

Table 2. Relative abundance of butterfly families in Madurai City.

Family	No. of species and relative abundance
Danaidae	5 (15.15%)
Acraeidae	1 (3.03%)
Satyridae	1 (3.03%)
Lycaenidae	5 (15.15%)
Pieridae	6 (18.18%)
Papilionidae	5 (15.15%)
Nymphalidae	10 (30.31%)
Total	33

terrestris.

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ADDITIONS TO THE ODONATA (INSECTA) OF THIRUVANANTHAPURAM DISTRICT, KERALA

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Peters (1981) reported 26 species of Odonata from Thiruvananthapuram District of Kerala State, southern India. The present study is based on the Odonata collections made from this district, during the faunistic surveys conducted by Zoological Survey of India (Western Ghats Field Research Station, Calicut and Southern Regional Station, Chennai) in 1997, 1998 and 2001. As a result of these surveys, 27 species and subspecies of Odonata belonging to 17 genera and seven families could be collected and identified. Of these, 17 species and subspecies are new additions to the Odonata fauna of Thiruvananthapuram District. Accordingly, till date a total of 43 species and subspecies of Odonata are known from this district. A systematic list of all the 43 species recorded from the district and a systematic account of the species collected during the current surveys are provided below. The specimens studied are deposited in the faunal depository of the Zooligcal Survey of India, Kozhikode.

The nomenclature followed here is after Fraser (1933, 1934, 1936) and Tyagi (1997).

Systematic list

Order: Odonata
Suborder: Zygoptera
Superfamily: Coenagrionoidea

Coenagrionidae

1. * *Aciagrion occidentale* Laidlaw
2. *Agriocnemis keralensis* Peters
3. *Agriocnemis pygmaea* (Rambur)
4. *Agriocnemis splendidissima* Laidlaw
5. *Ceriagrion cerinorubellum* (Brauer)
6. *Ceriagrion coromandelianum* (Fabricius)
7. * *Ischnura aurora aurora* Brauer
8. * *Ischnura senegalensis* (Rambur)
9. *Mortonagrion varralli* Fraser

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10. * *Pseudagrion malabaricum* Fraser
 11. * *Pseudagrion rubriceps* Selys

Platycnemididae

12. *Copera marginipes* (Rambur)
 13. * *Copera vittata* (Selys)

Protoneuriidae

14. *Caconeura verticalis annandalei* Fraser
 15. * *Indoneura risi* (Fraser)

Superfamily: Lestoidea

Lestidae

16. * *Lestes elata* Hagen

Superfamily: Calopterygoidea

Calopterygidae

17. * *Vestalis apicalis apicalis* Selys
 18. * *Vestalis gracilis gracilis* (Rambur)
 19. * *Vestalis gracilis montana* Fraser

Chlorocyphidae

20. * *Rhinocypha bisignata* (Selys)

Suborder: Anisoptera

Superfamily: Libelluloidea

Libellulidae

21. *Acisoma panorpoides* Rambur
 22. *Aethrimanta brevipennis brevipennis* Rambur
 23. *Brachydiplax chalybea* Brauer
 24. *Brachythemis contaminata* (Fabricius)
 25. *Bradinopyga geminata* (Rambur)
 26. *Crocothemis servilia* (Drury)
 27. *Diplacodes trivialis* (Rambur)
 28. *Lathrecista asiatica asiatica* (Fabricius)
 29. *Neurothemis tullia tullia* (Drury)
 30. *Orthetrum chrysostigma* Selys
 31. * *Orthetrum chrysostigma luzonicum* Brauer
 32. * *Orthetrum pruinatum neglectum* (Rambur)
 33. *Orthetrum sabina* (Drury)
 34. *Pantala flavescens* (Fabricius)
 35. *Potamarcha obscura* Rambur
 36. *Rhodothemis rufa* (Rambur)
 37. *Rhyothemis variegata variegata* (Linnaeus)
 38. *Tholymis tillarga* (Fabricius)
 39. *Tramea limbata* (Rambur)
 40. * *Trithemis aurora* (Burmeister)
 41. * *Trithemis festiva* (Rambur)
 42. * *Trithemis pallidinervis* (Kirby)
 43. *Zyxomma petiolatum* Rambur

* Additions to the Odonata fauna of Thiruvananthapuram

Systematic account**1. *Aciagrion occidentale* Laidlaw**

Aciagrion hisopa (Selys)? race *occidentalis* Laid., Rec. Ind. Mus. Vol. xvi, p. 186 (1919).

Material examined: One female, one male, 27.iii.1998, Kallar River site; one female, one male, 25.iii.1998, Kovalam, coll. P.T. Cherian.

Distribution: Southern India and Sri Lanka

2. *Agriocnemis pygmaea* (Rambur)

Agrion pygmaeum Ramb. Ins. Nevrop p. 278 (1842); Brauer, verh. zool.-bot. Ges. Wien, Vol. xiv, p. 161 (1864); id., Reise, 'Novara', p. 103 (1866).

Material examined: Four females, five males, 25.iii.1998, Kovalam; five exs., 1.iv.1998, Vamanapuram River; 3.iv.1998, five exs, Paighat; 27.iii.1998, one male, Kallar River site, coll. P.T. Cherian; one female, 16.xii.1997, Vely, coll. M.B. Raghunathan; three females, one male, 14.iii.2001, Attingal; two females, three males, 17.iii.2001, Parassala; one female, 17.iii.2001, Neyyattinkara; one female, three males, 16-iii-2001, Kulasekaram, coll. K.C. Gopi.

Distribution: Throughout India

Remarks: Peters (1981) recorded this species from Kovalam.

3. *Ceriagrion cerinorubellum* (Brauer)

Pyrrhosoma cerinorubellum Brauer, verh. zool.-bot. Ges. Wien, Vol. xv, p. 511. (1865)

Material examined: Three females, 3.iv.1998, Paighat, coll. P.T. Cherian; one female, two males, 18.iii.2001, Vithura-Chathankodu, coll. K.C. Gopi.

Distribution: Throughout India

Remarks: Peters (1981) recorded this species from Thiruvananthapuram.

4. *Ceriagrion coromandelianum* (Fabricius)

Agrion coromandelianum Fabr., Syst. Suppl. p. 287 (1798)

Material examined: One male, 14.iii.2001, Thenmalaiurukunnu; one female, one male, 14.iii.2001, Attingal; two males, 18.iii.2001, Vithura-Chathankodu; one female, four males, 17.iii.2001, Parassala; one female, two males, 17.iii.2001, Neyyattinkara, coll. K.C. Gopi.

Distribution: Throughout India

Remarks: Peters (1981) has recorded this species from Kovalam & Thiruvananthapuram.

5. *Ischnura aurora aurora* Brauer

Agrion delicatum Hagen, Verh. zool.-bot. Ges. Wien, Vol. viii, p. 479 (1858)

Material examined: One male, 18.iii.2001, Chathankodu, coll. K.C. Gopi.

Distribution: Throughout India

6. *Ischnura senegalensis* (Rambur)

Agrion senegalensis Ramb., Ins. Nevrop. p. 276 (1842); Selys,

Rev. Odon. p. 186 (1850).

Materials examined: Three males, 25.iii.1998, Kovalam, coll. P.T. Cherian.

Distribution: Throughout India

7. *Pseudagrion malabaricum* Fraser

Pseudagrion malabaricum Fras., Rec. Ind. Mus. Vol. xxvi, pp. 428, 494-5 (1924); id., ibid. Vol. xxxiii, pp. 448, 465 (1931)

Material examined: Five males, 18.iii.2001, Vithura-Chathankodu, coll. K.C. Gopi.

Distribution: India: Tamil Nadu and Western Ghats

Remarks: Abdominal segments one to seven, metallic greenish-black on dorsum, azure blue on sides.

8. *Pseudagrion rubriceps* Selys

Pseudagrion rubriceps Selys, Bull. Acad. Belg. (2) Vol. xiii, p. 510 (1876).

Material examined: Two females, one male, Kallar, 15.iii.2001, coll. K.C. Gopi.

Distribution: Throughout India

Remarks: In male, with three fine black lines terminating before the mid dorsum and humeral with two black lines not reaching base. In one of the females, thorax light brown bearing three fine black stripes on dorsum, humeral with two thin black stripes and anal appendages black.

9. *Copera marginipes* (Rambur)

Platycnemis marginipes Ramb. Ins. Nevrop. p. 240 (1842)

Material examined: Four females, six males, 16.iii.2001, Kulasekaram, coll. K.C. Gopi; one female, 2.iv.1998, Anchuthengu; one male, 9.iv.1998, Thenmalai urukunnu, coll. P.T. Cherian.

Distribution: Widely distributed throughout southern Asia and the Sondaic Islands.

Remarks: Peters (1981) recorded this species from Thiruvananthapuram.

10. *Copera vittata* (Selys)

Psilocnemis vittata selys, Bull. Acad. Belg. (2) Vol. xvi, p. 170 (1863); id., Mem. Cour. Vol. xxxviii, P. 121, (1886).

Material examined: One male, 16.iii.2001, Kulasekaram, coll. K.C. Gopi.

Distribution: Throughout India

Remarks: The black stripe and its pattern on head, more resemble with specimens from Bengal and Myanmar.

11. *Indoneura risi* (Fraser)

Indoneura risi Fras., Rec. Ind. Mus. Vol. xxxiii, pp. 449, 469-471, (1931).

Material examined: Five males, 16.iii.2001, Kulasekaram; one male, 18.iii.2001, Vithura - Chathankodu, coll. K.C. Gopi.

Distribution: Western Ghats

Remarks: Head with a light blue stripe across the front and a thin

blue stripe on the posterior border of the head, all other parts of head, black; second abdominal segment pale blue on sides and with a broad black stripe on dorsum.

12. *lestes elata* Hagen

Lestes elata Hagen, Verh. zool.-bot. Ges. Wien. Vol. viii, p. 478 (1858).

Material examined: One female, 25.iii.1998, Kovalam, coll. P.T. Cherian.

Distribution: Peninsular India

13. *Vestalis apicalis apicalis* Selys

Vestalis apicalis Selys. Bull. Acad. Belg. (2) Vol. xxxvi, p. 612, (1873).

Material examined: Three males, 16.iii.2001, Kulasekaram, coll. K.C. Gopi.

Distribution: Eastern Ghats, Western Ghats, northeastern India, West Bengal.

14. *Vestalis gracilis gracilis* (Rambur)

Calopteryx gracilis Rambur, Ins. Nevrop. p. 224 (1842).

Material examined: One male, 15.xii.1997, Kovalam, coll. M.B. Raghunathan.

Distribution: Andaman & Nicobar Islands, Bihar, West Bengal, Western Ghats

15. *Vestalis gracilis montana* Fraser

Vestalis gracilis amoena Fraser, J. Bombay nat. Hist. Soc. Vol. xxxiii, p. 583 (1929)

Material examined: One female, 16.iii.2001, Kulasekaram, coll. K.C. Gopi.

Distribution: Southern India.

16. *Rhinocypha bisignata* Selys

Rhinocypha bisignata Selys, Syn. Cal. p. 62 (1853)

Material examined: Two males, 15.iii.2001, Ponmudi, coll. K.C. Gopi; one male, 28.iii.1998, Golden Valley; one male, 29.iii.1998, way to Chankiri, coll. P.T. Cherian.

Remarks: In one of the male specimens from Ponmudi, the pterostigma is black with pale creamy centre as in the pterostigma of female.

Distribution: Southern India and Maharashtra.

17. *Crocothemis servilia* (Drury)

Libellula servilia Drury, III. Ex. Ins. Vol. i, pl. x1vii, fig. 6, pp. 112, 113 (1770); Rambur, Ins. Nevrop. P. 80 (1842).

Material examined: One female, 16.iii.2001, Kulasekaram, coll. K.C. Gopi; one female, one male, 2.iv.1998, Anchuthengu, coll. P.T. Cherian.

Distribution: Throughout India.

Remarks: Recorded by Peters (1981) from Kovalam and Karamana.

18. *Diplacodes trivialis* (Rambur)

Libellula trivialis Rambur, Ins. Nevrop. p. 115 (1842); Hagen, Verh. zool.-bot. Ges. Wien, Vol. viii, p. 480, (1858); Selys Ann. Soc. Ent. Belg. Vol. xii, p. 95 (1869).

Material examined: One female, 24.iii.1998, Neyyar Dam site; one male, 25.iii.1998, Kovalam; one female, one male, 28.iii.1998, Golden Valley; one female, one male, 29.iii.1998, way to Chankiri; one female, 30.iii.1998, Mottanood River, coll. P.T. Cherian; two males, 18.iii.2001, Chatankodu; one female, two males, 16.iii.2001, Kulasekaram; one male, 17.iii.2001, Parassala, coll. K.C. Gopi.

Distribution: Throughout India

Remarks: Recorded by Peters (1981) from Kovalam and Thiruvananthapuram.

19. *Neurothemis tullia tullia* (Drury)

Libellula tullia Drury, III. Exot. Ins. Vol. ii, pl.xvi, fig. 3, p. 85 (1773).

Material examined: Three females, one male, 3.iv.1998, Paighat, coll. P.T. Cherian; two males, 14.iv.1997, Vely, coll. M.B. Raghunathan; two males, 14.iii.2001, Attingal; three males, 17.iii.2001, Parassala; two males, one female, 17.iii.2001, Neyyattinkara; one female, one male, 18.iii.2001, Vithura-chathankodu, coll. K.C. Gopi.

Distribution: Throughout Peninsular India.

Remarks: Peters (1981) recorded this species from Thiruvananthapuram.

20. *Orthetrum chrysostigma luzonicum* Brauer

Libella luzonica Brauer, verh. zool.-bot. Ges. Wien. Vol. xviii, pp. 169, 732 (1868).

Material examined: One male, 15.iii.2001, Kallar, coll. K.C. Gopi

Distribution: Throughout India

Remarks: A teneral male with pale yellow body.

21. *Orthetrum pruinatum neglectum* (Rambur)

Libellula neglecta Rambur, Ins. Nevrop. p. 86 (1842).

Material examined: One male, 16.iii.2001, Kulasekaram; one male, 17.iii.2001, Neyyattinkara, coll. K.C. Gopi.

Distribution: Throughout India

22. *Orthetrum sabina* (Drury)

Libellula sabina Drury, Ill. Exot. Ins. Vol. i, pp. 114-115 (1770).

Material examined: One male, 18.xii.97, Karamana, Coll. M.B. Raghunathan; one female, 17.iii.2001, Parassala; one female, 15.iii.2001, Kallar, coll. K.C. Gopi.

Distribution: Throughout India

Remarks: Peters (1981) recorded this species from Kovalam and Thiruvananthapuram.

23. *Pantala flavescens* (Fabricius)

Libellula flavescens Fabricius, Ent. Syst. Suppl. p. 285 (1798); Hagen, stett. Ent. Zeit. Vol. xvii, pp. 366, 369-70 (1856); Selys, Hist. Cuba. p. 442 (1857).

Material examined: Five males, 17.xii.1997, Tropical Botanic Garden, Palode, coll. M.B. Raghunathan.

Distribution: Throughout India

Remarks: Peters (1981) recorded this species from Kovalam and Thiruvananthapuram.

24. *Tramea limbata* (Desjardins)

Libellula limbata Desjardins, Rapport Soc. Maurice, 1 (1832); id., Ann. Soc. Ent. Frane Bull. Vol. iv, p. iii (1835); Selys, Maillard, Reunion 11, k.p. 34 (1862); id., Pollen & Van Dam, Madgas, Ins. p. 22 (1869).

Material examined: One female, 30.iii.1998, Mottanood River, coll. P.T. Cherian.

Distribution: Throughout India

Remarks: This species has been recorded from Kovalam in 1981 by Peters.

25. *Trithemis aurora* (Burm.)

Libellula aurora Burmeister, Handb. Ent. Vol. ii, p. 859 (1839).

Material examined: One male, 15.iii.2001, Kallar, coll. K.C. Gopi; one female, one male, 28.iii.1998, Golden Valley; one male, 30.iii.1998, Mottanood River, coll. P.T. Cherian.

Distribution: Throughout India

26. *Trithemis festiva* (Rambur)

Libellula festiva Rambur, Ins. Nevrop. p. 92 (1842).

Material examined: One male, 28.iii.1998, Golden Valley, coll. P.T. Cherian

Distribution: Throughout India

27. *Trithemis pallidinervis* (Kirby)

Sympetrum pallidinervis Kirby, Trans. Zool. Soc. Lond. Vol. xii, p. 327, Pl. 1v, fig.4 (1889)

Material examined: One male, 27.iii.1998, Kallar River site, coll. P.T. Cherian.

Distribution: Throughout India

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