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Some Records of Owlet Moths (Lepidoptera: Noctuidae) of Chirpine Forest of Jammu Province

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ABSTRACT: During present investigation, eleven species of owlet moths (Lepidoptera: Noctuidae) were identified for the first time from Chirpine forest of six district of Jammu province. Chirpine forests of Jammu province were explored to access and study the Noctuid diversity. Extensive survey was conducted at different selected sites in various districts of Jammu and Kashmir. It has also been emphasized that the life history studies and location of larval host plants of non-pest species are essential from the conservation point of view.

Keywords: Noctuid moths; Biodiversity; Chirpine forest and Jammu & Kashmir.

INTRODUCTION: Habitat is very important requisite for proliferation and conservation of any living entity including lepidopteron species. The moth fauna of the world is quite well known; however, very few studies were conducted in North-West Himalayas.[1-4] So, an attempt had been prepared to study the habitat preferences of Noctuid moths in different parts of Chirpine forest of Jammu Province (J&K) India, to assess the habitat preference of different Noctuid species including development measures for conservation of the biodiversity.

Chirpine scientifically known as *Pinus roxburghii* (Family: Pinacea) is one of the most widely occurring pine of India. In India its forests are found in Jammu and Kashmir, Haryana, Himachal Pradesh, Uttar Pradesh, parts of Sikkim, West Bengal and Arunachal Pradesh. In Jammu and Kashmir there are a few areas of Chirpine forests in the lower parts of Jammu region. In this region its forests occur in abundance in the outer hills from 600 m to 1800 m altitude.

Lepidoptera have attracted more attention than other insects in the development of insect conservation, commonly as charismatic 'flagship' species. Wider benefits of conservation studies on single species include developing and clarifying their role as putative 'umbrella' taxa whereby their protection also confers protection on coexisting organisms, which are not as well documented. Potent umbrella taxa manifest many of the features of indicator and flagship taxa.[5-6] Due to drastic changes in the climate during last decade, different insect pests including moths are diversifying their host preferences and proliferating above threshold level with ease and are adapting well in changing climatic conditions which in return, has caused severe damages to the vegetation and forest ecosystem; thus, have highlighted the need to conserve and manage the existing forest ecosystem in systematic and fruitful way.

The moth fauna of the world is quite well known.[7-13] The Noctuidae or owlet moths are a family of robustly-built moths that includes more than 35,000 known species out of possibly 100,000 totals, in more than 4,200 genera. They constitute the largest family in the Lepidoptera. The largest representative family of moths from India is the family Noctuidae with 1500 identified species.[14] Their distribution is worldwide. Most have drab forewings, although some have brightly colored hindwings. There are usually few differences between the sexes. The overwhelming majority of Noctuid flies at night and are almost invariably strongly attracted to light. Many are also attracted to sugar and nectar-rich flowers. Some of the families are preyed upon by bats. Several species have larvae (Caterpillars) that live in the soil and are agricultural, horticultural and forestry pests. These are the "cutworm" that eats the bases of young brassicas and lettuces. The Noctuidae are also remarkable for containing an extraordinary number of species whose caterpillars are able to feed on certain poisonous plants without harm. These food plants - namely

Solanaceae (e.g., *Nicotiana*) and Fabaceae (e.g., *Sophora*) contain chemicals that would kill most insects trying to feed on them. The faunas covering the family Noctuidae are available for parts of Poland, [13, 15-16] Canada[11] and Finland[12]. Fauna of Poland and Finland contain useful illustrations of habitat and genitalia. Some useful references on sub-family Plusiinae for Old World are Dufay [17-19] and Holloway [20]. Holloway[20] conducted some research in tropical rain forests to determine which of the higher taxonomic groups in the Lepidoptera can be used to categorize undisturbed forest.

Noctuid moths (Lepidoptera) are of great economic and biological importance. Number of economically important species available in India laid under wrong generic names in the reference national collections. The present investigation on Noctuid moth group, which is a very large group, thus warrants fresh taxonomic treatment to all the Indian species, including pest species.

The work on biodiversity of the moths of Chirpine forest especially of Jammu province of J&K forest added new biodiversity data and species status so as develop the conservation strategy for the Lepidoptera species and lead to know the Taxonomic status of the species. The present study helped in forecasting future distribution patterns of selected species of Noctuid moths and their habitat, evolving Habitat Conservation Strategy and identifies moth species. The present attempt, therefore, seems to be most appropriate in this direction and is likely to yield encouraging and satisfactory results.

MATERIAL AND METHODS:

Study Area: Chirpine Forest of Jammu Province of districts Kathua, Jammu, Reasi, Udhampur, Samba and Ramban.

Methodology for Taxonomic Study: Pilot surveys (during March to October every year) were conducted to selected localities, which are selected as representatives of the habitat type during present study.

Study of associated vegetation, environmental factors (Temperature, humidity, rainfall, & altitude) and pest incidence was conducted in the field. Vegetation (Trees, shrubs, & herbs) of selected sites was studied by laying out quadrates of different sizes. Collection, preservation and storage of specimens of Noctuid moths were done.[21-26]

Identification of Noctuid fauna was done with the help of literature or through comparison with national reference collections being housed at Entomological Museums of I.A.R.I., New Delhi; Z.S.I., Kolkata and F.R.I., Dehradun. Study of wing venation [27, 22, 24-25] and dissection of imagos was done for the study of genitalia.[22, 24-25]

RESULTS AND DISCUSSION: The current study, with a checklist of eleven species from Jammu province, is the first extensive study on Noctuid moths from this region. In this investigation, 11 specimens were identified and illustrated in the table.

Table 1: List of identified Noctuid moth species.

S. No.	Genus	Family
1.	*Dichromia pullata*	Noctuidae
2.	*Calyptera emarginata*	Noctuidae
3.	*Dysgonia latifascia*	Noctuidae
4.	*Helicoverpa armigera*	Noctuidae
5.	*Thysanoplusia nigrisinha*	Noctuidae
6.	*Asota caricae*	Noctuidae
7.	*Trichoplusia orichalcea*	Noctuidae
8.	*Euxoa aequalis*	Noctuidae
9.	*Agrotis ipsilon*	Noctuidae
10.	*Digama hearseyana*	Noctuidae
11.	*Hypena abussimlis*	Noctuidae

Host plants *Pinus roxburghii*, *Lantana*, *Acasia nolitica*, *Parthenium hysterophorus*, *Ziziphus* spp., *Carissa carandas*, *Phoenix* spp., *Albizia julibrissin*, *Dodonaea viscose*, *Callistemon* spp., *Murraya koenigii*, *Ficus religiosa* L. and *Ficus racemosa* were recorded while collection of larvae and adult specimens and confirmed by comparing with existing literature. More surveys will certainly result in adding to the numbers of species already known. Future studies can now include ecological studies on these species, life histories, habitat preferences, moth assemblage composition, especially of endemic species, to provide information relevant to habitat restoration and species conservation programmes.

CONCLUSION: During the present investigation, eleven species of Noctuidae family was identified. Various host plants were also identified. While this checklist is by no means comprehensive, it aims to provide an insight into the moth diversity of Jammu provinces, and act as a baseline for more detailed and comprehensive studies of the moths of this region.

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