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New locality records of a rare Dragonfly *Gynacantha khasiaca* Maclachlan, 1896 (Odonata Aeshnidae) from India

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ABSTRACT *Gynacantha khasiaca* Maclachlan, 1896 (Odonata Aeshnidae) is a beautiful dragonfly, distributed mainly in South-eastern Asia. During Odonata survey in different parts of North-Eastern and Eastern India from 2014 to 2016, some specimens of this species were observed and photographed from 6 localities. Present record of this species from Purba Medinipur, West Bengal represents its Southernmost distribution in India.

KEY WORDS Aeshnidae; distribution; dragonflies; observation; Purba Medinipur.

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INTRODUCTION

Dragonflies and damselflies (Order Odonata) are the prominent and colorful insects of wetlands with long, slender abdomen, commonly known as aerial predators, hunting by sight. These are mostly found around the vicinity of freshwater habitats like rivers, streams, marshes, lakes and even small pools and rice fields. As predators it plays an important role in wetland and terrestrial food chains. Dragonflies are reliable indicators of overall ecosystem health and also good Biocontrol agents (Andrew et al., 2009; Tiple et al., 2013). Worldwide, 5952 species under 652 genera of odonates have been reported, of which 477 species, 50 subspecies in 142 genera and 18 families are known from India (Subramanian, 2014; Nair & Subramanian, 2014; Kiran et al., 2015; Emiliyamma & Palot, 2016).

Among dragonflies, the genus *Gynacantha* Rambur, 1842 are large in size, pale brown and green in colour and are crepuscular by nature (Fraser, 1936). The genus *Gynacantha* with 92 species is distributed throughout the world, especially in the tropics and subtropics region (Asahina, 1993; Schorr & Paulson, 2016). Among them about 30 species are known from the South-eastern Asia and in India the genus *Gynacantha* is represented only by 13 species (Subramanian, 2014; Khan, 2015a). This distribution range of *G. khasiaca* Maclachlan, 1896 is known from India (Mitra, 2002), Nepal (Vick, 1989) and Myanmar (Fraser, 1936), and possibly Tibet (Martin, 1909), although this record appears to be suspected by Fraser (1936). According to Mitra (2002), Bangladesh has also been included in the range of this species and Recently Khan (2015b) reported the species from Tilagor Eco Park of Bangladesh and confirmed its distribution in Bangladesh.

MATERIAL AND METHODS

The authors have been documenting the Odonata

diversity in different parts of Eastern and North-Eastern India from 2014–2016. During the extensive survey random specimen collection of *G. khasiaca* was not adopted, as morphologically this species shows some unique characteristics that can easily differentiate it from other Indian *Gynacantha*. Only one specimen was collected from Ramnagar, Purba Medinipur, West Bengal on 29th September 2015 and photographed, including its anal appendages and Wing Venation were taken with the help of Macro lens. We compared specimen and photographs, with known species of the genus *Gynacantha* and identified with the help of identification keys provided by Fraser (1936).

RESULTS

From the present survey 9 individuals (7 males, 2 females) were observed from 6 localities. Details of the sightings from 6 localities are presented in Table 1. Distributional range of *G. khasiaca* in Southern Asia is showed in figure 1 and morphological characters in figures 2–10.

Among the 9 individuals, we observed one brown morph male and one female, the rest were greenish in colour. This brown morph may be due to their young stage. As this kind of morphological colour changes with respect to aging as observed by Fraser (1936) in the specimens of *Gynacantha dravida* Lieftinck, 1960. In case of old *G. khasiaca* male, eyes are pale blue to olive green in colour. Labrum and labium olive brown in colour. Frons light green with black 'T' shaped mark on its upper side. Thorax is bright green, with two thick blackish brown stripes on each side of it. Legs are mainly black to blackish brown. Wings are hyaline, but at the base of wing tinted with bright amber colour. Pterostigma dark brown in colour and covering 4, 5 cells. Discoidal cells 5 celled in forewing, but in case of hind wing it varies from 4–6 cells. Length of the abdomen is mainly 47–51 mm. Segment 1 laterally green and dorsally brown. Segment 2 is laterally bluish and light green beneath. Segment 3–7 with jugal paired spots and greenish paired apical annule. Segment 8–10 entirely black. Anal appendages black in colour, where inferior anal appendages is two-third the length of the superior

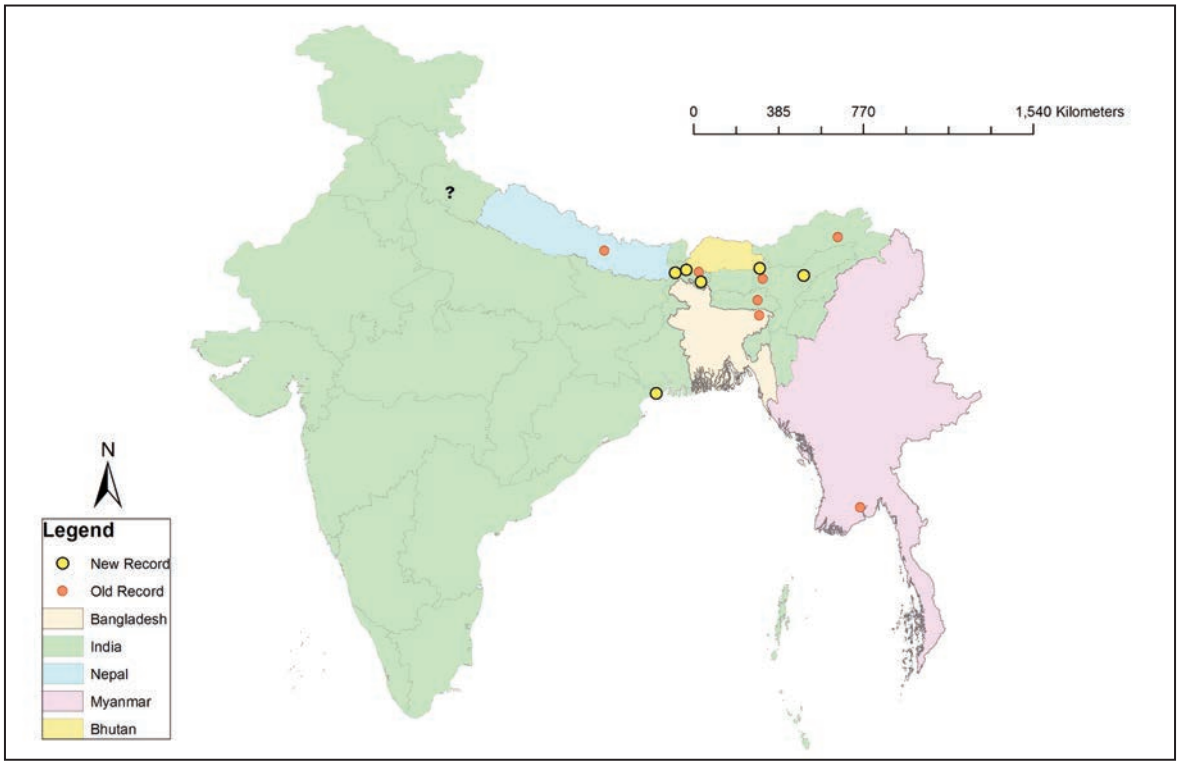
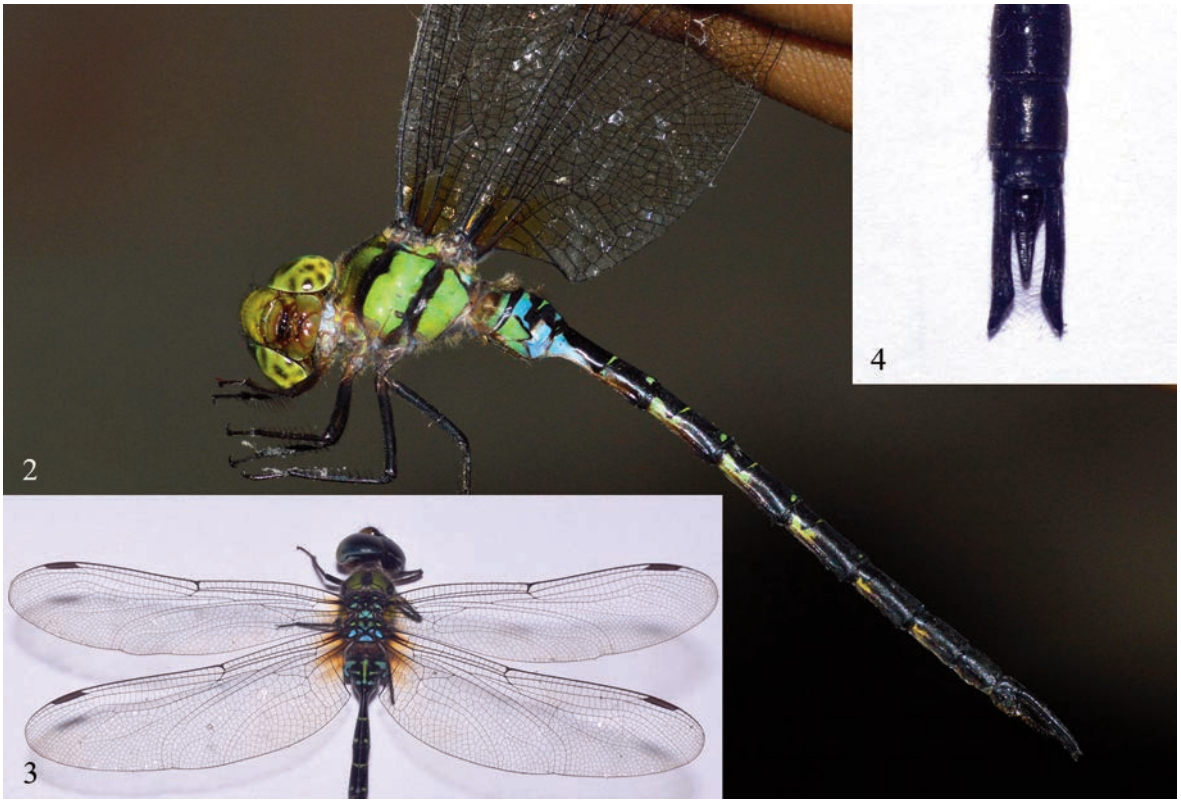


Figure 1. Distributional range of *Gynacantha khasiaca* Maclachlan, 1896 in Southern Asia.

Date and time	Location	Latitude and longitude	Altitude	Sex	Habitat
06.10.2014; 11.45 am	Deo Pahar, Golaghat, Assam	26°35’56”N 93°44’6”E	153 m	Male	Dense forest
18.11.2014; 5 pm	Murti River, Gorumara National Park, West Bengal	26°49’46”N 88°49’58”E	144 m	Male	Dense forest
12.07.2015; 10.17 am	Cooch Behar, West Bengal	26°19’21”N 89°26’48”E	46 m	Female	Human habitation
06.8.2015; 12.27 pm	Siliguri, West Bengal	26°42’21”N 88°22’12”E	125 m	Male	Human habitation
14.09.2015; 12.31 pm	Ramnagar, Purba Medinipur, West Bengal	21°40’19”N 87°34’29”E	7 m	Male	Human habitation
21.09.2015; 13.01 pm	Ramnagar, Purba Medinipur, West Bengal	21°40’19”N 87°34’29”E	7 m	Female	Human habitation
29.09.2015; 18.09 pm	Ramnagar, Purba Medinipur, West Bengal	21°40’19”N 87°34’29”E	7 m	Male	Human habitation
07.10.2015; 18.50 pm	Ramnagar, Purba Medinipur, West Bengal	21°40’19”N 87°34’29”E	7 m	Male	Human habitation
28.10.2015; 18.15 pm	Khalingduar Forest IB, Assam	26.51.43 N 91.52.47 E	377 m	Male	Human habitation

Table 1. Sighting records of *Gynacantha khasiaca* in different parts of Eastern India.



Figures 2–4. *Gynacantha khasiaca* male (Ramnagar, Purba Medinipur, West Bengal; 7.X.2015). Fig. 2: lateral view of the specimen. Fig. 3: wing venation of the specimen. Fig. 4: anal appendages (inferior anal appendages more than half the length of superior anal appendages).

Figures 5–10. *Gynacantha khasiaca*. Fig. 5: *Gynacantha khasiaca* male (Ramnagar, Purba Medinipur, West Bengal, 14.IX.2015): Young male shows brown morph. Fig. 6: *Gynacantha khasiaca* female (Cooch Behar Purba, West Bengal, 12.VII.2015): Young female shows brown morph. Fig. 7: *Gynacantha khasiaca* male (Deo Pahar, Golaghat, Assam, 06.X.2014): dorsal-lateral view. Fig. 8: *Gynacantha khasiaca* female (Ramnagar, Purba Medinipur, West Bengal, 21.IX.2015): lateral view. Fig. 9: *Gynacantha khasiaca* male (Murti River, Gorumara National Park, West Bengal, 18.XI.2014): lateral view. Fig. 10: *Gynacantha khasiaca* male (Siliguri, West Bengal, 06.VIII.2015): lateral view.

anal appendages. Old females are also similar to males except sexual characteristics.

In case of young male eyes are olive brown. Labrum and labium also brownish. Side of the thorax is light yellowish in colour. Base of the wing also tinted with brown amber colour. Dorsal surface of the all abdominal segments blackish brown and beneath pale yellow. Male and female specimens of *Gynacantha* were observed in dense forest area, human habitations with dense vegetation near aquatic bodies at different parts of Eastern and North-Eastern India (see Table 1).

Among the species of the genus *Gynacantha*, *G. khasiaca* is one of most beautiful dragonfly. It can be easily distinguished from other Indian *Gynacantha* by the greater length of inferior anal appendages which is more than half the length of superior anal appendages and two blackish brown stripes on each side of the bright green thorax (Fraser, 1936; Khan, 2015).

DISCUSSION

In India *G. khasiaca* was mainly restricted to North-eastern India and previously known from Meghalaya: Khasia Hills (Fraser, 1922; Kimmins, 1969; MacLachlan, 1896), Assam: Mangaldai (Laidlaw, 1923, Fraser, 1936), Arunachl Pradesh: Abor Hills (Laidlaw, 1914), West Bengal: Cooch Behar (Mitra, 2002) and Hasimara, Duars (Fraser, 1936), in Uttarakhand (Prasad & Sinha, 2010) collection locality is unknown. Presently we observed this species from 6 localities of both Eastern and North-Eastern India. Among them 5 localities are new for this species. The newly observed locality of *G. khasiaca* in Purba Medinipur, West Bengal, India lies approximately 550 km southwest of the Cooch Behar, West Bengal, India and Tilagarh Eco Park, Bangladesh, which are the nearest previously known localities. The observation of this species in Khalingduar Forest IB, Assam is also important as this place is very close to the Bhutan. Hence such new locality records indicate this species may be found in Bhutan as well as in other parts of Peninsular India in a next future. Despite the recent reports of *G. khasiaca* in Bangladesh by Khan (2015b) and in Nepal by Vick (1989), in India the last record of this species was made by Mitra (2002) and the examined specimen was collected in 1983. Therefore our present investigation designates its reports after a long time in India.

With the exception of the observation from Deo Pahar, Assam and Murti River bed, West Bengal; the remaining observed localities were very close to human habitations. During the last decade, the cities have expanded twice in their circumference causing loss of natural habitats for Odonates. Urban development is expected to have a deleterious impact on Odonata populations, if only because the construction of buildings and concretes replaces or reduces the area of natural and semi-natural habitats. The quality of residual habitats may also be adversely affected by various forms of pollutants (Tiple & Chandra, 2013; Tiple & Koparde, 2015). Due to the limited knowledge on distribution, seasonality, low number of known localities and continuous decline of habitats, *G. khasiaca* was categorized as a Data Deficient in IUCN (Mitra et al, 2010). Much work has yet to be done in future to clarify the distribution and status of the species, especially for the purposes of conservation.

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