

FURTHER ADDITIONS TO THE ODONATA (INSECTA) FAUNA OF GOA, INDIA

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The first peer reviewed work on the odonate fauna for the State of Goa was by Prasad (1995) wherein 22 species were reported. The Fauna of Goa: State Fauna Series (Kulkarni & Talmale 2008) by Zoological Survey of India added another 17 species to the list by Prasad, thereby increasing the tally to 39. Rangnekar et al. (2010) further added 34 species to the State list. Recently, Subramanian et al. (2013) described *Idionyx gomantakensis*, a species new to science collected from Collem, Goa based on samples collected by the authors. Thus, a total of 74 species were so far known from the State. In the present communication we report an additional 13 species from the State of Goa.

The authors surveyed varied habitats in the State of Goa from August 2011 to July 2012, especially forest habitats to document the odonate diversity. The surveyed sites are listed in Table 1.

Individual specimens were photo-documented from various angles and these images were cross-checked with identification manuals for identification (Images 1–13). Collection and killing was avoided for species which could be visually identified. For difficult species, specimens were collected using sweep nets, kept in paper envelopes

and then preserved in 70% alcohol. The collected specimens were identified using standard field guides (Fraser 1933, 1934, 1936; Subramanian 2005). The specimen are maintained with the corresponding author for further investigations and will be deposited in a recognised repository in the future

Of the species documented during the survey, 13 species are new records for the state. Of these, five species are endemic to the Western Ghats. A detailed, systematic account of the species is given below:

Suborder: Anisoptera

Family: Aeshnidae

1. *Gynacantha dravida* Lieftinck, 1960

Material examined: 1 male, 9.v.2012, coll. Rohan Naik

Distribution: Painguinim, Kapileshwari (Canacona)

Comment: The species was observed along forest paths under dense forest canopy with very little sunlight. The species was found active during overcast conditions.

Family: Gomphidae

2. *Gomphidia kodaguensis* Fraser, 1923

Material examined: 1 male, 18.v.2012, coll. Parag Rangnekar

Distribution: Mainapi (Sanguem), Collem and Dabhal (Dharbandhora)

Comments: The species is seen in flight from March to June along forest streams and rivers. This record extends its distribution northwards into the northern Western Ghats.



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Table 1. Survey locations

	Location	Taluka	District	Habitat
1	Savari	Sanguem	South Goa	Perennial hill stream
2	Ambeghat	Sanguem	South Goa	Hill stream with cascade
3	Collem	Dharbandhora	South Goa	Fast flowing, canopy laden river
4	Vichundrem	Sanguem	South Goa	Streams through paddy fields
5	Jakem	Sanguem	South Goa	Streams through paddy fields
6	Pachmi	Ponda	North Goa	Seasonal stagnant water body at the base of a hill
7	Karmali	Tiswadi	North Goa	Perennial lake and nearby paddy fields
8	Shivde	Dharbandhora	South Goa	Hill stream
9	Nirankal	Ponda	North Goa	Slow flowing stream
10	Dapodem	Sanguem	South Goa	Paddy fields
11	Mayem	Bicholim	North Goa	Lake
12	Dudhsagar	Dharbandhora	South Goa	Fast flowing hill stream
13	Sacorda	Dharbandhora	South Goa	Hill stream
14	Hivre	Sattari	North Goa	Hill stream
15	Charavane	Sattari	North Goa	Hill stream
16	Tambdi-Surla	Dharbandhora	South Goa	Hill stream
17	Barabhoomi	Dharbandhora	South Goa	Hill stream
18	Vante	Sattari	North Goa	River
19	Vaiguinim	Sattari	North Goa	Hill stream
20	Panshi	Dharbandhora	South Goa	River
21	Curtorim	Salcette	South Goa	Lake

	Location	Taluka	District	Habitat
22	Raitale	Salcette	South Goa	Lake
23	Pernem	Pernem	North Goa	Stream with adjoining paddy fields
24	Madkai	Ponda	North Goa	Lake
25	Kaskond	Dharbandhora	South Goa	Hill stream
26	Satpal	Dharbandhora	South Goa	Hill streams
27	Fulamol	Canacona	South Goa	Hill stream
28	Dabhel	Canacona	South Goa	Hill stream
29	Painguinim	Canacona	South Goa	Stream with paddy fields
30	Sonauli	Dharbandhora	South Goa	Hill stream
31	Mainapi	Sanguem	South Goa	Hill stream
32	Ponsuli	Sanguem	South Goa	Hill stream
33	Ganjem	Ponda	North Goa	River
34	Opa	Ponda	North Goa	River
35	Kodar	Ponda	North Goa	River
36	Keri	Ponda	North Goa	Hill stream
37	Bhironda	Sattari	North Goa	River
38	Macazana	Salcette	South Goa	Lake
39	Kapileshwari	Ponda	North Goa	Stream with paddy fields
40	Mapusa	Bardez	North Goa	Stagnant drains
41	Tulshimol	Canacona	South Goa	Pond

3. *Merogomphus longistigma* (Fraser, 1922)

Material examined: 1 male, 1 female, 23.ix.2011, coll. Parag Rangnekar & Rohan Naik

Distribution: Vichundre (Sanguem)

Comments: The species was observed during the monsoons. The species has a habit of perching on low vegetation along streams. This record extends its distribution northwards into the northern Western Ghats.

4. *Megalogomphus hannyingtoni* (Fraser, 1923)

Material examined: None. Sighted on 18.v.2012

Distribution: Mainapi (Sanguem)

Comment: The individual was identified based on images from various angles since efforts to collect a

specimen were in vain. The species is seen in flight from March to June along forest streams and rivers. This record extends its distribution northwards into the northern Western Ghats.

Family: Libellulidae

5. *Onychothemis testacea* (Ris, 1912)

Material examined: 1 male, 11.v.2012, coll. Parag Rangnekar & Rohan Naik

Distribution: Sonauli (Dharbandhora)

Comments: The species was observed during the summer season in the month of March along forest streams and rivers. The species does not prefer open areas like the Gomphids and keeps to shady places in the river with overhanging vegetation, where a number of

individuals of both sexes can be sighted.

6. *Urothemis signata* (Rambur, 1842)

Material examined: None

Distribution: Karmali (Tiswadi), Mapusa (Bardez), Curtorim (Salcette)

Comment: The individuals were identified based on images and hence collection was not necessary. This species prefers open tanks and lakes with reed-beds.

7. *Zygonyx iris malabarica* Fraser, 1926

Material examined: 1 male, 11.v.2012, coll. Parag Rangnekar & Rohan Naik

Distribution: Doodhsagar, Collem (Dharbandhora), Mainapi (Sanguem)

Comments: The species is seen hovering along forest streams. Very rarely can one see an individual perched. The species can be easily identified in flight by the metallic colours and the characteristic yellowish spot on the 7th abdominal segment.

Family: Macromiidae

8. *Epophthalmia vittata* Burmeister, 1839

Material examined: 1 male, 4.x.2011, coll. Rohan Naik

Distribution: Karmali (Tiswadi), Curtorim (Salcette), Satpal (Dharbandhora), Collem (Sanguem)

Comments: The species is a strong flier and is seen patrolling along the banks of large water tanks and lakes. The species is sighted in forest habitats as well. Very rarely can one sight an individual perched.

Suborder: Zygoptera

Family: Coenagrionidae

9. *Archibasis oscillans* (Selys, 1877)

Material examined: 1 male, 10.v.2012, coll. Rohan Naik

Distribution: Paiguinim (Canacona)

Comments: The species was sighted among the reeds around water tanks. The pale body color and the shape of the pterostigma separate it from other genus of the Marsh Darts such as *Pseudagrion*.

10. *Ceriagrion rubiae* Laidlaw, 1916

Material examined: 1 male, 2.ii.2012, coll. Rohan Naik

Distribution: Panshi (Ponda), Satpal (Dharbandhora)

Comments: This species was sighted in a variety of habitats, especially near the ephemeral lateritic pools.

11. *Pseudagrion rubriceps* Selys, 1876

Material examined: 1 male, 1 female, 24.i.2012, coll. Rohan Naik

Distribution: Mhadei (Sattari), Ganje (Ponda), Dabhal (Dharbandhora), Satpal (Dharbandhora), Pernem

Comments: The species was sighted along streams and rivers mostly in groups.

Family: Platystictidae

12. *Protosticta sanguinostigma* Fraser, 1922

Material examined: Four males, 25.iv.2012, 9.v.2012, 11.v.2012, 28.v.2012, coll. Parag Rangnekar, Rohan Naik & Shridhar Halali

Distribution: Collem, Dabhal (Dharbandhora), Mainapi, Savari (Sanguem)

Comments: The species can be differentiated from other of its genus by its blood-red pterostigma. The species is in flight from the beginning of the monsoons till the end of the monsoons after which the sightings seem to decrease. This record extends its distribution northwards into the northern Western Ghats.

Family: Protoneuridae

13. *Caconeura ramburi* (Fraser, 1922)

Material examined: 2 males, 28.v.2012, coll. Parag Rangnekar

Distribution: Collem (Dharbandhora), Mainapi (Sanguem)

Comments: The species is best sighted along small hill streams with good forest cover. The species is sighted during pre-monsoons and more commonly during the monsoons.

Discussion

With the addition of 13 new records for the State, the tally of odonate diversity stands at 87. Of these five are endemic to the Western Ghats. The study also adds one family Macromiidae not reported earlier from the State. Compared to the known diversity of Odonates from Peninsular India, which is around 200, the present species count is surely an underestimate. We strongly believe that sustained and co-ordinated efforts are necessary for documenting the odonate diversity of the state. This is possible through networking between the government and researchers for which the department of forest can act as the nodal agency. Further, since odonates are indicator species, it is necessary that other than diversity, abundance studies and long-term monitoring need to be taken up for major water bodies in the state.

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Image 1. *Caconeura ramburi*Image 2. *Ceriagrion rubiae*Image 3. *Pseudagrion rubriceps*Image 4. *Protosticta sanguinostigma* - FemaleImage 5. *Protosticta sanguinostigma* - MaleImage 6. *Gynacantha dravida*

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Image 7. *Merogomphus longistigma*



Image 8. *Megalogomphus hanningtonii*



Image 9. *Onycothemis testacea*



Image 10. *Urothemis signata*



Image 11. *Zygonix iris*



Image 11. *Zygonix iris*



Image 13. *Gomphidia koduguensis*

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