



A CHECKLIST OF ODONATA (DRAGONFLIES AND DAMSELFLIES) FROM FOREST AREAS OF RAISEN AND SEHORE DISTRICTS OF MADHYA PRADESH, CENTRAL INDIA

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ABSTRACT: The present study was conducted to explore the Odonates biodiversity from different forest areas of Raisen and Sehore district of Madhya Pradesh during 2022-2025. The data was collected through a direct observation method, collecting materials along diverse potential habitats such as water bodies, forests, and agricultural lands. A total of 45 Odonata species, belonging to 25 genera and six families, were recorded. Among these, thirty species (66.66%) belonged to Anisoptera (dragonflies), while fifteen species (33.33%) belonged to Zygoptera (damselflies). The family Libellulidae had the maximum species richness (18 species), followed by Coenagrionidae (10 species), Aeshnidae (4 species), Lestidae (3 species), Gomphidae (2 species) and Platycnemididae (2 species) were represented by two species each. The observations support the value of the forest areas and conservation areas in providing valuable resources for Odonata. However, rapid degradation of forest habitats due to human activities poses a major threat to odonates diversity and associated biodiversity.

Keywords: *Odonata, Dragonflies, Damselflies, Biodiversity survey, Ratapani Wildlife Sanctuary, Central India*

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INTRODUCTION

The state of Madhya Pradesh is located in central India and is the second-largest state, covering an area of 308,252 km². The State lies between 21°17' N to 26°52' N latitude and 74°08' E to 82°49' E longitudes. The State can be divided physiographically, into four regions, viz., the low-lying areas in north and north-west of Gwalior, Malwa Plateau, Satpuda and Vindhyan Ranges. Madhya Pradesh has a subtropical climate. The

State has reported extent of recorded forest area (RFA) 94,689 sq km which is 30.72% of its geographical area. The reserved, protected and unclassified forests are 65.36%, 32.84% and 1.80% of the recorded forest area in the State respectively.

Raisen and Sehore district of Madhya Pradesh, in Vindhya Range in central India, is one of the finest teak forests in the state. Raisen district (23.3327° N, 77.7824° E) is features significant

natural forest cover, comprising approximately 10% (83 kha) of its land area as of 2020. The region is characterized by the dense Ratapani Tiger Reserve, spanning 825 sq km in the Vindhya hills, serving as a key hub for biodiversity, eco-tourism, and wildlife, including tigers. The district is also home to the UNESCO World Heritage Site of Bhimbetka Rock Shelters, which are surrounded by lush, protected forests.

Sehore district (23.2032° N, 77.0844° E) in Madhya Pradesh, possesses rich forest biodiversity and significant forest cover, contributing to the state's central forest belt. It is characterized by dry deciduous forests, often featuring species like Teak and in some areas, it is known for producing various dye-yielding plants. The forest areas are often found in areas with moderate rainfall, with the region falling under the administrative jurisdiction of the Sehore Forest Division.

Ratapani Wildlife Sanctuary (23.4346° N and 77.4980° E) is famous and rich in flora and faunal biodiversity and spread in both the district. Several seasonal streams irrigate the site in the monsoon, and water is retained in some pools along these streams even in the summer. Two large reservoirs, namely Barna Reservoir and Ratapani Dam (Barrusot lake) are among the major water bodies adjacent to or inside the sanctuary. The forest of Ratapani is dry deciduous and moist deciduous type, with teak (*Tectona grandis*) as the main tree species. About 55% of the area is covered by teak. The remaining mixed forests consist of various dry deciduous species. Bamboo (*Dendrocalamus strictus*) overlaps the two aforementioned forest types and covers about one quarter of the forest area.

Odonata is one of the ancient groups of insect order and Fossil evidences suggest that origin of this group dates back to Permian. Dragonflies and damselflies are among the most conspicuous and ecologically important aquatic insects (Schorr and Paulson, 2020). They are

fascinating and widespread insects considered bioindicators of aquatic ecosystems stresses (Tiple *et al.*, 2012; Subramanian and Babu, 2024). They are among the most ancient-winged insects, featuring two pairs of wings and compound eyes (Davies and Tobin, 1985). They are usually sighted flying over aquatic bodies such as lakes, ponds, and streams and terrestrial areas like gardens, paddy fields, and forests (Nair 2011; Tiple, *et al.*, 2022; Paunikar and Talmale, 2024). The Odonates are distributed in all geographical realms, but their greatest numbers and diversity occur in the tropics. They are studied extensively worldwide (Kalkman, *et al.*, 2008). They act as an umbrella species and play the role of both prey and predators in aquatic ecosystem. They are one of the dominant invertebrate predators in the freshwater ecosystem and feed on widerange of aquatic invertebrates (Subramanian *et al.*, 2008; Paunikar, 2024ab). Being predator in both larval and adult stage, they play a vital role in the food chain in wetland ecosystem (Tiple and Koparde, 2015; Tiple, 2020; Paunikar, 2025). The habitat loss and degradation are major threats to Odonata, which are caused by water pollution, water extraction, eutrophication, acidification, urbanization, and tourism activities (Subramanian and Babu, 2020; Paunikar, 2026). Odonates are extensively studied and explored worldwide (Kalkman, *et al.*, 2020; Subramanian and Babu, 2024; Paunikar 2026).

Globally, 6,407 described species belonging to 693 genera and 18 families (Schorr and Paulson 2023), and distributed globally except in the poles.

In India, about 504 species belonging to 157 genera and 17 families have been reported (Kalkman *et al.*, 2020). The Western Ghats, Western and Eastern Himalaya have maximum number of species. In Madhya Pradesh 88 species of damselflies and dragonflies were compiled along with 11 species are endemic to state by Subramanian and Babu, (2024).

The initial work on the Odonata fauna of different states of India including Madhya Pradesh was done by Fraser (1933, 1934, 1936). Zoological Survey of India (ZSI) established in 1916, premier and recognized organization as on Taxonomy research under the Ministry of Environment, Forest and Climate Change. After establishing the trained taxonomists started collecting data and publishing lists of Odonata of localities or regions of the country. Researchers from the ZSI and various odonatologists from the different institutes of India have often surveyed various parts of the Indian region including Madhya Pradesh. After some year, Mitra (1988, 1995) have studied Odonata fauna of Madhya Pradesh. Srivastava and Suri Babu (1997) prepared a checklist of Odonata from Sagar district of central India. Mishra (2007) has reported several species of Odonates from the state. Tiple and Chandra (2013) studied on the Dragonflies and Damselflies of Madhya Pradesh and Chhattisgarh States. After that the various workers reported different species of Odonata from the different forest areas and conservation areas of the Madhya Pradesh (Tiple, 2012; Talmale, 2016ab; Paunikar, 2025 and 2026).

Recently, some workers reported dragonflies and damselflies from different forest areas and conservation areas like wildlife sanctuaries, national parks, tigers and biosphere reserves of the state but Raisen and Seohore forest areas including Ratapani Wildlife sanctuary is still unexplored for the odonates diversity. Therefore, the present study was undertaken to document the diversity of Odonata in forest habitats of Raisen and Seohore districts, including Ratapani Wildlife Sanctuary.

MATERIALS AND METHODS

Three extensive surveys of 10–12 days duration were conducted in different forest areas of Raisen and Seohore districts of Madhya Pradesh, including Ratapani Wildlife Sanctuary and its surrounding areas, during 2022–2024. The survey was conducted in different habitats such as lakes,

ponds, streams, and nala during the morning and evening. The common odonates species were identified in the field and unidentified species were collected using an aerial sweep net. Collected specimens were transferred into insect collection paper envelopes in the field and later transported to the laboratory of Central Zone Regional Centre, Zoological Survey of India, Jabalpur, where these were properly stretched, pinned, oven dried for 72 hours at 60°C and preserved in Insect Storage System of National Zoological Collection. In the field observations and in the laboratory, specimens were photographed prior to studies, using a Nikon digital camera and smartphone cameras. Specimens were identified using taxonomic keys provided by Fraser (1933, 1934, 1936), Mitra (2006), Andrew et al. (2008), and Subramanian (2009).

RESULTS AND DISCUSSION

The present study recorded a total of 45 species of Odonata from 28 genera and seven families under two suborders *Anisoptera* and *Zygoptera* from the study area. Among these, 30 species belonging to 20 genera were dragonflies (suborder *Anisoptera*), while 15 species belonging to 8 genera were damselflies (suborder *Zygoptera*) presented in the Table 1-2, Fig-1.

Libellulidae showed the highest species richness with 24 species (53.33%), followed by Coenagrionidae 10 (22.22%), Aeshnidae 4 (8.88%), Lestidae 3 (6.66%) and Gomphidae and Platycnemididae 2 (4.44%) each.

The dominant family Libellulidae and Coenagrionidae accounted for the highest number of genera and species, consistent with prior reported from the peninsular India (Subramanayam *et al.*, 2018). These two dominant families with highest genera and species were also reported from the central India including three states, Maharashtra, Madhya Pradesh and Chhattisgarh (Tiple, 2013; Tiple and Khoparde, 2025; Paunikar, 2025).

Recent time some studies have been workout from the different forest and conservation areas of Madhya Pradesh. Talmale (2016a) recorded 38 species belonging to 29 genera of 16 subfamilies and 7 families from Veerangana Durgawati Wildlife Sanctuary, District Damoh, Madhya Pradesh. Talmale, (2016b) reported 40 species belonging to 31 genera of 15 subfamilies and 9 families from Singhori Wildlife Sanctuary Raisen district, Madhya Pradesh. Talmale (2022) documented 50 species belonging to 33 genera of 7 families of Odonates from Nauradehi Wildlife Sanctuary, Madhya Pradesh. Paunikar and Talmale (2024) reported 38 species belonging to 24 genera under 7 families and 2 suborders of order Odonata from Sanjay-Dubri National Park. Further, Paunikar (2024ab) recorded 7 species of odonates, representing 24 genera across 6 families from Kuno-Palpur National Park and 38 species, 25 genera with 6 families from Ghughwa National Park, Dindori district of Madhya Pradesh. Paunikar (2025) reported also 41 species of Odonata from 25 genera and 6 families from Gandhisagar Wildlife Sanctuary, Neemach and Mandsaur district of Madhya Pradesh. Among

these, 26 species and 17 genera were Anisoptera (dragonflies), and 15 and 8 genera were Zygoptera (damselflies). Recently, Paunikar (2026) investigated and reported 54 species belong to 34 genera in 07 families and 6 superfamilies from Gangau Wildlife Sanctuary, Panna and Chhatarpur district of Madhya Pradesh.

The results indicate that forest and conservation areas of Madhya Pradesh support a rich diversity of Odonata. It is also urgently needed to explore not only the odonates faunal diversity but also other precious faunal of the different forest areas and other conservation areas of Madhya Pradesh.

CONCLUSION

The present study documented 45 species of Odonata from forest areas of Raisen and Sehore districts. The dominance of *Libellulidae* and *Coenagrionidae* is consistent with patterns reported from other parts of central India. These findings highlight the ecological importance of forest habitats and associated aquatic ecosystems for maintaining odonate diversity.

Table 1. Checklist of Dragonflies and Damselflies from forest areas of Raisen and Sehore, districts of Madhya Pradesh

S. No.	Suborder/ Anisoptera/ Family	Scientific Name (Dragonflies)	Authors/Year
1	Aeshnidae (4)	<i>Anax ephippiger</i>	(Burmeister, 1839)
2		<i>Anax immaculifrons</i>	Rambur, 1842
3		<i>Anax guttatus</i>	(Burmeister, 1839)
4		<i>Gynacantha bayadera</i>	Selys, 1891
5	Gomphidae (2)	<i>Ictinogomphu srax</i>	(Rambur, 1842)
6		<i>Paragomphus lineatus</i>	(Selys, 1850)
7	Libellulidae (24)	<i>Acisoma panorpoides</i>	Rambur, 1842
8		<i>Brachythemis contaminata</i>	(Fabricius, 1793)
9		<i>Brachydiplax sobrina</i>	(Rambur, 1842)
10		<i>Bradinopyga geminata</i>	(Rambur, 1842)
11		<i>Diplacode snebulosa</i>	(Fabricius, 1793)
12		<i>Diplacodes trivialis</i>	(Rambur, 1842)
13		<i>Crocothemis servilia</i>	(Drury, 1770)
14		<i>Neurothemis stullia</i>	(Drury, 1773)

Table contd...

15		<i>Orthetrum sabina</i>	(Drury, 1770)
16		<i>Orthetrum glaucaum</i>	(Brauer, 1865)
17		<i>Orthetrum chrysis</i>	(Selys, 1891)
18		<i>Orthetrum taeniolatum</i>	(Schneider, 1845)
19		<i>Orthetrum luzonicum</i>	(Brauer, 1868)
20		<i>Orthetrum pruinosum</i>	(Rambur, 1842)
21		<i>Pantala flavescens</i>	(Fabricius, 1798)
22		<i>Potamarcha congener</i>	(Rambur, 1842)
23		<i>Rhodothemis rufa</i>	(Rambur, 1842)
24		<i>Rhyothemis variegata</i>	Linnaeus, 1763)
25		<i>Tholymis tillarga</i>	(Fabricius, 1798)
26		<i>Tramea basilaris</i>	Kirby, 1889
27		<i>Trithemi sfestiva</i>	(Rambur, 1842)
28		<i>Trithemis aurora</i>	(Burmeister, 1839)
29		<i>Trithemi skirbyi</i>	Selys, 1891
30		<i>Zyxomma petiolatum</i>	Rambur, 1842
31	Lestidae (3)	<i>Lestes elatus</i>	Selys, 1862
32		<i>Lestes umbrinus</i>	Selys, 1891
33		<i>Lestes viridulus</i>	Rambur, 1842
34	Platycnemididae (2)	<i>Coper amarginipes</i>	(Rambur, 1842)
35		<i>Disparoneura quadrimaculata</i>	(Rambur, 1842)
36	Coenagrionidae (10)	<i>Agriocnemi spygmaea</i>	(Rambur, 1842)
37		<i>Agriocnemis splendidissima</i>	Laidlaw, 1919
38		<i>Amphiallagma parvum</i>	Selys, 1876
39		<i>Ceriagrion coromandelianum</i>	(Fabricius, 1798)
40		<i>Ischnura aurora</i>	(Brauer, 1865)
41		<i>Ischnura nursei</i>	(Morton, 1907)
42		<i>Ischnura senegalensis</i>	(Rambur, 1842)
43		<i>Pseudagrion decorum</i>	(Rambur, 1842)
44		<i>Pseudagrion microcephalum</i>	(Rambur, 1842)
45		<i>Pseudagrion rubriceps</i>	Selys, 1876

Table 2. Family-wise species richness in Odonata fauna of the forest areas of Raisen and Sehore districts of Madhya Pradesh

S. No.	Species and genera in suborder	Families	Genera	Species
1	Anisoptera (Dragonflies) (30 and 20)	Aeshnidae	2	4
2		Gomphidae	2	2
3		Libellulidae	16	24
4	Zygoptera (Damselflies) (15 and 08)	Coenagrionidae	5	10
5		Platycnemididae	2	2
6		Lestidae	1	3
	Total		28	45

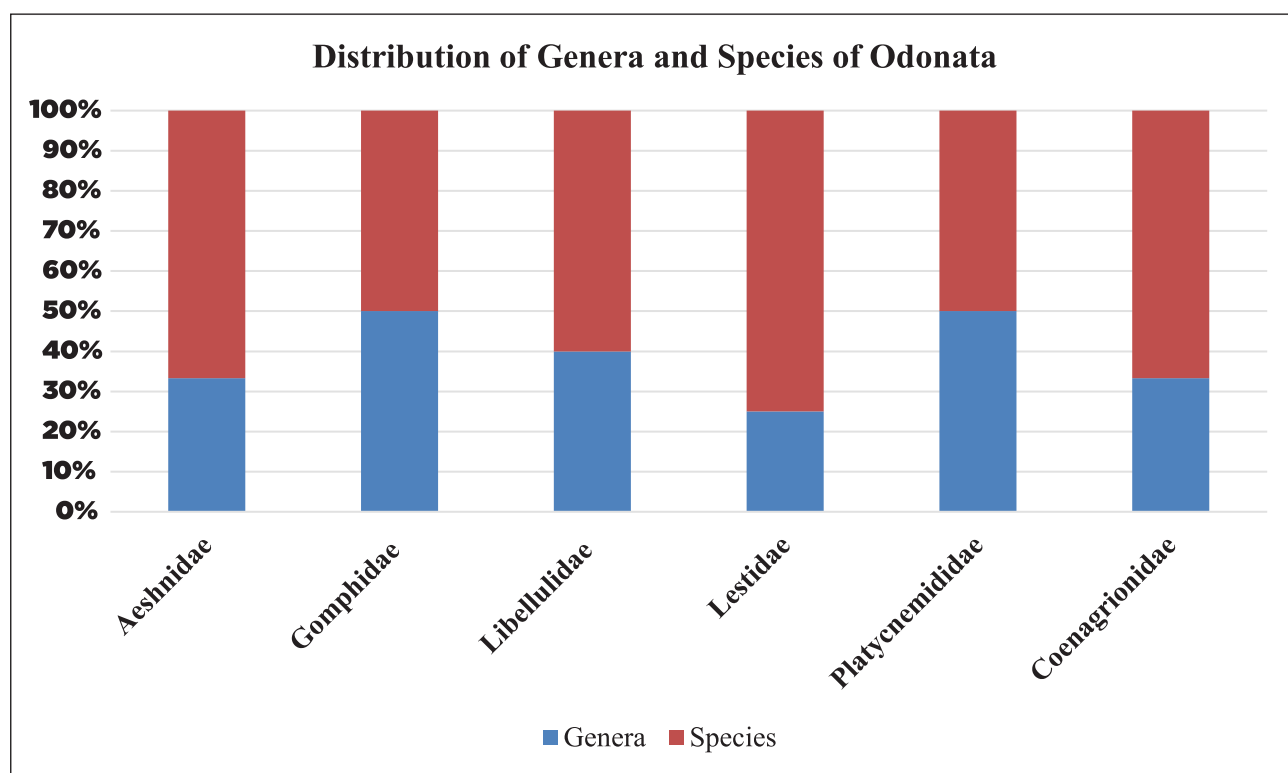


Fig.1. Graphical representation showing the distribution of families, genera, and species of Odonata recorded from the forest areas of Raisen and Sehore districts

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