New records of nasutiform termite (Nasutitermitinae: Termitidae: Isoptera) from Meghalaya, India

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New records of nasutiform termite (Nasutitermitinae: Termitidae: Isoptera) from Meghalaya, India

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Abbreviations: HFL—Hind femur length | HL—Head length without rostrum | HLR—Head length with rostrum | HW—Head width | HWC—Head width at constriction | PL—Pronotum length | PW—Pronotum width | PBH—Posterior buldge of head | PoL—Postmentum length | PoW—Postmentum width | RL—Rostrum length | TBL—Total body length.

Termites are widely distributed group of insects with around 3,106 species present worldwide (Krishna et al. 2013). They are usually more diverse and abundant in the tropical and subtropical regions (Bignell & Eggleton 2000). Among the nine families of termite, Termitidae is the largest family so far with 2072 living species under 238 genera in eight sub-families throughout the globe (Krishna et al. 2013). In India, there are 290 species of termites under 55 genera in six families (Krishna et al. 2013) with the family Termitidae having the highest species composition. The northeastern part of India harbors 76 species under 27 genera in five families (Bose 1999). Nasutitermitinae, a subfamily of Termitidae, is represented by the genera Nasutitermes, Bulbitermes, Hospitalitermes, Roonwalitermes from the northeastern region of India. Out of the 76 species from this region, 29 species were reported from Meghalaya under 17 genera (Bose 1999). Recently, Das and Choudhury (2020) also described a new subspecies, Microcerotermes labioangulatus wahkdaitensis and recorded the genus Microcerotermes and the species Reticulitermes chinesis from the state.

In this taxonomic account, which is a part of our study on the termite fauna of Meghalaya, we are reporting first record of two nasutiform termites Hospitalitermes jepsoni Snyder, 1934 and Nasutitermes matangensis matangensis Haviland, 1898. The genus Hospitalitermes Holmgren, 1912 is also documented first time from the state. Morphometrics for the species H. jepsoni has also been revised.

Materials and Methods

The specimens studied were collected from different part of Meghalaya and were preserved in 80% alcohol. Measurements of the specimens were done following Roonwal & Chhotani (1989) and Chhotani (1997) using Leica stereo zoom microscope S8AP0 and the identification was done based on available literature and taxonomic keys (Chhotani 1997). The specimens are deposited in the national repository of Zoological Survey of India in the NERC, Shillong.
Results and Discussion

1. *Hospitalitermes jepsoni* Snyder, 1934

Materials examined: IV/ISOP/ERS/4422, 10.xii.2017, one colony (3 soldiers & 8 workers) and IV/ISOP/ERS/4427, 21.viii.2019, one colony (66 soldiers & 22 workers), Nongkhyllem Reserved Forest, Lailad, Ri Bhoi, Meghalaya, India (25.931°N and 91.776°E), coll. R. Thangkhiew & party and K.S. Das & party, respectively.

*Hospitalitermes jepsoni* (Image 1) forages above ground mostly on leaf litters in an open air processional column (Miura & Matsumoto 1998). In the procession columns, the number of soldier individuals are comparatively more than the workers. Soldiers of the species are monomorphic whereas the worker individuals are dimorphic.

Diagnostic features: The head-capsule without rostrum pyriform, strongly constricted behind antennae. Posterior portion of the head dark brown and the anterior portion reddish-brown. Head vertex with two short hairs, rostrum back with three short hairs, one near the base and two at anterior portion. Rostrum cylindrical, base dark brown and anterior portion is light brown with three to four hairs on the tip, its length is slightly more than the half of the head length without rostrum. Antennae are long with 14 segments; segment 3 about two-and-half times of 2, 4 shorter than 3. Mandibles vestigial, each with an elongate, dark brown, pointed, spine like process. Pronotum strongly saddle-shaped.

Measurements: HLR 1.85–1.90; HL 1.20–1.27; HW 1.15–1.18; HWC 0.78–0.80; HWC / HW 0.70–0.72; RL 0.63; RL/HL 0.50–0.56; PBH 0.48–0.56; PBH/HL 0.40–0.46; PL 0.45; PW 0.60–0.70; PoL 0.28–0.30; PoW 0.45–0.48; HFL 1.80–1.90.

Workers are dimorphic. Worker major: Head-capsule subsquarish; Y-suture prominent. Antennae elongate with 15 segments; segment 3 longer than 2 or 4. Pronotum strongly saddle-shaped. Measurements: HL 1.10–1.15; HW 1.10–1.30; PL 0.40–0.55; PW 0.70–0.80. Worker minor: Antennae with 15 segments and smaller in size. Segment 3 either as long as or slightly longer than 2 or 4. Measurements: HL 0.75–0.90; HW 1.05; PL 0.40; PW 0.59–0.60.

Remarks: Variations in the morphology of the species *H. jepsoni* have not been reported earlier. In this study, we found variation both in the soldier and worker castes from the study area. In comparison to the earlier descriptions of the species available (Chhotani 1997), the head width at the constriction, rostrum length, and hind femur length are found here slightly more in case of the soldier individuals. In case of workers too, the pronotum length, pronotum width, and total body length of both the worker major and minor individuals have shown considerable variation. Though there are variations both in the soldier and worker individuals of the species, that is not enough to designate the species as a new species or subspecies. Therefore, we consider this species as *H. jepsoni* and revise its morphometrics based on available literature (Chhotani 1997) and the present study (Table 1).

Members of the genus mostly occur in oriental regions except one from Papuan region. Indian region consist of 25 species of the genus (Chhotani 1997). Earlier report of the species *H. jepsoni* was from Assam which was the only report from India.

2. *Nasutitermes matangensis matangensis* Haviland, 1898

Materials examined: IV/ISOP/ERS/4423, 22.i.2018, one colony (3 soldiers & 1 worker), Nongkhrah, Nongpoh, Ribhoi, Meghalaya, India (25.926°N & 91.889°E), coll. K.S. Das & party. Samples were collected from Indian Bay leaf plantation.

Diagnostic features: In case of the species *Nasutitermes matangensis matangensis* (Image 2), the head capsule brownish-yellow to castaneous brown, almost circular, slightly wider than long, in profile not depressed, basal hump distinct. Rostrum brown, darker near tip, conical in shape. Antennae pale brown with 13–14 segments; in 13 segmented antennae, segment 3 almost twice as long as 2; in 14-segmented ones, 3 as long as 2. Mandibles vestigial; with short, spine like processes. Pronotum saddle shaped.

Measurements: HLR 1.68–2.00; HL 0.95–1.23; HW 1.15–1.33; RL 0.63–0.78; RL/HL 0.60–0.65; PL 0.24–0.25; PW 0.39–0.69; PoL 0.28–0.33; PoW 0.35–0.40.

Workers are dimorphic. Head brown; body whitish.
to reddish-yellow. Head and body thinly hairy. Headcapsule squarish; head sutures and fontanelle distinct. Antennae with 14 segments; segment 3 a little longer than 2, 4 shorter than 2. Pronotum saddle shaped. Worker minor. Measurements: HL 1.00; HW 1.14–1.18; PL 0.30–0.48; PW 0.60–0.70.

Remarks: In the specimens studied, some of the diagnostic characters of the soldier caste are similar to the species Nasutitermes matangensisiformis and some are similar to Nasutitermes matangensis matangensis. The upper range of the head length with rostrum, head width and the rostrum length and rostrum index is similar with the values of N. matangensisiformis and rest of the characters in the soldier individuals match with N. matangensisiformis. Though the samples have shown similarity with N. matangensis matangensis and N. matangensisiformis in their morphology, the characters with greater taxonomic values are similar to that of N. matangensis matangensis. On the other hand, the species N. matangensisiformis has been designated elsewhere as the junior synonym of N. matangensis matangensis (Krishna et al. 2013; Amina et al. 2016). Thus, we consider the species as Nasutitermes matangensisiformis. This species was earlier reported from Little Andamans, Nicobars, Arunachal Pradesh, and here, this species is reported for the first time from Meghalaya (Nongkhrah, Nongpoh), India.

With these two new records of nasutiform termite from Meghalaya, the number of termite species found in the state increases from 31 to 33 and the number of genera from 18 to 19. This communication will also help in the identification of the species H. jepsoni from this region without any confusion with its revised morphometrics in future.

Table 1. Revised morphometrics for H. jepsoni from Meghalaya, India.

| Metric          | Soldier (in mm) | Worker major (in mm) | Worker minor (in mm) |
|-----------------|-----------------|----------------------|----------------------|
| TBL             | 4.00–5.20       | 4.00–5.20            | 3.00–3.75            |
| HLR             | 1.78–1.95       | –                    | –                    |
| HL              | 1.09–1.15       | 1.10–1.15            | 0.75–0.90            |
| HW              | 0.98–1.30       | 1.10–1.30            | 1.00–1.13            |
| HWC             | 0.70–0.80       | –                    | –                    |
| HWC/HW          | 0.63–0.72       | –                    | –                    |
| RL              | 0.55–0.63       | –                    | –                    |
| RL/HL           | 0.50–0.56       | –                    | –                    |
| PBH             | 0.40–0.56       | –                    | –                    |
| PBH/HL          | 0.33–0.46       | –                    | –                    |
| PL              | 0.30–0.48       | 0.40–0.55            | 0.30–0.40            |
| PW              | 0.60–0.70       | 0.70–0.80            | 0.50–0.60            |
| PoL             | 0.28–0.30       | –                    | –                    |
| PoW             | 0.45–0.48       | –                    | –                    |
| HFL             | 1.70–1.90       | –                    | –                    |

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Communications

Dusky Langurs Trachypithecus obscurus (Reid, 1837) (Primates: Cercopithecidae) in Singapore: potential origin and conflicts with native primate species
– Andie Ang, Sabrina Jabbar & Max Khoo, Pp. 15967–15974

A new report on mixed species association between Nilgiri Langurs Semnopithecus johnii and Tufted Grey Langurs S. priam (Primates: Cercopithecidae) in the Nilgiri Biosphere Reserve, Western Ghats, India
– K.S. Chetan Nag, Pp. 15975–15984

A review of the bacacular morphology of some Indian bats (Mammalia: Chiroptera)
– Bhargavi Srinivasulu, Harpreet Kaur, Tariq Ahmed Shah, Gundena Devender, Asad Gopi, Sreerami Raman & Chelmila Srinivasulu, Pp. 15985–16005

Status of the Critically Endangered Bengal Florican Houbaropsis bengalensis (Gmelin, 1798) in Koshi Tappu Wildlife Reserve, Nepal
– Hem Sagar Baral, Tek Raj Bhatta, Sailendra Raj Giri, Ashok Kumar Ram, Shyam Kumar Shah, Lakman Prasad Poudyal, Dhiraj Chaudhary, Gitanjali Bhattacharya & Rajan Amin, Pp. 16006–16012

Observations on breeding behaviour of a pair of endangered Egyptian Vultures Neophron percnopterus (Linnaeus, 1758) over three breeding seasons in the plains of Punjab, India
– Charn Kumar, Amritpal Singh Kaleka & Sandeep Kaur Thind, Pp. 16013–16020

Additions to the cicada (Insecta: Hemiptera: Cicadidae) fauna of India: first report and a new subspecies
– Aparna Sureshchandra Kalawate, Shital Pawara, A. Shabnam & K.P. Dinesh, Pp. 16123–16135

Status of the Critically Endangered Bengal Florican Houbaropsis bengalensis (Gmelin, 1798) in Koshi Tappu Wildlife Reserve, Nepal
– Hem Sagar Baral, Tek Raj Bhatta, Sailendra Raj Giri, Ashok Kumar Ram, Shyam Kumar Shah, Lakman Prasad Poudyal, Dhiraj Chaudhary, Gitanjali Bhattacharya & Rajan Amin, Pp. 16006–16012

The perceptions of high school students on the habitat of the crab Ucides cordatus (Linnaeus, 1763) (Crustacea: Decapoda: Ucididae) in northern Rio de Janeiro State, southeastern Brazil
– Laisa Fernanda Quintanilha Ribeiro, Laura Helena de Oliveira Côrtes & Ana Paula Madeira Di Benedetto, Pp. 16043–16047

Woody species diversity from proposed ecologically sensitive area of northern Western Ghats: implications for biodiversity management
– M. Tadwalkar, A. Inglekar, M. Mhaskar & A. Pathwardhan, Pp. 16048–16063

Resolving taxonomic problems in the genus Ceropogia L. (Apocynaceae: Asclepiadoideae) with vegetative micromorphology
– Savita Sanjaykumar Rahangdale & Sanjaykumar Ramlal Rahangdale, Pp. 16077–16099

Yata, 1990 (Lepidoptera: Erebidae: Arctiinae) from peninsular India with morphological variations
– Pankaj A. Gorule, Sachin M. Gosavi, Sanjay S. Kharat & Chandani R. Verma, Pp. 16136–16142

DNA barcode reveals the occurrence of Palearctic Olea scheleini Witt et al., 2005 (Lepidoptera: Erebidae: Arctiinae) from peninsular India with a morphological variation and a new subspecies
– Aparna Sureshchandra Kalawate, Shital Pawara, A. Shabnam & K.P. Dinesh, Pp. 16143–16152

Present status of the genus Spragueidus Maes, 1984 (Lepidoptera: Erebidae: Lymantriinae) from India
– Amritpal Singh Kaleka, Devinder Singh & Gagan Preet Kour Bali, Pp. 16153–16160

Early stages of Nilgiri Grass Yellow Eurema nilgiriensis (Yata, 1990) (Lepidoptera: Pieridae), with a note on its range extension in the Kerala part of the Western Ghats, India
– Balakrishnan Valappil & V.K. Chandrasekharan, Pp. 16161–16165

Notes

Breeding site records of three sympatric vultures in a mountainous cliff in Kahara-Thathi, Jammu & Kashmir, India
– Muzaffar A. Kichloo, Sudeesh Kumar & Neeraj Sharma, Pp. 16166–16169

First distribution record of Elongated Tortoise Indotestudo elongata (Blyth, 1853) (Reptilia: Testudinidae) from Bihar, India
– Arif, Sourabh Verma, Ayesha Mohammad Maslehuddin, Uttam, Ambarish Kumar Mall, Gaurav Ojha & Hemkant Roy, Pp. 16170–16172

The niche of shrimp stocks (Xiphopenaeus kroyeri Heller, 1862) from southeastern Brazil: a stable isotope approach
– Keltony de Aquino Ferreira, Leandro Rabello Monteiro & Ana Paula Madeira Di Benedetto, Pp. 16173–16176

Features of the White Tufted Royal Odonata) from Himachal Pradesh, extending its known range westwards
– Sanjay Sondhi, Pp. 16177–16179

Range extension of the Lilac Silverline (Xiphopenaeus kroyeri Heller, 1862) to southern Rajasthan and a review of the literature
– K.S. Gopi Sundar, Swati Kittur, Vijay Kumar Koli & Utkarsh Prajapati, Pp. 16180–16182

A record of gynandromorphism in the libellulid dragonfly Crocothemis servilia (Insecta: Odonata) from India
– R.V. Renjith & A. Vivek Chandran, Pp. 16183–16186

Carcass consumption by Nasutitermes (Nasutitermitinae: Termitidae: Isoptera) in highland forests from Brazil
– Igor Eloí, Márcio Herculano de Oliveira & Maria Avany Bezerra-Gusmão, Pp. 16187–16189

New records of nasutiform termites (Nasutitermitinae: Termitidae: Isoptera) from Meghalaya, India
– Khird Sankar Das & Sudipta Choudhury, Pp. 16190–16192

Corrigendum

Corrections to A citizens science approach to monitoring of the Lion Panthera leo (Carnivora: Felidae) population in Niokolo-Koba National Park, Senegal
– Arif, Sourabh Verma, Ayesha Mohammad Maslehuddin, Uttam, Ambarish Kumar Mall, Gaurav Ojha & Hemkant Roy, Pp. 16166–16169

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