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## Study of Biodiversity of Dragonflies Species near Januna Lake at Khamgaon (M.S.)

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### Abstract

The manuscript is about the dragonfly collected from Januna lake at Khamagaon taluka of Buldhana district, Maharashtra. Januna lake is unexplored as far as it's floral and faunal composition is concerned. Collection of Dragonfly was carried out from June 2022 to April 2023 to determine their diversity and occurrence. A total number of 07 Dragonfly species were collected by using strong light and insect net or long handle net method. The Dragonfly were identified upto family level. Family Libellulidae, Aeshnidae and Coenagrioidae were presented in collection samples. Family Libellulidae dominated among all the 3 families in diversity as well as in abundance.

**Keywords:** Dragonfly, diversity, strong light and insect net, long handle net, libellulidae

### Introduction

Dragonflies (Order-*Odonata*) are multi-coloured predatory insect of freshwater habitat and characterized by their elongated body extended wings and large eyes. Odonates are with the most exciting and energetic of all insects. India is also the most diverse with above 500 known species of Odonata (Subramanian; 2005) [12]. The Dragonfly (Suborder-*Anisoptera*) also called as darner, devil's arrow and devil's darning needle. Also commonly called as Helicopter. They are carnivorous and a number of species are predators. They prefer to live in freshwater, non-polluted and well oxygenated habitats. Therefore Dragonflies are precious bio-indicators for environmental contamination studies (Lehmkhul; 1976, Morin; 1984, Needham, *et al.* 2000) [4, 6, 8].

Dragonflies are relatively ever present in freshwater wetlands and occupy a critical trophic niche in these systems. By the way of reproduction Dragonflies lays eggs in or near only freshwater and thus, their abundance in an area is good indication of the quality of the habitat. Documenting diversity of Dragonfly fauna can help to lead a new evolutionary insights and a first step in developing conservation goals for the Odonata insects. Hence, in the present study an attempt has been made to study the diversity of Dragonflies from Januna lake at Khamgaon taluka, Maharashtra which is still

not investigated. The main objective was to study the Dragonfly fauna, collect them, identify the dragonfly diversity, and study their occurrence.

The present study reveals a total of 7 species from 3 families have been identified from Januna lake at Khamgaon taluka, in which the members of the family Libellulidae, outnumber the other dragonfly families. Aeshnidae and Coenagrioidae.

**Study Area:** The Khamgaon taluka known for being biggest emerged city in Buldhana district of Maharashtra co-ordinates at latitude 20, 6833 and longitude 76,5666. It has extreme climate the winters are very cold where summer has very hot. The area covers vegetation reach in tropical, deciduous, bushy and semi-evergreen plants species of mesophytic nature.

**Topography of Januna Lake:** The Januna lake is 6 to 10 km away from Khamgaon situated between latitude 76°44' to 76°47' and longitude 20°56' to 20°63' i.e. in high temperature zone. The rainfall is very low but in recent year the rainfall was quite good and there is a heavy rainfall so that the lake is full of water.

The Januna lake have numbers or diversity of microorganisms. It including zooplankton, phytoplankton, fishes, molluscs, dragonflies and some other migratory birds are also visited at the Januna lake. It is a small water reservoir in Khamgaon.

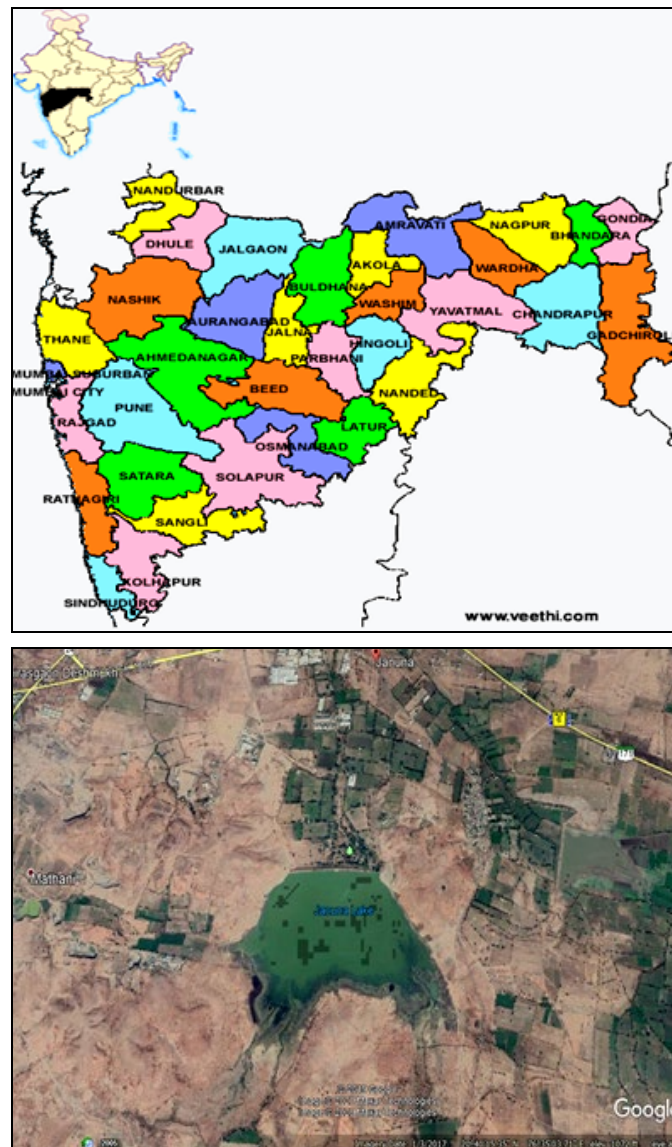


Fig 1: Geographical location of study area

## Methods

Dragonfly survey and recording has been done for a period of June 2021-April 2022. The study has been carried out during Sunday and holidays in such a way that there should be least one visit in each line transect during a week. Observations are made through walking transects of 0.6 km to 1 km length with 2 m to 5 m on either side with the aid of digital cameras. The present study is based on 5 line transects to study the dragonfly population. The sites are visited in morning, noon and evening hours to note maximum possible species of dragonflies and record its activities. The recorded species Januna Lake are identified with the help of photographs by using reference books and publications.

## Sampling Methods

Methods of sampling and preservation of Odonata were based on Orr (2003) and Borror and White (1970). Odonata were caught with light and strong insect net throughout the study areas on hot sunny days. The long handle net about 25 cm diameter with an open-mesh net with little air resistance so that it can be swung rapidly in order to catch the sample. This method requires a certain amount of speed and skill because the net should be swung at powerful flying of samples. The Odonata were grasped by its body and stunned by pinching the thorax after it was removed from the net. Then, the specimens caught were placed in the triangle envelope with

the wings were folded together above the body until preservation. Data on collection and information such as locality, date, time and the collector's name were written on the outside of the envelope. The microhabitats frequented by the odonates were recorded at every site where odonates were sampled. In general, only one specimen was kept in each envelop as they can damage each other. However, for pairs caught in tandem they were placed in the same envelope. Preserved samples were spread, pinned, dried and stored in dry boxes in General Biology Laboratory, Kustem. The collections were identified to the lowest possible taxa whenever possible. Samples were identified based on Fraser (1933, 1934, 1936) [2, 1, 3], Hamalainen and Pinratana (1999) and Orr (2003). During this study it is observed that the study area is species rich. Totally 7 species belonging to 7 genera are recorded that are distributed in 3 families. Dragonflies recorded during this study includes families Libellulidae, Aeshnidae, Coenagrionidae. Among the three families, the family Libellulidae was the most diverse family in terms of species richness.

## Observations and Results

A comprehensive survey Carried out in various habitat of region to study the diversity and distribution of dragonflies. This survey carried out from June 2019 to April 2020 in and around the study area. In the present study, total 7 species

belonging to Order-Anisoptera were recorded from all the study sites ecosystem in and around the study area. In the present study, total 7 species belonging to different families were recorded from all study sites in different ecosystem in and around the study area, They are distributed in 3 families, Libellulidae, Coenagrionidae, Aeshnidae viz., Libellulidae family has more species richness than the other two total 4 different species are found which are belonging to the family Libellulidae. The other two family in which Aeshnidae has 1 species while the Coenagrionidae family has 2 species. The family Libellulidae in which the Granite Ghost species belonging to genus Bradinopyga is most abundant and observed more than other species of the same family. The Granite Ghost has rich diversity in and around the study area. All the identified species listed in Table 1. Diversity indices were calculated using Past3 software, which showed Fishers alpha, Shannon index, evenness and species richness of family. Monthwise distribution of species given in Table3. And percentage of species richness in Table2. Graphs and Tables plotted with the help of MS-Excel. Photographs of all identified 7 species also provided along with scientific names by using Smartphone camera.

**Table 1:** Family distribution of *Odonata* species

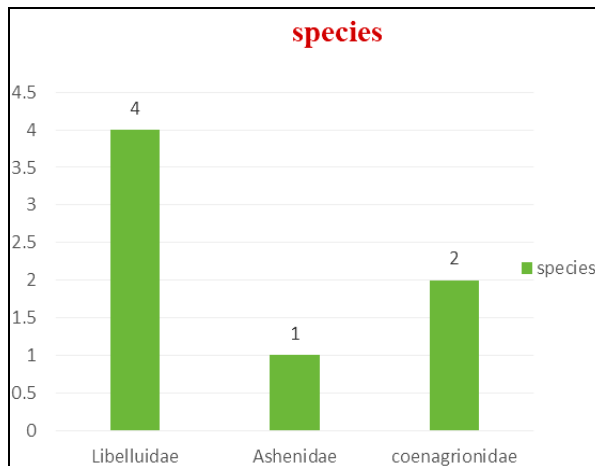
Sr. No	Name of Species	Order	Family	Genus
1	<i>Ditch Jewel</i>	Odonata	Libellulidae	Brachythemis
2	<i>Granite Ghost</i>	Odonata	Libellulidae	Bradinopyga
3	<i>Ruddy Marsh Skimmer</i>	Odonata	Libellulidae	Crocothemis
4	<i>Anax Guttatus</i>	Odonata	Aeshnidae	Anax
5	<i>Ishneura Aurora</i>	Odonata	Coenagrionidae	Ishnura
6	<i>Ishneura Heterosticta</i>	Odonata	Coenagrionidae	Ishnura
7	<i>Roseate skimmer (Orthemis ferruginea)</i>	Odonata	Libellulidae	Orthemis

**Table 2:** Distribution of genera and species in respective families.

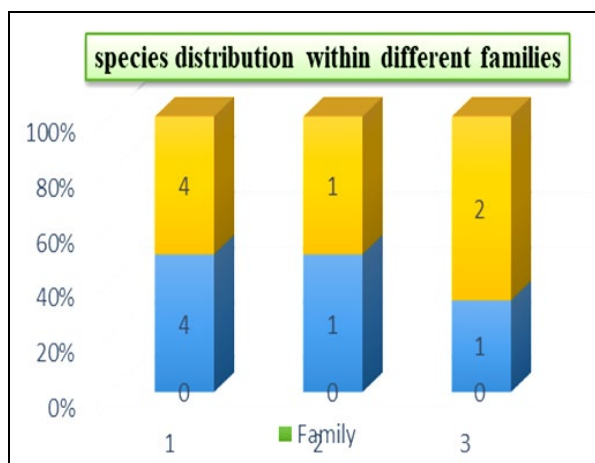
Sr. No.	Family	No. of genera	No. of species
1	Libellulidae	4	4
2	Aeshnidae	1	1
3	Coenagrionidae	1	2
Total	3	6	7

**Table 3:** Month wise Distribution of species

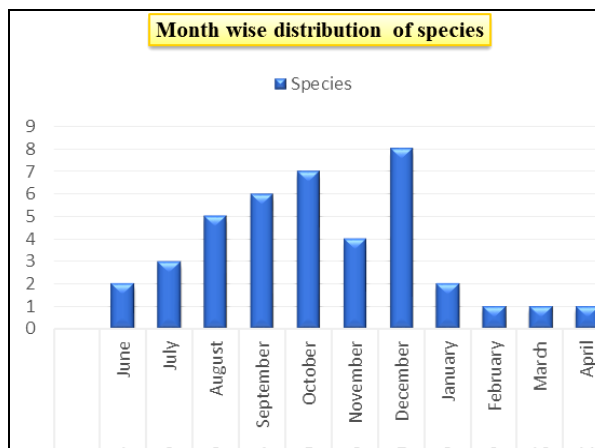
Sr. No.	Month	Species
1.	June	2
2.	July	3
3.	August	5
4.	September	6
5.	October	7
6.	November	4
7.	December	8
8.	January	2
9.	February	1
10.	March	1
11.	April	1



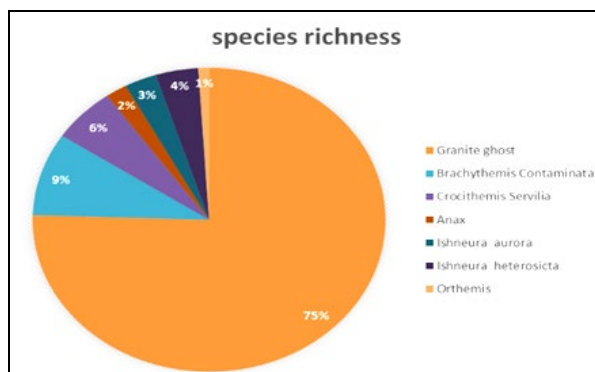
**Fig 1:** Family wise distribution of species.



**Fig 2:** Species distribution within different families



**Fig 3:** Month wise distribution of species



**Fig 4:** Species Richness



*Orthemis ferruginea**Ditch jewel**Bradinopyga geminata**Crocothemis servilia**Ishneura aurora**Anux guttatus**Ischnura heterosticta***Fig 5:** Photograph of seven identified Dragonfly Species

### Discussion

A comprehensive survey was made from June 2022 to April 2023 in and around Khamgaon study area regarding to the Januna lake to study the diversity and distribution of dragonflies. This topic tries to cover all of dragonflies diversity and it's composition in respective area for comparison of study sites. The diversity of living organisms classified in the level of organization such as order, family, genus and species. The most commonly observed species during the study of the Januna lake area is Granite Ghost which belongs to the family *Libellulidae*. While other species of same family are least abundant. There are 7 different

species are obtained which belonging to different families viz., *Libellulidae*, *Aeshnidae* and *Coenagrionidae*.

### Conclusion

While studying the biodiversity of Dragonfly fauna from Januna lake at Khamgaon taluka, a total of 7 species belonging to 3 families were recorded in the present work. Among these, *Libellulidae* family were predominant in the collection. Regarding their seasonal abundance the activity of Granite ghost species is higher throughout year.

In this paper, we have attempted to study the biodiversity of Dragonflies near Januna lake at Khamgaon taluka, district

Buldhana, Maharashtra. This work adds to the inventory of Dragonflies of this region which could be utilized for future studies.

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