



Study of Biodiversity in and around the Motha Gaon pond, Old Dombivili city of Thane district, Maharashtra with special reference to Insect and Avifauna Diversity

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Abstract: - The study of diversity of insects and birds was carried out in Motha Gaon pond situated in the Old Dombivli city of District Thane (Maharashtra, India). The vegetation in and around the pond is very vast with Ashoka, Banyan, Neem, Cashew nut, Jackfruit, Mango and many more with the medicinal plants. The study area's zoogeography supports and prospers an abundant biodiversity. The survey was carried out during June 2020 to November 2020. The chief objective of the present study was to determine and recognize the diversity of insect and birds present in the Motha Gaon Pond located in the Old Dombivli city. 17 insects were observed which were belonging to 6 orders and 12 species of aves belonging to 5 orders during the study period. The present study had recognized and identified, that there are major abundance of butterflies noted among the insects due to the vast number of vegetation present near the pond.

Keywords:- Biodiversity, Motha Gaon Pond, Insect, Butterflies, Aves

Introduction

One of the most captivating aspects of biology is Biological diversity. Different species are still being produced through evolution by natural selection. To describe the plants and animals in nature, the term that was being widely used by the scientific communities in the world was 'Natural Diversity'. In 1968 the wildlife conservationist Raymond F. Dasmann for the first time used the term 'Biological Diversity'. In an ecosystem, each and every organism of the habitat and their interaction, adds strength to the ecosystem and thereby increase its complexity. To assess the health of ecosystem of any region, biodiversity is being used as a basic parameter. The biodiversity of the rural ponds that is measured by species richness, considered to be generally elevated than the urban ponds (Oertli and Parris; 2019).

In the scientific literature there are around 1.4 million species of the insects reported. An Inherent part of earth's ecosystem is indeed the significant diversity of insect. In India the insect fauna is extensive. Many scholars worked on Biodiversity of Insects and Birds fauna at different regions in India. Sharma *et al.* (2012), studied in foothills of Itanagar, Arunachal Pradesh; Parandhaman (2012) in different habitats from Tamil Nadu of Western Ghats; Qureshi *et.al.* (2013) in District Kupwara from Jammu and Kashmir State; Arya *et al.*, (2014) studied in and around Kumaun University, Nainital, Uttarakhand. All had provided valuable informations through their research work. Chandra (2011) studied in the state of Sikkim (India). He recorded around 5892 species belonging to 2382 genera under 261 families and 22 orders of Insects.

With a unique geological history, India is considered as a wide ranging landmass. For investigation, research and preservation of tropical biodiversity, India is one of the majority critical centers. Comparing to the development that had been made by the overseas researchers in this area, India has not been able to keep the rapidity in documenting species diversity, from the rudimentary taxonomic characterization of species to huge apprehension of their biology. This diminutive growth of biological research had affected the bio-diverse group like plants, insects, microbes etc., that still persist poorly listed in India's biodiversity hotspots. For Insect biology, butterflies are frequently considered as flagship group, as they are very charismatic.

The crucial part of an ecosystem is being created by birds through their existence at different levels of a particular food web. According to Grimmett et; 1998, India is considered to be rich in avifaunal biodiversity, as around 1300 bird species had been noted, which forms 13 % of the entire species of birds that are found on earth. In Maharashtra state, Pande et al, (2011) reported that there are around 20 avian orders with 83 families, 272 genera and 568 species. As an indicator of an ecosystem and habitat, the avian diversity studies are being carried out (Morrison 1986).

Materials and Methods

Once in a week of every month the study area i.e. Motha Gaon Pond was visited. The observations were carried out in and around the Pond during June 2020 to November 2020. The Motha Gaon Pond was selected for the survey. This pond is situated in Old Dombivli of Thane district. This pond is 1 acre wide. The vegetation are grown around it's at about 12 acre of land. This pond is 2.5 Km away from the Dombivli Railway station. The area selected for the study consists of pond ecosystem. By extensive field observations, active exploration by walking across the pond, the photographs of insects and birds were taken. Their identifications were carried out with the assistance of a field guide. Throughout the study period field record was maintained. Observation and identification of birds till the species level was done by the standard methods that had been stated by Ali (2001) and Grimmett et al. (1998). The reference key and illustrations that are given by Carter (1992); Haribal (1992) and Mani (1986) were used for the identification of the butterflies and insects.

Table 1: Insect species recorded in the Motha Gaon Pond of Dombivli city

Sr. No	Class	Order	Family	Scientific Name	Present (+) or Absent (-)
1	Insecta	Hemiptera	Pentatomidae	<i>Halyomorpha halys</i>	+
2			Pentatomidae	<i>Chinavia hilaris</i>	+
3		Mantodea	Mantidae	<i>Rhombodera extensicollis</i>	+
4			Mantidae	<i>Mantis religiosa</i>	+
5		Hymenoptera	Ichneumonidae	<i>Pimpla pedalis</i>	+
6		Odonata	Libellulidae	<i>Sympetrum fonscolombii</i>	+
7			Libellulidae	<i>Diplacodes trivialis</i>	+

Table 2: Various Butterfly species recorded in the Motha Gaon Pond of Dombivli city

Sr. No	Class	Order	Family	Scientific Name	Present (+) or Absent (-)
1	Insecta	Lepidoptera	Sphingidae	<i>Agrius convolvuli</i>	+
2			Erebidae	<i>Ericeia lituraria</i>	+
3			Geometridae	<i>Geometra papilionaria</i>	+
4			Nymphalidae	<i>Neptis columella</i>	+
6			Uraniidae	<i>Micronia aculeata</i>	+
7			Saturniidae	<i>Actias luna</i>	+
8			Nymphalidae	<i>Euthalia aconthea</i>	+
9				<i>Ideopsis vulgaris</i>	+
10				<i>Hypolimnas bolina</i>	+
11				<i>Junonia atlites</i>	

Table 3: Various Aves species recorded in the Motha Gaon Pond of Dombivli city

Sr. No	Class	Order	Family	Scientific Name	Present (+) or Absent (-)
1	Aves	Passeriformes	Cisticolidae	<i>Prinia sylvatica</i>	+
2			Corvidae	<i>Corvus splendens</i>	+
3			Estrildidae	<i>Fringilla amandava</i>	+
4			Turdidae	<i>Turdus merula</i>	+
5			Muscicapidae	<i>Luscinia megarhynchos</i>	+
6			Sturnidae	<i>Acridotheres tristis</i>	+
7			Passeridae	<i>Passer domesticus</i>	+
8	Pelecaniformes	Ardeidae	<i>Ardeola grayii</i>	+	
9		Ardeidae	<i>Bubulcus ibis</i>	+	
10		Coraciiformes	Alcedinidae	<i>Alcedo atthis</i>	+
11		Strigiformes	Strigidae	<i>Glaucidium castanopterum</i>	+
12	Columbiformes	Columbidae	<i>Columba livia domestica</i>	+	

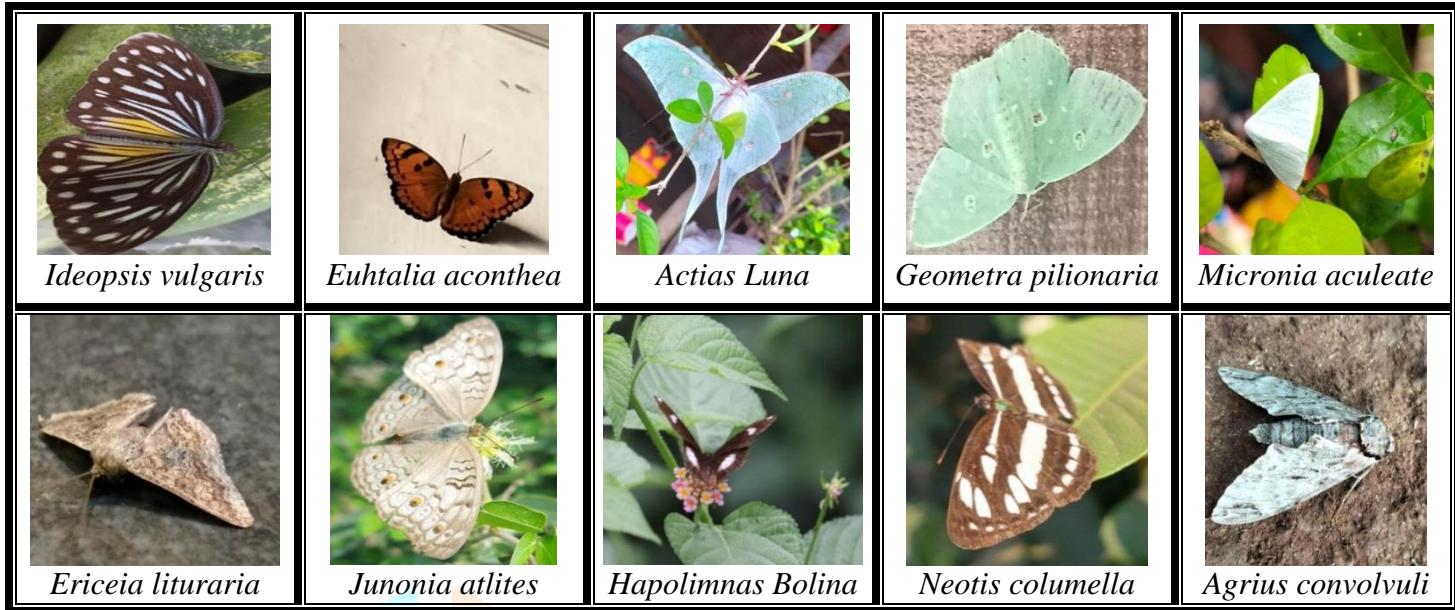
Result and Discussion

The Motha Gaon (village) Pond and its nearby area are found rich in diversity of insects, butterflies, Aves, Plants etc. 17 species of insects, belonging to 6 orders of class insecta and 12 species of birds that belong to 5 different orders of class aves were recorded during the limited study period. The ecological conditions of Motha Gaon (village) are favourable to insects and birds diversity. There is less anthropogenic activities, sewage disposal, habitat loss, waste and effluents at Motha Gaon Pond which make them fit to survive there. This pond ecosystem is a nursery, feeding and breeding ground, home for numerous animals and plants here. Several ecosystems are associated by water and ponds had been found to hold a huge biodiversity of species than any river systems or larger freshwater lakes . As such, ponds serve as a habitats for numerous different and varieties of organisms that includes fish, reptiles, amphibians, waterfowl, insects, plants and even some mammals.

Conclusion

Ponds are considered as a complex ecosystems that supports a totally aquatic, semi aquatic, and even terrestrial (land dwelling) organisms. Due to the accessibility of a continuous water source, ponds are typically higher in biodiversity (number of different species) than terrestrial (land) ecosystems.

		
<i>Halyomorpha halys</i>	<i>Chinavia hilaris</i>	<i>Rhombodera extensicollis</i>
		
<i>Pimpla pedalis</i>	<i>Sympetrum fonscolombii</i>	<i>Diplacodes trivialis</i>



References:-

Ali, 2001 : The book of Indian Birds- 13th Edition., Bombay Natural History Society /Oxford University Press, 156pp

Arya M. K., Dayakrishna and Chaudhary R. (2014): Species richness and diversity of Butterflies in and around Kumaun University, Nainital, Uttarakhand, India. Journal of Entomology and Zoology Studies; 2(3) Pages: 153-159

Carter David, 1992. *Butterflies and Moths*. Dorling Kindersley Limited, 9 Henrietta Street, London, 304 pp.

Chandra K. (2011): Insect Diversity Of Sikkim, India Pages 181-206

Grimmit R. et. al. Birds of Indian subcontinent, Oxford University Press, 888pp

Grimmett Richard, Carol Inskip and Tim Inskip. (2014): Birds of the Indian Subcontinent. Oxford University Press. 528 pp.

Haribal, M. 1992. *Butterflies of Sikkim Himalaya and their Natural History*. Nature Conservation Foundation, Gangtok, Sikkim. 217 pp.

ITIS website - Integrated Taxonomic Information system

Mani, M. S. 1968. Ecology and Biogeography of High Altitude Insects. The Hague: Dr. W. Junk BV Publishers : 524 pp.

Morrison, M. L. (1986): Bird population as indicators of environmental change. In Current Ornithology Vol. 3 Ed. R.J. Johnston, Plenum Publishing Corporation, London. pp 492-451.

Oertli, B., and K. M. Parris. (2019): Review: Toward management of urban ponds for freshwater biodiversity. *Ecosphere* 10(7):e02810. 10.1002/ecs2.2810

Pande, S., Deshapande, P. and Sant, N. (2011): Birds of Maharashtra .Publ. Ela Foundation, Pune, India. pp 1- 330.

Parandhaman D. (2012) Diversity of butterflies in different habitats from Tamilnadu part of Western Ghats (Lepidoptera: Rhopalocera). Savarimuthu Ignacimuthu et al. / Elixir Appl. Biology 51. Pages: 10861-10865.

Qureshi A.A. Bhagat and R.C. and P.C. Pathania (2013): Rhopalocera Diversity (Lepidoptera) of District Kupwara from Jammu and Kashmir State (India). *Biological Forum – An International Journal* 5(1): Pages: 100-106

Sharma G. (2011) Studies on Lepidopterous Insects Associated with Vegetables in Aravali Range Rajasthan, India. *Biological Forum -An International Journal*, 3(1) Page: 21-26