



Three new records of *Microcerotermes* Silvestri (Blattodea: Isoptera: Termitidae) from West Bengal, India

Rituparna Sengupta and K. Rajmohana*

Zoological Survey of India, 'M'-Block, New Alipore, Kolkata – 700053, West Bengal, India
Email: rituparnasengupta1234@gmail, mohana.skumar@gmail.com

Abstract

Three species of termites identified as *Microcerotermes annandalei* Silvestri, *Microcerotermes fletcheri* Holmgren & Holmgren, and *Microcerotermes pakistanicus* Akhtar (Isoptera: Termitidae) collected recently from West Bengal, are hereby reported as new records to the state. Earlier only two species of this genus were documented. *Microcerotermes pakistanicus* is for the first time reported as a minor pest of babul and bamboo.

Keywords: Distribution, *Microcerotermes annandalei*, *M. fletcheri*, *M. pakistanicus*, Termite

Introduction

Microcerotermes Silvestri 1901 (Blattodea: Isoptera: Termitidae), a widespread genus in the tropics is a wood feeding termite (Roisin & Pesteels, 2000) and has a minor pest status (Chhotani, 1980; Shanbhag & Sundararaj, 2013). They are moderately diverse, with 148 species recorded globally. Of the 50 species reported from the Oriental Region, 23 are from India, and among them 56% are endemic to the country (Krishna *et al.*, 2013). From the recent collections made from a few localities in West Bengal, three species identified as *Microcerotermes annandalei* Silvestri 1923, *Microcerotermes fletcheri* Holmgren & Holmgren 1917 and *Microcerotermes pakistanicus* Akhtar 1974, are new records to the state. Earlier only two species, namely *Microcerotermes besoni* Snyder 1933 and *Microcerotermes cameroni* Snyder 1934 were reported under the genus from West Bengal (Maiti, 1983).

Material and Methods

Termite specimens were collected from epigeal carton nests, live trees, tree stumps and fallen wooden logs, by R. Sengupta during the surveys undertaken in 2018-2019, to Coastal Agroclimatic Zone as well as Red and Laterite Agroclimatic Zone of West Bengal. All the specimens were collected by R. Sengupta and preserved in absolute

alcohol. Measurements of attributes were made under Leica EZ4 microscope. Species identifications and descriptions follow Chhotani (1997). All the voucher specimens are deposited in Zoological Survey of India, Kolkata, one of the national repositories.

Results

Systematic Accounts

Family TERMITIDAE

Genus *Microcerotermes* Silvestri, 1901

1. *Microcerotermes annandalei* Silvestri, 1923

1923. *Microcerotermes annandalei* Silvestri, *Rec. Indian Museum*, 25(2): 221–232.

Material examined: 4 Soldiers, 8 Workers (ZSI/4910/H11), India: West Bengal: Jalpaiguri: Lataguri (26.73675°N, 88.77123°E), 31.v.2019, Extracted from: Epigeal carton nest; 5 Imagoes, 4 Soldiers, 5 Workers (ZSI/4911/H11), India: West Bengal: Jalpaiguri: Lataguri (26.73675°N, 88.77123°E), 31.v.2019, Extracted from: Epigeal carton nest.

Diagnosis: Soldier (Table 1 and Figure 1A): Head yellow to brown, antennae 13 segmented; uniformly yellowish; segment three shortest, mandibles dark reddish, short and stout with coarse serration in each. Labrum subsquarish; yellowish in colour. Body creamy white. Fontanelle very

* Author for correspondence

Table 1. Measurements of soldier castes of the three species

Attributes	<i>M. annandalei</i> (in mm)	<i>M. fletcheri</i> (in mm)	<i>M. pakistanicus</i> (in mm)
Head length	1.57–1.90	1.37–1.68	1.44–1.64
Head width	0.91–1.09	0.85–0.98	0.83–0.98
Mandible length	0.90–1.18	0.87–0.92	0.76–0.89
Postmentum length	0.92–1.19	0.77–1.05	0.83–1.00
Postmentum width	0.32–0.33	0.30–0.32	0.30–0.35
Postmentum waist	0.17–0.27	0.17–0.20	0.18–0.20
Pronotum length	0.30–0.41	0.27–0.32	0.25–0.35
Pronotum width	0.55–0.73	0.55–0.60	0.53–0.60
Mandibular index (left mandible length/head length)	0.51–0.60	0.53–0.67	0.46–0.56
Head width index (head width/head length to base of mandible)	0.56–0.60	0.54–0.64	0.50–0.56

small; situated at about anterior third of head. Postmentum club-shaped with slender and elongated waist. Pronotum saddle-shaped; anterior margin with distinct deep notch; posterior margin substraight.

Worker (Table 2): Head capsule pale yellow. Fontanelle indistinct. Antennae 13 segmented; third segment shortest. Postclypeus swollen. Pronotum saddle-shaped; median deep notch in anterior portion; posterior margin weakly emerginate. Body creamy yellow.

Imago (Table 3): Head capsule, abdominal tergites castaneous brown. Postclypeus pale yellow. Legs and abdominal tergites yellowish. Head and body densely hairy. Epicranial suture distinct. Fontanelle at middle. Eyes subcircular. Ocelli oval. Antennae 14 segmented; segment three shortest. Postclypeus gently swollen. Pronotum trapezoid like.

Table 2. Measurements of worker castes of the three species

Attributes	<i>M. annandalei</i> (in mm)	<i>M. fletcheri</i> (in mm)	<i>M. pakistanicus</i> (in mm)
Head Length	0.97–1.05	0.90	0.83–0.89
Head Width	0.91–0.97	0.90	0.89
Pronotum Length	0.17–0.27	0.17–0.30	0.19
Pronotum Width	0.50–0.57	0.47–0.55	0.50

Table 3. Measurements of imago castes of three species

Attributes	<i>M. annandalei</i> (in mm)	<i>M. fletcheri</i> (in mm)	<i>M. pakistanicus</i> (in mm)
Head Length	0.77–0.91	0.80–0.83	0.72–0.75
Head Width (with eyes)	0.80–0.98	0.83–0.85	0.83–0.86
Ocelli long diameter	0.07–0.09	0.10–0.13	0.083
Ocelli short diameter	0.05–0.06	0.07–0.08	0.056
Pronotum Length	0.41–0.49	0.40–0.41	0.39
Pronotum Width	0.62–0.72	0.65–0.70	0.64–0.67
Forewing Length	6.0–6.4	-	-
Hindwing Length	5.8–6.0	-	-

Distribution: India: Bihar, Haryana, Nagaland, Odisha, Rajasthan, Tripura (Krishna *et al.* 2013), and West Bengal (present study).

Remarks: It is reported as a minor pest species in India (Shanbhag & Sundararaj, 2013; Krishna *et al.*, 2013).

2. *Microcerotermes fletcheri* Holmgren & Holmgren, 1917

1917. *Microcerotermes fletcheri* Holmgren & Holmgren, *Mem. Dept. Agric. India (Ent.)*, 5(3): 135–171.

Material examined: 2 Soldiers, 10 Workers (ZSI/4890/H11), India, West Bengal, Purulia: Bundwan, Duarsini

(22.76322°N, 86.45829°E), 10.iii.2019, Extracted from: Tree Stump; 3 Soldiers, 11 Workers (ZSI/4891/H11), India, West Bengal, Purulia: Bundwan, Duarsini (22.76322°N, 86.45829°E), 10.iii.2019, Extracted from: Epigeal carton nest.

Diagnosis: Soldier (Table 1 and Figure 1B): Head capsule pale to deep brown. Head moderately hairy; sides substraight. Fontanelle very small and at anterior 1/3rd of head. Antennae 13 segmented; segment 3 smallest. Labrum subpentagonal in shape; medial round projection. Mandibles coarsely serrated; one large serration behind middle point. Postmentum club-shaped. Pronotum saddle shaped, with a deep notch in anterior margin, posterior margin emarginated at middle.

Worker (Table 2): Head capsule subsquarish, pale yellow in colour, Body pale yellow. Fontanelle not distinct. Antennae 13 segmented. Postclypeus hairy, anterior margin straight, posterior margin rounded. Pronotum saddle shaped.

Imago: Head capsule dark brown, antennae, labrum and legs yellow, thorax and abdomen light brownish. Head and body densely hairy. Epicranial suture indistinctly present. Fontanelle small, circular. Ocelli oval. Antennae with 14 segments. Segment 3 shortest. Postclypeus little swollen. Pronotum shape almost trapezoidal (Chhotani, 1997).

Distribution: India: Karnataka, Kerala, Tamil Nadu, Uttar Pradesh (Krishna *et al.*, 2013), West Bengal (present study).

Remarks: This species is of relevance to agriculture, and is reported as a minor pest of coconut, Eucalyptus and teak (Shanbhag & Sundararaj, 2013).

3. *Microcerotermes pakistanicus* Akhtar, 1974

1974. *Microcerotermes pakistanicus* Akhtar, *Biologia* (Lahore), 20(1): 23–61.

Material examined: 4 Soldiers, 10 Workers (ZSI/4750/H11), India: West Bengal: Sagar Island, Phulbani (21.862°N, 88.129°E), 22.iii.2018, Extracted from: Epigeal carton nest; 1 Soldier, 8 Workers (ZSI/4748/H11), India: West Bengal: Sagar Island, Phulbani (21.862°N, 88.129°E), 22.iii.2018, Extracted from: Epigeal carton nest; 1 Soldier, 4 Workers (ZSI/4740/H11), India: West Bengal: Sagar Island, Phulbani (21.862°N, 88.129°E), 22.iii.2018, Extracted from: Epigeal carton nest; 4 Soldiers, 15 Workers (ZSI/4739/H11), India: West Bengal: Sagar Island, Phulbani (21.862°N, 88.129°E), 22.iii.2018, Extracted from: Mud plaster on trunk of live babul tree; 3 Soldiers, 6 Workers (ZSI/4746/H11), India: West Bengal: Sagar Island, Phulbani (21.862°N, 88.129°E), 22.iii.2018, Extracted from: Mud plaster on trunk of live babul tree; 3 Soldiers, 7 Workers (ZSI/4892/H11), India: West Bengal: Purulia, Bundwan, Kaira (22.831°N, 86.577°E), 11.iii.2019, Extracted from: Epigeal carton nest; 3 Soldiers, 11 Workers (ZSI/4893/H11), India: West Bengal: Purba Medinipore, Digha (21.623°N, 87.504°E), 18.iv.2019, Extracted from: Fallen wooden logs on ground; 1 Soldier,

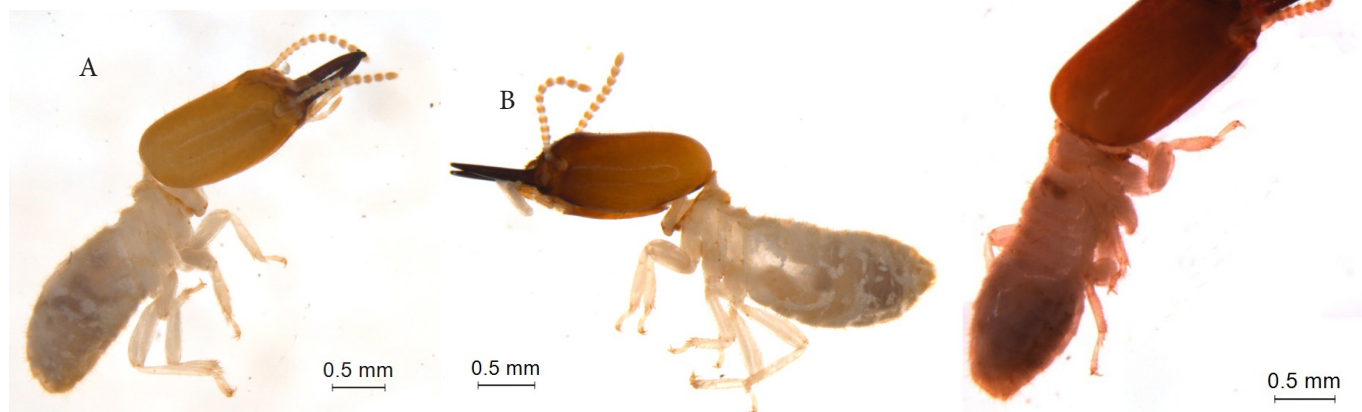


Figure 1. A. *Microcerotermes annandalei* Silvestri (Soldier); B. *Microcerotermes fletcheri* Holmgren & Holmgren (Soldier); and C. *Microcerotermes pakistanicus* Akhtar (Soldier).

4 Workers (ZSI/4987/H11), India: West Bengal: North 24 Parganas, Bira (22.783°N, 88.573°E), 19.xi.2019, Extracted from: basal part of live bamboo tree.

Diagnosis: Soldier (Table 1 and Figure 1C): Head capsule pale to dark brown; elongated; rectangular, moderately hairy. Fontanelle indistinct. Antennae yellow with brown tinge; 13 segmented, segment 2 equal to 3+4; 3 shortest. Labrum distinctly pentagonal; blunt tip. Mandibles coarsely serrated, reddish brown; short; well developed; strongly incurved. Postmentum club-shaped; waist long. Pronotum saddle shaped; anterior margin weakly notched, posterior margin emarginate slightly; sometimes substraight.

Worker (Table 2): Head capsule and pronotum pale yellow. Head subsquarish. Head and body moderately hairy. Fontanelle small, circular, translucent. Postclypeus swollen. Pronotum saddle shaped.

Imago: Head, pronotum postclypeus and abdominal tergites dark brown. Antennae and legs pale brown. Head and body densely hairy. Head subsquarish. Epicranial suture absent. Eyes subcircular. Ocelli oval. Antennae 14 segmented, 3 shortest. Pronotum subtrapezoidal. (Chhotani, 1997).

Distribution: India: Kerala (Krishna *et al.*, 2013) and West Bengal (present study).

Remarks: The species is recorded as a minor pest in India, causing damage to buildings and timbers (Shanbhag &

Sundararaj, 2013; Krishna *et al.*, 2013). In the present study the species was found attacking the trunks of several live babul trees (*Vachellia nilotica*) as well as the basal portions of live bamboo trees (*Bambusa* sp.).

Discussion

Microcerotermes annandalei Silvestri, an oriental endemic species, described for the first time from India is distributed in the north as well as northeast India. It is also known from Southeast Asia. This species could be documented presently in the Teesta Terai Alluvial Agroclimatic Zone of West Bengal. *M. fletcheri* Holmgren & Holmgren, largely reported from the south Indian states, remains endemic to India. Here the species is documented from Red and Laterite Zone. *M. pakistanicus* Akhtar discovered initially from Pakistan, also known from Malaysia, has its distribution in the Palearctics too (Krishna *et al.*, 2013). In India it was earlier reported only from Kerala (Verma, 1985), but the present study reports it from four locales in West Bengal, covering three agroclimatic zones- the Red and Laterite Zone, Coastal Zone and Gangetic Alluvial Zone, indicating a wide distribution.

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References

- Chhotani, O.B. 1980. Termite pests of agriculture in the Indian region and their control, Technical monograph, Publ. Zool. Surv. India, Calcutta, 4: 94 + 7 pls.
- Chhotani, O.B. 1997. *The fauna of India and the adjacent countries, Isoptera (Termites): (family Termitidae)*, Zool. Surv. India, Calcutta, 2: xx + 800.
- Krishna, K., Grimaldi, D.A., Krishna, V and Engel, M.S. 2013. Treatise on the Isoptera of the World, *Bull. Am. Mus. Nat. Hist.*, No. 377: 1-7. <https://doi.org/10.1206/377.6>.
- Maiti, P.K. 1983. Termite fauna (Isoptera) of West Bengal, India, Their recognition, biology and ecology, *Rec. zool. Surv. India, Occ. Paper* No. 42: iv + 152.
- Roisin, Y. and Pasteels, J.M. 2000. The genus *Microcerotermes* (Isoptera: Termitidae) in New Guinea and the Solomon Islands, *Invertebr. Taxon.*, 14(2):137-174. <https://doi.org/10.1071/IT99005>.
- Shanbhag, R. and Sundararaj, R. 2013. Host range, pest status and distribution of wood destroying termites of India, *J. Trop. Asian Entomol.*, 2(1):12-27.
- Verma, S.C. 1985. *Microcerotermes pakistanicus* Akhtar (Termitidae: Termitinae) from Kerala, India with descriptions of hitherto unknown imago and worker caste, *Annal. Entomol.*, 3(1):53-58.