



# REVIEW OF RESEARCH

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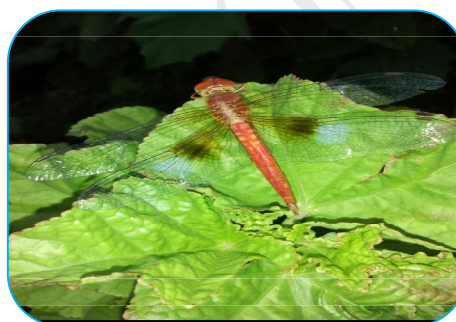
## ODONATA FAUNA OF PANDHARKAWADA FOREST OF YAVATMAL DISTRICT (M.S.) INDIA

**Sarita T. Kawade**

Department of Zoology, Bhalerao Science College, Saoner, Dist. Nagpur (MS).

### ABSTRACT:

A study of Pandharkawada forest was conducted from February 2014 to February 2016 which revealed the presence of 21 species of Odonata belonging to 19 genera 11 subfamily and five families. In which suborder Anisoptera (dragonflies) represented by 10 species and suborder Zygoptera (damselflies) represented by 11 species. It has been analysed that families Coenagrionidae and Libellulidae showed highest dominance with 9 species each followed by Platycnemididae, Lestidae and Aeshnidae showed less species diversity and represented by only one species.



**KEYWORDS:** Odonates, Pandharkawada forest, Diversity, Distribution, Habitat.

### INTRODUCTION:

Odonata is an order of carnivorous insects encompassing the dragonflies and the damselflies. Odonates are denizens of many aquatic ecosystems and their distribution covers a great deal of continuum from temporary to permanent water bodies (Corbet 1999). In the temperate regions of the world, dragonflies are frequently used as indicators of environmental health. Their aquatic larvae constitute a natural biological control over mosquito larvae and thus help to control several epidemic diseases like malaria, dengue, filaria etc. (Mitra, 2002). Globally 5,952 species of Odonates

under 652 genera have been reported (Schorr and Paulson, 2013). India harbours 474 species and 50 subspecies belonging to 142 genera in 18 families (Subramanian, 2014). Prasad, (1996) studied Odonata from Maharashtra state and published in Records of Zoological Survey, where he presented a list of all the 83 species known from Maharashtra state till then, including the species recorded by Laidlaw, (1917, 1919 and 1920) and Fraser, (1920, 1921, 1924, 1933, 1934 and 1936). Out of the 83 species he reported, 46 species and subspecies belonging to 27 genera under 8 families examined by him, 10 species and subspecies were recorded for the first time from Maharashtra. Kulkarni *et.al.*, (2012) reported Odonata

known from Maharashtra state in Fauna of Maharashtra, and described a total of 101 species, which includes 18 species recorded after the work of Prasad, (1996).

### MATERIALS AND METHODS

#### Study Area

Pandharkawada Forest is located between 77°31' to 78°34' East longitude and 19°52' to 20°42' North latitude. Temperature ranges from 8.2° c to 46° c. The average annual rain fall is 1011mm mostly from 2nd week of June and continues up to September. The study area is one of the most flourishing and valuable forest and fully covered with dense vegetations like *Tectona grandis*, *Bambusoideae*, *Diospyros melanoxylon*, *Terminalia*

*chebula*, *Bauhinia racemosa* and *Madhuca longifolia*.

### SAMPLING METHOD

Weekly surveys were conducted in Pandharkawada forest during February 2014 to February 2016 by using visual encounter method. The survey procedure involved spotting and taking a photograph of any individual in its natural habitat, without collecting any specimens. Only doubtful species were collected using an entomological net. During the course of the survey photographic records of adult individuals of different Odonate species were maintained using a digital SLR camera Nikkon D7000 with Nikkon microlens. The adult specimens were identified with the help of identification keys provided by Fraser (1933, 1934 and 1936); Mitra (2006); Subramanian (2005) and Andrew *et al.* (2009).

### OBSERVATION

#### Systematic Account

Order: Odonata  
Suborder: Anisoptera  
Family: Aeshnidae  
Subfamily: Aeshninae

#### *Anax immaculifrons* Rambur

1842. *Anax immaculifrons* Rambur, *Ins. Nevrop.* p. 189; Kirby, 1890. *Cat. Odon.*, P. 84;  
1942. *Anax indicus*, Lieftinck, *Treubia*, 18(3): 441-607.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** India: Bihar, Chandigarh, Maharashtra, Sikkim, West Bengal and Western Himalaya.

**Remarks :** Common in the grasslands.

Family: Libellulidae  
Subfamily: Symetrinae

#### *Brachythemis contaminata* (Fabricius)

1793. *Libellula contaminata*, Fabricius, *Ent. Syst.*, 2: 382.

1936. *Brachythemis contaminata*, Fraser, *Fauna Brit. India, Odonata*.3: 365-366.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male and one female.

**Distribution:** Throughout India.

**Remarks :** Very commonly seen on stones.

#### *Bradinopyga geminata* (Rambur)

1842. *Libellula geminata* Rambur, *Ins. Nevrop.* p. 90.

1911. *Bradinopyga geminata* Ris, *Cat. Coll Selys, fasc.*, 13: 545 & 548; Fraser, 1936, *Fauna Brit. India Odon.*: 349-350.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** India: Bihar, Central India. Haryana, Maharashtra, Orissa, Peninsular India, Rajasthan, Uttar Pradesh and West Bengal

**Remarks :** Very common along dry open area.

#### *Crocothemis servilia* (Drury)

1770. *Libellula servilia* Drury, *III. Ins.*, 1: 112-113; Rambur, 1842, *Ins. Nevrop.* p. 80.

1868. *Crocothemis servilia* Brauer, *Verh. zool. -bot. Ges. Wien.*, 18: 737.

1936. *Crocothemis servilia servilia* Fraser, *Fauna Brit. India Odon.*, 3: 345-347.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male and one female.

**Distribution:** Throughout India.

**Remarks :** Common throughout during winter and summer.

***Diplocodes trivialis* (Rambur)**

1842. *Libellula trivialis*, Rambur, *Ins. Neurop.*; 115.

1936. *Diplocodes trivialis*, Fraser, *Fauna Brit. India, Odonata*.3: 336-338.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male and one female.

**Distribution:** Throughout India.

**Remarks :** Very common in warmer conditions.

Subfamily : Libellulinae

***Lathrecista asiatica* (Rambur)**

1798. *Libellula asiatica* Fabricius, *Ent. Syst.,Suppl.* p.283.

1909. *Lathrecista asiatica asiatica* Ris, *Cat. Coll. Selys, fasc.*, 9: 129-132; Fraser, 1918, *J. Bombay nat. Hist. Soc.*, 26: 147-149; Fraser, 1936, *Fauna Brit. India Odon.*, 3: 281-284.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** India: West Bengal.

**Remarks :** Very rare found near rocks pools and similar small water condition.

***Orthetrum glaucum* (Brauer)**

1865. *Libellula glauca* Brauer, *Verh. zool.- bot. Ges. Wien*, 15: 1012.

1890. *Orthetrum glaucum* Kirby, *Cat. Odon.* p.39; Fraser, 1936, *Fauna Brit. India Odon.*, 3: 307-309.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** India: India: Arunachal Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, West Coast, and Western Himalaya.

**Remarks :** Commonly found in the shrubs and dry twigs.

***Orthetrum Sabina* (Drury)**

1770. *Libellula sabina*, Drury, *III. Exot. Int.*, 1: 114.

1936. *Orthetrum sabina*, Fraser, *Fauna Brit. India, Odonata*: 3: 300-302.

1995. *Orthetrum sabina sabina*, Prasad and Varshney, *Oriental Ins.*, 29: 409.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** India: Bihar, Bilaspur, Himachal Pradesh, Kangra, Maharashtra, Sirmaur, and Uttaranchal.

**Remarks :** Commonly found in the dry twigs and aquatic plants.

Subfamily: Trameinae

***Pantala flavescens* (Fabricius)**

1798. *Libellula flavescens*, Fabricius, *Ent. Syst. Suppl.*, 285.

1936. *Pantala flavescens*, Fraser, *Fauna Brit. India, Odonata*. 3: 414-416.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male and one female.

**Distribution:** India: Circumtropical and subtropical in distribution (Throughout India).

**Remarks :** Very commonly seen just before and after monsoon.

Subfamily : Trithemistinae

***Trithemis festiva* (Rambur)**

1842. *Libellula festiva*, Rambur, *Ins. Neurop.*, 92

1936. *Trithemis festiva*, Fraser, *Fauna Brit. India, Odonata*. 3:387-389.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** India: Assam; Himachal Pradesh, Maharashtra, Uttaranchal and West Bengal.

**Remarks :** During summer months, good population of this species has been recorded in Pandharkawada forest.

Suborder: Zygoptera

Family: Coenagrionidae

Subfamily: Agrionemidinae

***Agriocnemis pygmaea* (Rambur)**

1842. *Agriocnemis pygmaea*, Rambur, *Ins. Neurop.* 278.

1933. *Agriocnemis pygmaea*, Fraser, *Fauna Brit. India, Odonata*, 1: 398 – 401.

1988. *Agriocnemis pygmaea*, Prasad and Ghosh, *Rec. zool. Surv. India*. 85 (2): 203.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** Throughout India.

**Remarks :** Very common along the grass weeds.

***Mortonagrion varalli* Fraser**

1920. *Mortonagrion varalli*, Fraser, *J. Bombay nat. Hist. Soc.*, 27: 148.

1933. *Mortonagrion varalli*, Fraser, *Fauna Brit. India, Ddon.*, 1 : 409-411.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** India: Western Ghats, Goa, and Kerala and Maharashtra.

**Remarks :** Commonly found especially after first summer showers.

Subfamily : Argiinae

***Argia apicalis* (Say)**

1839. *Argia apicalis* Say, *J. Acad. Nat. Sci, Phila.* 8:40

1865. *Argia apicalis* Seys, *Bull. Acad. Sci, Belg.* 20:414

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one female.

**Distribution:** India: Arunachal Pradesh, Assam, Chhattisgarh, Delhi, Goa, Jharkhand, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Punjab, Sikkim, Tamil Nadu, Uttarakhand, and West Bengal.

**Remarks :** Large colonies are found in woods associated with ponds and marshes.

Subfamily: Ischnurinae

***Enallagma vesperum* Calvert**

1919. *Enallagma vesperum* Calvert, *Trans. Amer. Ent. Soc.* 45:379

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one female.

**Distribution:** India: Andhra Pradesh, Assam, Bihar, Chhattisgarh, Madhya Pradesh, Maharashtra, Manipur, Tamil Nadu, Tripura Uttarakhand and Uttar Pradesh.

**Remarks :** Very rarely collected during June and July.

***Ischnura verticali* (Say)**

1876 *Ischnura verticali* Seys, *Bull. Acad. Sci. Belg.* 41: 265

1839 *Agrion verticalis* Say, *J. Acad. Nat. Sci, Phila.* 8:37

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one female.

**Distribution:** India: Maharashtra, Manipur, Himachal Pradesh, South India and Uttar and Pradesh.

**Remarks :** Very rarely found in the marshes.

***Rhodischnura nursei* (Morton)**

1907. *Ischnura nursei*, Morton, *Trans. Ent. Soc. Lond.* pp. 306-307.  
 1919. *Rhodischnura nursei*, Laidlaw, *Rec. Indian Mus.*, 16 : 171, 177-  
 1933. *Rhodischnura nursei*, Fraser, *Fauna Brit. India, Odon.*, 1 : 369-371.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one female.

**Distribution:** India: Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Malabar, Orissa, Punjab, Rajasthan, and Uttarakhand.

**Remarks :** Rarely found in temporarily wet habitats.

Subfamily: Pseudagrionine

***Ceriagrion olivaceum* Laidlaw**

1914. Laidlaw, *Ceriagrion olivaceum*, *Rec. Indian Mus.*, 8 : 345-346.  
 1933. Fraser, *Ceriagrion olivaceum*, *Fauna Brit. India, Odon.*, 1 : 324-326.  
 1983. Mitra, *Ceriagrion olivaceum olivaceum*, *Ent. Mon. Mag.*, 119 : 29.  
 2000. Tsud~, *Ceriagrion olivaceum*, *A distributional list of World Odonata*, p. 29.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one female.

**Distribution:** India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Orissa, Tamil Nadu and West Bengal.

**Remarks :** Commonly observed along streams.

***Pseudagrion indicum* Fraser**

1924. *Pseudagrion indicum*, Fraser, *Rec. Indian Mus.*, 26 : 428, 495-497.  
 1933. *Pseudagrion indicum*, Fraser, *Fauna Brit. India, Odon.*, 1 : 303-304.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** India: Karnataka, Kerala, Nilgiris, Maharashtra, Tamil Nadu, and Western Ghats.

**Remarks :** This species can be seen in vegetation at the margins of lakes in forest.

***Pseudagrion rubriceps* Selys**

1876. *Pseudagrion rubriceps*, Selys, *Bull. Acad. Beig.*, (2) 42 : 510.  
 1933. *Pseudagrion rubriceps*, Fraser, *Fauna Brit. India, Odon.*, 1 : 296-299.  
 1954. *Pseudagrion rubriceps rubriceps*, Lieftinck, *Treubia*, 22 (suppl.) : 60.  
 1991. *Pseudagrion rubriceps rubriceps*, Tsuda, *A distributional list of World Odonata*, p. 46.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male and one female.

**Distribution:** Throughout India.

**Remarks :** Very commonly found in bushes close to marshes.

Family: Platycnemididae

Subfamily: Platycnemidinae

***Copera vittata* Laidlaw**

1914. Laidlaw, *Copera vittata assamensis*, *Rec. Indian Mus.*, 8 : 342-343.  
 1917. Laidlaw, *Copera vittata assanlensis*, *Rec. Indian Mus.*, 13 : 338.  
 1933. Fraser, *Copera assamensis*, *Fauna Brit. India, Odon.*, 1 : 201-203.  
 1991. Tsuda, *Copera vittata assamensis*, *A distributional list of Wor-Id Odonata*, p. 53.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one female.

**Distribution:** India: Assam, Arunachal Pradesh and Manipur. *Elsewhere:* China, Myanmar and Nepal.

**Remarks :** Very rarely seen in grasslands.

Family : Lestidae

Subfamily : Lestinae

***Lestes praemorsus* Kirby**

1933. *Lestes praemorsa praemorsa*, Fraser, *Fauna Brit. India, Odon.*, **1**: 30-33.

2000. *Lestes praemorsus decipiens*, Tsuda, *A distributional list of World Odonata*, p. 63.

**Material examined:** Maharashtra, Yavatmal district, Pandharkawada forest, one male.

**Distribution:** India : Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Goa, Madhya Pradesh, Nagaland, Odisha, Sikkim, Uttarakhand, Uttar Pradesh and West Bengal.

**Remarks :** Very rarely in dry twigs and aquatic plants.

**DISCUSSION**

In the present investigation, 21 species Odonata belonging to 19 genera 11 subfamily and five families were recorded from Pandharkawada forest. In which suborder Anisoptera (dragonflies) represented by 10 species with 9 genera, 5 subfamilies and 2 families and suborder Zygoptera (damselflies) represented by 11 species with 10 genera, 6 subfamilies and 3 families. Families Coenagrionidae and Libellulidae showed highest dominance with (9 species each) followed by Platynemididae, Lestidae and Aeshnidae showed less species diversity and represented by only one species.

*Trithemis festiva* was the dominant species followed by *Pantala flavescens*, *Brachythemis contaminata* and *Diplocodes trivialis*. Species such as *Crocothemis servilia*, *Agriocnemis pygmaea*, *Mortonagrion varralli*, *Pseudagrion rubriceps*, *Anax immaculifrons* and *Orthetrum glaucum* which usually occur in forest areas were also recorded. *Enallagma vesparum* and *Copera vittata* were not observed in first year observation but they recorded in second year observation during last summer and pre monsoon period.

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