

First report of four species of termites from India

(Blattodea, Isoptera, Termitidae)

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Four termite species belonging to the family Termitidae viz., *Microcerotermes cylindriceps* Wasmann, 1902, *Microcerotermes greeni* Holmgren, 1913 of subfamily Microcerotermitinae, *Odontotermes annulicornis* Xia & Fan, 1982, and *Odontotermes foveafrons* Xia & Fan, 1982 of subfamily Macrotermitinae are reported from India for the first time. Both *M. cylindriceps* and *M. greeni* were collected from West Bengal, while *O. annulicornis* was identified from the collections of Gujarat and Maharashtra. *O. foveafrons* was collected from Maharashtra. Previously, these four species were known only from their respective type-localities. Their documentation in India expands our understanding of termite distribution and highlights the potential for further discoveries in the region.

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Introduction

Termites are widespread eusocial insects and key ecosystem engineers (Jones et al. 1994). They are among the most dominant macroinvertebrates in tropical soils (Bignell & Eggleton 2000). India, rich in termite biodiversity, harbours approximately one-tenth of the world’s termite species. Baraik et al. (in press) reported 321 species belonging to 8 families and 53 genera in India, while the global species accounts to 3106 species of living and fossil termites classified into 12 families and 330 genera (Krishna et al. 2013). The present work reports four species belonging to family Termitidae as new records to India, namely, *Microcerotermes cylindriceps* Wasmann, 1902, *Microcerotermes greeni* Holmgren, 1913, *Odontotermes annulicornis* Xia & Fan, 1982 and *Odontotermes foveafrons* Xia & Fan, 1982. These species belong to two

subfamilies, genus *Microcerotermes* Silvestri, 1901 belongs to Microcerotermitinae and *Odontotermes* Holmgren, 1910 belongs to Macrotermitinae.

Comprising 34 genera and 229 species (Baraik et al. in press), the family Termitidae is the largest both globally and in India. The family includes a large number of wood-destroying termite species. Within this family, *Odontotermes* forms the largest genus comprising both major and minor wood-destroying pests, followed by *Microcerotermes*, which has so far been reported only as a minor pest (Shanbhag & Sundararaj 2013, Ranjith et al. 2025). Diagnostic characteristics of all the four newly recorded species are provided. Additionally, for *M. greeni* a few new diagnostic measurements, mandible length, head-width to head-length index and mandible-length to head-length ratio are presented which were not part of the original species description by Chhotani (1997).

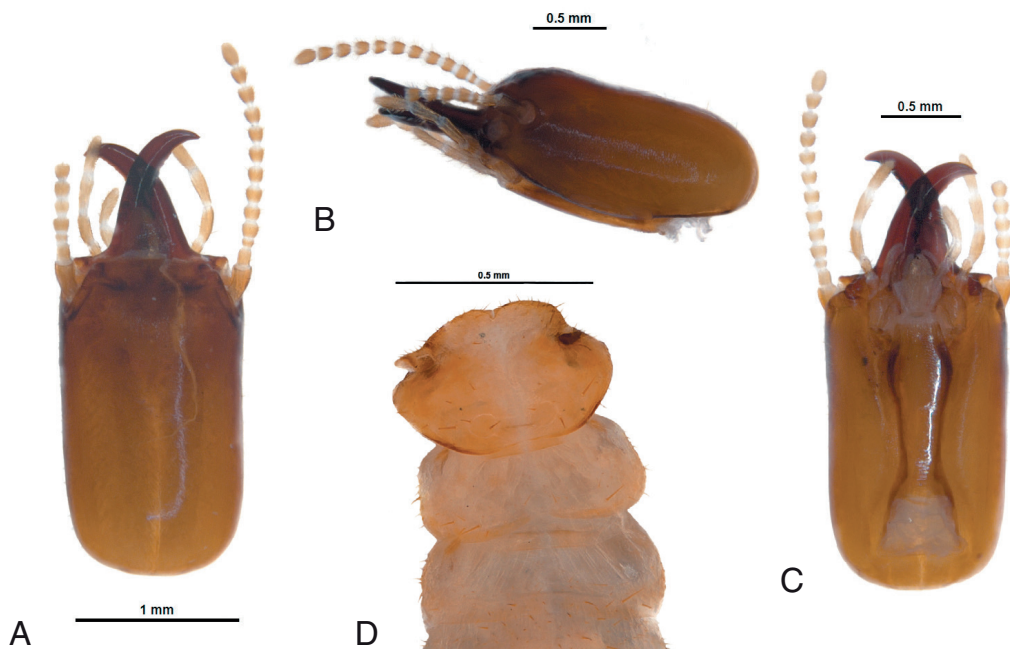


Fig. 1. *Microceroterme cylindriceps* Wasmann, 1902: **A.** Head dorsal. **B.** Head lateral. **C.** Head ventral. **D.** Pronotum.

Material and methods

Samples of *Microceroterme* and *Odontoterme* were collected during recent faunistic explorations in West Bengal and Gujarat, while *O. foveafrons* was sorted from the National Zoological Collection (NZC) of the Zoological Survey of India (ZSI), Kolkata. *O. annulicornis* was identified in both the NZC and recent collections. The study follows the revised termite classification (Hellemans et al. 2024). Species identification follows Chhotani (1997) and Xia & Fan (1982).

All specimens were preserved in absolute alcohol. Measurements were taken under a Leica EZ4 microscope with specimens kept in absolute alcohol. Images were captured using a Leica M205A stereo microscope fitted with a Leica DFC500 camera and processed using the extended focus software LAS Version 3.6. All voucher specimens are deposited in the NZC, ZSI, Kolkata.

Results

Microceroterme cylindriceps Wasmann, 1902

Material examined. 1 vial containing 1 S (soldier) and 8 W (workers), from Acacia Plantation and agriculture land Pingboni, dist. Paschim Medinipur, West Bengal, 04.04.2024, B. Baraik and party, extracted from dead bamboo pole.

Diagnostic characters (Table 1, Fig. 1). Head sparsely and body densely hairy. Head capsule yellow to yellowish brown, darker anteriorly; antennal segments are yellow; labrum yellowish brown and mandibles are blackish. Head capsule narrowly sub-rectangular, sides sub straight and parallel; head width half or slightly more than half of head length. Antennae 13 segmented, segment 3 shortest. Post-clypeus sub-semicircular, clearly demarcated from frons. Labrum broad, tongue-shaped. Mandibles short, thick, stout and finely serrated. Postmentum club-shaped; waist below middle and about 2/3 of maximum width. Pronotum saddle-shaped, weakly notched anteriorly and sub-straight posteriorly.

Distribution. India: West Bengal (new record). Type-locality: Pankulam, Sri Lanka (Krishna et al. 2013).

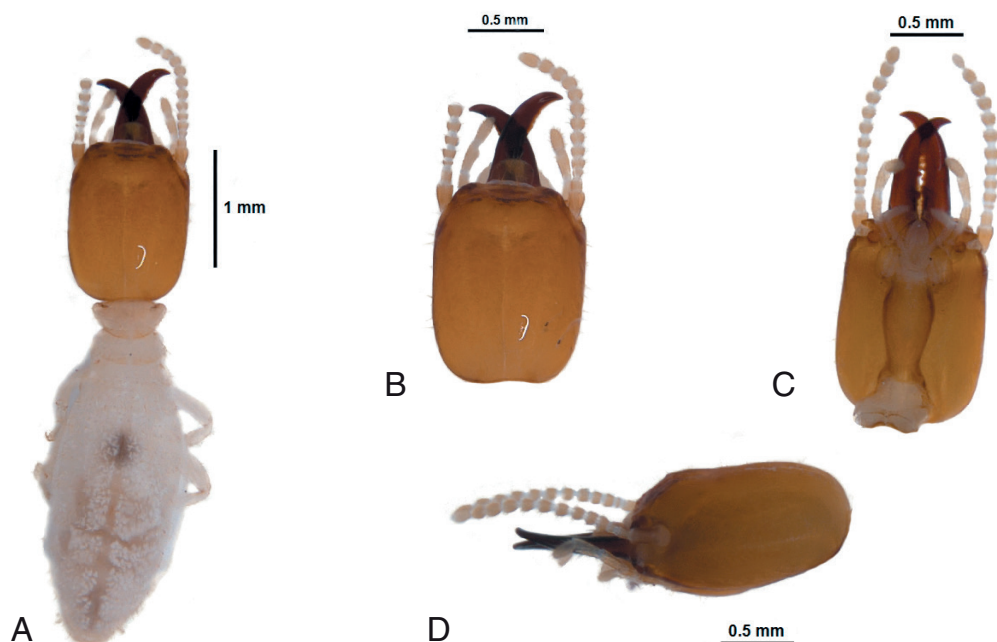


Fig. 2. *Microcerotermes greeni* Holmgren, 1913: **A.** Whole body. **B.** Head dorsal. **C.** Head ventral. **D.** Head lateral.

Remarks. The species was reported earlier from the type-locality only. Its pest status remains unknown. In the present study the species was found feeding on a bamboo pole.

Microcerotermes greeni Holmgren, 1913

Material examined. 1 vial containing 5 S and 13 W from Acacia Plantation Kumari Kanan, dist. Purulia, West Bengal, 01.04.2024, B. Baraik and party, extracted from Palash tree stump; 1 vial containing 2 S and 16 W from Sal Forest Plantation, Lalgah, dist. Jhargram, West Bengal, 05.04.2024, B. Baraik and party, extracted from carton nest.

Diagnostic characters (Table 1, Fig. 2). Body whitish to straw yellow. Head yellowish brown, sparsely hairy, head elongated, sub-rectangular with distinct transverse suture and minute fontanelle. Antennae 13 segmented, segment 2 equal to 3+4, segment 3 shortest. Labrum roundly pentagonal. Mandibles short, coarsely serrated, incurved apically. Pronotum saddle-shaped.

Distribution. India: West Bengal (new record). Type-locality: Ambalangoda, Sri Lanka (Krishna et al. 2013).

Remarks. It is reported as secondary pest of tea (Hemachandra et al. 2012). In the present study it was found feeding on stumps of Palash tree.

Table 1. Measurements (mm) of soldiers of *Microcerotermes cylindriceps* Wasmann, 1902 and *M. greeni* Holmgren, 1911.

Characters	<i>Microcerotermes cylindriceps</i> Wasmann, 1902	<i>Microcerotermes greeni</i> Holmgren, 1913
Head-length with mandible	2.35–2.58	1.75–1.91
Head-length without mandible	1.60–1.80	1.27–1.41
Head-width maximum	0.85–0.90	0.81–0.84
Mandible-length	0.75–0.78	0.48–0.50
Head-width / head-length index	0.50–0.53	0.59–0.63
Mandible-length / head-length	0.43–0.48	0.30–0.37

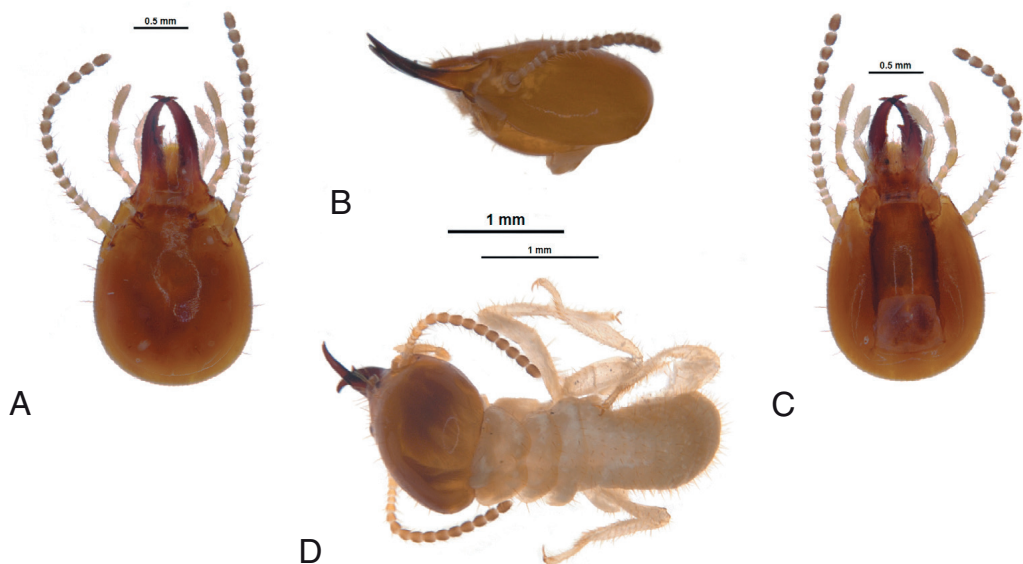


Fig. 3. *Odontotermes annulicornis* Xia & Fan, 1982: **A.** Head dorsal. **B.** Head lateral. **C.** Head ventral. **D.** Whole body.

***Odontotermes annulicornis* Xia & Fan, 1982**

Material examined. 1 vial containing 2 S and 17 W from 15 km North East of Sangala-Mangalwedha Road, dist. Solapur, Maharashtra, 02.09.1983, A. S. Mahabal and party; 1 vial containing 2 S and 5 W from Mandvi, dist. Kachchh, Gujarat, 30.10.2024, Dilip Mondal, extracted from dead log; 1 vial containing 4 S and 3 W from Naranpur Ravli, dist. Kachchh, Gujarat, 30.10.2024, Dilip Mondal, extracted from under dung; 1 vial containing 6 S and 5 W from Nani Khakhar NH41, dist. Kachchh, Gujarat, 31.10.2024, Dilip Mondal, extracted from dead log.

Diagnostic characters (Table 2, Fig. 3). Head nearly pear-shaped, maximum width of head is at the posterior end. Antennae 16 segmented, 4th segment smallest. Anterior part of teeth of mandibles quite slender. Lateral margin of postmentum convex, with maximum width in the middle.

Distribution. India: Gujarat, Maharashtra (new record). Type-locality: Jinghong, Yunnan, China (Krishna et al. 2013).

Remarks. The species was reported from the type-locality only. The pest status of the species is unknown.

Table 2. Measurements (mm) of soldiers of *Odontotermes annulicornis* Xia & Fan, 1982 and *O. foveafrons* Xia & Fan, 1982.

Characters	<i>Odontotermes annulicornis</i> Xia & Fan, 1982	<i>Odontotermes foveafrons</i> Xia & Fan, 1982
Antennal segment	16	16
Head-length to lateral base of mandible	1.25–1.50	1.19–1.47
Head-width maximum	1.08–1.28	1.03–1.23
Head-width at base of mandible	0.59–0.72	0.61–0.77
Mandible-length	0.78–0.93	0.72–0.88
Tooth-distance	0.22–0.28	0.19–0.25
Tooth index (tooth distance / mandible length)	0.26–0.30	0.25–0.29
Head-width / head-length index	0.82–0.89	0.81–0.88
Mandible-length / head-length	0.62	0.59–0.60

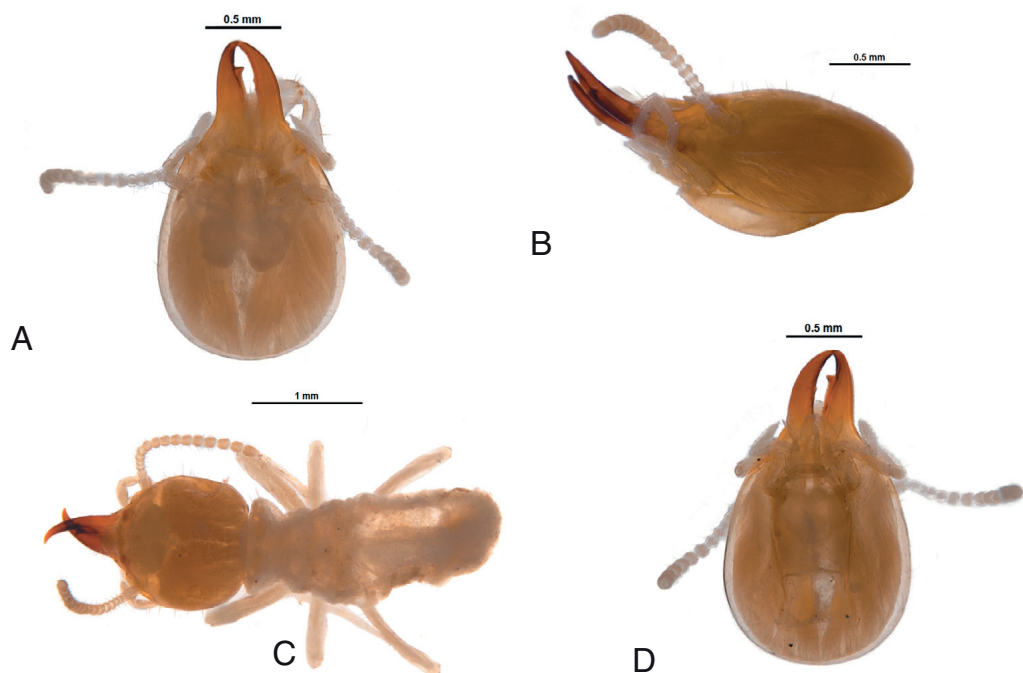


Fig. 4. *Odontotermes foveafrons* Xia & Fan, 1982: A. Head dorsal. B. Head lateral. C. Whole body. D. Head ventral.

Odontotermes foveafrons Xia & Fan, 1982

Material examined. 1 vial containing 3 S and 20 W from Chakhan, dist. Pune, Maharashtra, 03.07.1976, K. Reddiah and party, extracted from dead log.

Diagnostic characters (Table 2, Fig. 4). Head is rectangularly oval, maximum width of head is in the middle. Antennae is 16 segmented, 4th segment smallest. Mandibles are somewhat stout and tips are incurved. Lateral margin of postmentum convex with maximum width is at the posterior.

Distribution. India: Maharashtra (new record). Type-locality: Yangwu, Yunnan, China (Krishna et al. 2013).

Remarks. The species was reported from the type-locality only. The pest status remains unknown.

Discussion

According to Krishna et al. (2013), the genus *Microcerotermes* comprises 148 species worldwide, while 200 species of *Odontotermes* are currently known. In India, 26 species of *Microcerotermes* have been

reported (Baraik et al. in press). Within the Indian region, *Microcerotermes* species are recorded to be new to different states of India in recent past (Amina et al. 2016, Sengupta & Rajmohana 2020). They are taxonomically categorized into two groups based on mandibular morphology of the soldier caste: a) species with finely serrated mandibles and b) species with coarsely serrated mandibles (Chhotani 1997).

Among the newly recorded species, *M. cylindriceps* belongs to the species group characterized by finely serrated mandibles, distinguished by its long, narrow head, compared to short mandibles. Its mandible length is half of its head-length (Fig. 1). In contrast, *M. greeni* falls under species group b (coarsely serrated mandibles), characterized by tooth-like large serrations on its mandible and is approximately one fourth of its head-length (Fig. 2). These species are morphometrically distinct from all previously known *Microcerotermes* species in India. *M. greeni* is obviously closely related to *M. beelsoni* but differs in key morphological features, particularly mandible length. While both species have apically incurved mandibles, the mandibles of *M. greeni* (0.48–0.50 mm) are significantly shorter than those of *M. beelsoni* (0.75–0.92 mm). Similarly, *M. cylindriceps* is closely related to *M. crassus* but differs in head

shape and mandible length. The head of *M. cylindriceps* is narrowly sub-rectangular, whereas *M. crassus* has a broader sub-rectangular head. Additionally, the mandible length of *M. cylindriceps* is less than half of its head-length, whereas in *M. crassus*, it exceeds two-thirds of the head-length.

The genus *Odontotermes* is restricted to the Ethiopian and Oriental zoogeographical regions and is considered the most diverse and widely distributed termite genus (Chhotani 1997). In India, 43 species of *Odontotermes* have been documented (Chhotani 1997, Baraik et al. in press). However, species identification within this genus remains challenging due to subtle morphological variations between species, and many species are described solely from type specimens (Chhotani 1997). This study adds two more species, namely *O. annulicornis* and *O. foveafrons*, to the Indian fauna. Previously, both species were known only from their type-localities in China, with *O. annulicornis* reported from Yunnan (Jinghong: Daimenglong) and *O. foveafrons* from Yunnan (Yangwu) (Xia & Fan 1982). These species can be distinguished from all previously known *Odontotermes* species in India based on morphometric measurements. They are closely related to *O. obesus* but differ in head shape, postmentum structure, mandible morphology and tooth index.

O. foveafrons has a rectangularly-oval head, with its maximum width at the centre. Its mandibles are stout with incurved tips, and the postmentum has a convex lateral margin, widest at the posterior end. The key diagnostic character of *O. foveafrons* is swollen fore-tibia and length of hind-tibia shorter than head-width (Xia & Fan 1982). *O. annulicornis* has a pear-shaped head, with its maximum width at the posterior end. Its mandibles are slender anteriorly, and the postmentum is convex, with the widest point at its centre. In *O. annulicornis* the fore-tibia is not swollen whereas the length of hind-tibia is longer than the head width (Xia & Fan 1982). *O. obesus*, in contrast, has an oval head that weakly converges anteriorly. Its mandibles are long, slender, and sabre-shaped, with a sharp, prominent tooth on the left mandible (Chhotani 1997). The postmentum is sub-rectangular, and its tooth index differs from that of *O. annulicornis* and *O. foveafrons*.

As more and more species become documented, our understanding of termite diversity, distribution, and endemism is evolving. The addition of these four species underscores the potential for further discoveries of termite species in India. In the past decade, 16 new species are described from India by various authors (Amina & Rajmohana 2016, Amina et al. 2019, Ipe & Mathew 2019, Amina et al. 2020, Basak et al. 2020, Ipe et al. 2020, Amina et al. 2022,

Ranjith & Kalleshwaraswamy 2022a,b, Sengupta et al. 2022b, Das & Choudhury 2023, Joseph et al. 2023b, 2024). These species belong to 3 families, 5 subfamilies and 13 genera, a few being *Ceylonitermes nivedita* Basak, Rituparna & Rajmohana, 2020, *Rinacapritermes abundans* Amina & Rajmohana, 2022, *Amitermes kavattiensis* Rituparna & Rajmohana, 2022, *Neotermes viraktamathi* Ranjith & Kalleshwaraswamy, 2022 and *Prorhinotermes cotym* Joseph, Amina & Mathew, 2023. In addition, 12 species were reported as new records from India by Amina et al. 2020, Joseph et al. 2022, Sengupta et al. 2022a, Basak et al. 2022, Ranjith et al. 2022c, Das et al. 2023 and Bhanupriya et al. 2022, some of them being *Pericapritermes ceylonicus* (Holmgren, 1911), *Pericapritermes semarangi* (Holmgren, 1913), *Odontotermes hainanensis* (Light, 1924), *Dicuspitermes hutsoni* (Kemner, 1926), *Ahmaditermes pyricephalus* Akhtar, 1975. Taxonomic exploration of termites across various states of India highlights their significant ecological versatility and indicates a trend of range expansion into diverse habitats. As a considerable number of species exhibit range extension, data from the past three years documenting new record of termites from different states of India are presented here. Bhanupriya & Gupta (2022) and Kumar et al. (2023) documented 14 species from Haryana, Rajmohana K. (2024a,b) reported 11 species of termite from Amrabad and Kawal Tiger reserve, Telangana. Anushya & Swaran (2024) listed 3 species from Kerala, Ranjith et al. (2025) reported 4 species from Andhra Pradesh, and Buragohain et al. (2025) added one more species of *Odontotermes* to the already known 35 species. This systematic inventory of termite species gives essential insights into the variety and distribution of termites across different environmental niches. The addition of these four species underscores the potential for further discoveries of termite species in India.

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