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Biodiversity of odonata fauna in and around Navegaon Bandh Reservoir, District Gondia, MS, India.

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ABSTRACT
Navegaon Bandh is very important fresh water reservoir located in block Arjuni Morgaon district Gondia. Which has an important water source for this area and surroundings. Due to the variety of different habitats and favorable climate throughout the year, a significant number of diversity of insect observed here particularly dragonfly and damselfly. The reservoir is fast thrashing its capacity of supporting life forms since of the diverse anthropogenic activities in and around the reservoir because it calls for regular monitoring of the biodiversity and taking appropriate measures for its conservation. This habitat attracted 03 families and 15 genus of 18 species in different orders of odonata.

Keywords: Navegaon Bandh reservoir, Biodiversity, dragon fly, damselfly, Conservation.

INTRODUCTION

Gondia district admirable in the country considering the total area occupied by tropical dry deciduous forest as well as proportion of its total forest area to total geographic area. 51.2% area of this district is covered with dense and Zudpi forest. The famous Nagzira wildlife Sanctuary situated in Arjuni, Goregaon, Tiroda and Navegaon National Park is spread over Arjuni Morgaon taluka. Most of area of this district is covered by green forest and aquatic water bodies. The Navegaon National Park is also known as Navegaon Bandh, the word "Bandh" is Marathi word mean reservoir is located at Navegaon, Tahsil Arjuni Morgaon, District- Gondia of Maharashtra. Navegaon Bandh has a catchment area of 10,344 km^2 with a storage capacity of 7,100 cubic mi.

Water of the reservoir is mainly used for irrigation and fishing purpose. Water of this reservoir is mainly used for irrigation and fishing purpose. The water of this lake is getting polluted only due to manmade activities like tourist, waste disposal and boating activities. Due to addition of organic and inorganic fertilizer substances like phosphates, potash and sulphates from catchment areas the ecosystem of this fresh water is changing. Any change in ecosystem has a cascading effect on the biotope. It is well documented that the seasonal changes on odonate faunal diversity depends on the quality of water most of the odonates are pollution indicator [1,2,3].

Odonates are primarily aquatic beautifully coloured and hovering insect commonly called dragonfly. Dragonflies and damselflies (Order- Odonata) are prominent and colourful insects of wetlands. They are ancient groups of insects, evolved during Permian about 250 million years ago. The life history of odonates is closely associated with wetlands. Adults lay eggs in specific aquatic habitats. About 5,000 species of odonates are found throughout the world In India about 500 species and subspecies are reported and of this, about 200 species are found in the peninsular India [4,5,6]. The order Odonata comprises three sub-orders, the Anisoptera- robust dragonflies with the fore-wings and hind-wings different in shape; the Zygoptera- or damselflies which are small and delicate with similar wings and the third group Anisozygoptera which superficially resembling Anisoptera but are intermediate between the two groups in several respect and only one species, *Epiophlebia laidlawi* is found at the Himalayas [7].

Data collected from four directions of few localities in and around Navegaon bandh area. The efforts done by us for making checklist of odonats are not as same as made for all sites [8]. The pirpose of this study is to prepare a first-hand record of diversity and status of odonates in and around this lake, which can be help in future studies related to odonotes faunal diversity and ecology [9].

METHODOLOGY

Study Area:

The geographical area under investigation is Navegoan bandh reservoir and the geographical location of Navegoan bandh reservoir is 20^0 56' North longitude and 80^0 10' East latitude. Navegoan bandh is situated at a height of 302.41 meters above sea level. It has tropical dry equable climate having three main seasons: June/July wet Monsoon and its after month from June till October, the cool dry winter from October/November to February/March and the hot dry season from April till the onset of rains.

Temperature of city ranges from minimum of 15-27°C to maximum 32-45°C with a relative humidity minimum 25-35% to maximum 75-95% (RH). Sampling were done from which the few study sites were selected for this two year study. Height of Navegaon Bandh dam above lowest foundation is 11.58m while the length is 625m. The volume gross storage capacity is 45,943km^3.

The four study sites for observations were as follows:
Site 1: The land around the bank of lake that used for farming. This site remains saturated with water most time of the year and has a lot of emergent vegetation.
Site 2: The next site is located near the dam where is small greenland of various plants.
Site 3: Third site is just away from dam and around the village where we observed the fishing activities in little ponds.
Site 4: The fourth selected study site is front main door of dam there is little emergent vegetation at this place.

Method
odonates were collected using a net during early in morning and at evening from study site. All the collected specimens were observed and taken photograph but some identical stare specimen were preserved in 70% alcohol. Specimen up to the genus level by using Zeiss Axio cam ERc5s Stereo microscope and software version stereo Axio Vision Documentation on taxonomic keys of were identified and documented.

Occurrence of Insect
Odonates species that were documented in almost all visits in all the three season were selected as 'common' species and the species which were recorded in only one or two seasons were considered as 'Seasonal' species. The some specimens were recorded only one visit was considered as 'sporadic'.

RESULTS AND DISCUSSION

During the above survey period from four study sites a total of 18 odanots species were recorded (**Table 1**) belonging to two suborders, 03 families and 15 genus of 18 species . Libellulidae family represented maximum nine specimen of dragenfly followed by Gomphidae family having three and three specimen of damselfly belonging Coenagrionidae family.

Table 1: Checklist of common odonates found around Navegaoa bandh Reseviour

Sr.No.	Suborder	Family	Scientific Name	Common Name
01	**Anisoptera**	**Gomphidae**	*Paragomphus lineatus*	Common Oartail
			Hemianax ephippiger	Ochre-tailed Brown Darner
			Acisoma panorpoides	Trumpet Tail
		Libellulidae	*Brachythemis contaminata*	Ditch Jewel
			Bradinopyga geminate	Granite Ghost
			Crocothemis servilia	Ruddy Marsh Skimmer
			Diplacodes trivialis	Ground Skimmer
			Diplacodes nebulosa	Blacktipped Ground Skimmer
			Neurothemis tullia	Pied Paddy Skimmer
			Orthetrum chrysis	Brown-backed Red Marsh Hawk
			Orthetrum pruinosum	Crimson-tailed Marsh Hawk
			Orthetrum Sabina	Green Marsh Hawk
			Pantala flavescens	Wandering Glider
			Rhyothemis variegate	Common Picture Wing
			Trithemis aurora	Crimson Marsh Skimmer
02	**Zygoptera**	**Coenagrionidae**	*Ceriagrion coromandelianum*	Coromandel Marsh Dart
			Ischnura senegalensis	Senegal Golden Dartlet
			Pseudagrion microcephalum	Blue Grass Dartlet

The earlier studies on odonates were undertaken by investigators like who studied odonates from Achankamar- Amarkantak Biosphere Reserve, Madhya Pradesh and Chhattisgarh [10] and listed odonates of Kanha National Park Madhya Pradesh, [11] Collection of Odonata from Brahmapuri and surrounding area of Central India, [12] reported dragonfly in the Dehradun valley, India, while [13] studied Species Diversity of Odonata in and around Nagpur City, Central India [14,15].

CONCLUSION

Throughout the study of odonates diversity disturbed because putrefaction of water were found because of washing activities, agricultural runoff and human disturbances. Human generated waste matter find its way in water stream and polluting the available water thus causing threat to the life of insects and linked food web with potent damage to their habitat and ecosystem. Therefore, there is need to implement the proper policy so that the modernization process does not affect the biodiversity and ecosystem. The present study was paying attention on the ecological status of odonates diversity and density in the study area which is in needed to be conserved for better sustainability and safe ecosystem.

Conflicts of interest: The authors stated that no conflicts of interest.

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