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On Any Aspect Related with Life Forms

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Cover Photo of founder of BIONOTES *Late* Dr. R.K. Varshney

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CITY IF NOT FOREST: NEW HABITAT RECORD OF *MACROMIA CINGULATA* RAMBUR,1842 (ODONATA, MACROMIIDAE)

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Abstract

The habitat preferred by Rambur's Torrent Hawk dragonfly (*Macromia cingulata* Rambur,1842) was previously known to be interior forest streams and submontane forests. This study reports a new habitat preference of the species i.e. urban residential area within the busy city limits from Thiruvananthapuram, Kerala. The Probable causes for the habitat shift and need for future surveys are discussed.

Keywords: Rambur's Torrent Hawk, dragonfly, new habitat, submontane forest, streams, urban residential area, city limits, Kerala, habitat shift, survey

Introduction

Odonates are excellent models to study the health of aquatic and wet land ecosystems. They act as bioindicators for understanding ecological integrity of the river corridor as the taxon provides information about their aquatic breeding sites, and the surrounding terrestrial habitat (Golfieri, 2016). India has 488 species and 27 subspecies in 154 genera and 18 families of odonata out of which the family Libellulidae is the richest (Subramanian & Babu, 2017). The Libellulid genus *Macromia* Rambur includes large sized dragonflies, coloured dark metallic green or blue vividly marked with citron-yellow; the sexes closely similar in colour and markings; head very large, eyes globular, very broadly contiguous: vesicle simple in both sexes; prothorax small, thorax large and robust, naked; legs very long and spidery (Fraser 1936). As far as Indian species are concerned they breed in sub montane streams at altitudes of 2,000 to 4,000 feet (Fraser 1936). They are commonly known as Torrent Hawks/River Cruisers from their habit of

hawking/cruising long distances along river banks.

The genus includes 14 species (Subramanian & Babu, 2017). *Macromia cingulata* Rambur is a species distributed in submountain habitat of peninsular India (Fraser 1936). Later it was reported from West Bengal (Dwari et al 2018). The species can be identified by the following characters: Male-head labium bright yellow, borders of lateral lobes and the middle lobe black; labrum bright citron-yellow, heavily bordered with black; anteclypeus black; postclypeus and frons pale citron-yellow, the latter with a broad T-shaped mark formed by confluence of a broad spot on front of frons and thick line in the floor of sulcus above; vesicle steely blue-black; occiput black; eyes blue during life, glossy black and unmarked behind. Prothorax dark brown, two small lobes and anterior and bright yellow; thorax a beautiful metallic bluish-violet, marked with bright citron-yellow. Legs black, wings hyaline. Abdomen black, ringed with pale citron-yellow almost creamy-white in some specimens. Anal appendages black, as long as

segment 9: superiors tapering to a point. Female closely resembles the male but more robust. The abdomen markedly compressed (Fraser 1936). Its small delicate build, black colour with strongly contrasted yellow markings, lips broadly bordered with black, and face bright yellow barred with black will easily distinguish it from other Indian Macromiidae (Fraser 1936). It is purely a riverine species, and is usually found hawking over shallow, rippling water flowing over clean, gravelly bottoms. Being a submontane species most of its habitat records are from hilly forested area (Fraser 1936, Dwari et al 2018, Dawn and Chandra 2014). This study presents a new habitat record of the species.

Materials and Methods

Opportunistic surveys were conducted in a residential area (Indira Nagar, Peroorkada, 8.53472 50°N 76.972765°E) in Thiruvananthapuram city limits, capital of Kerala from May 2020 to June 2021. The study site is situated in suburb in Municipal Corporation of Thiruvananthapuram, Kerala and has an altitude of just 18m MSL. The area is devoid of forest patches or riverine and is fairly populated with close neighbour hoods and residential buildings which are close to the vehicular city road. The habitat of the study site is an urban area with few some trees and a small marshy area with a natural spring 700m away. The water from the spring flows through small residential drainage canal passing through plots with sparse trees, shrubs, plantains and kitchen gardens joining the main drainage canal. Field photographs were captured using Canon 6D Mark II DSLR camera with 100-400 mm Canon zoom lens. The species identity was determined by comparing the detailed photographs (all angles) with descriptions furnished by Fraser (1924, 1936).

Results and Discussion

During the one year survey period the *M. cingulata* Rambur, 1842 was spotted in eight occasion. In the initial sighting a single

individual was found hanging vertically from an electric line above a tarred road. The height of the perch was 20 feet (approximate) from the ground level. After the initial sighting, we could sight the species perching on the same electric line six more instances from 13th August 2020 to 30th October 2020, four times male (fig.1), one time female (fig.2) and once a mating pair (fig.3). After seven months on 31st May 2021 we could also sight a male on the same electric cable (Table 1).

The individuals we observed were hanging vertically from an electric cable above the tarred vehicular road most of the time with occasional hawking over the road for hunting small insects. Average perching time/duration was 20 to 25 minutes. A mating pair was seen clinging on the same electric cable for a duration of 90 minutes. The individuals were not seen disturbed by the noise or movement of any vehicle but the movement of pedestrians disturbed them. On such disturbances they flew away from the perch and settled back in a new perch a bit away from the earlier perch.

The habitat of the individuals sighted in the study is entirely different from previously described habitat of the species. *M. cingulata* Rambur is purely a riverine species, and is usually found hawking over shallow, rippling water flowing over clear, gravelly bottoms (Fraser 1936). Hilly tracts with forest vegetation and proximity of streams are usually preferred by the species. Dwari et al (2018) had reported it from vegetated hilly area of West Bengal. The study reveals a new habitat preference of the submontane species i.e. low altitude urban city residential. Due to its submontane habitat preference the earliest records of the species are mostly from medium to high elevation hilly areas (Fraser 1936, Dwari et al 2018, Dawan and Chandra 2014). The authors have previously spotted the species from Ponmudi Hills (8°45'37"N, 77°07'00"E) at an altitude of 1200 m MSL & valleys of Athirumala (8°37'N 77°15'E) part of

Peppara Wildlife Sanctuary at an altitude of 1400m MSL (Unpublished observation). The present urban habitat has an elevation of just 18 MSL. The continuous sighting (in seven occasion) over a period of almost one year and the sighting of a mating pair suggests a confirmed preference of the new urban habitat by the species. The study area has no nearby riverine or forest patch except a spring which is about 700m away which waters the drainage canals passing through the plots in the residential area. Whether such a drainage channels could support the breeding of *M. cingulata* Rambur, 1842 needs to be investigated. The sighting of mating pairs suggest breeding attempts.

The adaptation of such submontane riverine species to urban habitat is noteworthy in the backdrop of habitat degradation and climate change. Distribution patterns of Odonata are strongly associated with both natural changes along the river system and management impacts (Hoffman and Mason 2005). Whether such effects in the original riverine habitat of *M. cingulata* Rambur, 1842 had favoured this new urban habitat preference is to be further investigated by surveys in the nearby hill riverine systems. Further the effect local factors like reduced human disturbances due to the present COVID related restrictions which could probably help the species to find new corridors for habitat exploration also needs to be factored for future detailed surveys.

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Table 1. Observations on *Macromia cingulata* Rambur from the residential area

Sl.No	Date of observation	Number of species observed and sex	Activities observed and time duration
01.	13 th August 2020	1 male	Perching and then flew off (10 minutes)

02.	20 th August 2020	1 male	Perching and occasionally hawking (13 minutes)
03.	23 rd August 2020	1 male	Perching and occasionally hawking (20 minutes)
04.	26 th August 2020	1 mating pair	Perching and then flew off (90 minutes)
05.	3 rd September 2020	1 male	Perching and then flew off (20 minutes)
06.	5 th September 2020	1 female	Perching and hawking occasionally (30 minutes)
07.	30 th October 2020	1 male	Perching and then flew off (20 minutes)
08.	31 st May 2021	1 male	Perching and then flew off (25 minutes)



Fig.1: *Macromia cingulata* Rambur male



Fig.2: *Macromia cingulata* Rambur female



Fig.3: *Macromia cingulata* Rambur mating pair



Fig.4: New urban habitat of *Macromia cingulata* Rambur