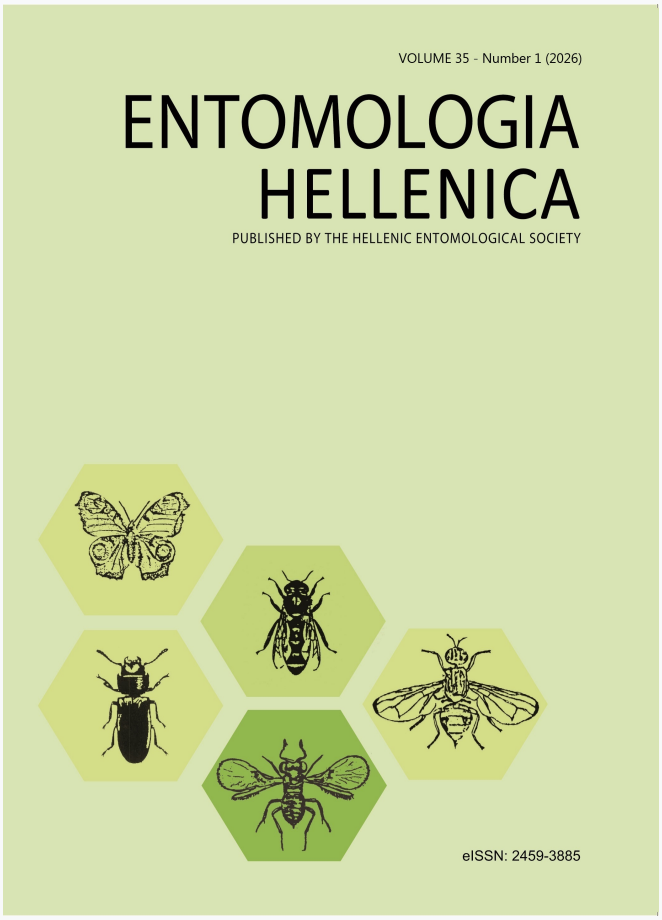
ENTOMOLOGIA HELLENICA

Vol 35, No 1 (2026)

Entomologia hellenica 35(1)



A Preliminary checklist of Dragonflies and Damselflies (Odonata) in a small part of Madugundi, Karnataka, India

Tejas Mehendale

doi: 10.12681/eh.42338

To cite this article:

Mehendale, T. (2026). A Preliminary checklist of Dragonflies and Damselflies (Odonata) in a small part of Madugundi, Karnataka, India. *ENTOMOLOGIA HELLENICA*, *35*(1), 46–62. https://doi.org/10.12681/eh.42338

Received 2 August 2025 Accepted 1 February 2026 Available online 3 February 2026

A preliminary checklist of Dragonflies and Damselflies (Odonata) in a small part of Madugundi, Karnataka, India

TEJAS MEHENDALE

601, Manisha CHS, VP Road, Pendse Nagar, Dombivli (E), 421201, Thane, Maharashtra, India

ABSTRACT

A preliminary study was conducted in a small area of Madugundi village, Western Ghats, Chikkamagaluru district, Karnataka, India, to document Odonata diversity. The author recorded 67 species of odonates belonging to 10 families. This study aims to aid understanding the region's biodiversity and highlights the urgent need for targeted conservation strategies to protect the freshwater ecosystems and their unique Odonata assemblages from ongoing environmental threats.

KEY WORDS: Conservation; diversity; Madugundi; odonates; Western ghats.

Introduction

Odonata, is a group that includes dragonflies (Anisoptera) and damselflies (Zygoptera), which are captivating freshwater insects, easily recognized by their striking colours and graceful, nimble flight. These ancient predators, with fossils over 300 million years old, thrive in freshwater habitats like ponds and rivers (Grimaldi and Engel, 2005). Odonata play a key role in ecosystems, serving as important bioindicators of freshwater habitats and contributing to the regulation of populations of disease-transmitting organisms such as mosquitoes (Kadoya et al., 2004; Vatandoost, 2021). Odonata are a group of widely distributed insects comprising approximately 6300 species worldwide (Paulson et al., 2024). India, with its varied climate, diverse topography, and rich ecosystems, supports a remarkable diversity of odonates, encompassing approximately 500 species (Subramanian et al., 2018), of which 186 species are endemic to India (Kalkman et al., 2020). The state of Karnataka is recognized for its significant ecological heterogeneity, supporting a broad spectrum of habitat types and numerous wildlife protected areas, which fosters a rich biodiversity, encompassing a wide array of flora and fauna, including a notable representation of Odonata species (Shastry et al., 2010; Subramanian KA, 2009). Madugundi is a small village located in the Western Ghats surrounded by shola habitats consisting of tropical evergreen forests. The present study aims to document Odonata diversity by providing a checklist for a small part of the region. This baseline data may provide an insight into the regional biodiversity, serving as a critical ecological reference point for subsequent investigations in ecological dynamics, and conservation biology. By documenting the diversity, the study advocates for the implementation of targeted conservation strategies to preserve the integrity of freshwater ecosystems within the geographical region.

Materials and Methods

Study area: The study area is a part of Madugundi village (Fig 1.), (13°08'05.8"N 75° 26'53.8"E, 764 m) made up of forested stream, rocky hill stream, riverine habitat and a perennial waterbody (Fig 2. A-D.) surrounded by tropical evergreen forests and

*Corresponding author: tmehendale28@gmail.com

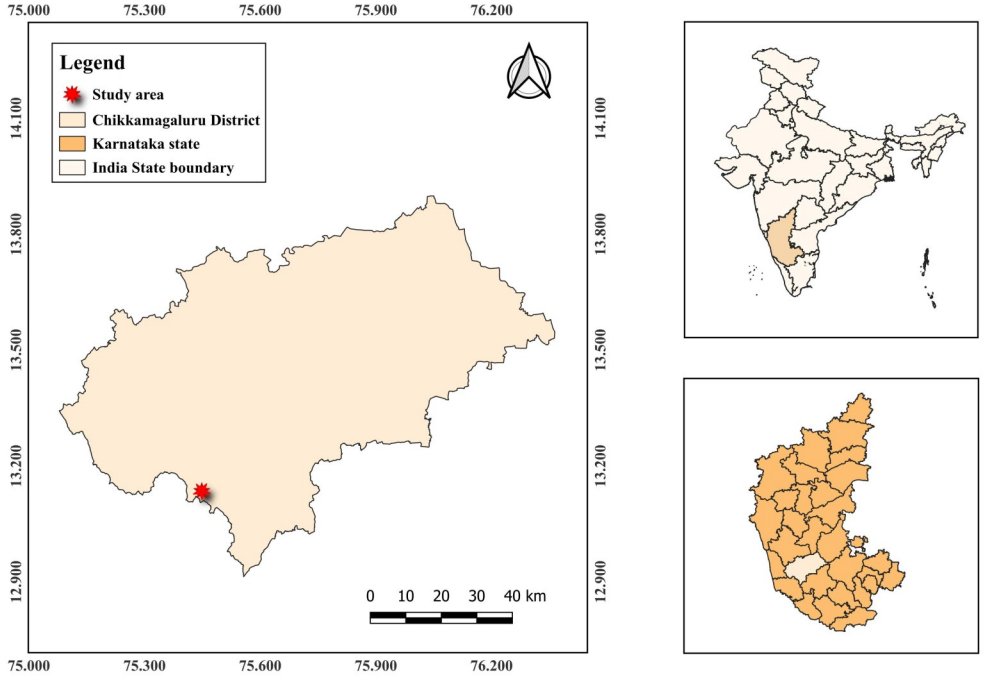


FIG. 1: Map of the study area.

shola grasslands. The Netravati River runs through the study area which creates two main freshwater habitats: parts that flow through forests and parts that are rocky streams in the hills. The study was conducted between October 2024 to May 2025 for two seasons (post monsoon and pre monsoon), in different habitats of the study area.

Data collection: The documentation was conducted using an opportunistic sampling methodology, where observations and data collection were carried out whenever suitable conditions or subjects were encountered, rather than following a predetermined, systematic sampling design. Photographs of the species were taken using Nikon d3400 with Nikkor 18-55mm, Nikkor 70-300mm kit lenses and Osaka DF860 mark III external flash. The species were identified using the taxonomic keys provided by Fraser, 1933a, 1934b, 1936c and with the help of the photographic guidebook of Subramanian, 2009, Nair, 2011 and Subramanian et al., 2018. No specimens of any species were collected during the study. The data was compiled and analysed using Microsoft Excel and Quantum GIS (QGIS) version 3.3.2 was used to create the map of study area.

Results and Discussion

A total of 67 species of odonates belonging to 45 genera from two suborders with 10 families were recorded from the study area. Thirty-four (34) species belonged to Zygoptera and the remaining 33 species represented Anisoptera. Libellulidae (Anisoptera) was the most abundant family with 25 species (37%) followed by Coenagrionidae (Zygoptera) with 13 species (19%). Contrarywise, the remaining families were represented by only a low number of species, i.e. from the suborder Zygoptera: Platycnemididae by 6 species (9%), Platystictidae by 4 (6%), Euphaeidae by 4 (6%) Calopterygidae by 3 (5%), Chlorocyphidae by 2 (3%) and Lestidae by 2 (3%), while from the suborder Anisoptera: Gomphidae was represented by 5 species (7%) and Aeshnidae by 3 (5%) (Fig. 3). Among the observed species, *Euphaea dispar* Rambur, 1842, *Euphaea fraseri* (Laidlaw, 1920), *Protosticta gravelyi* Laidlaw, 1915, *Proto-*

FIG. 2: Habitats of the species. A: Forested stream; B: Rocky hill stream; C: Riverine area D: Perennial waterbody.

sticta mortoni Fraser, 1924, *Protosticta sanguinostigma* Fraser, 1922, *Indosticta deccanensis* (Laidlaw, 1915), *Melanoneura bilineata* Fraser, 1922, *Pseudagrion indicum* Fraser, 1924, *Lestes elatus* Hagen in Selys, 1862, *Gomphidia kodaguensis* Fraser, 1923, *Melligomphus acinaces* (Laidlaw, 1922) are endemic to Western ghats and *Heliocypha bisignata* (Hagen in Selys, 1853), *Libellago indica* (Fraser, 1928), *Heliogomphus promelas* (Selys, 1873), *Hylaeothemis apicalis* Fraser, 1926 are endemic to India (Kalkman et al., 2020). Among the species identified, *I. deccanensis* stood out as a notable finding, representing the northernmost recorded distribution of the species (Mehendale & Padiyar, 2024). During the study, one species from the genus *Euphaea* Selys, 1840 was provisionally identified as *Euphaea pseudodispar* Sadasivan & Bhakare, 2021, as *Euphaea wayanadensis* Anooj, Susanth & Sadasivan, 2025 had not yet been formally published. With the subsequent description of *E. wayanadensis* recently (Anooj et al., 2025), it became

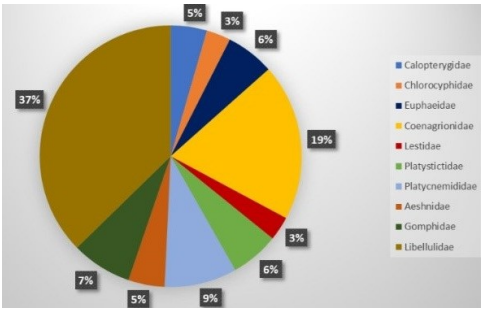


FIG. 3: Pie chart showing percentage distribution of Odonata species among families in Madugundi, Karnataka, India.

clear that the specimen recorded was indeed this newly recognized species. *M. bilineata* and *H. promelas* are categorized as Near Threatened (NT), while *P. sanguinostigma* and *I. deccanensis* are listed as Vulnerable (VU) on the IUCN Red List of Threatened Species (IUCN, 2025). An annotated list as well as photos of the observed species is provided in the Table 1 and the Appendix.

Conclusion

This study provides a baseline checklist of 67 Odonata species from a small area of the Madugundi region of the Western Ghats, Karnataka, highlighting the area's significant ecological value. The observed diversity, including 16 endemic species of Odonata from the Western Ghats, underscores its importance for regional Odonata conservation. However, the region faces mounting threats from habitat fragmentation due to agricultural expansion, riparian forest degradation, and siltation of hill streams from road construction, which compromise the delicate micro-habitats required by endemic taxa. This foundational data is crucial for understanding regional biodiversity and emphasizes the necessity of targeted conservation strategies, such as the restoration of natural riparian buffers and the implementation of long-term citizen science monitoring, to protect these vital freshwater ecosystems and their unique Odonata assemblages against ongoing environmental threats.

Acknowledgements

The author would like to thank Mr. Srjith Gowda and Mr. Ajith Padiyar of Rivermist resorts for allowing to conduct the research.

References

Anooj, S.S., Susanth, C., Sadasivan, K., Bhakare, S.D., Sawant, D. and Nair, V.P., 2025. A new species of Euphaea Selys, 1840 (Odonata, Euphaeidae) from Wayanad, Western Ghats, Kerala, India. Entomon, 50(1), pp.73-84.

Fraser, F. C. 1933 - Fauna of British India, Odonata 1. Taylor & Francis Ltd. London, 423 pp.

Fraser, F. C. 1934 - Fauna of British India, Odonata II. Taylor & Francis Ltd. London, 398 pp.

Fraser, F. C. 1936 - Fauna of British India, Odonata III. Taylor & Francis Ltd. London, 461 pp.

Grimaldi, D. and Engel, M.S., 2005. Evolution of the Insects. Cambridge University Press.

IUCN. 2025. The IUCN Red List of Threatened Species. Version 2025. https://www.iucnredlist.org. Accessed on [11 June 2025].

Kalkman, V.J., Babu, R., Bedjanič, M., Conniff, K., Gyeltshen, T., Khan, M.K., Subramanian, K.A., Zia, A. and Orr, A.G., 2020. Checklist of the dragonflies and damselflies (Insecta: Odonata) of Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka. Zootaxa, 4849(1), pp.1-84.

Kadoya, T., Suda, S.I. and Washitani, I., 2004. Dragonfly species richness on man-made ponds: effects of pond size and pond age on newly established assemblages. Ecological Research, 19(5), pp.461-467.

Nair, M.V., 2011. Dragonflies & damselflies of Orissa and eastern India. Wildlife Organisation, Forest & Environment Department, Government of Orissa.

Paulson D., Schorr M. and Deliry C. (2024) World Odonata list. Last revision: 11 April 2022. Online on the internet. Available from: http://www.pugetsound.edu/academics/academic resources/slatermuseum/biodiversity resources/dragonflies/world-odonata-list2

Subramanian K.A. (2009). Dragonflies of India: A field guide. Vigyan Prasar.

Subramanian, K.A., 2018. Atlas of Odonata (Insecta) of the Western Ghats, India. Zoological Survey of India.

Shastry, D.K. and Ravikumar, S. 2010. Biodiversity of Karnataka: A glimpse. Karnataka Biodiversity Board.

Mehendale, T. and Padiyar, A., 2024. Northernmost record of the endemic damselfly Indosticta deccanensis (Laidlaw, 1915) (Odonata, Zygoptera, Platystictidae) from Western Ghats, Karnataka, India. Entomon, 49(4), pp.549-552.

Vatandoost, H., 2021. Dragonflies as an important aquatic predator insect and their potential for control of vectors of different diseases. Journal of Marine Science, 3(3), pp.13-20.

Table 1. Annotated list of recorded Odonata species in the study area. IUCN Red List status - NT: Near Threatened, LC: Least Concern, VU: Vulnerable, NE: Not Evaluated, DD: Data Deficient.

SL	Suborder/Family/ Scientific Name	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	IUCN Status
	Suborder Zygoptera									
	Family: Calopterygidae Selys, 1850									
1	*Neurobasis chinensis* (Linnaeus, 1758)	+						+		LC
2	*Vestalis apicalis* Selys, 1873						+			LC
3	*Vestalis gracilis* (Rambur, 1842)	+				+				LC
	Family: Chlorocyphidae Cowley, 1937									
4	*Heliocypha bisignata* (Hagen in Selys, 1853)	+			+	+	+			LC
5	*Libellago indica* (Fraser, 1928)			+		+				LC
	Family: Euphaeidae Yakobson & Bainchi, 1905									
6	*Dysphaea ethela* Fraser, 1924						+			LC
7	*Euphaea dispar* Rambur, 1842						+	+		LC
8	*Euphaea fraseri* (Laidlaw, 1920)						+	+		LC
9	*Euphaea wayanadensis* Anooj, Susanth & Sadasivan, 2025	+								NE
	Family: Coenagrionidae Kirby, 1890									
10	*Aciagrion approximans* (Selys, 1876)	+		+		+				LC
11	*Aciagrion occidentale* Laidlaw, 1919		+	+		+				LC
12	*Agriocnemis pieris* Laidlaw, 1919	+		+		+				LC

Table 1. continued

13	*Agriocnemis pygmaea* (Rambur, 1842)			+		+			LC
14	*Agriocnemis splendidissima* Laidlaw, 1919			+					LC
15	*Amphiallagma parvum* (Selys, 1877)					+			LC
16	*Ceriagrion olivaceum* Laidlaw, 1914		+						LC
17	*Ceriagrion rubiae* Laidlaw, 1916	+		+					LC
18	*Ischnura rubilio* Selys, 1876		+			+			LC
19	*Pseudagrion australasiae* Selys, 1876	+		+		+			LC
20	*Pseudagrion indicum* Fraser, 1924	+	+	+		+			LC
21	*Pseudagrion malabaricum* Fraser, 1924					+			LC
22	*Pseudagrion rubriceps* Selys, 1876			+		+			LC
Family: Lestidae Calvert, 1907									
23	*Lestes elatus* Hagen in Selys, 1862			+		+	+		LC
24	*Lestes decipiens* Kirby, 1893	+		+					LC
Family: Platystictidae, Kennedy, 1920									
25	*Protosticta gravelyi* Laidlaw, 1915		+						LC
26	*Protosticta mortoni* Fraser, 1924						+	+	LC
27	*Protosticta sanguinostigma* Fraser, 1922						+	+	VU
28	*Indosticta deccanensis* (Laidlaw, 1915)		+						VU

Table 1. continued

Family: Platycnemididae Yakobson & Bainchi, 1905									
29	*Caconeura ramburi* (Fraser, 1922)							+	DD
30	*Copera marginipes* (Rambur, 1842)			+		+			LC
31	*Copera vittata* Selys, 1863	+				+			LC
32	*Melanoneura bilineata* Fraser, 1922							+	NT
33	*Onychargia atrocyana* (Selys, 1865)		+			+			LC
34	*Prodasineura verticalis* (Selys, 1860)	+	+			+			LC
Suborder Anisoptera									
Family: Aeshnidae Leach, 1815									
35	*Anax immaculifrons* Rambur, 1842	+					+		LC
36	*Anax indicus* Lieftinck, 1942	+	+					+	LC
37	*Gynacantha millardi* Fraser, 1920						+	+	LC
Family: Gomphidae Rambur, 1842									
38	*Gomphidia kodaguensis* Fraser, 1923		+			+	+		DD
39	*Heliogomphus promelas* (Selys, 1873)							+	NT
40	*Ictinogomphus rapax* (Rambur, 1842)	+				+			LC
41	*Melligomphus acinaces* (Laidlaw, 1922)	+	+						DD
42	*Paragomphus lineatus* (Selys, 1850)	+	+					+	LC

Table 1. continued

Family: Libellulidae Leach, 1815										
43	*Acisoma panorpoides* Rambur, 1842		+	+						LC
44	*Brachythemis contaminata* (Fabricius, 1793)								+	LC
45	*Cratilla lineata* (Brauer, 1878)					+	+			LC
46	*Diplacodes trivialis* (Rambur, 1842)	+								LC
47	*Hylaeothemis apicalis* Fraser, 1926								+	DD
48	*Indothemis limbata* (Selys, 1891)					+				LC
49	*Lathrecista asiatica* (Fabricius, 1798)		+							LC
50	*Neurothemis fulvia* (Drury, 1773)	+	+		+					LC
51	*Neurothemis intermedia* (Rambur, 1842)					+				LC
52	*Neurothemis tullia* (Drury, 1773)		+	+						LC
53	*Onychothemis testacea* Laidlaw, 1902						+		+	LC
54	*Orthetrum chrysis* (Selys, 1891)	+				+				LC
55	*Orthetrum glaucum* (Brauer, 1865)	+		+						LC
56	*Orthetrum luzonicum* (Brauer, 1868)		+			+				LC
57	*Orthetrum pruinosum* (Burmeister, 1839)		+	+						LC
58	*Orthetrum sabina* (Drury, 1770)	+								LC
59	*Palpopleura sexmaculata* (Fabricius, 1787)			+		+				LC

Table 1. continued

60	*Pantala flavescens* (Fabricius, 1798)	+					LC
61	*Rhyothemis triangularis* Kirby, 1889			+			LC
62	*Tetrathemis platyptera* Selys, 1878	+					LC
63	*Tramea limbata* (Desjardins, 1832)				+		LC
64	*Trithemis aurora* (Burmeister, 1839)	+	+			+	LC
65	*Trithemis festiva* (Rambur, 1842)	+					LC
66	*Urothemis signata* (Rambur, 1842)			+			LC
67	*Zygonyx iris* Selys, 1869			+	+		LC

Appendix. Photographs of the list of dragonflies and damselflies observed in the study area.

Neurobasis chinensis Linnaeus, 1758

Vestalis apicalis Selys, 1873

Heliocypha bisignata Hagen in Selys, 1853

Libellago indica Fraser, 1928

Euphaea dispar Rambur, 1842

Euphaea fraseri Laidlaw, 1920

Aciagrion approximans Selys, 1876

Aciagrion occidentale Laidlaw, 1919

Appendix. Photographs of the list of dragonflies and damselflies observed in the study area.

Vestalis gracilis Rambur, 1842

Agriocnemis pygmaea Rambur, 1842

Dysphaea ethela Fraser, 1924

Ceriagrion olivaceum Laidlaw, 1914

Euphaea wayanadensis Anooj, Susanth & Sadasivan, 2025

Pseudagrion australasiae Selys, 1876

Agriocnemis pieris Laidlaw, 1919

Pseudagrion rubriceps Selys, 1876

Appendix. Photographs of the list of dragonflies and damselflies observed in the study area.

Agriocnemis splendidissima Laidlaw, 1919

Amphiallagma parvum Selys, 1877

Ceriagrion rubiae Laidlaw, 1916

Ischnura rubilio Selys, 1876

Pseudagrion indicum Fraser, 1924

Pseudagrion malabaricum Fraser, 1924

Lestes elatus Hagen in Selys, 1862

Lestes decipiens Kirby, 1893

Appendix. Photographs of the list of dragonflies and damselflies observed in the study area.

Protosticta gravelyi Laidlaw, 1915

Protosticta mortoni Fraser, 1924

Indosticta deccanensis Laidlaw, 1915

Caconeura ramburi Fraser, 1922

Copera vittata Selys, 1863

Melanoneura bilineata Fraser, 1922

Prodasineura verticalis Selys, 1860

Anax immaculifrons Rambur, 1842

Appendix. Photographs of the list of dragonflies and damselflies observed in the study area.

Protosticta sanguinostigma Fraser, 1922

Gynacantha millardi Fraser, 1920

Copera marginipes Rambur, 1842

Ictinogomphus rapax Rambur, 1842

Onychargia atrocyana Selys, 1865

Acisoma panorpoides Rambur, 1842

Anax indicus Lieftinck, 1942

Hylaeothemis apicalis Fraser, 1926

Appendix. Photographs of the list of dragonflies and damselflies observed in the study area.

Gomphidia kodaguensis Fraser, 1923

Heliogomphus promelas Selys, 1873

Melligomphus acinaces Laidlaw, 1922

Paragomphus lineatus Selys, 1850

Brachythemis contaminata Fabricius, 1793

Cratilla lineata Brauer, 1878

Indothemis limbata Selys, 1891

Lathrecista asiatica Fabricius, 1798

Appendix. Photographs of the list of dragonflies and damselflies observed in the study area.

Neurothemis fulvia Drury, 1773

Neurothemis intermedia Rambur, 1842

Orthetrum chrysis Selys, 1891

Orthetrum glaucum Brauer, 1865

Orthetrum pruinosum Burmeister, 1839

Palpopleura sexmaculata Fabricius, 1787

Rhyothemis triangularis Kirby, 1889

Tetrathemis platyptera Selys, 1878

Appendix. Photographs of the list of dragonflies and damselflies observed in the study area.

Onychothemis testacea Laidlaw, 1902

Zygonyx iris Selys, 1869

Orthetrum luzonicum Brauer, 1868

Pantala flavescens Fabricius, 1798

Urothemis signata Rambur, 1842

