHMA!); Talamalai RF, *S. Maurya* 1464 (AHMA!).

Economic/ Medicinal Usage: Used in various types of herbal medicines to cure asthma, ulcer, genital problems and as analgesic.

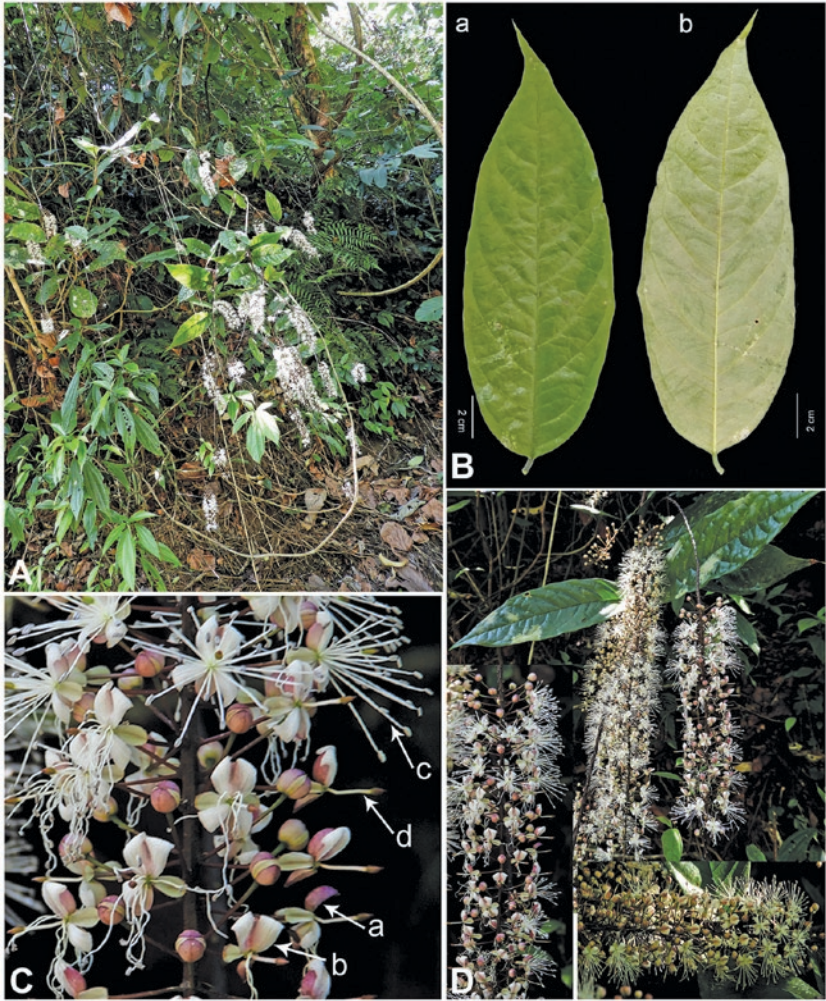
Section: Monostichocalyx

6. *Capparis assamica* Hook.f. & Thomson, Fl. Brit. India [J. D. Hooker] 1(1): 177. 1872.

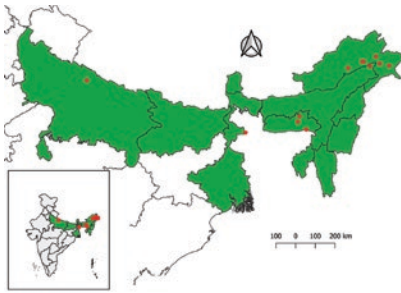


Photo: Momang Taram

Habit: Shrubs, rarely climbing, 2–4 m. Innovations very sparsely pubescent, with appressed, sessile, 2-armed hairs, soon glabrescent. Shoots at the base with cataphylls. Thorns up to 2 mm, straight, directed upwards, but often wanting, in the leaf axils often a small abortive bracteate shoot. **Leaves:** blades elliptic, oblanceolate, 15–21 × 4–7 cm; base acute, apex abruptly acuminate, tip up to 1 cm long, blunt, mucronate; 3–4 times as long as wide, widest about the middle or above; subcoriaceous, surfaces glabrous, rather dull; midrib deeply sunken all over, nerves sub depressed, 8–12 pairs, reticulation distinct; petiole 6–8 mm. **Inflorescence:** a densely flowered terminal



Capparis assamica Hook.f. & Thomson:— A. habit; B. leaves (a. adaxial surface, b. abaxial surface); C. open flowers (a. sepals, b. petals with red blotch, c. androphore, d. gynophore); D. inflorescence (inset: close view of inflorescence). (Photos A, C, & D: Momang Taram)



or subterminal raceme, 10–30 cm long, peduncle short or none, the basal part surrounded by conferted bracts, rachis slender with small decurrent ribs, sparsely puberulous, bracts subulate, 2 mm, glabrous, pedicels solitary in the axil of a bract, filiform, 0.8–1.2 cm, sparsely puberulous. **Flowers:** white. Sepals 4, subequal, elliptic, ovate, 2–5 mm long, sepals turn to purple at maturity, sparsely puberulous outside.

Petals ovate, truncate, 4–6 × 1.5 mm, puberulous towards the base. Stamens 16–20; filaments up to 10 mm. Gynophores 6–9 mm long, glabrous; ovary 1–2 mm long, glabrous, placentas 2. **Fruits:** on thin stalk, globose, 0.5 cm diameter, red. Seed 1.

Diagnostic characters: Terminal inflorescence with up to 30 cm long rachis; flowers fragrant, each one subtended with a small subulate bract at the base.

Type: Griffith 602 hb. (K000247300!) East India Company 188 (K), India, East Bengal, fl.

Etymology: The specific epithet is based on the first report of the species from the Assam state of North East India.

Phenology: Fls.: March–April; Frts.: June–September.

Distribution: INDIA: North East India (Arunachal Pradesh, Assam, Bihar, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Uttar Pradesh and West Bengal). [CHINA, MYANMAR, THAILAND, VIETNAM].

Specimens examined: INDIA. Arunachal Pradesh: Sille, *M. Taram & D. Borah* 1474 (AHMA!); Mishmi hill, Kamlang river, *F. kingdom-ward* 18423, 18572 (NYBG!); NEFA, *A.S. Rao* 47757 (ASSAM!); Pasighat, *G.K. Deka* 16938 (ASSAM!); Assam: Laikul, *Walter N. Koelz* 27863 (L!); Lakhimpur, *P.R. Datta* 2094A (ASSAM!); Meghalaya: K.J. Hills, *G. K. Deka* 12241 (ASSAM!); K.J. Hills, *R. N. De* 19881 (ASSAM!); Khasi hills, *R. C. Thakur* 6220 (L!); Khasi hills, *U. Kanjilal* 7348 (ASSAM!); THAILAND. Chiang mai, *J.F. Maxwell* 06-254 (CMV!); *CF Van Beusekom* 274 (L!); Mae Sai, *J.F. Maxwell* 05-254 (L!); LAOS. *J.E. Vidal* 1247 (P!).

Economic/ Medicinal Usage: Dried leaves and roots are used against headache and body pain (Maikhuri and Gangwar 1993).

7. *Capparis bodinieri* H.Lév., Repert. Spec. Nov. Regni Veg. 9: 450. 1911. *C. acutifolia* subsp. *bodinieri* (A. Lév.) M.Jacobs, Blumea 12: 431-432 22a-c. 1965.



Habit: Shrubs or small trees, up to 10 m. Innovations with a light brown, rarely greyish tomentum, mostly late glabrescent. Thorns mostly present, up to 4 mm. **Leaves:** blades ovate, 1.8–3.3 times as long as broad, 5–18 × 2–6 cm; base rounded to acute, top gradually acuminate, apex blunt; firmly herbaceous to subcoriaceous; midrib rather broad, slightly raised to sunken, nerves 5–9 pairs, reticulation sub-distinct to obscure; petiole



Capparis bodinieri H.Lév.:— flowering twig with open flowers.
(Photo: Dr. Navendu Page)



4–8 mm. **Inflorescence:** supra-axillary, 2–3 flowers in vertical rows. **Flowers:** greenish white with brown spots, 1.2–1.6 cm across, pedicels filiform, 1.5–1.8 cm long. Sepals 4, obtuse, 6–9 × 2–4 mm, all with some tomentum at the margin, especially towards the top, sometimes outer sepals with tomentum. Petals up to 10–14 × 2–5 mm, tomentose, also on the surfaces. Stamens 28–32, filaments white; anthers black. Gynophore very rarely thinly puberulous towards the base.

Fruits: globose, apiculate, ca. 6–10 mm across. Seeds 1–3.

Diagnostic characters: stipular thorns present and persistent; flowers greenish white.

Type: Bodinier *s.n.* (E- E00327224!, holo; A, L, phot.), China, Yunnan, Yun-Nan-Sen, fl. 24. III. 1897.

Etymology: Named in honour of Étienne Soulange-Bodin (1774–1846), a French biologist, botanist and army officer. He played a major role in the organisation of professional horticulture in France.

Phenology: Fls.: February–March; Frts.: April–May.

Distribution: INDIA: North East India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura), West Bengal. [CAMBODIA, LAOS, CHINA, MYANMAR, THAILAND, VIETNAM].

Specimens examined: CHINA. Yunnan, *George Forrest* 2028 (000380488- K!).

Economic/ Medicinal Usage: Leaves are eaten in many countries of south East Asia (Lansky et al. 2014).

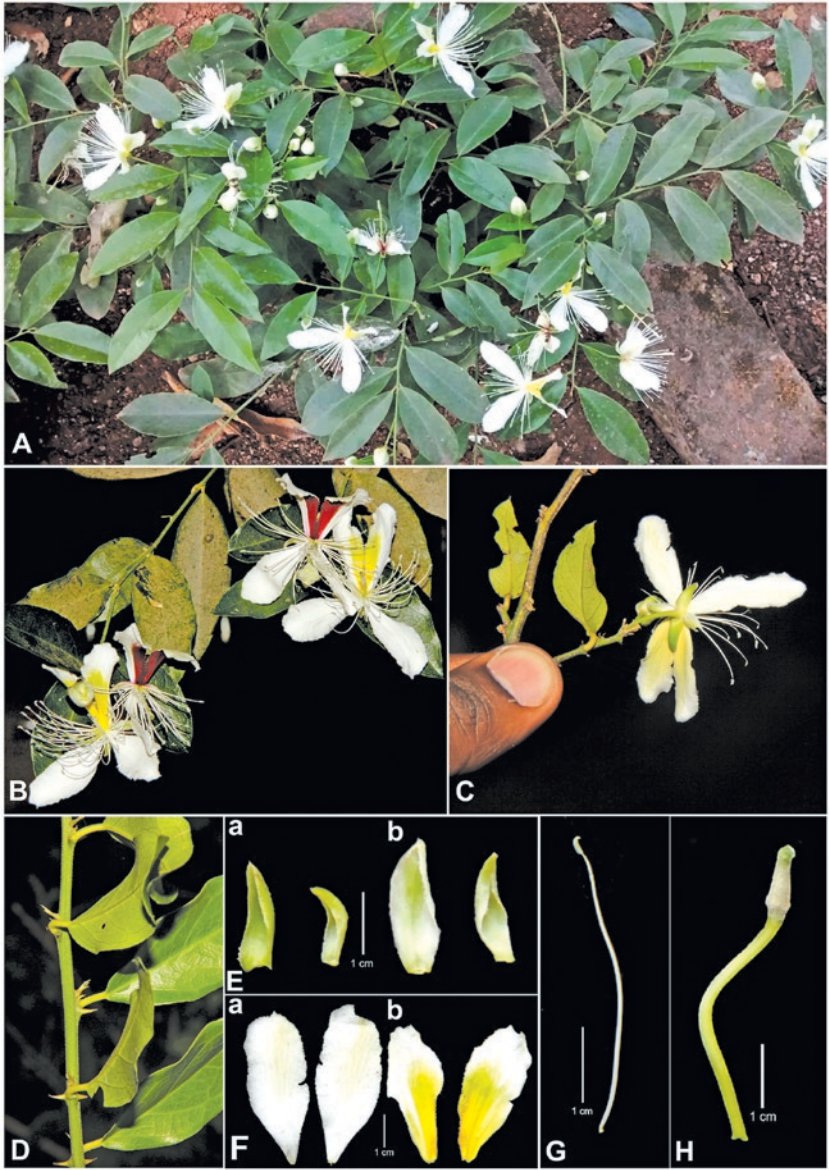
8. *Capparis brevispina* DC., Prodr. [A. P. de Candolle] 1: 246. 1824.



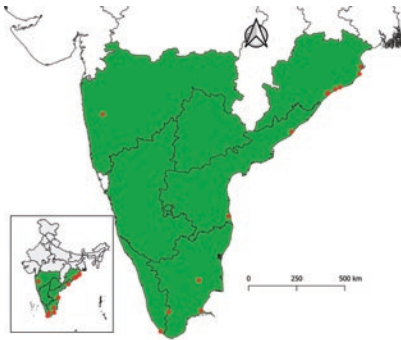
Habit: Shrubs or small trees.

Innovations with densely stellate hairs, soon glabrescent, base surrounded by many cataphylls. Twigs turn brownish after drying. Thorns straight or slightly recurved, pointing upwards, up to 6 mm long. **Leaves:** blades variable in shape and size, elliptic to oblong, 3–14 × 1.5–5 cm; base acute to cuneate, apex acute with a stiff mucro up to 1 mm long; coriaceous; midrib deeply sunken, nerves 4–6 pairs, forms an intra-marginal loop, reticulation distinct, adaxial surface glossy; petiole 2–8 mm long. **Inflorescence:** solitary, axillary, sometimes on small lateral twigs with two to three terminal flowers. **Flowers:**

pedicels 1–3 cm long, glabrous. Buds obovoid, at anthesis half covered by the sepals. Sepals 4, unequal, acute, outer pair boat-shaped, subacuminate, 5–12 × 3–6 mm, glabrous outside, sparsely tomentose to densely villose towards the margin inside; inner



Capparis brevispina DC.:— A. habit; B. inflorescence with open flowers; C. dorsal view of an open flower; D. stem showing thorns and cataphylls; E. sepals (a. outer sepals, b. inner sepals); F. petals (a. outer petals, b. inner petals); G. androphore; H. gynophore. (Photo A: Puroshottam Gorade)



pair ovate and slightly longer than the outer pair, sparsely tomentose to densely villose towards the margin, glabrous inside. Petals obovate, 1.5–3.5 × 0.5–1.5 cm, tomentose towards the top, hairy at margins, white, upper pair with a yellow blotch turning purplish. Stamens 30–35, filaments 3–5 cm long. Gynophores 1.5–3.5 cm long, glabrous, ovary ovoid, long-beaked, 5–6 × 1.5 mm, thick-tomentose, placentas 4, in some flowers the gynoeceum vestigial. **Fruits:** ovoid to ellipsoid, distinctly pointed, 2.5–3 × 1.5–2 cm, pericarp smooth, thin, red or bright orange-pink. Seeds up to 15, in white creamy pulp.

Diagnostic characters: Presence of axillary cataphylls; flowers much smaller than its closest ally *C. rheedei*; petals with yellowish blotch turning purple at maturity.

Type: Roxburgh (G–DC), India, fl. M. Lambert 1815.

Etymology: *Brevis*= short, *spina*= spines (in Latin). The specific epithet refers to the presence of short spines/ thorns on the plant.

Phenology: Fls.: April, October–November; Frts.: June–September.

Distribution: INDIA: Endemic to Peninsular India (Andhra Pradesh, Karnataka, Kerala, Maharashtra, Odisha, Tamil Nadu and Telangana) and SRI LANKA.

Specimens examined: INDIA. Andhra Pradesh: Kadapatra, R.K. Choudhary & S. Maurya 1444 (AHMA!); Maharashtra: S.P. College campus (cultivated), Bhushan Shigwan 708 (AHMA!); Odisha: Brahmagiri Road, Chilika Lake, R.K. Choudhary & S. Maurya 1430, 1435, 1436 (AHMA!); Tamil Nadu: Sivagiri RF, S. Maurya 1463 (AHMA!).

9. *Capparis cantoniensis* Lour., Fl. Cochinch. 1: 330. 1790.



Habit: Drooping climber, 2–25 m. Twigs almost straight, greenish or greyish, angular and puberulous when young, terete and glabrescent when older, internodes 1–4 cm. Thorns recurved, 2–5 mm long, on flowering branches minute or wanting. **Leaves:** blades oblong to lanceolate, 4–12 × 2–5 cm; base obtuse to acute, apex narrowed, acuminate, often blunt, sometimes slender and acute, mucronate, sometimes ovate, rarely obovate; 2–5 times as long as wide; subcoriaceous, above glabrous and pale

greenish when dried, abaxial surface sparsely puberulous but soon glabrescent and often brownish when dry, young leaves pink to reddish; midrib above sunken all over, nerves inconspicuous, 6–9(–11) pairs; petiole 5–10 mm, hairy as the twig. **Inflorescence:** axillary subumbels, often arranged in a terminal panicle, ca. 15–20 cm long, each with a few cm peduncles, sparsely hairy. **Flowers:** sometimes fragrant, pedicels slender, 1–2 cm. Bracts subulate, 1–2 mm long, caduceous, bracteoles basal, minute, sometimes



Capparis cantoniensis Lour.:—herbarium image. ©Royal Botanic Garden, Kew



flowers and caducous soon.

Type: Neotype: Levine 1247, E, (A, GH, K, L, US), China, Kwangtung, Canton & vic, fl. 9. III. 1917.

Etymology: The specific epithet refers to the first report of the species from Canton city in China.

Distribution: INDIA: Andman & Nicobar, North East India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura), West Bengal. [BHUTAN, CAMBODIA, CHINA, INDONESIA, MYANMAR, PHILIPPINES, THAILAND, VIETNAM].

Phenology: Fls.: August–December; Frts.: September–February.

Specimens examined: INDIA. West Bengal: Darjeeling, *Gamble* 28030 (000380491–K!), South Andaman, *S. Kurz*, *s.n.* (000247302–K!); CHINA. *S. Coll* 353 (000380490–K!); HONG KONG. *Hance* 7490 (000380492–K!); *C. O. Levin*, *s.n.* (000380489–K!).

10. *Capparis cinerea* M. Jacobs, *Blumea* 12(3): 444. 1965.

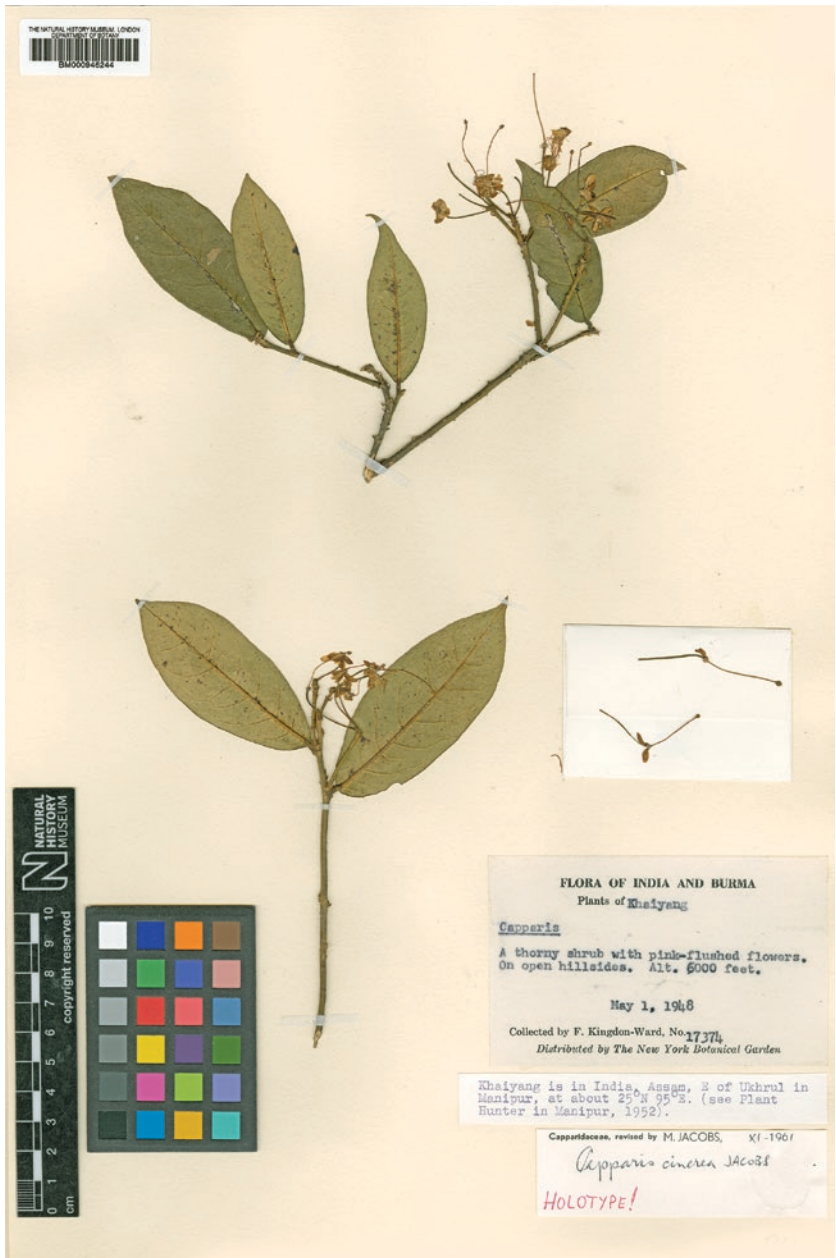


wanting. Buds globular, 4–5 mm diameter. Sepals 4, outer sepals 3–7 mm diameter, sometimes sparsely puberulous at the base outside, inner sepals elliptic to obovate, 3–8 × 3–6 mm, with membranous, ciliate margin. Petals 4, mostly obovate, 3–7 × 2–4 mm, white (sometimes greenish or pinkish), pubescent. Stamens 20–45, 15–30 mm long, filaments white. Gynophores 4–12 mm, glabrous; ovary ellipsoid, 1 × 2 mm, glabrous, placentas 2. **Fruits:** globose to ellipsoid, 1–2 cm diameter, pericarp thin, leathery, smooth. Seeds one to few, globular.

Diagnostic characters: Inflorescence panicle; subulate bracts at the base of

Habit: Shrubs, innovations densely set with small simple greyish–fulvous hairs which are hooked or curved upwards, the base surrounded by cataphylls. Twigs straight, late or not glabrescent. Thorns fairly vigorous, conical, ascending, 1–2 mm. **Leaves:** blades elliptic, 8–10 × 3.5 cm; base obtuse, apex slightly acuminate with acute tip; 2.5–3 times as long as wide, widest about the middle; coriaceous; midrib above sunken, nerves 7–8 pairs, thin and rather obscure above, reticulation

rather obscure on both sides, surfaces dullish, darkish green above, more yellowish below, thinly pubescent on the midrib on both sides and on the main nerves below, otherwise glabrous; petiole 4–5 mm. **Inflorescence:** up to 5 in lateral branches, subumbels 1–2



Capparis cinerea M. Jacobs:— herbarium image. ©Natural History Museum (BM)



cm stalked. **Flowers:** pink flushed, bracts subulate, 1–2 mm, pedicels 1.5–2.5 cm, puberulous. Sepals 4, subequal, elliptic, 6 × 4 mm, outer pair partly covering the inner pair, ciliate. Petals obovate, 9 × 4 mm, whitish tomentose on both sides. Stamens 30–35, 2.5 cm long. Gynophores 2–2.5 cm long, glabrous; ovary ellipsoid, 1.5 mm long with indistinct stigma, glabrous, placentas 2. **Fruits:** unknown.

Diagnostic characters: Twigs greyish hairy; inflorescence short stalked, few flowered.

Type: Kingdon–Ward 17347, holo!, BM[BM000946244!] (NY), India, Manipur/Burma frontier area, Khaiyang, fl. I. V. 1948.

Etymology: The specific epithet refers to the presence of greyish fulvous/ ash-grey hairs (*cinereum*= grey; in Latin) on the stem.

Phenology: Fls.: May.

Distribution: INDIA: Manipur.

Specimens examined: INDIA. Assam, Khaiyang (presently in Manipur) *Kingdon–Ward* 17347 (BM!, BM000946244!).

Note: Never reported after the type collection. Known by a single herbarium sheet available in BM. Our efforts to collect the plant from Manipur yielded no results. Presumably extinct.

11. *Capparis cleghornii* Dunn, Bull. Misc. Inform. Kew 1916(3): 61. 1916. *C. roxburghii* Cooke, Fl. Bombay, i. 46 (1901), non DC.

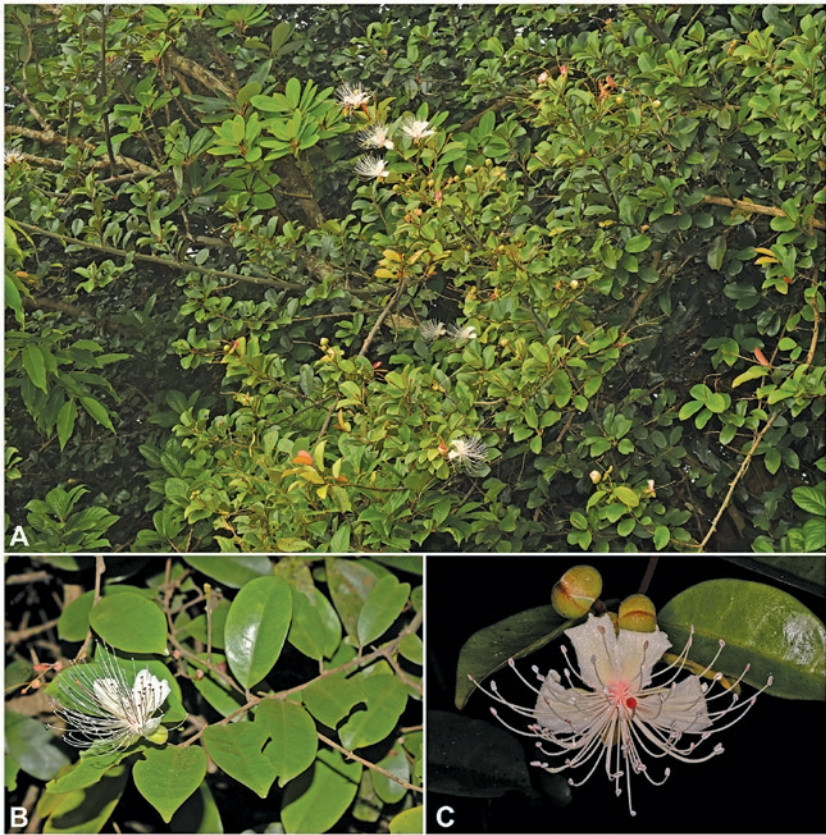


Photo: Dr. Navendu Page

Habit: Trailing shrubs over 3 m, twigs fulvous–pubescent, glabrescent at maturity, dark-coloured when dried. Thorns rather vigorous, recurved, 3–7 mm.

Leaves: blades obovate, 5–10 × 2–5 cm; base acute, apex rounded, abruptly acuminate with a short blunt apex, 1.6–2.4 times as long as wide; subcoriaceous; midrib flat, nerves 4–6 pairs, thin, reticulation obscure, both adaxial and abaxial surface dull, pinkish when young and fresh, greenish when dried,

glabrous; petiole 7–10 mm. **Inflorescence:** flowers solitary at the top of twigs, sometimes with 2–3 flowers. **Flowers:** white, pedicels slender, 2–4 cm, hairy. Sepals 4, thick, subequal, strongly concave, 10–15 × 7–10 mm, outside densely hairy, inside glabrous.



Capparis cleghornii Dunn:— A. habit; B. a twig with open flowers; C. open flower and buds. (Photos: Dr. Navendu Page).



Petals about $14-18 \times 7-10$ mm, hairy towards the base on both sides. Stamens 65–80, white first, turning reddish at maturity, 2–3 cm long. Gynophores 2–5 cm long, glabrous; ovary 3 mm long, glabrous, placentas 3–4. **Fruits:** on slender dark-coloured stalk, dark purple fresh and dried, globose and umbonate, 14–18 mm, 3–4 cm, endocarp scarlet. Seeds 1–4.

Diagnostic characters: Thorns vigorous; corymbose inflorescence; sepals and petals pubescent; stamens 65–80 white and turn red at maturity.

Type: Cleghorn D176 (K), India, Deccan Peninsula, Balalroodroog.

Etymology: Named in honour of Hugh Francis Clarke Cleghorn (1820-1895), a Scottish physician who worked in India and is known as the father of scientific forestry in India.

Phenology: Fls.: February–April; Frts.: April–October.

Vernacular names: **Kannada:** *Baduhugali, Badumungri, Malaitthohikai, Navi-karemanjahanu.*

Distribution: Endemic to Western Ghats of INDIA (Karnataka, Kerala, Maharashtra and Tamil Nadu) and [SRI LANKA].

Specimens examined: INDIA. Karnataka: Chikmangalur, *Shama Rajyadhyaksha* 405 (AHMA!); Shimoga, *Sundararaghavan* 80943, 90453 (BSI!); Yedur, *Sundararaghavan* 86214, 74599 (BSI!); Meracara, *Sundararaghavan* 74216, 90391, 74216 (BSI!); Agumbe, *A.S. Rao* 85569 (BSI!); Canara, *Stocks* 133630 (BSI).

Economic/ Medicinal Usage: Fruits are edible (*Sundararaghavan* 1993).

12. *Capparis diversifolia* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 27. 1834.



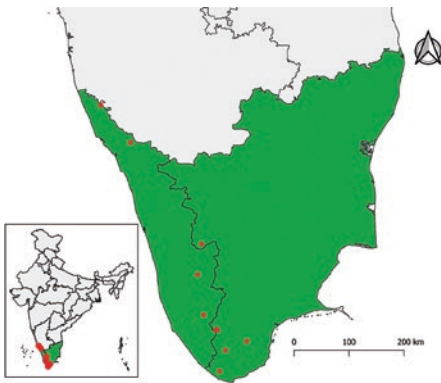
Habit: Shrubs up to 2 m. Innovations white stellate-hairy, soon glabrescent. Thorns slender, slightly recurved, 2–3 mm. **Leaves:** blades ovate to lanceolate; in some of the specimens very variable in width and size, the smallest leaf 2 × 0.3 cm, the largest leaves 6–8 × 2–4 cm; base acute to rounded, apex attenuate, acute, mucronate, rarely blunt; coriaceous, surfaces glabrous, rather glossy; midrib flattish, nerves 6–9 pairs, raised, reticulation very distinct on both sides; petiole 2–8 mm. **Inflorescence:**

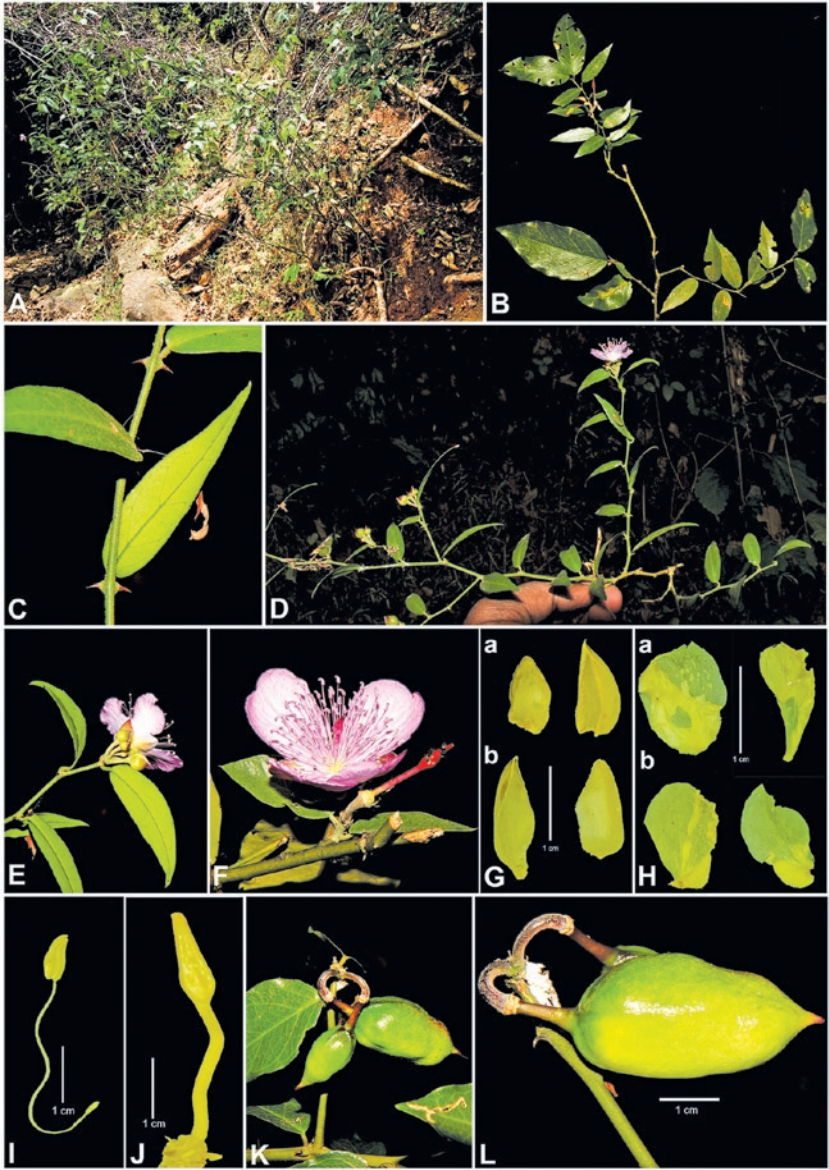
with 3–5 flowers, subumbellate at the top of twigs. **Flowers:** 4 cm across, purple or pink, very distinct from rest of the *Capparis* species, with 3–5 subumbellate at the top of twigs, pedicels 1–2 cm long, densely hairy, pubescent. Sepals 4, subequal, ovate, 10–15 × 4–6 mm, subacuminate, outer pair glabrous outside, densely tomentellous inside, inner pair densely tomentellous outside, glabrous inside. Petals obovate, 10–20 × 5–10 mm,

glabrous but upper pair tomentellous at the base. Stamens 60–70, purple colour, base of filaments shows yellow blotch. Gynophores 8–15 mm, glabrous; ovary fusiform, 5–8 mm long, includes a 2 mm long beak, 2 mm wide, glabrous, placentas 4, sometimes the gynoeocium vestigial.

Fruits: on thin stipe, ellipsoid, 3 × 2 cm or smaller, apiculate, pericarp thin, when dried constricted around the seeds, red. Seeds 6–10.

Diagnostic characters: Inflorescence subumbel with 3–5 flowers at the top





Capparis diversifolia Wight & Arn.:— A. habit; B. twig showing variation in leaf shape and size; C. stem showing presence of recurved thorns; D. a branch with inflorescence and open flower; E. dorsal view of an open flower; F. front view of an open flower; G. sepals (a. outer sepals, b. inner sepals); H. petals (a. outer petals, b. inner petals); I. androphore; J. gynophore; K. young fruits; L. mature fruit.

of twigs; flowers 4 cm across, purple/pink; very distinct from rest of the Indian *Capparis* species.

Type: Wight 952 (CGE, G, K, P), India, Travancore (?), fl.

Etymology: The specific epithet refers to diverse or dimorphic leaves, i. e. leaves showing variations in shapes and sizes.

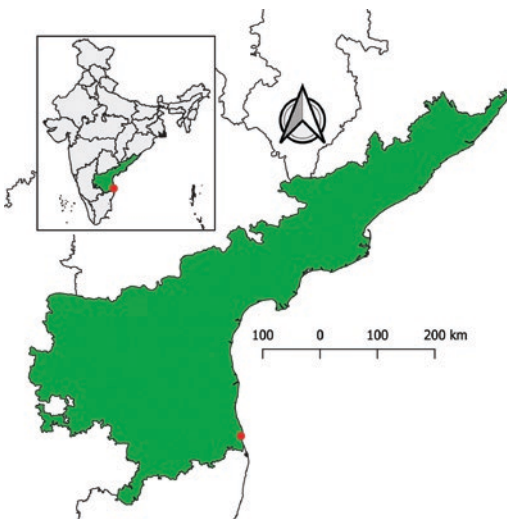
Phenology: Fls.: March–July; Frts.: July–September.

Distribution: Endemic to Western Ghats of INDIA (Tamil Nadu, Kerala) and [SRI LANKA].

Specimens examined: INDIA. Tamil Nadu, Courtallum, Manimuthar to Manjolai forest path, R.K. Choudhary and M.N. Datar 703, 705 (AHMA!); Courtallum, Manimuthar to Manjolai forest path, S. Maurya 1459, 1460, 1461, 1470 (AHMA!).

13. *Capparis flavicans* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 39 (2): 62. 1870.

Habit: Shrubs or small trees 2–12 m, covered with a dense tomentum of fulvous brown stellate hairs. Twigs slender, internodes short. Thorns 1–3 mm, slightly curved upwards or downwards, sometimes minute, on the flowering twigs, sometimes wanting. **Leaves:** blades elliptic obovate or oblong, 1.5–5 × 1–1.5 cm; base obtuse, apex rounded, sometimes notched, sometimes mucronulate or rarely with a small recurved apex; 1.1–2.5 times as long as wide, widest about the middle or sometimes above; firmly herbaceous to subcoriaceous, midrib sunken, sometimes flat or slightly raised, nerves 3–5 pairs, the first 2 pairs mostly radiating from the very base, thin, reticulation obscure, surfaces more or less glabrescent, dull; petiole 3–7 mm. **Inflorescence:** flowers axillary, on the younger part of twigs. **Flowers:** pedicels slender, 1–3.5 cm. Sepals 4, 6–8 × 4–5 mm, glabrous inside, outer pair boat-shaped, inner pair ovate to obovate, more hairy than the outer pair. Petals 8–12 × 6 mm, obovate, tomentose outside towards the top, rarely inside, yellow, upper pair with very fleshy base and golden yellow blotch which turns brown. Stamens 6–12, green–yellow; anthers comparatively large. Gynophores 1.5 × 2.5 cm,



densely hairy all over but some after anthesis glabrescent; ovary ovoid, 3 mm long, small beaked, densely hairy; stigma knob-shaped up to 1 mm wide, placentas 4(–5). In part of the flowers the gynoecium vestigial. **Fruits:** subglobose to ellipsoid, 2–4 × 2.5–3.5 mm, in fruit the pedicel and the gynophore woody and more or less equally incrassate, 3–9 mm long, glabrous, pericarp 2–5 mm thick, orange or bright red, smooth to very densely set with small knobs ca. 2 mm. Seeds in yellow pulp, many.

Diagnostic characters: Plant densely tomentose; leaves with



Capparis flavicans Kurz.:— herbarium image. ©Royal Botanic Garden, Kew

obscure reticulation; flowers axillary in the younger part of twigs; gynophore hairy during anthesis.

Type: Teijsmann HB 5931, BO (CAL, K, U), southwestern Siam, Radburi, Kankian, fl.

Etymology: The specific epithet refers to its dense fulvous tomentum (*fulvus*= yellow; in Latin) on the leaves.

Phenology: Fls.: January–March; Frts.: July–September.

Vernacular names: **Telugu:** *Pula-tiga*.

Distribution: INDIA: Andhra Pradesh (known only from Sriharikota). [CAMBODIA, CHINA, LAOS, MYANMAR, THAILAND, VIETNAM].

Specimens examined: BURMA (MYANMAR). *s. loc.*, Wallich 7003 (K!); *s. loc.*, Pierre 501 (K!); THAILAND. *s. loc.*, Teijsmann 5931 (K!)

Economic/ Medicinal Usage: Leaves are edible. Also used as galactagogue (Luecha et al. 2009)

14. *Capparis floribunda* Wight, Ill. Ind. Bot. pts. 1–8: 35, t. 14. 1840.



Habit: Woody climbers or rarely shrubs, glabrous, but rarely puberulous with simple fulvous hairs. Thorns small, recurved, but mostly wanting.

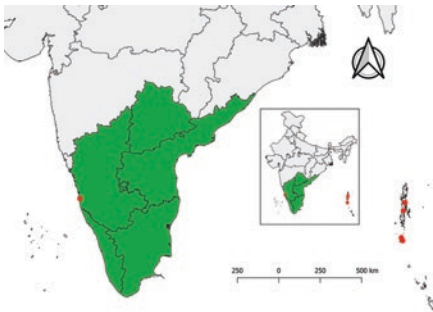
Leaves: blades oblong or elliptic; 4–13 × 2–5 cm; base mostly rounded or subcordate, apex retuse, without mucro, rarely acute; firmly herbaceous, midrib mostly sunken, nerves 7–12 pairs, thin, obscure reticulation, margin often slightly recurved; petiole 0.5–2 cm. **Inflorescence:** subumbels 1–3 cm stalked and arranged together in a terminal panicle up to 15 × 10 cm, with some additional smaller axillary panicles. **Flowers:** numerous, white.

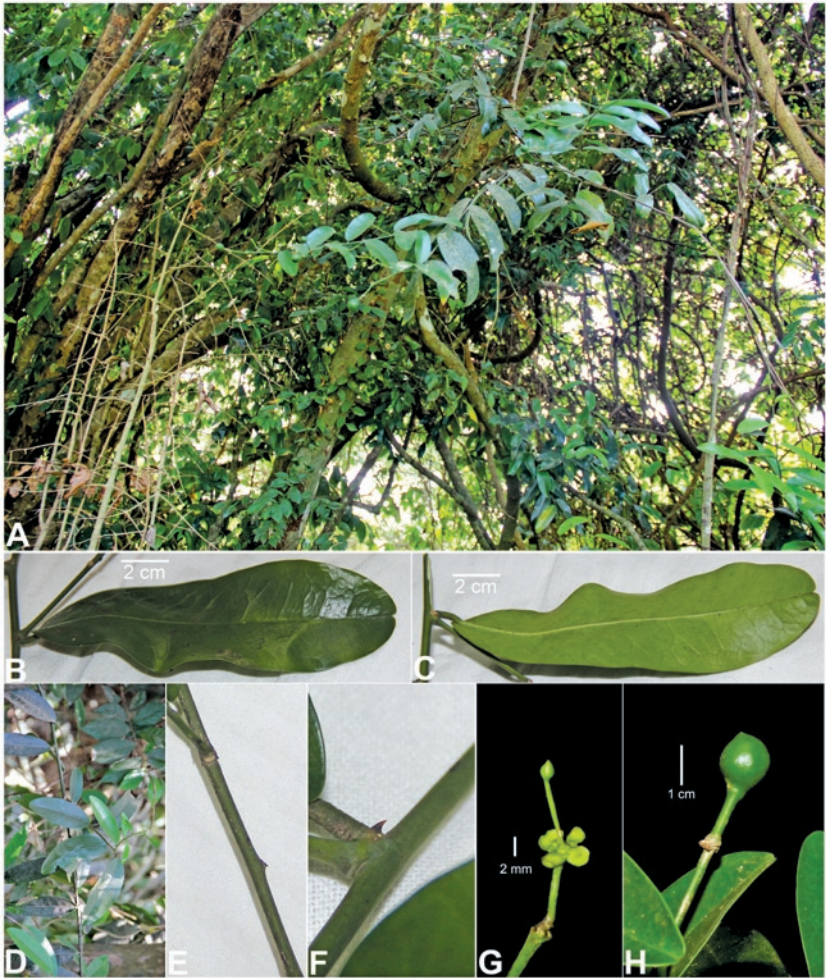
Sepals 4, subequal, concave, elliptic to orbicular, 2–4 × 1.5–2.5 mm, persistent for a short time after anthesis, inner pair sometimes wider with a wide membranous margin. Petals very thin, oblong or ovate, 3–5 × 1.5–2 mm. Stamens 7–12, white. Gynophores

4–6 mm, glabrous; ovary ovoid, 0.5–1.5 mm long, glabrous, placentas 4. **Fruits:** on a thin stipe, globose, 1.5–2 cm diameter, soft, fleshy, pericarp leathery, smooth, orange at maturity. Seeds 1–3.

Diagnostic characters: Woody climbers; panicle inflorescence densely flowered; stamens 8–12.

Type: Wight Prodr. 2439 (K) India, fl. Fr.





Capparis floribunda Wight.:— A. habit; B. abaxial surface of leaf; C. adaxial surface of leaf; D. a vegetative twig; E. young stem; F. stem showing thorns; G. persistent sepals and gynophore after anthesis; H. young fruit.

Etymology: The specific epithet refers to the presence of flowers in dense clusters or panicle (*floribunda*= many flowers, in Latin).

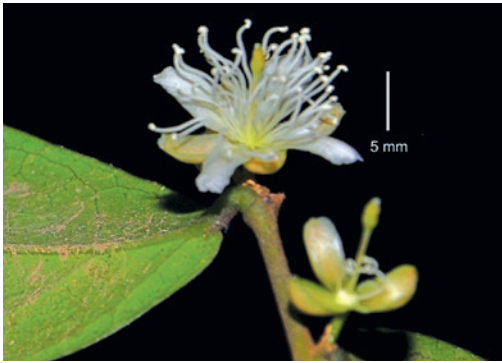
Phenology: Fls.: January–April; Frts.: May–June.

Distribution: INDIA: (Andman & Nicobar, Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Telangana). [CAMBODIA, CHINA, LAOS, MYANMAR, PHILIPPINES, THAILAND, AND VIETNAM].

Specimens examined: INDIA. Karnataka: Udupi, *K.G. Bhat & S. Maurya* 730, 731 (AHMA!); Peninsular India, *Wight* 2439 (000247308, K000247309- K!); Peninsular India, *King, s.n.* (000247310, 000247311- K!).

15. *Capparis fusifera* Dunn, Bull. Misc. Inform. Kew 1914(10): 377. 1914.
C. parviflora (non Hook. f. & Th.) Bedd., IC. Pl. Ind. Or. (1874) 65, t. 276.

Photo: Dr. K. Ravikumar



Habit: Large shrubs, spreading, much-branched. Twigs with some cataphylls at the base, rather densely brown-puberulous, hairs long persistent. Thorns up to 3 mm, slightly recurved, or wanting. **Leaves:** blades ovate, or elliptic, 9–16 × 3–6 cm; base obtuse, apex long-tapering and gradually acuminate to rounded; 2–4 times as long as wide, widest at the middle;

firmly herbaceous; midrib sunken but flattish at the top, nerves 8–12 pairs, forms intra marginal loop, prominent beneath, reticulation distinct, both adaxial and abaxial surfaces dull, glabrous except for some pubescence in the furrow of the midrib; grey-greenish after drying; petiole dark-coloured, 4–12 mm. **Inflorescence:** umbellate on condensed, 3–6 flowered axillary or subterminal on 4–8 cm long peduncle, puberulous. **Flowers:** white, fragrant, 1.2–1.6 cm in diameter, pedicel up to 1.8 cm long, filiform, glabrous. Sepals 4, glabrous, sometimes ciliate, thin, ca. 6 mm diameter, membranous towards the margin, outer pair in bud completely covering the inner pair. Petals 6–10 × 3–5 mm, sparsely hairy. Stamens 42–56; filaments up to 15 mm long. Gynophores glabrous, 6–8 mm long; ovary spindle-shaped, unilocular or sometimes bilocular due to presence of false septa, glabrous, placentas 2. **Fruits:** fusiform to spindle shaped, beaked, 4–5 × 2.2–3.0 cm, rough on surface. Stipe 1–1.8 cm long, ca. 4 mm thick. Seeds 1 or 2.

Diagnostic characters: Twigs brownish hairy; inflorescence 3–6 flowered, axillary; flowers greenish white; fruits fusiform to spindle shaped.

Type: Barber 5726 (K, holo; MH), S. India, Udumanparai, Anamalais, fr. 30. IV. 1903.

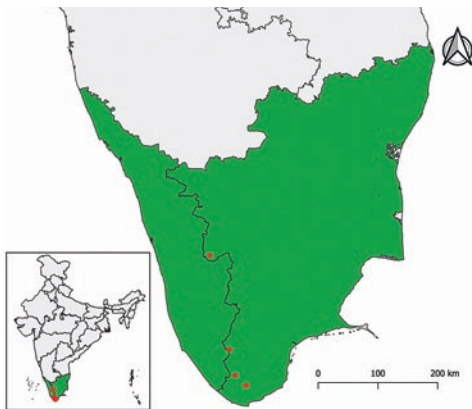
Etymology: The specific epithet refers to the fusiform fruits (*fusiformis* (Latin)= spindle shaped/ tapering at both the ends) of the plant.

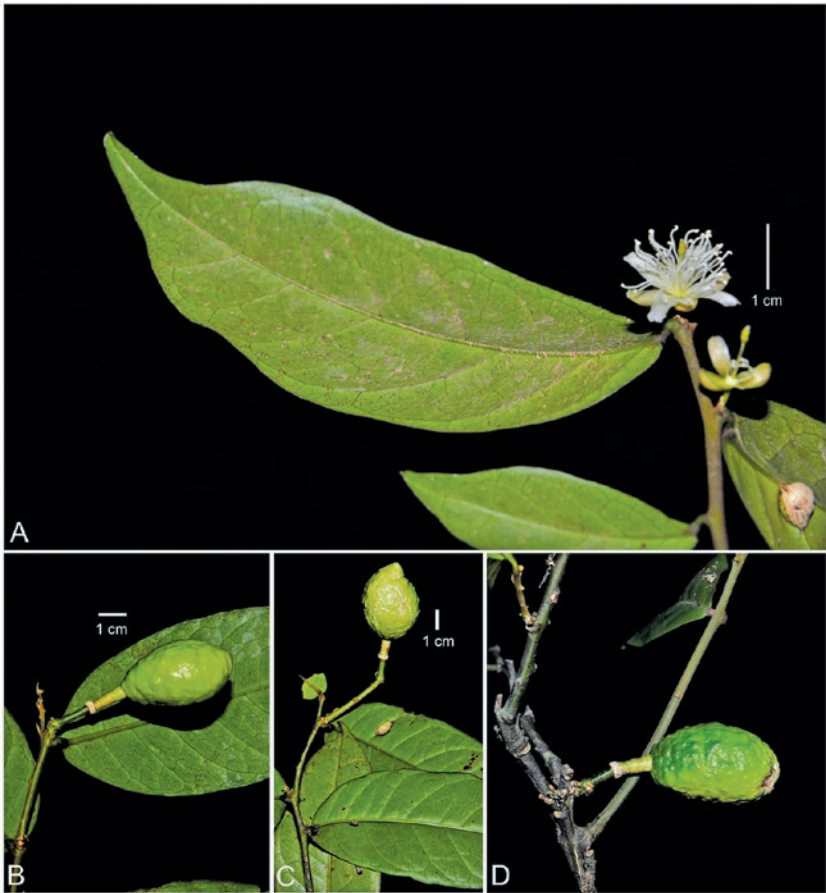
Phenology: Fls.: October–December; Frts.: November–April.

Vernacular name: Tamil: *Siruvalli*

Distribution: INDIA: Narrowly endemic to Tamil Nadu and Kerala.

Specimens examined: INDIA. Tamil Nadu, Anamalai, Barber 5726 (K!); Travancore, Beddome 61, 243 (K!); Madras, S. Coll. 61 (K!).





Capparis fusifera Dunn:— A. a flowering twig; B., C. & D. fruits.
(Photos: Dr. K. Ravikumar)

16. *Capparis grandiflora* Wall. ex Hook.f. & Thomson, Fl. Brit. India [J. D. Hooker] 1(1): 174. 1872.



Habit: Shrubs with spreading branches, up to 2.5 m in height but the lateral branches spread on ground. Innovations covered with tomentum of stellate hairs persistent on the twigs. Thorns recurved, 2–5 mm long, brown, sharp. **Leaves:** blades elliptic to lanceolate, 1.5–3 × 1–1.5 cm; base rounded to subcordate, apex acute, with sharp mucro; subcoriaceous; midrib sunken, mostly with hairs in the furrow, nerves 3–4 pairs, thin, reticulation distinct above, obscure below, adaxial surface glossy; petiole 2–3 mm. **Inflorescence:** solitary, axillary. **Flowers:** pedicels 1–2 cm long, tomentose. Sepals 4,

outer pair boat-shaped, 14–18 × 8–10 mm, glabrous or sparsely tomentose outside, villose towards the margins inside, inner pair ovate, equal to outer pair, thin, outside villose towards the margin, inside glabrous. Petals 4, obovate-triangular, almost truncate, 2–4 × 1.5 cm, white, base turns red at maturity, glabrous. Stamens 80–110, exceeding the gynoeceum by ca. 1 cm; filaments white, base turns red at maturity; anthers blue. Gynophores 2–2.5 cm, glabrous; ovary ovoid to cylindrical, 5–8 × 2 mm, placentas and furrows 4–5, stigma cushion-shaped, hairy, ovary glabrous. **Fruits:** on stipe 2 mm thick, ovoid, 4–8 cm long, including a beak 5 mm long. Seeds 5–7 × 5.5–6.5 mm.

Diagnostic characters: Shrubs with spreading branches; leaves subcoriaceous; flowers solitary-axil; bases of petals and stamens yellow which turns purple to red at maturity; stamens up to 110.

Type: Heyne hb. Wallich 6984A Holo (K!), India, fl. 23. XII. 1821.

Etymology: The specific epithet refers to the presence of big/grand size of flowers on the plant.

Phenology: Fls.: February–August; Frts.: July–October.

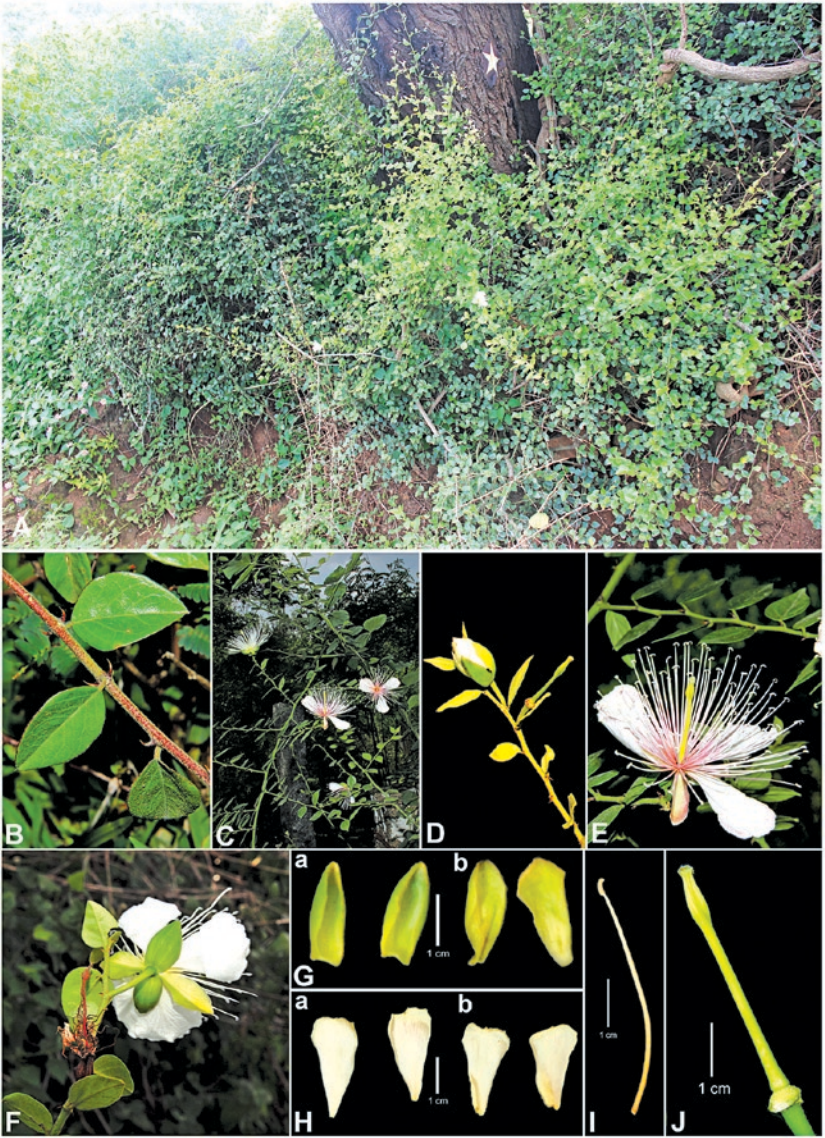
Distribution: Western Ghats of India (Karnataka, Kerala, Maharashtra, Tamil Nadu) and Madhya Pradesh.



Specimens examined: INDIA. Tamil Nadu: Anaikatti Road, R.K. Choudhary & M.N. Datar 492, 493, 494, 495, 497, 498, 499 (AHMA!), Anaikatti Road, S. Maurya 753 (AHMA!) Hasanur, S. Maurya 733, 734 (AHMA!), Jaganari Slopes RF, S. Maurya 753, 1458 (AHMA!).

Economic/ Medicinal Usage: Fruits are edible, and used in various herbal medicines

Note: The distribution record of *C. grandiflora* in Madhya Pradesh and Maharashtra is based on Khanna 2001 and Naik 1998 respectively. Our field surveys and herbarium studies could not confirm this record.



Capparis grandiflora Wall. ex Hook.f. & Thomson:— A. habit; B. stem with thorns; C. inflorescence; D. flower bud; E. an open flower; F. dorsal view of the flower; G. sepals (a. outer sepals, b. inner sepals); H. petals (a. outer petals, b. inner petals); I. androphore; J. gynophore.

17. *Capparis grandis* L.f., Suppl. Pl. 263. 1782.



Habit: Trees up to 12 m tall. Twigs fulvous or greyish, densely pubescent. Thorns 3–9 mm long, slightly recurved, but often wanting, especially on the flowering twigs. **Leaves:** blades obovate, elliptic ovate or suborbicular, 3–9 × 3–6 cm; base acute, rarely cuneate, apex mostly acute, rarely rounded or subacuminate, sometimes mucronate; firmly herbaceous to subcoriaceous, midrib shallowly sunken at the base, nerves 5–12 pairs, forms intra-marginal loop, more or less parallel, mostly without intermediary nerves, reticulation rather distinct, adaxial surface glabrescent, mostly dull, abaxial surface densely covered with long straight fulvous or greyish hairs; petiole 6–14 mm long. **Inflorescence:** up to 20 flowers densely conferted terminally, subumbel or rarely solitary. **Flowers:** white, puberulous. Pedicels 1–3 cm long, puberulous. Sepals 4, outer pair boat-shaped, 6–9 × 4–7 mm, herbaceous, sparsely puberulous outside; inner pair obovate, 6–11 mm long, glabrous but the margins ciliate. Petals 4, obovate, 8–15 × 3–5 mm, puberulous inside, sometimes hairy at margins. Stamens 30–50, white, filaments filiform. Gynophores 1–3 cm, hairy towards base, ovary ovoid, 2 × 1 mm, glabrous, placentas 2. **Fruits:** pedicels hairy, globose, often somewhat umbonate, 2–4 cm diameter, pericarp coriaceous, smooth purple. Seeds few to 15, 10–15 × 8–14 × 5 mm.

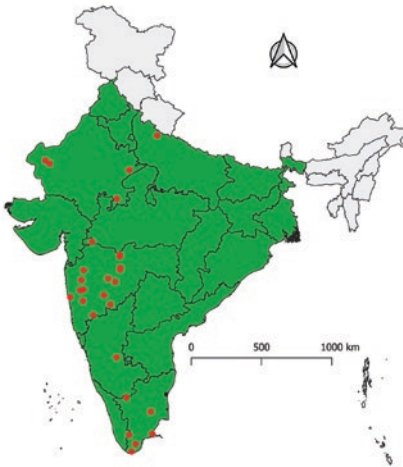
Diagnostic characters: Trees with brown coloured young branches; leaves with light green velvety indumentum; umbel inflorescence and gynophore hairy at base.

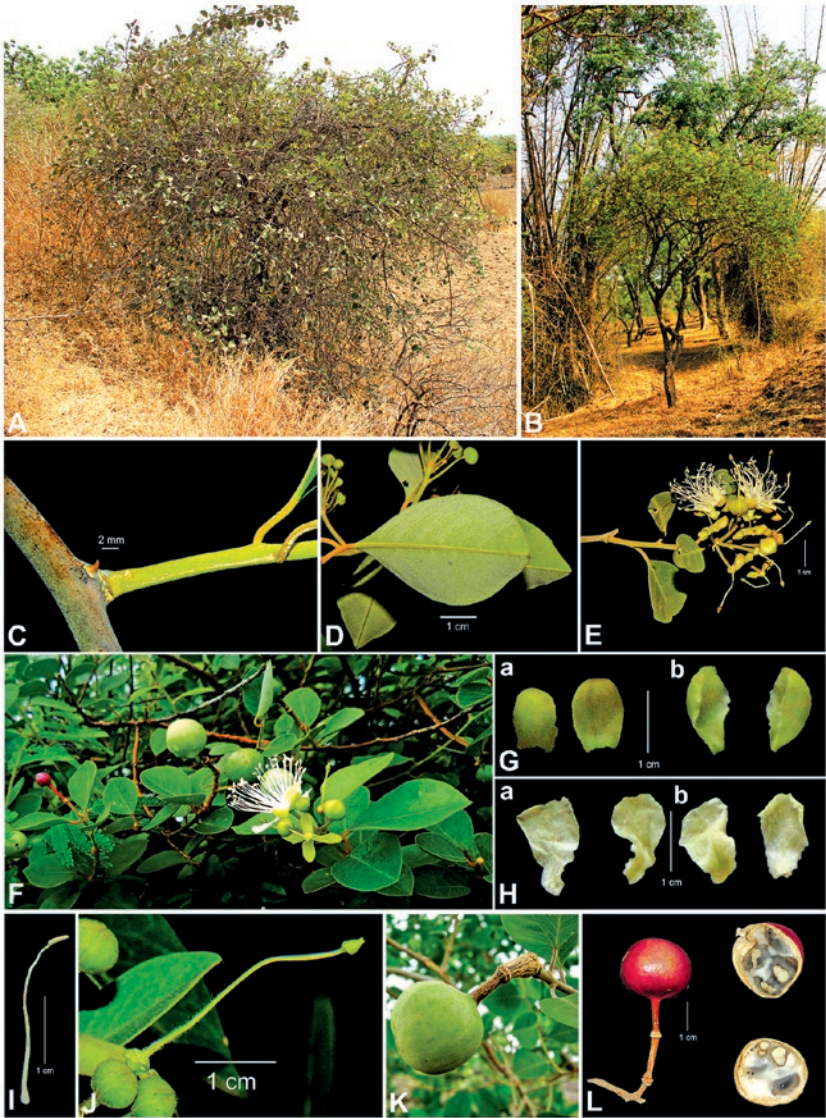
Type: Koenig (n.v.), Ceylon.

Etymology: The specific epithet refers to the presence of grand appearance of tree as compared to other *Capparis* species.

Phenology: Fls.: Throughout the year; Frts.: June–January.

Comman English/ Vernacular names: **English:** Grand Caper,





Capparis grandis L.f.:— A. & B. habit; C. stem showing recurved thorns; D. abaxial surface of leaf; E. inflorescence with buds & open flowers; F. branches with open flowers and fruits; G. sepals (a. outer sepals, b. inner sepals); H. petals (a. outer petals, b. inner petals); I. androphore; J. gynophore; K. mature fruit; L. fruit.

Tree Caper; **Hindi:** *Pachunda, Padanbor*; **Kannada:** *Torate*; **Marathi:** *Kandel, Katarni, Pachara, Pachunda*; **Tamil:** *Mudkondai, Thotti maram*; **Telugu:** *Guli, Nallupi, Ragota, Reghoti Cettu*.

Distribution: INDIA: throughout the country except North East India, Himachal Pradesh, Jammu & Kashmir, Ladakh and Uttarakhand. [CAMBODIA, CHINA, LAOS, MYANMAR, PAKISTAN].

Specimens examined: INDIA. Karnataka: Chitradurga, *N.P. Singh* 146905 (BSI!); Maharashtra: Vetul Hills, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 404, 711 (AHMA!); Law college hill, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 715 (AHMA!); Dandoba hills, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 466 (AHMA!); Kesnand, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 473, 474, 475 (AHMA!); Junnar, Shivneri hills, *K. Hemadri* 108119, 98272 (BSI!); Ranipur-Toranmal, *Seshagiri Rao* 96671 (BSI!); Ranipur camp, *R. D. Pataskar* 105708, 101434, 110230 (BSI!); Pune, Bund Garden Grave, *B.M. Wadhwani* 64314 (BSI!); Wadala, Solapur, *J. Jayanthi & SC Yadav* 199275 (BSI!); Tamil Nadu: Hassanur, Sivagiri RF, *S. Maurya* 736, 1451, 1466 (AHMA!).

Economic/ Medicinal Usage: A timber yielding species. Leaves and barks are used against swelling and eruptions (Lansky et al. 2013).

18. *Capparis incanescens* DC., Prodr. [A. P. de Candolle] 1: 247. 1824. *C. sepiaria* var. *incanescens* (DC.) Hook.f. & Thomson 177: 1872



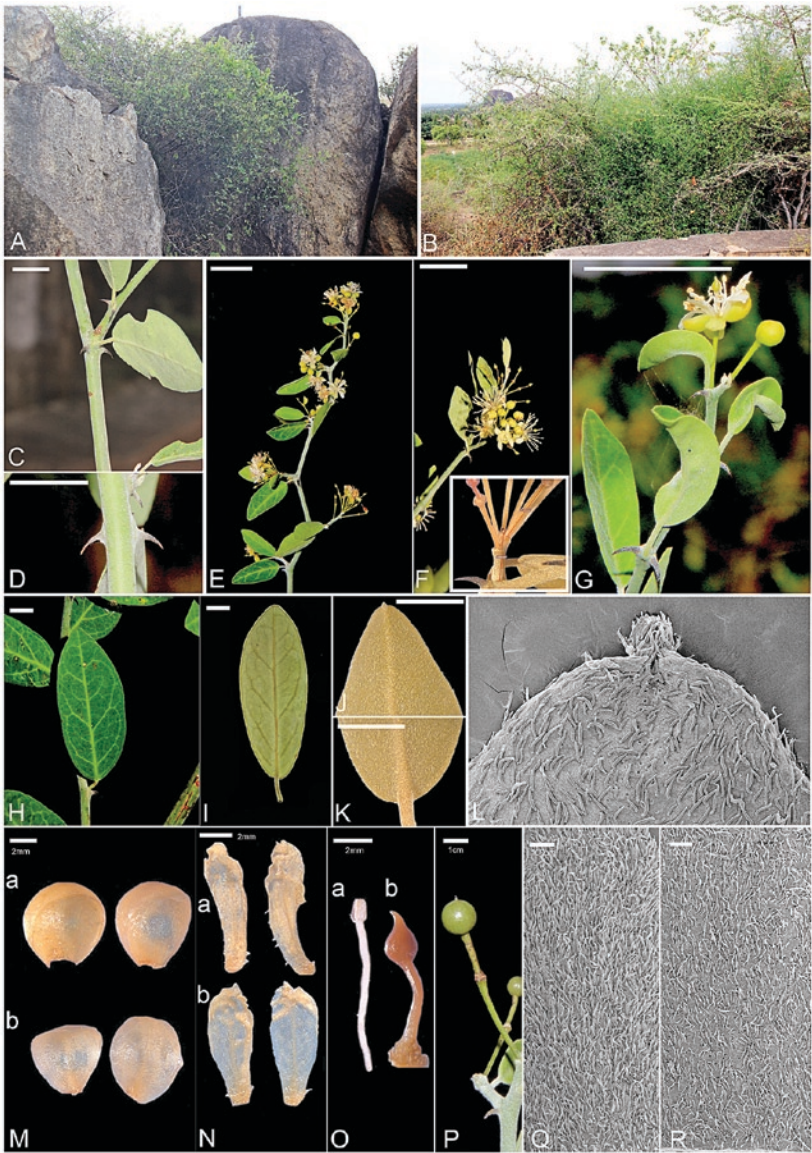
Habit: Shrubs up to 3 m, much branched. Innovations white tomentose. Twigs stout, zig-zag, pubescent or rarely puberulous on maturity. Thorns numerous, recurved 4–6 mm long. **Leaves:** blades lanceolate to elliptic lanceolate or oblanceolate; 3–5 cm × 1–1.5 cm long; entire at margins, apex mucronate, base obtuse to rounded; greenish brown after drying; both abaxial and adaxial surfaces pubescent, on maturity adaxial surface turning puberulent; midrib prominent, nerves 5–6 pairs, secondary veins prominent

on both side and forming intramarginal loops; petioles 3–6 mm. **Inflorescence:** corymb to subumbels, 8–12 mm long, 10–15 flowers, terminal and on lateral branches. **Flowers:** non-fragrant, 6–8 mm across, pedicels 5–8 mm long, glabrous. Sepals in two whorls, subequal, ovate, outer sepal more concave than inner ones, 3.5–4 × 1.5–2.5 mm, inner sepal membranous 3–3.5 × 1.5–2.5 mm, margin eciliate, glabrous, green. Petals 4, oblanceolate, apex acute to obtuse, 3.5–5 × 1.2–2 mm, glabrous, creamy-white. Stamens 20–24, filaments 3–6 mm long, white; anthers basifixed, creamy white. Gynophores 3–4 mm long, glabrous at base; ovary ovoid, glabrous, placentas 2. **Fruits:** berry, globose, 10–12 mm across, dark purple when ripen. Seed 1, globose, 0.7–0.8 mm across.

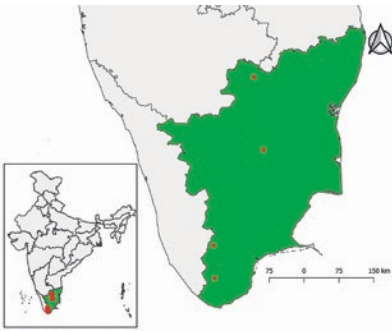
Diagnostic characters: *Capparis incanescens* DC. is closely allied to *Capparis sepiaria* L. but differs from the later in having tomentose innovations (vs puberulent to glabrous); mucronate leaf apex (vs emarginated or retuse apex); 10–15 flowers (vs 8–30 flowers) in inflorescence; eciliate calyx; glabrous petals and gynophore base; 20–24 stamens (vs 30–45 stamens).

Type: INDIA. Mysore (v.s. in h. Banks) BM (000629173, digital image- BM!)

Etymology: The specific epithet refers to the presence of white tomentum on young branches due to which the plant looks greyish- white (*canescens*= becoming grey/white



Capparis incanescens DC.:— A. & B. habitat and habit; C. young stem showing white tomentose surface; D. mature stem showing recurved thorns; E. flowering twig; F. inflorescence (inset: glabrous pedicel); G. flower; H & I. abaxial & adaxial surface of leaf; J. leaf apex showing a mucro; K. leaf base; L. SEM Image showing a pubescent mucro at leaf apex; M. sepals (a. outer & b. inner sepals) showing eciliate margin; N. petals (a. outer petals, b. inner petals); O. androphore & gynophore; P. immature fruit; Q, R. SEM image of young stem surface; R. SEM image of mature stem surface. (C-K scale of 1 cm).



with old age; in Latin).

Phenology: Fls.: March–May; Frts.: May–September.

Distribution: INDIA: Endemic to Tamil Nadu.

Specimens examined: INDIA. Tamil Nadu, Mysore, *Dr. Buchanan, s.n.*, (000629173, digital image-BM!); Namakkal District, Vellakaradu–Murugan temple Road, *S. Maurya*, 745, 746, 747, 748, 749, 750, 751 (AHMA!); Tirunelveli District, Kalakkad Mundanthurai Tiger Reserve, Ambasamudram Taluka, Manimuthar to Monjolai Road, near Ambasamudram forest check post, 20 April 2019, *S. Maurya* 1469A,

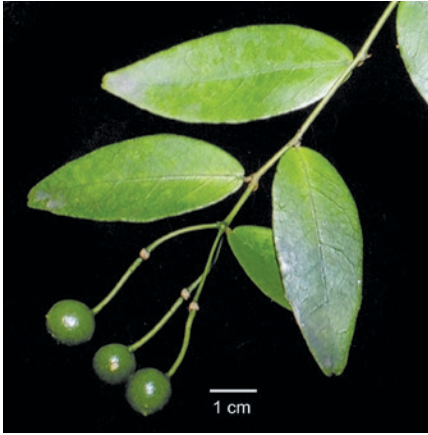
1469B, 1469C, 1469D, 1469E (AHMA!); Tirunelveli District, Sivagiri forest, Thalayan Road, 19 April 2019, *S. Maurya* 1467A, 1467B, 1467C, 1468A, 1468B (AHMA!).

Economic/ Medicinal Usage: The local people of Sivagiri forest informed that the leaves of *Capparis incanescens* are eaten by the white goats of the area whereas the black goats avoid eating them. They further informed that the black goats of the area often face tumour related problems whereas it is not reported in the white goats. As per their belief, *Capparis incanescens* might possess some anti-tumour properties.

Notes: *Capparis incanescens* was first described by DeCandolle in his Prodrromus Systematis Naturalis Regni Vegetabilis, where he enlisted 53 species of *Capparis*. He described this species based on two distinguishing characters viz. adpressed canescent stem and leaf, mucronate leaf apex and differentiated it from *C. sepiaria* L. Later, Hooker (1875) reduced this species to a variety of *C. sepiaria* and considered this as a rare variation of the Indian population with very dense whitish indumentum and pointed leaf apex. However, Gamble (1957) in his Flora of the Presidency of Madras synonymized it under *C. sepiaria*. The same was followed by Jacobs (1965) while revising *Capparis* in Indus to Pacific land. Henceforth, all subsequent floristic works in India (Matthew 1983, Sundararaghavan 1993 etc.) followed the same treatment. However, our critical morphological and molecular studies confirmed this as a distinct taxon. The molecular data showed striking variations in both *trnLF* and ITS regions. ITS having 15 variable – parsimonious informative sites (PI) with eight transition and seven transversions, whereas *trnLF* with 11 variable-PI with five transition and six transversions. Besides, an insertion of a 49bp long stretch of nucleotide in the *matK* gene of *C. incanescens* was also observed, an important character to discriminate *C. incanescens* from its allied species (NCBI Accession nos: *C. incanescens* – ITS MN892489 (Namakkal, TN), MN396796 (KMTR, Ambai Ghat, TN); *trnLF* MN897918 (Sivagiri, TN) MN897919 (Namakkal, TN) MN442075 (Ambai Ghat, TN); *matK* MN897922 (Sivagiri, TN), MN897923 (Namakkal, TN), MN449430 (Ambai Ghat, TN). *C. sepiaria* – ITS MN892488 (Raigad, MH) MN396795 (Erode, TN); *trnLF* MN442067 (Raigad, MH), MN897920 (Salem, TN), MN897921 (Erode, TN); *matK* MN442060 (Raigad, MH), MN897924 (Salem, TN), MN897925 (Erode, TN)). Therefore, *C. incanescens* DC. is reinstated and treated distinctly in the present work.

19. *Capparis kollimalayana* M.B. Viswan., Kew Bull. 55(1): 245. 2000.

Photo: Dr. K. Ravikumar



Habit: Straggling shrubs, irregularly and profusely branched, up to 3 m high. Innovations rusty-pubescent, early glabrescent, hairs simple, both unicellular and multicellular. Twigs terete. Stipular thorns present, brown, recurved, mostly about 3 mm long.

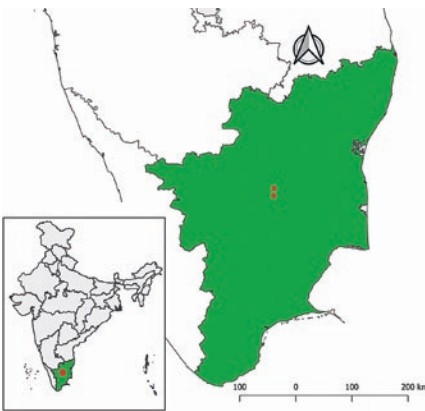
Leaves: blades ovate to elliptic or oblong, 3.4–7.6 × 1–2.4 cm; obliquely obtuse-truncate at base, with slightly undulate margin, apex abruptly subacute or subacuminate and retuse; subcoriaceous, glabrous on both surfaces, green and shining above, pale green or greenish brown beneath; midrib slightly raised in mature leaves,

lateral nerves 12–16, prominent above, obscure beneath; petioles rusty-pubescent, 1.5–3.5 × 0.5–1.2 mm. **Inflorescence:** solitary and axillary or 1–8 borne on terminal or more rarely sub-terminal or axillary subumbels, ca. 1.5 cm across, the subumbels sessile or pedunculate. **Flowers:** zygomorphic, not fragrant, peduncles 5–20 mm long, pedicels thin and slender, glabrous, 14–22 mm long. Sepals 4, deciduous, free at the base, the outer pair ca. 6 × 3.5 mm, oblong-obovate, concave, hood-shaped, truncate at base, margin entire and finely ciliate, obtuse at apex, glabrous within and without, green, the inner pair similar but c. 6 × 4.2 mm, suborbicular, obtusely rounded at apex, greenish white. Petals 4, subsessile, subequal, ca. 6–8 × 3.5 mm, oblong-elliptic, whitish to pale green, truncate and densely tomentose-sericeous outside at base, sericeous-tomentose within along midrib, entire and densely ciliate at margin, acute or subacute at apex, midrib prominent, inner petals similar but larger, ca. 8 × 4 mm, sub-orbicular, irregularly undulate. Stamens 24–26, glabrous, filaments white, 9–13 mm long; anthers greyish white, sub-basifixed, introrse, oblong, ditheous, ca. 1.8 × 0.8 mm. Gynophore 12–15

mm long, filiform, slightly widened at the base of ovary, white; ovary green, ovoid, glabrous, ca. 2–3 × 1–2 mm.

Fruits: one-seeded, globose, 8–10 mm in diameter, stipitate, stipe ca. 1 mm in diameter, pericarp smooth, green, brown when dry, pulp slimy, brown. Seed globose, 6–8 mm in diameter, embedded in pulp.

Diagnostic characters: *Capparis kollimalayana* is allied to *C. shevaroyensis* Sundararagh (= *C. parviflora* Hook.f. & Thomson.) but differs in its prominent recurved thorns (absent or minute in the latter); in the





Capparis kollimalayana M. B. Viswan.:— A. twigs showing presence of leaves, thorns and fruits. (Photo: Dr. K. Ravikumar)

longer pedicels (14–22 mm vs 4–5 mm long); sepals and petals about twice as large; in the longer gynophores (15 mm vs 6 mm) (Viswanathan 2000).

Type: India, Tamil Nadu, Salem Distr., Viswanathan 17322 (holotypes MH; isotype K, MH).

Etymology: The specific epithet refers to the type locality of the species i.e. Kolli hills (*Kolimalay*) of Tamil Nadu state of India, from where the species was first described.

Phenology: Fls.: April–May; Frts.: June–October.

Vernacular names: Tamil: *Kokkimul*.

Distribution: INDIA: Narrowly endemic to Tamil Nadu (reported only from Kolli hills).

Specimens examined: INDIA. Tamil Nadu, Kolli hills, *Viswanathan* 17322, 17240 (Holo–MH!, K!).

20. *Capparis membranifolia* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42: 70. 1874. *C. acutifolia* Sweet subsp. *viminea* M.Jacobs in Blumea 12: 429-437. 1965. *C. viminea* Hook. f. & Thomson, Fl. Brit. India [J. D. Hooker] 1(1): 179, 1872. non J. D. Hooker & Thomson ex Oliver (1868).



Photo: Dr. Santanu Dey

Habit: Shrubs, rarely climbing, up to 6 m, trunk thorny, up to 15 cm diameter. Innovations densely minutely light brown tomentose, soon glabrescent. Thorns mostly wanting, if present (on the main twigs) straight, ascending, up to 4 mm long. **Leaves:** blades elliptic or oblong; 6–13 × 3–6 cm; base abruptly narrowed into the petiole, apex up to 1 cm acuminate, tip blunt to acute; 2–3 times as long as wide, widest at the middle or somewhat lower; herbaceous,

sometimes subcoriaceous, light green when fresh; midrib comparatively broad, sunken above in the basal part, nerves 5–7 pairs, reticulation more or less distinct, surfaces glabrous but vestiges of the tomentum long persistent on the main nerves; petiole 6–11 mm. **Inflorescence:** supra-axillary, with 2–3 flowers in a vertical row. **Flowers:** mostly white, with dark anthers. Sepals 4, much equal, outside tomentose, glabrescent, the margins ciliate. Petals obovate, oblong, 7–9 × 2.5–3.5 mm long, densely tomentose. Stamens 28–30, filaments white, anthers dark coloured or black. Gynophores filiform, 2–2.5 cm long; ovary ovoid, glabrous. **Fruits:** 1–1.5 cm diameter, dark-coloured, pulp yellow. Seeds 1–5.

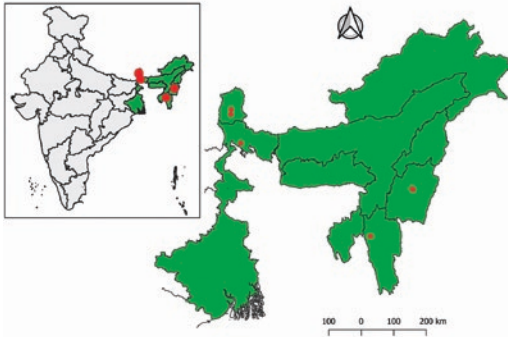
Diagnostic characters: Leaf base broadly cuneate and decurrent on petiole; Stipular thorns very small or mostly wanting; white flowers with greenish striations.

Type: Kurz 1826 (CAL-0000004987, K), Burma, Pegu, Choungmenah Choung, fl.

Etymology: The specific epithet refers to the presence of membranous / thin leaves.

Phenology: Fls.: March–April; Frts.: May–July.

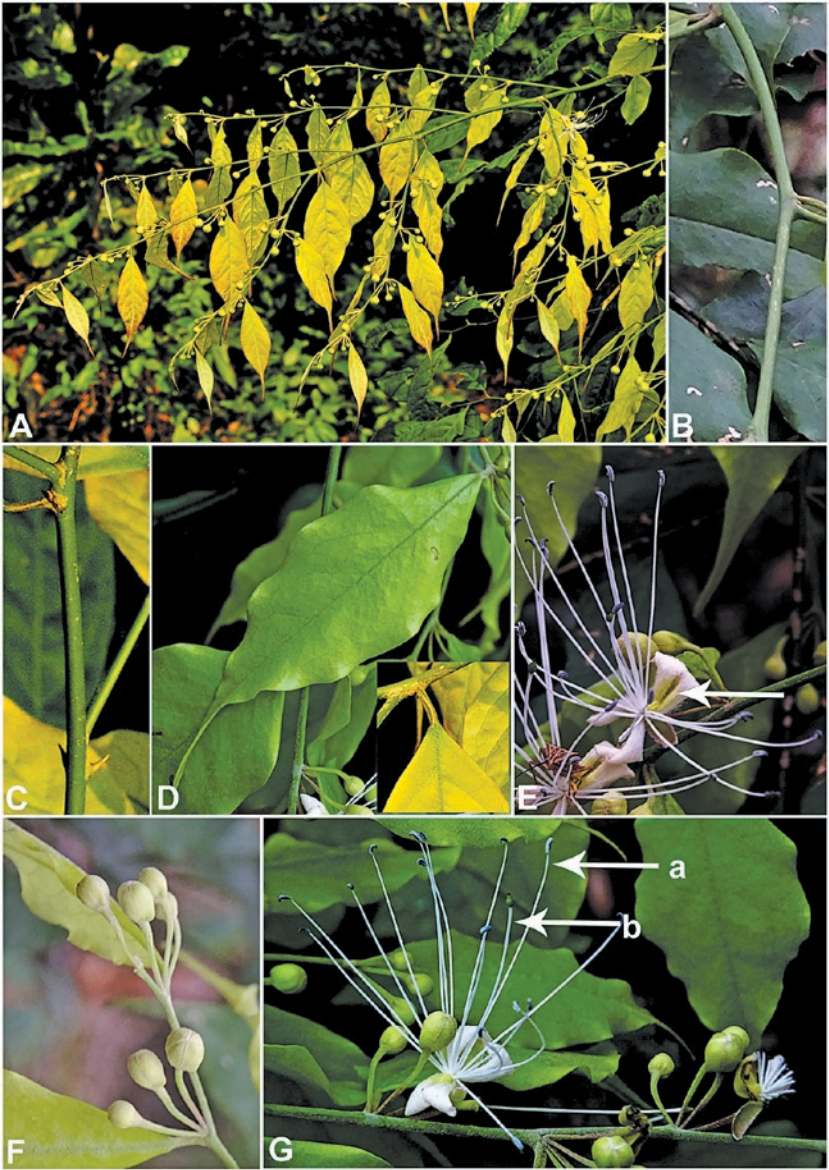
Distribution: INDIA: North East India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura), West Bengal. [CAMBODIA, CHINA, LAOS, MYANMAR, THAILAND, VIETNAM].



Specimens examined:

INDIA. Sikkim: *J.D. Hooker* 48 (000247292–K!); MYANMAR. *s. loc.*, *S. Kurz* 1826 (000247294–K!); BURMA. Pegu, Choungmenah Choung, *Kurz* 1826 (CAL-0000004987!).

Economic/ Medicinal Usage: Leaves are eaten in many countries of south East Asia (Lansky et al. 2014)



Capparis membranifolia Kurz:— A. habit; B. glabrous young stem; C. mature stem with thorns; D. abaxial surface of leaf; E. an open flower with green striations on inner petal; F. flower buds; G. inflorescence with open flowers (a. arrow showing androphore, b. arrow showing gynophore). (Photo A: Dr. Navendu Page; B, D, E, F, & G. by Dr. Santanu Dey)

21. *Capparis micracantha* DC., Prodr. [A. P. de Candolle] 1: 247. 1824.

Habit: Shrubs or small trees, rarely climbers, 4–10 m., trunk greyish. Innovations sparsely pubescent. Shoots at the base surrounded by cataphylls. Stipular thorns conical, 3–7 mm long, patent or directed upwards, straight or rarely recurved. **Leaves:** blades oblong to lanceolate, 8–32 × 4–12 cm; base mostly rounded, sometimes blunt to subcordate or acute, apex broadly or narrowly rounded, sometimes slightly emarginate, or acute, rarely acuminate, dark apex; midrib prominent above, nerves 5–10 pairs, reticulation distinct; surfaces light green when dry; petiole 6–15 mm long. **Inflorescence:** supra-axillary series in vertical rows. **Flowers:** up to 6. Pedicels 1–2 cm. Sepals subequal, herbaceous, 3 × 5 mm, nearly boat-shaped, ovate to oblong, the margins mostly hairy. Petals oblong to lanceolate, 10–25 × 3–7 mm, white, turning dark red or brownish, or dark violet. Stamens 16–35(–75); filaments 18–30 mm. Gynophores 15–30(–35) mm glabrous; ovary ovoid to ellipsoid, ca. 3 × 2 mm, glabrous, exceptionally hairy but soon glabrescent, placentas 4, in some flowers gynoeceum vestigial. In fruit gynophores 4–6 mm diameter, pedicel thinner. **Fruits:** globose to ellipsoid, with 4 longitudinal sutures, 3–6 × 3–11 cm, yellow, orange or red, pericarp smooth, 2 mm thick, when dry woody-coriaceous, pulp juicy. Seeds 6–8 × 4–7 × 3–5 mm, red to shiny black.

Diagnostic characters: Presence of cataphylls at the base of shoots; inflorescence in supra-axillary series up to six flowers in a row.

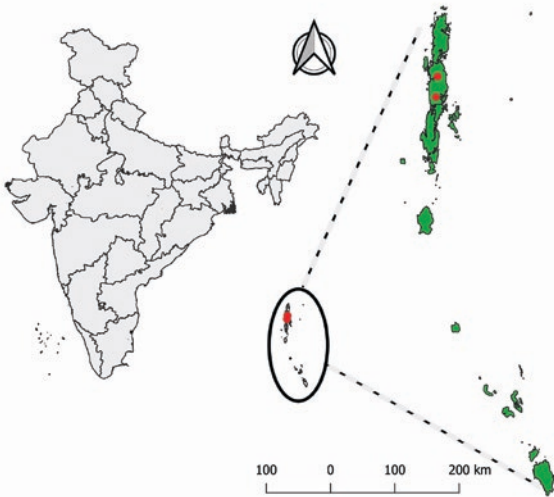
Type: Lahaye *s.n.* (G-DC, holo; P), Malesia, Java, fl.

Etymology: The specific epithet refers to the presence of small thorns on the plant (*mikrós*= small, *akantha*= thorn; in Greek).

Phenology: Fls.: February–March; Frts.: April–May.

Distribution: INDIA: Andaman and Nicobar Island. [CAMBODIA, CHINA, LAOS, MYANMAR, THAILAND, VIETNAM].

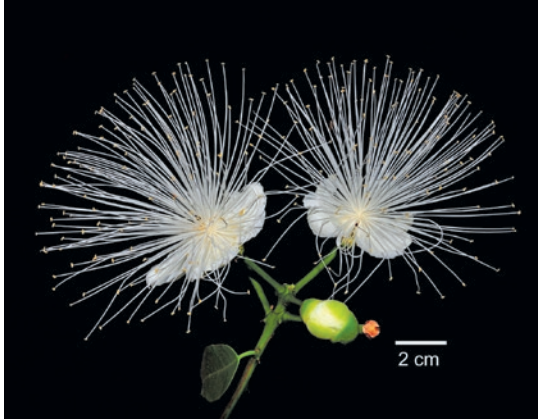
Specimens examined: BORNEO. *s. loc.*, *Korthals, s.n.* (K!); PHILIPPINES. *s. loc.*, *Ramos M., s.n.* (K!); SINGAPORE. *s. loc.*, *Wall.* 6992 (K!); THAILAND. Sulawesi, *s. loc.*, *Van Balgooy* 136 (K!); VIETNAM. *s. loc.*, *L. Pierre* 4012, 38, 38 (K!).





Capparis micrantha DC.:— herbarium image. ©Royal Botanic Garden, Kew

22. *Capparis moonii* Wight, Illustr. Ind. Bot. i. 35. 1840.



Habit: Shrubs or climbers, stems up to 15 cm diameter, 2–4 m tall. Innovations puberulous, mature plant glabrous. Twigs purplish brown, tender shoots unarmed, puberulous. Thorns recurved, 2–3 mm, rarely wanting. **Leaves:** blades elliptic to lanceolate to oblanceolate, 6–16 × 3–7 cm; base rounded to subcordate sometimes cuneate, apex acute to acuminate, with a

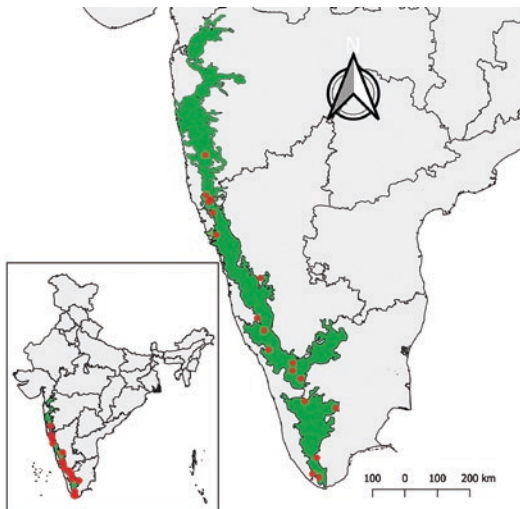
short, blunt, leathery tip; subcoriaceous; midrib shallowly sunken, nerves 6–16 pairs, reticulation indistinct; petiole 8–15 mm. **Inflorescence:** up to 6 terminal flowers or sub terminal corymbs. **Flowers:** 8–10 cm across, conferted with up to 6 towards the top of a twig, the lower ones in leaf axil, pedicels 2.5–9 cm long, sometimes sparsely puberulous towards the top. Sepals 13–25 mm diameter, outer pair highly concave and glabrous, inner pair flattish and fulvous–puberulous outside. Petals obovate, 20–35 × 10–25 mm, white, pubescent inside towards the base. Stamens 100–140; filaments white, turning brick-red. Gynophores 5–9 cm long, glabrous; ovary ovoid to ellipsoid, 3–4 × 2.5–3 mm, glabrous, placentas 4. Pedicels in fruits and the gynophore woody and thick, 5–6 mm, purplish brown. **Fruits:** sub-globose to ellipsoid, 15 × 10 cm, pericarp 5–6 mm thick, smooth. Seeds many, ca. 1.5 × 1.0 cm.

Diagnostic characters: Shrubs or climbers; flowers 8–10 cm across; up to 6 flowers at the top of twigs; stamens 100–140.

Type: Wight *s.n.* (K000247316 - K!), India, Ceylon, fl. III. 1836.

Etymology: The species was named in honour of the famous botanist Alexander Moon (1755–1825), the director of the Botanical Gardens, Peradeniya, Sri Lanka.

Phenology: Fls.: October–April; Frts.: March–October.





Capparis moonii Wight:— A. & B. habitat & habit; C. mature stem; D. mature twig showing presence of leaves and thorns; E. young stem showing presence of recurved thorns; F. adaxial surface of leaves; G. abaxial surface of leaves; H. inflorescence with open flower; I. dorsal view of an open flower; J. sepals (a. outer sepals, b. inner sepals); K. petals (a. outer petals, b. inner petals); L. androchore; M. gynochore; N. fruits on stem; O. fruit cut in two halves; P. mature fruit; Q. seeds with coiled embryo.

Common English/ Vernacular names: English: Indian Caper; **Kannada:** *Bandiraroveldi, Mullu kathari, Tatla, Totte, Tottulla*; **Marathi:** *Poorvi, Rudranti, Tambadvel*; **Odia:** *Udipi* **Sanskrit:** *Rudanti*; **Telugu:** *Aadsenda, Adonda*.

Distribution: Endemic to Western Ghats of India (Goa, Karnataka, Kerala, Maharashtra and Tamil Nadu) and [SRI LANKA].

Specimens examined: INDIA. Karnataka: Kumta, *Sundararaghavan* 79458, 79447 (BSI!); Hassan Ghat, *S.D. Mahajan* 34816 (BSI!); Maharashtra: Patagaon, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 436 (AHMA!); Amboli, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 436, 437, 438, 439, 440, 441, 442, 443, 444, 456, 457 (AHMA!); Choral Ghat, *R.K. Choudhary, M.N. Datar & Sneha Joshi* 484, 485 (AHMA!); Bhatkal, *Sundararaghavan* 74341, 79648, 79649, 153163 (BSI!); Kumbharli Ghat, *M.P. Nayar* 97816 (BSI!); Old Lonavala, *B. Venkata Reddi* 120949 (BSI!); Ramghat Amboli, *B.G. Kulkarni* 105291 (BSI!); Khandala, *R.D. Pataskar* 52507 (BSI!); Koyana, *P.S. Tour* 158442 (BSI!); Tamil Nadu: Anaikatti, Sholayoor, *S. Maurya* 754 (AHMA!).

Economic/ Medicinal Usage: Used against emaciating conditions of the body, and to delay the signs of ageing (Yadav & Malpathak 2016). Fruits and seeds are used against cough, spitting and weakness in tuberculosis. The presence of sterol (Moonisterol) has been reported from the seed extracts (Ramachandram et al. 2004).

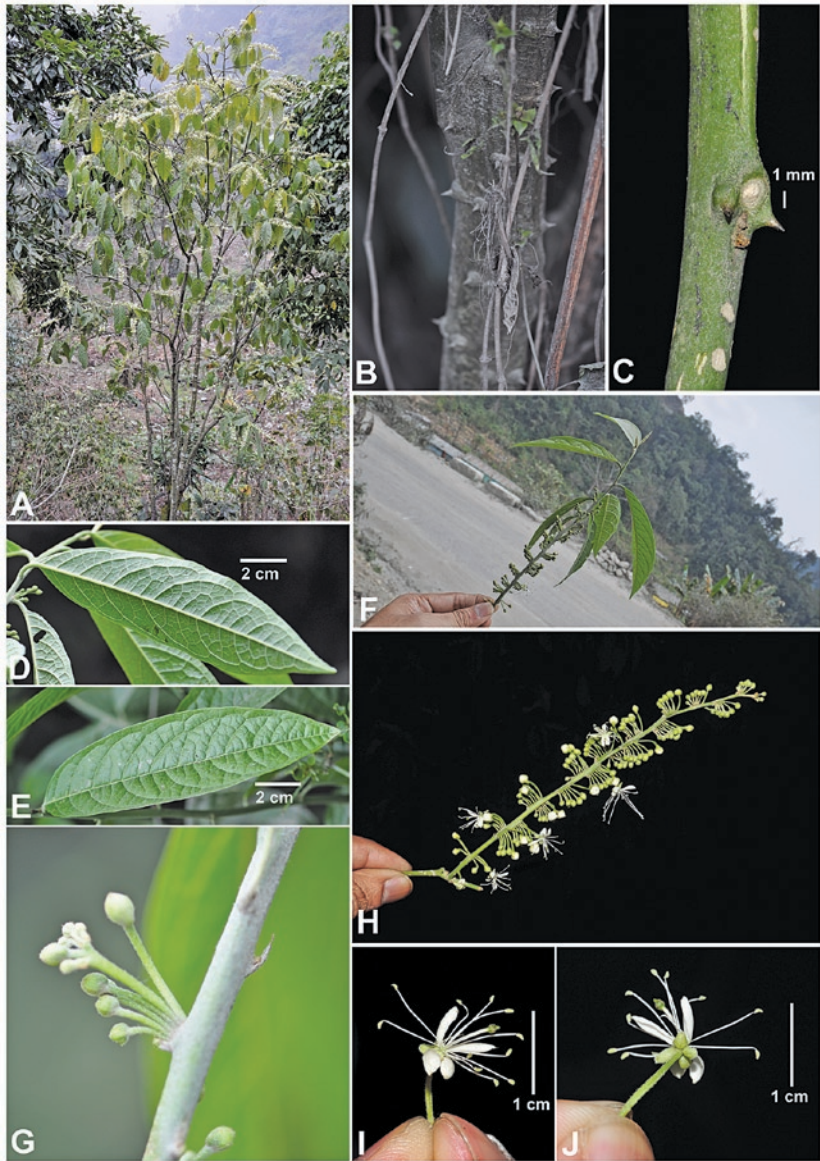
23. *Capparis multiflora* Hook.f. & Thomson, Fl. Brit. India [J. D. Hooker] 1(1): 178. 1872.



Habit: Shrubs or trees up to 7 m, less branched. Innovations consist of whitish hairs. Twigs slender, innovations glabrescent at maturity, the base with cataphylls. Thorns weak, ascending, up to 2 mm long, sometimes wanting. **Leaves:** blades elliptic oblong, or oblanceolate, 12–27 × 4–10 cm; base cuneate to acute, apex more or less tapering, gradually to abruptly acuminate, tip up to 2 cm, blunt, 2.5–4.5 times as long as wide, widest above or sometimes about the middle; herbaceous; midrib narrowly raised at adaxial surface, nerves 7–12 pairs, thin, reticulation distinct, surfaces dull; petiole 6–12 mm.

Inflorescence: supra axillary with 7–10

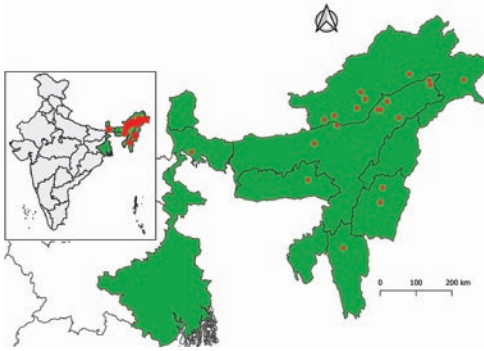
flowers in a vertical rows, 1–2 cm long, subtended by a reduced subulate bract-like leaf, 2–3 mm long with 2 minute adnate thorns, sometimes subtended by a normal leaf, hence the twigs being densely surrounded with flowers up to 10–20 cm between the previous and the new leaves. **Flowers:** white, sweet-scented, pedicels filiform, 6–25 mm. Sepals 3–5 × 1.5–2.5 mm, minutely puberulous, outer pair boat-shaped, ovate, obtuse, inner pair ovate to obovate, rounded, margins membranous, puberulous at the top. Petals ca. 5–8 × 2–4 mm, puberulous, hairy at margins. Stamens 10–12. Gynophores 6–14 mm, glabrous; ovary ovoid, 1.2–1.6 × 1 mm, pubescent, placentas 2, ovules few. Gynoecium sometimes abortive. **Fruits:** 1–3 in a row, on a thin stipe, subglobose, ca. 1.5 cm diameter, pericarp thin, blackish. Seeds 1–4, ca. 8 × 6 × 4 mm.



Capparis multiflora Hook.f. & Thomson:— A. habit; B. mature stem with thorns; C. young stem with thorns; D. adaxial surface of leaf; E. abaxial surface of leaf; F. a flowering twig; G. supra-axillary inflorescence; H. inflorescence with open flowers; I. front view of an open flower; J. dorsal view of an open flower.

Diagnostic characters: Flowers supra-axillary in vertical rows between the two leaves, each having small bract; flowers white; gynophore glabrous but ovary covered with brown hairs.

Type: Griffith hb. East India Company 186 (K, holo; P), India, eastern Himalaya, Darjeeling, fl. yfr.



Etymology: The specific epithet refers to the presence of many flowers in a supra-axillary series between old and new leaves or patches of supra-axillary flowers in a continuous row.

Phenology: Fls.: February–June; Frts.: September–March.

Vernacular name: Assamese: *Thanim-niu-tre*.

Distribution: INDIA: North East India (Arunachal Pradesh, Assam, Manipur, Meghalaya,

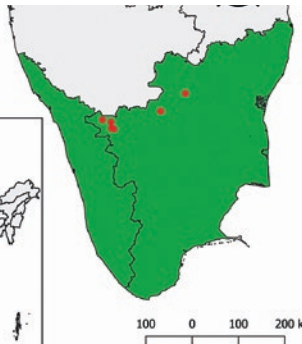
Mizoram, Nagaland, Sikkim, Tripura), West Bengal. [CAMBODIA, CHINA, MYANMAR, THAILAND, VIETNAM].

Specimens examined: INDIA. Arunachal Pradesh: W. Kameng District, Sessa village, *R.K. Choudhary* & *M.N. Datar* 723a–d (AHMA!); NEFA, *A.B. Deb* 26150, 25799 (ASSAM!); Lohit, *A.S. Chaban* 99672 (ASSAM!); *A.S. Rao* 47804 (ASSAM!); Kameng, *K.P. Singh* 101490 (ASSAM!); Aka hills, *N.L. Bor* 15329 (ASSAM!); Lohit, *J. Joseph* 48309 (ASSAM!); Sissini, NEFA, *G. Panigrabi* 6122, 5927 (ASSAM!); Assam: Dulong reserve forest, *G. Panigrabi* 27629 (ASSAM!); Lakhimpur, Shillong, *D.M. Verma* 46657, 9709 (ASSAM!); Lakhimpur, Sivasagar, *U. Kanjilal* 4387, 1578, 1945 (ASSAM!); Balipara F.T., *G.K. Deka* 41571 (ASSAM!); West Bengal: Darjeeling, *Griffith* 186 (Holo-K!).

24. *Capparis nilgiriensis* Subba Rao, Kumari & V.Chandras., J. Bombay Nat. Hist. Soc. 78(1): 146. 1981.

Habit: Scandent shrubs up to 5 m high, branches irregularly spreading, branchlets terete, glabrous, more or less flexuous, thorns ascending small, cataphylls few, linear.

Leaves: blades ovate or elliptic to oblong, 4.0–12 × 1.5–5 cm; entire at margins, acute to obtuse at apex, almost round at base; glabrous; nerves 5–7 pairs, forms intra-marginal loops, midrib and nerves prominent abaxially, reticulations not prominent; petioles 6–10 mm long, glabrous. **Inflorescence:** flowers axillary, solitary or sometimes conferted with up to 4 at the apex of a twig. **Flowers:** up to 4 cm across, cataphylls or bracts 2–5 mm long, linear, minutely puberulous, thick, pedicels 1.5–4 cm long, puberulous. Sepals 4, subequal, concave, outer sepals ca. 9 × 6 mm, ovate, obtuse, puberulous outside; inner sepals ca. 8 × 5 mm, elliptic to obovate, tomentose on both sides, obtuse, narrowed towards base. Petals 4, white, two lower petals free, 1.5–3.0 × 0.5–1.2 cm, elliptic to obovate, tomentose, apex subacute, upper two petals 1.9–2.3 × 0.6–1.0 cm, oblong-obovate, tomentose outside, obtuse to subacute, united at base forming inside a tomentose callus. Stamens 16–24; filaments 2–4 cm. Gynophores 3–4 cm; ovary densely pubescent furrowed with obscure beak; stigma sessile, glabrous; placentas 4, many ovules.



Fruits: pendulous, ovoid-oblong, 4–6 × 2–3 cm; stipe slender, 4–6 cm long. Seeds 8–16, reniform.

Diagnostic characters: Shrubs; branchlets glabrous; obtuse apex, leaves glabrous, reticulation not prominent, petioles with deep ridges and uneven margins; inner sepals tomentose on both sides; 16–24 stamens.

Type: Tamil Nadu, Nilgiri district, Chinnacoonoor, *Subbarao*, Holotype 40259A (CAL!), Isotypes 40259B–F (MH!).

Etymology: The specific epithet refers to the type locality i.e. Nilgiri hills, from where the species was first described.

Phenology: Fls.: March–April; Frts.: May–June

Vernacular names: Tamil: *Karipandal-chedi*

Distribution: INDIA: Narrowly endemic to Tamil Nadu and Kerala.

Specimens examined: INDIA. Tamil Nadu: Nilgiri district, Chinnacoonoor, *Subbarao* 40259A (CAL!), Chinnacoonoor, *Subbarao* 40259B–F (MH!).

25. *Capparis olacifolia* Hook.f. & Thomson, Fl. Brit. India [J. D. Hooker] 1(1): 178. 1872.



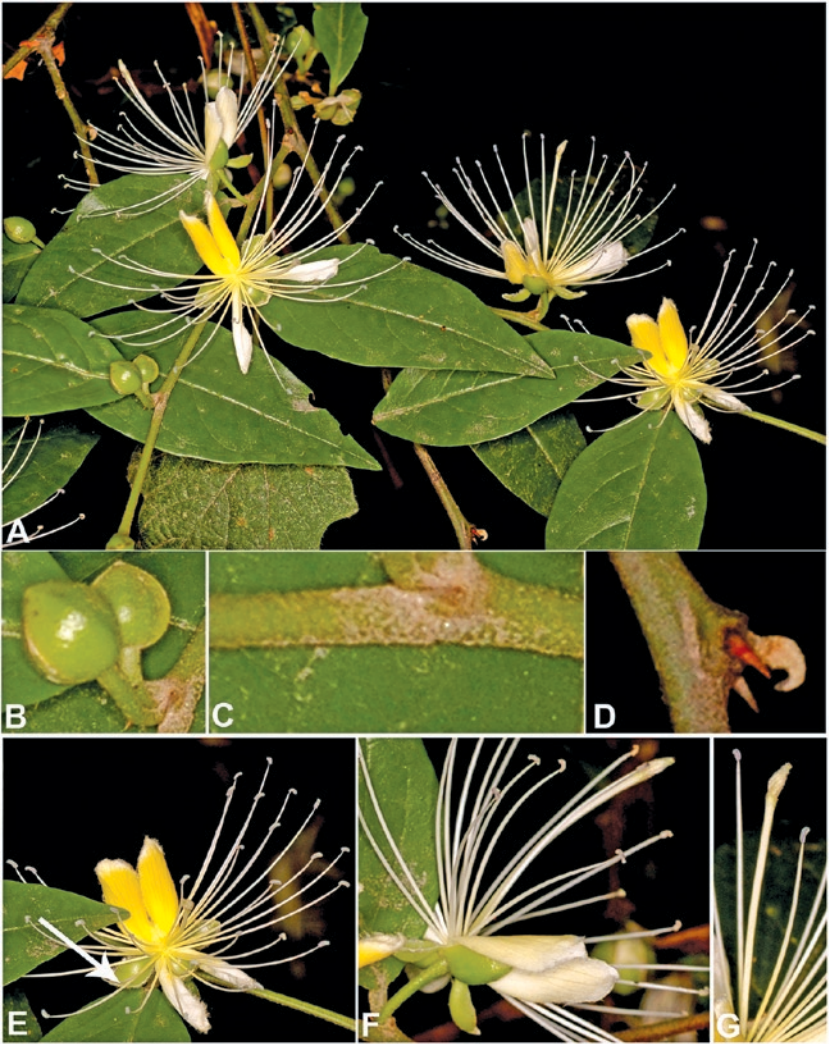
Photo: Dr. Navendu Page

Habit: Shrubs or small trees with spreading branches, up to 5 m. Innovations at the base surrounded by a few cataphylls, densely fulvous or greyish tomentose with small ca. 5–armed stellate hairs, leaves glabrescent. Thorns slender, straight, 4–8 mm, ascending or rarely patent. **Leaves:** blades ovate, 8–16 × 4–6 cm; base rounded, apex tapering, gradually acuminate, apex blunt to acute, mucronulate; more or less firmly herbaceous; midrib flat, nerves 5–8 pairs, obscure reticulation, abaxial surfaces

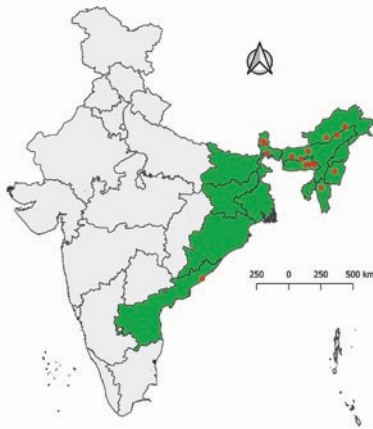
early glabrescent, rather glossy at adaxial surface; petiole 5–6 mm, hairy as the twig.

Inflorescence: flowers supra-axillary with 2–3 in vertical rows, rarely solitary axillary.

Flowers: white, pedicels 0.5–1.5 cm, hairy. Sepals 4, 6–10 × 3–6 cm, tomentose margin, outer pair boat-shaped, ovate, acute, surfaces glabrous, inner pair elliptic, membranous. Petals 15–22 × 5–8 mm, obovate, rounded, tomentose outside towards the top and along the margins, outer pair white, inner pair with a purple or yellow blotch at base. Stamens 34–40, equalling the gynophore, anthers 2 mm long. Gynophores 2.5–4.0 cm, often slightly incrassate towards the top, glabrous; ovary ellipsoid, 1–2 mm wide, densely tomentose, 4–6 mm long, placentas 2. **Fruits:** globose, beaked with persistent



Capparis olacifolia Hook.f. & Thomson:— A. habit; B. flower buds; C. innovations; D. stem showing thorns; E. front view of the flower; F. dorsal view the flower; G. androphore & gynophore. (Photos: Dr. Navendu Page)

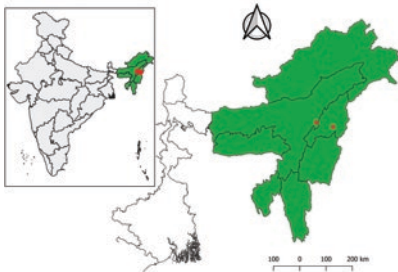


Distribution: INDIA: Eastern Ghats (Andhra Pradesh, Odisha and West Bengal), North East India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura). [CAMBODIA, CHINA, LAOS, MYANMAR, THAILAND, and VIETNAM].

Specimens examined: INDIA. Sikkim, *J.D. Hooker* 47 (K!).

26. *Capparis pachyphylla* M. Jacobs, *Blumea* 12(3): 476. 1965.

Habit: Shrubs or small trees, 4–15 m with big scrambling branches. Innovations densely puberulous with simple fulvous hairs curved towards the top, with cataphylls at the base. Twigs straight, late glabrescent. Thorns slightly recurved 1–3 mm. **Leaves:** blades elliptic oblong, 8–13 × 4–5.5 cm; base subcordate, top rounded to obtuse, mucronulate; thick–coriaceous; midrib flattish to shallowly depressed, yellow–brown beneath, nerves 5–7 pairs, thin, reticulation obscure; both adaxial and abaxial surfaces dull, in the dried state green above, light green beneath; petiole 3–5 mm. **Inflorescence:** flowers with up to 6 in racemose bundles which are axillary or arranged along a lateral or subterminal stalk up to 3 cm long to form a panicle. **Flowers:** pedicels ca. 5–7 mm, filiform, subglabrous, subtended by thorn–like bracts and bracteoles. Sepals ca. 5–6 mm, subequal, outside very sparsely puberulous, ciliate, outer pair very concave; inner pair flatter. Petals ca. 7 × 3–4 mm long, white, later turns to purple, fringed with long hairs. Stamens ca. 33, white. Gynophore glabrous, ovary small, glabrous, placentas 2. **Fruits:** unknown.



style ca. 2 mm long, 0.5–1 cm diameter, pericarp fairly thick, red. Seeds 1–3.

Diagnostic characters: Leaves drying brown; indistinct reticulation; flowers supra–axillary, 2–3 in vertical rows; ovary up to 7 mm long, densely tomentose.

Type: Lectotype: *Hooker f.* s.n. (C, G, K, P), India, Sikkim, 1–4000', fl. fr. –Fig. 29, (Jacobs 1965).

Etymology: The specific epithet refers to the resemblance of the leaves with *Olea*, the Olive.

Phenology: Fls.: February–June; Frts.: August–April.

Vernacular names: Assamese: *Kotabar*, *Lokra*, *Borun–khasai*, *Philla–phang*.

Diagnostic characters: Cataphylls prominent; flowers in axillary racemose bundles, arranged in the form of panicle.

Type: *Kingdon–Ward* 11183. holo! BM[BM000629520!] (CAL, L), India, Assam/Burma border area, Tuzu Gorge, buds 14. III. 1935.



Capparis pachyphylla M. Jacobs:— herbarium image of *Capparis pachyphylla*. ©Natural History Museum (BM)

Etymology: The specific epithet refers to the presence of thick leaves of the plant (*pachys*= thick, *phylla*= leaves; in Greek).

Phenology: Fls.: March.

Distribution: INDIA: North East India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura). [CAMBODIA, CHINA, LAOS, MYANMAR, THAILAND, VIETNAM].

Specimens examined: INDIA. Assam: Tezu river, *Kingdon-Ward* 11183 (BM!)

27. *Capparis rheedei* DC., Prodr. [A. P. de Candolle] 1: 246. 1824. *Capparis baducca* L., Sp. Pl. 1: 504. 1753, nom. inval. nom. rej.



Habit: Shrubs or trees, much-branched up to 5–6 m, the trunk thorny. Innovations brown–red tomentose with small stellate hairs, soon glabrescent. Twigs brown–red when dry, sometimes verruculose, shoots at the base with cataphylls. Thorns straight, patent, up to 2 mm, but often wanting or vestigial. **Leaves:** blades ovate, elliptic ovate to lanceolate, 7–15 × 3–7 cm; 2–3 times as long as wide, base acute to blunt or cuneate, apex acute or subacuminate,

mucronate; coriaceous, sometimes brownish tinged when dry; mid rib and main nerves flattish or slightly sunken, very prominent and brown or yellowish coloured below, nerves 2–4 pairs, conferted towards the base, reticulation distinct, adaxial surface covered with brown tomentum but at maturity more or less glossy; petioles 0.5–1.2 cm. **Inflorescence:** solitary, axillary, occasionally on a twig 1 cm long with bract-like scales. **Flowers:** white, pedicels 1–2 cm, tomentose. Sepals at anthesis covers half of the flower, outer pair of sepals boat-shaped, 9–18 × 5–7 mm, sparsely tomentose outside, densely villose towards the top inside, inner pair 10–18 × 5–9 mm, flat, densely villose outside, sometimes inside towards the top. Petals 3–5 × 1–3 cm, more or less obovate, glabrous, at first white, later pale bluish, the upper pair with a yellow blotch. Stamens about 80–110, slightly exceeding the gynophore. Gynophores 2–4 cm, glabrous; ovary 4-angular with densely tomentose furrows between, 5 × 12 mm, placentas 4. **Fruits:** 4–6 cm diameter, ovoid, sometimes beaked.

Diagnostic characters: Inflorescence solitary, axillary, occasionally on a twig ca. 1 cm long with bract-like scales; flowers 8–12 cm across; petals pale blue or white, upper pair with yellowish blotch; stamens more than 80. Morphologically resembles to *C. brevispina*.

Type: in hb. Banks (*n.v.*).

Etymology: The species was named in honour of the famous naturalist Hendrik Adriaan van Rheedee (1636–1691), a military man and a colonial administrator of the Dutch East India Company, known for his monumental work ‘Hortus Malabaricus’.

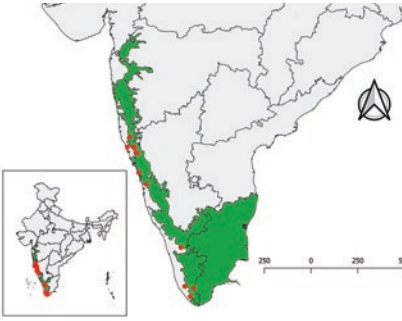
Distribution: Endemic to Western Ghats of India (Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu) and [SRI LANKA].

Phenology: Fls.: February–June; Frts.: July–November.

Common English/ Vernacular names: **English:** Caper, Church blossom; **Marathi:** *Charyuka*.



Capparis rheedei DC.:— A. habit; B. a mature flower; C. young flower and buds; D. inflorescence with young and mature flowers showing presence of yellow and red blotch on inner petals; E. abaxial surface of leaf; F. sepals (a. outer sepals, b. inner sepals); G. petals (a. outer petals, b. inner petals with yellow blotch); H. androphore; I. gynophore. (Photos: B. & D. by Dr. KM Prabhukumar; C. by Dr. Navendu Page)



Specimens examined: INDIA. Karnataka: Kunta, *Sundararagavan* 79407 (BSI!); Kollur forest, *P.G. Divakar & R.K. Singh* 184300 (BSI!); Kerala: Trivandrum, *K.M. Prabhukumar* 720 (AHMA!); Kanara, *Dalzell* 1615 (K!); Goa: Chorla ghat, *Sneha Joshi* 481, 482, 483 (AHMA!); Maharashtra: Vangini forest, *K.C. Kanodia* 96455 (BSI!).

Economic/ Medicinal Usage: Used as diuretic, sedative, and against skin problems, spasms, and dropsy (Duke 1993). Also, fruits are claimed to be poisonous (Standley 1920–1926).

Note: The proposal by Prado et al. (2013) to conserve the name *Capparis baducca* L.

with a conserved type against *Capparis rheedei* DC. has been completely rejected under Proposal & Disposal (Appendix V) with reference to the ICN code 14.6 & 14.7 (Applequist 2014).

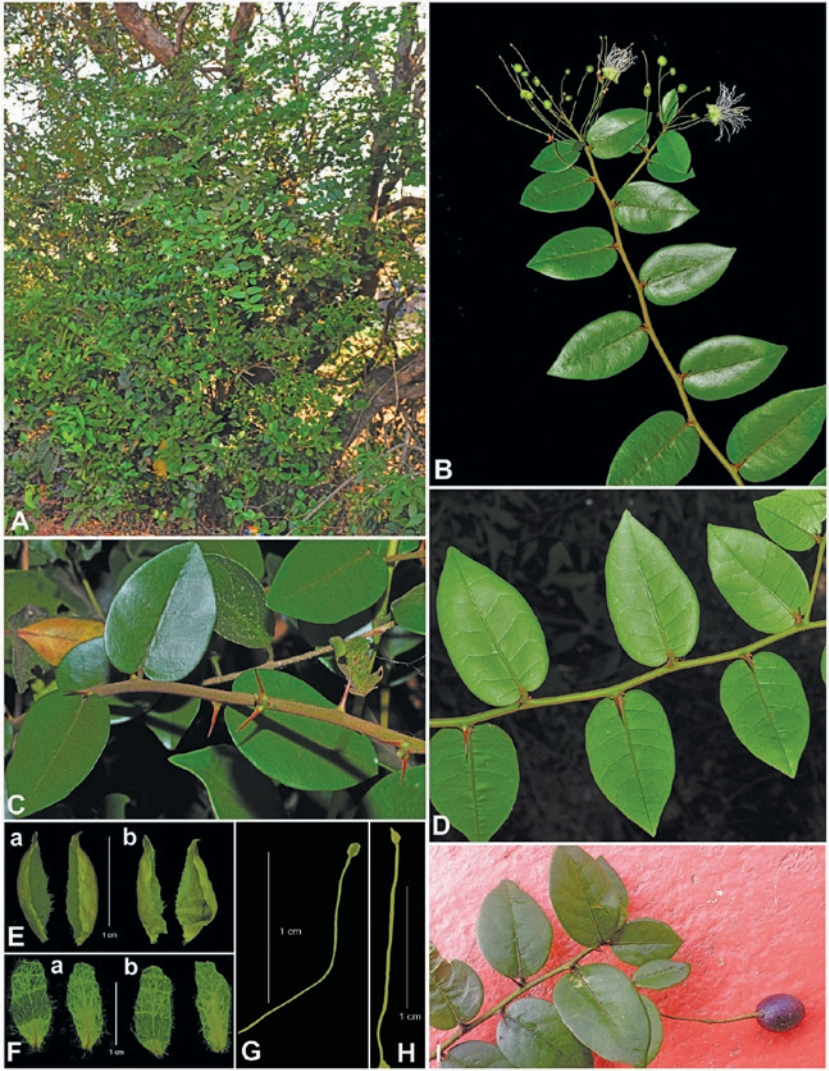
28. *Capparis rotundifolia* Rottler, Neue Schriften Ges. Naturf. Freunde Berlin iv. 185. 1803.



Habit: Dense shrubs 3–5 m or sometimes climbers. Twigs slender, straight, with short internodes, densely pubescent, sooner glabrescent. Thorns recurved 2–5(–8) mm, to straight, acicular 2–13 mm. **Leaves:** blades ovate to subcordate to suborbicular; 1–4 × 1–2.5 cm; base cordate, apex rounded and/or acute to abruptly acuminate with acute tip 0.5 cm, mostly mucronate; subcoriaceous, surfaces mostly glabrous, to rather densely pubescent especially on the nerves, upper surface often minutely wrinkled; midrib obscure above, sometimes narrowly sunken, nerves 3–5 pairs, thin,

obscure, margin often slightly revolute; petiole 1–3 mm. **Inflorescence:** umbel to sub-umbel or sometimes solitary axillary. **Flowers:** with few to many at the top of lateral peduncles 2–15 mm, or occasionally axillary solitary, pedicels filiform, 1–4 cm, glabrous. Sepals 4, thin, imbricate, glabrous, rarely puberulent outside, 4–5 × 2–3 mm, outer pair with narrow membranous margin, inner pair with wider membranous margin. Petals very thin, of about the same size as the sepals, pubescent inside towards the base. Stamens 27–36, white. Gynophores 13–20 mm, filiform, glabrous; ovary 1.5 mm long, pointed, glabrous, placentas 2. **Fruits:** globose, sometimes with a small point, 1–1.5 cm diameter, pericarp 1 mm thick, smooth. Seed 1, 7–10 × 6–10 × 5–6 mm.

Diagnostic characters: *Capparis rotundifolia* is closely allied to *C. sepiaria* but differs in dimorphic thorns (vs uniform recurved thorns); leaves with cordate base (vs leaves with rounded or acute base); acute to acuminate apex (vs retuse to emarginated apex).



Capparis rotundifolia Rottler:— A. habit; B. inflorescence with open flowers; C. twig showing thorns and adaxial surface of leaves; D. abaxial surface of leaves; E. sepals (a. outer sepals, b. inner sepals); F. petals (a. outer petals, b. inner petals); G. androphore; H. gynophore; I. ripen fruit.



Type: Rottler *s.n.* (K, P), India, Madras, fr. X. 1799.

Etymology: The specific epithet refers to the rounded leaves of the species (*rotundus*= round, *folia*= leaves; in Latin).

Phenology: Fls.: October–January; Frts.: April–October.

Common English/ Vernacular names: **English:** Round leaf Caper; **Marathi:** *Kolisma*.

Distribution: Endemic to Peninsular India (Andra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu, Telangana) and [SRI LANKA].

Specimens examined: INDIA. Karnataka: Parwad, *M.Y. Ansari* 107845 (BSI!); Maharashtra: Amboli, *R.K. Choudhary*, *M.N. Datar* & *Sneha Joshi* 445, 446, 447, 448,

449, 450, 451, 452, 453, 454, 455 (AHMA!). Amboli, *R.D. Pataskar*, 105280 (BSI!); Raigad, *SCM* & *SKDD* 190926 (BSI!); Bhimashankar, *K.P. Janardhanan* 69611, 72145 (BSI!); Matheran, *G.S. Puri* 12812 (BSI!); Junnar, *K. Hemadri* 108183 (BSI!); Rangana fort, *R.D. Pataskar* 105282, 120099 (BSI!); Bhimashankar, *S.D.M.* 12601 (BSI!); Ambeghar, *R.K. Kochbar* 158293 (BSI!).

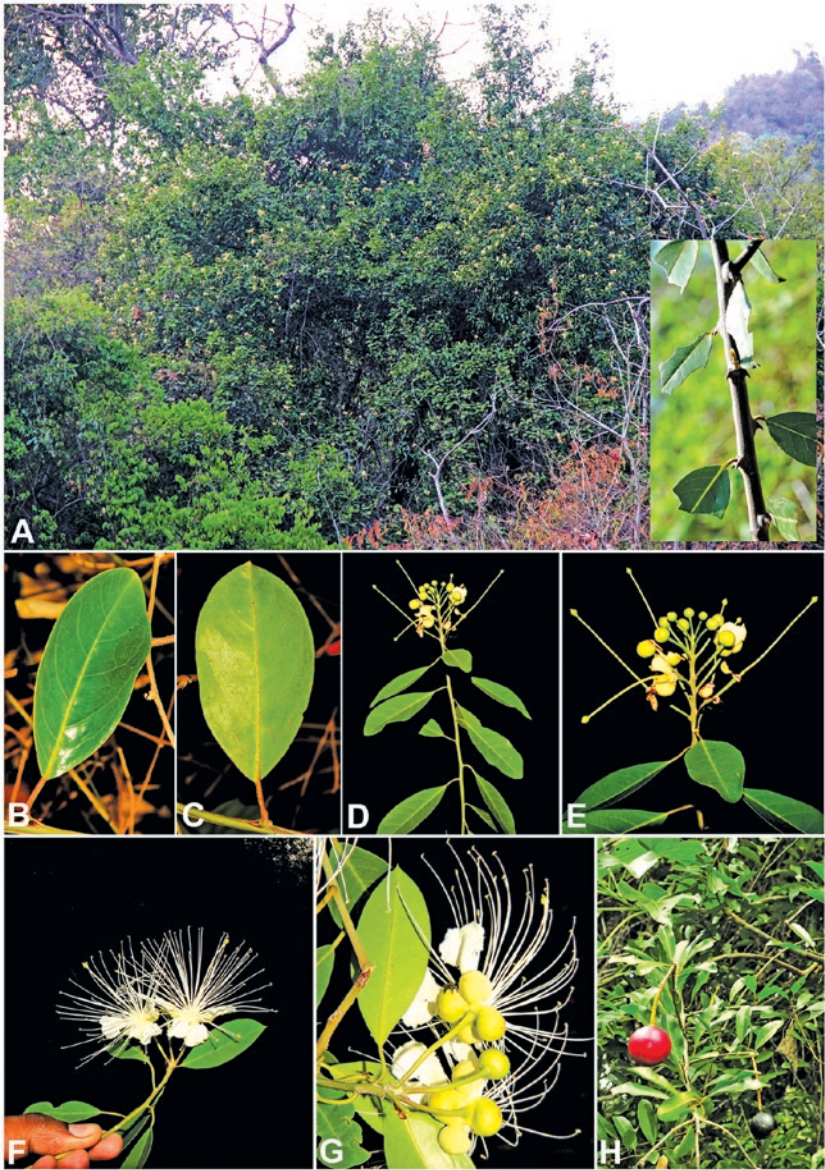
Economic/ Medicinal Usage: The crude extract is used against earache. Young fruits are highly toxic (Lansky et al. 2014). Also used in a variety of herbal medicines.

29. *Capparis roxburghii* DC., Prodr. [A. P. de Candolle] 1: 247. 1824.

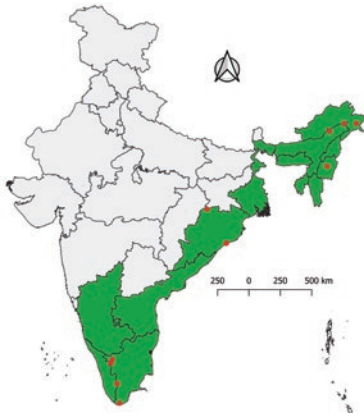


Habit: Woody climbers or shrubs. Innovations brown-fulvous puberulous, sooner glabrescent, purplish brown. Thorns recurved, up to 4 mm long, but mostly wanting. **Leaves:** blades elliptic to lanceolate to oblanceolate, 3.5–8 × 2–4 cm; base blunt to cuneate, apex blunt or acute, rarely retuse; lamina rarely subcoriaceous, brownish when dry; midrib shallowly sunken, nerves 4–7 pairs, thin, reticulation obscure, surfaces glabrous, shiny, mostly

dull; petiole 1–1.5 cm, glabrous. **Inflorescence:** 6–15 flowered terminal corymb or sub-umbels. **Flowers:** pedicels slender, 2–3 cm long, glabrous. Sepals 4, 10–12 mm long, glabrous, outer pair very concave, 4–6 mm wide, inner pair flattish, 6–8 mm wide. Petals obovate, 13–20 × 7–10 mm, pubescent towards the base, especially inside, hairy



Capparis roxburghii DC.:— A. habit (inset: stem with thorns); B. abaxial surface of leaf; C. adaxial surface of leaf; D. a flowering twig; E. close view of inflorescence showing gynophore; F. open flowers; G. dorsal view of flowers showing sepals; H. ripen fruits. (Photo H: Dr. Navendu Page)



along margins. Stamens 45–70. Gynophores 4–6 cm, glabrous; ovary ellipsoid, 2–4 × 2.5 mm, glabrous, placentas 4. **Fruits:** globose, 4–5 cm diameter, fruits glossy orange; pedicel and the gynophore thick up to 5 mm and dull purplish brown. Seeds 12–16 × 10 mm long, reddish brown.

Diagnostic characters: *Capparis roxburghii* may often be confused with *C. moonii* due to similar morphology. However, it differs from *C. moonii* in having smaller leaves and flowers, 6–15 flowers conferted at top (vs. up to 6 flowers conferted at top) in inflorescence; 45–70 stamens (vs 100–140 stamens).

Type: Roxburgh's description and unpublished plate no. 158 [Illustration!].

Etymology: The species was named in honour of Dr. William Roxburgh (1751–1815), a Scottish surgeon and botanist who explored extensively in India, describing a large number of species.

Phenology: Fls.: March–July; Frts.: May–Oct.

Vernacular names: Odia: *Handiphuta, Kaodini*.

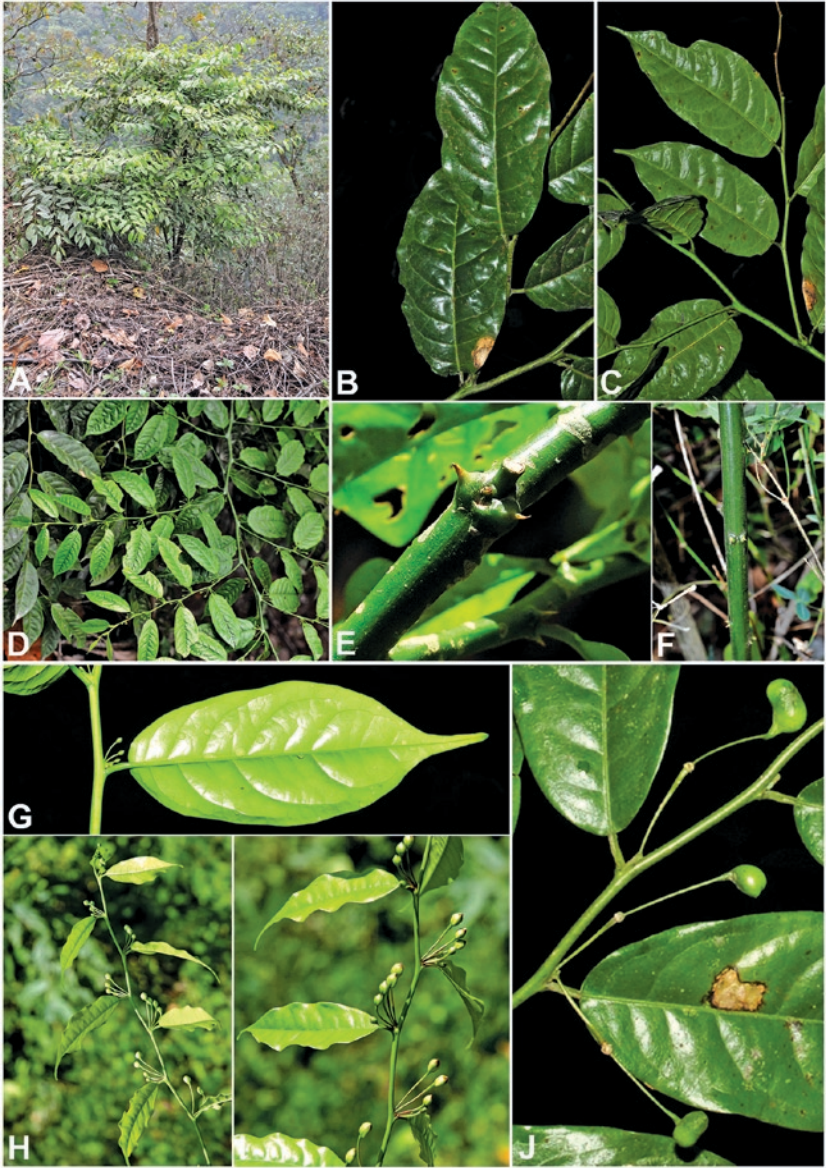
Distribution: INDIA: Western Ghats (Karnataka, Kerala and Tamil Nadu), Eastern Ghats (Andhra Pradesh, Odisha, and West Bengal, North east India (Arunachal Pradesh, Aasam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura), [SRI LANKA].

Specimens examined: INDIA. Odisha: Brahmagiri–Satapada, Chilika Lake, *R.K. Choudhary* & *S. Maurya* 1431, 1437, 1438 (AHMA!); Tamil Nadu: Jaganari Slopes RF, *S. Maurya* 1455, 1456, 1457 (AHMA!); Thekkumalai, *Sundararaghavan* 74349 (BSI!); Coimbatore, *K.S. Subramaniam* KNS235 (BSI!); Madurai, *K.M. Sebastine* 198 (BSI!); Madurai, *B.V. Shetty* 10273 (BSI!).

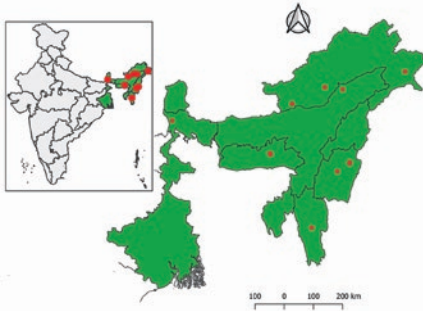
30. *Capparis sabiifolia* Hook.f. & Thomson, Fl. Brit. India [J. D. Hooker] 1(1): 179. 1872. *C. acutifloia* subsp. *sabiaefolia* (Hook.f. & Thomson) M.Jacobs, Blumea 12: 432–433. 1965.



Habit: Shrubs or trees or climber up to 10 m, glabrous. Thorns almost 1 mm in young twigs and up to 5 mm in old branches or sometimes wanting. **Leaves:** blades lanceolate to oblanceolate, 5–13 × 2–4 cm; base rounded to acute, apex gradually acuminate, tip 0.5–1.5 cm long, blunt to acute; 2–4 times as long as wide, widest at or below the middle; thinly herbaceous, in the herbarium specimen often dark-coloured; midrib slightly sunken above, sometimes in the basal part only, nerves thin, 7–8 pairs rarely up to 10 pairs, reticulation fairly distinct; petioles up to 0.5 cm. **Inflorescence:** supra-axillary, with 2–6 flowers in vertical rows.



Capparis sabiifolia Hook.f. & Thomson:— A. habit; B. abaxial surface of leaf; C. adaxial surface of leaf; D. branch with flower buds; E. mature stem showing thorns; F. young stem showing thorns; G. leaf with acuminate apex; H. & I. twig showing front and back view of supra-axillary inflorescence; J. stem showing supra-axillary fruits.



Flowers: white, fragrant, 10–15 mm across. Sepals 4, broadly obovate, glabrous, only the inner pair ciliate, greenish white. Petals outside largely glabrous, inside densely tomentose. Stamens 20–25. Gynophores up to 4 cm long, filiform; ovary pear shaped, acute at apex. **Fruits:** subglobose to pear shaped. Seeds ca. 6 × 4 mm.

Diagnostic characters: Lateral nerves of the leaves more than 7 pairs. Morphologically allied to *C. acutifolia*.

Type: Hooker f. & Thomson 1692 (BM, C, CGE, G, GH, K, L, P, W), India, Assam, Khasia Hills 1–6000', yfr. 13. VII, fr. 28. VII. 1850.

Etymology: The specific epithet was given based on similarity of leaves to *Sabia* genus. *Sabi* (stem of *Sabia*) + *folia* = *sabiifolia* = leaf similar to *Sabia*'s leaf.

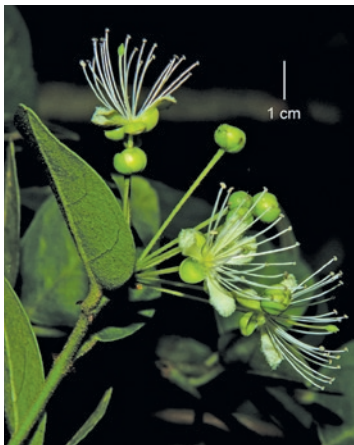
Phenology: Fls.: March–May; Frts.: August–October.

Distribution: INDIA: North East India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and West Bengal). [CHINA, MYANMAR, THAILAND, VIETNAM].

Specimens examined: INDIA. Arunachal Pradesh, W. Kameng District, Sessa village, R.K. Choudhary & M.N. Datar 722, 724 (AHMA!).

Economic/ Medicinal Usage: Leaves are eaten in many countries of south East Asia (Lansky et al. 2014)

31. *Capparis sepiaria* L., Syst. Nat. ed. 10. 2: 1071. 1759.



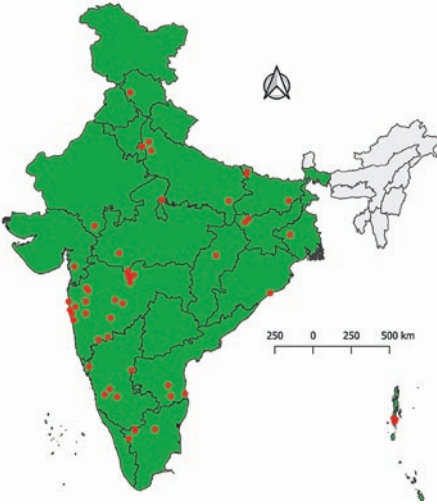
Habit: Shrubs up to 8 m tall, much branched. Innovation densely fulvous or greyish. Twigs stout, zig-zag, glabrous at maturity, thorns numerous, recurved 4–8 mm long. **Leaves:** blade ovate, ovate–elliptic, oblong to oblong-lanceolate, 1.5–5.5 × 0.4–3.5 cm, entire at margins, often rounded, emarginate or retuse at apex, herbaceous or subcoriaceous, greyish-green when dried, abaxial surface early glabrescent and adaxial surface puberulent; midrib slightly sunken at base, 4–6 pairs of secondary veins, obscure reticulation but prominent after drying; petioles 3–5 mm long. **Inflorescence:** terminal and on lateral branches, corymbose to subumbellate, 2–3 cm long. **Flowers:** 8–30, fragrant, 8–12 mm

across, pedicels 1–2 cm long; puberulent. Sepals 4, in two whorls, subequal, ovate, or suborbicular, outer pair 3.5–4 × 2–3 mm, inner pair smaller, green, ciliate along margins. Petals white, obovate, oblong–spathulate, 5–6 × 2–3 mm, rounded at apex, pubescent.

Stamens 30–45; filaments 1–1.4 cm long, white; anthers basifixed, white. Gynophores 6–15 mm long, puberulous at base; ovary ovoid, glabrous, placentas 2. **Fruits:** globose to subglobose, more or less fleshy, whitish–yellow to almost black after ripening. Seeds 1–4.

Diagnostic characters: Scandent shrubs; stem glabrous; leaf apex often rounded, emarginate or retuse; inflorescences 8–30 flowered; stamens 30–45; gynophores puberulous at base.

Type: Herb. Linn.No. 664.4 (LINN).



Etymology: The specific epithet refers to its habitat. The plant mostly grown as hedges (*sepes*=hedge; in Latin) and popularly known as a Hedge Caper.

Phenology: Fls.: March–July; Frts.: October–November.

Common English/ Vernacular

names: **English:** Hedge Caper,

Wild Caper Bush; **Hindi:** *Hiun,*

Kanthari; **Kannada:** *KaaduKathari,*

Kattirigida, *Olleuppigida;*

Malayalam: *Kaakkaaththonti;*

Marathi: *Kannatodi,* *Kanthara,*

Maastodi; **Odia:** *Kakachincha,*

Pirika; **Tamil:** *Curai,* *Karu–n–curai,*

Kattu–k–kattari; **Telugu:** *Nallapuyyi,*

Nalluppi

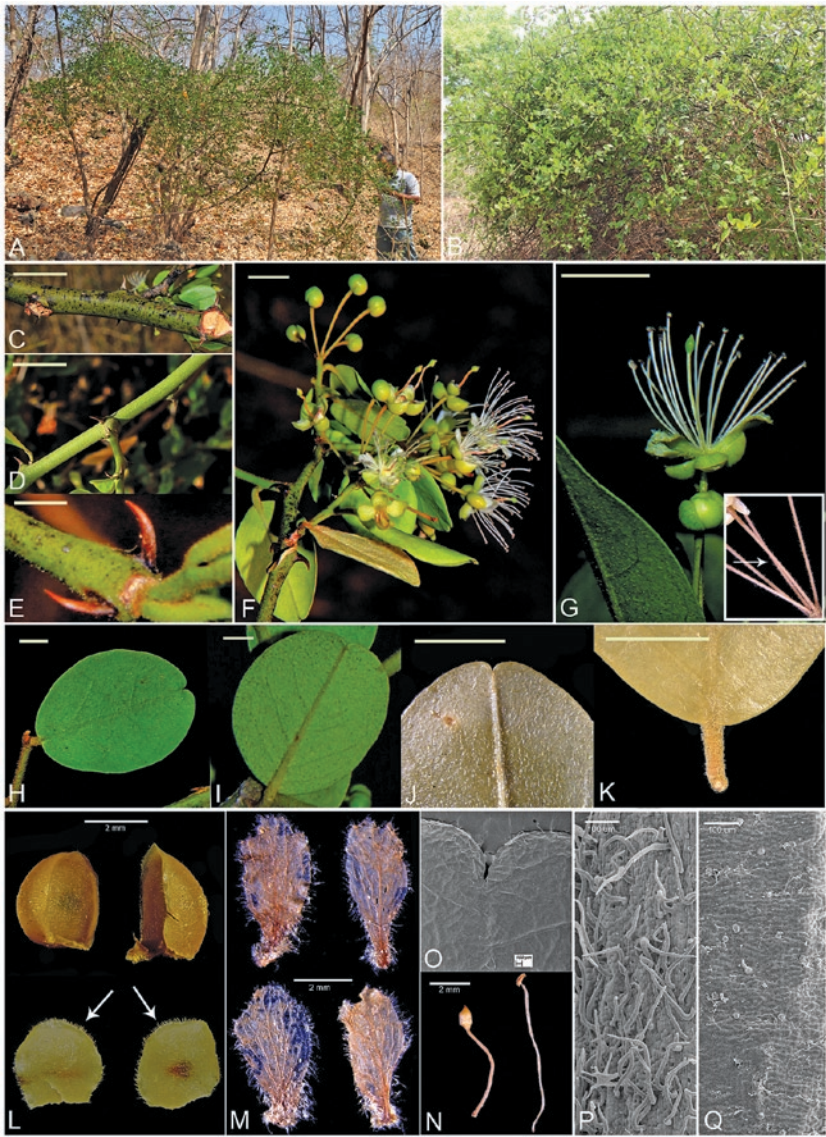
Distribution: INDIA: throughout the

country except North East India. [Distributed throughout the old world. AFGHANISTAN, AFRICA, AUSTRALIA, CAMBODIA, CHINA, IRAN, IRAQ, ITALY, LAOS, MYANMAR, TURKEY, PAKISTAN, PHILIPPINES, SAUDI ARABIA, THAILAND, VIETNAM].

Specimens examined: *s. loc.*, K.K. Ahuja 96637 (BSI!); Odisha: Chilika lake, R.K. Choudhary & S. Maurya 1423, 1432 (AHMA!); Tamil Nadu: Hasanur, Gudamalai Reserve Forest, Anaikatti Road, S. Maurya 737, 738, 739, 755 (AHMA!); *s. loc.*, N. Wallich 6993 (K!); *s. loc.*, S. Coll. 6993 (001126523, 001126524-K!); *s. loc.*, V. Jacquemont 250 (P!). ETHIOPIA. *s. loc.*, Schimper 1347 (K!); MADAGASCAR. *s. loc.*, L. Allorge 468 (P!); *s. loc.*, R. Decary 10664 (P!); *s. loc.*, J.H. McWhirter 137 (P!); MAYOTTE. *s. loc.*, G. Viscardi & V. Guiot 210 (P!); MYANMAR. *s. loc.*, H. Collet 538 (K!); PHILIPPINES. *s. loc.*, L. Escritor, s.n. (K000643992) (K!); *s. loc.*, C. Gaudichaud 213 (P!); *s. loc.*, F. Otanes 18318 (P!); P05364143 (P!); SRI LANKA. *s. loc.*, Thwaites 2550 (K!); TANZANIA. *s. loc.*, Rounce 307 (000230818, 000230819, 000230820-K!); *s. loc.*, Kirk 12 (K!); *s. loc.*, Stuebelmann 8659 (K!); *s. loc.*, J.M. Hildebrandt 7202 (K!); THAILAND. *s. loc.*, W. Anusarinthon 6 (P!); VIETNAM. *s. loc.*, B. Balansa 1377 (P!).

Notes: *Capparis sepriaria* may often be confused with *C. incanescens* DC. due to similar morphology. However, it differs from the later in having puberulent to glabrous innovations (vs tomentose), emarginate or retuse (vs mucronate) leaf apex, inflorescence with 8–30 flowers (vs 10–15), ciliate calyx, pubescent petals, puberulous gynophore base and 30–45 stamens (vs 20–24 stamens).

Economic/ Medicinal Usage: All parts of plants are used in various herbal preparations, against snakebites, and as anti-inflammatory (Lansky et al., 2014). Also reduces blood sugar (Selvamani et al., 2008) and fever (Sebastian & Bhandari, 1984).



Capparis sepiparia L.:— A. habitat; B. habit; C. mature stem; D. young stem; E. recurved thorns; F. inflorescence; G. flower (arrow in the inset image showing puberulous pedicel); H & I. abaxial & adaxial surfaces of the leaf; J. leaf showing emarginate apex; K. leaf base; L. outer and inner sepals (arrows indicate ciliate margins); M. hairy petals, N. gynophore & androphore; O. SEM image of notched leaf apex; P. puberulous young stem; Q. glabrous mature stem. (C–K scale of 1 cm).

32. *Capparis shevaroyensis* Sundararagh., Kew Bull. 37(1): 72. 1982. *Capparis parviflora* Hook.f. & Thomson, Fl. Brit. India [J. D. Hooker] 1(1): 176–177. 1872., non Boissier (1843).

Habit: Shrubs, spreading irregularly branched. Innovations fulvous–puberulous, glabrescent early, cataphylls none. Thorns small, straight and directed upwards, but mostly wanting. **Leaves:** blades lanceolate or oblanceolate, 5–12 × 11–4 cm; almost 3 times longer than wide, widest at the middle, base blunt, top gradually acuminate, apex up to 1 cm, blunt; midrib sunken in the basal half, nerves 6–8 pairs, thin, reticulation rather distinct above, less so beneath; surfaces dull, greenish above, yellow green beneath; petiole 2 mm. **Inflorescence:** 3–10 flowers forming a subterminal (sub) umbel, bracts subulate, 1–2 mm, caducous. **Flowers:** pedicels filiform, 7–13 mm. Sepals subequal, 3 mm long. Petals obovate, 3–3.5 mm, inside hairy at the base. Stamens 17–26. Gynophores filiform, 5–6 mm, glabrous; ovary ovoid 2 mm long, light–coloured, glabrous, placentas 2. **Fruits:** pisiform ca. 9 mm diameter, smooth. Seed 1.

Diagnostic characters: Mostly unarmed, sometimes armed with very few straight and short thorns; flowers 5–10, umbels, creamy white.

Type: Second step lectotype designated by Kottaimuthu (2018) (K000247321!), Isolectotype Kew (K000247320!) & GH (HUH00042271!).

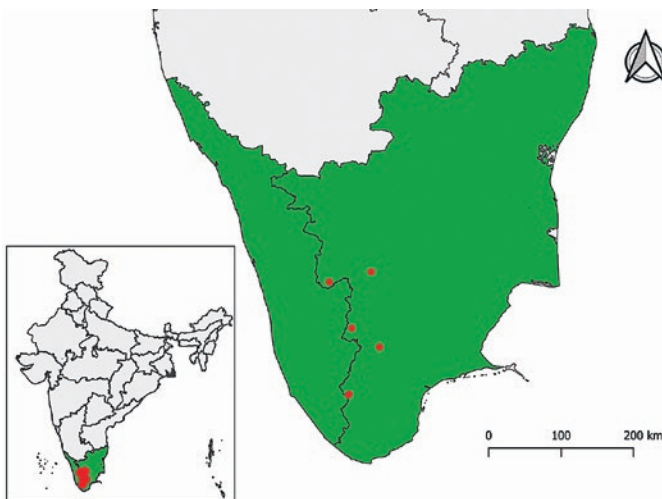
Etymology: The specific epithet refers to the small flowers (*parvi*= small, *flora*= flowers; in Latin).

Phenology: Fls.: March–April; Frts.: August–September.

Distribution: INDIA: Narrowly endemic to Tamil Nadu and Kerala.

Specimens examined: INDIA. Tamil Nadu: Shevagerry Hills, *Wight* 70 (K!).

Note: *Capparis parviflora* Hook.f. & Thomson was described in 1872. However, being it a later homonym of *Capparis parviflora* Boissier (1843), Sundararaghavan (1982) proposed a new name *Capparis shevaroyensis* Sundararagh. based on Jacobs' treatment (1965) who misunderstood and erroneously stated the type locality as Shevaroy instead of Shevagerry (Sivagiri Hills). However, this species has never been reported from Shevaroy (Kumar & Krishnamurthy 1993, Pullaiah & Rao 2001).





Capparis shevaroyensis Sundararagh.:— herbarium image. ©Royal Botanic Garden, Kew

33. *Capparis sikkimensis* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 43(3): 181. 1874.

Photo: Dr. Santanu Dey



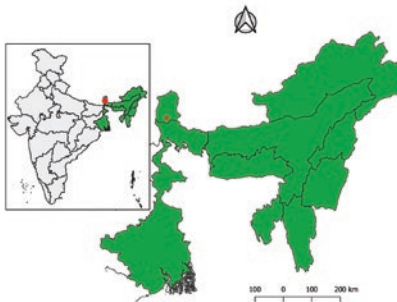
Habit: Trees, shrubs, or climbers up to 8 m. Innovations with indumentum of pale to red-brown, simple, short hairs, late glabrescent, twigs often dull purplish-brown tinged. Thorns recurved, up to 6 mm, but mostly wanting. **Leaves:** blades elliptic or ovate, 7–19 × 3–10 cm; 1.5–2.5 times as long as wide, widest about the middle to rarely below; base acute, apex rounded, often abruptly and shortly

acuminate or only a small callous tip present; midrib flattish to shallowly sunken, nerves 6–8 pairs, thin, reticulation rather obscure; surfaces soon glabrescent, when fresh glaucous with purplish midrib and nerves, when dry mostly red-brownish tinged, dull or glossy; petiole 0.5–2.0 cm. **Inflorescence:** peduncles up to 10 cm, angular, bearing 3–8, rarely 20 pedicels conferted towards top, subumbels axillary, the apical ones often forming together a terminal panicle, or the flowers solitary in the upper leaf axils. **Flowers:** pedicels 1.5–5.5 cm, hairy. Sepals subcoriaceous, 7–25 mm long, densely fulvous-puberulous outside, outer pair concave, and 5–14 mm wide, inner pair 6–15 mm. Petals obovate, 12–28 × 5–8 mm, hairy inside, white. Stamens 30–120, pink. Gynophores 2.5–6.0 cm, glabrous; ovary 2–4 × 1.5–2 mm, glabrous, placentas 4. **Fruits:** on a stipe 3–11 mm incrassate, globose to ellipsoid or ovoid, sometimes umbonate or pointed 5–6 × 4–5 cm, deep purple, pericarp to 10 mm thick, smooth but rarely sculptured. Seeds 16–21 × 12–15 × 10–11 mm.

Diagnostic characters: Stems dull purplish when dried; innovation pubescent; inflorescence subumbellate; placentas 4.

Type: Kurz 29236 (CAL, *n.v.*), India, Sikkim, Kurseong, figured in Prain, Ann. Gard. Calc. 9, 1 (1901) t. 10

Etymology: The specific epithet refers to the first report of the species from the Sikkim state of India.

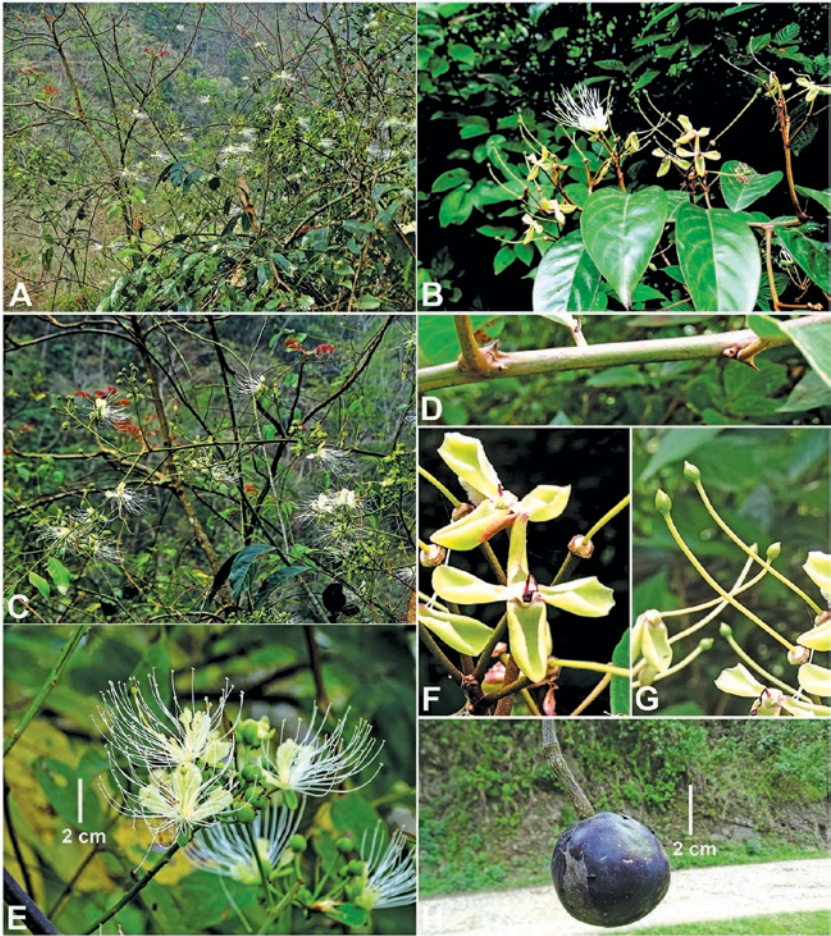


Phenology: Fls.: May–June; Frts.: September–November.

Distribution: INDIA: North East India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and West Bengal). [CAMBODIA, CHINA, LAOS, PHILIPPINES, MYANMAR, THAILAND, VIETNAM].

Specimens examined: INDIA. Sikkim: Kurseong, Kurz 29236 (CAL!).

Economic/ Medicinal Usage: Fruits are edible and also believed to have antitumor properties.



Capparis sikkimensis Kurz:— A. habit; B. a flowering twig; C. a branch showing inflorescence pattern; D. stem showing thorns; E. open flowers; F. outer and inner sepals; G. gynophore; H. ripen fruit. (Photos: Dr. Santanu Dey)

34. *Capparis tenera* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 41. 1850.

Photo: Dr. Navendu Page



Habit: Shrubs or climbers, up to 3 m, often the spreading branches and leaves distichous. Innovations glabrous or tomentose and early glabrescent. Thorns recurved, sharp, 3–4 mm.

Leaves: blades ovate, elliptic or oblong, 4–8 × 2–5 cm; broad middle of above, base rounded to subcordate, sometimes acute, top rather abruptly

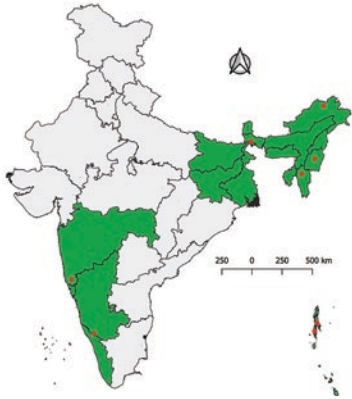
acuminate, tips up to 1.0 cm long, blunt; herbaceous to coriaceous; midrib shallowly sunken, nerves 3–5 pairs, reticulation distinct to obscure; petiole 3–6 mm. **Inflorescence:** supra-axillary with 2–3 flowers in vertical rows. **Flowers:** pedicels 1–5 mm, filiform, fragrant. Sepals 4, 3 × 2.5 mm, outside glabrous but rarely hairy inside, outer pair ovate, acute, boat-shaped, mostly covering the inner pair, inner pair ovate to elliptic, obtuse to acute, sometimes hairy at the margin. Petals 4, ovate, rounded, 4–7 × 1–3 mm, white, the upper pair with red basal spot, margin and surfaces tomentose. Stamens 8–18. Gynophores 12–20 mm, filiform, glabrous; ovary pear-shaped, 1.5 × 0.5 mm, glabrous, placentas 2, ovules few. **Fruits:** subglobular, 0.5–1.5 cm diameter, sometimes beaked, pericarp thin, deep orange or red when ripe. Seeds 1–4.

Diagnostic characters: Shrubs or climbers with recurved thorns; flowers 2–3 in supra-axillary series/vertical rows; stamens 16–20; ovary glabrous; fruits globose.

Type: hb. Dalzell *s.n.* (DD, holo; K), India, Syhadree, fl.

Etymology: The specific epithet refers to the presence of soft or tender leaves and branches (*tenera*= tender; in Latin).

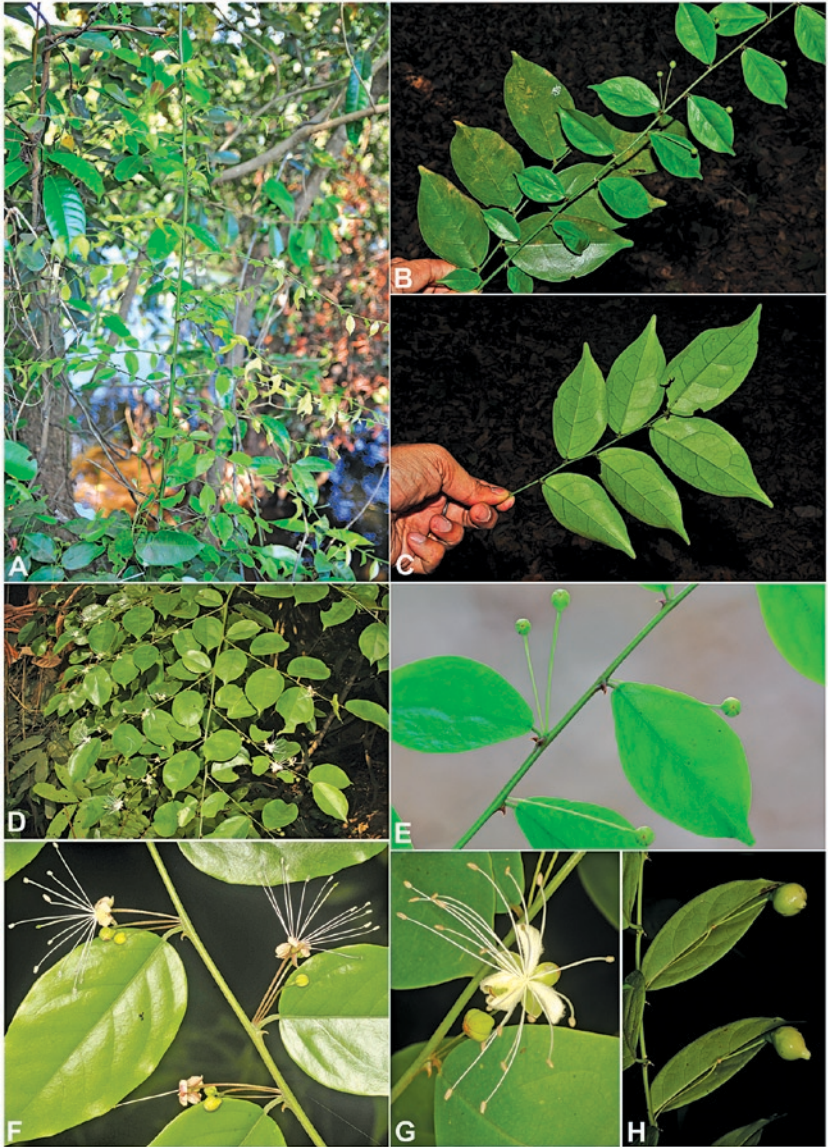
Phenology: Fls.: February–May; Frts.: May–June



Distribution: INDIA: (Andman & Nicobar, Arunachal Pradesh, Assam, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and West Bengal) [CAMBODIA, CHINA, LAOS, MYANMAR, PHILIPPINES, THAILAND, AND VIETNAM].

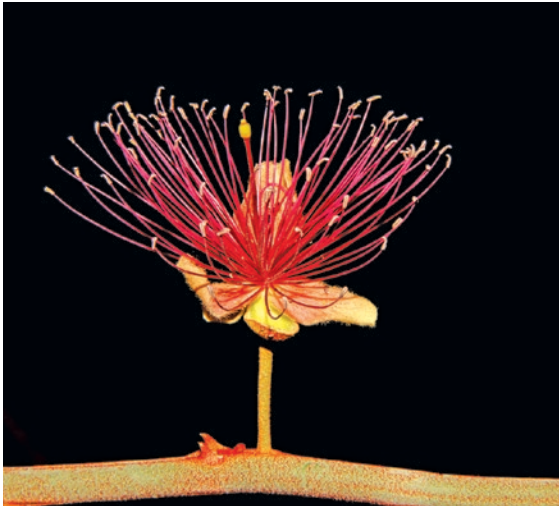
Specimens examined: INDIA. Karnataka: Bhadrakali, *Revati Gindi* 756 (AHMA!); Maharashtra: Patgaon, *R.K. Choudbary, M.N. Datar & Sneha Joshi* 432, 433, 434 (AHMA!).

Economic/ Medicinal Usage: Commonly used as hedge.



Capparis tenera Dalzell:— A. habit; B. abaxial surface of leaves; C. adaxial surface of leaves; D. branch with flowers; E. stem with thorns and flower buds; F. supra-axillary inflorescence with open flowers; G. an open flower; H. mature fruit with beak. (Photos: D, F, G & H by Dr. Navendu Page)

35. *Capparis zeylanica* L., Sp. Pl. ed. 2. 1: 720. 1762.



Habit: Climbing shrubs up to 10 m tall. Innovations densely brown-red to greyish tomentose, glabrous at maturity; thorns recurved, 3–7 mm long. **Leaves:** blades elliptic to lanceolate, obovate, sometimes linear, base rounded, sometimes subcordate or rarely acute, apex acute to rounded, slightly acuminate, with a recurved, stiff, leathery, dark coloured mucro up to 3–4 mm long; 4–18 × 2.5–8 cm, subcoriaceous;

midrib flat to depressed above, nerves 3–8 pairs, reticulation distinct above; adaxial surface soon glabrescent and glossy, abaxial surface tomentose; petioles 5–15 mm long. **Inflorescence:** supra-axillary, 2–6 flowers in vertical rows on young twigs. **Flowers:** pedicels 4–20 mm long, hairy. Sepals 4, outer pair elliptic, 6–10 × 4–8 mm, acute to oblong, inner pair elliptic to oblong 5–8 × 3–6 mm, apex rounded, green, tomentose and margins hairy. Petals 4, oblong-rounded, 8–16 × 3–8 mm, whitish, mostly glabrous, sometimes hairy, outer pair with pink to red basal spot. Stamens 30–45(–70), 2–5 cm long, white, turn reddish at maturity, anthers ca. 2 × 1 mm. Gynophores 2–6 cm long, puberulous at base. Ovary ellipsoid, placentas 4, glabrous. **Fruits:** globular to ellipsoid, up to 5 × 4 cm, pericarp thick, smooth, reddish, orange to purple. Seeds many.

Diagnostic characters: Innovations yellow to brown tomentose; leaves with small acumen, up to 5 mm long; flowers white turning reddish or pink and stamens turns white to reddish at maturity.

Type: Lectotype: Herb. Hermann 1: 35; 2: 58, No. 210 (BM).

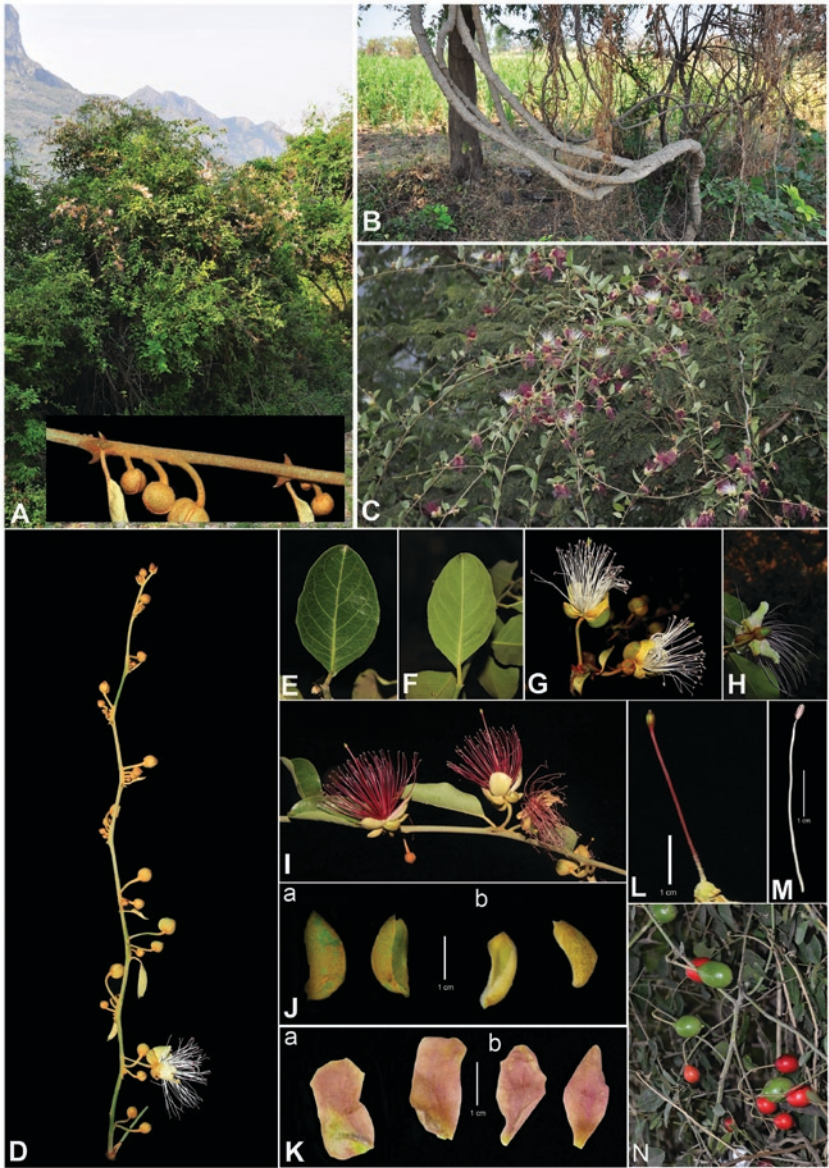
Etymology: The specific epithet refers to Sri Lanka, which was known as Ceylon/ Zeylon during the colonial period.

Phenology: Fls.: February–April; Frts.: August–October.

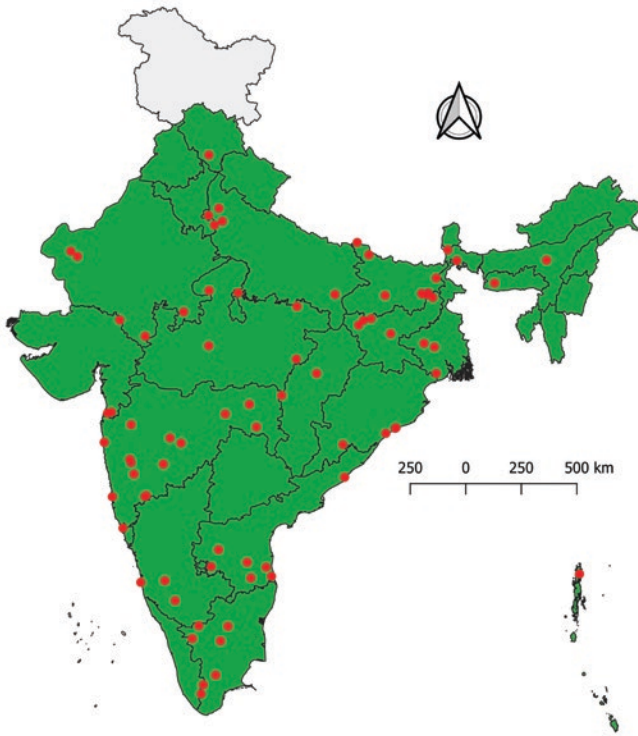
Common English/ Vernacular names: **English:** Ceylon Caper, Indian Caper; **Hindi:** *Ardanda*, *Hinsa*, *Kalhins*; **Marathi:** *Torrati*, *Waghati*; **Odia:** *Oserwa*; **Tamil:** *Adhandai*, *Adondai*; **Telugu:** *Adonda*, *Adondathivva*

Distribution: INDIA: Throughout the country except Jammu & Kashmir and Ladakh [One of the most wide spread species of genus, distributed throughout Asia– CAMBODIA, CHINA, LAOS, MYANMAR, PAKISTAN, PHILIPPINES, THAILAND, VIETNAM].

Specimens examined: INDIA. Andhra Pradesh: Pulicat Lake near Sriharikota, Kalyani Dam, Kadapa–Renigunta Road, *R.K. Choudhary* & *S. Maurya* 1441, 1447, 1449 (AHMA!), Penukonda Junction, *S. Maurya* 1472 (AHMA!); Bihar: Bhagalpur, Kahalgaoon, *R.K. Choudhary* 402, 710, 1419, 1420, 1421, 1422 (AHMA!); Karnataka: Malpe Island, *S. Maurya* 729 (AHMA!); Odisha: Brahmagiri–Satapada Road, Chilika Lake, *R.K. Choudhary* & *S. Maurya* 1429, 1433, 1434 (AHMA!); Maharashtra: Jambhul Aad, *Girish Pathak* 403 (AHMA!),



Capparis zeylanica L.:— A. habitat (inset image: stem with thorns); B. mature stem; C. habit; D. supra-axillary inflorescence with open flower; E. abaxial view of leaf; F. adaxial view of leaf; G. young open flowers; H. dorsal view of an open flower; I. mature flowers with purple-red stamens; J. sepals (a. outer sepals, b. inner sepals); K. petals (a. outer petals, b. inner petals); L. gynophore; M. androphore; N. mature and ripen fruits. (Photo N: by Navendu Page)



Kalambi, R.K. Choudhary & M.N. Datar 463, 465, 487 (AHMA!), Saswad–Lonand Road, S. Maurya 1411, 1412 (AHMA!), Dive Ghat, S. Maurya 1415, 1416, 1417 (AHMA!); Tamil Nadu: Coimbatore, Palamalai Road, R.K. Choudhary & M.N. Datar 500 (AHMA!), Hasanur, Gudamalai RF, Sivagiri RF, S. Maurya 732, 735, 1465 (AHMA!).

Note: The species is widely distributed in Central, South and South East Asia. It possesses huge variation in leaf morphology (Jacobs, 1965).

Economic/ Medicinal Usage: Traditionally the fruits are pickled in India; leaves are used as stomachic, anti-inflammatory, and to cure piles. Root barks are used as antiperspirant, sedative, stomachic, and against cholera (Chakravarti & Venkatasubban 1932; Quisumbing 1951; Duke 1993; Ashton et al. 1997; Lansky et al. 2013).

Excluded species

Capparis versicolor Griff., Not. Pl. Asiat. 4: 577. 1854.

Zhang & Tucker (2008) reported *Capparis versicolor* Griff. from the Assam state of India. However, we could not locate this species in India during our fieldwork, literature survey and scrutiny of various national and international herbaria. Hence, it has been excluded from the present work.

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Capparis brevispina DC.

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About the Book

The Genus *Capparis* L. in India

- A detailed account of 35 taxa belonging to genus *Capparis* L. in India.
- Taxonomic descriptions, photo-plates, herbarium images of the species.
- Comprehensive distribution maps with overall distribution and point locations.
- Etymology unraveled, phenology explained, and species distributions elaborated.
- Details of specimens examined given.
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- Local names in major Indian languages collated.
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- Economic and medicinal usage compiled.
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