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The moths (Lepidoptera: Heterocera) of Osmanabad: A Preliminary checklist

Pawar N A[1] and Chati R S[2]

[1]Thakur College of Science and Commerce, Kandivali (E) Mumbai, India 400101

[2]Shri Shivaji Mahavidyalaya Barshi, Solapur, 413401

Abstract-

Moths constitute the larger division of the order Lepidoptera. Prior to this study there has been only few surveys have carried out in January 2021 to December 2022 especially in Osmanabad district. We have Find the patterns of biodiversity of moths for study area by extensive survey. Some common moths are found during the survey such as *Spodoptera exigua, Spodoptera litura, Helicoverpa armigera, Chrysodeixis eriosoma ,Mythimna separata, Achaea Janata, Spodoptera litura.* The arthropod, which includes insects, spiders, mites, and their relatives, is without question the most successful group of organisms on the planet. Lepidoptera is the second largest order of class insecta. They are also monitored to indicate climatic changes and environmental degradation. Occurrence and population of moth has greatly influenced by environment that includes biotic and abiotic factors, Rainfall, humidity, wind. Etc. Diversity is one of the important cornerstones of sustainable development and represents the biological wealth of a given Nation. Insects and plants are becoming extinct because of habitat loss, over-exploitation, pollution, overpopulation and the threat of global climatic changes. To establish a foundation for research on moths and provide a scientific data to forest dept. & wildlife for evaluating the threatened and endangered species values for their conservation in future.

Keywords- Lepidoptera, Heterocera, Moth, Diversity, Osmanabad.

Osmanabad is one of administrative district of state Maharashtra. Most of the area is rocky, while remaining park is plain. Osmanabad Weather Forecast Providing a local hourly Osmanabad weather forecast of rain, sun, wind, humidity and temperature. Osmanabad is 629 m above sea level and Osmanabad district is located in southern part of state, located at 18.17° N 76.03° E. Most part of district surrounded by Balaghat range (Washi, Kalamb, Osmanabad, and Tuljapur Tahsil.) Some part of the major rivers like Godavari and Bhima flows through this district. Osmanabad district is surrounded by following districts.

1)Solapur - South East 2) Ahmednagar -North West.

3)Beed - North 4) Latur - East. 5)Bidar and Gulbarga (Karnataka) – South

Crops: -

Both Kharif and Rabi crops are taken in this district. The main crops are Jawar, Sunflower, Gram, Hybrid-Jawar, Sugarcane, Tur etc. Total cultivable area is – 5.70 lakhs hectares. Out of which Kharif crop is 3.26 Lakhs hectares and rabbi crops 3.47 hectares.

Biodiversity of Osmanabad: -

The Yedashi Ramling Ghat Wildlife Sanctuary is located in Osmanabad district. It is situated in the Balaghat mountain range of the Sahyadri. In 1997, the government declared an area of 2237.5 hectares as 'Ramling Ghat' Sanctuary for the protection of various plants, animals and birds. It is also known as hill station as it is high above sea level.

The forest types are of the type of South tropical (regional) arid deciduous forests and thorny forests. Most of the forest area is hilly wooded land with patches of scrub land. The common trees found are Apta, Sag, Sandalwood, Guggul / Salai, Neem, Bhera, Garadi, Savar, Ain, Bor, Dhaman, Sitaphal, Saada, Moh, Medshing, Behda, Acacia catechu (Khair), Acacia leuco phloea (Hiwar), Acacia nilotica (Babul), Aegle marmelos (Bel), Albizzia lebbek, Albizzia procera, Anogeissuslatifolia (Dhawda), Buteamonosperma (Palas), Boswelliaserrata (Salaia), Ficus and Terminalia species. The common shrubs include Vites negundo, zizyphus species, Cassia auriculata(tarwad), Carissa carandas, and Helicteres isora (Murudsheng) and Ghaneri shrubs are also found in large numbers here. Apart from these, the forest department has planted a large number of trees like Bor, Shisam, Subabhul, Glyricidia etc. The animals include Leopard, wild cat, striped Hyaena, Black Buck, Jackal, wolf, fox, monitor lizards, porcupine, Barking deer, Hares. More than 100 species of birds are recorded in the sanctuary area. The threats include Illicit cutting, forest fires, encroachment, hunting and tress passing. The spread of shrubby weed Lantana camara is causing damage to the grasslands. The animals in the sanctuary face water scarecity during summer.

Materials and Methodology

Collection and Identification: -

The collection of moth samples was done from Osmanabad quarter where eight talukas included similar as Paranda.Bhum, Washi, Tuljapur, Omerga, Lohara, Kalamb and Osmanabad Maharashtra during June 2021 to June 2022. In the present study data was collected from 52 trap nights within the named spots for about 4 hr. enmeshing each night. The collection of nightly moths was accepted with light traps at a light distance using either a Philips HQL 125W mercury vapour bulb. Several traps had been cooked for landing moths, similar as the Roth Amsted trap, Heath trap and Robinson trap (Fry & Waring 1996); for this study a light trap was designed grounded on principles of standard traps. As extensively honored by lepidopterists, numerous trap designs aren't particularly suitable for use in tropical conditions, primarily because they're too small to manage with the enormous catches that are so constantly encountered (Barlow 1982). To overcome these difficulties, utmost moths were recorded at a light distance. As noted by numerous lepidopterists, relaxing, setting and labeling of samples are both laborious and time- consuming procedures (Fatimah & Catherine 2002). therefore, in the present study, species cornucopia data was recorded in the field and utmost moths released, with only a small sample collected. Cocoons of moths of family Bombycidae were collected from sericulture granges in which Bombyx mori are domesticated for the product of mulberry raw silk. Identification of the moths was carried out with the help of identification keys, standard reference books, and available literature. Species whose individualities couldn't be caught on from external morphology were studied by anatomizing the genitalia with the stereoscopic binocular microscope using standard styles. Species not assigned to species position were given a morphospecies marker, pending farther disquisition, and are held at Zoology Research Centre shri Shivaji Mahavidyalaya Barshi combined to P.A.H. Solapur University Solapur. They're listed in the roster as (rubric) sp. The bracket used substantially follows Holloway (1983, 1985, 1986, 1987b, 1988, 1989, 1994, 1996, 1997, 1999); Kristensen 1999 but also incorporating recent changes in superfamily Noctuidae (Lafontaine & Schmidt 2010; van Nieukirken etal. 2011; Zahiri etal. 2010, 2011; Dubatolov & de Vos 2010).

Table 1. Preliminary checklist of moth fauna from Osmanabad Maharashtra.

Sr.No.	Scientific Name	Family
1	*Spodoptera exigua*	Noctuidae
2	*Spodoptera litura*	Noctuidae
3	*Mythimna separata*	Noctuidae
4	*Helicoverpa armigera*	Noctuidae
5	*Chrysodeixis chalcites*	Noctuidae
6	*Maruca vitrata*	Crambidae
7	*Thysanoplusia orichalcea*	Noctuidae
8	*Agrotis ipsilon*	Noctuidae
9	*Agrius convolvuli*	Sphingidae
10	*Daphnis nerii*	Sphingidae
11	*Acherontia styx*	Sphingidae
12	*Agathia laetata*	Geometridae
13	*Blenina donans*	Nolidae
14	*Aloa lactinea*	Erebidae
15	*Olene mendosa*	Erebidae
16	*Achaea Janata*	Erebidae
17	*Agrotis segetum*	Noctuidae
18	*Netria multispinae*	Notodontidae

Results

A total of 800 moth specimens were collected, which were classified into 18 species and 17 genera. A larger number of Microlepidoptera were recorded than Macrolepidoptera due to greater efforts taken to record these moths using light sheet and light trap methods rather than other methods, and also due to the difficulty with identification of Microlepidoptera; many of the specimens are thus pending further investigation. The Microlepidoptera families Geometridae, Saturniidae, Sphingidae, Saturniidae, Pieridae, Nolidae, Noctuidae, Erebidae and Crambidae were represented by the 18 species and 17 genera. Noctuidae are the dominant microlepidoptera family represented by 8 species.

Discussion:

The study moth diversity of Osmanabad recorded 18 species from 17 genera in 7 families, with families Noctuidae dominant in that area followed by Erebidae followed by Sphingidae followed by all rest of families. Ghosh (2003) studied the geometrid moths of Sikkim and reported 525 species, and cited a total of 460 and 260 species of

Geometridae from Meghalaya and West Bengal respectively. Gurule et al. (2010) catalogued 70 species of moths from the family Noctuidae (including Erebidae) in Nashik District of Maharashtra. Sidhu et al. (2010) documented 109 microlepidoptera species in the online version of the Zoological Survey of India. Finally, Rose & Pooni (2004, 2005) recorded 18 species belonging to the superfamily Pterophoroidea and 16 species belonging to the superfamily Tortricoidea from the north-western part of India. In the present survey, family Noctuidae includes most of the species (9), followed by the families Erebidae (3).The surveyed area has a higher proportion of plants from the families Cupressaceae, Menispermaceae, Fabaceae, Malvaceae, Solanaceae, Convolvulaceae, Euphorbiaceae, Mimosaceae, Ebenaceae, Sapotaceae, Sapindaceae, Brassicaceae, Asteraceae, Poaceae, Linaceae and Amaranthaceae, which may serve as indicator taxa for noctuid moths, with lower proportions of plants from families Myrtaceae, Rutaceae, Rhizophoraceae, Periplocaceae, Combretaceae, Thymeliaceae, Fagaceae and Santalaceae indicating a rich geometrid fauna (Kitching et al. 2000). The ratio obtained in the present study suggests the moth assemblages recorded are typical of human-disturbed forest of wild with relatively low geometrid component and moderate agriculture and open habitats. So, samples obtained from the light sheet proved to be extremely valuable for the production of a preliminary checklist of the moth fauna of northern Maharashtra. However, the sampling period is really insufficient to estimate species richness, being relatively short. A more exhaustive survey of all regions is required with other sampling methods, including crepuscular netting, baiting, larval searching, diurnal nectaring and malaise trapping, and this is sure to yield new records for this area.

Conclusion:

The results of this survey indicate that the moth fauna of given study area of Osmanabad is characterized by larger proportions of Noctuidae, Erebidae, Crambidae, Geometridae and Sphingidae, which are also among the most diverse families of moths in this region, other families being relatively rare. Conservation of the area's flora and plantation by the Forest Division thus helps preserve a reservoir for moth and other insects but more efforts are required towards their scientific documentation and conservation.

A future course of action:

Inventorying is the first step in conservation. The list of moths presented here is preliminary, considering the rich faunal diversity of the area; a more comprehensive study is required to document the entire biodiversity present in this area. A detailed survey will be carried out to record the moth fauna of this area with proper scientific documentation. This exhaustive survey of all regions will be conducted using the additional sampling methods noted above.

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