



## Four new records of dragonflies (Insecta, Odonata) from Amboli region of Western Ghats, Maharashtra, India

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**ABSTRACT:** *Microgomphus souteri* Fraser, 1924, *Macromia flavocolorata* Fraser, 1924, *M. irata* Fraser, 1924 and *Idionyx corona* Fraser, 1921 are reported from Maharashtra State for the first time. The records are the northern most distribution range for the respective species. Brief description with identification characters of the species is provided. © 2023 Association for Advancement of Entomology

**KEYWORDS:** Genera *incertae sedis*, Gomphidae, Hiranyakeshi, Nangartas, range extension

The Western Ghats mountain range, a global biodiversity hotspot, is divided into three biogeographic regions namely northern, central and southern Western Ghats (Kuriakose and Sebastian, 2016). Fraser (1933, 1934, 1936) and many others (Subramanian *et al.*, 2018; Nair *et al.*, 2021) did comprehensive documentation in this region. A major part of this biodiversity hotspot lies in the State of Maharashtra. Tiple and Koparde (2015) enlisted 134 Odonata species from the Maharashtra State. After that many species have been added to the Odonata list by Joshi and Sawant (2019, 2020), Mujumdar *et al.* (2020), Kalkman *et al.* (2020), Bhakare *et al.* (2021), Koli and Dalvi (2021), Koli *et al.* (2021), Dalvi and Koli (2022), Joshi *et al.* (2022a, b) and Payra *et al.* (2022). Sawant *et al.* (2022) added six more species to the list and revised the total number of Odonata species to 144.

Amboli region is known for high floral and faunal diversity. The landscape around Amboli is varied

with patches of evergreen forest, riparian habitats, open lateritic plateaus with grasslands, and moist deciduous forests at mid and low elevations (Sawant *et al.*, 2022). Due to the unique location at the junction of northern and central Western Ghats and drastic variations in habitats, it harbors many odonate species (Subramanyam and Nayar, 1974; Sawant *et al.*, 2022). In this paper, four new State records of dragonflies from family Gomphidae and Genera *incertae sedis* with their brief diagnosis and distribution map are presented.

Hiranyakeshi (15.95 °N; 74.02 °E, 840 m asl) and Nangartas (15.99 °N; 74.06 °E, 790 msl) area of Amboli village of Sawantwadi Taluka, Sindhudurg District, Maharashtra State was surveyed in June 2022 for documenting odonates. Samples from non-protected areas were collected and photographed for the purpose of identification and their morphological features. Field photographs were taken with DSLR cameras and macro lenses

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(Canon Inc. and Nikon Inc., Japan). Species were identified based the identification keys given in the standard literature (Fraser, 1934, 1936; Subramanian *et al.*, 2018; Joshi *et al.*, 2022a). Systematic arrangement of the species follows Kalkman *et al.* (2020). The general terminology used in description follows Garrison *et al.* (2006).

From the collections of odonates, four species were found to be new records for Maharashtra State. All these observations are in the northern most range extensions of Western Ghats. Taxonomical and distributional notes are follows-

### 1. *Microgomphus souteri* Fraser, 1924

(Figs. 1A-F)

Locality: Hiranyakeshi, Amboli; Habitat: Hill stream surrounded by trees; 06.vi.2022; 3m, 2f, 15.95°N; 74.02 °E; 840 msl.

Locality: Nangartas, Amboli; Habitat: Hill stream with bushes; 19.vi. 2022; 15.99°N; 74.06°E; 790 m above sea level (m asl).

Identification: Small size, peculiar scissor-like male caudal appendages with medial branch of cerci longer than that of the lateral, mesothoracic collar interrupted at the middle, absent antehumeral spot, lesser markings on abdomen and unmarked segment 9-10.

Notes: Earlier, *Microgomphus souteri* was known from Coorg and South Kanara (Fraser, 1934). Subramanian *et al.* (2018) plotted the distribution from Kerala to Goa State. Recently Dattaprasad Sawant photographed a female of *M. souteri* at Hadpid village, Sindhudurg District, Maharashtra (Joshi *et al.*, 2022b) (Fig. 1E). However the presence of the species was confirmed after the close observation of male caudal appendages found in Amboli, hence extending the distribution range up to the Maharashtra State. Previously, from *Microgomphus* genus only *M. torquatus* Selys, 1854 was reported from Maharashtra (Tiple and Koparde, 2015). Both the *Microgomphus* spp. are unique in terms of small size and scissor-like cerci. *Microgomphus torquatus* has its range till Karnataka and yet to be found in more southern

parts of India (Subramanian *et al.*, 2018), whereas *M. souteri* now has its range from Maharashtra to Kerala. In Amboli, a collective population of around 20 individuals was found in Hiranyakeshi and Nangartas area. The Gomphid is very shy and gets disturbed by the slightest movement. They tend to perch on small bushes and hop around when they get disturbed.

### 2. *Macromia flavocolorata* Fraser, 1924 (Fig. 2)

Locality: Nangartas, Amboli; Habitat: Hill stream with bushes; 20.vi.2022; 1f, 15.99°N; 74.06°E; 790 m asl.

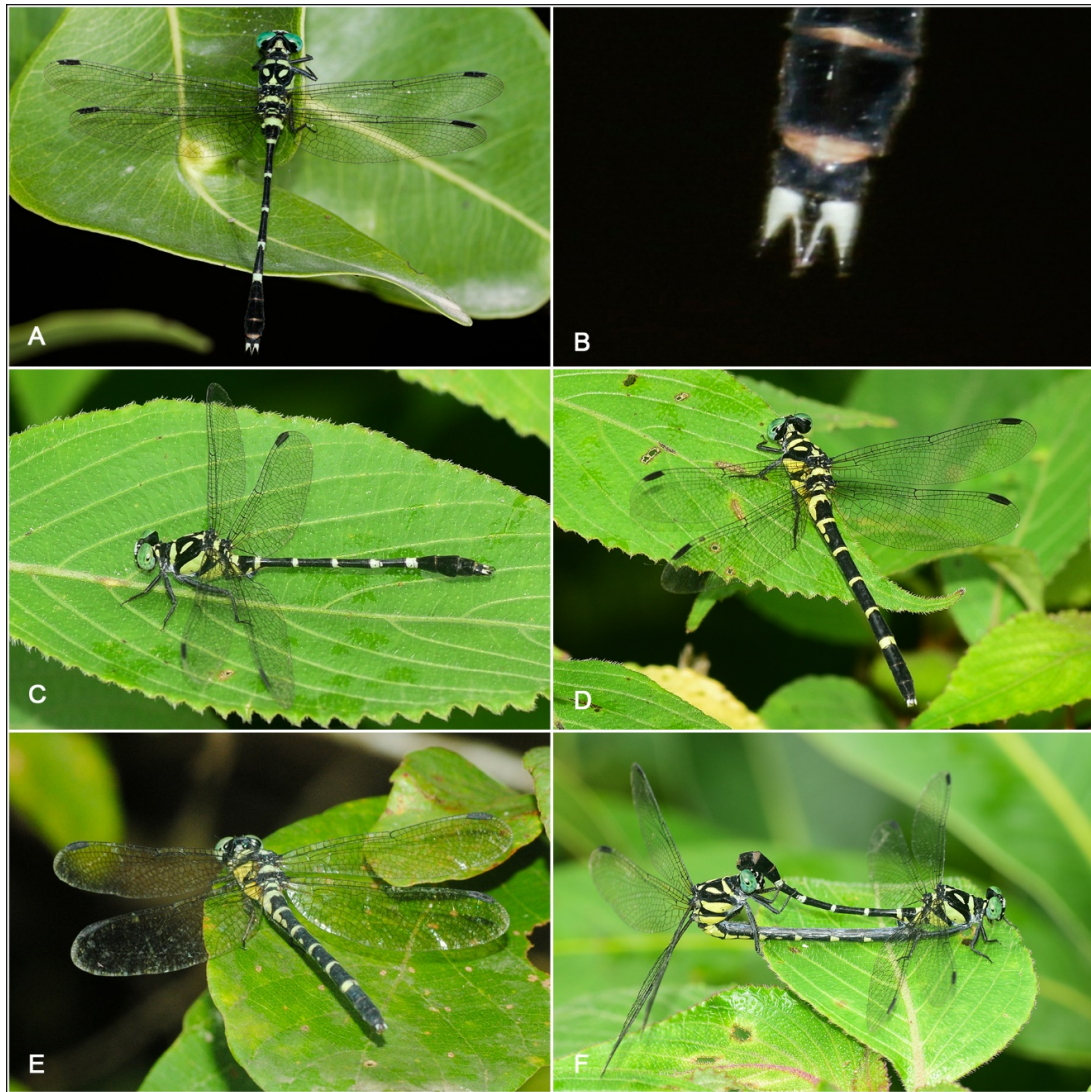
Identification: A pair of yellow spots on labrum base, reddish-brown wing base, well defined humeral stripes, segment 7 with large yellow annular ring at base, segment 8 with large basal triangular yellow spot and quadrate spot on each side, vulvar scale with deep cleft forming two conical lobes (Figs. 2D-F).

Notes: Earlier, *M. flavocolorata* was known from Karnataka, Kerala, Tamil Nadu and West Bengal within Indian limits, and from China, Lao People's Democratic Republic, Myanmar, Nepal, Thailand and Viet Nam (Subramanian *et al.*, 2018). A *Macromia* male was photographed in Sadavali village, Ratnagiri District and identified as *M. flavocolorata* on the basis of photographs (Joshi *et al.*, 2022a). However no specimen was observed or collected. Thus, our record confirms its presence in the State and extends its distribution range. *M. flavocolorata* Fraser, 1924 is unique in terms of facial and thoracic markings.

### 3. *Macromia irata* Fraser, 1924 (Fig. 3)

Locality: Nangartas, Amboli; Habitat: Hill stream with bushes; 12.vi.2022; 2m, 2f, 15.99°N; 74.06°E; 790 m asl.

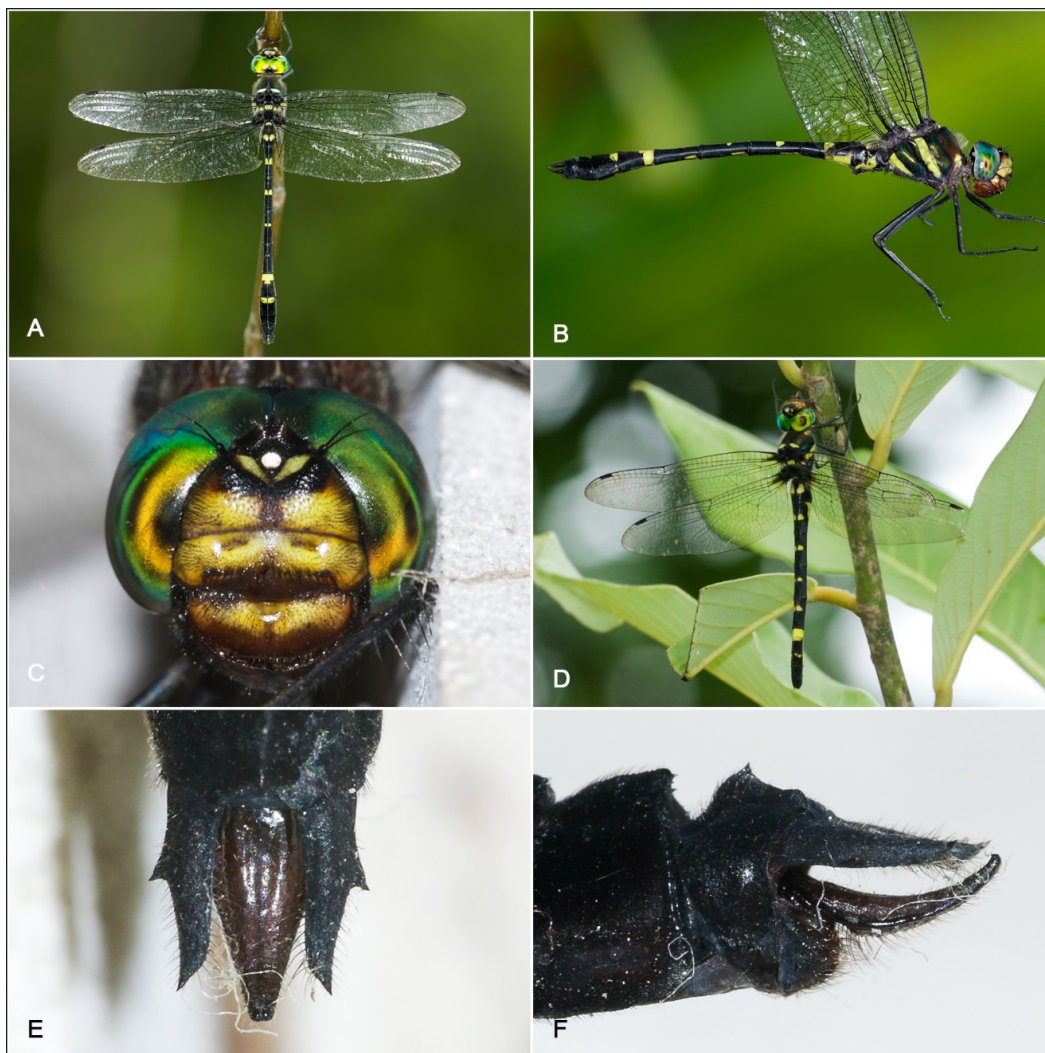
Identification: Male with diamond shaped yellow spots on dorsum of segment 2, peculiar yellow markings at segment 8, robust spine on dorsum of segment 9, cerci shorter than paraprocets (Figs. 3A-C, E-F) and female having similar markings on segment 2 and 8, brownish pigmentation at the wing base (Fig. 3D).



**Fig. 1** *Microgomphus souteri* Fraser, 1924: A–Male from Hiranyakeshi; B–Close up of male caudal appendages; C–Male from Nangartas; D–Female from Nangartas; E–Female from Hadpid; F–Copula from Nangartas (Photos: A, B– Hemant Ogale; C–F– Dattaprasad Sawant)



**Fig. 2** *Macromia flavocolorata* Fraser, 1924 (Female): A–Lateral habitus; B–Lateral view of head and thorax; C–Dorsal view of head and thorax; D–Front view of head; E–Dorsal view of abdomen end segments; F–vulvar scales (Photos:DattaprasadSawant)



**Fig. 3** *Macromia irata* Fraser, 1924: A–Male dorsal habitus; B–Male lateral habitus; C–Front view of head of male; D–Female lateral habitus; E–Dorsal view of male caudal appendages; F–Lateral view of male caudal appendages (Photos: Hemant Ogale)

Notes: *M. irata* is endemic to the Western Ghats and known from Karnataka and Kerala (Subramanian *et al.*, 2018). *M. irata* Fraser, 1924 is unique in terms of caudal appendages and diamond shaped mark on segment 2. These observations extend the distribution range up to Maharashtra. Both *M. flavocolorata* and *M. irata* were found in Nangartas stream hovering at a great speed.

#### 4. *Idionyx corona* Fraser, 1921 (Fig. 4)

Locality: Hiranyakeshi, Amboli; Habitat: Hill stream surrounded by trees; 05.vi.2022; 1m; 15.95°N: 74.02°E; 840 m asl. (Figs. 4B-C).

Locality: Hiranyakeshi, Amboli; Habitat: Hill stream surrounded by trees; 09.vi.2022; 2m, 1f; 15.95°N: 74.02°E; 840 m asl. (Figs. 4A, D-F).



**Fig. 4** *Idionyx corona* Fraser, 1921: A–Male from Hiranyakeshi; B–Male from Hiranyakeshi; C–Male dorso-lateral habitus; D–Female from Hiranyakeshi; E–Dorsal view of male caudal appendages; F–Lateral view of male caudal appendages (Photos: A, D, E, F– Hemant Ogale; B, C– Dattaprasad Sawant)

Identification: caudal appendages with longer paraprocts than cerci and tiny spine-like projections on the upper border of paraprocts (Figs. 4E-F).

Notes: Previously *I. corona* was split into two subspecies namely, *I. corona corona* and *I. corona burliyarensis*, which were distinguished by the shape of spine of paraprocts (Fraser 1924). However *I. corona burliyarensis* is currently considered a synonym of *I. corona* (Kalkman *et*

*al.*, 2020; Paulson *et al.*, 2022). Earlier *I. corona* was known from Karnataka, Kerala, Tamil Nadu (Subramanian *et al.*, 2018; Joshi *et al.*, 2022b). This is the second species from the *Idionyx* genus reported from Maharashtra State after *I. saffronata*. These observations are the northernmost record of the species and extend its distribution range. *I. corona* is the second species to be reported from Maharashtra State, after *I.*

*saffronata* Fraser, 1924 (Sawant *et al.*, 2022). A good number of both species were observed flying high in the skies at Hiranyakeshi throughout the early June. Females of *I. corona* Fraser, 1921 can be easily distinguished even in flight by their dark pigmentation of wings. They prefer tall trees of Hiranyakeshi to perch early in the morning and late in the evening.

Amboli-Chaukul-Parpoli region is one of the most bio-diverse regions in the northern Western Ghats. Being situated at the junction of northern and central Western Ghats, Amboli shares common flora and fauna of these two regions. The area was surveyed for Odonata documentation and it was found to have 93 species with ~16 per cent Western Ghats endemic species (Sawant *et al.*, 2022b). The four species reported are the addition to Odonata fauna of Amboli region as well as Maharashtra State. In the last two years Amboli has revealed other six new State records of odonates and a new species *Burmagomphus chaukulensis* Joshi, Ogale and Sawant, 2022 (Joshi *et al.*, 2022b; Sawant *et al.*, 2022). However, Sawant *et al.* (2022) did not include three species namely, *Archibasis oscillans* Selys, 1877, *Burmagomphus chaukulensis* and *Merogomphus tamaracherriensis* Fraser, 1931 in the list of Maharashtra State. These three species are recorded from the state (Dalvi and Koli, 2022; Joshi *et al.*, 2022; Sawant and Kambli, 2023). Therefore along with the current four records, Maharashtra State now has 152 Odonata species from 13 families. Earlier, except *M. souteri* other three species were known till the southern region of Karnataka. The present observations from Amboli are ~350 km away north from the previously known localities of *M. irata*, *M. flavocolorata* and *I. corona*. *Microgomphus souteri* was known from the neighboring Goa State which is ~100 km south to Amboli region.

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