SHILAP Revista de lepidopterología, 53 (211) septiembre 2025: 557-565 eISSN: 2340-4078 ISSN: 0300-5267
https://doi.org/10.57065/shilap.1088 https://shilap.org
https://zoobank.org/ADC4612F-615B-4D35-9627-20DC1DFFBDD2

A preliminary list of Heterocera in high altitude Gulmarg, Kashmir, India (Insecta: Lepidoptera)

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Abstract

Field investigations were made to record the diversity of Heterocera from the world-famous high-altitude tourist spot Gulmarg in Kashmir Valley. The present study has been carried out to elucidate the fauna which has not been explored before. The study is carried out from June 2022 to September 2023 including meadows and forests, in order to eventually contribute to biodiversity conservation as well as to management of forest ecosystem of this area. A total of 33 species belonging to 10 families were recorded from this site. The Erebidae family was found to be dominant with the highest number of eight species followed by Family Crambidae with a record of seven species.
Keywords: Insecta, Lepidoptera, diversity, high altitude, conservation, Gulmarg, India.

Una lista preliminar de Heterocera en la altitud de Gulmarg, Cachemira, India (Insecta: Lepidoptera)

Resumen

Se realizaron investigaciones de campo para registrar la diversidad de Heterocera del mundialmente famoso lugar turístico de gran altitud Gulmarg, en el valle de Cachemira. El presente estudio se ha llevado a cabo para dilucidar la fauna que no ha sido explorada antes. El estudio se lleva a cabo desde junio de 2022 hasta septiembre de 2023, incluyendo praderas y bosques, con el fin de contribuir eventualmente a la conservación de la biodiversidad, así como a la gestión del ecosistema forestal de esta zona. En este lugar se registraron un total de 33 especies pertenecientes a 10 familias. La familia Erebidae resultó ser la dominante con el mayor número de ocho especies, seguida de la familia Crambidae con un registro de siete especies.
Palabras clave: Insecta, Lepidoptera, diversidad, gran altitud, conservación, Gulmarg, India.

Introduction

The importance of biological diversity has been widely recognized because it affects not only the global economy and human welfare, but also human survival. Biological diversity can provide an essential ecological service through enhancing the resilience of the ecosystem (Elmqvist et al. 2003). The order Lepidoptera, comprising butterflies and moths are taxonomically well known and critical to the functioning of many ecosystems, with the species having functional roles as selective herbivores, pollinators and prey for birds and small mammals (Schowalter et al. 1986). Much less attention has been given to the less conspicuous species, even though they are known to comprise more than 90% of the known lepidopteran species and are distributed globally throughout a wide range of habitats (Janzen 1988). Heterocera are responsible for a great variety of ecological processes and ecosystem functions as pollinators, selective herbivores, and prey for migratory passerines (Summerville and Crist 2004). There have been substantial population declines in many species, including two-thirds of analyzed common Heterocera species in the UK (Conrad et al. 2006). The main

drivers of decline are expected to include climate change, agricultural intensification and deforestation (Fox et al. 2013).

Gulmarg is a hill station situated in the Pirpanjal range in the Western Himalayas. Gul means flower and Marg means meadow, thus Gulmarg means meadow of flowers. Gulmarg lies in Baramulla District of the state Jammu and Kashmir, India. It has world famous beauty and attracts tourists all over the world. It is popular and appealing in all seasons of the year. Even though Gulmarg is considered to have a high biological diversity because of the well-balanced preservation and management programs put in place, still no research has been undertaken to investigate the moths in this area. Thus, the present survey is a must and utmost to highlight the diversity of species.

Materials and Methods

Study site

Gulmarg is a mountainous area extending between 74º 28' to 74º 31' East and 34º 03' to 33º 58' North (Singh et al. 1987). Situated at an altitude of 2730 m (meters above sea level) covering an area of 180 sq. km. Besides being a wildlife Sanctuary, it is known for its unparallel beauty and is rated as one of the matchless tourist spots of the world.

Sampling method and period

Light traps were set using a solar powered lantern or gas petromex in front of a white 10' x 6' cloth sheet hung between two vertical poles in such a way that whole sheet was brightly illuminated for moth attraction and photography of moths was done. When Heterocera were unidentified or difficult to identify by visual observation, they were captured with the help of insect net carefully, transferred to air-free plastic transparent box and then identified with references.

Identification was made by comparison with the available literature by Kendrick (2002) and by iNaturalist guides to Heterocera species. The photographs have been taken in their most likely natural resting positions. None of these species were killed, frozen or stuck just for the sake of obtaining a perfect picture. The moth species recorded in this study have been determined to a specific level with a good level of certainty by external examination, on the basis of their size, shape, wing pattern, antennae and colored markings on wings, and wingspan.

Results

Table 1. List of moth species recorded during present study.

Family	Species	Author
Drepanidae	*Oreta vatama*	Moore, [1866]
Geometridae	*Ligdia adustata*	([Denis & Schiffermüller],1775)
	Abraxas sylvata	(Scopoli, 1763)
	Agathia carissima	Butler, 1878
	Orthonama obstipata	(Fabricius, 1794)
	Prasinocyma semicrocea	(Walker, 1861)
	Chiasmia cymatodes	Wehrli, 1932
Noctuidae	*Trachea atriplicis*	(Linnaeus, 1758)
	Acontia lucida	(Hufnagel, 1766)
	Polymixis flavicincta	([Denis & Schiffermuller], 1775)
	Arcte coerula	(Guenée, 1852)

	Dysgonia algira	(Linnaeus, 1767)
Erebidae	*Cyana peregrina*	(Walker, 1854)
	Syntomoides imaon	(Cramer, 1780)
	Utetheisa pulchelloides	Hampson, 1907
	Euproctis lutea	(Fabricius, 1775)
	Lymantria concolor	Walker, 1855
	Cyana hamata	Walker, 1854
	Spilosoma obliqua	Walker, 1855
	Somena scintillans	Walker, 1856
Crambidae	*Nomophila nearctica*	Munroe, 1973
	Leucinodes orbonalis	Guenée, 1854
	Nausinoe gueyraudi	Guillermet, 2003
	Anania verbascalis	([Denis & Schiffermüller], 1775)
	Glyphodes bicolor	(Swainson, 1821)
	Glyphodes pyloalis	Walker, 1859
	Omphisa anastomosalis	(Guenée, 1854)
Nolidae	*Earias cupreoviridis*	(Walker, 1862)
	Nola confusalis	(Herrich-Schäffer, 1847)
Tineidae	*Monopis monachella*	(Hübner, 1796)
Tortricidae	*Gypsonoma aceriana*	(Duponchel, 1843)
Lasiocampidae	*Euthrix laeta*	(Walker, 1855)
Zygaenidae	*Praezygaena cashmirensis*	(Kollar, [1844])

Acknowledgments

We are highly thankful to the Gulmarg development authority who allowed us to carry out this research work in Gulmarg region of District Baramulla State Jammu and Kashmir.

Conflict of interest

The authors declare that there is no known financial interest or personal relationships that could have influenced the work presented in this article.

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(Recibido para publicación / *Received for publication* 21-III-2024)
(Revisado y aceptado / *Revised and accepted* 3-X-2024)
(Publicado / *Published* 30-IX-2025)

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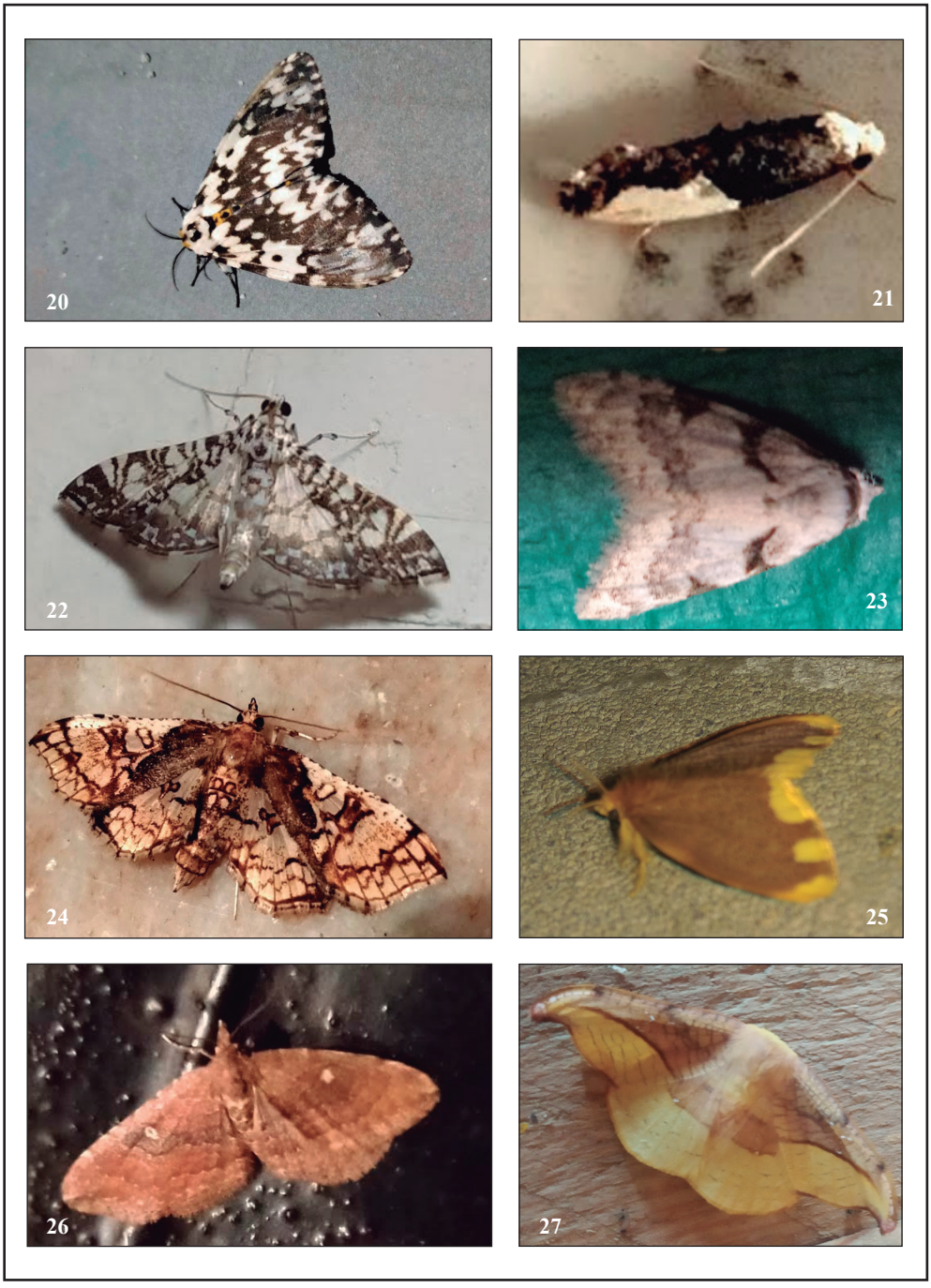

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