

INSECTA : ODONATA

K.A. SUBRAMANIAN¹ and PRIYANKA DUTTA SAHA²

1. Zoological Survey of India, M-Block, New Alipore, Kolkata

2. Zoological Survey of India, Western Regional Centre, Pune

INTRODUCTION

The order Odonata comprising of suborders Zygoptera, Anisozygoptera and Anisoptera are one of most primitive groups of insects. The larvae are aquatic and adults are terrestrial. The larval and adult habitats are highly species specific. They are very sensitive to changes in terrestrial and wetland habitat quality and are reliable indicators of ecosystem health. Globally 5,740 species of odonates are known of this 470 species in 139 genera and 19 families exist in India (Subramanian, 2009).

The Odonata fauna of northern Western Ghats was earlier explored by Fraser (1924, 1932, 1933-36). The Odonata of the Western Ghats is characterized by high levels of endemism and habitat-restricted species. They are also threatened with various anthropogenic impacts (Subramanian *et.al.*, 2011). Recent studies on the odonate fauna of northern Western Ghats are species checklists based on field surveys (Prasad, 1987; Kulkarni *et al.*, 2006a and 2006b; Kulkarni and Talmale, 2009) and provide updated information on Odonata of the region. However, there were no specific studies on Odonata diversity of Chandoli National Park and hence this study was carried out.

MATERIALS AND METHODS

Adult Odonata were collected from streams, reservoir banks and forest trek paths of the national park by different survey teams with a hand held sweep net. Few representative samples were collected for identification. Dried specimens were identified by consulting Fraser (1933-1936). Species which are very common and easily identifiable in the field were not collected but was recorded.

RESULTS AND DISCUSSION

A total of 58 adult Odonates were collected and studied. The Odonata fauna of the national park comprise of 17 species in 14 genera, 6 families and 2 suborders. The family Libellulidae dominated the Odonata fauna of the National Park with 8 genera and 11 species. All the 17 species recorded are very widespread in the Oriental region and there were no Western Ghats endemics. However, *Rhynocypha bisignata* is restricted to peninsular India. Species such as *Vestalis gracilis gracilis* and *Rhynocypha bisignata* breed in streams and other in lentic habitats such as marshes and pools.

SYSTEMATIC LIST

Order : **ODONATA**

Suborder : **ZYGOPTERA**

Superfamily : **CALOPTERYGOIDEA**

Family : **CALOPTERYGIDAE**

Subfamily : **CALOPTERYGINAE**

Genus: ***Vestalis*** Selys, 1853

1. *Vestalis gracilis gracilis* (Rambur) 1842

Family : **CHLOROCYPHIDAE**

Genus : ***Rhinocypha*** Rambur, 1842

2. *Rhinocypha bisignata* Hagen in Selys, 1853

Superfamily : **COENAGRIONOIDEA**

Family : **COENAGRIONIDAE**

Subfamily : **PSEUDAGRIONINAE**

Genus : ***Pseudagrion*** Selys, 1876

3. *Pseudagrion hypermelas* Selys, 1876

Subfamily : **AGRIOCNEMIDINAE**

Genus : ***Agriocnemis*** Selys, 1877

4. *Agriocnemis splendidissima* Laidlaw, 1919

Family : **PLATYCNEMIDIDAE**

Subfamily : **PLATYCNEMIDINAE**

Genus : ***Copera*** Kirby, 1890

5. *Copera marginipes* (Rambur) 1842

Superfamily : **LESTOIDEA**

Family : **LESTIDAE**

Subfamily : **LESTINAE**

Genus: ***Lestes*** Leach, 1815

6. *Lestes elatus* Hagen in Selys, 1862

Suborder : **ANISOPTERA**

Superfamily : **LIBELLULOIDEA**

Family : **LIBELLULIDAE**

Subfamily : **SYMPETRINAE**

Genus : ***Brachythemis*** Brauer, 1868

7. *Brachythemis contaminata* (Fabricius) 1793

Genus : ***Bradinopyga*** Kirby, 1893

8. *Bradinopyga geminata* (Rambur) 1842

Genus : ***Diplacodes*** Kirby, 1889

9. *Diplacodes trivialis* (Rambur) 1842
Genus : **Crocothemis** Brauer, 1868
10. *Crocothemis servilia servilia* (Drury, 1770)
Subfamily : LIBELLULINAE
Genus : **Orthetrum** Newman, 1833
11. *Orthetrum chrysis* (Selys) 1891
12. *Orthetrum glaucum* (Brauer) 1865
13. *Orthetrum pruinosum* Burmeister, 1839
Subfamily : PALPOPLEURINAE
Genus : **Palpopleura** Rambur, 1842
14. *Palpopleura sexmaculata sexmaculata* (Fabricius) 1787
Subfamily : TRAMEINAE
Genus : **Pantala** Hagen, 1861
15. *Pantala flavescens* (Fabricius) 1798
Subfamily : TRITHEMISTINAE
Genus : **Trithemis** Brauer, 1868
16. *Trithemis aurora* (Burmeister) 1839
17. *Trithemis festiva* (Rambur) 1842

SYSTEMATIC ACCOUNT

Order : ODONATA
Suborder : ZYGOPTERA
Superfamily : CALOPTERYGOIDEA
Family : CALOPTERYGIDAE
Subfamily : CALOPTERYGINAE
Genus : **Vestalis** Selys, 1853

1. *Vestalis gracilis gracilis* (Rambur) 1842

1842. *Calopteryx gracilis*, Rambur, *Ins. Neurop.*, :224.

1934. *Vestalis gracilis gracilis*, Fraser, *Fauna Brit. India, Odon.*, 2 : 126-128.

Material examined: 1 male, 8.xii.2007, Nivalegaon, compt.no. 31, Coll. S.G.Patil; 1 male, 2 females, 25.i.2008, Zolambi, Coll. P.P.Kulkarni.

Distribution: India: Assam, Bihar, Maharashtra, West Bengal.

Elsewhere: Myanmar, Thailand, Vietnam.

Family : CHLOROCYPHIDAE
Genus : **Rhinocypha** Rambur, 1842

2. *Rhinocypha bisignata* Hagen in Selys, 1853

1853. *Rhinocypha bisignata*, Selys, *Bull. Acad. Belg. 20(Annexe) Syn. Calopt.* : 214.

Material examined: 1 male, 31.iii.2009, Zolambi, Coll. P.D.Rane.

Distribution: India: Orissa, Maharashtra (Mumbai, Khandala,), Central India, South India (Cochin, Coorg, Nilgiris, Palnis, Silent Valley).

Superfamily : COENAGRIONOIDEA

Family : COENAGRIONIDAE

Subfamily : PSEUDAGRIONINAE

Genus: *Pseudagrion* Selys, 1876

3. *Pseudagrion hypermelas* Selys, 1876

1876. *Pseudagrion hypermelas*, Selys, *Bull. Acad. Belg.* (2) **42**: 519.

1933. *Pseudagrion hypermelas*, Fraser, *Fauna Brit. India, Odon.* **1**: 289-292.

Material examined: 1 male, 30.iii.2009, Lapangarh, on the way to Zolambi, Coll. P.D.Rane; 1 female, 31.iii.2009, Zolambi, Coll. P.D.Rane; 1 female, 17.ii.2010, Kasav Pani, Coll. S.S.Talmale.

Distribution: India: Bihar, Maharashtra (Mahabaleshwar, Pune), Punjab, West Bengal.

Subfamily : AGRIOCNEMIDINAE

Genus : *Agriocnemis* Selys, 1877

4. *Agriocnemis splendidissima* Laidlaw, 1919

1919. *Agriocnemis splendidissima* Laidlaw, *Rec. Indian Mus.*, **16**: 180-182.

1933. *Agriocnemis splendidissima*, Fraser, *Fauna Brit. India, Odon.*, **1** : 392-394.

Material examined: 1 female, 17.ii.2010, Mokacha Odn and around, Coll. S.S.Talmale.

Distribution: Throughout India.

Elsewhere: Australia, China, Indonesia, Myanmar, Nepal, Philippines, Papua, Sri Lanka, Singapore.

Family : PLATYCNEMIDIDAE

Subfamily: PLATYCNEMIDINAE

Genus: *Copera* Kirby, 1890

5. *Copera marginipes* (Rambur) 1842

1842. *Platycnemis marginipes* Rambur *Ins. Neurop.* : 240.

1993. *Copera marginipes*, Fraser, *Fauna Brit. India, Odon.*, **1** : 192-197.

Material examined: 1 male, 30.iii.2009, Lapangarh, on the way to Zolambi, Coll. P.D.Rane; 2 males, 1 female, 31.iii.2009, Zolambi, Coll. P.D.Rane; 2 males, 17.ii.2010, Kasav Pani, Coll. S.S.Talmale; 1 male, 18.ii.2010, Zolambi and around, Coll. S.S.Talmale.

Distribution: India: Assam, Bihar, Chandigarh, Madhya Pradesh, Maharashtra (Lone, Pune, Khandala, Hingoli, Wardha, Gondhonkher, Buldana, Amravati), Rajasthan, South Andaman Islands, West Bengal, Western Ghats and Western Himalayas.

Elsewhere: Indonesia, Malaysia, Nepal, Sri Lanka and Thailand.

Superfamily : LESTOIDEA

Family : LESTIDAE

Subfamily : LESTINAE

Genus : **Lestes** Leach, 1815

6. **Lestes elatus** Hagen in Selys, 1862

1858. *Lestes elata* Hagen, *Verh. Zool.-bot. Ges. Wein.* **18** : 478.

1933. *Lestes elata*, Fraser, *Fauna Brit. India. Odon.*, **1** : 37-40.

Material examined: 1 female, 7.xii.2007, Zolambi, Lapangarh, compt.no. 20, Coll. S.G.Patil; 3 females, 8.xii.2007, Nivalegaon, compt. no.31, Coll. S.G.Patil.

Distribution: India: Goa, Maharashtra, Orissa, Southern India (Coorg, Nilgiris, Cochin, Kanara, Bangalore), Tamil Nadu.

Elsewhere: Asia, Sri Lanka.

Remarks: Common throughout the year and found usually among dry long grasses.

Suborder : ANISOPTERA

Superfamily : LIBELLULOIDEA

Family : LIBELLULIDAE

Subfamily : SYMPETRINAE

Genus : **Brachythemis** Brauer, 1868

7. **Brachythemis contaminata** (Fabricius) 1793

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

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

Material examined: 2 male, 8.xii.2007, Dhigara Amba and around, compt. no.26, Coll. S.G.Patil.

Distribution: India: Bihar, East Himalaya, Himachal Pradesh, Madhya Pradesh, Maharashtra (Melghat Tiger Reserve, Amravati, Osmanabad, Pune, Khandala, Khed, Lonavla, Tadoba-Andhari Tiger Reserve), West Bengal.

Elsewhere: China, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Singapore, Sri Lanka and Thailand.

Remarks: It is common species in India and found in large numbers flying over water surface throughout the year.

Genus : **Bradinopyga** Kirby, 1893

8. **Bradinopyga geminata** (Rambur) 1842

1842. *Libellula geminata*, Rambur, *Ins. Neurop.* : 90.

1936. *Bradinopyga geminata*, Fraser, *Fauna Brit. India, Odon.*, **3** : 349-350.

Material examined: 2 males, 25.i.2008, Zolambi, Coll. P.P.Kulkarni.

Distribution: India: Bihar, Delhi, Eastern Himalayas, Madhya Pradesh, Maharashtra, Uttar Pradesh: Dehradun, Nainital; West Bengal.

Elsewhere: Sri Lanka.

Remarks: This species is found in cultivated and near wells, small tanks and small plastered walls. They exhibit protective and cryptic coloration and found during March to October.

Genus : *Crocothemis* Brauer, 1868

9. *Crocothemis servilia servilia* (Drury, 1770)

1770. *Libellula servilia*, Drury, *III. Ex. Ins.*, 1 : 16.

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

Material examined: 1 male, 7.xii.2007, Zolambi - Lapangarh, compt. no.20, Coll. S.G.Patil.

Distribution: India: Bihar, Himachal Pradesh, Madhya Pradesh, Maharashtra (Buldana, Colaba, Osmanabad, Pune, Khed, Lone, Amravati, Satara). WestBengal.

Elsewhere: Australia, Iraq, Indonesia, Japan, Myanmar, Philippines, Sri Lanka.

Remarks: Common species in India. Adults are seen throughout the world. Teneral males and females are identical in color (pale straw-yellow) and differ from mature males, which may confuse the identity of the species.

Genus: *Diplacodes* Kirby, 1889

10. *Diplacodes trivialis* (Rambur) 1842

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

1936. *Diplacodes trivialis*, Fraser, *Fauna Brit. India, Odon.*, 3: 336-338.

Material examined: 1 male, 6.xii.2007, Vasant Sagar and around, Coll. S.G.Patil; 1 male, 7.xii.2007, Zolambi, compt. no.21, Coll. S.G.Patil; 1 male, 7.xii.2007, Zolambi - Lapangarh, compt. no.20, Coll. S.G.Patil; 1 male, 8.xii.2007, Nivalegaon, compt. no.31, Coll. S.G.Patil; 1 male, 1.iv.2009, Niwale and around, Coll. P.D.Rane.

Distribution: Throughout India.

Elsewhere: Indonesia, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand.

Subfamily : LIBELLULINAE

Genus: *Orthetrum* Newman, 1833

11. *Orthetrum chrysis* (Selys) 1891

1891. *Libella testacea* race? *chrysis*, Selys, *Ann. Mus. Civ. Genova*, 30: 462.

1936. *Orthetrum chrysis*, Fraser, *Fauna Brit. India. Odon.*, 3 :310-311.

Material examined: 1 male, 7.xii.2007, Zolambi, compt. no.21, Coll. S.G.Patil.

Distribution: Oriental Region.

12. *Orthetrum glaucum* (Brauer) 1865

1865. *Libellula glauca*, Brauer, *Varh, zool. Bot. Ges. Wien*, 15 : 1012.

1936. *Orthetrum glaucum*, Fraser, *Fauna Brit. India, Odon.*, 3 : 307-309.

Material examined: 1 female, 7.xii.2007, Zolambi - Lapangarh, compt. no.20, Coll. S.G.Patil; 1 female, 30.iii.2009, Lapangarh, on the way to Zolambi, Coll. P.D.Rane; 1 male, 31.iii.2009, Zolambi, Coll. P.D.Rane; 1 male, 1 female, 1.iv.2009, Niwale and around, P.D.Rane; 1 male, 17.ii.2010, Mokacha Odn and around, Coll. S.S.Talmale.

Distribution: Throughout India.

Elsewhere: Java, Indonesia, Malaya Archipelago, Nepal, Papua, Philippines, South China, Sri Lanka.

13. ***Orthetrum pruinatum neglectum*** (Rambur) 1842

1842. *Libellula neglecta*, Rambur, *Ins. Neurop.*, 86.

1936. *Orthetrum pruinatum neglectum*, Fraser, *Fauna Brit. India, Odon.*, 3 : 311-313.

Material examined: 1 male, 6.xii.2007, Vasant Sagar and around, Coll. S.G.Patil; 2 males, 7.xii.2007, Zolambi- Lapangarh, compt. no.20, Coll. S.G.Patil; 1 male, 1 female, 7.xii.2007, Zolambi, compt. no.21, Coll. S.G.Patil; 1 male, 6.iii.2009, Zolambi, Coll. A.S.Mahabal; 1 male, 30.iii.2009, Lapangarh, on the way to Zolambi, Coll. P.D.Rane; 1 male, 31.iii.2009, Zolambi, Coll. P.D.Rane; 1 male, 1.iv.2009, Niwale and around, P.D.Rane; 1 male, 18.ii.2010, Zolambi and around, Coll. S.S.Talmale.

Distribution: India: Bihar, Himachal Pradesh, Maharashtra, Uttar Pradesh, Uttaranchal.

Elsewhere: Hong Kong, Nepal, Myanmar, Malaya, Sri Lanka, Thailand.

Remarks: Breeds in small tanks; also recorded from altitude of 7,250 from Ooty, Nilgiris. Variation in nodal index is recorded.

Subfamily : PALPOPLEURIINAE

Genus : ***Palpopleura*** Rambur, 1842

14. ***Palpopleura sexmaculata sexmaculata*** (Fabricius) 1787

1787. *Libellula sexmaculata* Fabricius, *Mant. Ins.* 1: 338.

1936. *Palpopleura sexmaculata sexmaculata*, Fraser, *Fauna Brit. India. Odon.*, 3 :318-320.

Material examined: 2 males, 2 females, 6.iii.2009, Zolambi, Coll. A.S.Mahabal; 1 male, 7.iii.2009, Zolambi, Coll. A.S.Mahabal; 1 male, 8.iii.2009, Niwale, Coll. A.S.Mahabal; 1 male, 31.iii.2009, Zolambi, Coll. P.D.Rane.

Distribution: India: Arunachal Pradesh, Assam, Manipur, Maharashtra, Mizoram, Nagaland, Sikkim, Tripura, Uttar Pradesh, Southern India(Kodai kanal, Palni, Nilgiris, Annaimalai, Cochin, Coorg),Tamil Nadu, West Bengal.

Elsewhere: Afghanistan, China, Hong Kong, Laos, Malaysia, Nepal, Sri Lanka, Thailand, Vietnam.

Subfamily : TRAMEINAE

Genus : ***Pantala*** Hagen, 1861

15. ***Pantala flavescens*** (Fabricius) 1798

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

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

Material examined: 1 male, 6.xii.2007, Vasant Sagar and around, Coll. S.G.Patil.

Distribution: Circumtropical and subtropical in distribution; throughout India.

Elsewhere: China, Indonesia, Malaysia, Morocco, Myanmar, Sri Lanka, and Thailand.

Remarks: Common species, breeds in marshes and weedy tanks. Large numbers of specimens emerge out and take to swarming from September to November/December.

Subfamily : TRITHEMISTINAE

Genus : *Trithemis* Brauer, 1868

16. *Trithemis aurora* (Burmeister) 1839

1839. *Libellula aurora* Burmeister, Handb Ent. 2 : 859.

1936. *Trithemis aurora*, Fraser, *Fauna Brit. India, Odon.*, 3 : 383-385.

Material examined: 1 male, 17.ii.2010, Kasav Pani, Coll. S.S.Talmale.

Distribution: Throughout India.

Elsewhere: Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka.

Remarks: It is a common species found near streams.

17. *Trithemis festiva* (Rambur) 1842

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

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

Material examined: 1 male, 7.xii.2007, Zolambi- Lapangarh, compt. no.20, Coll. S.G.Patil; 1 male, 18.ii.2010, Zolambi and around, Coll. S.S.Talmale.

Distribution: India: Assam, Bihar, Himachal Pradesh, Maharashtra (Khed, Pune, Matheran, Poladpur, Lingmal Falls, Mahabaleshwar, Bordharan, Wardha, Rajpur, Buldhana, Amaravati), Uttar Pradesh, West Bengal.

Elsewhere: Indonesia, Nepal, Myanmar, Philippines, Singapore, West Malaysia.

SUMMARY

Faunistic Survey of Chandoli National Park, District Sangli was undertaken by the Zoological Survey of India, Western Regional Station, Pune. During this survey, altogether 58 adult odonates were collected and studied which comprise of 17 species in 14 genera, 6 families and 2 suborders. The family Libellulidae dominated the Odonata fauna of the National Park with 8 genera and 11 species.

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REFERENCES

- FRASER, F.C. 1932. Additions to the survey of odonate fauna of Western India, with descriptions of nine new species. *Rec. Indian Mus.* 32: 443-474.
- FRASER, F.C. 1924. A Survey of The Odonate (Dragonfly) Fauna of Western India with Special Remarks on the Genera *Macromia* and *Idionyx* and descriptions of thirty new species with Appendices I, II. *Rec. Indian Mus.* (A Journal of Indian Zoology). Vol. 26, Part V. 423-522.
- FRASER, F.C. 1933. The Fauna of British India, including Ceylon and Burma, Odonata, Vol.1, *Taylor & Francis Ltd., London*, : 1-423

- FRASER, F.C. 1934. The Fauna of British India, including Ceylon and Burma, Odonata, Vol.2, *Taylor & Francis Ltd., London*, : 1-398
- FRASER, F.C. 1936. The Fauna of British India, including Ceylon and Burma, Odonata, Vol.3, *Taylor & Francis Ltd., London*, : 1-461
- KULKARNI, P. P. and Talmale, S. S. 2009. Insecta: Odonata. In: Fauna of Bhimashankar Wildlife Sanctuary, Dist. Pune (Maharashtra). *Conservation Area Series*, **42**: 231-250.
- KULKARNI, P.P., Talmale, S. S. and Prasad, M. 2006a. Insecta: Odonata. In: Fauna of Sanjay Gandhi National Park (Invertebrates), *Conservation Area Series* **26**: 19-40.
- KULKARNI, P.P., Talmale, S. S. and Prasad, M. 2006b. Insecta : Odonata. In: Fauna of Tadoba-Andhari Tiger Reserve (Maharashtra), *Conservation Area Series*, **25**:197-226.
- PRASAD, M. 1987. A note on the Odonata from South India. *Fraseria*, No.12:50.
- SUBRAMANIAN, K.A. 2009. A Checklist of Odonata (Insecta) of India. Zoological Survey of India, Kolkata. Online: www.zsi.gov.in
- SUBRAMANIAN, K.A., Francy Kakkassery and Manoj.V.Nair. 2011. The Status and Distribution of Dragonflies and Damselflies (Odonata) of the Western Ghats: In-Molus,S., Smith, K.G., Daniel, B.A. and Darwall, W.R.T (Compilers). 2011. The Status and Distribution of Freshwater Biodiversity in the Western Ghats, India. Cambridge, UK and Glad, Switzerland: IUCN and Coimbatore, India: Zoo Outreach Organization. Pages 63-72.