

Northernmost records of two endemic odonates
***Protosticta sanguinostigma* Fraser, 1922**
and *Idionyx saffronatus* Fraser, 1924
from the northern Western Ghats, Maharashtra, India

(Odonata, Platystictidae)

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The present communication deals with new spatial records of two endemic odonates of Western Ghats *Protosticta sanguinostigma* Fraser, 1922 and *Idionyx saffronatus* Fraser, 1924 for the State of Maharashtra, based on the materials collected from the Thoseghar Waterfall of Satara district, Maharashtra, India. Both records represent northernmost localities of the species. Detailed diagnostic characters and photographs are provided.

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Introduction

The Western Ghats, one of the 36 global biodiversity hotspots, is a 1600 km long mountain chain that transverse the states of Gujarat, Maharashtra, Goa, Karnataka, Kerala, and Tamil Nadu along the west coast of India (Subramanian et al. 2018). The region is home to about 203 species of odonates (dragonflies and damselflies), of which 84 species are endemic to the region (Nair et al. 2021).

On 25 June 2022, a survey on odonates was carried out at Thoseghar Waterfall, situated at the eastern edge of the northern Western Ghats of Satara district, Maharashtra, India. During the survey, we newly observed two endemic odonate species of Western Ghats biodiversity hotspot, namely *Protosticta sanguinostigma* Fraser, 1922 (Platystictidae) and *Idionyx saffronatus* Fraser, 1924 (Genera insertae sedis). The records represent the northernmost locality of both species and the second record of *Idionyx saffronatus* for the state of Maharashtra.

Materials and methods

Three specimens were captured using an entomological net and stored in ethanol. These were studied and photographed using a Carl Zeiss stereomicroscope (Stemi 305) with a microscope camera (MICAPS ECOC-MOS510B). Measurements of the specimens were taken by a digital caliper. Identification was confirmed with the help of identification keys provided by Fraser (1924, 1933, 1936), Subramanian et al. (2013), and Joshi et al. (2020).

Results

***Protosticta sanguinostigma* Fraser, 1922**
(Platystictidae)

Examined material. India, Maharashtra, Satara, Thoseghar Waterfall (17°35'54.98"N, 73°50'35.43"E, 977 m a.s.l.), 25.VI.2022, 1 ♂, leg. A. Payra & A. Deshpande.

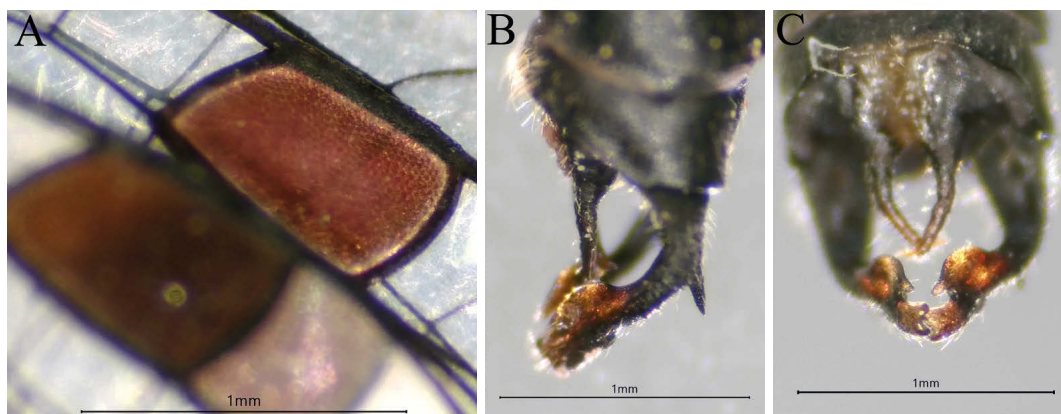


Fig. 1. *Protosticta sanguinostigma* (male). **A.** Blood red pterostigma. **B.** Lateral view of caudal appendages. **C.** Ventral view of caudal appendages. Scale bars: 1mm.

Measurements (in mm). Male: abdomen+caudal appendages=39.8, fore wing=23.3, hind wing=22.5.

Diagnosis. Red pterostigma (Fig. 1A), cerci with a long robust basal spine (Fig. 1B) and bilobed outer fork of cerci (Fig. 1C) will serve to distinguish it from other species of the genus (Fraser 1933, Joshi et al. 2020).

Remarks. The endemic damselfly is listed as “Vulnerable” in the IUCN Red List (Subramanian 2013) and reported from Goa, Karnataka, Kerala, and Tamil Nadu (Subramanian et al. 2018). The ‘type locality’ of the species is Coonoor road, Nilgiris, Tamil Nadu (Fraser 1922). Fraser (1924) recorded the species from Burliyar and Kallar Rivers of Nilgiris, Coorg (Karnataka), Dhoni forest (Kerala) and Chengalpattu (Tamil Nadu). Then in 1933, Fraser reported

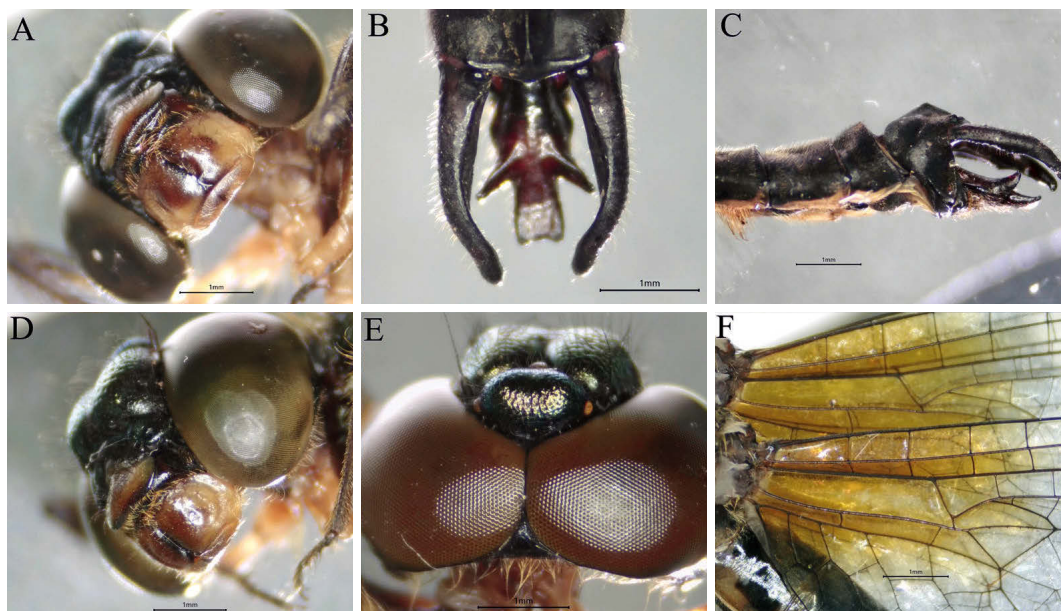


Fig. 2. *Idionyx saffronatus* (male=A-C, female=D-F). **A.** Labrum. **B.** Dorsal view of caudal appendages. **C.** Lateral view of caudal appendages and end segments of abdomen. **D.** Labrum. **E.** Dorsal view of head. **F.** Saffronated wing base. Scale bars: 1mm.

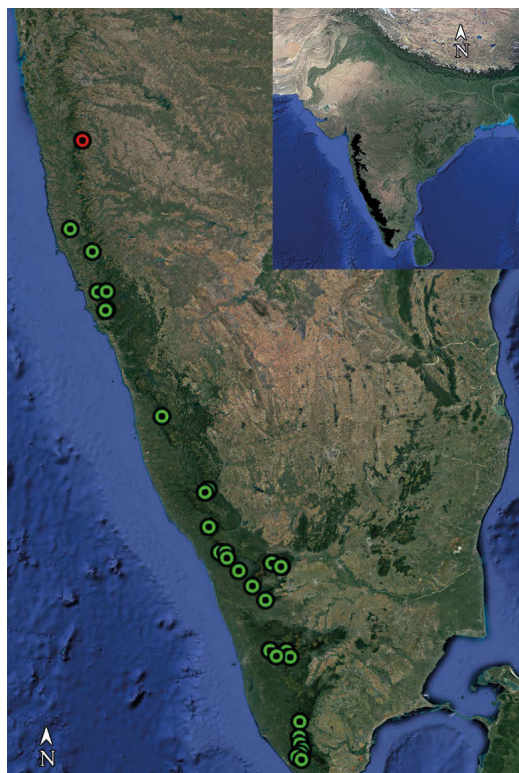


Fig. 3. Distribution map of *Protosticta sanguinostigma* in Western Ghats, India (●=present record, ●=previous records).

it from Coorg, Nilgiri Hills, Wayanad, Palakkad, Mettupalayam Ghat (Fraser 1933). In Goa the species has been recently recorded from South Goa district (Rangnekar & Naik 2014). According to Nair et al. (2021) *P. sanguinostigma* is common in Kerala and recorded between 200–1200 m altitude in all major landscapes like Agasthyamalai, Nilgiris, Kannur Ghats, Lower Periyar, Kozhikode, Wayanad and Coorg landscape. In Maharashtra, the species has been photographed from Varavade of Sindhudurg District on 10 October 2021 by Amol Kulkarni (Anonymous 2022). Recently it has been recorded from the nearby area of Nene (Sawant et al. 2022). On 25 June 2022, we encountered about 11 individuals (7 males and 4 females) under the stream periphery dense vegetation near Thoseghar Waterfall. The present locality record constitutes the northernmost range of the species and is about 155 km (aerial distance) from the previously known nearest locality of Varavade of Sindhudurg District, Maharashtra (Fig. 3).

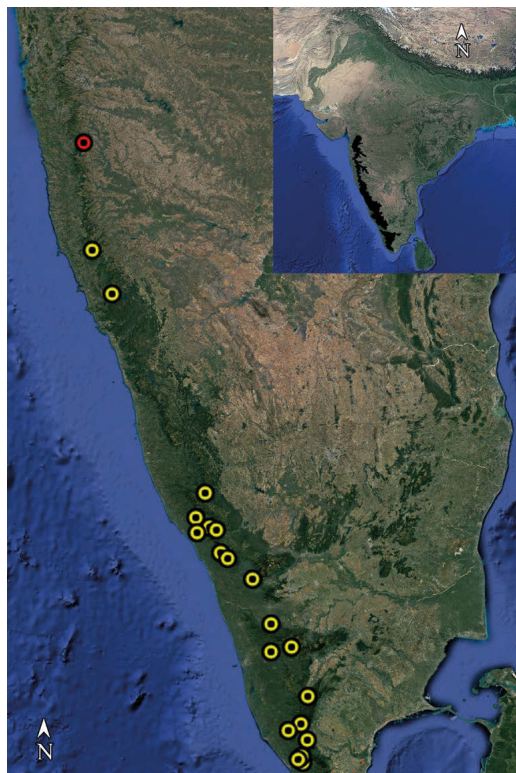


Fig. 4. Distribution map of *Idionyx saffronatus* in Western Ghats, India (●=present record, ●=previous records).

Idionyx saffronatus Fraser, 1924
(Genera insertae sedis)

Examined material. India, Maharashtra, Satara, Thoseghar Waterfall (17°35'54.98" N, 73°50'35.43" E, 977 m a.s.l.), 25.VI.2022, 1 ♂ and 1 ♀, leg. A. Payra & A. Deshpande.

Measurements (in mm). Male: abdomen + caudal appendages = 31.5, right fore wing = 30.6, right hind wing = 29. Female: abdomen + caudal appendages = 31.2, fore wing = 33.3, hind wing = 31.8

Diagnosis. Males of this species can be distinguished from the congeners by having bright citron yellow labrum bordered with black (Fig. 2A), below the basal half of cerci with row of teeth (Fig. 2C), epiproct trifid and broad epical portion shallowly emerginate and directed straight back in line with the basal portion. Middle lobe of epiproct broad and directed straight back (Fig. 2B–C). Segment 7 to 10 bright yellow ventrally with a yellow hair tuft below Segment 7 (Fig. 2C) (Fraser 1924, 1936, Subramanian

et al. 2013). Females can be separated by having bright citron yellow labrum bordered with black (Fig. 2D), simple rounded frontal vesicle (Fig. 2E) and saffronated wing base (Fig. 2F) (Fraser 1922, 1936, Subramanian et al. 2013).

Remarks. Earlier this endemic dragonfly was known from Goa, Karnataka, Kerala and Tamil Nadu (Subramanian et al. 2018) and listed as “Data Deficient” in the IUCN Red List (Dow 2009). Recently the species has been reported from Amboli of Maharashtra (Swant et al. 2022). *I. saffronatus* was described based on the specimens collected from Coorg, Karnataka (Fraser 1924). Then Fraser (1936) mentioned its distribution in Coorg, Anamalais, South Malabar and Travancore. During the revision of *Idionyx* Hagen, 1867 of Western Ghats, Subramanian et al. (2013) updated the distribution of *I. saffronatus* from the hills of Agasthyamalai, Anamalais, Silent Valley National Park, Wayanad, Coorg and Goa. Recently Nair et al. (2021) stated the species as common and reported it from almost all the major landscape of Kerala, namely Agasthyamalai hills, Pandalam and Cardamom hills, Kannur Ghats, Wayanad, Kozikode and Nelliampathies-Anamalais landscape. The Western Ghats is well known for its high diversity of *Idionyx* Hagen, 1867, constitutes ten species and one subspecies ranges between 8°N–16°N and are confined in the wet southern and western slopes of the Ghats (Subramanian et al. 2013). During the present survey, one mating pair was observed perching on a tree twig about 5 m above the ground, near a stream at Thoseghar Waterfall. Our record of *I. saffronatus* from Thoseghar Waterfall, located at the eastern slope of the Ghats (Narmada Valley dry deciduous forest), is approximately 185 km (aerial distance) northwards from the previously known nearest locality, Amboli of Maharashtra (Sawant et al. 2022) (Fig. 4).

Discussion

During recent time (2010–2022), many odonate species have been newly recorded (Koparde et al. 2014, Koli & Dalvi 2021, Koli et al. 2021, Payra et al. 2022, Sawant et al. 2022) and described from the northern Western Ghats (Joshi & Sawant 2020, Joshi et al. 2022). Our present locality Thoseghar Waterfall itself is the ‘type locality’ of two recently described damselflies *Euphaea pseudodispar* Sadasivan & Bhakare, 2021 and *E. thosegharensis* Sadasivan & Bhakare, 2021 (Bhakare et al. 2021). We presume that two endemic odonate species *P. sanguinostigma* and *I. saffronatus* were previously unreported from this part of northern Western Ghats, possibly due to the

lack of extensive and expert sampling in the region. Our records indicate these species may occur along the Ghat areas between Amboli and Koyna Wildlife Sanctuary, and also the need of extensive surveys in the unexplored regions of northern Western Ghats.

Acknowledgements

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