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SHORT COMMUNICATION
ODONATA OF EASTERN BANGLADESH WITH THREE NEW RECORDS FOR THE COUNTRY

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Odonata of eastern Bangladesh with three new records for the country

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Abstract: A study was conducted in the eastern region of Bangladesh to contribute to the knowledge of the country’s Odonata fauna. A total of 75 species belonging to nine families was recorded during the study period from April 2014 to July 2016. Two zygopteran species, Calicnemia imitans and Prodasineura autumnalis, and one anisopteran species, Megalogomphus smithii, are new records for the country. The Megalogomphus genus is recorded for the first time from Bangladesh.

Keywords: Distribution, diversity, Indo-Burma biodiversity hotspot, Odonata.

Bangladesh, situated in southern Asia, possesses an enormous area of wetlands including ponds, rivers, freshwater lakes, marshes, and extensive mangrove swamps. The hilly areas of the northeastern and southeastern regions receive precipitation throughout the year and are rich in waterfalls and streams. In addition, during monsoon, many paddy fields and irrigation channels hold water for more than three months and generate numerous temporary water reservoirs. These diverse range of water resources offers ambient microhabitats for many Odonata species (Chowdhury & Mohiuddin 1994). Till date, 105 species of odonates are recorded from Bangladesh (Begum et al. 1977; Chowdhury & Akhteruzzaman 1983; Chowdhury & Mia 1989; Chowdhury & Mohiuddin 1993; Noruma & Alam 1995; Chowdhury & Mohiuddin 2011; Khan 2015a,b). Among these, 76 species from seven families are reported from the northeastern region (Khan 2015b). On the other hand, 90 species are reported from the southeastern region (Chowdhury & Mohiuddin 2011). The checklist of the eastern region, however, is not comprehensive and many prospective habitats are yet to be explored.

The eastern region of Bangladesh is situated in the Indo-Burma biodiversity hotspot and is rich with diverse floral and faunal communities. This region has a few semi-evergreen forests and wildlife sanctuaries enriched with numerous streams and waterfalls. In addition to that, there are many marshes and lakes that provide ambient habitats for odonates. Despite being a suitable habitat for Odonata fauna, there is a lack of studies annotating the order of the eastern region to date. Moreover, the previous research initiatives left many potential habitats to survey. The current study is a comprehensive approach for the documentation of the Odonata diversity of the eastern region of Bangladesh.

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Materials and Methods

Study area

The odonates were surveyed from the entire Sylhet Division and five districts of Chittagong Division, namely, Bandarban, Cox’s Bazar, Chittagong, Khagrachari, and Rangamati, of Bangladesh (Fig. 1). In the northeastern region that is administratively under Sylhet Division, odonates were surveyed in Khadimnagar National Park, Tilagar Eco Park, Shahjalal University of Science and Technology campus, Satchari National Park, Lawachara National Park, and Madhobpur Lake. On the other hand, in the southeastern region that is administratively under Chittagong Division, odonates were surveyed in the Chittagong University campus, Kaptai National Park, Bariadhala National Park, and many streams and waterfalls in the areas associated with Chittagong, Khagrachari, and Bandarban districts.

Specimen collection and identification

During the survey, potential habitats like marshes, ponds, streams, streams associated with forest patches, and temporary watersheds created during the monsoon were scanned thoroughly from 09.00hr to 16.00hr. In the field, the species were photographed using a Canon 600 DSLR camera fitted with a 55–250 mm telephoto zoom lens. The specimens were captured using an insect-sweeping net and brought into the Department of Biochemistry and Molecular Biology, Shahjalal University of Science and Technology, Sylhet, Bangladesh, for further identification and deposition. In the laboratory, the specimens were examined under the microscope and identified based on the available identification keys provided by Fraser (1933, 1934, 1936) and Asahina (1993). The odonates were classified according to Dijkstra et al. (2013). The collected specimens are stored in my personal collection in the department of Biochemistry and Molecular Biology department in the Shahjalal University of Science and Technology, Bangladesh.

Results

A total of 75 species from nine families belonging to 45 genera were recorded from the eastern region of Bangladesh (Table 1, Fig. 2). Among the documented odonates, 45.33% (34 species) of 18 genera belong to the Zygoptera suborder while 54.66% (41 species) of 27 genera belong to the Anisoptera suborder (Table 1). Libellulidae was the predominant Anisoptera family with 35 species from 22 genera (Table 1, Fig. 2). On the other hand, Coenagrionidae was the best represented Zygoptera family with 18 species from six genera (Table 1, Fig. 2). Three species, Calicnemia imitans, Prodasineura autumnalis, and Megalogomphus smithii, were recorded for the first time from Bangladesh.
Odonata of eastern Bangladesh

Khan

Prodasineura autumnalis (Fraser, 1922) (Image 1C,D)

I recorded this species based on two males and one female collected from the Kaptai National Park, Rangamati, Chittagong (22.497°N & 92.184°E, 51.4m), on 17 October 2014 (ODO-010, ODO-011 and ODO-012). I resighted this species later on 2 June 2015 from Richang Waterfalls, Khagrachari, Chittagong (23.110°N & 92.002°E, 78m), and on 04 June 2015 from Debota Pond, Khagrachari, Chittagong (23.085°N & 91.971°E, 52m). The length of the abdomen and hindwing of the males are 30–31 mm and 18–20 mm, respectively. Prodasineura autumnalis is superficially similar to P. verticalis and P. sita; however, they can be distinguished by the unmarked black thorax and the white-tipped inferior anal appendages (Image 1C). The females are found close to males and can be distinguished by their blue ante-humeral stripe (Image 1D). The species was previously known from China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Singapore, Thailand, and Vietnam (Fraser 1933; Vick 1989; Hamalainen & Pinratana 1999; Wilson & Reels 2003; Orr 2005; Cuong & Hoa 2007; Wilson 2005; Tang et al. 2010). The present record extends its distribution to Bangladesh.

Megalogomphus smithii (Selys, 1854) (Image 1E)

I recorded this species based on one male collected from the Khadimnagar National Park, Sylhet, Bangladesh (24.951°N & 91.918°E, 56m), on 10 April 2015 (ODO-013). The lengths of the abdomen and hindwing in males are 53–55 mm and 42–44 mm, respectively. This species has a prominent M-shape marking in the thorax and can be easily distinguished from the other members of the genus by its yellow-marked black legs.

Discussion

In the current study, the Odonata fauna of the eastern region of Bangladesh was documented. A total of 75 species from 45 genera was recorded. Among them, three species and one genus were recorded newly for Bangladesh.

Megalogomphus smithii was previously known from Assam, India, which is adjacent to the northeastern region of Bangladesh. Considering the similarity of habitats, this species was predicted to be present in Bangladesh too (Fraser 1934). I recorded this species based on one male collected from the Khammamagar National Park, Sylhet, Bangladesh (24.951°N & 91.918°E, 56m), on 10 April 2015 (ODO-013). The lengths of the abdomen and hindwing in males are 53–55 mm and 42–44 mm, respectively. This species has a prominent M-shape marking in the thorax and can be easily distinguished from the other members of the genus by its yellow-marked black legs.

Newly recorded odonates for Bangladesh

Calicnemia imitans Lieftinck, 1948 (Image 1A,B)

Calicnemia imitans is one of the most abundant species of odonates in the southeastern hilly streams of Bangladesh. They prefer streams associated with shady bushes for perching. This is the third recorded species of this genus from Bangladesh after C. eximia and C. pulverulans. I recorded this species based on the two male specimens collected from the Alutila Cave, Khagrachari, Chittagong (23.085°N & 91.956°E, elevation 281m), on 02 June 2015 (specimen registration number ODO-008 and ODO-009). The length of the male abdomen is 29–31 mm and that of the hindwing is 20–22mm. This species can be distinguished by its body colouration and anal appendages. The ground colour of male is black; orange and red colours are absent in the thorax; narrow straight blue ante-humeral stripe present, inferior is two third of the superior, tip of the superior is wide apart. This species was previously known from India, Laos, Myanmar, Thailand, and Vietnam (Fraser 1933; Hamalainen & Pinratana 1999; Cuong & Hoa 2007)

Prodasineura autumnalis (Fraser, 1922) (Image 1C,D)

I recorded this species based on two males and one female collected from the Kaptai National Park, Rangamati, Chittagong (22.497°N & 92.184°E, 51.4m), on 17 October 2014 (ODO-010, ODO-011 and ODO-012). I resighted this species later on 2 June 2015 from Richang Waterfalls, Khagrachari, Chittagong (23.110°N & 92.002°E, 78m), and on 04 June 2015 from Debota Pond, Khagrachari, Chittagong (23.085°N & 91.971°E, 52m). The length of the abdomen and hindwing of the males are 30–31 mm and 18–20 mm, respectively. Prodasineura autumnalis is superficially similar to P. verticalis and P. sita; however, they can be distinguished by the unmarked black thorax and the white-tipped inferior anal appendages (Image 1C). The females are found close to males and can be distinguished by their blue ante-humeral stripe (Image 1D). The species was previously known from China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Singapore, Thailand, and Vietnam (Fraser 1933; Vick 1989; Hamalainen & Pinratana 1999; Wilson & Reels 2003; Orr 2005; Cuong & Hoa 2007; Wilson 2005; Tang et al. 2010). The present record extends its distribution to Bangladesh.

Megalogomphus smithii (Selys, 1854) (Image 1E)

Megalogomphus smithii was previously known from Assam, India, which is adjacent to the northeastern region of Bangladesh. Considering the similarity of habitats, this species was predicted to be present in Bangladesh too (Fraser 1934). I recorded this species based on one male collected from the Khadimnagar National Park, Sylhet, Bangladesh (24.951°N & 91.918°E, 56m), on 10 April 2015 (ODO-013). The lengths of the abdomen and hindwing in males are 53–55 mm and 42–44 mm, respectively. This species has a prominent M-shape marking in the thorax and can be easily distinguished from the other members of the genus by its yellow-marked black legs.

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Table 1. A list of the Anisoptera and Zygoptera species recorded in the current study from eastern Bangladesh. The species newly discovered from Bangladesh are indicated with asterisks (*). The species present in a particular area are shown by tick sign (√) and the species absent are shown by cross mark (X).

| Species | Recorded from the north-eastern region | Recorded from the south-eastern region | Habitat feature |
|---------|---------------------------------------|---------------------------------------|----------------|
| **Lestidae** | | | |
| 01 | Lestes peregrinus Hagen in Selys, 1862 | √ | X | Paddy field, pond |
| **Calopterygidae** | | | |
| 02 | Neurobasis chinensis (Linnaeus, 1758) | X | √ | Stream, waterfalls |
| 03 | Vestalis gracilis (Rambur, 1842) | √ | √ | Forest, stream |
| **Chlorocrididae** | | | |
| 04 | Aristocypha quadrimaculata (Selys, 1853) | √ | √ | Stream, waterfalls |
| 05 | Libelligo lineata (Burmeister, 1839) | √ | √ | Stream |
| **Euphaeidae** | | | |
| 06 | Euphaea ochracea Selys, 1859 | X | √ | Stream |
| **Platycnemididae** | | | |
| 07 | Callicomis imitans Lichtenfink, 1948* | X | √ | Stream |
| 08 | Coecilia bimaculata Laidlaw, 1914 | √ | X | Forest |
| 09 | C. didyma (Selys, 1863) | X | √ | Forest, stream |
| 10 | Prodesinera autumnalis (Fraser, 1922)* | X | √ | Stream |
| 11 | P. laila (Forster in Laidlaw, 1907) | √ | X | Stream, forest |
| 12 | P. ventralis (Selys, 1860) | X | √ | Stream |
| 13 | Gynacantha atrocyana Selys, 1865 | √ | X | Lake, forest |
| 14 | Copera marginipes (Rambur, 1842) | √ | √ | Stream, forest |
| 15 | C. viitata (Selys, 1863) | √ | X | Stream |
| 16 | Pseudocoropera ciliata (Selys, 1863) | √ | √ | Lake, marsh, pond |
| **Coenagrionidae** | | | |
| 17 | Agriocnemis clauseni Fraser, 1922 | √ | X | Forest stream |
| 18 | A. femina (Brauer, 1868) | √ | √ | Marsh, pond |
| 19 | A. katinga Nair & Subramanian, 2014 | X | √ | Lake, marsh, pond |
| 20 | A. lacteola Selys, 1877 | √ | √ | Marsh, pond, paddy field |
| 21 | A. pennis Selys, 1877 | X | √ | Marsh, pond |
| 22 | A. pygmaea (Rambur, 1842) | √ | √ | Marsh, pond |
| 23 | Ceriagrion cerninobellum (Brauer, 1855) | √ | √ | Lake, marsh, pond |
| 24 | C. coromandelianum (Fabricius, 1798) | √ | √ | Lake, marsh, pond |
| 25 | C. olivaceum Laidlaw, 1914 | X | √ | Forest |
| 26 | Ichthnura aurora (Brauer, 1865) | √ | √ | Marsh, paddy field |

| Species | Recorded from the north-eastern region | Recorded from the south-eastern region | Habitat feature |
|---------|---------------------------------------|---------------------------------------|----------------|
| 27 | I. rufofasciata Selys, 1876 | √ | X | Pond, marsh, paddy field |
| 28 | I. senegalensis (Rambur, 1842) | √ | √ | Lake, marsh, pond |
| 29 | Mortonagria aborensis (Laidlaw, 1914) | √ | X | Ditch, pond |
| 30 | Paracercion calamorum, (Ris, 1916) | √ | X | Lake |
| 31 | P. malayanum (Selys, 1876) | √ | X | Lake |
| 32 | Pseudagria microcepholium (Rambur, 1842) | √ | √ | Lake, pond |
| 33 | P. rubriceps Selys, 1876 | √ | √ | Lake, pond, stream |
| 34 | P. species Fraser, 1922 | √ | X | Lake |
| **Aeshnidae** | | | |
| 35 | Anax indicus Lichtenfink, 1942 | √ | X | Lake, pond |
| **Gomphidae** | | | |
| 36 | Ictinogomphus rapax (Rambur, 1842) | √ | √ | Lake, pond |
| 37 | Macroagomphus montanus Selys, 1869 | X | √ | Hilly lake |
| 38 | M. robustus (Selys, 1854) | √ | X | Forest stream |
| 39 | Megalagomphus smithii (Selys, 1854)* | √ | X | Forest stream |
| 40 | Paragomphus lineatus (Selys, 1850) | √ | √ | Forest edge, stream |
| **Libellulidae** | | | |
| 41 | Acisoma panorpoides Rambur, 1842 | √ | √ | Marsh, paddy field |
| 42 | Aethinamanta brevipennis (Rambur, 1842) | √ | √ | Forest edge, lake |
| 43 | Brachydiplax chalybea Brauer, 1868 | √ | √ | Ditch, lake, pond |
| 44 | B. farinosa Kruger, 1902 | √ | √ | Ditch, lake, pond |
| 45 | B. sobrina (Rambur, 1842) | √ | √ | Ditch, lake, pond |
| 46 | Brachythemis contaminata (Fabricius, 1793) | √ | √ | Ditch, pond |
| 47 | Cratilla lineata (Brauer, 1878) | √ | √ | Forest |
| 48 | Crocothemis servilia (Drury, 1770) | √ | √ | Pond, lake, stream |
| 49 | Diplacodes nebulosa (Fabricius, 1793) | √ | X | Marsh, paddy field |
| 50 | D. trivialis (Rambur, 1842) | √ | √ | Marsh, paddy field |
| 51 | Hydrobasileus croceus (Brauer, 1867) | √ | X | Forest |
| 52 | Lathrecista asiatica (Fabricius, 1798) | √ | X | Forest |
| 53 | Neurothemis fulva (Drury, 1773) | √ | √ | Forest, lake |
| 54 | N. intermedia (Rambur, 1842) | √ | √ | Forest, marsh |
Odonata of eastern Bangladesh

was previously known from China, India, and Indonesia. The present study reported this species for the first time within the geographical area of Bangladesh. The individual number of this two data deficient species recorded from the current study is very low and thus long-term studies are essential to assess their population trends and distribution range.

In conclusion, the diverse Odonata fauna and newly recorded species of the eastern region indicate that the area may accommodate hitherto unknown species. Moreover, the current study suggests that more long-term surveys are required to annotate the Odonata fauna of Bangladesh to estimate their current status and to determine their conservation needs.

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Image 1. Zygoptera and Anisoptera species newly recorded from Bangladesh in the present study. 
A - Callicnemia imitans (male), B - C. imitans (female), C - Prodasineura autumnalis (male), D - P. autumnalis (male & female in tandem position), E - Megalogomphus smithii (male)
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The pattern of bird distribution along the elevation gradient of the Sutlej River basin, western Himalaya, India
-- Balraj Santhakumar, P. Ramachandran Arun, Ramaparth Kozhummal Sony, Maruthakutti Murugesan & Chinnasamy Ramesh, Pp. 12715–12725

Morphological variations in marine pufferfish and porcupinefish (Teleostei: Tetraodontiformes) from Tamil Nadu, southeastern coast of India
-- K. Kalesh Kumar, R. Rajaram, P. Purushothaman & G. Arun, Pp. 12726–12737

Odonata of eastern Bangladesh with three new records for the country
-- M. Kawsar Khan, Pp. 12821–12827

Two new species of phytoseiid mites Euseius (Acari: Phytoseiidae) from Kerala, India
-- P.P. Santhosh, Mary Anithalatha Sadanandan & M.P. Rahul, Pp. 12828–12832

Notes
First photographic record of tiger presence at higher elevations of the Mishmi Hills in the Eastern Himalayan Biodiversity Hotspot, Arunachal Pradesh, India
-- Aisho Sharma Adhikarimayum & G.V. Gopi, Pp. 12833–12836

An old collection reveals an additional distribution record of the Greater Long-tongued Fruit Bat MacroGLOSSUS SOBREINUS K. Anderson, 1911 (Chiroptera: Pteropodidae) from southern West Bengal, India
-- Tauseef Hamid Dar, M. Kamalakannan, C. Venkatraman & Kailash Chandra, Pp. 12837–12839

Breeding reports and conservation implications of the Endangered Black-bellied Tern STerna ACUTICAUDA I.E. Gray, 1831 (Aves: Charadriiformes: Laridae) in Odisha, eastern India
-- Tuhinsansu Kar, Himanshu Shekhar Palei & Subrat Debata, Pp. 12840–12843

A first record of the Redbelly Yellowtail Fusilier Caesio cuning (Bloch, 1791) (Teleostei: Caesionidae) from Visakhapatnam coastal waters, India
-- Muddula Krishna Naranji, Govinda Rao Velamala & Kondamudi Ramesh Babu, Pp. 12844–12846

A record after 92 years, and a first recording of the moth MECODINA METAGRAPTA Hampson, 1926 (Lepidoptera: Erebidae: Aganainae) from the Western Ghats’ part of Maharashtra, India
-- Aparna Sureshchandra Kalawate, Pp. 12847–12849

A new record of the Malay Cardamom Amomum Acejuleum Roxb. (Zingiberaceae) for mainland India
-- Sameer Chandrakant Patil & P. Lakshminarishimahan, Pp. 12850–12853

New distribution records of the leopard plants ZINGIBERACEAE: Aglanineae) from the Western Ghats’ part of Maharashtra, India
-- Vishal Satos, Vikrant Choursiya, Rakesh Deulkar & Sasikumar Menon, Pp. 12800–12804

DNA barcoding and morphological characterization of moth Antoculea ornatissima (Walker, 1858) (Lepidoptera: Noctuidae), a new range record from western Himalayan region of India
-- Twinkle Sinha, P.R. Shashank & Pratima Chaudhuri Chattopadhyay, Pp. 12817–12820