

ON THE SPECIES *CAPRITERMES FLETCHERI* HOLMGREN & HOLMGREN AND
EUTERMES INCOLA WASMANN (ISOPTERA : TERMITIDAE :
TERMITINAE) : THEIR STATUS, DESCRIPTIONS, ETC.

O. B. CHHOTANI

Scientist Emeritus

Zoological Survey of India, Calcutta

INTRODUCTION

Holmgren and Holmgren (1917) described the species *Capritermes fletcheri* from material which on examination has been found to belong to two different genera viz. *Dicuspiditermes* Krishna and *Pseudocapritermes* Kemner as we know them today. The material was from three different localities such as Puthupadi Forest (Malabar, Kerala), Anamalai Hills (Tamil Nadu) and Bababudin Hills (Karnataka). A detailed study of all the type material of the species (*C. fletcheri*) available and that of other related species as well as of a large undetermined collection of these two genera has revealed that *Capritermes fletcheri* Holmgren and Holmgren actually belongs to the genus *Pseudocapritermes*. It is also seen that the species *P. fontanellus* Mathur and Thapa, *P. goanicus* Chatterjee and Thakur and *P. roonwali* Verma are its junior synonyms. The species *Dicuspiditermes fletcheri* (Holmgren and Holmgren) as has been referred to in recent literatures, is in fact *D. incola* (Wasmann). The details of the study are given here in this paper.

ABBREVIATIONS USED

FRI, Forest Research Institute, Dehra Dun ; IARI, Indian Agricultural Research Institute, New Delhi ; Im, imago ; NHM, Natural History Museum, Masstricht ; S, soldier ; W, worker ; ZSI, Zoological Survey of India, Calcutta.

MATERIAL EXAMINED

A. *In Zoological Survey of India (ZSI)*

1. A vial with one S and 6 W (damaged, head separated from body) labelled *Capritermes fletcheri*, Anamalai Hills, coll. Fletcher, 22.i.1912, ex "colony and dead log", also with two separate labels of "cotype" and "det. Nils Holmgren". Redet. G. Bose (1984) as *Procapritermes fontanellus* Mathur and Thapa. This is the same collection as (2) of "*Capritermes fletcheri* n. sp." vide Holmgren and Holmgren, 1917, page 169. Now determined (O. B. Chhotani, 1992) as *Pseudocapritermes fletcheri* (Holmgren and Holmgren) and soldier designated 'Lectotype'.

2. A vial with one S and one W (damaged) of *Capritermes fletcheri*, Bababudin Hills, Mysore State, T. B. Fletcher coll., 12.xi.1912, ex "galleries and chambers 2-10" below soil at roots of coffee" also with a loose lable of "cotype". This meterial was received by FRI from IARI and one S and one W from FRI was donated to ZSI. This material is same as (3) of *Capritermes fletcheri* n. sp. "vide Holmgren and Holmgren, 1917, p. 169. Now determined (O. B. Chhotani, 1992) as *Dicuspiditermes incola* (Wasmann).

3. A vial with 4 S and 4 W, labelled as *Capritermes incola* Wasmann, Bababudin Hills. Mysore State, coll. Flecher, with a loose label of "det Nils Holmgren". This is the same material as (3) of *Capritermes incola* Wasm. vide Holmgren and Holmgren, 1917, p. 170. Now determined (O. B. Chhotani, 1992) *Dicuspiditermes incola* (Wasmann).

4. Several vials with S and W, det. G. Bose (1984) as *Procapritermes fontanellus* Mathur and Thapa, now det. *Pseudocapritermes fletcheri* (H. & H.) ; and as *Dicuspiditermes fletcheri* (Holmgren and Holmgren) now det. *D. incola* (Wasm). Also several undetermined collections of S and W of *Pseudocapritermes* from Karnataka, Tamil Nadu and Kerala states and of *Dicuspiditermes* from Maharashtra, Tamil Nadu, Kerala and Karnataka (one with imagoes only). These are now determined as *Pseudocapritermes fletcheri* (Holmgren and Holmgren) and *Dicuspiditermes incola* (Wasmann).

5. Paratypes of *Pseudocapritermes fontanellus* Mathur and Thapa and of *P. goanicus* Chatterjee and Thakur and holotype of *P. roowali* Verma. Now det. *P. fletcheri* (Holmgren and Holmgren).

B. In Indian Agricultural Research Institute, New Delhi (IARI)

A vial with 7 W having three labels : 1. "Malabar Dt., Puthupadi Forest, under rotting bamboo, Y. R. coll., 22.I.13". 2. "Fletcher coll. AAD Malabar". 3. "*Capritermes* sp." These are surely syntypes of *Capritermes fletcheri* Holmgren and Holmgren though not labelled as such the data tallies with No. (1) of *Capritermes fletcheri* n. sp." vide Holmgren and Holmgren, 1917, p. 169. Now det. *Pseudocapritermes fletcheri* (Holmgren and Holmgren).

C. In Wasmann Collection at Natural History Museum, Masstricht (Holland)

Three dealate imagoes (paratypes ? of *Eutermes incola* Wasmann) on one pin with two labels : (1) "Colombo Redeman" and (2) "b. Termes Redemani". These specimens are same as those of "Case V : Ceylon, Colombo, collected by A. Redemann ("bei *Termes Redemanni*")", determined by E. Wasmann (winged, dealated). In the collection on indication, same colony as Holotype *incola*, labeled van Boven, 1967". This is as given by van Boven (1969) in the list of types in Wasmann Collection, but there is no label by van Boven on the specimens.

One S and one W (paratype of *Capritermes longicornis* Wasmann), on one pin, with three labels : 1. Khandala (Bombay). 2. Assmuth 30, Bombay. 3. *Capritermes longicornis* Wasm. The third label is in red ink.

OBSERVATIONS AND RESULTS

A. On *Capritermes fletcheri* Holmgren and Holmgren :

While studying the *Capritermes*—complex genera of the Indian Region it was noticed that the material from which Holmgren and Holmgren (1917) described the species *Capritermes fletcheri* came from three localities viz. Puthupadi Forest (Malabar, Kerala), Anamalai Hills (Tamil Nadu) and Bababudin Hills (Karnataka). These on study have been found to belong to two different genera i.e. *Dicuspiditermes* Krishna and *Pseudocapritermes* Kemner as we know today.

Since the original material of the species belongs to two genera and while going through the description of Holmgren and Holmgren (1917) it was observed that their description and measurements of the soldier of the species *Capritermes fletcheri* were actually based on the Anamalai Hills and Puthupadi Forest material and not on the Bababudin Hills specimens. In the description, the authors mention "Fontanelle punctiform. Labrum long, considerably longer than broad, deeply incised anteriorly. "Mandibles shorter than head. Antennae 14-jointed, third joint almost as long as second, fourth shorter than third" All these are the characters of *Pseudocapritermes* soldier, as such the species *Capritermes fletcheri* Holmgren and Holmgren is transferred to the genus *Pseudocapritermes* and that the Anamalai Hills and Puthupadi Forest specimens taken as the syntypes of *Pseudocapritermes fletcheri* (Holmgren and Holmgren) and the soldier from the Anamalai Hills collection in the ZSI is designated as the Lectotype. The third or the Bababudin Hills collection soldiers, besides being larger in size than the measurements given by the authors, have been seen to have (i) deeply incurved anterior margin of the labrum with short processes (serrations) on antero-lateral margin, (ii) the mandibles almost as long as head and (iii) the antero-lateral corners of head produced into pointed cusps. These are the characters of *Dicuspiditermes* and there is no such mention of these characters in the authors' description of the species.

Evidently the authors had the Anamalai Hills and Puthupadi Forest specimens before them while drawing up the description of *C. fletcheri*. Moreover it may be mentioned that Holmgren and Holmgren (1917, p. 170) had another collection from Bababudin Hills which was included under *Capritermes incola* (Wasm.). It was very probably an inadvertent mistake that the collection taken as syntypes of *Capritermes fletcheri* from Bababudin Hills was referred under this species.

On comparison of the paratypes of *Pseudocapritermes fontanellus* Mathur and Thapa and the now designated lectotype of *P. fletcheri* (Holmgren and Holmgren), it has been

found that *P. fontanellus* is synonymous with *P. fletcheri*. Also on examination of other collections of presently determined *P. fletcheri* it was observed that the characters on the basis of which the species *Pseudocapritermes goanicus* was described by Thakur and Chatterjee (1969) fall within the range of variations of the species *P. fletcheri* (Holmgren and Holmgren). Thakur and Chatterjee (1969) separate *P. goanicus* soldier from that of *fontanellus* (now a synonym of *fletcheri*) for having comparatively smaller fontanelle gland, for second segment of antenna subequal to third vs longer than third and different head indices. The variation in the size of fontanelle gland (Fig. 2) is shown in the figures of soldier head from two different collections from Periyar Lake (Kerala) and Mercara (Karnataka). The measurements also fall within the range of variation (Table 1). The species *P. goanicus* Thakur and Chatterjee (1969), therefore, is relegated to the synonymy of *Pseudocapritermes fletcheri* (Holmgren and Holmgren). The characters on the basis of which the species *P. roonwali* is separated by Verma (1985) also fall in the range of variations of *P. fletcheri*, and as such *roonwali* is also relegated to the synonymy of *P. fletcheri* (Holmgren and Holmgren).

B. On *Eutermes incola* Wasmann :

The syntypes of *Capritermes fletcheri* Holmgren and Holmgren (1917) from Bababudin Hills (Karnataka) so determined by them and it being a larger collection got distributed to various museums in the course of time. These actually belong to the genus *Dicuspiditermes* Krishna and thus created some confusion in literature in respect of the identity of the species *fletcheri*. It is because of this that Krishna (1965, 1968) and Bose (1984) refer the species *fletcheri* to *Dicuspiditermes* whereas it actually is a *Pseudocapritermes* as discussed above.

On examination of the paratypes of *Eutermes incola* Wasmann [= *Dicuspiditermes incola* (Wasmann)] and *Capritermes longicornis* Wasmann (synonym of *incola* vide Holmgren, 1913 and Snyder, 1949), received from the Natural History Museum, Maastricht (Holland), it has been found that the Bababudin Hills syntypes of *Capritermes fletcheri* could not be separated from the paratype soldier of *Capritermes longicornis* Wasmann. As such, it was either a misidentification by Holmgren and Holmgren (1917) or the so named 'cotypes' by them were inadvertently placed under *Capritermes fletcheri* as mentioned above.

The collections so determined as *Dicuspiditermes fletcheri* by Bose (1984) and present in ZSI were re-determined as *D. incola* (Wasmann) (= *Eutermes incola* Wasmann). The paratypes of *Dicuspiditermes pername* Thakur and Chatterjee were also examined and redetermined as *D. incola* (Wasmann), therefore, the name *pername* is treated here as junior synonym of *incola*.

Due to all this confusion in the literature in respect of the species *Pseudocapritermes fletcheri* (Holmgren and Holmgren) and *Dicuspiditermes incola* (Wasmann), the species

are redescribed, giving detailed synonymies with their measurements and figures from the type material of the species, to clear the position.

REDESCRIPTION OF THE SPECIES

PSEUDOCAPRITERMES FLETCHERI (HOLMGREN AND HOLMGREN)

AND

DICUSPIDITERMES INCOLA (WASMANN)

***Pseudocapritermes fletcheri* (Holmgren and Holmgren)**

Synonyms : *Pseudocapritermes fontanellus* Mathur and Thapa (1961), *P. goanicus* Thakur and Chatterjee (1969) and *P. roonwali* Verma (1985)]

(Figs. 1-3 ; Table 1)

1917. *Capritermes fletcheri* Holmgren, K. and Holmgren, N. *Mem. Dept. Agric. India*, 5 : 169.
S. W. Syntypes in ZSI, FRI, IARI, AMNH and probably in Holmgren collection, Naturhist, Riksmuseet, Stockholm, Type-localities. Puthupadi Forest (Malabar, Kerala), Anamalai Hills (Tamil Nadu) and Babadudin Hills (Karnataka). S from Anamalai Hills in ZSI now designated Lectotype and type-locality restricted to Anamalai Hills (Tamil Nadu).
1949. *Capritermes fletcheri* ; Snyder T. E. *Smiths. misc. Colls.*, 112 : 193. (Partim).
1953. *Capritermes fletcheri* ; Rattan Lal and Menon, R. D. *Cat. Indian Insects*, pt. 27 : 47. (Partim).
1958. *Capritermes fletcheri* ; Ahmed, M. *Biologia*, Lahore, 4 : 190.
1961. *Pseudocapritermes fontanellus* Mathur, R. N. and Thapa, R. S. *J. Timber Dry. Pres. Assoc.*, 7 : 3-7.
S. and W. Holotype : S in FRI. Type-locality : Top slip (Tamil Nadu). New synonymy.
1968. *Procapritermes fontanellus* ; Krishna, K. *Bull. Am. Mus. nat. Hist.*, 135 (Art. 5) : 303.
1969. *Pseudocapritermes goanicus* Thakur, M. L. and Chatterjee, P. N. *Orient. Ins.*, 3 (2) : 189-192.
S. and W. Holotype : S in FRI. Type-locality : About 1 km from Moleum Rest House towards Belgaon side, Moleum Forest Range, South Goa Forest Division, Goa, India. New synonymy.
1969. *Pseudocapritermes fontanellus* ; Thakur, M. L. and Chatterjee, P. N. *Orient. Ins.*, 3 (2) : 191.
1970. *Pseudocapritermes fontanellus* ; Roonwal, M. L. In : *Biology of Termites* (Eds. Krishna, K. and Weesner, F. M.) : 354.
1975. *Pseudocapritermes goanicus* ; Sen-Sarma, P. K. et al. *Wood Destroying Termites of India* (Final Tech. Rep. PL 480 Proj. No. A7-FS-58) : 2, 63.
1978. *Procapritermes fontanellus* ; Roonwal, M. L. *Z. ang. Ent.*, 85 : 19.
1981. *Pseudocapritermes fontanellus* ; Ahmad, M. *Pakistan J. Zool.*, 13 (1-2) : 20.
1981. *Pseudocapritermes goanicus* ; Ahmad, M. *Pakistan J. Zool.*, 13 (1-2) : 20.
1984. *Procapritermes fontanellus* ; Bose, G. *Occ. Pap. Rec. zool. Surv. India*, No. 49 : 155-157.
1984. *Procapritermes goanicus* ; Bose, G. *Occ. Pap. Rec. zool. Surv. India*, No. 49 : 155, 157-158.
1985. *Pseudocapritermes roonwali* Verma, S. C. *Indian J. For.*, 8 (3) : 179-180.
Holotype S in ZSI. Type-locality : Kottavasal, Kerala, India. New synonymy.

IMAGO : Unknown.

SOLDIER (Figs. 1 & 2 ; Table 1) : Head-capsule yellowish, fontanelle gland area creamy white ; antennae, legs and body creamish ; left mandible blackish, right reddish black. Head fairly and body densely hairy. Total body-length 4.00-5.50 mm.

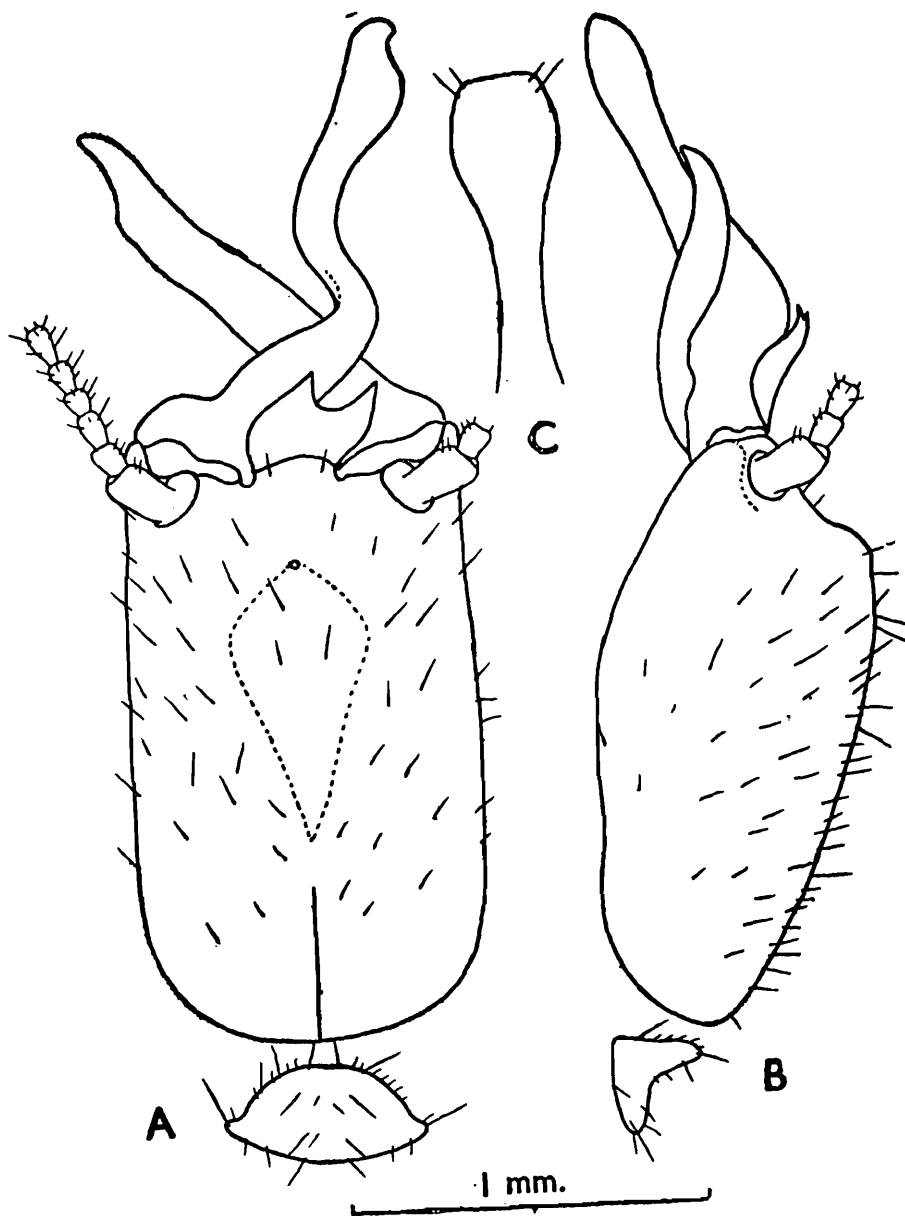


Fig. 1. *Pseudocapritermes fletcheri* (Holmgren and Holmgren). Lectotype soldier. Anamalai Hills, coll. Fletcher, 22.1.1912. A. Head and pronotum, dorsal view. B. Same, side view. C. Postmentum.

Head-capsule subrectangular, sides substraight ; width a little more than $\frac{3}{4}$ of length to base of mandibles (length to base of mandibles 1.40-1.80, max. width 0.90-1.03 mm. index width/length 0.75-0.85) ; with a weak frontal projection ; sharply inclined in front at frons and weakly inclining behind ; median suture present, extending from posterior margin to about $\frac{1}{3}$ - $\frac{1}{2}$ of head-length. Fontanelle small, situated below frontal projection ; fontanelle gland variable in size (Fig. 2). Antennae with 14 segments ; segment 3 generally shorter than 2, club-like ; 4 generally shortest ;

sometimes segments 2 and 3 subequal, 4 a little shorter than 3. Labrum asymmetrical, sides convex; anterior margin deeply incurved; antero-lateral corners projecting in front. Mandibles asymmetrical, subequal, shorter than head. Left mandible strongly twisted and with an incurved beak-like tip; portion below tip strongly convex and swollen on inner margin and very broad at twist. Right mandible blade-like, with a

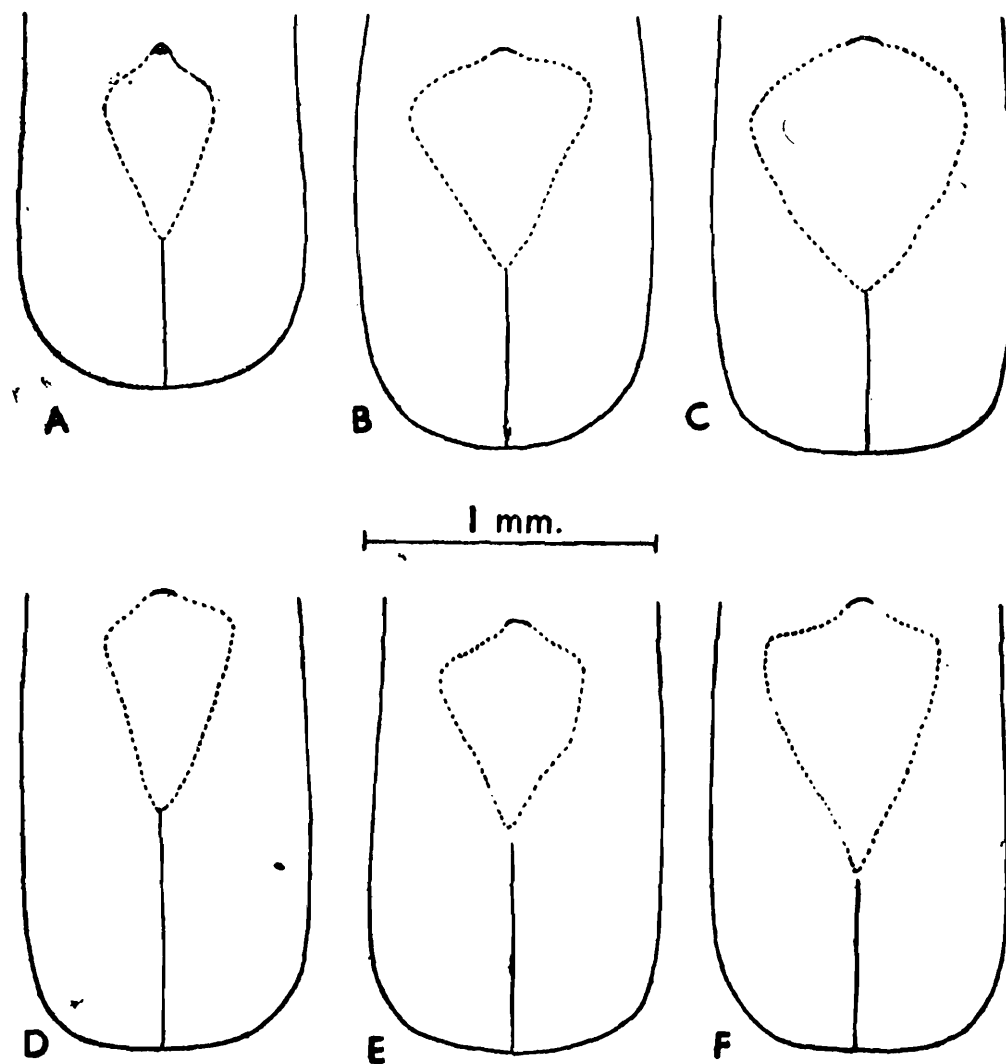


Fig. 2. *Pseudocapritermes fletcheri* (Holmgren and Holmgren). Variation in size of fontanelle gland in soldier. A-C. From specimens from Kuttikanam, Peermade (Kerala, India), coll. O. B. Chhotani, 3.iii.1969. D-F. From specimens from Mercara (Karnataka, India), coll. O. B. Chhotani, 20.xi.1962.

long incurved apical part; outer margin weakly incurved in anterior half and inner margin near middle. Postmentum club-shaped; waist lying below mid-point. Pronotum strongly saddle-shaped; anterior and posterior margins faintly emarginate. Legs thin, long, hairy; apical tibial spurs 3 : 2 : 2, dorsal spur on foretibia small; tarsi 4-jointed. Abdomen elongate, hairy; cerci 2-jointed; styli absent.

WORKER (Fig. 3; Table 1): Head, antennae and labrum pale yellow. Densely hairy. Total body-length 3.25-4.00 mm.

Head-capsule subcircular; sides weakly narrowed behind; broader than long. Fontanelle plate oval to subcircular. Antennae with 13-14 segments; segment 3 in 13 segmented antennae sub-dividing; in 14-segmented ones 3 and 4 short, 3 slightly longer than 4. Postclypeus swollen, less than half as long as wide, hairy; medially divided. Labrum dome-shaped, hairy. Mandibles each with an apical and two marginals; apical much larger than 1st marginal and angle between two wide. Left

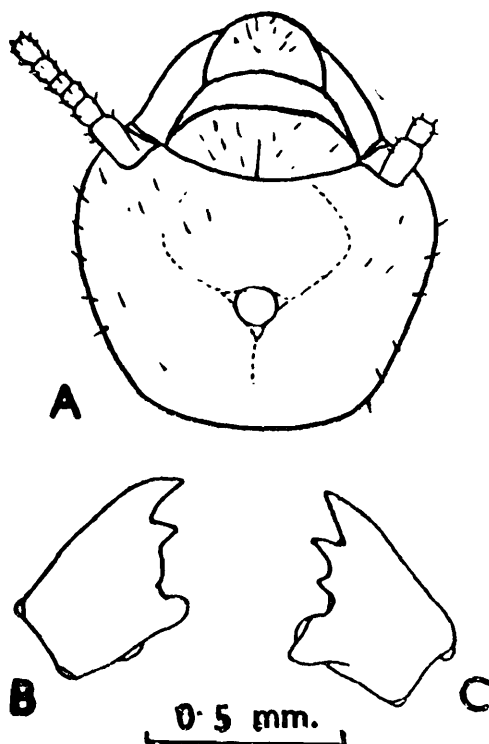


Fig. 3. *Pseudocapritermes fletcheri* (Holmgren and Holmgren). Lectomorphotype worker. Anamalai Hills, coll. Fletcher, 22.i.1912. A. Head, dorsal view. B. Left mandible, C. Right mandible

mandible with 2nd marginal rudimentary and separated from 1st by a long posterior margin of 1st; molar projection extending up to about the level of 1st marginal; index i. e. distance between apical and 1st marginal/distance between 1st and 2nd marginals c 0.80. Right mandible with 1st marginal having posterior margin slightly longer than anterior margin; 2nd marginal small, with a long weakly incurved posterior margin; molar plate longer than posterior margin of 2nd marginal. Pronotum strongly saddle-shaped; anterior margin weakly notched. Legs short, hairy; foretibia slightly swollen; apical tibial spurs 3; 2; 2; tarsi 4-jointed.

Type-specimens: The soldier ex syntypes of *Capritermes fletcheri* Holmgren and Holmgren from Anamalai Hills, present in ZSI, is designated here as 'Lectotype' and workers as paralectotypes; both in separate vials with ZSI Registration Nos. 3320/H 11 and 3321/H 11 respectively, deposited in National Zoological Collections, ZSI, Calcutta. The workers from Puthupadi Forest (syntypes), present in IARI, are also designated as paralectotypes and are deposited there.

TABLE 1. Measurements (in mm), etc. of *Pseudocapritermes fletcheri* Holmgren and Holmgren.

	Range (20 exs)	Lectotype soldier (Anamalai Hills, T. B. Fletcher, 22.i.1912) Det. N. Holmgren <i>Capri- termes fletcheri</i>
SOLDIER		
Total body-length c	4.00-5.50	5.40
Length of head with mandibles	2.50-3.00	2.70
Length of head to base of mandibles	1.40-1.80	1.65
Occipito-fontanellus distance	1.20-1.48	1.43
Max. width of head	0.90-1.03	0.95
Height of head	0.75-0.85	0.80
Head index width/length to base of mandibles	0.572-0.645	0.575
Length of labrum	0.25-0.33	0.25
Width of labrum	0.20-0.25	0.23
Length of mandibles ; Left	1.10-1.35	1.30
Right	1.15-1.35	1.30
Mandible-head index (length of left mandible/ head-length to base of mandibles)	0.750-0.819	0.788
Length of postmentum	0.70-0.88	0.88
Max. width of postmentum	0.28-0.33	0.33
Width of postmentum at waist	0.10-0.15	0.13
Length of pronotum	0.25-0.28	0.27
Max. width of pronotum	0.55-0.60	0.55
WORKER		
	Range (10 exs)	Paralectotype (2 exs)
Total body-length c	3.25-4.00	4.00
Length of head to tip of labrum	1.05-1.18	1.13-1.17
Length of head to base of mandibles	0.60-0.78	0.70-0.78
Max. width of head	0.75-0.88	0.88
Length of postclypeus	0.16-0.18	0.18
Width of postclypeus	0.45-0.50	0.50
Length of pronotum	0.13-0.20	0.13-0.15
Max. width of pronotum	0.40-0.55	0.50

Type-locality and distribution : Type-locality : Anamalai Hills, Tamil Nadu, India.
Distribution : INDIA : Tamil Nadu, Kerala, Karnataka and Goa states.

Dicuspiditermes incola (Wasmann)

[Synonyms : *Capritermes longicornis* Wasmann and *Dicuspiditermes pername* Thakur and Chatterjee]

(Figs. 4 and 5 ; Tables 2 and 3)

1893. *Eutermes incola* Wasmann, E. *Wien Ent. Zeit.*, **12** (7) : 242.
1902. *Capritermes incola* ; Wasmann, E. *Zool. Jahrb. Syst.*, **17** (1) : 126, 128.
- 190` *Capritermes longicornis* Wasmann, E. *Zool. Jahrb. Syst.*, **17** (1) : 126-128.
1904. *Termes (Eutermes) incola* ; Desneux, J. *Genera Insect.*, Fasc. **25** : 43.
1904. *Termes (Eutermes) longicornis* ; Desneux, J. *Genera Insect.*, Fasc. **25** : 43.
1909. *Eutermes longicornis* ; Lefroy, H. M. *Indian Insect Life*. Vol. 1 : 120.
1912. *Capritermes incola* ; Holmgren, N. *J. Bombay nat. Hist. Soc.*, **21** (3) : 792-793.
1913. *Capritermes incola* ; Holmgren, N. *K. Svenska Vetensk-Akad. Handl.*, **50** (2) : 252.
1913. *Capritermes incola* ; Green, E. *Spol. Zeyl.*, **9** (22) : 13.
1914. *Capritermes incola* ; Bugnion E. *Bull. Mus. Hist. nat. Paris*, **20** (4) : 184-202.
1914. *Capritermes incola* ; Silvestri, F. *Rec. Indian Mus.*, **8** : 435.
1917. *Capritermes incola* ; Holmgren, K. and Holmgren N. *Mem. Dept. Agric. India*, **5** : 170.
1917. *Capritermes fletcheri* Holmgren K. and Holmgren, N. *Mem. Dept. Agric. India*, **5** : 169. (Partim, specimen from Bababudin Hills only are *incola*).
1922. *Capritermes longirostris* ; Silvestri, F. *Rec. Indian Mus.*, **24** : 537.
- Silvestri refers to *C. longirostris* Wasm. in comparing his species *gravelyi* and also described his var. *cornutella* under *Capritermes longirostris* Wasm ; whereas Wasmann described *C. longicornis* and not *longirostris*, it is evidently an inadvertent mistake.
1922. *Capritermes incola* ; Hegg, E. *Les Termites* : 48.
1925. *Capritermes incola* ; John, O. *Treubia*, **6** (3-4) : 418.
1934. *Capritermes longicornis* ; Marghabandhu, V. *J. Bombay nat. Hist. Soc.*, **37** (3) : 711.
1949. *Capritermes fletcheri* ; Snyder, T. E. *Smiths. misc. Colls.*, **112** : 193 (Partim).
1949. *Capritermes incola* ; Snyder, T. E. *Smiths. misc. Colls.*, **112** : 104.
1953. *Capritermes incola* ; Rattan Lal and Menon, R. D. *Cat. Indian Ins.*, Pt. **27** : 47-48. See for synonymy.
1958. *Capritermes incola* ; Ahmad, M. *Biologia*, Lahore, **4** : 184-185, 190.
1962. *Capritermes incola* ; Mathur, R. N. and Thapa, R. S. *Indian For. Leaflet*, No. 167 : 109.
1962. *Capritermes fletcheri* ; Mathur, R. N. and Thapa, R. S. *Indian For. Leaflet*, No. 167 : 108.
1965. *Dicuspiditermes fletcheri* ; Krishna, K. *Am. Mus. Novit.*, No. 2210 : 17.
1965. *Dicuspiditermes incola* ; Krishna, K. *Am. Mus. Novit.*, No. 2210 : 18.
1968. *Dicuspiditermes fletcheri* ; Krishna, K. *Bull. Am. Mus. nat. Hist.*, **138** (Art. 5) : 290.

1968. *Dicuspiditermes incola* ; Krishna, K. *Bull. Am. Mus. nat. Hist.* 138 (Art. 5) : 290.
1970. *Dicuspiditermes incola* ; Roonwal, M. L. In : *Biology of Termites* Vol. 2 (Eds. Krishna, K. and Weesner, F. M.) : 353.
1971. *Dicuspiditermes pername* Thakur and Chatterjee, *Zool. Anz.*, 187 : 77-87, New synonym.
1975. *Dicuspiditermes incola* ; Sen-Sarma, P. K. *Rec.*, et al. *Wood Destroying Termites of India* (Final Tech. Rep. PL 480 Proj. No. A-7-FS-58) : 2, 63.
1977. *Dicuspiditermes pername* ; Chhotani, *Occ. Pap. zool. Surv. India*, No. 9 : 33.
1978. *Dicuspiditermes incola* ; Roonwal, M. L. *Zeit. ang. Ent.*, 85 : 19.
1979. *Dicuspiditermes incola* ; Roonwal, M. L. *Termite Life and Termite Control in Tropical South Asia* : 135.
1984. *Dicuspiditermes fletcheri* ; Bose, G. *Occ. Pap. Rec. zool. Surv. India*, No. 49 : 144-146.
1984. *Dicuspiditermes pername* ; Bose, G. *Occ. Pap. Rec. zool. Surv. India*, No. 49 : 144, 149-150.

IMAGO (Fig. 4 ; Table 2) : Paratypes examined. Head-capsule dark brown ; post-clypeus yellowish brown ; antennae pale brown ; pronotum brown ; legs brownish

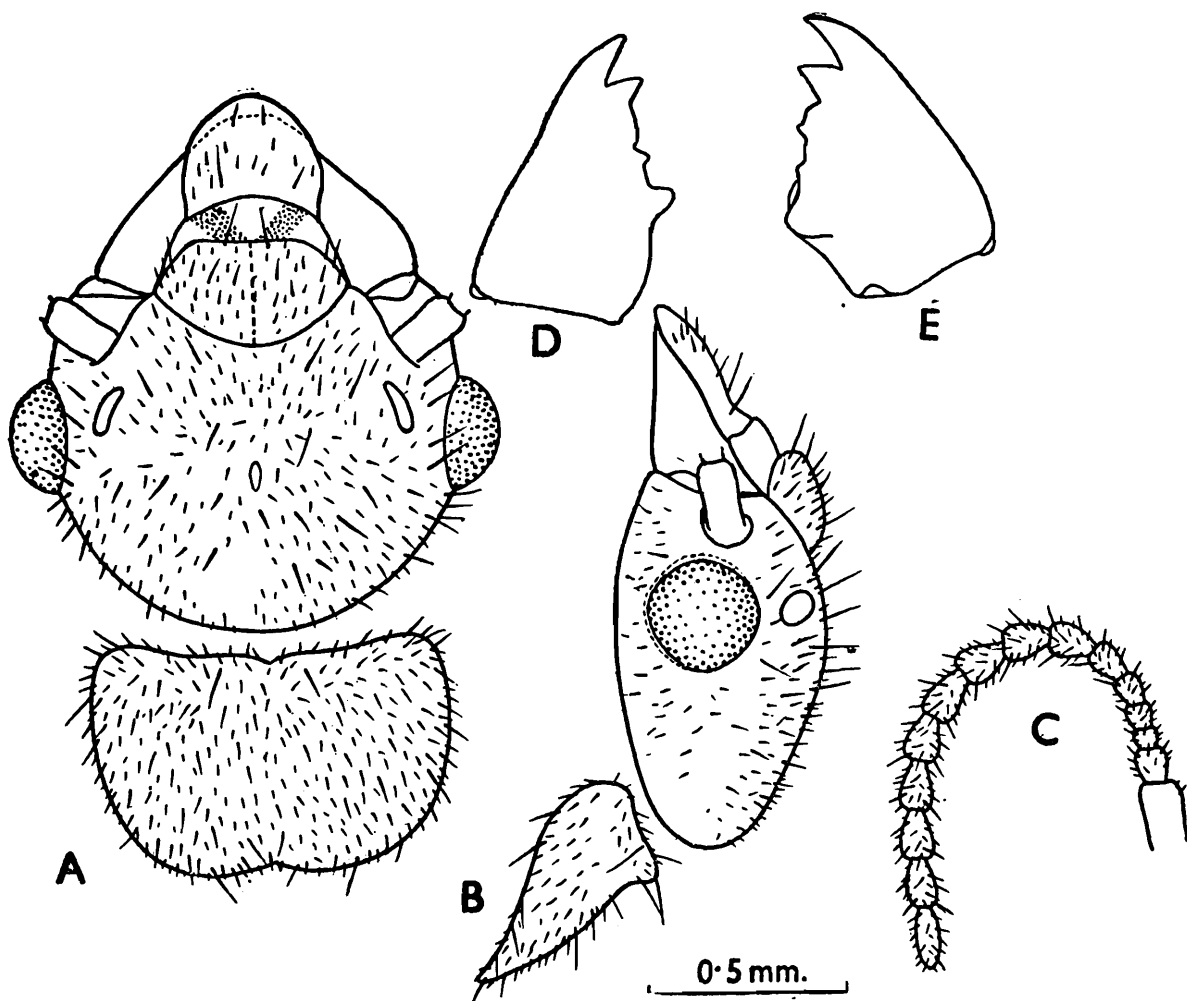


Fig. 4. *Dicuspiditermes incola* (Wasmann). Paratype Imago. Colombo, Sri Lanka, coll. A. Redemann. A. Head and pronotum, dorsal view. B. Same, side view. C. Left antenna. Drawings from 2nd specimen of the three specimens on one pin, present in Natural History Museum, Maastricht (Holland). D. and E. Left and right mandibles from a specimen from Virajpet near Mysore, India.

yellow ; wings pale brown ; abdomen brown above and a little paler below. Head and body covered with a thick coat of short hairs and several long hairs. Total body-length without wings c 5.60-8.5, with wings 12.50-14.20 mm.

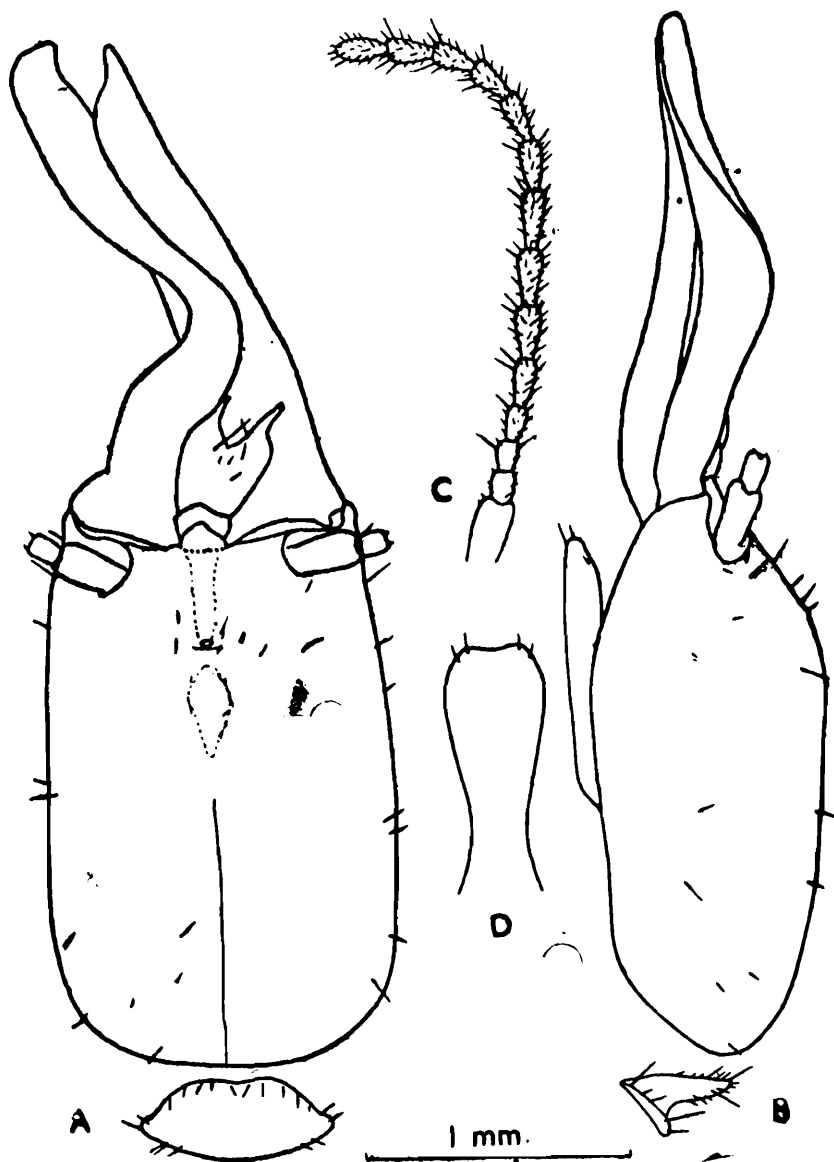


Fig. 5. *Dicuspiditermes incola* (Wasmann). Paratype soldier of *Capritermes longicornis* Wasmann, Khandala (Bombay), coll. Assmuth, present in Natural History Museum, Maastricht (Holland). A. Head and pronotum, dorsal view. B. Same, side view, C. Right antenna. D. Postmentum.

Head-capsule subcircular, with eyes broader than long (width with eyes 1.25-1.38, length to base of mandibles 0.88-1.00 mm) ; Y-suture absent. Fontanelle plate translucent, long and narrow (length 0.075-0.10 mm). Eyes round, fairly well projected ; equidistant from lower margin and antennae. Ocelli broadly oval ; situated at half to about their long diameter from eyes. Antennae with 14-15 segments ; segment 3

shortest ; in 14-segmented antennae segments 4 and 5 subequal and in 15-segmented ones 5 slightly shorter than 4. Postclypeus swollen, hairy ; length about half of width ; divided into 2 halves by a faint groove. Mandibles each with an apical and two marginals ; size of teeth as in figure. Pronotum flat but slightly raised at anterior margin when viewed in lateral view ; narrower than head, width 0.88-1.10 mm ; anterior margin weakly incurved and with a median notch ; posterior margin rounded with a prominent median notch. Legs elongate, hairy, fairly strong ; apical tibial spurs 3 : 2 : 2 ; tarsi 4-jointed. Wing pale brown, hairy along margins and scantily hairy on membrane ; microsculpture consists of papillae on margins and micrasters on membrane. Forewing : Costa thick, along anterior margin ; subcosta short, meeting costa just outside scale ; radius running along costa-subcosta and as thick as that ; media thin, arising separately from scale, running medially and with 3-4 branches near distal end ; cubitus with 8-10 branches to posterior margin. Hindwing venation as in forewing except subcosta wanting and media arising from radius outside scale and with 2-3 branches. Abdomen elongate, densely hairy ; cerci 2-jointed.

TABLE 2. Measurements (in mm), etc. of imagoes of *Discuspiditermes incola* (Wasmann).

	Range 8 exs (including 3 dealate paratypes)
Total body-length with wings c	12.5-14.20
Total body-length without wings c	5.60-8.50
Length of head to tip of labrum	1.35-1.57
Length of head to base of mandibles	0.88-1.00
Max. width of head with eyes	1.25-1.31
Max. height of head	0.53-0.62
Occipito-fontanelle distance	0.33-0.38
Max. diameter of eye	0.30-0.33
Min. diameter of eye	0.26-0.30
Eye-lateral margin of head distance	0.05-0.10
Max. diameter of ocellus	0.13-0.18
Min. diameter of ocellus	0.10-0.15
Min. eye-ocellus distance	0.08-0.13
Min. ocellus-antennal distance	0.13
Length of postclypeus	0.25-0.30
Width of postclypeus	0.50-0.60
Length of pronotum	0.58-0.63
Max. width of pronotum	0.88-1.10
Length of forewing with scale	10.3-11.20
Length of hindwing with scale	10.00-11.00

TABLE 3. Measurements (in mm), etc. of soldier and worker of *Dicuspiditermes incola* (Wasmann) and syntype of *Capritermes fletcheri* Holmgren and Holmgren and paratype of *Capritermes longicornis* Wasmann.

	Range (20 exs)	Paratypes of <i>C. longicornis</i> (1 ex)	Bababudin syntypes of <i>C. fletcheri</i> (1 ex)
SOLDIER			
Total body-length c	5.50-8.50	5.50	6.80
Length of head with mandibles	3.90-4.40	3.90	4.40
Length of head to base of mandibles	2.08-2.45	2.08	2.30
Occipito-fontanelle distance	1.70-2.10	1.70	1.90
Max. width of head	1.33-1.50	1.33	1.375
Head index (width/length to base of mandibles)	0.589-0.652	0.638	0.598
Height of head	0.90-1.0	0.90	0.95
Length of labrum	0.40-0.63	0.40	0.50
Width of labrum	0.30-0.40	0.30	0.35
Length of mandibles : Left	1.85-2.20	1.85	2.075
Right	1.87-2.15	1.87	2.075
Mandible-head length index (left mandible-length/head-length to base of mandibles)	0.844-0.933	0.889	0.902
Length of postmentum	1.00-1.20	1.00	1.05
Max. width of postmentum	0.33-0.43	0.33	0.425
Width of postmentum at waist	0.18-0.22	0.18	0.18
Length of pronotum	0.25-0.35	0.25	0.35
Max. width of pronotum	0.75-0.88	0.75	0.80
WORKER			
	(10 exs)	(1 ex)	(1 ex)
Total body-length c	3.60-5.50	3.60	5.50
Length of head to tip of labrum	1.33-1.40	1.375	1.375
Length of head to base of mandibles	0.85-0.93	0.875	0.875
Max. width of head	1.05-1.13	1.05	1.125
Length of postclypeus	0.26-0.28	0.28	0.275
Width of postclypeus	0.50-0.55	0.55	0.525
Length of pronotum	0.25-0.30	—	0.30
Max. width of pronotum	0.50-0.60	—	0.55

SOLDIER (Figs. 5-6, Table 3) : Paratype of *Capritermes longicornis* Wasmann from Khandala examined. Head-capsule yellowish (fresh specimens) to yellowish brown (older specimens) ; antennae yellowish brown to pale brown ; labrum translucent, very weakly chitinised medially ; left mandible blackish brown, right reddish brown ; legs and body creamy white to pale yellow. Head and body fairly pilose. Total body-length c 5.5-8.5 mm.

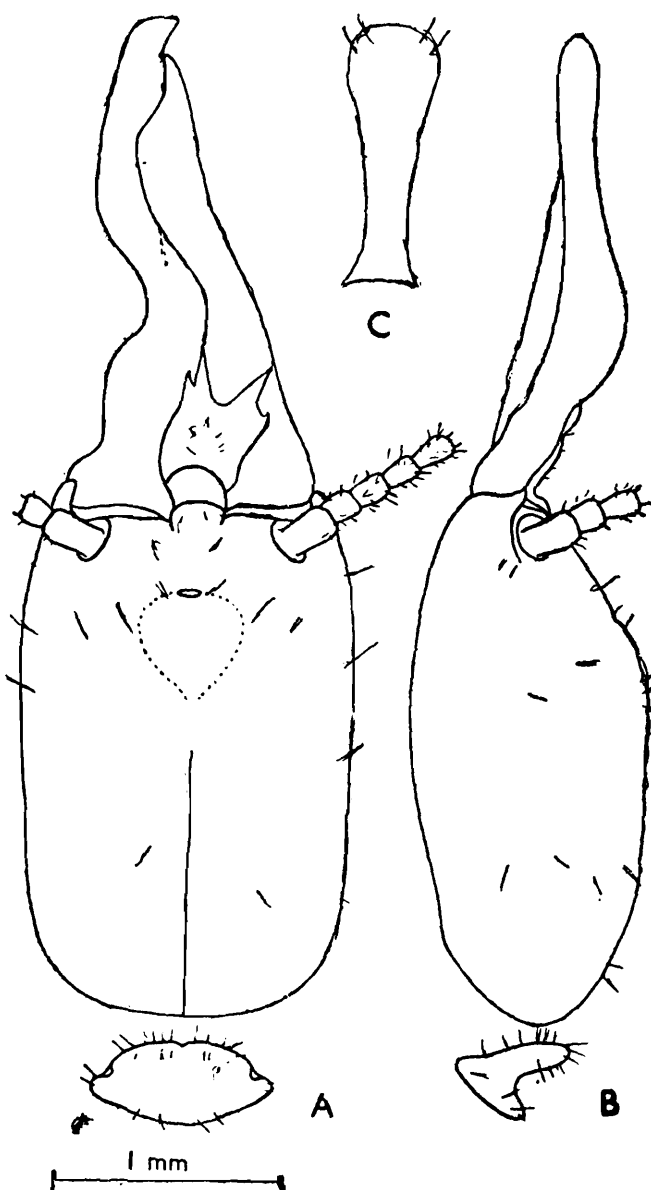


Fig. 6. *Dicuspiditermes incola* (Wasmann). Syntype soldier of *Capritermes fletcheri* Holmgren and Holmgren. Bababudin Hills, coll. T. B. Fletcher, 12.xi.1912. ex "galleries and chambers 2-10" below soil at roots of coffee. A. Head and pronotum, dorsal view. B. Same, side view. C. Postmentum.

Head-capsule subrectangular, sides substraight or slightly converging in front ; antero-lateral corners projected in front as cusps ; width more than half of length (index max. width/length to base of mandibles 0.570-0.638) ; median suture extending upto half of head-length from posterior margin ; frons inclined at 45° angle. Fontanelle

transverse, situated anteriorly; with a minute, brownish tube leading into a small fontanelle gland. Antennae with 14 segments; segments 2, 3 and 4 subequal, 3 sometimes longer than 2 or 4 and 4 sometimes slightly shorter than 3. Labrum asymmetrical, deeply incurved at anterior margin; antero-lateral corners produced into long needle-like processes; antero-lateral margins with 1 or 2 tooth-like projections or serrations at base of lateral processes. Mandibles asymmetrical, only a little shorter than head

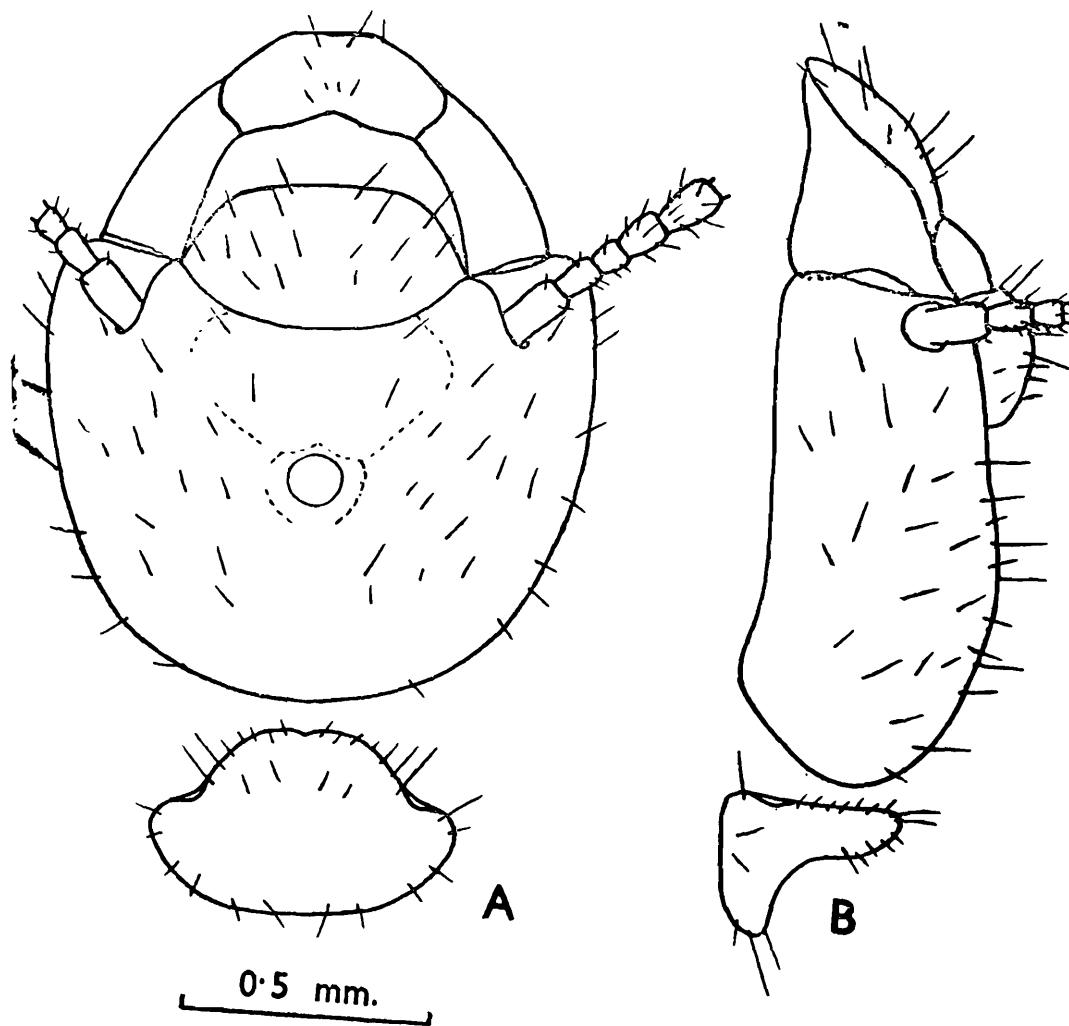


Fig. 7. *Dicuspiditermes incola* (Wasmann). Syntype worker of *Capritermes fletcheri* Holmgren and Holmgren. Data same as in fig. 6. A. Head and pronotum, dorsal view. B. Same, side view.

(index left mandible length/head-length to base of mandibles 0.844-0.933). Left mandible twisted at middle and with a prominent beak-like tip (sometimes tip worn-out; portion below tip swollen on inner margin. Right mandible subequal to or slightly shorter than left mandible; blade-like with a weakly incurved inner and outer margins; strongly incurved at apical portion and with a long pointed apex. Postmentum club-like, about half or little less than half of head-length; waist long and narrow, minimum width lying below middle. Pronotum strongly saddle-shaped, anterior margin weakly notched. Legs thin, long, hairy; apical tibial spurs 3 : 2 : 2; tarsi 4-jointed. Abdomen elongate; cerci 2-jointed; styli absent.

WORKER (Fig. 7, Table 3) : Head, antennae and postclypeus creamish to yellowish ; legs and thorax a little paler ; abdomen transparent with greyish intestinal contents showing through. Head and body fairly pilose. Total body-length 3.60-5.50 mm.

Head-capsule subcircular, wider than length to base of mandibles ; slightly depressed in region of fontanelle. Fontanelle plate oval to round, 0.10-0.17 mm in diameter. Antennae with 14 segments ; segment 3 slightly shorter than 2 and 4 slightly shorter than 3. Postclypeus swollen, hairy ; length about half or a little more than half of width. Mandibles typically *Dicuspiditermes* type. Pronotum and abdomen as in soldier ; legs also as in soldier but shorter.

Type-specimens : Type (=Holotype) and paratype in "Wasmann Collection" at Natural History Museum, Maastricht (Holland). Of *Capritermes longicornis* : Type and paratypes in "Wasmann Collection" as above. Of *Dicuspiditermes pername* : Holotype S in FRI and paratype S and W in FRI and ZSI.

Type-locality and Distribution : Type-locality : Sri Lanka : Colombo. Distribution : Sri Lanka and India (Maharashtra, Karnataka, Tamil Nadu and Kerala states).

SUMMARY

The species *Capritermes fletcheri* Holmgren and Holmgren has been found to belong to genus *Pseudocapritermes* Kemner and the species *P. fontanellus* Mathur and Thapa, *P. goanicus* Chatterjee and Thakur and *P. roonwali* Verma are its junior synonyms.

The species *Dicuspiditermes fletcheri* (Holmgren and Holmgren) as referred to in recent literature is actually *D. incola* (Wasmann).

The two species viz. *Pseudocapritermes fletcheri* (Holmgren and Holmgren) and *Dicuspiditermes incola* (Wasmann) are described in detail giving their complete synonymies. The types of all the relevant species were examined.

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