

New records of aquatic and semi-aquatic Heteroptera (Insecta: Hemiptera) from Mainland India

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Abstract

Four species of the aquatic and semi-aquatic Hemiptera such as *Anisops occipitalis* Breddin (1905), *Hydrometra okinawana* Drake (1951), *Neolardus typicus* (Distant, 1903) and *Limnometra ciliata* Mayr (1865), of families Notonectidae, Hydrometridae, Veliidae and Gerridae respectively, are the first records from mainland India and were collected from different districts of Meghalaya. The recorded species are very rare and have been collected from a single locality.

Keywords: First Records, Gerridae, Hydrometridae, Meghalaya, Notonectidae, Taxonomy, Veliidae, Water Bugs

Introduction

In recent years several studies have been made on the taxonomy of aquatic and semi-aquatic Hemiptera from northeast India (Lyngdoh, 2010, 2013; Jehamalar & Chandra, 2013a, 2017, 2020; Jehamalar *et al.*, 2014, 2018a, 2018c, 2019; Basu *et al.*, 2016). The study on water bugs is very much necessary because of their role in the ecosystem and the bioindicator potential. Since the freshwater bodies are shrinking in a faster rate, the fauna of such ecosystem has to be documented urgently for conservation. An effort has been made to document the aquatic bugs of Meghalaya and several species collected are yet to be identified and published. As a part of the findings from Meghalaya four new records from the mainland India such as *Anisops occipitalis* Breddin (1905), *Hydrometra okinawana* Drake (1951), *Neolardus typicus* (Distant, 1903) and *Limnometra ciliata* Mayr (1865) are treated here. All these four species have previously been recorded from Andaman and Nicobar Islands, but for mainland India these species are reported for the first time.

Material and Methods

Meghalaya are blessed with freshwater bodies such as streams, rivers, ponds and lake. The state has a world record of receiving highest rainfall in Mawsynram of East Khasi Hills district. The studied materials were

collected from the freshwater bodies of Meghalaya using D-frame aquatic insect net and preserved in 75 % ethanol. The specimens were studied under Leica Stereozoom Microscope M205A. The photography and measurements were made by the software Leica Application Suite (version 3.6). The examined specimens are deposited in the National Zoological Collection, Hemiptera Section, Zoological survey of India, Kolkata.

Results

Order HEMIPTERA Linnaeus, 1758
Suborder HETEROPTERA Latreille, 1810
Infraorder NEPOMORPHA Popov, 1968
Superfamily NOTONECTOIDEA Latreille, 1802
Family NOTONECTIDAE Latreille, 1802
Subfamily ANISOPINAE Hutchinson, 1929
Tribe **Anisopini** Hutchinson, 1929
Genus *Anisops* Spinola, 1837

Anisops occipitalis Breddin, 1905

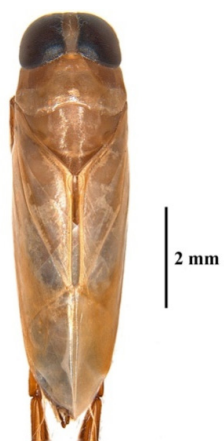
1905. *Anisops occipitalis* Breddin, *Mitteil. Naturh. Mus. Hamburg*, 20: 152.

Material examined: 5782/H15, 1 ♂, 2 ♀♀, Laddemthring Pond, Demthring Village, West Jaintia Hills, Meghalaya, 9.iii.2016, 1361 m asl, 25.43447° N, 92.18622° E, E.E. Jehamalar.

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Diagnosis: This species can easily be identified by its large size. Body length: male 8.18 mm, female 7.70 mm to 7.98 mm. The anterior region of head slightly truncate medially; synthlipsis wide; rostral prong having a depression medially and the prong is longer than the third rostral segment; the third rostral segment with a posterior protrusion; tylus is swollen; labrum is covered with short setae.

Distribution: India: Andaman and Nicobar Islands (Great Nicobar Island) (Jehamalar & Chandra, 2013b) and Meghalaya (West Jaintia Hills). *Elsewhere:* Australia, southeast China, Indonesia, Japan, Malaysia, New Caledonia, New Guinea, the Philippines, Singapore and Taiwan (Zettel *et al.*, 2012).



Anisoptera occipitalis Breddin

Infraorder GERROMORPHA Popov, 1971
 Superfamily HYDROMETROIDEA Billberg, 1820
 Family HYDROMETRIDAE Billberg, 1820
 Subfamily HYDROMETRINAE Billberg, 1820
 Genus *Hydrometra* Latreille, 1796

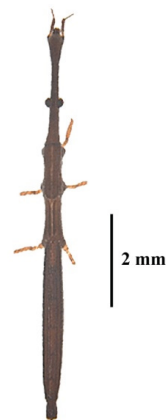
***Hydrometra okinawana* Drake, 1951**

1951. *Hydrometra okinawana* Drake, *Bull. South. Calif. Acad. Sci.*, **50**(2): 101.

Material examined: 8850/H15, 1 brachypterous ♂, Fishery Pond, Kumaligaon Village, South West Garo Hills, Meghalaya, 16.vi.2016, 15 m asl, 25.50533°N, 89.90559° E, E.E. Jehamalar.

Diagnosis: Body length: 8.51 mm; the anteclypeus is long, conical and has pointed tip; the seventh abdominal sternum of the male anterolaterally with a pair of thorn-like process on each side; the caudal process of the male is short.

Distribution: India: Andaman and Nicobar Islands (Great Nicobar Island) (Jehamalar & Chandra, 2014a) and Meghalaya (South West Garo Hills). *Elsewhere:* Borneo, Japan, Malaysia, Singapore and Thailand (Yang & Zettel, 2005).



Hydrometra okinawana Drake

Superfamily GERROIDEA Reuter, 1910
 Family VELIIDAE Amyot & Serville, 1843
 Division MICROVELIIFORMES Andersen, 1982
 Subfamily MICROVELIINAE China & Usinger, 1949
 Genus *Neoalardus* Distant, 1912

***Neoalardus typicus* (Distant, 1903)**

1903. *Alardus typicus* Distant, *Fascicula Malayenses*, *Zool.*, **2**: 219.

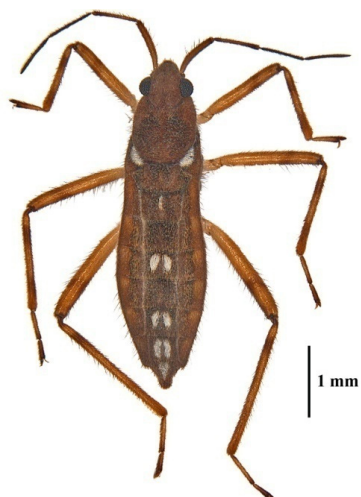
1912. *Neoalardus typicus* (Distant): Distant, *Ann. Mag. nat. Hist.*, **9**(8): 471.

Material examined: 8851/H15, 1 apt. ♀, Bhogai River, Dalu Village, West Garo Hills, Meghalaya, 10.vi.2016, 25 m asl, 25.20213° N, 90.25153° E, E.E. Jehamalar.

Diagnosis: Body length 4.49 mm; body setiferous; femora of all legs beyond middle with a brown mark, hind tibia subbasally and fore and mid tibia both subbasally and subapically with brown marks; thorax near posterolateral region of pronotum with silvery white patch; tergum II anteromedially with a narrow silvery white patch; terga IV, VI and VII with a pair of median silvery white patch; silvery white patch on the posterior margin of tergum VII continued up to posterior region of tergum VIII; connexivum laterally yellowish brown.

Distribution: India: Andaman and Nicobar Islands (North Andaman) (Polhemus & Starmühlner, 1990) and Meghalaya (West Garo Hills). *Elsewhere:* Thailand, China (Hainan), Indonesia (Sumatra), Singapore and Peninsular Malaysia (Zettel, 1998; Andersen *et al.*, 2002).

Family GERRIDAE Leach, 1815
 Division GERRIFORMES Andersen, 1982
 Subfamily GERRINAE Bianchi, 1896
 Genus *Limnometra* Mayr, 1865

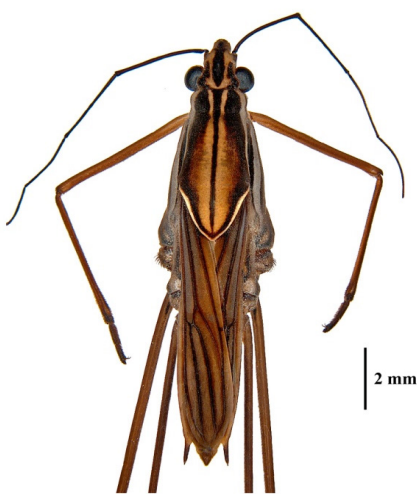


Neoalardus typicus (Distant)

***Limnometra ciliata* Mayr, 1865**

1865. *Limnometra ciliata* Mayr, *Verh. Zool-bot. Vereins Wien*, 15: 444.

Material examined: 8852/H15, 1 mac. ♂, arecanut processing water tank, Umkiang Village, Narpuh WLS, East Jaintia Hills, Meghalaya, 11.iii.2016, 19 m asl., 25.06997° N, 92.3785° E, E.E. Jehamalar.



Limnometra ciliata Mayr

Diagnosis: Body Length: macropterous male 13.70 mm. Apical half of the mid femur fringed with short fine setae; sternum VIII of male sublaterally with a V-shaped process.

Distribution: India: Andaman and Nicobar Islands (Great Nicobar Island) (Chandra *et al.*, 2012) and Meghalaya (East Jaintia Hills). *Elsewhere:* Fiji, Indonesia, Malaysia, Mariana Islands, Papua New Guinea, the Philippines, Solomon Islands, East Timor, Singapore, Thailand and Vietnam (Damgaard *et al.*, 2014).

Discussion

Three field surveys were undertaken for duration of more than 20 days each in Meghalaya yielded several species of aquatic and semi-aquatic Heteroptera. The present study reveals the faunal affinities between the northeast India and Andaman and Nicobar Islands. The aquatic and semi-aquatic Heteroptera known from Andaman and Nicobar Islands and Meghalaya are 50 species (Chandra & Jehamalar, 2012; Chandra *et al.*, 2012; Jehamalar & Chandra, 2013, 2014a,b; Jehamalar *et al.*, 2018b, 2019) and 68 species (Jehamalar & Chandra, 2020), respectively. Of which 13 species are present in both the regions and the current records of four species presently occur only in Andaman and Nicobar Islands and Meghalaya. Of the four species reported, *Anisops occipitalis*, *Hydrometra okinawana*, *Limnometra ciliata*, were previously reported from Great Nicobar Island by Jehamalar & Chandra (2013b), Jehamalar and Chandra (2014a), and Chandra *et al.* (2012) respectively. Polhemus & Starmühlner (1990) had reported *Neoalardus typicus* from North Andaman Island. The study of aquatic and semi-aquatic bugs from northeast India and Andaman and Nicobar Islands will give better understanding on the zoogeography with other Southeast Asian countries. The water bugs from northeast India are underexplored and less than 25 species in four states each were reported out of eight north eastern states of India, altogether with an average of 32 per cent are known in northeast India (Thirumalai, 2002, 2007; Lyngdoh, 2010, 2013; Jehamalar & Chandra, 2013a, 2017, 2020; Jehamalar *et al.*, 2014, 2018a, 2018c, 2019; Basu *et al.*, 2016). The high diversity of aquatic and semi-aquatic Heteroptera is recorded from Tamil Nadu and West Bengal states, are 105 species and 114 species respectively, though several districts of both the states are underexplored. So it is estimated by the biogeographic position and also by the unnamed collections resulted from the recent surveys that nearly 30 per cent of the aquatic and semi-aquatic bugs have been explored from northeast India and about 70 per cent of the water bugs including several new records to the country and new species are yet to be discovered.

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