Journal on New Biological Reports
JNBR 9(1) 53 – 59 (2020)

ISSN 2319 – 1104 (Online)

Published by
www.researchtrend.net

Checklist of Odonate Fauna (Insecta : Odonata) of Nagpur, Maharashtra, India

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| **Received**: 20 January 2020 | **Accepted**: 10 March 2020 |

How to cite: Gajbe PU. 2020. Checklist of Odonate Fauna (Insecta : Odonata) of Nagpur, Maharashtra, India. J New Biol Rep 9(1): 53-59.

ABSTRACT

Odonates constitute a very primitive and important group of insects. Nagpur, Maharashtra is home to many important wildlife conservation areas. A checklist of the odonates of Nagpur has been prepared. According to this checklist, the odonate fauna of Nagpur consists of 99 species in 53 genera of 10 families. It includes 60 species of dragonflies (Anisoptera) in 37 genera of 5 families and 39 species of damselflies (Zygoptera) in 16 genera of 5 families.

Key words: Checklist, damselfly, dragonfly, Maharashtra, Nagpur, Odonata.

INTRODUCTION

Dragonflies and damselflies are very familiar insects which are classified in order Odonata. They are well admired for their beautiful colours and spectacular flying abilities. Being closely associated with freshwater bodies like ponds, lakes, streams and rivers, odonates are used as bio-indicators of environment health. As odonates are exclusively carnivorous and prey on other insects, they have an important role in controlling the populations of their prey base.

Nagpur (*C.* 21.1458° N, 79.0882° E) is located in the north-eastern part of Maharashtra. Nagpur is a very important region in Central India regarding wildlife conservation, since many conservation areas are either located in Nagpur district or close to it. These conservation habitats include Bor Wildlife Sanctuary, Pench Tiger Reserve, Umred-Karhandla Wildlife Sanctuary, Tadoba-Andhari Tiger Reserve, Melghat Tiger Reserve, Nagzira Wildlife Sanctuary and Navegaon Tiger Reserve. The weather of Nagpur is generally warm with mildly cool winters and very hot summers. In the summer season, maximum temperature may rise up to 47°C. The average annual precipitation is approximately 1100 mm. Nagpur has abundant green cover and is considered one of the greenest cities in India. Nagpur district has many lakes, ponds, reservoirs and rivers, which provide abundant habitat for odonate fauna.

MATERIALS AND METHODS

First of all, literature available on the odonate fauna of Nagpur was collected. This literature included printed books and research papers, as well as literature searched for and collected from online websites and archives. The collected literature was arranged from the earliest to the latest years. After carefully reviewing the literature, a checklist of odonates reported from Nagpur was prepared.

RESULTS AND DISCUSSION

A review of the available literature reveals that about 6000 species and subspecies of odonates are known from the world (Schorr & Paulson, 2020). According to Subramanian (2014), 474 species and subspecies of odonates are known from India. Fraser (1933, 1934, 1936) in his seminal work on the Indian Odonata, had reported only a few odonate species from the Central Indian region. However, in recent times, the easy availability of distribution data and literature on the internet, as well as the publication of various handbooks on Indian Odonates (Subramanian, 2005; Andrew *et al*., 2008) has led to a renewed interest in studying the diversity and ecology of odonates occurring in Central India.

During the last decade, many researchers have published data on the distribution of odonates in various regions of Nagpur district. Andrew & Tembhare (1997) reported 43 species of odonates from Nagpur. Andrew et al. (2008) identified 45 species of odonates from Nagpur district. Tiple et al. (2008) reported 62 species of odonates from Nagpur. Tijare & Patil (2012) recorded 31 odonate species from Gorewada wetland, Nagpur. Tiple (2012) reported 72 odonate species from Nagpur. Andrew (2013) identified 34 odonate species from Zilpi Lake near Nagpur city. Shende & Patil (2013) recorded 34 species of dragonflies (Anisoptera) from Gorewada Bio-Park, Nagpur. Tiple et al. (2013) reported 82 odonate species from Vidarbha region of Maharashtra, of which, 81 odonate species were shown to be occurring in Nagpur district. Patil et al. (2014) recorded 38 species of odonates from Mahurzari Wetland near Nagpur city. Patil et al. (2014a) identified 21 species of damselflies (Zygoptera) from Gorewada Bio-Park, Nagpur. Andrew et al. (2015) reported parasitic mite infestation in 7 odonate species found at Wena Dam near Nagpur city. Gajbe (2015) reported 28 species of odonates from Umred-Karhandla Wildlife Sanctuary in Nagpur district. Tiple & Koparde (2015) recorded 134 odonate species from Maharashtra and provided notes on the distribution of many of these species in Nagpur district. Gajbe (2019) identified 25 species of odonates from Sonegaon Lake in Nagpur city.

Examination of the literature available on the distribution of odonates in Nagpur region shows that the odonate fauna of Nagpur district consists of 99 species in 53 genera of 10 families (Table 1). It includes 60 species of dragonflies (Anisoptera) in 37 genera of 5 families (Table 2) and 39 species of damselflies (Zygoptera) in 16 genera of 5 families (Table 3). Most of the references cited herein are recent and provide distribution records from the year 2008 onwards.

Table 1. Checklist of Odonates of Nagpur, Maharashtra.

S. No.	Zoological Name	Reported by
	Suborder Anisoptera (Dragonflies)	
	Family Aeshnidae	
1.	*Anax guttatus* (Burmeister, 1839)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
2.	*Anax immaculifrons* (Rambur, 1842)	Andrew et al. (2008), Andrew (2013), Gajbe (2015), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
3.	*Anax parthenope* (Selys, 1839)	Andrew et al. (2008), Tiple (2012), Tiple et al. (2013)
4.	*Gynacantha bayadera* (Selys, 1891)	Andrew et al. (2008), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
5.	*Gynacantha dravida* (Lieftinck, 1960)	Tiple (2012), Tiple et al. (2013)
6..	*Hemianax ephippiger* (Burmeister, 1839)	Andrew et al. (2008), Andrew (2013), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
	Family Gomphidae	
7.	*Anormogomphus heteropterus* Selys, 1854	Tiple (2012), Tiple et al. (2013)
8.	*Cyclogomphus wilkinsi* (Fraser, 1926)	Tiple & Koparde (2015)
9.	*Gomphidia t-nigrum* (Selys, 1854)	Tiple & Koparde (2015)
10.	*Ictinogomphus distinctus* Ram, 1985	Tiple (2012), Tiple et al. (2013)
11.	*Ictinogomphus rapax* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)

12.	*Macrogomphus annulatus* (Selys, 1854)	Tiple (2012), Tiple et al. (2013)
13.	*Microgomphus torquatus* (Selys, 1854)	Tiple & Koparde (2015)
14.	*Paragomphus lineatus* (Selys, 1850)	Andrew et al. (2008), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
	Family Libellulidae	
15.	*Acisoma panorpoides* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Andrew et al. (2015), Gajbe (2015), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
16.	*Aethriamanta brevipennis* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Patil et al. (2014), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
17.	*Brachydiplax sobrina* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Andrew et al. (2015), Gajbe (2015), Patil et al. (2014), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
18.	*Brachythemis contaminata* (Fabricius, 1793)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
19.	*Bradinopyga geminata* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
20.	*Cratilla calverti* Forster, 1903	Tiple (2012)
21.	*Cratilla lineata* (Brauer, 1878)	Tiple et al. (2013)
22.	*Crocothemis servilia* (Drury, 1770)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Andrew et al. (2015), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
23..	*Diplacodes lefebvrii* (Rambur, 1842)	Tiple (2012), Tiple et al. (2013)
24.	*Diplacodes nebulosa* (Fabricius, 1793)	Andrew et al. (2008), Andrew (2013), Tiple (2012), Tiple et al. (2013)
25.	*Diplacodes trivialis* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Andrew et al. (2015), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
26.	*Indothemis carnatica* (Fabricius, 1798)	Tiple (2012), Tiple et al. (2013)
27.	*Lathrecista asiatica* (Fabricius, 1798)	Tiple (2012), Tiple et al. (2013)
28.	*Neurothemis fulvia* (Drury, 1773)	Tiple et al. (2013)
29.	*Neurothemis intermedia* (Rambur, 1842)	Patil et al. (2014), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
30.	*Neurothemis tullia* (Drury, 1773)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Andrew et al. (2015), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
31.	*Orthetrum chrysis* (Selys, 1891)	Andrew et al. (2008), Patil et al. (2014), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
32.	*Orthetrum glaucum* (Brauer, 1865)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015), Patil et al. (2014), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
33.	*Orthetrum japonicum* (Uhler 1858)	Tiple (2012), Tiple et al. (2013)
34.	*Orthetrum luzonicum* (Brauer, 1868)	Andrew & Tembhare (1997), Andrew et al. (2008), Patil et al. (2014), Gajbe (2015, 2019), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
35.	*Orthetrum neglectum* (Rambur, 1842)	Tiple (2012)
36.	*Orthetrum pruinosum* (Burmeister, 1839)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple et al. (2013)
37.	*Orthetrum sabina* (Drury, 1773)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil

		(2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
38.	*Orthetrum taeniolatum* (Schneider, 1845)	Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
39.	*Palpopleura sexmaculata* (Fabricius, 1787)	Tiple et al. (2013)
40.	*Pantala flavescens* (Fabricius, 1798)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
41.	*Potamarcha congener* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
42.	*Rhodothemis rufa* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew (2013), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
43.	*Rhyothemis variegata* (Linnaeus, 1763)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
44.	*Tetrathemis platyptera* (Selys, 1878)	Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
45.	*Tholymis tillarga* (Fabricius, 1798)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
46.	*Tramea basilaris* (Kirby, 1889)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
47.	*Tramea limbata* (Desjardins, 1858)	Andrew (2013), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple et al. (2013)
48.	*Tramea virginia* (Rambur, 1842)	Andrew et al. (2008), Tiple (2012), Tiple et al. (2013)
49.	*Trithemis aurora* (Burmeister, 1839)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
50.	*Trithemis festiva* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
51.	*Trithemis kirbyi* (Selys, 1891)	Tiple (2012), Tiple et al. (2013)
52.	*Trithemis pallidinervis* (Kirby, 1889)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Andrew et al. (2015), Gajbe (2015, 2019), Patil et al. (2014), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
53.	*Urothemis signata* (Rambur, 1842)	Tiple (2012), Tiple et al. (2013)
54.	*Zyxomma petiolatum* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Shende & Patil (2013), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
55.	*Hylaeothemis indica* (Fraser, 1946)	Tiple & Koparde (2015)
	Family Macromiidae	
56.	*Epopthalmia frontalis* (Selys, 1871)	Tiple & Koparde (2015)
57.	*Epophthalmia vittata* (Burmeister, 1839)	Andrew et al. (2008), Shende & Patil (2013), Tiple (2012), Tiple et al. (2013)
58.	*Macromia flavicincta* (Selys, 1874)	Tiple (2012), Tiple et al. (2013)
59.	*Macromia cingulata* (Rambur, 1842)	Tiple & Koparde (2015)
	Family Corduliidae	
60.	*Hemicordulia asiatica* (Selys, 1878)	Tiple & Koparde (2015)
	Suborder Zygoptera (Damselflies)	
	Family Chlorocyphidae	
61.	*Libellago indica* (Fraser, 1928)	Tiple (2012)
62.	*Libellago lineata* (Burmeister, 1839)	Tiple et al. (2013)
	Family Coenagrionidae	
63.	*Aciagrion hisopa* (Selys, 1876)	Patil et al. (2014), Patil et al. (2014a),

64.	*Aciagrion occidentale* (Laidlaw, 1919)	Patil et al. (2014), Patil et al. (2014a), Tiple et al. (2013)
65.	*Aciagrion pallidum* (Selys, 1891)	Andrew et al. (2008), Tiple (2012), Tiple et al. (2013)
66.	*Agriocnemis femina* (Brauer, 1868)	Andrew et al. (2008), Andrew (2013), Tiple (2012), Tiple et al. (2013)
67.	*Agriocnemis lacteola* (Selys, 1877)	Patil et al. (2014a), Tiple (2012), Tiple et al. (2013)
68.	*Agriocnemis pieris* (Laidlaw, 1919)	Tiple & Koparde (2015)
69.	*Agriocnemis pygmaea* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Patil et al. (2014a), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
70.	*Agriocnemis splendidissima* (Laidlaw, 1919)	Patil et al. (2014a)
71.	*Ceriagrion cerinorubellum* (Brauer, 1865)	Tiple (2012), Tiple et al. (2013)
72.	*Ceriagrion coromandelianum* (Fabricius, 1798)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Andrew et al. (2015), Gajbe (2015, 2019), Patil et al. (2014), Patil et al. (2014a), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
73.	*Ceriagrion olivaceum* (Laidlaw, 1914)	Patil et al. (2014a), Tiple et al. (2013)
74.	*Ceriagrion rubiae* (Laidlaw, 1916)	Patil et al. (2014), Patil et al. (2014a)
75.	*Enallagma parvum* (Selys, 1876)	Patil et al. (2014), Patil et al. (2014a), Tiple (2012), Tiple et al. (2013)
76.	*Ischnura aurora* (Brauer, 1865)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Patil et al. (2014a), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
77.	*Ischnura senegalensis* (Rambur, 1842)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014a), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
78.	*Mortonagrion varralli* (Fraser, 1920)	Andrew et al. (2008), Tiple (2012), Tiple et al. (2013)
79.	*Paracercion calamorum* (Ris,1916)	Tiple (2012), Tiple et al. (2013)
80.	*Paracercion malayanum* (Selys, 1876)	Tiple (2012), Tiple et al. (2013)
81.	*Pseudagrion decorum* (Rambur, 1842)	Gajbe (2019), Patil et al. (2014), Patil et al. (2014a), Tiple (2012), Tiple et al. (2013)
82.	*Pseudagrion hypermelas* (Selys,1876)	Tiple (2012), Tiple et al. (2013)
83.	*Pseudagrion indicum* (Fraser, 1924)	Patil et al. (2014a)
84.	*Pseudagrion malabaricum* Fraser, 1924	Tiple et al. (2013)
85.	*Pseudagrion microcephalum* (Rambur, 1842)	Andrew et al. (2008), Gajbe (2019), Patil et al. (2014a), Tiple (2012), Tiple et al. (2013)
86.	*Pseudagrion rubriceps* (Selys, 1876)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Patil et al. (2014), Patil et al. (2014a), Tiple (2012), Tiple et al. (2013)
87.	*Pseudagrion spencei* Fraser, 1922	Tiple (2012), Tiple et al. (2013)
88.	*Rhodischnura nursei* (Morton, 1907)	Andrew & Tembhare (1997), Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Patil et al. (2014a), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
	Family Lestidae	
89.	*Lestes elatus* Hagen in (Selys, 1862)	Andrew et al. (2008), Patil et al. (2014a), Tiple (2012), Tiple et al. (2013)
90.	*Lestes umbrinus* (Selys, 1891)	Andrew et al. (2008), Andrew (2013), Gajbe (2015, 2019), Patil et al. (2014), Patil et al. (2014a), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
91.	*Lestes viridulus (Rambur, 1842)*	Patil et al. (2014), Patil et al. (2014a), Tijare & Patil (2012), Tiple et al. (2013)

	Family Platycnemididae	
92.	*Copera deccanensis* Laidlaw, 1917	Tiple (2012)
93.	*Copera marginipes* (Rambur, 1842)	Andrew et al. (2008), Patil et al. (2014), Tijare & Patil (2012), Tiple (2012), Tiple et al. (2013)
94.	*Copera vittata* Laidlaw, 1917	Tiple et al. (2013)
	Family Protoneuridae	
95.	*Caconeura ramburi* (Fraser, 1922)	Tiple et al. (2013)
96.	*Disparoneura quadrimaculata* (Rambur, 1842)	Tiple (2012), Tiple et al. (2013)
97.	*Elattoneura nigerrima* (Laidlaw, 1917)	Tiple & Koparde (2015)
98.	*Prodasineura annandalei* Fraser, 1921	Tiple (2012)
99.	*Prodasineura verticalis* (Selys, 1860)	Tiple et al. (2013)

Fig. 1. Some Odonate species of Nagpur. A. *Crocothemis servilia*, B. *Trithemis pallidinervis*, C. *Orthetrum sabina*, D. *Brachythemis contaminata*, E. *Trithemis aurora*, F. *Neurothemis tullia*, G. *Pseudagrion microcephalum*, H. *Ischnura senegalensis*.

Table 2: Number of Families, Genera and Species of Dragonflies (Anisoptera) known from Nagpur

Family	Genera	Species
Aeshnidae	03	06
Gomphidae	07	08
Libellulidae	24	41
Macromiidae	02	04
Corduliidae	01	01
5 Families	**37 Genera**	**60 Species**

Table 3: Number of Families, Genera and Species of Damselflies (Zygoptera) known from Nagpur

Family	Genera	Species
Chlorocyphidae	01	02
Coenagrionidae	09	26
Lestidae	01	03
Platycnemididae	01	03
Protoneuridae	04	05
5 Families	**16 Genera**	**39 Species**

ACKNOWLEDGEMENTS

I am thankful to the Principal, S. M. Mohota College of Science, Nagpur for facilities.

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