BIOSYSTEMATICS OF HOSPITALITERMES HOSPITALIS HOLMGREN (ISOPTERA) FROM BORNEO

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Abstract. This article redescribes *Hospitalitermes hospitaalis* of open-air processional column termites from Central Borneo Indonesia. In many publications, this nasute termite is one of very incomplete description. Condition of head capsule and its coloration (soldier caste), mandibles and antennae (soldier caste) are importance chracters identification work. This species showed a large variation of nesting sites and dimorphism of worker caste.
Key words: Biosystematics, *Hospitalitermes*, Borneo

Introduction

Hospitalitermes is a genus of termite belongs to subfamily Nasutitermitinae that widely distributed in the Oriental and Papuan regions[1,2]. Soldiers and workers forage on the ground in open-air processional columns[2,3,4,5,6,] especially in the primary forest floor. Morphologically soldier and worker castes of the genus relatively similar with *Lacessititermes*[7] and phylogenetically both of these species closely related with another genera of the open-air processional columns termite group, *Longipeditermes*[8].

H. hospitalis is a species under this genus that distributed in Bormeo, Sumatra, and Malay Peninsula[7,9,10]. This species has also been seriously problematical in identification work[6,9]. In this paper I describe morphological characters and nesting sites of *H. hospitalis* based on material collected from Borneo (Kalimantan, Indonesia).

Materials and Methods

Specimens of *H. hospitalis* were collected from secondary forest at Bukit Tangkiling, primary and secondary at Barito Ulu, secondary forest at Ampahan, primary forest at Pararawen, Central Kalimantan, Borneo on June 2014. Soldier and workers were photographed using a digital microscope, KEYENCE HF VH-8000, then multi-focused montage images were produced using Helicon Focus 4.03 Pro. Artifacts/ghosts and unnecessary parts (unfocused appendages, shaking alcohol effects, etc.) surrounding or covering target objects were erased and cleaned up using the retouching function of Helicon Focus "see Ref, 5,7". General morphological terminology used for describing specimens follow those of [5,6,11,]12, while measurements follow those in "see Ref. 13".

Results and Discussion

***Hospitalitermes hospitalis* (Haviland)**

1898. *Termes hospitalis* Haviland, p. 437.
1902. *Eutermes monoceros hospitalis*: Wasmann, p. 131.
1912. *Eutermes (Hospitalitermes) hospitalis*: Holmgren, p. 67.
1925. *Eutermes (Hospitalitermes) hospitalis*: John, pp. 403-404.
1949. *Hospitalitermes hospitalis*: Snyder, p. 320.
1958. *Hospitalitermes hospitalis*: Ahmad, p. 143.
1992. *Hospitalitermes hospitalis*: Tho, p. 182.

Type material examined

Syntype (one soldier). *Eutermes hospitalis* (Haviland). Sarawak, Haviland Coll., B.M. 1899-41. BMNH#103771.

Description. Alates. Not available

Soldier. Monomorphic. Head capsule brown to dark sepia brown (some specimens blackish) with anterior part slightly paler than posterior part; nasus with apical two-thirds lighter with reddish tinge, and basal third darker; antenna (except for the first and second segments) uniformly pale brown to sepia brown, and paler than or similar to the posterior part of head capsule in coloration. Head and nasus with scattered microscopic hairs. Its capsule in dorsal view weakly to moderately constricted behind antennal sockets, with anterior part excluding nasus clearly smaller in size than posterior part; its posterior margin weakly to moderately indented in the middle; dorsal outline (including nasus) in profile weakly to moderately concave; nasus more than half as long as head capsule; antenna with 14 segments; third segment longer than fourth; fourth slightly shorter than or equal to fifth; 6th-14th gradually decreasing in length.

***Thorax*:** Pronotum seen from above paler than or similar to head capsule in coloration, saddle-shaped, with anterior and posterior margins weakly indented in the middle; coxae brown to sepia brown; femora pale brown to brown; tibiae pale brown.

***Abdomen*:** whitish brown to pale brown.

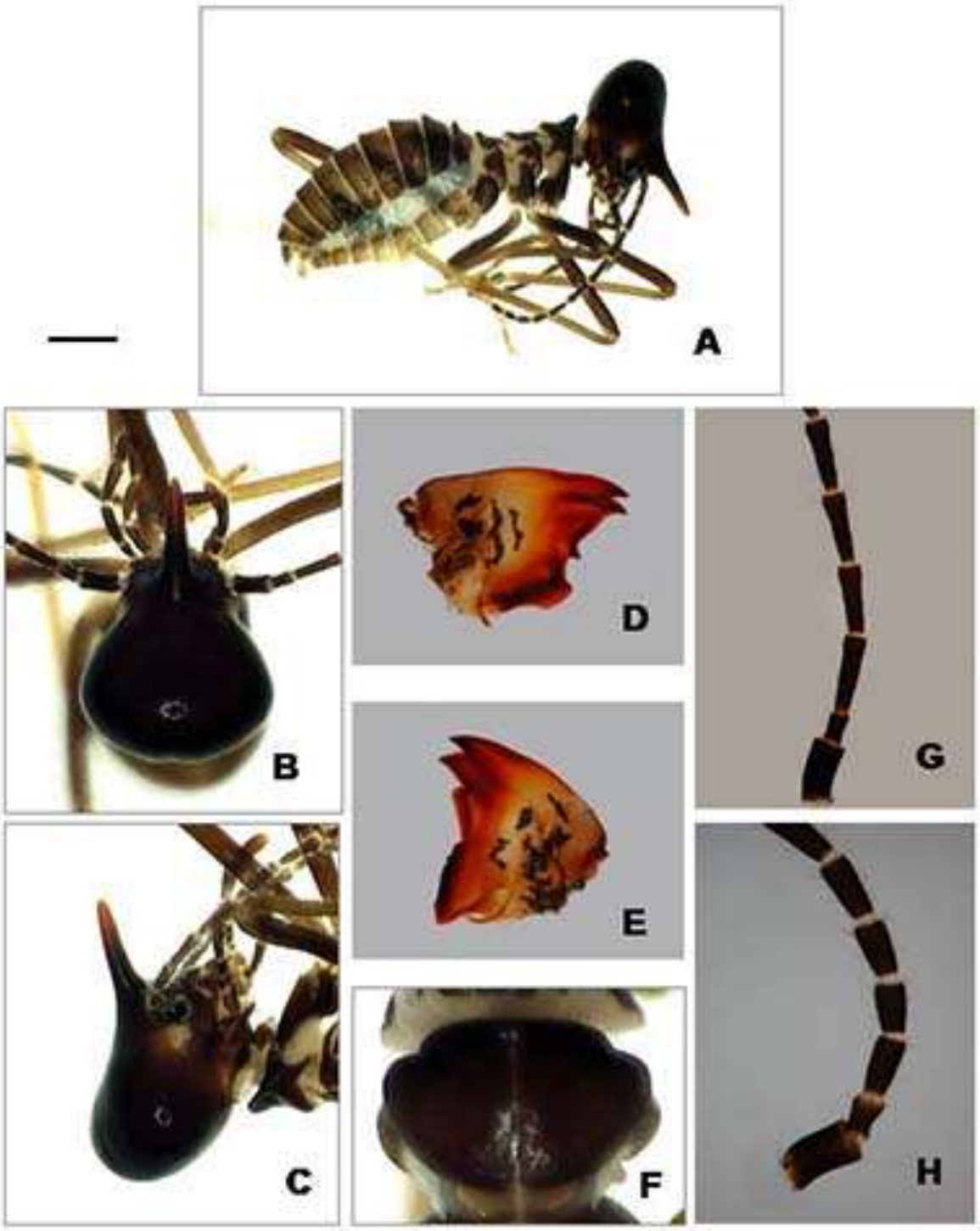
Worker. Dimorphic. First antennal segment blackish brown to black, and darker than the subsequent segments; consisting of 15 segments; third segment longer than fourth; fourth and fifth almost equal in length; 6th-15th gradually increasing in length.

***Left mandible*:** Apical tooth shorter (often clearly shorter) than first marginal tooth; third marginal moderately protruding from cutting edge; fourth completely hidden behind molar prominence.

***Right mandible*:** Posterior edge of second marginal tooth nearly straight; inner layer of molar plate weakly to moderately concave.

Table 1. Measurements for 20 largest soldiers of *H. hospitalis*.

Character	Range
Head length including nasus	1.75-1.90
Head length measured to base of mandibles (HL)	1.09-1.20
Nasus length (NL)	0.58-0.70
Nasus index = NL/HL	0.50-0.59
Head width at point of constriction	0.63-0.98
Maximum head width	1.11-1.24
Maximum height of head excluding postmentum	0.82-0.95
Pronotum length	0.35-0.45
Pronotum width	0.61-0.70



Figures 1. *H. hospitalis*. Soldier (A, B, F, G) and worker (D, E, H). Body in profile (A), head in dorsal view (B), head in profile (C), left (D) and right (E) mandibles, pronotum (F), antennae (G, H). Scale bar: 0.6 mm (A), 0.3 mm (B, C), 0.1 mm (D, E, G, H), 1.7 mm (F).

Figure 2. Finding colony of *H. hospitalis* at base of tree at Pararawen, Central Kalimantan.

Figure 3. Soldiers and workers of *H. hospitalis* are in a processional column at Borneo.

Bionomics

This species is relatively common in Borneo. Usually workers and soldiers forage in column on tree trunks, on logs and in leaf litter on forest floor in afternoon and evening *en masse*[2], where their foraging event can approach 500.000 individuals[4,20]. Colonies of these termites are often closely associated with nest of *Termes*[21], especially for nest mainly constructed from soil-like material. Some colonies like carton nests, which are large and black in coloration, lie at base of huge trees. Other nests were made of soil, very hard, mound-shaped with two entrances. Mosses and lichens were seen covering the surface of the nest. Its size got larger during three years of observation. *Hospitalitermes* has a dimorphic worker caste[9], while "see Ref. 22" found three types of worker (major, medium and small) for *H. medioflavus*. *Lacessititermes* is hardly distinguished from *Hospitalitermes*, except in the worker caste by the absence of notch at molar plate of the right mandible[4,14,15,16,17,18]. As many as 36 species of *Hospitalitermes* have been described from Indo-Malayan and Papuan regions[15,16,17].

Geographical distribution: Sumatra, Peninsular Malaysia, Borneo.

Conclusion

1. In description for *H. hospitalis*, combination both soldier and worker characters are needed for better taxonomy work.
2. Coloration on head capsule and nasus (soldier caste) is a determined aspect for identification of the species.
3. *H. hospitalis* showed a large variation in nesting sites in Central Kalimantan.

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