

Department of Zoology

**Dr.BRR Government College
Jadcherla**



**Student Study
Project
On**

**“Abundance and diversity of Dragonflies and
Damselies in and around of Dr.BRR
Government Degree College Jadcherla Town
of Telangana State”.**

Academic Year 2022-2023

DEPT. OF ZOOLOGY
Dr. B.R.R. GOVT. COLLEGE
JADCHERLA

PRINCIPAL
Dr.B.R.R. Govt. Degree College
Jadcherla



Dr. BRR GOVERNMENT DEGREE COLLEGE
JADCHERLA – 509 301

(Accredited with B** by NAAC)

Dr. CH. Appiya Chinnamma, M.Sc., Ph.D.
Principal

The department of Zoology has conducted student study projects during the academic year 2022-2023

Title: "Abundance and diversity of Dragonflies and Damselflies in and around of Dr.BRR Government Degree College Jadcherla Town of Telangana State".

Place of Work: Dr.BRR Government Degree College Jadcherla T.S

Members of The Group Project

| | | |
|------------------|---------------------|----------------|
| 1.M.GANESH | B.Sc.(BZC) III year | 20033006445574 |
| 2.S.SHIVAIAH | B.Sc.(BZC) III year | 18033006445603 |
| 3.A.SRIKANTH | B.Sc.(BZC) III year | 20033006445501 |
| 4.V.VIJAY KUMAR | B.Sc.(BZC) III year | 20033006445611 |
| 5.A.NAVEEN KUMAR | B.Sc.(BZC) III year | 20033006445003 |

m. Ganesh
S. Shivalah
A. Srikanth
N. vijay kumar
A. Naveen



Dr. BRR GOVERNMENT DEGREE COLLEGE
JADCHERLA – 509 301

(Accredited with B⁺⁺ by NAAC)

Dr. CH.Appiya Chinnamma, M.Sc., Ph.D.
Principal

The department of Zoology has conducted student study projects during the academic year 2022-2023

Title: "Abundance and diversity of Dragonflies and Damselflies in and around of Dr.BRR Government Degree College Jadcherla Town of Telangana State".

Place of Work: Dr.BRR Government Degree College Jadcherla T.S

Members of The Group Project

| | | |
|------------------|---------------------|----------------|
| 1.M.GANESH | B.Sc.(BZC) III year | 20033006445574 |
| 2.S.SHIVAIAH | B.Sc.(BZC) III year | 18033006445603 |
| 3.A.SRIKANTH | B.Sc.(BZC) III year | 20033006445501 |
| 4.V.VIJAY KUMAR | B.Sc.(BZC) III year | 20033006445611 |
| 5.A.NAVEEN KUMAR | B.Sc.(BZC) III year | 20033006445003 |

m. Ganesh
S. shivalah
A. Srikanth
V. vijay kumar
A. Naveen



**Dr. BRR GOVERNMENT DEGREE COLLEGE
JADCHERLA – 509 301**

(Accredited with B⁺⁺ by NAAC)

Dr. CH.Appiya Chinnamma, M.Sc., Ph.D.
Principal

Department of Zoology

Dr.BRR Government Degree College Jadcherla

A Group Project

On

“Abundance and diversity of Dragonflies and Damselflies in and around of Dr.BRR Government Degree College Jadcherla Town of Telangana State”.

By

Supervised By

B.Ravinder Rao, Asst. Professor of Zoology

| | | | |
|----------------------|-------|----------------|----------------|
| 1.M.GANESH | B.Sc. | (BZC) III year | 20033006445574 |
| 2.S.SHIVAIAH | B.Sc. | (BZC) III year | 18033006445603 |
| 3.A.SRIKANTH | B.Sc. | (BZC) III year | 20033006445501 |
| 4.V.VIJAY KUMAR | B.Sc. | (BZC) III year | 20033006445611 |
| 5. A.NAVEEN KUMAR | B.Sc. | (BZC) III year | 20033006445003 |



Supervisor

In-Charge of the Department

Principal

**Dr. BRR GOVERNMENT DEGREE COLLEGE
JADCHERLA – 509 301**

B.Ravinder Rao
Assistant professor of Zoology
Dr.BRR Government College
Jadcherla-509301

Student Study Project Certificate

CERTIFICATE

This to certify that, the project work “Abundance and diversity of Dragonflies and Damselflies in and around of Dr.BRR Government Degree College Jadcherla Town of Telangana State” is a bonafide work done by M.Ganesh, S.Shivaiah, A.Srikanth, V.Vijay Kumar, and A.NaveenKumar, the students of B.Sc (BZC) VI semester under my supervision in Zoology at the Department of Zoology Dr.BRR Government Degree College Jadcherla during the academic year 2022-23 and the work has not been submitted to any other college or university either part or full for the award of any degree.

Place

Date:

B.Ravinder Rao

Asst, Prof, of Zoology

*Valued
Kijyothi*

Asst P

Department of Zoology
Dr.BRR Government Degree College Jadcherla

A Student Group Project

on

“Abundance and diversity of Dragonflies and Damselflies in and around of Dr.BRR Government Degree College Jadcherla Town of Telangana State”.

by

| | | | |
|-------------------|-------|----------------|----------------|
| 1.M.GANESH | B.Sc. | (BZC) III year | 20033006445574 |
| 2.S.SHIVAIAH | B.Sc. | (BZC) III year | 18033006445603 |
| 3.A.SRIKANTH | B.Sc. | (BZC) III year | 20033006445501 |
| 4.V.VIJAY KUMAR | B.Sc. | (BZC) III year | 20033006445611 |
| 5. A.NAVEEN KUMAR | B.Sc. | (BZC) III year | 20033006445003 |

Supervised by RavinderRaoBakshi, Asst.Professor, Department of Zoology Dr.BRR Government College Jadcherla

Acknowledgements:

The members of this project extend thanks to Dr.CH.AppiyaChinnamma, Principal for permitting to conduct this project.

The team is indebted to all the zoological student community for allowing us to use Animal album

Special thanks are due to K.Neeraja, lecturer in Zoology and Smt.K.SubhashiniAsst.Prof, of Zoology for their help and advice to complete this project.

Finally thanks are also due to Sri B.RavinderRao,HOD for guiding the team to during period the project.

Objectives:

To Promote interest in research aptitude among students

To promote the concept of Biodiversity

To preserve the natural composition of Biota in the College garden

To know the niche of odonates in Nature

ABSTRACT :

The present work is aimed to study diversity and abundance of dragonflies and damselflies in Jadcherla in the surroundings of Dr.BRR Government Degree College Jadcherla. This study has been carried out for three months from march 2023 to may 2023. The team observed a total of 28 species of odonates, including 18 species of dragonflies (Suborder Anisoptera) belonging to 3 families and 10 species of damselflies (Suborder Zygoptera) belonging to two families. The most abundant family was Libellulidae comprising 14 species followed by Coenagrionidae comprising 9 species. The least abundant families were Gomphidae, Ashnidae, and Platycnemididae comprise one, three and one species respectively

Key words: Diversity, Dragonflies, Damselflies and Dr.BRR Government Degree College Jadcherla

INTRODUCTION

Dragonflies and damselflies (Order – Odonata) are multicolored predatory insects of freshwater habitat and characterized by their elongate body, extended wings and large eyes. Odonates are the most exciting and energetic of all insects. Silsby (2001), recorded eight super families, 29 families and some 58 sub-families of dragonflies for just about 600 genera and 6000 named species have up to now been explained all over the world. India is also most diverse with above 500 known species of Odonata (Subramanian, 2005). These are carnivorous and a number of species are predators. They prefer to live in freshwater, non-polluted and well oxygenated habitats. Therefore, Dragonflies and Damselflies are precious bio-indicators for environmental contamination studies (Lehmkuhl, 1976; Morin, 1984; Needham, et al., 2000). Yet, there is no report on Diversity and abundance of Dragonflies and Damselflies of the Erstwhile district of Mahabubnagar, Telangana State. The present investigation was, therefore, done as a project work to document the Diversity and abundance of Dragonflies and Damselflies in the surroundings of Dr.BRR Government College Jadcherla of Telangana State A **dragonfly** is an insect belonging to the order 'Odonata'. Dragonflies are not actually a fly even though they both have six legs and three body parts, head, thorax and abdomen. The main difference between them is that flies only have two wings whereas dragonflies have four wings. Dragonflies are sometimes confused with Damselflies.

Even though they are both members of the same order, they have slight differences whereby when resting, damselflies hold their wings together, a dragonfly holds its wings horizontally or slightly down and forward and their hindwings are broader near the base.

The eyes on a damselfly are separated, in most dragonflies the eyes touch. However, being in the same order makes their life cycles quite similar. The Dragonfly name comes from their fierce jaws, which they use to catch their prey.

Dragonfly Characteristics

A Dragonfly has two large compound eyes which take up most of its head. Dragonflies have long, delicate, membranous wings which are transparent and some have light yellow coloring near the tips. Their bodies are long and slender and they have a short antennae.

Dragonflies are very colorful, for example the Green Darner Dragonfly has a green thorax and a blue segmented abdomen. Some are red like the Comet Darner and yellow like the Emerald Darner.

Dragonflies breath through spiracles which are tiny holes located on their abdomen. They can beat each pair of wings together or separately and their rear wings can be out of phase with the front wings. Their wing beat is around 50 – 90 beats per second.

Dragonflies have complicated neck muscles which allow them to tilt their head sideways 180 degrees, back 70 degrees and down 40 degrees.

Dragonflies can hover in mid air and then rapidly accelerate. Traveling at almost 30 miles per hour, dragonflies are the fastest insects in the UK.

Dragonfly Diet and Vision

All dragonflies are carnivorous in both the larval and adult stages of their lives. Dragonflies typically eat mosquitoes, midges and other small insects like flies, bees and butterflies, catching its prey while it is flying. A Dragonflies ability to manoeuvre in many directions makes them able to out-fly their prey.

Dragonflies also have the advantage of excellent eyesight. Each of their two large eyes is made up of thousands of six-sided units. Together, these smaller eyes enable a dragonfly to detect even the slightest movement. They have large optic brain lobes and 80% of their mental processes are devoted to vision and they can detect color, ultraviolet light and polarization.

Dragonfly Habitats

Dragonflies are usually found around water such as lakes, ponds, streams and wetlands because their larvae, known as 'nymphs', are aquatic.

Dragonfly Reproduction

A dragonfly undergoes incomplete metamorphosis. Female dragonflies lay eggs in or near water, often on floating or emergent plants. When laying eggs, some species will submerge themselves completely in order to lay their eggs on a suitable surface. After about two weeks, the eggs hatch and an immature dragonfly, or nymph, emerges. The nymphs are not as attractive as the adults. They have tiny wings and a large lower lip, which they use to catch their prey (often mosquito larvae).

Dragonfly nymphs live in the water. As they grow, they molt (shed their skin). Nymphs of some species may take as long as three years to mature. Most of a dragonfly's life is spent in the larval stage beneath the water's surface, using internal gills to breathe and using extendable jaws to catch other invertebrates or even vertebrates such as tadpoles and fish. The life span ranges from about 6 months to over 7 years (most of it is spent in the nymph stage – the adult lives for only a few weeks).

When the larva is ready to metamorphose into an adult, it climbs up a reed or other emergent plant at night. Exposure to air causes the larvae to begin breathing. The skin splits at a weak spot behind the head and the adult dragonfly crawls out of its old larval skin, waits for the sun to rise, pumps up its wings and flies off to feed on midges and flies.

Dragonflies and Humans

Dragonflies do not normally bite or sting humans, although they will bite in order to escape, if grasped by the abdomen. They are valued as predators that help control populations of harmful insects, such as mosquitoes. Dragonflies are one of several insects commonly referred to as 'mosquito hawks' in North America.

Dragonfly History

The oldest known species of dragonfly is the 320 million year old (*Delitzschalabitterfeldensis*). Another is 'Namurotypus' an extinct genus of dragonfly. Dragonflies are ancient insects. They were around before

the dinosaurs. Ancient dragonflies may have been considerably larger than those we see today. A fossilized impression of a dragonfly wing, found in a coal mine in England, is the oldest known dragonfly specimen. This dragonfly lived 320 million years ago and had a wingspan of 8 inches. The largest known dragonfly had a wingspan of 24 inches (two feet). Today, the largest dragonfly is found in South America and has a wingspan of slightly over seven inches. Other than being smaller, modern-day dragonflies do not look very different from their ancestors.

Dragonfly Conservation

Fifty years ago there were twice as many ponds in Britain as there are today. The draining of agricultural land, filling in and pollution have all contributed to the disappearance of most countryside ponds. Canals have also suffered from pollution, especially by chemicals used on farmland draining into water. The loss of suitable fresh water habitats has affected dragonflies enormously and they are becoming increasingly rare. The Norfolk aeshna, *Aeshna isosceles*, which can be found living only in the Norfolk Broads, is on the list of Britain's endangered species of insects.

Helping Dragonflies

Garden ponds have become very popular over recent years and these are helping to save Britain's threatened pond-life including dragonflies. Creating a pond habitat in your garden at home, or in your school grounds, is a practical and worthwhile conservation project.

MATERIALS AND METHODS: 1) Study area:

Jadcherla Town is located 80KMs away from Hyderabad, the capital city of Telangana State. It is located on National Highway 44 south to Hyderabad. The topographical details are Longitude: 78.1442814, Latitude: 16.7629646, Elevation: 548m / 1798feet and Barometric Pressure: 95KPa. Population of Jadcherla in 2021 is 127,430. Dr. BRR Government Degree college is located at Signalgadda landmark with an area of around 15 Acres of land. This college has good greenery with gardens covering 7 Acres of land.



Fig.1: Map of Study area - Jadcherla

2) Specimen observations and photography:

The present study was done for three months from march 2023 to may 2023. Specimens of Dragonflies and damselflies were observed in the field with careful note on their habitats. Repeated visits to the field have been made in morning, afternoon and evening time. For diversity and abundance, specimen numbers of each species have been counted by visual observations.

The students studying biological science in this college are having a habit of preparing Animal albums with locally inhabiting faunal species to submit for their Practical lab study. In the present study project, the data of odonate species is collected from the Animal albums of the Department of Zoology and compared with the available checklist. The findings presented here are based on a bi-weekly random survey in and around areas of Jadcherla town carried out by the members of this group project. Odonates were accessed in the study area by random observations during walking through the college garden and nearby crop fields based on habitats present in the study area as per COVID-19 precautions. In the field, photographs of the odonates were taken with the mobile cameras of students for the identification purpose.

The specimens were identified in the field by using field guides. Most specimens were identified in the field by visual observations. The photography was done by using the Mobile phone

cameras. Though the clarity of pictures is not satisfactory, the specimens are identified by using standard classification charts. Results were recorded by visualizing the specimens



Fig. 2: Number of species of Odonates at Jadcherla

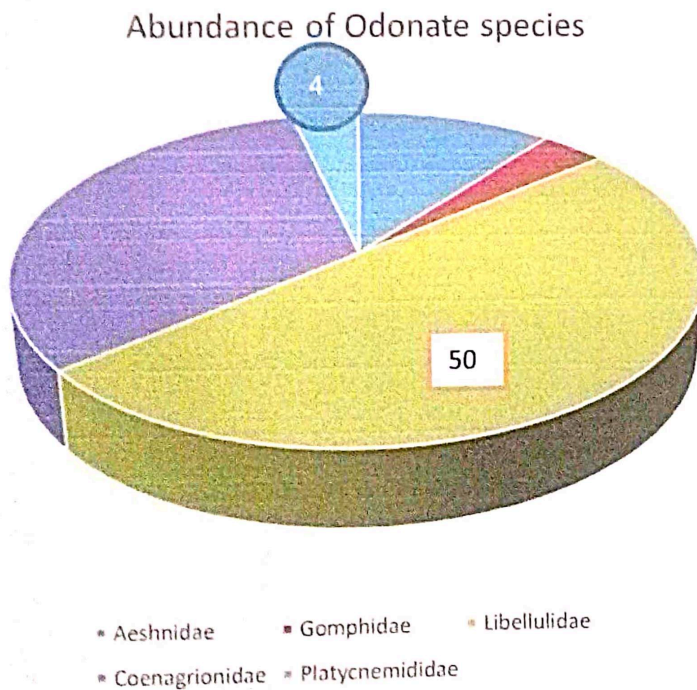
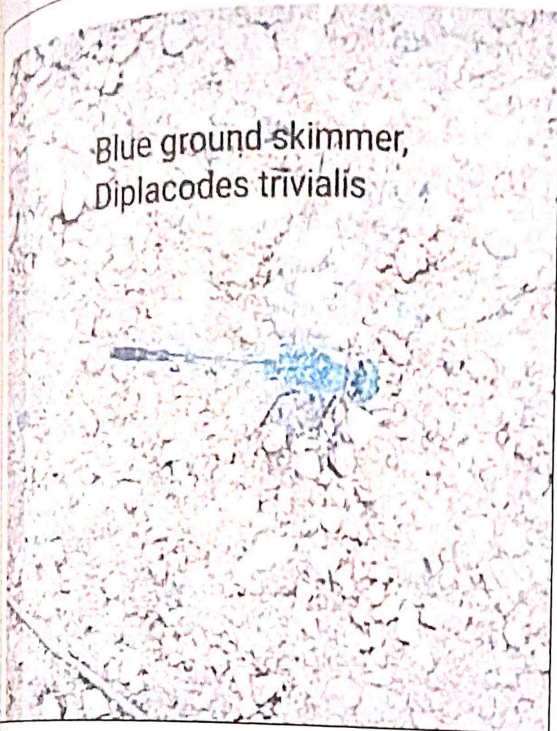


Fig.3: Representation of Odonates at Jadcherla







Blue ground skimmer,
Diplacodes trivialis



Blue ground skimmer,
Diplacodes trivialis female



Dichrochorda
brachyptera contaminata

Badepalle, Telangana, India
Q47W+EVV, Badepalle, Telangana 509301, India
Lat 16.763784°
Long 78.14714°
08/10/21 04:38 PM
Scanned by Sharmistha Go



Trithemis aurora
the crimson marsh dragon Male

Fig. 4: Odonates (selected species) of Jadcherla of Telangana State, India

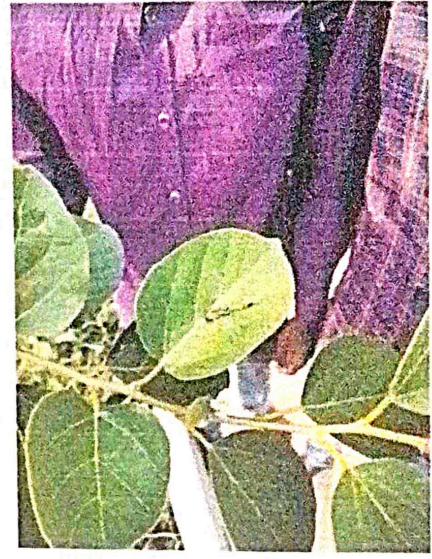


Table 1: Odonates of Jadcherla, Dist.Mahabubnagar, Telangana State India

| S.No | Family | Scientific Name | Common Name | Status |
|------|-----------------|---------------------------|---------------------------|--------|
| 1 | Aeshnidae | Rusty darner | Anaciaeschnajaspidea | C |
| 2 | | Blue-tailed green darner | Anaxguttatus | NR |
| 3 | | Blue darner | Anaximaculifrons | NR |
| 4 | Gomphidae | Common clubtail | Ictinogomphusrapax | VC |
| 5 | Libellulidae | Trumpet tail | Acisomapanorpoides | NR |
| 6 | | Little blue marsh hawk | Brachydiplaxsobrina | NR |
| 7 | | Ditch jewel | Brachythemiscontaminata | VC |
| 8 | | Granite ghost | Bradinyopygageminata | VC |
| 9 | | Ruddy marsh skimmer | Crocothemisservilia | C |
| 10 | | Ground skimmer | Diplacodestrivialis | VC |
| 11 | | Pied paddy skimmer | Neurothemistullia | NR |
| 12 | | Blue marsh hawk | Orthetrumglaucum | NR |
| 13 | | Crimson-tailed marsh hawk | Orthetrumprunosum | NR |
| 14 | | Green marsh hawk | Orthetrumsabina | VC |
| 15 | | Wandering glider | Pantalaflavescens | C |
| 16 | | Common picture wing | Rhyothemisvariegata | VC |
| 17 | | Crimson marsh glider | Trithemis aurora | C |
| 18 | | Long-legged marsh glider | Trithemispallidinervis | VC |
| 19 | Coenagrionidae | Pigmy dartlet | Agriocnemispygmaea | NR |
| 20 | | Coromandel marsh dart | Ceriagrioncoromandelianum | VC |
| 21 | | Rusty marsh dart | Ceriagrionolivaceum | C |
| 22 | | Unknown | Coenagriondyeri | R |
| 23 | | Golden dartlet | Ischnura aurora | VC |
| 24 | | Senegal golden dartlet | Ischnurasenegalensis | VC |
| 25 | | Elegant sprite | Pseudagriondecorum | R |
| 26 | | Blue grass dartlet | Pseudagrionmicrocephalum | C |
| 27 | | Pixie dartlet | Rhodischnuranursei | VR |
| 28 | Platycnemididae | Blue bush dart | Coperavittata | R |

Key: VC-Very Common, C-Common, NR-Not Rare, R-Rare, VR-Very Rare Unknown: Common name unknown.

RESULTS AND DISCUSSION: In present investigation of three months we recorded a total of 28 species of odonates, including the most abundant family, Libellulidae comprising 14 species 50% followed by Coenagrionidae comprising 9 species 32%, Ashnidae 11%,. The least abundant families were Gomphidae 4%, and Platycenemididae 4% comprising one, three and one species respectively.

CONCLUSION: From the above investigation we conclude that Jadcherla is moderate in Dragonflies and Damselflies diversity. Some protection plans have to be implemented in the area to preserve and build up the diversity.

ACKNOWLEDGEMENT: The team members are thankful to Dr.CH AppiyaChinnamma, Principal for permitting to do the project

6. Reference:

1. Subramanian KA. Dragonflies and Damselflies of Peninsular India – A Field Guide. E-Book of Project Lifescape, Centre for Ecological Sciences, Indian Institute of Sciences, Bangalore, 2005, 118.
2. Prasad M, Varshney RK. A checklist of the Odonata of India including data on larval studies. *Oriental Insects* 1995; 29:385- 428. 3. Neesemann H, Shah RDT, Shah DN. Key to the larval stages of common Odonata of Hindu Kush Himalaya, with short notes on habitats and ecology. *Journal of Threatened Taxa* 2011; 3(9):2045-2060.
4. Andrew RJ, Subramaniam KA, Tiple AD. Common Odonates of Central India. E-book for The 18th International Symposium of Odonatology, Hislop College, Nagpur, India, 2008, 55.
5. Champion FW, Seth SK. A Revised Survey of the Forest Types of India. Manager. Government of India Press, Delhi, India, 1968, 404.
6. Srinivasulu C, Srinivasulu B. Odonates of Greater Hyderabad, Andhra Pradesh, India, 56-57, In: Srinivasulu C & Srinivasulu B, Glimpses of Biodiversity of Greater Hyderabad. Greater Hyderabad Municipal Corporation, Hyderabad, Osmania University, Hyderabad and Zoo Outreach Organization, Coimbatore, 2012, 86.
7. Tiple AD, Khurad AM, Andrew RJ. Species diversity of odonata in and around Nagpur City, Central India. *Fraseria* (Proceedings of the 18th International Symposium of Odonatology, Nagpur) 2008; 7:41-45.

8. Fraser FC. The Fauna of British India including Ceylon and Burma. Odonata Vol. I, Taylor and Francis Ltd., London, 1933, 423.
9. Fraser FC. The Fauna of British India including Ceylon and Burma. Odonata Vol. II, Taylor and Francis Ltd., London, 1934, 398.
10. Fraser FC. The Fauna of British India including Ceylon and Burma. Odonata Vol. III, Taylor and Francis Ltd., London, 1936, 461.
11. Mitra TR. Handbook on Common Indian Dragonflies (Insecta: Odonata). Published by the Director, Zoological Survey of India, Kolkata, 2006, 24.
12. IUCN, IUCN Red List of Threatened Species. Version 2012.2, 2012.
<http://www.iucnredlist.org>. 17 June, 2013.
13. Hilton DFJ. A terminology for females with colour patterns that mimic males. Entomology News 1987; 98:221-223.
14. Cordero A. The inheritance of female polymorphism in the damselfly *Ischnuragraellsii* (Rambur) (Odonata: Coenagrionidae). Heredity 1990; 64:341-346.
15. Corbet PS. Dragonfly Behaviour and Ecology of Odonata. Harley Books, Colchester, England, 1999, 829.
16. Prasad M, Kulkarni PP, Talmale SS. New record of andromorphic females in two species of *Neurothemis* dragonflies (Odonata: Libellulidae) from central India. Bionotes 2000; 2:54.
17. Cordero AR, Andres JA. Colour polymorphism in Odonates: Females that mimic males? Journal of the British Dragonfly Society 1996; 12:50-60.
18. Lahiri AR. Odonata (Insecta) from different states of north east India. Oriental Insects 1979; 13:119-132.
19. Asahina S. Seasonal variation in *Neurothemistullia* (Drury). Tombo 1981; 24:12-16.
20. Kumar A. On the andromorphic female of *Neurothemis t. tullia* (Dru.) (Anisoptera: Libellulidae). Notule Odonatologicae 1988; 3:12-16.
21. Mitra TR. Another record of an andromorphic female of *Neurothemis t. tullia* (Dru.) (Anisoptera: Libellulidae). Notule Odonatologicae 1991; 3:133-134.
22. Andrew RJ. Andromorphic female of the dragonfly *Neurothemistulliatullia* (Drury) (Odonata: Libellulidae), central India. Journal of Threatened Taxa 2013; 5(1):3571-3573.
23. Robertson HM. Female dimorphism and mating behavior in a damselfly, *Ischnuramburi*: female mimicking male. Animal Behaviour 1985; 33:805-809.