

## Survey of odonate diversity in and around the Dibrugarh university campus

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### Abstract

Odonates are crucial in maintenance of the balance of an ecosystem by serving the role of predatory insects. They are indicators of water quality parameter as well as status of a habitat. However, their population is declining due to negligence and lack of awareness. For effective conservation strategy it is important to have a proper documentation of the species available in the region. In this study, we have prepared a baseline data of diversity of Odonates in the Dibrugarh University campus. We found dragonflies from the family Libellulidae and damselflies from the family Coenagrionidae to be most dominant.

**Keywords:** dragonflies, damselflies, biodiversity, entomology, insects, conservation

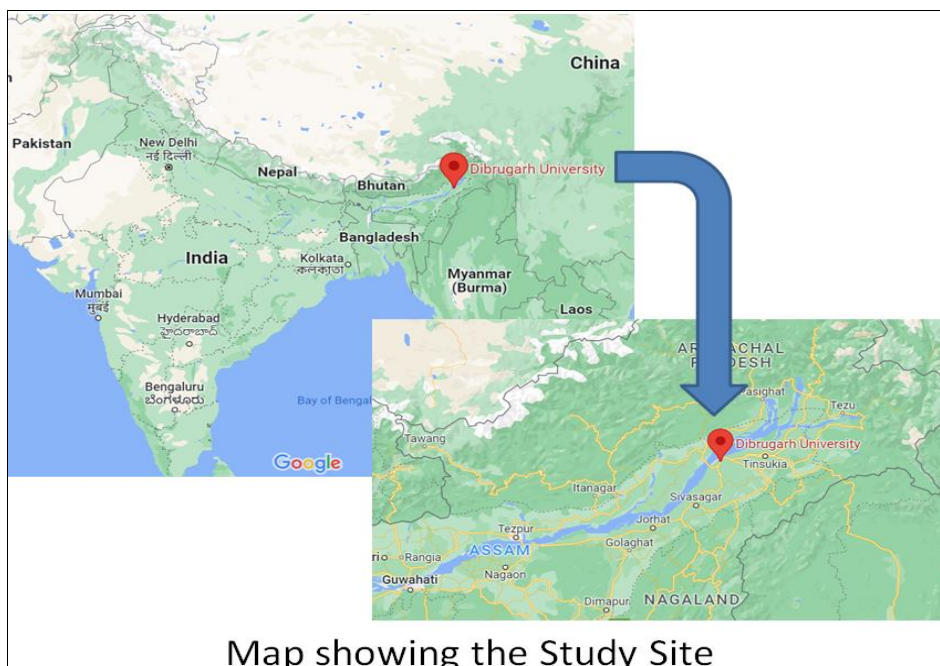
### Introduction

Odonates are well known for their predatory behavior (Edgehouse & Brown, 2014)<sup>[2]</sup> and serve a crucial role in the ecosystem by acting as intermediate to top level predators in an aquatic food chain (May, 2019)<sup>[3]</sup>. They help to control mosquito population and can serve as biological control agents (Saha *et al.*, 2012)<sup>[4]</sup>. In addition to this, they also act as bioindicators owing to their sensitive nature to fluctuations in climatic conditions and water parameters. Due to many anthropogenic activities there is a decline in the diversity of odonates and they remain as a neglected group. For effective conservation strategies, it is crucial to have data on the diversity of the group in a particular area. Limited studies have been conducted in the state of Assam concerning the diversity of Odonates. Our study aims to provide a baseline of the odonate diversity present in and around the lush green Dibrugarh University campus.

### Methodology

The study was conducted in the Dibrugarh University Campus, Dibrugarh, Assam, India from the month of October, 2021 to October 2022.

Study site: The university campus is located between 27° 29' North Latitude and 94° 55' East Longitude in Rajabheta, Dibrugarh district, State of Assam, India. It is located 5 kms away from the town area and bisected by the NH37 as seen in Figure 1. The site includes buildings having high human interference, botanical garden with no human interference, floral gardens with medium human interference and a park area having a large pond with minimum human interference. The nearby locality also has paddy fields and ditches. The elevation of the study area is 108m and temperature during summer season reaches upto 32.7°C and drops upto 9°C during winter. It receives upto 415.6 mm of rainfall in monsoon season (July).



Map showing the Study Site

Fig 1: Study Area

## Survey method

The survey was conducted thoroughly throughout the campus and photographs were taken of the individuals. Random days with good weather conditions were picked for the study. The habitat was noted along with the different observations in field notebook. Capture Recapture Method was employed for identification. The common ones were identified in the site itself while others were brought to laboratory and observed carefully for taxonomic keys. The identification was done using standard guidebooks and photoguides (Andrew *et al.*, 2008; Subramanian, 2018; V Gopalan *et al.*, 2022)<sup>[1, 5, 6]</sup>.

## Result

From the survey of Odonates at the selected sites of the campus, a total number of 32 Odonate species were recorded. A total of 22 dragonfly species from 2 families and 19 genera were found while in case of damselfly species, a total of 10 species from 2 families and 7 genera were found in the study area during the study period. The list of species is given in Table 1 along with data IUCN conservation status.

**Table 1:** List of odonates recorded in the Dibrugarh University campus, Dibrugarh, Assam, India. (1=very common, 2=common, 3= not common) (LC=Least Concern, DD= Data deficient)

Sub Order: Anisoptera (Dragonflies)				
Family: Libellulidae				
Sl. No.	Genus Name	Common Name	Scientific Name	IUCN Status
1	<i>Acisoma</i>	Trumpet Tail/ Asian Pintail	<i>Acisoma panorpoides</i>	LC
2	<i>Aethriamanta</i>	Scarlet Marsh Hawk	<i>Aethriamanta brevipennis</i>	LC
3	<i>Brachydiplax</i>	Blue Marsh Hawk	<i>Brachydiplax sobrina</i>	LC
4	<i>Brachythermis</i>	Ditch Jewel	<i>Brachythermis contaminata</i>	LC
5	<i>Bradinopyga</i>	Granite Ghost	<i>Bradinopyga geminata</i>	LC
6	<i>Cratilla</i>	Emerald-Banded Skimmer	<i>Cratilla lineate</i>	LC
7	<i>Crocothemis</i>	Ruddy Marsh Skimmer/ Scarlet Skimmer	<i>Crocothemis servilia</i>	LC
8	<i>Diplacodes</i>	Ground Skimmer	<i>Diplacodes trivialis</i>	LC
9	<i>Lyriothemis</i>	Dwarf/ Little bloodtail	<i>Lyriothemis acigastra</i>	DD
10	<i>Lathrecista</i>	Asiatic Blood tail	<i>Lathrecista asiatica</i>	LC
11	<i>Neurothemis</i>	Fulvous Forest Skimmer	<i>Neurothemis fulvia</i>	LC
12	<i>Neurothemis</i>	Pied Paddy Skimmer	<i>Neurothemis tullia</i>	LC
13	<i>Orthetrum</i>	Crimson tailed Marsh Hawk	<i>Orthetrum pruinosum</i>	LC
14	<i>Orthetrum</i>	Slender Skimmer	<i>Orthetrum sabina</i>	LC
15	<i>Orthetrum</i>	Blue tailed forest Hawk	<i>Orthetrum triangulare</i>	LC
16	<i>Potamarcha</i>	Yellow-Tailed Ashy Skimmer	<i>Potamarcha congener</i>	LC
17	<i>Rhodothermis</i>	Rufous Marsh Glider	<i>Rhodothermis rufa</i>	LC
18	<i>Rhyothemis</i>	Common Picture Wing	<i>Rhyothemis variegata</i>	LC
19	<i>Tholymis</i>	Coral tailed cloudwing/ Old World Twister	<i>Tholymis tillarga</i>	LC
20	<i>Trithemis</i>	Kirby's dropwing/ Orange winged Dropwing	<i>Trithemis kirbyi</i>	LC
21	<i>Zyxomma</i>	Brown tailed Hawk	<i>Zyxomma petiolatum</i>	LC
Family: Aeshnidae				
22	<i>Gynacantha</i>	Duskhawker	<i>Gynacantha khasiaca</i>	DD
Zygoptera (Damselies)				
Family: Coenagrionidae				
23	<i>Aciagrion</i>	Unknown	<i>Aciagrion hisopa</i>	LC
24	<i>Agriocnemis</i>	Milky Dartlet	<i>Agriocnemis lacteola</i>	LC
25	<i>Agriocnemis</i>	Pigmy Dartlet / Wandering Midget	<i>Agriocnemis pygmaea</i>	LC
26	<i>Ceriagrion</i>	Orange tailed Marsh Dart	<i>Ceriagrion cerinorubellum</i>	LC
27	<i>Ceriagrion</i>	Rusty Marsh Dart	<i>Ceriagrion olivaceum</i>	LC
28	<i>Ceriagrion</i>	Coromandel Marsh Dart	<i>Ceriagrion coromandelianum</i>	LC
29	<i>Ischnura</i>	Golden Dartlet/ Gossamer Damselfly	<i>Ischnura aurora</i>	LC
30	<i>Mortonagrion</i>	Unknown	<i>Mortonagrion aborense</i>	LC
31	<i>Pseudagrion</i>	Blue Grass Dartlet	<i>Pseudagrion microcephalum</i>	LC
Family: Lestidae				
32	<i>Lestes</i>	Spreadwing	<i>Lestes nodalis</i>	LC

From the survey it was seen that there is a high diversity of Odonates in the campus encompassing skimmers, hawks, dropwings, spreadwings, dartlets etc. Maximum number of Odonates was recorded in the University Park area which has a huge pond with no human interference. Thus it suggests the water quality of the pond is good enough for the Odonates to propagate in that area. Among dragonflies, members of the family Libellulidae were found to be most dominant with species from 19 genera and members of family Aeshnidae were also spotted. Genus *Neurothemis* and Genus *Orthetrum* of family Libellulidae were represented by 2 and 3 species respectively. Among

damselies members of family Coenagrionidae were most prevalent represented by 6 genera followed by members of family Leshnidae, which are also known as spreadwings. Genus *Agriocnemis* and genus *Ceriagrion* of the family Coenagrionidae were represented by 2 and 3 species respectively. As per IUCN, the species recorded were categorized in Least Concern Category except for *Gynacantha khasiaca* and *Lyriothemis acigastra* which were placed in data deficient category. The graphical representation of the diverse range of Odonates found is shown in the Figure 2.

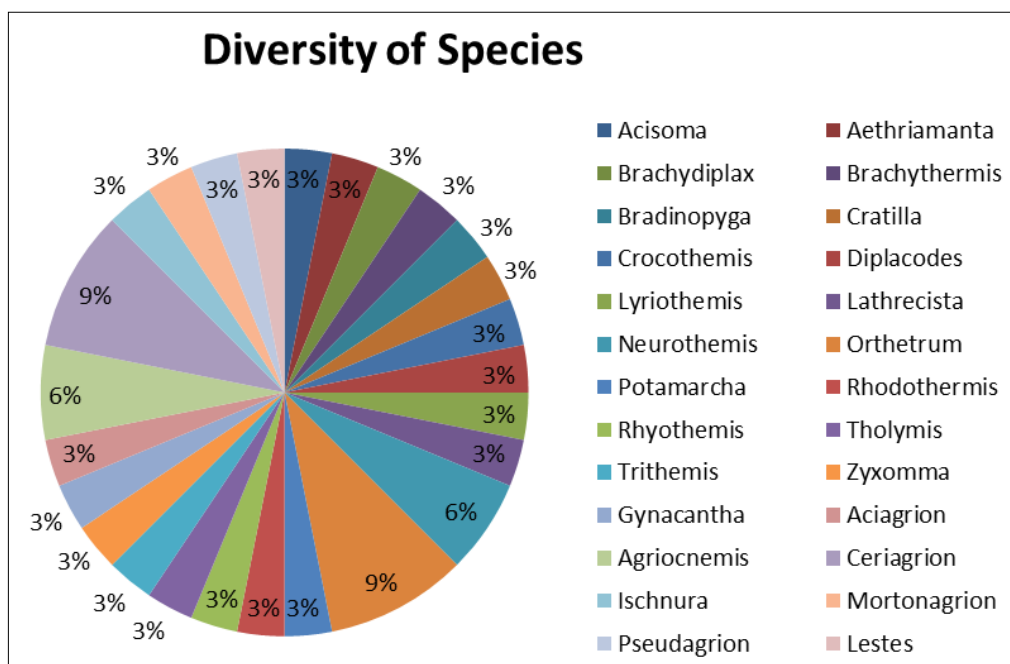
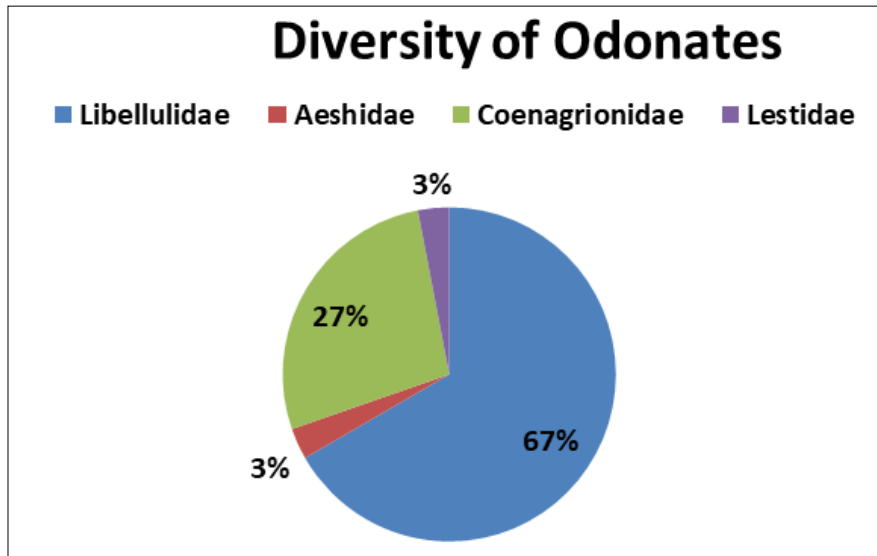


Fig 2: Diversity of Odonates with respect to Families and Genera

**Conclusion**

Our study reports the Odonates spotted during the study period at the selected sites of the campus and this will serve as baseline to observe any changes in relation any factor to the Odonate diversity in the area. For any conservation strategy to be successful there is a need to identify all the species available in a region. Data on the abundance of any species in addition to acquiring knowledge about the habitat preference and the impact of environmental factors and anthropogenic factors on their population can serve as a baseline to formulate effective measures.

**Conflict of Interest**

None to Declare

**Author Contribution**

RN and AB did the field survey. AB and MP did the identification. MP did the manuscript preparation.

**References**

- Andrew R, Subramanian KA, Tiple A. Common odonates of central India, 2008. <https://doi.org/10.13140/2.1.1110.1760>
- Edgehouse M, Brown CP. Predatory Luring Behavior of Odonates. *Journal of Insect Science*, 2014, 14(1). <https://doi.org/10.1093/jisesa/ieu008>
- May ML. Odonata: Who They Are and What They Have Done for Us Lately: Classification and Ecosystem Services of Dragonflies. *Insects*,2019:10(3):3. <https://doi.org/10.3390/insects10030062>
- Saha N, Aditya G, Banerjee S, Saha GK. Predation potential of odonates on mosquito larvae: Implications for biological control. *Biological Control*,2012:63(1):1-8. <https://doi.org/10.1016/j.biocontrol.2012.05.004>
- Subramanian KA. Dragonflies and Damselflies of India-A field Guide. Project Lifescape, 2018.
- V Gopalan S, Sherif M, Chandran AV. A checklist of dragonflies & damselflies (Insecta: Odonata) of Kerala, India. *Journal of Threatened Taxa*,2022:14:20654-20665. <https://doi.org/10.11609/jott.7504.14.2.20654-20665>