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## THE STATE OF *POLYOMMATUS MYRRHA CINYRAEA* NEKRUTENKO & EFFENDI, 1979 IN ARMENIA

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### ABSTRACT

A study of endemic subspecies *Polyommatus myrrha cinyraea* Nekrutenko & Effendi, 1979 was implemented in the Southern Zangezur Mountains of Armenia. The Study shows that *P.m. cinyraea* species lives in rocky subalpine grasslands at about 2500 m a.s.l., the distribution range of the species makes 4.56 ha, its host plant is *Cicer anatolicum* Alef., and the flight period of imago lasts from mid July to early August. Population of the species is in steep decline as well as the population of the host plant. The existing conservation measures are insufficient and the proposed conservation measures include strengthening population of its host plant, detailing its biological peculiarities; evaluation of conservation status of the species and its subspecies for IUCN Red List; strengthening conservation status of the land and its protection regime; securing obligatory Environmental Impact Assessment of all the business and land use projects in the gorge.

**Key words:** *Polyommatus myrrha cinyraea*, conservation status, Armenia, butterflies.

### INTRODUCTION

Among over 64,000 animal species assessed for IUCN Red List, insects make about 7,000 species (11%) [8], while Insects are the most species-rich group of animals, representing over 50% of terrestrial biodiversity [13]. C. Insects consist of huge variety of highly specialized species, many of which are endemics of various geographical areas. Among insects, Butterflies are one of the most vulnerable groups, since they consist of high number of habitat specialists, which are often have very narrow and restricted distribution and therefore are very sensitive to habitat degradation [13].

Armenia is a country rich with butterfly species diversity [10]. Among Armenian butterflies there are number of regional endemics, which have not been assessed neither for International Red List nor for Red Book of Animals of Armenia [1].

One of such species is *Polyommatus myrrha* (Herrich-Schäffer, [1852]), which is a least studied species inhabiting Anatolian province in Turkey [5], and small patches in Armenia, Nakhichevan, and Northwestern Iran. Its subspecies *P.m. cinyraea* Nekrutenko & Effendi, 1979 is even rarer and inhabits two patches in the world: Voghchi River Gorge at southern part of Zangezur Mountains of Armenia and Bichanak Pass in Nakhichevan. The species was found in Armenia in 1997, however the only knowledge on it were based on the males, which have been visiting a watering-place. No information existed on the distribution of the species, its abundance at the habitat, its host plant in Armenia, its habitat requirements and biological cycle, threats, etc.

Therefore the main aim of the current study is to clarify some biological and ecological peculiarities of the species, which can help in justification of its conservation status.

### METHODS

For the purpose we have organized four expeditions to the Voghchi River Gorge and other parallel gorges in the period of July-August of 2016 and July-August of 2017. For understanding of the species abundance we have been counting the adult butterflies using Standardized Transect Counts, better known as Pollard Walks [11]. Routes of transects were laid out to sample representative habitat and ran for 100 m parallel to the slopes. The width of routes was 5 meters. The walks have been implemented during 11:00-13:00 in sunny weather, with the wind speed less than 3 by Boffort Scale. Generally we realized counts with moderate speed of walk registering only those individuals which have been found within the five meter strip of route. Later in a day – from 14:00 to 15:00 we have been counting males at the watering place. For identification of the host plant we have been searching for the ovipositing females. The threats have been classified using IUCN Threat Classification Scheme [6,7]. While the current stage of our study doesn't require statistical data analysis, the mapping works have been conducted using ArcGIS 10.1.

### REZULTS AND DISCUSSION

### *Distribution and biological peculiarities in Armenia*

The known distribution of the subspecies in Armenia is restricted by Voghchi River Gorge, where the micro-habitat of the species makes 4.56 ha, including core biotope and the watering place. The habitat of the species is rocky subalpine grasslands at 2500 m a.s.l. The host plant of the species is *Cicer anatolicum* Alef. Flight period of imago lasts from mid July to early August.

### *Population dynamics*

As it was mentioned, the species was found in Armenia in 1997 [12], (Danchenko *pers. comm.*). Although the area was visited regularly, the information is insufficient for calculation of population trend. Nevertheless it is possible to state that the abundance of the species is relatively low (less than two specimens recorded per 100 m of transect) and in 2016 and 2017 is much lower than it was observed in the period from 1997 to 2008. The small population of its host plant, which was found in 2016 significantly decreased in 2017. The conducted observation show that the host plant prefers only screes made by fairly small stones; number of such screes in the studied area is very limited.

### *Possible threats*

At current it is unclear what kind of threats can affect the habitat and the population of the species; however the recent construction of Hydro Power Plant in the gorge was documented. The project passed formal Environmental Assessment, however the EIA did not take its possible influence into consideration neither on *P.m. cinyraea*, nor on the other butterfly species inhabiting the gorge, which include IUCN listed *Parnassius apollo* and *Phengaris arion*, as well as species included into Red Book of Animals of Armenia [1].

### *Conservation measures*

Although the species *P. myrrha* was assessed for the Red Book of Butterflies of Turkey [9], the species has not been evaluated for IUCN Red List, for Red Book of Animals of Armenia, also it is not listed in CITES, and in Bern Convention [3]. The distribution range of the species is included in Zangezur Biosphere Complex, however the status of the land refers to a state sanctuary, which allows implementation of such projects as construction of Hydro Power Plant in the gorge. The following steps appear to be important for conservation of the species: strengthening population of its host plant via artificial planting and creating more appropriate micro-habitats for the plant, detailing distribution, abundance, and better understanding biological peculiarities of *P.m. cinyraea*; evaluation of conservation status of the species and its subspecies for IUCN Red List; strengthening conservation status of the land and its protection regime; securing obligatory Environmental Impact Assessment of all the business and land use projects in the gorge; popularization of the area for butterfly-watching and creation of alternative income opportunities for local people.

At current, the gorge inhabited by *P.m. cinyraea* is recognized as Prime Butterfly Area Kajaran [2] and included in the Emerald Site Zangezur [4].

## CONCLUSION

*Polyommatus myrrha cinyraea* is a species in critical conditions; the existing conservation measures are obviously insufficient. Therefore the state of the species requires immediate actions and long term initiatives. The immediate actions include: strengthening population of its host plant via artificial planting and creating more appropriate micro-habitats for the plant, detailing distribution, abundance, and better understanding biological peculiarities of *P.m. cinyraea*; evaluation of conservation status of the species and its subspecies for IUCN Red List; strengthening conservation status of the land and its protection regime. The longer-term initiatives include: securing obligatory Environmental Impact Assessment of all the business and land use projects in the gorge; and popularization of the area for butterfly-watching and creation of alternative income opportunities for local people.

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