



ADDITIONAL RECORDS OF ODONATA (INSECTA) FROM PARAMBIKULAM WILDLIFE SANCTUARY, KERALA, INDIA.

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INTRODUCTION

Emiliyamma and Radhakrishnan (2000) reported 25 species of Odonata (Insecta) from Parambikulam Wildlife Sanctuary, Kerala, India. A subsequent survey in the Sanctuary yielded information on 14 more species of Odonata (Table-1), thus expanding the list up to 39 species under 26 genera and 7 families. The study reveals the occurrence of four species viz., *Agriocnemis pieris*, *Pseudagrion indicum*, *Caconeura risi* and *Epithemis mariae*, which are endemic to Western Ghats (Subramanian, 2007), in the Sanctuary. A systematic list and a key of all the species hitherto known from the Sanctuary are provided.

SYSTEMATIC LIST

Order ODONATA

Suborder ANISOPTERA

Family AESHNIDAE

1. *Anax immaculifrons* Rambur, 1842#

Family LIBELLULIDAE

2. *Brachythemis contaminata* (Fabricius, 1793)#
3. *Cratilla lineata* Foerster
4. *Crocothemis servilia* (Drury, 1770)
5. *Diplacodes trivialis* (Rambur, 1842)
6. *Epithemis mariae* (Laidlaw, 1915)*
7. *Neurothemis fulvia* (Drury, 1773)

8. *Neurothemis intermedia* (Rambur, 1842)
9. *Neurothemis tullia* (Drury, 1773)
10. *Orthetrum chrysis* (Selys, 1891)#
11. *Orthetrum glaucum* (Brauer, 1865)#
12. *Orthetrum luzonicum* (Brauer, 1868)#
13. *Orthetrum pruinosum neglectum* (Rambur, 1842)
14. *Orthetrum sabina* (Drury, 1770)
15. *Palpopleura sexmaculata* (Fabricius, 1787)
16. *Pantala flavescens* (Fabricius, 1798)
17. *Potamarcha congener* (Rambur, 1842)
18. *Rhodothemis rufa* (Rambur, 1842)#
19. *Rhyothemis variegata* (Linnaeus, 1763)
20. *Tholymis tillarga* (Fabricius, 1798)
21. *Tramea limbata* (Desjardins, 1832)#
22. *Trithemis aurora* (Burmeister, 1839)
23. *Trithemis festiva* (Rambur, 1842)
24. *Trithemis kirbyi* Selys, 1891
25. *Zygonyx iris malabarica* Fraser, 1926

Suborder ZYGOPTERA

Family CALOPTERYGIDAE

26. *Neurobasis chinensis* (Linnaeus, 1758)
27. *Vestalis apicalis* Selys, 1873
28. *Vestalis gracilis* (Rambur, 1842)

29. *Vestalis gracilis montana* (Fraser, 1934)

Family CHLOROCYPHIDAE

30. *Rhinocypha bisignata* Hagen in Selys, 1853

Family COENAGRIONIDAE

31. *Agriocnemis pieris* Laidlaw, 1919*, #

32. *Agriocnemis pygmaea* (Rambur, 1842)

33. *Ceriagrion coromandelianum* (Fabricius, 1798)#

34. *Pseudagrion indicum* Fraser, 1924*, #

35. *Pseudagrion rubriceps* Selys, 1876 #

Family PLATYCNEMIDIDAE

36. *Copera marginipes* (Rambur, 1842)#

37. *Copera vittata deccanensis* Laidlaw

Family PROTONEURIDAE

38. *Caconeura risi* (Fraser, 1931)*, #

39. *Prodasineura verticalis annandalei* (Fraser, 1921)#

* Endemic to Western Ghats

Additional records

SYSTEMATIC ACCOUNT

1. *Anax immaculifrons* Rambur, 1842

Material examined: 1 Male, Venkoli, 10-xii-2007, Coll. K.G. Emiliyamma and party. *Male:* Thorax pale bluish green dorsally, turquoise blue on sides with a broad black stripe; 1st abdominal segment jet black, segments 2 & 3 turquoise blue, remaining segments black on apical half, pale reddish brown towards base; wings colored with amber yellow from tip to base of discoidal cell. *Female:* similar to the Male, but the turquoise blue replaced by pale greenish yellow on thorax and base of abdomen; segment 1 warm reddish brown instead of black; wings palely tinted.

Distribution: Throughout India and Oriental Region.

2. *Brachythemis contaminata* (Fabricius, 1793)

Material examined: 1 Female, Thellickal, 9-xii-2007, Coll. K.G. Emiliyamma and Party.

This species is recognized by its wing colouration. *Male:* wings having a reddish reticulation with bright orange broad band extending from wing base to pterostigma in forewing and hindwing, this band variable in extent and depth of colour according to the age of specimen. *Female:* hind wings very palely tinted with yellow at base, bright orange band seen in the *Male* absent; abdomen with a narrow black stripe on middorsal carina extending from segment 2 to 10.

Distribution: All over India and Oriental region.

3. *Orthetrum chrysis* (Selys, 1891)

Material examined: 1 *Male*, Kariyilathodupalam, 8-xii-2007; 1 *Male*, Thellickal, 9-xii-2007, coll. K.G. Emiliyamma and party. *Male:* Bright red; eyes, frons and abdomen bright red; thorax dark reddish brown; wings with a dark golden-brownish yellow spot at base of hind wing extending to the first antenodal nervure. *Female:* the red colour replaced by bright brownish yellow throughout; wings without yellow basal marking.

Distribution: Himachal Pradesh, Orissa, south Andaman Islands and Western Ghats.

4. *Orthetrum glaucum* (Brauer, 1865)

Material examined: 1 Male, Thellickal, 9-xii-2007; 1 Female, Muthuvan's Colony, 11-xii-2007, coll. K.G. Emiliyamma and party. *Male:* labium, labrum and frons glossy black; thorax pruinose dark blue or black; extreme base of wings with dark yellowish brown; abdomen pruinose blue from segment 1 to 8, segments 9 and 10 black. Sub adults Male and Female: labium, labrum, and face olivaceous brown; thorax olivaceous on mid dorsum, bordered by reddish brown humeral stripe; laterally reddish brown with two yellowish white narrow stripes; wings similar to the *Male*; abdomen reddish brown with two yellowish white narrow stripes; wings similar to the *Male*; abdomen reddish brown with a broad greenish yellow stripe on mid dorsum extending from segments 1 to 7; segments 8, 9 and bases of 10 black on mid dorsum.

Distribution: Oriental Region.

5. *Orthetrum luzonicum* (Brauer, 1868)

Material examined: 1 Male, Thellickal, 9-xii-2007, coll. K.G. Emiliyamma and party. *Male:* labrum, face and frons pale bluish or greenish yellow; thorax pale olivaceous green dorsally, a broad reddish brown humeral stripe bordered in front with black; laterally three brown stripes; wings hyaline, *Cui* in hind wing arising well away from the posterior angle of discoidal cell; abdomen pruinosed blue, the sides of segments 1, 2 and base of 3 bright yellow. Female and sub-adult Male: sides of thorax palest green with fine black sutures lateral brown stripes absent; wings similar to the *Male*; abdomen greenish yellow, with black markings, a broad black stripe on each side of segments 4 to 8, segments 9 and 10 black or 10 with an oval yellow dorsal spot.

Distribution: Throughout india and south East Asia.

6. *Tramea limbata* (Desjardins, 1832)

Material examined: 1 Male, Venkoli, 10-xii-2007, coll. K.G. Emiliyamma and party. *Male:* This species can be easily separated from other species of the genus by its hindwing base with a narrow, single black spot, not invading base of anal loop; nervures in this area are reddish; the spot is not surrounded by golden areola; thorax with a reddish tinge on dorsum; abdomen blood red, marked with black on last three segments.

Female: Exactly similar to Male; balck markings of abdomen broad.

Distribution: Throughout India, Oriental region.

7. *Rhodothemis rufa* (Rambur, 1842)

Material examined: 1 Female, Muthuvan's colony, 11-xii-2007, coll. K.G. Emiliyamma and party. *Male:* Eyes, frons and vesicle blood red; thorax reddish-brown; wings with a dark amber yellow spot at base of fore and hindwings; costa and basal neuration reddish; abdomen and anal appendages brilliant scarlet red. *Female:* A bright

citron yellow stripe starting from prothorax, running through thorax (split into two antehumeral stripes), between the root of wings and ends on the abdominal segment 4. Eyes reddish-brown above, olivaceous below; frons bright citron yellow; thorax golden-golden-brown laterally, blackish brown dorsally; abdomen dark golden-brown, segments 5 to 9 with a pair of citron yellow spots.

Distribution: Oriental region.

8. *Agriocnemis pieris* Laidlaw, 1919

Material examined: 3 Male, Thellickal, 9-xii-2007; 2 Male, Venkoli, 10-xii-2007, Coll. K.G. Emiliyamma and party. *Male:* thorax black, marked with pink antehumeral stripe; laterally blue with black spot; wings hyaline, pterostigma pale yellow or pink with the center black or gray enclosed in thick black nervures; abdomen pale blue, deepening on the distal four segments, marked with black; segment 2 with an anchor shaped dorsal marking, sometimes the flukes of anchor enclosed two small blue spots. *Female:* More robust than Male, wings with pterostigma golden yellow, abdomen broadly marked with black from segments 1 to 9, segments 8 and 9 entirely black with a narrow blue stripe on 8, segment 10 with a square shaped black mark.

Distribution: Endemic to Western Ghats.

9. *Ceriagrion coromandelianum*
(Fabricius, 1798)

Material examined: 1 Female, Thellickal, 9-xii-2007, coll, K.G. Emiliyamma and party. *Male:* This species can easily be distinguished by the bright citron yellow abdomen, without marking; thorax uniformly olive-green, tinted with ochreous on dorsum, citron-yellow on sides, Female: more robust and dull coloured than male; thorax golden olivaceous brown, paler at the sides and beneath; abdomen uniformly olivaceous, with golen brown tint on dorsum, which deepens on the hinder segments.

Distribution: Widely distributed in Oriental Region.

10. *Pseudagrion indicum* Fraser, 1924

Material examined: 1 Male, Thellickal, 9-xii-2007, coll. K.G. Emiliyamma and party. *Male:* thorax green on dorsum, azure blue on sides, marked with medial and humeral black stripes; beneath white; abdomen azure blue on segments 1, 2 and basal half of 3, 3 to 7 greenish laterally; 8 to 10 azure blue; segment 2 with a goblet shaped black mark; 3 to 7 with broad dorsal stripe, 8 to 9 azure blue, with broad dorsal annules and segment 10 black. *Female:* Differs from the male in colour and markings, thorax grass green on dorsum, pale yellowish green on sides; three fine parallel black lines on mid dorsal carina and a fine black humeral line; abdomen azure blue, markings similar to Male; segment 2 with a thistle head marking on dorsum; segments 8 and 9 black with fine blue rings, segment 10 entirely blue.

Distribution: Endemic to Western Ghats.

11. *Pseudagrion rubriceps* Selys, 1876

Material examined: 1 Male, 1 Female, Thellickal, 9-xii-2007 1 Female, Venkoli, Coll. K.G. Emiliyamma and party. *Male:* This species can be easily recognized by the reddish orange colour on labrum, face, vertex and frons; thorax golden green on dorsum, azure blue on sides, dorsum with two thick black stripe; humeral stripe narrow and sinuous; abdomen marked with black on dorsum; segment 2 with a goblet shaped marking on dorsum. *Female:* Differs in colour and markings from the male: labrum, face, vertex and occiput uniform dark olivaceous thorax with markings similar to the male, but the ground colour of the dorsum dull bluish green; posterior lobe of prothorax with two short forwardly directed spines at the base; abdomen with dorsal markings broader.

Distribution: Oriental Region.

12. *Copera marginipes* (Rambur, 1842)

Material examined: 1 Female, Thellickal, 9-xii-2007, coll. K.G. Emiliyamma and party. *Male:* The two hind pairs of tibiae bright orange, moderately dilated; superior anal appendage only one fourth

the lengths of inferiors; female with posterior lobe of prothorax without spines.

Distribution: Throughout India and Oriental Region.

13. *Caconeura risi* (Fraser, 1931)

Material examined: 2 Male, Muthuvan's colony, 11-xii-2007, coll. K.G. Emiluyamma and party. *Male:* Small species, lunder surface of head azure blue; abdominal segments 3 to 7 with narrow blue basal annules; superior anal appendage with a tiny sub basal tooth or spine. Abdomen black, marked with blue as follows; segment 1 almost entirely blue, marked on the dorsum with a broad black band; segment 2 unmarked on dorsum, broadly blue at the sides; segments 3 to 7 with narrow blue basal annules; segments 8 to 10 entirely blue.

Distribution: Western Ghats, Northeast India extending to Southeast Asia.

14. *Prodasineura verticalis annandalei* (Fraser, 1921)

Material examined: 1 Male, Kariyilathodupalam, 8-xii-2007, coll. K.G. Emiliyamma and party. The key characters are wings with Cuii vein extending only 4 cells in length; Iriii arising distal to the subnode. *Male:* thorax velvet black, marked with very narrow brick red antehumeral stripes; abdomen black, marked with pale. *Female:* More robust than the Male, and markings pale creamy white instead of bright red or ochreous; posterior lobe of prothorax armed with 1 or 2 pairs of strongly curved hooks; thorax black with yellow antehumeral stripes; abdomen similar to the Male, but the sides of all segments rather broadly yellow.

Distribution: Western Ghats, Northeast India extending to Southeast Asia.

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REFERENCES

- Fraser, F.C. 1933. The Fauna of British India, including Cylon and Burma, Odonata, Vol. **1**, pp XII+428. Taylor and Francis Ltd., London.
- Fraser, F.C. 1934. The Fauna of British India, including Cylon and Burma, Odonata, Vol. **2**, pp XII+398. Taylor and Francis Ltd., London.
- Fraser, F.C. 1936. The Fauna of British India, including Cylon and Burma, Odonata, Vol. **3**, pp XII+461. Taylor and Francis Ltd., London.
- Emiliyamma, K.G. and Radhakrishna, C. 2000. Odonata (Insecta) of Parambilulam Wildlife Sanctuary, Kerala, India. *Rec. zool. Surv. India*, **98**(Part-1): 157-167.
- Subramanian, K.A. 2007. Endemic Odonates of the Western Ghats: Habitat, distribution and conservation. In : *Biology of Odonata* (Ed. Tyagi, B.K.) : 257-271. Published by Scientific Publisher, Jodhpur, India.