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First report of the order Mantodea from Sundarban biosphere reserve, India

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ABSTRACT

Mantids are predatory insects actively feeding on a variety of other insects including small vertebrates in rare instances and play very important role in the food pyramid of the terrestrial ecosystems including a beneficial role in the biological control of noxious insect pests. This is the first report of the order Mantodea with 8 species under 7 genera belonging to 7 subfamilies of 5 families from the mangroves of Sundarban. Of them, three species, namely, *Leptomantella montana* (Beier, 1942), *Hierodula tenuidentata* Saussure, 1869 and *Heterochaetula tricolor* (Wood-Mason, 1876) are endemic to India.

Key words: Mantids, Sundarban Biosphere Reserve, new record.

INTRODUCTION

Presently, the Sunderban Biosphere Reserve is bounded in the East by the International boundary of Bangladesh formed by the rivers Ichamati, Raimangal and Kalindi, Bay of Bengal in the South and river Hooghly in the West. The Northern limit cannot be clearly demarcated due to high degree of reclamation; though an imaginary Dampier-Hodges line has marked (considered in 1831) the North-Western limit of this Biosphere Reserve – an imaginary line from Kulpi (South 24-Parganas) to Basirhat (North 24-Parganas) (Mitra 2015).

Mangroves have attained great importance both in terms of economic and ecological aspects and Insects are believed to constitute a significant portion of the fauna in mangrove communities. But unfortunately, mangrove faunal diversity is well known for the larger animals and poorly known for tiny insects. Study of insect biodiversity can help in assess its potential productivity and in better conservation of mangroves.

The knowledge of insect faunal diversity of the Sundarban Biosphere Reserve (SBR) is very recent. Probably, the first attention was drawn on the insects and Diptera in particular from Sundarban by Chatterjee in the year 1907. Sundarban Biosphere Reserve is now enriched with 591 species under 404 genera of 100 families belonging to 13 orders of insects (Mitra *et al.* 2016). However, there is no report on the diversity of the order Mantodea from SBR till date.

Present communication reports 8 species under 7 genera of 7 subfamilies belonging to 5

families of the order Mantodea for the first time from this mangrove ecosystem of SBR.

MATERIALS AND METHODS

Study Area

Sundarban is the largest single block of tidal halophytic mangrove forest in the world (Chakraborty, 2011). It shares an international border between India and Bangladesh. SBR is covering an area of 9630 sq km (in India) and lying in between 21° 32' – 22° 40' N and 88° 45' – 89° 04' E. The insect collections were made from Canning, Gosaba, Bakkhali, Sagar Island and Kakdwip of SBR (Map.1).

Collection and Preservation

The mantids were collected by bare hand and a few by insect net. They were preserved in 90% alcohol with three changes. Date, locality and other necessary data were written on a paper slip and inserted in the respective tube of the insects. These were later brought to the laboratory and properly identified. Some live photos were taken at field and rest was done at laboratory. Taxonomic identity was revealed through their study under stereoscopic binocular Leica EZ4 stereo zoom microscope.

RESULTS

Family Hymenopodidae Giglio-Tos, 1915
Subfamily Hymenopodinae Giglio-Tos, 1915
Tribe Hymenopodini Giglio-Tos, 1915

1. *Creobroter sp.*

Materials examined: 1male, Forest Bunglow: Bakkhali, South 24 Parganas, 21°33’42.45” N, 88°16’20.78’’ E, 28.v.2016, coll. B. Mitra and Party; 1 male, Pakhirala: Gosaba Island, South 24 Parganas, 22°7’57.54” N, 88°49’32.52’’ E, 05.vi.2016. coll. B. Mitra and Party.
Distribution: This genus is known from Arunachal Pradesh, Himachal Pradesh, Maharashtra, Sikkim, Uttar Pradesh.
Elsewhere: China, Java, Myanmar, Sunda Island, Thailand and Vietnam.
Remarks: This species is close to *Creobroter gemmatus* (Stoll, 1813) but differs by the extent of extension of smoky patch in the discoidal area of hind wings in males.

Subfamily Acromantinae Brunner de Wattenwyl, 1893
Tribe Ambiviini Giglio-Tos, 1919

2. *Ambivia undata* (Fabricius, 1793)

Mantis undata Fabricius, 1793: 2: 88. Probable type, sex ? (NHRS). Type locality India: Kolkata.
Material examined: 1male, Forest Bungalow: Bakkhali, South 24 Parganas, 21°33’42.45” N, 88°16’20.78’’ E, 28.v.2016, coll. B. Mitra and Party.
Distribution: India: Andhra Pradesh, Kerala, Madhya Pradesh, Maharashtra, Sikkim, West Bengal.
Elsewhere: Borneo; Laos; Malaysia; Myanmar; Nepal; Sri Lanka; Sumatra; Thailand; Vietnam.

Family Liturgusidae Giglio-Tos, **1915**
Subfamily Liturgusinae Giglio-Tos, 1915
Tribe Humbertiellini Brunner de Wattenwyl, 1893

3. *Humbertiella* sp.

Material examined: 1 male, Phulbari Guest House:Sagar Island, South 24 Parganas, 21°51’57.06” N, 88°7’22.20’’ E, 21.v.2014. coll. B. Mitra and Party.
Distribution: In India, the genus is known from Andhra Pradesh, Assam, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal and outside India from Myanmar, Nepal and Sri Lanka.
Remarks: The costal area of fore wings contains a mixture of parallel and irregular veinules. However, the middle of upper edge of frontal sclerite is straight. Hence the specimen is close to *Humbertiella similis* Giglio-Tos, 1917.

Family Iridopterygidae Giglio-Tos, 1915
Subfamily Tropidomantinaem Giglio-Tos, 1915

4. *Leptomantella montana* (Beier, 1942)

Leptomantis montana Beier. 1942: 52:139. Holotype female, paratype female (MIZ). Type locality India: Assam.
Materials examined:1male, 1female nymph, Pakhirala: Gosaba Island, South 24 Parganas, 22°7’57.54” N, 88°49’32.52’’ E, 16.v.2015, coll. B. Mitra and Party.
Distribution: India: Assam, Meghalaya, West Bengal.
Remarks: This species is endemic to India.

Family Mantidae Latreille, 1802
Subfamily Hierodulinae Brunner de Wattenwyl, 1893

5. *Hierodula patellifera* (Audinet-Serville, 1839)
Mantis simulacrum Fabricius, 1793: 2: 21 (34). Type information not available.

Materials examined:1 male, Pakhirala: Gosaba Island, South 24 Parganas, 22°7’57.54” N, 88°49’32.52’’ E, 11.xii.2014. coll. B. Mitra and Party;1 male, Pakhirala: Gosaba Island, South 24

Parganas, 22°7’57.54” N, 88°49’32.52’’ E, 26.v.2015, coll. B. Mitra and Party.
Distribution: India: Arunachal Pradesh, Bihar, Himachal Pradesh, Kerala, Maharashtra, Madhya Pradesh, Nagaland, Tamil Nadu, Uttar Pradesh, West Bengal.
Elsewhere: China; Hawaii; Japan; Java; Korea; Nepal;New Guinea; Philippines; Sumba; Taiwan; Thailand; Vietnam.

6. ***Hierodula tenuidentata*** Saussure, 1869

Hierodula tenuidentata Saussure, 1869: 3: 68. Holotype female (MHNG). Type locality India.
Materials examined: 1male, Pakhirala: Gosaba Island, South 24 Parganas, 22°7’57.54” N, 88°49’32.52’’ E, 07.x.2015, coll. B. Mitra and party; 1male, Pakhirala: Gosaba Island, South 24 Parganas, 22°7’57.54” N, 88°49’32.52’’ E, 02.iv.2016, coll. B. Mitra and party; 1male,1female (nymph), Forest Bungalow: Bakkhali, South 24 Parganas, 21°33’42.45” N, 88°16’20.78’’ E, 07.v.2016. coll. B. Mitra and party.
Distribution: India: Karnataka, Kerala, Maharashtra, Madhya Pradesh, Orissa, Tamil Nadu, West Bengal.
Remarks: This species is endemic to India. The colouration of prosternum is similar to *Hierodula doveri* Chopard, 1924.

Subfamily Mantinae Burmeister, 1838

7. ***Statilia apicalis*** (Saussure, 1871)
Mantis apicalis Saussure, 1871: 21: 291. Holotype male (NHMW). Type locality Australia: Sydney.
Material examined: 1 male, 1 female, South 24 Parganas, 26.vii.1975, coll. T. Mukherjee; 1 female, Kakdwip: South 24 Parganas, 21°52’33.30”N, 88°11’7.06’’E, 23.x.2015, coll. S. Mandal.
Distribution: India: Andaman Island, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Sikkim, Uttar Pradesh, West Bengal.
Elsewhere: Australia; China; Congo; Ghana; New Caledonia; New Guinea; Prince of Wales Island; Philippines; Sulawesi; Sumba; Timor.

Family Toxoderidae Saussure, 1869
Subfamily Oxyothespinae Giglio-Tos, 1916

8. ***Heterochaetula tricolor*** (Wood-Mason, 1876)

Heterochaeta tricolor Wood-Mason, 1876: 4(108): 441-443. Holotype female (NZSI). Type locality India: Kolkata (Calcutta).
Material examined: 1male, Canning: South 24 Parganas, 22°18’37.10” N, 88°39’28.37’’ E, 12.x.2010, coll. A. Banerjee.
Distribution: India: Bihar, Maharashtra, Orissa, West Bengal.
Remark: This species is endemic to India.

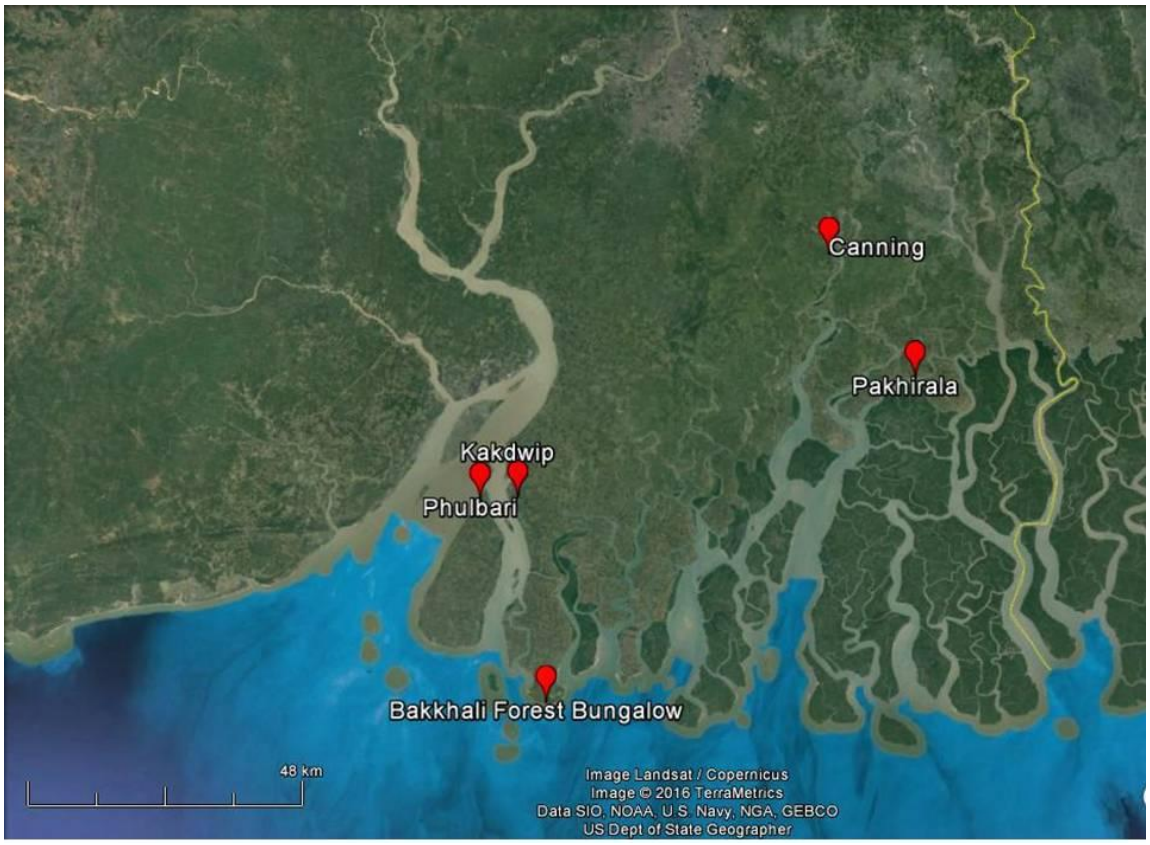

Fig.1. Map of Study area.

Fig.2-9. **2.** *Creobroter* sp.; **3.** *Ambivia undata* (Fabricius, 1793); **4.** *Humbertiella* sp.; **5**. *Leptomantella montana* (Beier, 1942); **6.** *Hierodula patellifera* (Audinet-Serville, 1839); **7.** *Hierodula tenuidentata* Saussure, 1869; **8.** *Statilia apicalis* (Saussure, 1871); **9.** *Heterochaetula tricolor* (Wood-Mason, 1876).

DISCUSSION

The human settlement outside SBR and its fringe areas with vegetation provide good habitat for mantids. Present survey was mostly made from the human inhabiting islands or buffer zone of SBR and a total of 8 species under 7 genera of 7 subfamilies belonging to 5 families of the order Mantodea for the first time are reported from SBR. Of them, Family Mantidae shares maximum number of species (3), followed by Family Hymenopodidae (2), Family Liturgusidae (1), Family Iridopterygidae (1) and Family Toxoderidae (1).

The core area of SBR is unexplored or underexplored due to tiger infested jungle. Therefore the exact diversity of Mantodea in such a mangrove biosphere may remain unknown to science for a long time. The Mantodea from other mangrove forests of India are also remained unknown. Therefore, this communication is also the first report on mantid fauna from mangrove ecosystem of India.

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