PART IV

REVISION OF TERMITE GENUS AMITSTENES

(TERMITIDAE : AMITERTITINAE)

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Proc. nation. Inst. Sci. India, New Delhi,
(B) 31 (3 & 4), pp. 111-113.
REVISION OF TERMITE GENUS *EURYTERMES*
(TERMITIDAE: AMITERMITINAE)

by

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*Issued separately March 7, 1966*
REVISION OF TERMITE GENUS EURYTERMES
(TERMITIDAE : AMITERMITINAE)


(Received January 5, 1965)

Until recently only two species and a subspecies were known in the genus Eurytermes Wasmann. The genus has been revised and a new species, E. boveni, added from India. The other species are re-described and illustrated from type specimens. The genus is confined to India and Ceylon.

The genus Beesoniitermes Chatterjee and Thapa (1963), based on a single species, B. topslipensis C. & T., has been synonymized with Eurytermes.

The systematic affinities of Eurytermes are discussed. On the basis of imago, worker and soldier characters, especially the mandibles, the genus is placed in the subfamily Amitermitinae (family Termitidae) whose most primitive member is Protohamitermes. The latter leads first to the 'Speculitermes' group (probably also including Anoplotermes) and then to the 'Euhamitermes' group which includes the following genera in the ascending order: Euhamitermes, Eurytermes and Hoplotermes. Keys to the identification of imagoes and soldiers of the species are provided. The following taxa are now included in the genus Eurytermes: E. assmuthi assmuthi Wasmann (India); E. a. modestior Silvestri, E. ceylonicus Holmgren (Ceylon); and E. topslipensis (Chatterjee and Thapa) (India).

I. INTRODUCTION

The termite genus Eurytermes (Isoptera; Termitidae; Amitermitinae) was erected by Wasmann (1902) to accommodate a single new species, E. assmuthi, from Khandala near Bombay (Maharashtra, India). Holmgren (1913) added a second species, E. ceylonicus, from Ceylon and Silvestri (1923) added the subspecies E. assmuthi modestior from India. Recently, Chatterjee and Thapa (1963) created the genus Beesoniitermes, on the basis of a new species, B. topslipensis; in our opinion this new genus is synonymous with Eurytermes, as discussed below. As previous descriptions are often meagre, we have, where necessary, re-described and illustrated the known species and subspecies, viz. E. assmuthi assmuthi Wasm., E. a. modestior Silvestri, E. ceylonicus Holmgren and E. topslipensis (C. & T.), and also described a new species from India. In all cases, except E. a. modestior, we have examined the type specimens.*

* The following abbreviations have been used: Im., imago; Ny., nymph; Q., queen; S., soldier; Z.S.I., Zoological Survey of India, Calcutta; W., worker.
II. Systematic Account of Genus

Genus Eurytermes Wasmann

(Synonym: Beesonitermes Chatterjee and Thapa)

(i) Genus Eurytermes


(ii) Genus Beesonitermes


(iii) Genus *Termes* L. (in part)


Type of genus: *Eurytermes assmuthi* Wasmann, 1902. (Type by monotypy.)

Geographical distribution: The genus is restricted to India and Ceylon.

(a) Characters of genus Eurytermes Wasmann

We have amplified below the brief characters given by Wasmann (1902, on a single species, *E. assmuthi*), our amplification being based on five known species and subspecies.

1. **Imago.**—Head-capsule dark reddish brown to blackish brown; wings pale to dark brown; densely pilose on margins. Head-capsule subcircular. Fontanelle varying from small and dot-like (*assmuthi* and *boveni* n. sp.) to large, oval and ocellus-like (*ceylonicus*) spot situated below the middle of head-dorsum. Eyes small and round; ocelli oval and widely separated from eyes. Antennae generally with 15 segments (14 in the right antenna of the single specimen of *E. ceylonicus* available for study); segment 3 shortest. Postclypeus swollen, pilose; either subequal to or shorter than half the width; anteclypeus apilose, flat. Labrum broader than long. Mandibles with an apical and 2 marginal teeth; apical finger-like. Left mandible: 1st marginal a little shorter than apical and with a long posterior margin, 2nd marginal short and separated from 1st by a deep marginal cut. Right mandible: 1st marginal tooth as in left; 2nd marginal short with weakly concave posterior margin; molar plate concave. Pronotum narrower than head-width with eyes; mesonotum and metanotum with a deep median notch on posterior margin. Wings strongly punctate and with hairy margins; costa and radial
sector prominent and thickly chitinoid; subcosta short and indistinctly separable only near proximal margin; median in forewing arising separately inside the scale and with 2-4 branches, in hindwing arising from radial sector outside the scale and with 1-3 branches. Legs densely pilose; apical tibial spurs 3 in fore-legs and 2 each in middle- and hind-legs; tarsi 4-jointed; abdomen oblong, densely hairy; cerci small, 2-jointed. Styli absent.

2. Soldier.—Head pale yellow to yellow; body whitish. Head fairly, and body densely, pilose. Head-capse subrectangular, thick, longer than broad. Fontanelle indistinct. Eyes and ocelli absent. Antennae with 14 segments, the segments thin and narrow. Labrum subtriangular, with the narrow truncate distal end with or without a shallow medial notch. Mandibles thick, stout and broad basally, narrower and incurved at tip. Left mandible: Inner margin with a short and obtuse to a prominent and anteriorly directed tooth at about the distal one-fourth from tip; and a small indentation in the proximal third. Right mandible: Inner margin with a short to prominent tooth at about the distal one-third from tip; and with or without an indentation in the proximal third. Postmentum long, club-shaped. Pronotum much narrower than head-capse; strongly saddle-shaped; not notched at anterior and posterior margins. Legs fairly hairy; fore-legs longer than middle-legs, hind-legs longest; apical tibial spur formula 3:2:2; tarsi 4-jointed. Abdomen elongate; cerci short, 2-jointed.

3. Worker.—Head pale yellow; abdominal tergites and sternites transparent and colourless; abdomen appears greyish because of intestinal contents showing through; head fairly, and body densely, pilose. Head-capse subcircular, broader than its length to base of mandibles. Fontanelle white, round or oval, spot-like, lying a little below middle of head-dorsum. Eyes and ocelli absent. Antennae with 14 segments. Postclypeus swollen, about half as long as wide, or a little longer than half. Labrum broader than long. Mandibles longer than broad; incurved at anterior margins; teeth on inner margin as in imago except for the somewhat sharper 2nd marginal of left mandible and the strongly incurved posterior margin of the 2nd marginal of right mandible; the molar plate of left mandible more spatulate and that of right mandible strongly incurved. Pronotum strongly saddle-shaped. Legs fairly pilose; fore-tibia swollen; apical tibial spur formula 3:2:2, outer spur of fore-tibia minute and sometimes not discernible. Tarsi 4-segmented. Abdomen elongate and hairy; cerci short, 2-jointed.

(b) Keys to species and subspecies of Eurytermes

Five species and subspecies of the genus Eurytermes are known. The imago caste is known in 4 taxa (E. assmuthi assmuthi, E. a. modestior, E. boveni and E. ceylonicus) and the soldier caste also in 4 taxa (E. assmuthi assmuthi, E. a. modestior, E. boveni and E. topslipensis).
1. **Key to imagos of *Eurytermes***

1 (2) Fontanelle large, oval, ocellus-like (maximum diameter 0.15 mm); larger species (maximum width of head with eyes 1-30 mm). ............................................................. 1. *E. ceylonicus* Holmg.

2 (1) Fontanelle small, round, dot-like (maximum diameter 0.03-0.06 mm); smaller species (maximum width of head with eyes 1.07-1.13 mm).

3 (4) Ocelli larger (length 0.10-0.13, width 0.09-0.10 mm); postclypeus longer (index Length/Width 0.46-0.53) and with weakly convex anterior margin. 2. *E. boceni* n. sp.

4 (3) Ocelli smaller (length 0.09-0.10, width 0.07 mm); postclypeus shorter (index Length/Width 0.43) and with weakly concave anterior margin.

5 (6) Eyes smaller (maximum diameter 0.27 mm). 3. *E. assmuthi assmuthi* Wasm.


2. **Key to soldiers of *Eurytermes***

1 (4) Left mandibular tooth short and obtuse-angled.

2 (3) Head smaller (length to upper base of mandibles 1.87; maximum width 1.05 mm); mandibles shorter and narrower (length of left mandible from upper base of lateral condyle to tip 0.73 mm; index Width at base/Length 0.52); tooth on left mandible shorter, that on right reduced and point-like. 1. *E. topalisensis* (C. & T.)

3 (2) Head larger (length to upper base of mandibles 2.0; maximum width 1.2 mm); mandibles longer and broader (length of left mandible from upper base of lateral condyle to tip 0.87 mm; index Width at base/Length 0.57); tooth on left mandible somewhat larger, that on right prominent and large. 2. *E. boceni* n. sp.

4 (1) Left mandibular tooth large and acute-angled.

5 (6) Larger species (head 2-0 mm long, 1.3 mm wide; mandibles 0.83-0.87 mm long). 3. *E. assmuthi assmuthi* Wasm.

6 (5) Smaller species (head 1.7 mm long, 1.08 mm wide; mandibles 0.75 mm long). 4. *E. assmuthi modestior* Silv.

(c) **Note on genus *Beesonitermes* C. & T.**

The genus *Beesonitermes* was recently erected by Chatterjee and Thapa (1963) for a new species, *B. topalisensis* C. & T. They separated it from *Eurytermes* on the following characters: (i) **Workers**: Right mandible with a strongly concave molar plate and with the angle between the apical and the 1st marginal teeth smaller. (ii) **Soldiers**: Mandibles not attenuated in anterior half and not sharply incurved distally (es. attenuated and incurved); tooth on left mandible obtuse-angled (es. acute-angled and anteriorly directed).

* Differentiation is based on Silvestri (1923, p. 228); specimens of *E. a. modestior* were not available to us.
† Head-length is taken from Wasmann (1902), as the specimen (cotype) available to us is now damaged, *vide infra* under *E. a. assmuthi*.
‡ Measurement taken from Silvestri (1923, p. 229).
We have before us a new species, described below, represented by all castes (imagos, soldiers and workers) which is close to B. topslipensis C. & T. and is intermediate between Beesonitermes and Eurytermes. In the soldier the left mandibular tooth is as in B. topslipensis except that it is a little larger, but the mandibles are attenuated as in Eurytermes though rather weakly. The associated imagos are hardly separable from E. assmuthi. The worker mandibles are as in B. topslipensis (the molar plate on right mandible is strongly concave; and the angle between the apical and the 1st marginal teeth is larger than in B. topslipensis but smaller than in E. assmuthi). We have also compared variation in these characters with those in the soldiers and workers of the genera Speculitermes Wasm. (vide Roonwal and Chhotani 1960, for the soldier caste) and Euhamitermes Holmg. which are separable from the Eurytermes-Beesonitermes group. With the more abundant material available to us it is clear that the forms occurring in Eurytermes and Beesonitermes are not sharply separable but are connected by intermediates. It is, therefore, advisable not to treat Beesonitermes as a discrete genus but merge it with Eurytermes.

(d) Affinities of genus Eurytermes

(Fig. 1)

According to Wasmann (1902, p. 124), the imago of Eurytermes assmuthi is close to Capritermes [Termitinae], but the fontanelle is much smaller or even lacking. The soldier, according to him, also resembles Capritermes in the large, thick, cylindrical head, the 14-segmented antennae and the membranous labrum, but the shape of the mandibles as well as the shape of the labrum are quite different and remind one of genus Amitermes. It differs, however, from Amitermes in having the mandibles thicker and broader, the postclypeus with no trace of the longitudinal furrow and the large cylindrical head.

Holmgren (1912, pp. 81–83) placed Eurytermes in his Hamitermes series. He stated that though the imago of Eurytermes can be separated from allied genera on the position of the fontanelle, this character alone does not help much in determining its systematic position. But the soldier provides good characters for that purpose. The teeth of the mandibles resemble Prohamitermes and Cephalotermes on the one hand and Hamitermes (subgenus Euhamitermes) on the other. The left mandible comes, in regard to teeth, undoubtedly close to Prohamitermes and Cephalotermes; the great reduction of tooth on the right mandible reminds one of Euhamitermes hamatus. In its short, thick, basally strongly widened mandibles and very similar teeth, Eurytermes is also very close to Syntermes [Nasutitermitinae]. On these considerations, Holmgren concluded that the genera Prohamitermes and Eurytermes arose from a common branch from the Syntermes base, and Eurytermes separated
itself rather early from that branch. (However, in his Chart on p. 81, Holmgren shows Prohamitermes as separating earlier than Eurytermes.)

Grasse (1949, pp. 538-539) placed Eurytermes in the subfamily Amitermitinae (family Termitidae), but does not appear to have arranged the genera phylogenetically. Snyder (1949) also places it in the Amitermitinae in the following order, presumably phylogenetic: Prohamitermes, Prohamitermes, Eurytermes, Hoplotermes, Anoplotermes, Speculitermes, Cephalotermes, Labritermes, Cylindrotermes, Enhamitermes, etc. Ahmad (1950, pp. 64-66), on the basis of the imago-worker mandibles, largely follows the assignment of Snyder with some variations and places Eurytermes in the 'Protohamitermes series' whose left mandible is characterized, in its most primitive condition (Protohamitermes), by three well-developed marginal teeth; in the remaining genera, including Eurytermes, the 2nd marginal is absent and is represented by a distinct cut in the margin. In his Chart (p. 45) Ahmad placed the genera of the Protohamitermes stem in the following ascending order: Protohamitermes, Eurytermes, Speculitermes, Anoplotermes, Euhamitermes, Hoplotermes and Ahmitermes.

![Diagram](image-url)

**Fig. 1.** The scheme of evolution of some of the Amitermitinae genera of the Protohamitermes series to indicate the position of Eurytermes. (The position of Anoplotermes is doubtful; its exact determination is difficult due to the absence of the soldier caste.)

The general placement of Eurytermes in the Amitermitinae and in the 'Protohamitermes series' as discussed above seems to be correct, but the arrangement of genera needs further consideration in view of the recent discovery (Roonwal and Chhotani 1960) of the soldier caste in Speculitermes. On the basis of the soldier characters (head, mandibles and antennae) the genera Euhamitermes, Eurytermes and Hoplotermes seem to belong to one group, which we may call the 'Euhamitermes group', and Speculitermes to another which we may call the 'Speculitermes group' (Fig. 1). The exact position of Anoplotermes cannot be easily determined because of the absence of the soldier caste, but in our opinion it comes closest to the Euhamitermes.
group of genera. The soldier of Speculitermes, with large and thick mandible and longer 3rd antennal segment, seems to be less evolved than the Euhamitermes group and its position should be close to the genus Prototermes which is the most primitive genus on the basis of imago-worker mandibles (the soldiers have not yet been described in that genus). The genus Anoplotermes, on the basis of imago-worker mandibles which are very close to Speculitermes, follows the latter genus, and Euhamitermes, Eurytermes and Hoplotermes then follow each other in that sequence. Eurytermes and Hoplotermes seem to be at a higher evolutionary status than Euhamitermes because of the gradual reduction in massiveness of the soldier mandibles. This view is also supported by the reduction of posterior margin of the 1st marginal of left mandible of workers in Hoplotermes and the great similarity of the worker mandibles of Euhamitermes (recently studied by us in some species, Roonwal and Chhotani 1965) and Eurytermes.

(c) Zoogeography of genus Eurytermes

(Fig. 2)

As at present known, the genus Eurytermes is found in Ceylon and in Peninsular and Central India north to about 22° N. latitude (Kanha National
Park, Mandla District, Madhya Pradesh). It is essentially an oriental genus, is confined to deciduous forests and is subterranean in habit. It is likely to be found in similar deciduous and even evergreen forest areas north up to the Terai (base of the Himalayas) and in Eastern India. Like *Speculitermes* it seems to live in relatively moist areas and is, therefore, unlikely to be found in the arid areas of Western and North-western India. In the areas it prefers it seems to have similarities with the allied genera *Speculitermes, Enhamitermes* and *Anoplotermes*, the last genus having been recorded recently from Eastern India (Roonwal and Chhotani 1959, 1960a; Roonwal et al. 1962).

III. Description of Species

1. *Eurytermes assmuthi assmuthi* Wasmann

(Figs. 3–6; Tables I–III)

(i) *Eurytermes assmuthi* Wasmann


1912. *Eurytermes assmuthi*, N. Holmgren, *K. svenska Vetensla. Handl.*, 48, 82-83, fig. 51 (Im., left mandible), fig. 52 (S., mandibles), 'Vorderindien (Bombay)'.


1953. *Eurytermes assmuthi*, Rattan Lai and R. D. Menon, *Catalogue of Indian Insects. Part 27, Isoptera*, p. 38. Delhi (Govt. India Publ.). Ceylon and India. [Specimens from India only; Ceylon specimens are *E. ceylonicus* Holmg.]

(ii) Wrong determinations as *Eurytermes assmuthi* Wasm. (Are actually *E. ceylonicus* Holmg. Also see under *E. ceylonicus* below.)


Material

(a) Present in Natural History Museum, Maastricht (Holland): The following type material* from the Wasmann Collection, all from Khandala (Maharashtra, India), coll. J. Assmuth (n. 2), present in the Natural History Museum, Maastricht (Holland), and received through the courtesy of Dr. J. van Boven, was examined: (i) Two imagos (an alate and a dealate) and a nymph mounted dry on card, (ii) a soldier (anterior portion of head cut off) and 2 workers, mounted dry on card, (iii) two slides, one with 6 wings and the other with the anterior portion of the head of the soldier mentioned above.

(b) Present in Zoological Survey of India, Calcutta: (iv) Two vials with several workers (one with nymphs also), Barkuda Island (Chilka Lake, Orissa, India), coll. N. Annandale, Z.S.I. Reg. Nos. 7287/H2, coll. on 11.X.1920; and 7286/H2; det. F. Silvestri.

Description

1. Imago (Figs. 3, 5d; Table I).

   General: Head-capulse blackish brown; mandibles, antennae and legs brownish, labrum somewhat paler; postclypeus, pronotum and abdominal tergites dark brown, the last paler at the sides; sternites pale brown, paler medially. Wings brown. Head and body thickly hairy with a coat of fine short hairs and several longer hairs. Forewing scale densely hairy; the radial sector fairly, and the wing-membrane sparsely, hairy. Hindwing scale densely, and the radial sector sparsely, hairy; wing-membrane without hairs. Total body-length without wings c. 6-8-7-1 mm.

   Head: Head-capulse subcircular; broader than long (length to lateral base of mandibles 0-80-0-83; maximum width with eyes 1-10-1-13 mm); posterior margin rounded; frons weakly depressed medially. Fontanelle: A small round, white spot situated a little behind middle of head-dorsum; maximum diameter 0-05 mm. Eyes: Two lateral blackish, compound eyes one on either side; maximum diameter 0-27 mm. Ocelli: Two lateral, translucent, oval ocelli, one on either side; eye-ocellus distance greater than half the long diameter of ocellus and subequal to its small diameter; maximum diameter 0-09-0-10 mm; minimum diameter 0-07 mm. Antennae: With 15 segments; fairly densely pilose; segment 1 largest, cylindrical; 2 longer than half of 1, cylindrical; 3 shortest; 4-8 gradually increasing in size and becoming pyriform; 9-14 subequal and pyriform; last (15) ovate and tapering in front, a little longer than the preceding one. Clypeus: Divided into an ante- and a postclypeus. Anteclypeus a translucent, flat pilose plate with anterior margin somewhat projected medially and pointed; with a V-shaped dark chitinoid band on body. Postclypeus swollen, pilose, with numerous short

* Ex nest in ground at foot of a mango tree, from which a carton nest of the ant Cremasto- 
gaster royenhoferi Mayr was found (vide Wasmann 1902, p. 125).
and long hairs; anterior margin weakly concave, posterior margin convex; divided into right and left halves by a faint longitudinal line. **Labrum**: Broadly tongue-shaped, brownish, hyaline at anterior end; broader than long; with several short and long hairs on body. **Mandibles**: Could not be examined in the type-specimens available for study, but a figure of left mandible given by Holmgren (1912, p. 82) is reproduced here (Fig. 5d).

**Thorax**: **Pronotum**: Slightly narrower than head-width with eyes; broader than long (maximum length 0.57–0.66; maximum width 0.87–0.93 mm); anterior margin weakly concave; sides sloping backwards; antero-lateral

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**Fig. 3.** *Eurytermes assmanni assmanni* Wasmann. Imago. Drawings from specimens from Khandala near Bombay (Maharashtra, India). Figs. (a) and (b) from paratype imago ♂; Figs. (c)–(f) from paratype imago ♀; and Figs. (g) and (h) from paratype slide, sex unknown.

(a) Head and pronotum, in dorsal view. (b) Same, in side view. (c) Right antenna. (d)–(f) Right fore-, middle- and hind-legs respectively, in dorsal view. (g), (h) Left forewing and right hindwing, in dorsal view.

*Csu., costa; C+Sc., costa-subcosta; Cu., cubitus; e., eye; ft., fontanelle; M., median; oc., ocellus; Rs., radial sector; tb.sr., apical tibial spurs.*
corners moderately, and postero-lateral corners greatly, rounded; posterior margin substraight, with a slight median incurving. Mesonotum and metanotum: With posterior margins deeply notched medially. Legs: Densely pilose, with both short and long hairs; fore-legs more strongly chitinized than others; femora not swollen in any leg; apical tibial spurs 3 in fore-legs and 2 each in middle- and hind-legs. Tarsi 4-jointed.

Wings: Forewing without scale slightly longer than hindwing without scale; forewing scale also longer than hindwing scale and not covering the latter. Forewings: Wing-membrane with a few small hairs. Costa thick, chitinoid and hairy; bordering the anterior margin. Subcosta fused with costa, separable only near the proximal end of wing-membrane. Radial sector as thick as costa-subcosta but less hairy; running close to and parallel with costa-subcosta and fusing with the latter near distal margin of wing. Median arising independently inside scale and running a little above the middle of wing to the distal margin; with 3 main branches in distal one-third. Cubitus arising independently, running parallel with median and giving off 8-11 branches to posterior margin of wing. Hindwing: Wing-membrane without hairs. Costa, subcosta and radial sector as in forewing; the last with even fewer hairs than in forewing. Median arising from radial sector outside the scale and running a little above the middle of wing-membrane; with 3 main branches distally, the branching starting either a little distal to middle or in the distal one-third of wing-membrane. Cubitus as in forewing, and with 8-9 main branches.

Abdomen: Oblong, densely pilose with short and long hairs. Cerci 2-jointed, c. 0-10 mm long. Styli absent.

2. Soldier (Figs. 4, 5a-c; Table II).—

General: Head yellow; body and legs creamy white; mandibles dark brown apically, yellowish brown basally; labrum pale yellow. Head-capsule with a few hairs (most of the hairs probably fallen off); body densely pilose.

Head*: Head-capsule subrectangular; longer than broad [length without mandibles 2-00 mm, Wasmann 1902; length to base of antennal socket 1-77 mm; maximum width 1-30 mm (not 1-00 mm as given by Wasmann); sides substraight and subparallel, somewhat narrowed posteriorly; hind margin convex. Fontanelle: Indistinct. Eyes and ocelli: Absent. Antennae: Not present in the single example (lectotype) available for study. Wasmann (1902, p. 125) described the antennae thus: Antenna 14-segmented, very thin and narrow, of length of head (without mandibles), the 2nd segment thick but slightly longer than the 3rd; all segments longer than broad. Claspers: Not present either on specimen on card or the portion of head on slide.

* As stated above under 'Material', the head of the type is damaged.
Labrum: Almost subtriangular; tip broadly pointed; with a few short and long hairs. Mandibles: Thick and stout; broad basally and narrower, pointed and incurved distally. Inner margin of left mandible with a large, sharp, acute-angled tooth at about the distal one-fourth; a weak indentation posteriorly near base of middle 3rd portion; and a small spine further down. Inner margin of right mandible with a small tooth at about distal one-third of mandible from tip and a small spine in proximal one-third. Postmentum: Incomplete in the specimen examined; long and club-shaped, with the waist in posterior one-third.

Thorax: Pronotum: Much narrower than head; broader than long (maximum length 0.33; maximum width 0.57 mm); saddle-shaped, with the anterior lobe upturned; both anterior and posterior margins without median indentations. Mesonotum and metanotum: Damaged in the specimen. Legs:

Fig. 4. Eurytermes assmuthi assmuthi Wasmann, Soldier. Drawings from the lectotype soldier, Khandala, India. Figs. (a), (b), (f) and (g) from specimen on card, and Figs. (c)-(e) from slide.

(a) Head (without anterior portion) and pronotum, in dorsal view. (b) Ditto, in side view. (c) Labrum, in dorsal view as mounted on slide. (d), (e) Left and right mandibles respectively. (f) Postmentum, in ventral view; distal margin damaged. (g) Right hind-leg, in dorsal view.

c, indentation; t., tooth; tbsr., apical tibial spurs.
Only the right hind-leg and the left middle-leg (damaged) present in the specimen, the others broken off; hind-leg with 2 apical tibial spurs and 4 tarsal joints.

**Abdomen:** Oblong, densely pilose. Cerci short, 2-jointed, c. 0.05 mm long. Styli absent.

3. Worker (Figs. 5c, f, 6; Table III).

**General:** Head-capsule yellowish; labrum somewhat paler and translucent apically; mandibles yellowish, with tooth margins brownish; antennae, legs and thorax creamy white; abdominal tergites and sternites transparent and colourless, abdomen appearing greyish due to intestinal contents showing through. Head and body fairly densely pilose. Total body-length (excluding antennae) c. 3.0–3.5 mm.

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**Head:**
Head-capsule subcircular, broader than long (length to base of mandibles 0.70–0.73; maximum width 0.87–0.90 mm). **Fontanelle:** Present as a small (diameter 0.03 mm), white, translucent spot in middle of head-dorsum. **Eyes and ocelli:** Absent. **Antennae:** With 14 segments; segment 1 longest, cylindrical; 2 longer than half of 1, cylindrical; 3 slightly shorter than 2 and subequal to 4; 4–9 gradually increasing in size; 10 to 13 subequal; 14 ovate, longer than 13. ** Clypeus:** As in imago. Postclypeus half as long as wide; with a distinct line to separate right and left halves. **Labrum:** As in imago. **Mandibles:** Could not be examined in type-specimens, but a
figure of cotype worker mandibles given by Ahmad (1950, p. 64) is reproduced here (Fig. 5e, f). Examined in specimens from Barkuda Island, Orissa. Longish and incurved at outer margin. Left mandible: With an apical and 2 marginal teeth; apical finger-like; 1st marginal subequal to apical, with a long posterior margin; 2nd marginal short and separated from 1st by a deep notch at base of its anterior margin. Right mandible: Also with an apical and 2 marginal teeth; apical finger-like; 1st marginal subequal to apical but with a short posterior margin; 2nd marginal short and with an incurved posterior margin.

Fig. 6. *Enygyptes ammonchii ammonchii* Wasmann. Worker. Drawings are from a paratype, Khandala, India, coll. J. Axsmvth (n. 2).

(a) Head and pronotum, in dorsal view. (b)-(d) Left fore-, middle- and hind-legs respectively, in dorsal view.

ft., fontanelle; tb.sr., apical tibial spurs.

Thorax: Pronotum: As in soldier. Mesonotum narrower than, and metanotum as wide as, pronotum. Legs: Fore-legs longer than middle- and shorter than hind-legs; tibia of fore-legs swollen; apical tibial spurs 3 in fore-legs (outer spur minute) and 2 each in middle- and hind-legs. Tarsi 4-jointed.

Abdomen: Oblong, densely pilose. Cerci short, 2-jointed, c. 0.05 mm long. Styli absent.

Type-specimens

No holotype was designated by Wasmann (1902). The following types are selected here from the cotype material present in the Wasmann Collection.
in the Natural History Museum, Maastricht (Holland): Lectotype: A soldier on a card (vide 'Material (ii)' above; with the anterior part of head cut off and mounted on a slide (vide 'Material (iii)' above). Paralecotypes: Two workers mounted on card (on same pin as lectotype soldier), vide 'Material (ii)' above; 2 imagos (one dealate) and one nymph mounted on a pin, vide 'Material (i)' above; and a slide with 6 wings, vide 'Material (iii)' above.

### Table I

Measurements (in mm), etc., of Eurytermes assmuthi assmuthi Wasmann; E. boveni n. sp.; and E. eeylonicus Holmgren. Castes: Lasago

<table>
<thead>
<tr>
<th>Body parts</th>
<th>E. assmuthi assmuthi (2 examples: Types)</th>
<th>E. boveni (15 examples)</th>
<th>E. eeylonicus (1 example: Cotype)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total body-length with wings (excluding antennae), c.</td>
<td>—</td>
<td>11-12-13-14</td>
<td>—</td>
</tr>
<tr>
<td>2. Total body-length without wings (excluding antennae), c.</td>
<td>6-8 - 7-1</td>
<td>6-7 - 8-0</td>
<td>8-5</td>
</tr>
<tr>
<td>3. Length of head to tip of labrum</td>
<td>1-27 - 1-30</td>
<td>1-20 - 1-30</td>
<td>1-50</td>
</tr>
<tr>
<td>4. Length of head to lateral base of mandibles</td>
<td>0-68 - 0-63</td>
<td>0-75 - 0-83</td>
<td>0-93</td>
</tr>
<tr>
<td>5. Maximum width of head (with eyes)</td>
<td>1-10 - 1-13</td>
<td>1-07 - 1-13</td>
<td>1-30</td>
</tr>
<tr>
<td>6. Maximum height of head</td>
<td>0-50</td>
<td>0-43 - 0-47</td>
<td>0-33</td>
</tr>
<tr>
<td>7. Diameter of fontanelle</td>
<td>0-36</td>
<td>0-33 - 0-36</td>
<td>0-33</td>
</tr>
<tr>
<td>8. Maximum length of postclypeus</td>
<td>0-23</td>
<td>0-23 - 0-25</td>
<td>0-27</td>
</tr>
<tr>
<td>9. Maximum width of postclypeus</td>
<td>0-33</td>
<td>0-34 - 0-30</td>
<td>0-40</td>
</tr>
<tr>
<td>10. Maximum length of labrum</td>
<td>0-20 - 0-23</td>
<td>0-20 - 0-23</td>
<td>0-20</td>
</tr>
<tr>
<td>11. Maximum width of labrum</td>
<td>0-37 - 0-40</td>
<td>0-37 - 0-41</td>
<td>0-47</td>
</tr>
<tr>
<td>12. Maximum diameter of compound eye (with ocular sclerite)</td>
<td>0-27</td>
<td>0-27 - 0-30</td>
<td>0-30</td>
</tr>
<tr>
<td>13. Minimum distance of eye from lateral base of head-capsule</td>
<td>0-07</td>
<td>0-08 - 0-08</td>
<td>0-09</td>
</tr>
<tr>
<td>14. Maximum diameter of lateral ocellus</td>
<td>0-09 - 0-10</td>
<td>0-10 - 0-13</td>
<td>0-13</td>
</tr>
<tr>
<td>15. Minimum diameter of lateral ocellus</td>
<td>0-09</td>
<td>0-09 - 0-10</td>
<td>0-11</td>
</tr>
<tr>
<td>16. Minimum eye-ocular distance</td>
<td>0-02-0-07</td>
<td>0-07-0-07</td>
<td>0-09</td>
</tr>
<tr>
<td>17. Minimum eye-antennal distance</td>
<td>0-05</td>
<td>0-01 - 0-05</td>
<td>0-07</td>
</tr>
<tr>
<td>18. Minimum ocellus-ocular distance</td>
<td>0-13 - 0-15</td>
<td>0-12 - 0-14</td>
<td>0-13</td>
</tr>
<tr>
<td>19. Maximum length of pronotum</td>
<td>0-27 - 0-36</td>
<td>0-20 - 0-20</td>
<td>0-67</td>
</tr>
<tr>
<td>20. Maximum width of pronotum</td>
<td>0-67 - 0-73</td>
<td>0-60 - 0-60</td>
<td>1-17</td>
</tr>
<tr>
<td>21. Length of forewing without scale</td>
<td>9-5 - 10-0</td>
<td>9-1 - 10-1</td>
<td>1-13</td>
</tr>
<tr>
<td>22. Length of forewing scale</td>
<td>0-6 - 0-7</td>
<td>0-60 - 0-67</td>
<td>0-67</td>
</tr>
<tr>
<td>23. Length of hindwing without scale</td>
<td>8-83 - 9-30</td>
<td>8-4 - 9-5</td>
<td>10-0</td>
</tr>
<tr>
<td>24. Length of hindwing scale</td>
<td>0-5</td>
<td>0-43 - 0-50</td>
<td>0-37</td>
</tr>
<tr>
<td>25. Number of antennal segments</td>
<td>15</td>
<td>15</td>
<td>15 (left); 14 (right)</td>
</tr>
</tbody>
</table>

* Measured on wings on slide, vide 'Material (iii)' above under E. assmuthi assmuthi Wasmann.
### Table II

**Measurements (in mm), etc., of Eurytermes assmuthi assmuthi** Wasmann; **E. boveni** n. sp.; and **E. topslipensis** Chatterjee and Thapa. **Caste:** Soldier

<table>
<thead>
<tr>
<th>Body-parts</th>
<th>( E. \text{assmuthi} )</th>
<th>( E. \text{boveni} )</th>
<th>( E. \text{topslipensis} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( E. \text{assmuthi} ) (1 example: Lectotype)</td>
<td>( E. \text{boveni} ) (1 example: Holotype)</td>
<td>( E. \text{topslipensis} ) (1 example: Holotype)</td>
<td></td>
</tr>
<tr>
<td>Total body-length (excluding antennae), c.</td>
<td>5.9</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Length of head to lateral base of mandibles</td>
<td>2.00</td>
<td>1.87</td>
<td></td>
</tr>
<tr>
<td>Length of head-capsule to base of antennal socket</td>
<td>1.77</td>
<td>1.77</td>
<td>1.63</td>
</tr>
<tr>
<td>Maximum width of head</td>
<td>1.30</td>
<td>1.20</td>
<td>1.05</td>
</tr>
<tr>
<td>Maximum height of head</td>
<td>0.87</td>
<td>0.87</td>
<td>0.87</td>
</tr>
<tr>
<td>Head Index I (Width/Length up to base of mandibles)</td>
<td>0.60</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>Head Index II (Height/Width)</td>
<td>0.67</td>
<td>0.81</td>
<td>0.83</td>
</tr>
<tr>
<td>Head Index III (Height/Length)</td>
<td>0.49</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>Head Index IV (Width/Length up to antenna)</td>
<td>0.734</td>
<td>0.647</td>
<td></td>
</tr>
<tr>
<td>Maximum length of labrum</td>
<td>0.30</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>Maximum width of labrum</td>
<td>0.31</td>
<td>0.27</td>
<td>0.25</td>
</tr>
<tr>
<td>Length of mandibles (from upper base of clypeus to tip):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( a ) Left mandible</td>
<td>0.87</td>
<td>0.87</td>
<td>0.73</td>
</tr>
<tr>
<td>( b ) Right mandible</td>
<td>0.83</td>
<td>0.83</td>
<td>0.73</td>
</tr>
<tr>
<td>Maximum width of left mandible at base</td>
<td>0.50</td>
<td>0.47</td>
<td>0.38</td>
</tr>
<tr>
<td>Left mandibular tooth distance (base of tooth to tip of mandible)</td>
<td>0.20</td>
<td>0.23</td>
<td>0.20</td>
</tr>
<tr>
<td>Right mandibular tooth distance (base of tooth to tip of mandible)</td>
<td>0.25</td>
<td>0.33</td>
<td>0.25</td>
</tr>
<tr>
<td>Head-mandibular length index (Left mandible-length/Head-length)</td>
<td>0.435</td>
<td>0.396</td>
<td>0.32</td>
</tr>
<tr>
<td>Left mandibular tooth index (Tooth distance/Mandible-length)</td>
<td>0.23</td>
<td>0.27</td>
<td>0.27</td>
</tr>
<tr>
<td>Right mandibular tooth index (Tooth distance/Mandible-length)</td>
<td>0.20</td>
<td>0.19</td>
<td>0.34</td>
</tr>
<tr>
<td>Minimum median length of postmentum</td>
<td>1.23</td>
<td>1.12</td>
<td></td>
</tr>
<tr>
<td>Maximum width of postmentum</td>
<td>0.33</td>
<td>0.33</td>
<td>0.30</td>
</tr>
<tr>
<td>Width of postmentum at waist</td>
<td>0.20</td>
<td>0.20</td>
<td>0.18</td>
</tr>
<tr>
<td>Maximum length of pronotum</td>
<td>0.33</td>
<td>0.33</td>
<td>0.20</td>
</tr>
<tr>
<td>Maximum width of pronotum</td>
<td>0.57</td>
<td>0.70</td>
<td>0.60</td>
</tr>
<tr>
<td>Pronotum-head index (Pronotum-width/Head-width)</td>
<td>0.438</td>
<td>0.58</td>
<td>0.57</td>
</tr>
<tr>
<td>Pronotum index (Length/Width)</td>
<td>0.58</td>
<td>0.47</td>
<td>0.50</td>
</tr>
<tr>
<td>Maximum width of mesonotum</td>
<td>0.50</td>
<td>0.43</td>
<td></td>
</tr>
<tr>
<td>Maximum width of metanotum</td>
<td>0.67</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>Number of antennal segments</td>
<td>14</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>
### Table III

Measurements (in mm), etc., of *Eurytermes assmuthi assmuthi* Wasmann; *E. boveni* n. sp.; *E. ceylonicus* Holmgren; and *E. topslipensis* (Chatterjee and Thapa). 

<table>
<thead>
<tr>
<th>Body Parts</th>
<th><em>E. assmuthi assmuthi</em> (2 examples: Cotype series)</th>
<th><em>E. boveni</em> (10 examples)</th>
<th><em>E. ceylonicus</em> (1 example: Cotype series)</th>
<th><em>E. topslipensis</em> (3 examples: Morphotype series)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total body-length (excluding antennae), c.</td>
<td>3-0 -3-5</td>
<td>4-1 -4-3</td>
<td>—</td>
<td>3-0 -3-2</td>
</tr>
<tr>
<td>2. Length of head to tip of labrum</td>
<td>1-13 (1 ex.)</td>
<td>1-10-1-17</td>
<td>1-27</td>
<td>1-00-1-10</td>
</tr>
<tr>
<td>3. Length of head to lateral base of mandibles</td>
<td>0-79-0-73</td>
<td>0-78-0-77</td>
<td>0-83</td>
<td>0-67-0-70</td>
</tr>
<tr>
<td>4. Maximum width of head</td>
<td>0-87-0-90</td>
<td>0-87-0-90</td>
<td>1-80</td>
<td>0-83</td>
</tr>
<tr>
<td>5. Maximum height of head</td>
<td>0-40 (1 ex.)</td>
<td>0-40-0-47</td>
<td>0-40</td>
<td>—</td>
</tr>
<tr>
<td>6. Diameter of fontanelle</td>
<td>0-03</td>
<td>0-10-0-13</td>
<td>0-09</td>
<td>0-07 (1 ex.)</td>
</tr>
<tr>
<td>7. Maximum length of post-clypeus</td>
<td>0-20-0-25</td>
<td>0-23-0-27</td>
<td>0-23</td>
<td>0-20</td>
</tr>
<tr>
<td>9. Maximum length of labrum</td>
<td>0-30 (1 ex.)</td>
<td>0-27-0-33</td>
<td>0-37</td>
<td>0-23-0-25</td>
</tr>
<tr>
<td>10. Maximum width of labrum</td>
<td>0-23 (1 ex.)</td>
<td>0-27-0-40</td>
<td>0-41</td>
<td>0-20-0-32</td>
</tr>
<tr>
<td>11. Maximum length of pronotum</td>
<td>0-23-0-25</td>
<td>0-23-0-27</td>
<td>0-30</td>
<td>0-17 (1 ex.)</td>
</tr>
<tr>
<td>12. Maximum width of pronotum</td>
<td>0-50</td>
<td>0-50-0-53</td>
<td>0-57</td>
<td>0-40-0-43</td>
</tr>
<tr>
<td>13. Number of antennal segments</td>
<td>—</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
</tbody>
</table>

**Type-locality and Distribution**

*Eurytermes assmuthi assmuthi* differs from allied taxa as follows:

**From *E. assmuthi modestior* Silv.—Imago:** (i) Eyes smaller; (ii) 3rd antennal segment shortest (vs. subequal to 4). **Soldier:** Larger (head 2-0 mm long, 1-3 mm wide vs. 1-7 and 1-08 respectively; mandibles 0-83-0-87 vs. 0-78 mm long).

**From *E. boveni* n. sp. and *E. topslipensis* (C. & T.).**—**Soldier:** Tooth on left mandible sharp, acute-angled and prominent (vs. obtuse-angled and less prominent).

**From *E. ceylonicus* Holmgren.—Imago:** (i) Darker and smaller (head-width with eyes 1-10-1-13 vs. 1-30 mm; head-length to lateral base of mandibles
6.80–0.83 vs. 0.93 mm; length of forewing without scale 9.50–10.00 vs. 11.3 mm), (ii) fontanelle minute (vs. large, oval and ocellus-like).

2. Eurytermes assimuthi modestior Silvestri

(Fig. 7)


Material

Specimens of this subspecies were not available to us for study. The original description of Silvestri (1923) is, therefore, reproduced below.

Description

'Queen.—Length of body 6 mm, of head 0.96; width of the same between the eyes 0.90; length of antennae 1.72; of tibia III, 1.18.

Fig. 7. Eurytermes assimuthi modestior Silvestri. Imago, soldier and worker. (After Silvestri, 1923, p. 229, fig. V.)
(a) Head of imago, in dorsal view. (b) Same, in side view. (c), (d) Mandibles of imago. (e) Thorax of imago, in dorsal view. (f) Head of soldier, in dorsal view. (g) Same, in side view. (h) Labrum of soldier. (i) Distal portion of third (hind) leg of soldier. (j) Fore-tibia of worker. (k) Middle-tibia of worker.
Antennae composed of 15 joints of which the second is double the length of the third which is subequal to the fourth.

Soldier.—Head 1·70 mm long, 1·08 wide, mandible 0·78 long.

Antennae 14-jointed, second joint ca. $\frac{1}{2}$ longer than third which is a little longer than fourth.

Worker.—Head 0·84 mm wide.

**Type-specimens**

This subspecies was described from the material sent to Prof. F. Silvestri from the Zoological Survey of India. The types are believed to be present in the Silvestri Collection in the Entomological Institute, Agricultural University, Portici (Italy), but no further information is available. A cotype worker is present in the Forest Research Institute, Dehra Dun.

**Type-locality and Distribution**

Type-locality: Barkuda Island (Chilka Lake, Orissa, India). Distribution: Known only from the type-locality.

**Comparison**

Silvestri (1923) differentiated *E. a. modestior* from the typical form, *E. assmuthi assmuthi* Wasm., and from *E. ceylonicus* Holmgr. as follows:

A small nest with very young queen and king, a number of workers and a soldier. The specimens from this nest are smaller than the typical form. The difference of size of worker and soldier may be related to the age of the nest, but the royal pair is smaller than in *Eurytermes ceylonicus* Holmgr. and the eyes larger than in *Eurytermes assmuthi* Wasm. from Khandala.5

In addition, the following differences from *E. a. assmuthi* may also be mentioned: *Imago*: 3rd antennal segment subequal to 4th (vs. shortest in assmuthi). *Soldier*: Smaller (head 1·7 long, 1·08 mm wide vs. 2·0 and 1·3 mm respectively; mandibles 0·78 mm vs. 0·83–0·87 mm long).

3. **Eurytermes boveni** n. sp.

(Figs. 8–10; Tables I–III)

**Material**

(i) One vial with a soldier and several imagos and workers, Kanha National Park, Mandla District (Madhya Pradesh, India), Z.S.I. Collecting Station No. 8, c. one km north of Forest Rest-house, c. 22° 15' N. lat. and 80° 35' E. long., coll. O. B. Chhotani (No. 022/15.6.64), 15th June, 1964, ex 'in

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*N* Named after Dr. J. van Boven, Conservator of the Wasmann Collection, Maastricht (Holland), for his kind co-operation.
galleries in ground, 2-5 cm below ground-level'. (ii) One vial with several imagos and workers, coll. O. B. Chhotani (No. 02/16.664), 16th June, 1964, ex 'under stone'; other data as above.

**Description**

1. **Imago ♀** (Fig. 8; Table I).—

   **General:** Head-capule blackish brown; postclypeus, pronotum and abdominal tergites dark brown, the last somewhat paler on sides; sternites pale

![Diagram of Eurytermes boveni n. sp.](image-url)

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**Fig. 8. Eurytermes boveni n. sp. Imago ♀.** Drawings from paramorphotype, Kanha National Park, Madhya Pradesh, India.

(a) Head and pronotum, in dorsal view. (b) Ditto, in side view. (c) Left and right mandibles respectively, in dorsal view. (d)-(g) Left fore-, middle- and hind-legs respectively, in dorsal view. (h), (i) Left fore- and hind-wings respectively, in dorsal view. (j), (k) Proximal portions of left fore- and hind-wings, enlarged.

*ap.t.*, apical tooth of mandibles; *C.*, costa; *C. + Sc.*, costa-subcosta; *Cu.*, cubitus; *c.*, eye; *R.*, fontanelle; *M.*, median; *m₁, m₂*, 1st and 2nd marginal teeth of mandibles respectively; *oc.*, occilus; *R₁*, radial sector; *Sc.*, subcosta; *th.sr.*, apical tibial spurs.
brown, somewhat darker on sides; antennae and legs brown, fore-legs somewhat darker; wings brownish. Head and body with a thick coat of fine hair interspersed with several longer bristles. Total body-length (excluding antennae) with wings 11-2-12-8 mm, without wings 6-5-8-0 mm.

**Head:** Head-capsule subcircular; broader than long (length to base of mandibles 0-77-0-83; width with eyes 1-07-1-13 mm); posterior margin round. **Fontanelle:** A small (diameter 0-03-0-06 mm) but distinct, round, whitish dot-like spot, lying a little behind the middle of head-dorsum. **Eyes:** Two round, black, lateral, faceted eyes, one on either side; maximum diameter 0-27-0-30 mm. **Ocelli:** Two oval, translucent, lateral ocelli, one on either side, a little above the eyes; diameter: maximum 0-10-0-13, minimum 0-09-0-10 mm; eye-ocellus distance half, or a little more, of maximum diameter of ocellus and a little less than its minimum diameter. **Antennae:** With 15 segments; fairly densely pilose; segment 1 cylindrical and longest; 2 a little longer than half of 1, cylindrical; 3 shortest and narrowest; 4-8 gradually increasing in size and becoming pyriform; 8-14 long, pyriform and subequal; 15 ovate and slightly longer than the penultimate one. **Clypeus:** Divided into an ante- and a postclypeus. Anteclypeus an apilose hat, translucent plate; with a pale brown, V-shaped chitinoid band on body; anterior margin somewhat projected in front medially. Postclypeus swollen and pilose with both short and long hairs; divided into right and left halves by a median line; anterior margin substraight or slightly convex; posterior margin round; length equal to half of maximum width. **Labrum:** Broadly tongue-shaped; wider than long; with hairs near anterior margin and on body. **Mandibles:** Of the typically *Isoptera*-type. Left mandible with an apical and 2 marginal teeth; apical finger-like; 1st marginal subequal to apical but with a long posterior margin; 2nd short, triangular and separated from 1st by a deep notch; molar plate large and prominent. Right mandible also with an apical and 2 marginal teeth; apical finger-like but broader than the apical of left mandible; 1st marginal slightly shorter than apical; 2nd short and with a slightly incurved posterior margin. **Thorax:** **Pronotum:** Broader than long (maximum length 0-6-0-7; maximum width 0-90-0-97 mm); slightly narrower than head with eyes; anterior margin concave; antero-lateral corners narrow and rounded; postero-lateral corners broadly rounded; sides substraight; posterior margin weakly concave. **Mesonotum and metanotum:** Deeply notched medially at posterior margin. **Legs:** Densely pilose, with long and short hairs; fore-legs more strongly chitinized and darker than others; apical tibial spurs 3 in fore-legs and 2 each in middle- and hind-legs. **Wings:** Brown. Wing scales densely hairy and wing-membrane with a fringe of hairs all round margin; costa with several short hairs; radial sector and wing-membrane in forewing moderately hairy, and in hindwings almost
without hairs except for a few on radial sector. Forewings slightly longer than hindwings; forewing scale also slightly longer than hindwing scale. 

**Forewing:** 
Costa thick, chitinized and densely pilose; running along anterior margin of wing-membrane. Subcosta mostly fused with costa, demarcated from the latter only near base by a dark line. Radial sector as thick as costa-subcosta, and hairy. Median arising independently inside scale and running all along a little above the middle of wing-membrane; with 2-4 branches in distal third. Cubitus running almost parallel with median and giving 10-13 main branches to posterior margin of wing. **Hindwing:** 
Costa, subcosta and radial sector as in forewing; radial sector hairy only in proximal portion. Median arising from radial sector, otherwise as in forewing; with 2-3 branches in distal third. Cubitus as in forewing; with 9-12 main branches some of which are sometimes branched further.

**Abdomen:** Oblong; densely pilose; 7th sternite broad, shield-like. Cerci present, 2-jointed, 0.07-0.10 mm long. Styli absent.

2. **Imago ♂**

As in imago ♀ except that the 7th sternite is narrower.

3. **Soldier** (Fig. 9; Table II).

**General:** Head-capsole pale yellow, anterior margin pale brown; antennae, labrum, legs and body whitish; mandibles dark brown, paler basally. Head-capsole fairly, and body moderately densely, pilose. Total body-length (excluding antennae) c. 5.9 mm.

**Head:** Head-capsole subrectangular; longer than broad (length to base of mandibles 2.0; maximum width 1.2 mm); sides substraight, weakly incurved a little behind middle and slightly converging posteriorly; posterior margin convex. **Fontanelle:** Indistinct. **Eyes and ocelli:** Absent. **Antennae:** With 14 segments; fairly pilose, proximal segments somewhat less so; segment 1 longest, cylindrical; 2 narrower and cylindrical, about half of 1; 3 a little longer than 2; 4 shortest; 4-9 gradually increasing in size and becoming long and club-shaped; 10-13 subequal and club-shaped; 14 ovate. **Clypeus:** Divided into an ante- and a postclypeus. Anteclypeus a narrow, pilose strip. Postclypeus pilose; broader than long (maximum width 0.57; maximum length 0.15 mm). **Labrum:** Subtriangular, with a few long and several short hairs. **Mandibles:** Thick, stout and broad basally; narrower, pointed and incurved distally. Left mandible with a tooth (apparently somewhat damaged in the single example) lying at about one-fourth the mandible length from distal tip; and a small indentation at the basal one-fourth. Right mandible with a prominent tooth a little below one-third of mandible length from tip; and a small indentation at the basal one-fourth. **Postmentum:**
Long, club-shaped; broadest at about distal one-third; and narrowest a little behind the middle, with a long waist; anterior margin straight; posterior margin concave.

_Thorax:_ **Pronotum**: Strongly saddle-shaped; much narrower than head-capsule; broader than long (maximum length 0.33; maximum width 0.70 mm); both anterior and posterior margins without medial notch. **Mesonotum** and **metanotum**: The former greatly, and the latter slightly, narrower than pronotum; posterior margins of both without a median incurving or notch. **Legs**: Long and fairly pilose; fore-legs longer than middle-legs, the latter shortest; hind-legs longest; fore-tibia somewhat swollen; apical tibial spurs 3 in fore-legs (dorsal spur minute) and 2 each in middle- and hind-legs (apical spur formula 3:2:2). Tarsi 4-jointed.

_Abdomen_: Oblong; moderately densely pilose. **Cerci** 2-jointed, 0.08 mm long. **Styli** absent.

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**Fig. 2.** *Entoloma hainzei* n. sp. Soldier. Drawings from holotype, Kanha National Park, Madhya Pradesh, India.

(a) Head and pronotum, in dorsal view. (b) Ditto, in side view. (c) Labrum, in dorsal view. (d) Postmentum, in ventral view. (e)-(g) Right fore-, middle- and hind-legs, in dorsal view.

_tbr_t_, apical tibial spurs.
4. **Worker** (Fig. 10; Table III).—

**General**: Head-capscule, postclypeus and antennae pale yellow; mandibles pale brown, teeth and outer margins dark brown; thorax and legs crema­nish white, paler than head; abdominal tergites and sternites colourless and transparent, but abdomen appears greyish due to intestinal contents showing through. Head fairly, and body densely, pilose. Total body-length (ex­cluding antennae) 4.1–4.5 mm.

![Diagram](image-url)

**Fig. 10. Eurytermes lowei** n. sp. Worker. Drawings from paramorphotype, Kanha National Park, Madhya Pradesh, India.

(a) Head and pronotum, in dorsal view. (b), (c) Left and right mandibles respectively, in dorsal view. (d)-(f) Left fore-, middle- and hind-legs, in dorsal view.

**Head**: Head-capsule subcircular, flat; broader than long (length to base of mandibles 0.70–0.77; maximum width 0.87–0.90 mm). **Fontanelle**: A white, translucent, round spot present in middle of head-dorsum; maximum diameter 0.10–0.13 mm. **Eyes and ocelli**: Absent. **Antennae**: With 14 seg­ments; fairly densely pilose; segments 1 and 2 as in soldier; 3 shorter than or subequal to 2; 4 shortest; 4–9 gradually increasing in size and becoming club­shaped; 10–13 subequal and club-shaped; last (14) ovate and longer than 13. **Ocypus and labrum**: As in imago. **Mandibles**: As in imago, except for the
following: Posterior margin of 2nd marginal tooth of right mandible more incurved; molar plate of right mandible more incurved, of left mandible more spatulate.

Thorax: Pro-, meso- and meta-nota as in soldier. Legs: As in soldier, but fore-tibia greatly swollen.

Abdomen: Oblong, densely pilose and generally tapering behind. Cerci 2-jointed, 0.07 mm long. Styli absent.

**Type-specimens**

*Holotype and morphotypes: Holotype (soldier), Z.S.I. Reg. No. 4154/H8, in a vial, in spirit; and *morphotypes* (an imago and a worker), Reg. No. 4155/H8, *vide* 'Material (i)' above in another vial; both deposited in National Zoological Collections, Zoological Survey of India, Calcutta. *Paramorphotypes*: *Vide* 'Material (i)' above; deposited as follows: (i) Seven imagos and 25 workers in Zoological Survey of India, Reg. No. 4156/H8. (ii) One imago and 2 workers in Forest Research Institute, Dehra Dun. (iii) One imago and 2 workers in Indian Agricultural Research Institute, New Delhi. (iv) One imago and 2 workers with Prof. A. E. Emerson, U.S.A.

**Type-locality and Distribution**

*Type-locality*: Kanha National Park (Mandla District, Madhya Pradesh, India); see *supra*, 'Material', for other details. *Distribution*: Known only from the type-locality.

**Comparisons**

*Eurytermes boveni* n. sp. is close to *E. assmuthi assmuthi* Wasmann and *E. topslipensis* (Chatterjee and Thapa), but is separable as follows:

From *E. assmuthi assmuthi*.—*Imago*: (i) Ocello larger (0.10-0.13 mm long and 0.09-0.10 mm wide, vs. 0.09-0.10 and 0.07 mm respectively). (ii) Postclypeus longer (index Length/Width 0.46-0.53 vs. 0.43), and with anterior margin weakly convex (vs. weakly concave). (iii) Wings darker and with stronger punctation (vs. paler and with weaker punctation). *Soldier*: (i) Head-capsule narrower and thicker (width 1.20, height 0.97 mm vs. 1.30 and 0.87 mm respectively; and index Height/Width 0.81 vs. 0.67). (iii) Left mandible with a thick tooth (vs. with an acute tooth), the tooth lying at one-third of its distance from tip (vs. at one-fourth). (ii) Right mandible tooth a little larger and placed more medially (vs. at about one-third of its distance from tip; index Tooth-distance/Mandible-length 0.4 vs. 0.3).

From *E. topslipensis*.—*Soldier*: Generally larger (head-length to base of mandibles 2.0 mm vs. 1.87; head-width 1.2 mm vs. 1.05). (ii) Mandibles longer (index Left mandible-length/Head-length to base of mandibles 0.44 vs. 0.39; and index Left mandible-width at base/Mandible-length 0.57 vs. 0.52). (iii) Right mandibular tooth large (vs. short and point-like).
4. Eurytermes ceylonicus Holmgren

(Figs. 11, 12; Tables I, III)

(i) *Eurytermes ceylonicus* Holmgren


(ii) **Synonym:**

The following is a synonym, vide Snyder, 1949; we have been unable to examine the specimens:


(iii) **Wrong determinations:**

The following are wrong determinations of *E. ceylonicus* as *E. assimathi*.

(Also see above under *E. assimathi assimathi* Wasmann.)


(Vide Holmgren, 1913, supra, p. 223.)


**MATERIAL**

The following type material, present in the Forest Research Institute, Dehra Dun, and received through the courtesy of Dr. P. N. Chatterjee, Forest Entomologist, was examined: An image ♂ (partly damaged; hind portion of abdomen, left forewing and 2 hindwings lying detached from body) and a worker (abdomen damaged), in spirit in a vial, *cotype*, Ceylon, coll. E. Escherich.

**DESCRIPTION**

1. **Imago ♂** (Fig. 11; Table I).

**General:** Head-capsule dark reddish brown; postclypeus, legs and pronotum yellowish brown, the former somewhat darker; antennae and labrum pale yellowish brown; mandibles yellowish brown, dark reddish brown distally and at toothed margins; abdominal tergites reddish brown, paler than head-capsule, antero-laterally yellowish brown; sternites yellowish brown,
paler medially. Head, body and legs densely pilose, with a fine, thick, coat of short hairs and several long hairs. Total body-length without wings c. 8.5 mm.

**Head**: Oval; head-capscule subcircular; broader than its length to base of mandibles (length to base of mandibles 0.93; width including eyes 1.30 mm);

![Diagram of insect parts](image)

**Fontanelle**: Large, oval, ocellus-like; lying in middle of head-dorsum slightly below the middle; diameter: maximum 0.15, minimum 0.10 mm. **Eyes**: Two medium-sized, black, round, lateral, compound eyes, one on either side; maximum diameter with ocellar sclerite 0.30 mm. **Ocelli**: Two lateral, broadly oval, translucent ocelli, one on either side; minimum eye-ocellus distance 0.09 mm; diameter: maximum 0.13,
minimum 0·11 mm. Antennae: With 14-15 segments (in the single specimen, the right antenna with 14, the left with 15 segments); densely pilose; segment 1 longest and cylindrical; 2 about half the length of 1, narrower and cylindrical; 3 shortest; 4-14 (or 15) club-shaped and gradually becoming longer; last ovate and longer than the penultimate one. Clypeus: Divided into an ante- and a postclypeus. Anteelypeus hyaline, apilose; anterior margin somewhat projected medially. Postclypeus swollen and pilose; length less than half the width; divided into right and left halves by a dark, median line. Labrum: Somewhat tongue-shaped, with a truncate apex; slightly broader than long; broadest a little below the middle; with several long and short hairs on body and near distal margin. Mandibles: Of typically Eurytermes-type, each with an apical and two marginal teeth; apical finger-like. Left mandible: 1st marginal slightly shorter than apical and widely separated from 2nd; 2nd short, separated from 1st by a sharp cut; molar plate small. Right mandible: 1st marginal slightly shorter than apical; less widely separated from 2nd than in left mandible; 2nd marginal short but with a longer and weakly incurved posterior margin; molar plate weakly concave.

Thorax: Pronotum: Slightly narrower than head-capsule with eyes; broader than long (maximum length 0·67; maximum width 1·17 mm); anterior margin weakly concave without a median notch; sides round and sharply narrowing behind the middle; posterior margin substraight and without a median notch. Mesonotum and metanotum with a sharp median notch in posterior margin. Legs: Long and densely pilose; fore-legs shortest; hind-legs longest; apical tibia! spur 3 in fore-legs (outer spur in left fore-leg broken) and 2 each in middle- and hind-legs. Tarsi 4-jointed.

Wings: Pale brown; forewings slightly longer than hindwings; forewing scale also longer than hindwing scale. Forewings: Costa thick, strongly chitinized and pilose; bordering the anterior margin of wing. Subcosta separated from costa only for a short distance proximally, otherwise fused with the latter throughout. Radial sector strongly chitinized, thicker than costa-subcosta and scantly pilose; running parallel with and rather close to costa-subcosta, fusing with the latter at the distal margin. Median arising separately and running a little above the middle of wing-membrane all through its length; giving off 3 main branches in distal one-fourth. Cubitus running almost parallel with median and giving off 8 main branches to posterior margin all along its course. Hindwings: Costa, subcosta and radial sector as in forewing. Median arising out of radial sector outside the scale, running either unbranched to the distal margin or bifurcating in distal one-fourth. Cubitus as in forewing but giving off 9 main branches to posterior margin.

2. Soldier.—

Unknown.
3. **Worker** (Fig. 12; Table III).—

**General**: Head-capsule and postclypeus pale yellowish brown; antennae, labrum, legs and body paler than head-capsule; abdominal tergites and sternites transparent. Head, body and legs fairly densely pilose.

**Head**: Head-capsule subcircular; broader than its length to base of mandibles (length to base of mandibles 0.83; maximum width 1.0 mm) sides somewhat narrowing posteriorly. **Fontanelle**: A round, translucent, mid-dorsal spot, lying a little posterior to the middle of head; diameter 0.09 mm.

**Eyes and ocelli**: Absent. **Antennae**: With 14 segments; fairly densely pilose; segments 1 and 2 as in imago; 3 subequal to 2 and weakly subdivided; 4-14 (last) gradually increasing in length and becoming long and club-shaped. ** Clypeus**: As in imago; postclypeus length equal to half its width. **Labrum**: As in imago. **Mandibles**: Of typically *Eurytermes* type.

**Thorax**: **Pronotum**: Much narrower than head-capsule; broader than long (maximum length 0.30; maximum width 0.57 mm), both anterior and posterior margins without a median notch. **Mesonotum** slightly narrower,
and metanotum broader than pronotum; hind margin in both without a median notch. Legs: fore-legs longer than middle-legs; hind-legs longest; fore tibia swollen; apical tibial spurs 2 on each tibia, the outer spur of fore-leg not present.

**Abdomen:** Incomplete in the specimen examined.

**Type-specimens**

*Colotypes:* (i) An imago and a worker (both slightly damaged), *vide* 'Material' above, present in Forest Research Institute, Dehra Dun. [No type-specimens are traceable in Holmgren Collection, in the Swedish Museum of Natural History, Stockholm—letter dated 4th September, 1964, from that Museum.]

**Type-locality and Distribution**

*Type-locality:* No specific locality was given by Holmgren, 1913. His material consisted of Escherich's collection, most probably the one previously determined by Holmgren (1911, in Escherich: *Termiteleben auf Ceylon* as *E. assmanni* Wasmann, from Peradeniya [Ceylon], and Green's collection for which no locality is given in literature nor were specimens available to us for study. We may thus confine the type-locality to Peradeniya. *Distribution:* Ceylon: Badulla; Peradeniya.

**Comparison**

*Eurytermes ceylonicus* differs from *E. assmanni assmanni* Wasm. and *E. boveni* n. sp. (supra) as follows:

From *E. assmanni assmanni.*—See above under that species.

From *E. boveni.* *Imago:* (i) Generally paler and larger species (head-width with eyes 1.30 vs. 1.07–1.13 mm; head-length to lateral base of mandibles 0.95 vs. 0.77–0.83 mm; length of forewing without scale 11.3 vs. 9.1–10.1 mm). (ii) Postclypeus-length shorter in relation to width (Length/Width index 0.45 vs. 0.46–0.51). (iii) Fontanelle large, ocellus-like (vs. minute). (iv) Minimum eye-ocellus distance larger (0.00 mm vs. 0.05–0.07 mm). *Worker:* (i) Generally larger (head-width 1.00 vs. 0.87–0.90 mm; head-length to lateral base of mandibles 0.83 vs. 0.70–0.77 mm). (ii) Postclypeus-length shorter in relation to width (Length/Width index 0.50 vs. 0.56–0.62).

5. *Eurytermes topslipensis* (Chatterjee and Thapa) (Fig. 13: Tables 11, 111)

Material

(i) A vial with a soldier (the holotype) and a worker (morphotype), Mount Stuart, Top Slip (Coimbatore Dist., Madras State, India), R. N. Molnar coll., 16 Jan., 1961, ex. in soil, in Forest Research Institute, Dehra Dun.  (ii) A vial with 2 paramorphotype workers from lot (i) above, in the Zoological Survey of India, Calcutta.

Description

As the species has been described in detail recently, a further description is not called for and only a summary of the main characters is provided below.

1. Imago.—

Unknown.

2. Soldier (Fig. 13; Table II).

Head similar to E. boveni but smaller. Fontanelle indistinct. Antennae with 14 segments. Labrum subtriangular, with the distal tip faintly notched or incurved. Mandibles short (head-mandibular index, Left mandible length/Length of head-capsule, 0.48), stout, subequal to head-width. Left mandible: With a small obtuse-angled tooth at anterior one-fourth from tip, a weak notch in middle and a bigger notch in posterior third. Right mandible: With a small, point-like tooth in anterior third and a prominent notch in posterior third. Legs: Apical tibial spur formula 3:2:2. Tarsi 4-segmented.

Fig. 13. Eucryptermes insulatus Chatterjee and Thapa. Soldier. Drawing from holotype, Mt. Stuart, Top Slip, Coimbatore Dist., India.
3. Worker (Table III).—

Head and body-parts as in E. hoveni. Antennae with 14 segments. Mandibles: With an apical and two marginal teeth. Left mandible: The angle between apical and 1st marginal acute; 2nd marginal widely separated from 1st, and the margin with a deep notch just above it; a basal projection present. Right mandible: 1st marginal larger than in left; no notch between 1st and 2nd marginals; molar plate large, concave and without corrugations. Legs: Apical tibial spur formula 3:2:2. Tarsi 4-segmented.

**Type-specimens**

*Holotype* and *morphotype*: As in Material (i) above, deposited in the Forest Research Institute, Dehra Dun. Also, *parmorphotype* workers from the same lot: 2 in the Zoological Survey of India, Calcutta; and 2 with Prof. A. E. Emerson (U.S.A.).

**Type-locality and Distribution**

*Type-locality*: Mount Stuart, Top Slip (Coimbatore District, Madras State, India). *Distribution*: Known only from the type-locality.

**Comparison**

*E. topslipensis* is close to *E. hoveni* R. & C. For comparison see above under the latter species.

**Acknowledgements**

We are obliged to the following gentlemen for kindly sending on loan the types of the species mentioned below: Dr. J. van Boven, Conservator of the Wasmann Collection at the Natural History Museum, Maastricht (Holland), for types of *Eurytermes asmuthi asmuthi* Wasmann; and Dr. P. N. Chatterjee, Forest Entomologist, Forest Research Institute, Dehra Dun, for types of *Eurytermes cyphonius* Holmgren and *Beesoonitermes topslipensis* C. & T.

**References**


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