

Records of Dragonflies & Damselflies (Insecta, Odonata) from Gondia district, Maharashtra, India

Divya Bharathi

Deputy Conservator of Forests, Melghat Tiger Reserve, Maharashtra, India.

✉ divya.manikannan@gmail.com

 <https://orcid.org/0000-0002-9203-5088>

Pankaj Koparde

School of Sustainable Development, Faculty of Sustainability Studies, Dr. Vishwanath Karad MIT World Peace University, Pune, Maharashtra, India.

✉ pankajkoparde@gmail.com

 <https://orcid.org/0000-0002-7418-8814>

ABSTRACT. The Vidarbha region of India harbours a significant amount of biodiversity. However, the region still severely lacks data on lesser-known taxa such as odonates (dragonflies and damselflies). To partially fill in the knowledge gap on odonates, opportunistic surveys were conducted across nine sites in the Gondia district of Vidarbha between 2019 and 2021. In this report, the presence of 35 species from the study area, representing around 1/4th of the total odonate diversity of Maharashtra is recorded. The results are indicative of the need for consistent sampling efforts in the region. Further systematic and long-term monitoring studies on odonates in Vidarbha Region are proposed.

Key words: Central India, Vidarbha, diversity, occurrence, species richness, reserved forest

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INTRODUCTION

The Vidarbha region harbours a significant amount of biodiversity including several conservation priority species. The region has characteristic dry and mixed moist deciduous vegetation interspersed with scrubland and multiple human-use landscapes. The region is also known for mountains and hills, creating a mosaic of habitats suitable for several species. The region still lacks data on lesser-known taxa such as amphibians, invertebrates, and fishes (Tiple et al., 2013). Odonates (dragonflies and damselflies) are freshwater insects that are often used as indicator taxa in environmental studies (Kutcher & Bried, 2014; Koparde, 2016; Gómez-Tolosa et al., 2021). Data on odonate richness and abundance can be useful in understanding habitat health (Jere et al., 2020) and changes in weather (Basel et al., 2021). As per an estimate of 2015, the State of Maharashtra harbours around 134 odonates (Tiple & Koparde, 2015). The Vidarbha region may harbour up to 65% of the total diversity (Tiple et al., 2013). In this study, data was collected on odonates through systematic documentation from Gondia district within Vidarbha.

Corresponding author: Koparde, P., E-mail: pankajkoparde@gmail.com

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MATERIAL AND METHODS

The occurrence of odonates was recorded and photographed across nine sites (six taluks) in the Gondia district between 2019 and 2021 (three years). The details of the study sites are listed in Fig. 1 and Table 1. Sampling was done during Monsoon and Post Monsoon seasons, as odonate activity is significant during these seasons in Peninsular India (Subramanian, 2009; Koparde, 2016). The Odonata identification was based on taxonomic keys (Fraser, 1933, 1934, 1936) and field guides (Andrew et al., 2008; Subramanian, 2009; Nair, 2011). A species list was prepared following Kalkman et al. (2020). A site-wise listing analysis was conducted to find out areas that are species hotspots. We converted occurrence data into categories, namely, exclusive (occurring only at one site), uncommon (occurring in 2–3 sites), common (occurring in 4–6 sites), and abundant (occurring in >6 sites).

RESULTS

35 odonates (Dragonflies = 22; Damselflies = 13) were recorded during the surveys from Gondia district (Table 2, Fig. 2). The family Libellulidae was well-represented (16 species) followed by Coenagrionidae with eight species. The family Lestidae was represented by three species but this includes a species (*Lestes cf. malabaricus*) whose identity remains uncertain due to lack of specimens in hand. Of nine sites, Mhaisuli Talav (S1, n = 22) turned out to be a highly species-rich area, followed by Umarzari Dam (S3, n = 13) and Navegaon Bandh (S2, n = 12) (Table 3).

Table 1. Study site metadata.

| No. | Site Name | Taluk | GPS Location | Elevation (masl) | Habitat |
|-------|------------------------|----------------|--------------------------------|------------------|--|
| i. | Mhaisuli Talav | Deori | 20°28'04.80"N 80°17'30.48"E | 298 | Seasonal pond located inside reserved forest |
| ii. | Nawegaon Bandh | Arjuni Morgaon | 20°54'15.84"N 80°07'54.12"E | 277 | Reservoir located partially in protected area with dry deciduous forest vegetation |
| iii. | Umarzari Dam | Sadak Arjuni | 21°09'40.68"N 80°15'34.92"E | 312 | Dam located inside reserve forest with dry deciduous forest vegetation |
| iv. | Ambe Nala | Sadak Arjuni | 21°10'30.72"N 80°16'35.76"E | 330 | Perennial stream that shows seasonal stagnancy post monsoon and is located deep inside a reserve forest with dry deciduous forest vegetation |
| v. | Zilmili Talav | Gondia | 21°21'53.40"N 80°18'06.84"E | 302 | Pond and marshy land surrounded by rice fields |
| vi. | Lakshmi Nagar Panvatha | Salekasa | 21°27'56.88"N 80°11'49.20"E | 313 | Human-made water holes used for livestock |
| vii. | Kanholi Talav | Arjuni Morgaon | 20°52'06.96"N 80°07'32.16"E | 296 | Perennial lake with surrounding scrub and dry deciduous vegetation |
| viii. | Jamdi Forest Stream | Goregaon | 21°12'57.24"N 80°13'48.00"E | 313 | Slow flowing seasonal stream inside reserve forest with dry deciduous forest vegetation |
| ix. | Chichgad Forest Stream | Deori | 20°53'37.68"N 80°19'07.68"E | 233 | Primarily stagnant and seasonal stream inside reserve forest with dry deciduous forest vegetation |

masl: meter above sea level.

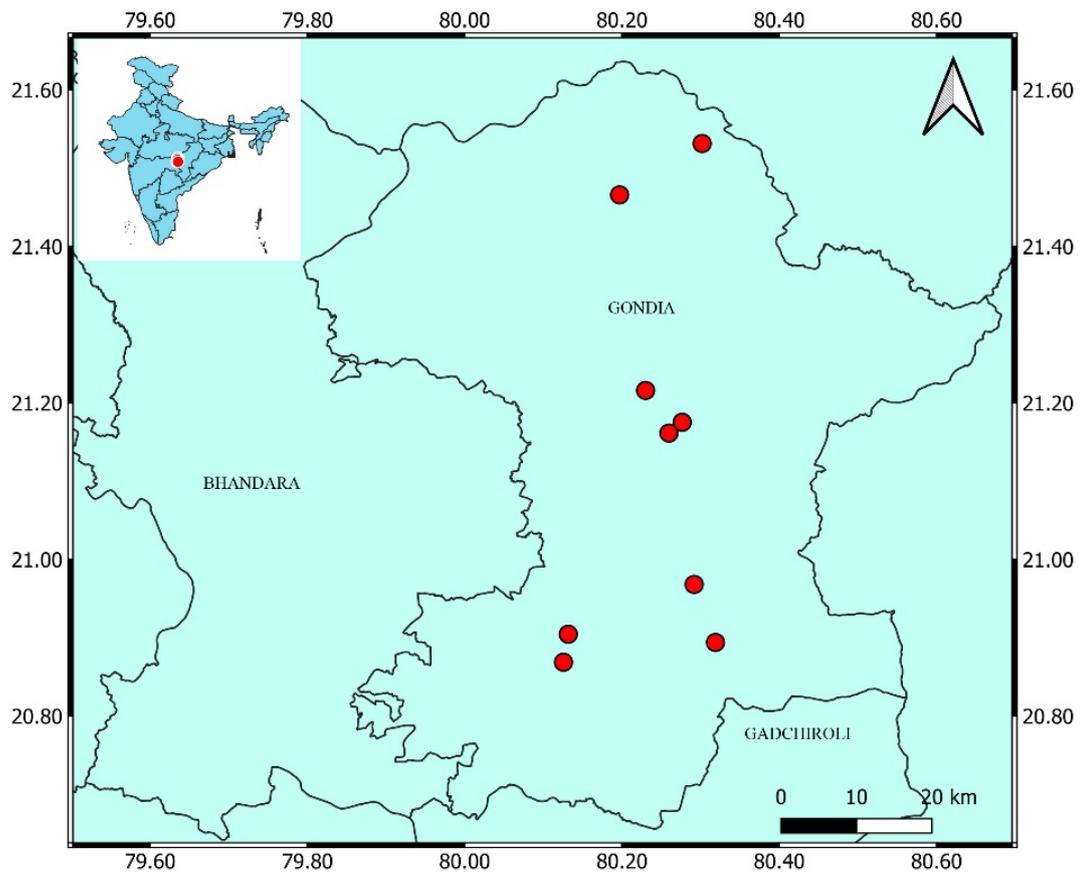


Figure 1. Study sites were distributed across the Gondia district in Vidarbha, Maharashtra.



Figure 2. Photographic records of Malabar Spreadwing (*Lestes cf. malabaricus*) were sighted at Mhaisuli Talav, Gondia, Maharashtra, India.

Table 2. List of odonates observed during the surveys at Gondia district.

| Sl. No. | Scientific Name | Common Name |
|---|---|----------------------------|
| Zygoptera Selys, 1854 (Damselflies = 13) | | |
| Family: Lestidae Calvert, 1907 | | |
| 1 | <i>Lestes concinnus</i> Hagen in Selys, 1862 | Dusky Spreadwing |
| 2 | <i>Lestes cf malabaricus</i> Fraser, 1929 | Malabar Spreadwing |
| 3 | <i>Lestes viridulus</i> Rambur, 1842 | Emerald-striped Spreadwing |
| Family: Coenagrionidae Kirby, 1890 | | |
| 4 | <i>Agriocnemis pygmaea</i> (Rambur, 1842) | Pygmy Dartlet |
| 5 | <i>Amphiallagma parvum</i> (Selys, 1876) | Azure Dartlet |
| 6 | <i>Ceriagrion coromandelianum</i> (Fabricius, 1798) | Coromandel Marsh Dart |
| 7 | <i>Ischnura nursei</i> Morton, 1907 | Pixie Dartlet |
| 8 | <i>Ischnura rubilio</i> Selys, 1876 | Golden Dartlet |
| 9 | <i>Ischnura senegalensis</i> (Rambur, 1842) | Senegal Golden Dartlet |
| 10 | <i>Pseudagrion decorum</i> (Rambur, 1842) | Three-striped Blue Dart |
| 11 | <i>Pseudagrion rubriceps</i> Selys, 1876 | Saffron-faced Blue Dart |
| Family: Platycnemididae Yakobson & Bainchi, 1905 | | |
| 12 | <i>Copera marginipes</i> (Rambur, 1842) | Yellow Bush Dart |
| 13 | <i>Copera vittata</i> Selys, 1863 | Blue Bush Dart |
| Anisoptera Selys, 1854 (Dragonflies = 22) | | |
| Family: Aeshnidae Leach, 1815 | | |
| 14 | <i>Anaciaeschna jaspidea</i> (Burmeister, 1839) | Rusty Darner |
| 15 | <i>Anax guttatus</i> (Burmeister, 1839) | Lesser Green Emperor |
| Family: Gomphidae Rambur, 1842 | | |
| 16 | <i>Ictinogomphus rapax</i> (Rambur, 1842) | Common Clubtail |
| Family: Libellulidae Leach, 1815 | | |
| 17 | <i>Brachythemis contaminata</i> (Fabricius, 1793) | Ditch Jewel |
| 18 | <i>Cratilla lineata</i> (Brauer, 1878) | Emerald-banded Skimmer |
| 19 | <i>Crocothemis servilia</i> (Drury, 1770) | Ruddy Marsh Skimmer |
| 20 | <i>Diplacodes trivialis</i> (Rambur, 1842) | Blue Ground Skimmer |
| 21 | <i>Indothemis carnatica</i> (Fabricius, 1798) | Light-tipped Demon |
| 22 | <i>Neurothemis fulvia</i> (Drury, 1773) | Fulvous Forest Skimmer |
| 23 | <i>Neurothemis intermedia</i> (Rambur, 1842) | Paddyfield Parasol |
| 24 | <i>Orthetrum glaucum</i> (Brauer, 1865) | Blue Marsh Hawk |
| 25 | <i>Orthetrum luzonicum</i> (Brauer, 1868) | Tricoloured Marsh Hawk |
| 26 | <i>Orthetrum pruinosum</i> (Burmeister, 1839) | Crimson-tailed Marsh Hawk |
| 27 | <i>Orthetrum sabina</i> (Drury, 1770) | Green Marsh Hawk |
| 28 | <i>Pantala flavescens</i> (Fabricius, 1798) | Wandering Glider |
| 29 | <i>Potamarcha congener</i> (Rambur, 1842) | Yellow-tailed Ashy Skimmer |
| 30 | <i>Rhyothemis variegata</i> (Linnaeus, 1763) | Common Picturewing |
| 31 | <i>Tamea basilaris</i> (Palisot de Beauvois, 1805) | Red Marsh Trotter |
| 32 | <i>Tamea limbata</i> (Desjardins, 1832) | Black Marsh Trotter |
| 33 | <i>Trithemis aurora</i> (Burmeister, 1839) | Crimson Marsh Glider |
| 34 | <i>Trithemis festiva</i> (Rambur, 1842) | Black Stream Glider |
| 35 | <i>Trithemis pallidinervis</i> (Kirby, 1889) | Long-legged Marsh Glider |

Table 3. Site-wise species list from Gondia district, Maharashtra, India.

| Sl. No. | | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | OC |
|---|---|----|----|----|----|----|----|----|----|----|----|
| Zygoptera Selys, 1854 | | | | | | | | | | | |
| Lestidae Calvert, 1907 | | | | | | | | | | | |
| 1 | <i>Lestes concinnus</i> Hagen in Selys, 1862 | | | | | | + | | | + | U |
| 2 | <i>Lestes cf malabaricus</i> | + | | | | | | | | | E |
| 3 | <i>Lestes viridulus</i> Rambur, 1842 | | | | | | + | | | | E |
| Coenagrionidae Kirby, 1890 | | | | | | | | | | | |
| 4 | <i>Agriocnemis pygmaea</i> (Rambur, 1842) | + | | + | | | | | + | | U |
| 5 | <i>Amphiallagma parvum</i> (Selys, 1876) | + | | | | + | | + | | | U |
| 6 | <i>Ceriagrion coromandelianum</i> (Fabricius, 1798) | + | + | + | | | | + | | | C |
| 7 | <i>Ischnura nursei</i> Morton, 1907 | | | | | | | + | | | E |
| 8 | <i>Ischnura rubilio</i> Selys, 1876 | + | + | + | | | | + | + | | C |
| 9 | <i>Ischnura senegalensis</i> (Rambur, 1842) | | + | | | | | | | | E |
| 10 | <i>Pseudagrion decorum</i> (Rambur, 1842) | | | | | + | | | | | E |
| 11 | <i>Pseudagrion rubriceps</i> Selys, 1876 | | | | | | | | + | | E |
| Platycnemididae Yakobson & Bainchi, 1905 | | | | | | | | | | | |
| 12 | <i>Copera marginipes</i> (Rambur, 1842) | | | | + | | | | + | | U |
| 13 | <i>Copera vittata</i> Selys, 1863 | | | | | | | | + | | E |
| Suborder Anisoptera Selys, 1854 | | | | | | | | | | | |
| Aeshnidae Leach, 1815 | | | | | | | | | | | |
| 14 | <i>Anaciaeschna jaspidea</i> (Burmeister, 1839) | + | | | | | | | | | E |
| 15 | <i>Anax guttatus</i> (Burmeister, 1839) | + | + | | | | + | | | | U |
| Gomphidae Rambur, 1842 | | | | | | | | | | | |
| 16 | <i>Ictinogomphus rapax</i> (Rambur, 1842) | + | + | + | | + | + | + | | + | A |
| Libellulidae Leach, 1815 | | | | | | | | | | | |
| 17 | <i>Brachythemis contaminata</i> (Fabricius, 1793) | + | + | + | | + | | + | | | C |
| 18 | <i>Cratilla lineata</i> (Brauer, 1878) | | + | | | | | | | | E |
| 19 | <i>Crocothemis servilia</i> (Drury, 1770) | + | + | + | | + | + | + | | | A |
| 20 | <i>Diplacodes trivialis</i> (Rambur, 1842) | + | + | + | + | | + | + | | + | A |
| 21 | <i>Indothemis carnatica</i> (Fabricius, 1798) | + | | | | | | + | | | U |
| 22 | <i>Neurothemis fulvia</i> (Drury, 1773) | + | | | | | | | | | E |
| 23 | <i>Neurothemis intermedia</i> (Rambur, 1842) | | | + | | | | | | | E |
| 24 | <i>Orthetrum glaucum</i> (Brauer, 1865) | + | | + | | | | | | | U |
| 25 | <i>Orthetrum luzonicum</i> (Brauer, 1868) | | | + | | | | | | | E |
| 26 | <i>Orthetrum pruinosum</i> (Burmeister, 1839) | + | | | | | | | | | E |
| 27 | <i>Orthetrum sabina</i> (Drury, 1770) | + | + | + | | + | + | | | | C |
| 28 | <i>Pantala flavescens</i> (Fabricius, 1798) | | | | | | | | | + | E |
| 29 | <i>Potamarcha congener</i> (Rambur, 1842) | + | | | | | + | | | + | U |
| 30 | <i>Rhyothemis variegata</i> (Linnaeus, 1763) | | + | | | | | | | | E |
| 31 | <i>Tramea basilaris</i> (Palisot de Beauvois, 1805) | + | | + | | + | + | | | | C |
| 32 | <i>Tramea limbata</i> (Desjardins, 1832) | + | | + | | | | | | | U |
| 33 | <i>Trithemis aurora</i> (Burmeister, 1839) | + | | + | | + | | | | | U |
| 34 | <i>Trithemis festiva</i> (Rambur, 1842) | + | | | | | | + | | | U |
| 35 | <i>Trithemis pallidinervis</i> (Kirby, 1889) | + | + | | | + | + | | | + | C |
| TOTAL | | 22 | 12 | 13 | 3 | 9 | 10 | 10 | 5 | 6 | |

S1: Mhaisuli Talav; **S2:** Nawegaon Bandh; **S3:** Umarzari Dam; **S4:** Ambe Nala; **S5:** Zilmili Talav; **S6:** Lakshmi Nagar Panvatha; **S7:** Kanholi Talav; **S8:** Jamdi Forest Stream; **S9:** Chichgad Forest Stream; + refers to presence; **E:** Exclusive (occurring in one site); **U:** Uncommon (occurring in 2–3 sites); **C:** Common (occurring in 4–6 sites); **A:** Abundant (occurring in >6 sites).

DISCUSSION

This study reports the presence of 35 odonates from Gondia district of Vidarbha Region of Maharashtra State. Tiple et al. (2013) recorded 82 species from Vidarbha region through a year-seven (2006–2012) survey. Apart from this, there have been scanty records (Tiple, 2012; Tiple et al., 2013; Talmale & Tiple, 2013; Tiple, 2020; Tiple et al., 2022) of odonates documented across the Vidarbha region. This list contains 42% of the species reported by Tiple et al. (2013), comprising around 1/4th of species reported from the State of Maharashtra. The opportunistic observations support the importance of a variety of Odonata habitats within Gondia district. The maximum species richness was recorded from Mhaisuli Talav, a pond within the protected area surrounded by dry deciduous forest having moderate anthropogenic and grazing pressure. Sites with streams such as S4, S8, and S9 had comparatively lower species richness. A high level of site exclusivity was recorded amongst the odonates (damselflies = 7, dragonflies = 5). Three abundant species were found which can be called as generalists across the study region, namely, *I. rapax*, *C. servilia*, and *D. trivialis*. Jere et al. (2020) reported *C. servilia* as a generalist and *I. rapax* as an urban specialist. Our results regarding generalists are partially in line with Jere et al. (2020). During the survey, a *Lestes* species similar to *L. malabaricus* was recorded. The identification of the species could not be confirmed due to the lack of specimens in hand, however, based on photographic records the species matches the description of *L. malabaricus*. The species is known from Kerala, Chandigarh, and Punjab (Dow, 2021). This is the first record of the species from Central India. A single individual was recorded from inside the protected area at a seasonal pond (Mhaisuli Talav). As per Fraser (1933), the species is abundant in certain areas. Subramanian et al. (2018) described the species to be common at the edges of the paddy fields. The recorded observation is from a completely different habitat not reported earlier. Apart from *Lestes* cf. *malabaraicus*, *Cratilla lineata* which is a forest species was found in dry deciduous forest vegetation.

The present study from Gondia district spanning two years adds significant information on the odonates of Vidarbha and highlights the need for such surveys (Koparde et al., 2014; Mujumdar et al., 2020). Future studies to focus on seasonal variation and habitat correlates of species dynamics are recommended to develop a comprehensive conservation plan to safeguard the wetland habitats of odonates.

AUTHOR'S CONTRIBUTION

The authors confirm their contribution to the paper as follows: D.B. collected primary data and helped in drafting the manuscript. P.K. curated and analyzed data and wrote the final version of the manuscript. All authors reviewed the results and approved the final version of the manuscript.

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CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

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گزارش آسیابک‌ها و سنجاقک‌ها (Insecta: Odonata) از ناحیه گوندیا، ماهاراشترا، هند

دیویا بهارتی^۱ و پانکاج کپارده^{۲*}

۱. معاون حفاظت از جنگل‌ها، ذخیره‌گاه ببر ملقات، ماهاراشترا، هند.

۲. بخش آموزش توسعه پایدار، دانشکده مطالعات پایداری، پونا، ماهاراشترا، هند.

* پست الکترونیک نویسنده مسئول مکاتبه: pankajkoparde@gmail.com

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چکیده: منطقه ویدارباى هند دارای تنوع زیستی قابل توجهی است. با این حال، این منطقه فاقد اطلاعاتی درخصوص گونه‌های راسته Odonata (سنجاقک‌ها و آسیابک‌ها) است. برای شناسایی گونه‌های این راسته، بررسی‌هایی در ۹ مکان از منطقه گوندیای ویداربا طی سال‌های ۲۰۱۹ و ۲۰۲۱ انجام شد. در این بررسی، ۳۵ گونه شناسایی شد که حدود یک چهارم کل گونه‌های ثبت شده در ماهاراشترا را شامل می‌شود. نتایج نشان می‌دهد که برای شناسایی گونه‌ها، نیاز به نمونه‌گیری مداوم از منطقه است. مطالعات سیستماتیک و بلندمدت بر روی این راسته در منطقه ویداربا پیشنهاد شد.

واژگان کلیدی: هند مرکزی، ویداربا، تنوع گونه‌ای، غنای گونه‌ای، جنگل حفاظت‌شده