



VERY RARE SP. OF ODONATES (DRAGONFLIES AND DAMSELFLIES) AT SALIM ALI LAKE (AURANGABAD CITY)

JB Aghade<sup>1</sup> SA Saraf<sup>2</sup>

Department of Zoology, Government College of Arts and Science, Dr. B. A. M. University, Aurangabad.

Department of Zoology, Government College of Arts and Science, Dr. B. A. M. University, Aurangabad.

Corresponding Author - JB Aghade

Email:- [jayeshaghade@gmail.com](mailto:jayeshaghade@gmail.com)

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**Abstract:**

Odonates can be utilized as biological markers of environmental quality and play a critical part in ecosystem functioning. Even though a lot of research has been done on the prevalence and distribution of different insect orders in Aurangabad, little has been done to understand the variety and spread of odonates. Therefore, an effort has been made in the current study to examine the variety and richness of odonates in Salim Ali Lake, Aurangabad, India. Between July, August, and September 2022, a total of 5 species of odonates were discovered in the research region. With two species, the family Cornagrionidae dominated the Zygoptera (damselflies), followed by the Libellulidae and Aeshnidae families (1 sp.). The one species of dragonfly (Anisoptera) that has been observed is a member of the family Cordulegastridae. It can be assumed that the region has an unusual diversity given that it is home to 5 species of odonates, including 3 species of Anisoptera and 2 species of Zygoptera. This uncommon diversity may be due to the area's grasslands, shrubs, and tiny water bodies.

**Keywords:** Abundance, diversity, Very Rare, India, Aurangabad, Odonates.

**Introduction:**

One of the most prevalent insects flying over forests, farms, meadows, ponds, and rivers are dragonflies and damselflies, which are collectively referred to as Odonates. The number of living species worldwide is about 6,000. With more than 500 species known to exist, India is very varied [1]. They are prehistoric insect families that emerged some 250 million years ago, during the Carboniferous (Permian) era. The Zygoptera (damselflies) and the Anisoptera are the two suborders of living dragonflies (dragonflies). Anisozygoptera, a third suborder, was previously recognized with two living species from the eastern Himalayas and Japan [2]. Two species of the Anisozygoptera, which resemble Zygoptera in certain ways, are known from Darjeeling, including *Epiophlebia laidlawi*. India's Odonata fauna is made up of 499 species and subspecies, 3 suborders, 17 families, and 139 genera [3]. 463 of the 499 species listed by Mitra [4] and later validated by Subramanian [5] up to this

point. However, for the majority of the species in this region of the world, evidence of abundance and distribution is still lacking. Several species of damselflies have been documented in northeastern India. Fraser [6] gives documentation on 536 species and subspecies from India, including numerous species from Madhya Pradesh, Bangladesh, Bhutan, Myanmar, Nepal, Pakistan, and Sri Lanka, in his three published volumes on Odonata in the "Fauna of British India." Odonates and many types of water bodies are intricately related. While some species like rushing water like rivers, rivulets, hill streams, etc., others prefer standing waterbodies like reservoirs, lakes, backwaters, ponds, or even seasonal rainwater puddles. Odonates, which are the top predators both as adults and as larvae, are essential for the health of the environment because they regulate other insects, particularly those that are dangerous to people (such as mosquitoes and blood-sucking flies). In addition to serving as



predators in the ecosystem, predators have recently received a lot of attention for their importance as indicators of habitat quality. According to anecdotal evidence, certain odonates are so habitat-specific that even little changes can cause them to vanish [1]. In order to prepare the way for future research and the creation of a successful strategy for the conservation of this significant group of insects, the current study set out to explore the species richness and variety of odonates in various places of Salim Ali Lake.

#### Material and Methods:

In order to evaluate the diversity of uncommon Odonates, the current study was carried out in Salim Ali Lake, Aurangabad, Maharashtra, India in July, August, and September of 2022.

#### Study Area:

Near the Indian state of Maharashtra, Salim Ali Lake in Aurangabad is situated between 19.8992° N and 75.3423° E latitudes. It is situated at a height of 568 meters above

mean sea level, which is a region with heavy rainfall (588 mm annually). The temperature ranges from 23 to 28 °C for the annual high and minimum.

#### Survey Method:

In order to cover all the habitats, surveys were carried out throughout the region. During the day, field notes, photos (taken with a Sony Cyber-shot H300 camera), and observations were made. Transect counting was used to track population trends over the course of the study [7]. To decrease the number of variables, present and eliminate bias, the same individual conducted all counts at each location by using the same inspection route.

#### Identification:

Cross-referencing with standardized references and photo guides from [6, 8, 9, 10, 5, 11] allowed us to photo-document and identify specific photographs of Odonates. Within the region, each species' relative abundance or status is designated as VR-Very Rare (5 sightings).

Fig 1: Location map of Salim Ali Lake, Aurangabad, Maharashtra, India.

#### Results and Discussion:

The Salim Ali Lake in Aurangabad, Maharashtra, India, was home to a total of 5 species of odonates, including 3 species of anisoptera (dragonflies) and 2 species of zygoptera (damselflies) (Table 1). The Coenagrionidae, which has two species, is the most prevalent family of Zygoptera, followed by the Libellulidae (which has one species), and the Aeshnidae (1 sp.). The family Coredulegastridae is home to the lone species of Anisoptera that have been identified.

#### Species richness and composition:

The five species of Odonates that have been identified are all extremely rare, according to the number count method for estimating relative abundance.

#### Species Dominance:

The most common species found in the Zygoptera were Coenagrion mercuriale and Pyrrhosoma nymphula, while the most common species in the Anisoptera were Aeshna caerulea, Sympetrum sanguineum, and Cordulegaster boltonii.

JB Aghade SA Saraf



*SA Saraf*  
PRINCIPAL  
Govt. College of Arts & Science  
Aurangabad

Table 1: List of Very Rare Odonates Recorded in Salim Ali Lake, Aurangabad, and Maharashtra, India.

Sl. No.	Common Name	Scientific Name	IUCN status [11]	Abundance
A	Anisoptera (Dragonflies)			
Family: Libellulidae				
1	Ruddy darter	<i>Sympetrum sanguineum</i>	LC	VR
Family: Aeshnidae (Darners)				
2	Azure hawk	<i>Aeshna caerulea</i>	LC	VR
Family: Cordulegastridae				
3	Golden-Ringed Dragonfly	<i>Cordulegaster boltonii</i>	LC	VR
B	Zygoptera (Damselflies)			
Family: Coenagrionidae (Marsh Dart)				
4	Southern Damsel	<i>Coenagrion mercuriale</i>	NT	VR
5	Large red Damsel	<i>Pyrrhosoma nymphula</i>	LC	VR

Odonates have a tropical evolutionary history and have adapted to temperate climates, making them one of the best taxa to study the effects of environmental warming and climate change [12, 13]. Odonates play a key role in environmental monitoring, but little is being done to understand the variety and abundance of this insect group in Maharashtra. Due to its abundance of grassland, bushes, and small water bodies, the Salim Ali Lake has been found to meet the majority of the criteria necessary for Odonates during the study. The information gathered in this study might be useful as a resource for estimating how the local environment will change in the near future.

#### Strategy for Conservation:

Any plan for protecting odonates—or any other species of creatures, for that matter—must include these three fundamental components [11].

1. Creating protected areas (national parks, nature reserves, etc.) and ensuring that operations in already-existing protected areas are properly managed to ensure the survival of odonates.

2. Modifying agricultural, forestry, and industrial practices to conserve habitats outside of protected areas.

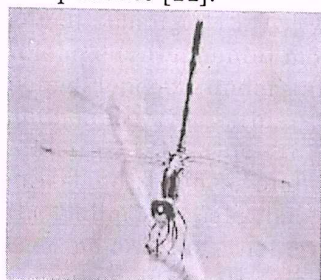
3. Taking action to support options 1 and 2. These are the main ones:

Research, particularly taxonomy and analyses of species distributions and biological needs

a) Reducing pollution

b) Lawmaking, particularly to create protected areas, to regulate development, and to reduce pollution.

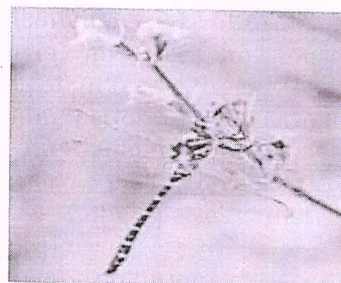
c) Public awareness and education.



Azure hawk  
(*Aeshna caerulea*)



Ruddy darter  
(*Sympetrum sanguineum*)



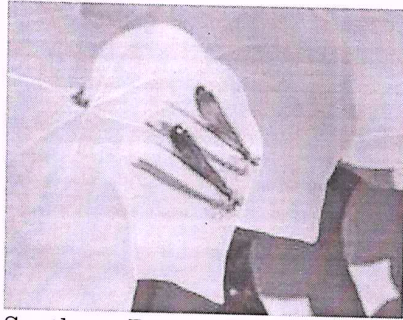
Golden-Ringed Dragonfly  
(*Cordulegaster boltonii*)

Fig 2: Photographs of some Dragonflies recorded during the study.

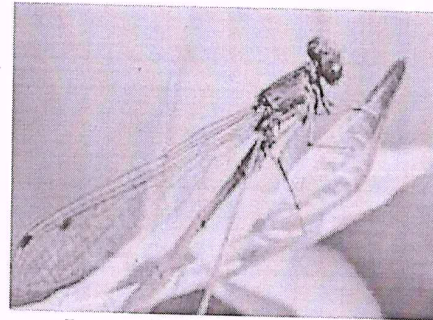
JB Aghade SA Saraf



*[Signature]*  
PRINCIPAL  
Govt. College of Arts & Science  
Aurangabad



Southern Damselfly  
(*Pyrrhosoma nymphula*)



Large Red Damselfly (*Coenagrion mercurial*)

**Fig 3: Photographs of some Damselflies recorded during the study.**

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PRINCIPAL  
Govt. College of Arts & Science  
Aurangabad