

New state records and distributional range extensions of termite species in India

M. Roy, J. Basak, B. Baraik and K. Rajmohana*

Zoological Survey of India, M Block, New Alipore, Kolkata 700053, West Bengal, India.

Email: madhumitamoe@gmail.com; jayatizsi.jb@gmail.com; bbaraik.zsi@gmail.com;

mohana.skumar@gmail.com

ABSTRACT: The present study documents new distributional records of thirteen termite species from four Indian states. Taxonomic studies revealed five species as new addition to the termite fauna of both Arunachal Pradesh and Odisha, while two species are added to the termite fauna of Tamil Nadu and one species to West Bengal. The Indian endemic genus *Ampoulitermes* Mathur and Thapa, 1962 and genus *Pericapritermes* Silvestri, 1914 are reported for the first time from Tamil Nadu and Odisha respectively. These findings not only contribute to the understanding of termite diversity in India but also highlight the significance of continued taxonomic surveys in underexplored regions.

© 2025 Association for Advancement of Entomology

KEY WORDS: Diversity, first report, *Ampoulitermes*, *Pericapritermes*, Indian states

INTRODUCTION

Termites (Order Blattodea) constitute one of the most fascinating groups of social insects due to their ubiquitous distribution in the tropics, superb architectural ability, cryptobiotic nature of life and enormous economic importance. They are ecosystem engineers (Jones *et al.* 1994) and are among the most dominant macroinvertebrates (Bignell and Eggleton, 2000), arthropod decomposers in tropical soils as well as they also play a central role in nutrient fluxes. Their nesting activities promote soil aeration, improve the absorption and storage of water in the soil, and facilitate carbon flux (Sileshi *et al.*, 2010). As per the revised classification by Hellemans *et al.* 2024, worldwide there are more than 3000 species of living and fossil termites classified into 13 families and 330 genera. However, only 321 species are

known from India classified under 53 genera and 8 families (Baraik *et al.*, in press). The family Termitidae is the most dominant among termites worldwide. About 70 per cent of termite species belongs to single family Termitidae, comprising 238 genera. In India, Termitidae is represented by 208 species across 35 genera, classified under seven subfamilies, also accounting for 71 per cent of the country's termite diversity (Baraik *et al.*, in press). Among the Indian states, Kerala harbors the highest termite diversity with 94 recorded species (Abhirami and Prasad, 2024), followed by Karnataka (76 species), Tamil Nadu (64 species), and West Bengal (62 species) (Baraik *et al.*, in press). The present study reports the first state records of thirteen termite species, documenting their newly observed distributions in the Indian states of Arunachal Pradesh, Odisha, Tamil Nadu, and West Bengal.

* Author for correspondence

MATERIALS AND METHODS

The present study is based on termite specimens preserved in the National Zoological Collection, Isoptera Section, Zoological Survey of India (ZSI), Kolkata. The examined material comprises specimens collected during various faunal surveys conducted between 1971–1973, 1989, 2014, and 2019–2024 across different states of India by ZSI team, including the authors of this paper. Several specimens within these collections had remained unidentified, and this study was undertaken to examine, identify, and document these previously unidentified materials, along with freshly collected specimens.

Measurements of attributes of termite specimens were made 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. Species identification and description follow Roonwal and Chhotani (1989) and Chhotani (1997). All the specimens are deposited in Zoological Survey of India, Kolkata.

RESULTS AND DISCUSSION

A total of 13 termite species representing nine genera were documented in the present study as detailed in the systematic account. Of these, twelve species belong to the family Termitidae, distributed across four subfamilies: Macrotermitinae, Microcerotermitinae, Mirocapritermitinae, and Nasutitermitinae. The family Heterotermitidae is represented only by a single species. All thirteen species are detailed in the systematic account and represent new distributional records for the states of Arunachal Pradesh, Odisha, Tamil Nadu and West Bengal.

Systematic Account

Family 1: Heterotermitidae Froggatt, 1897;

Genus *Heterotermes* Froggatt, 1897

1. *Heterotermes indicola* (Wasmann, 1902) (Fig. 1)

Leucotermes indicola Wasmann, 1902: Zool. Jb.

(Syst.), 17(1): 118–119. S, W. Lectotype: S (designated O.B.Chhotani), in Nat. Hist. Mus., Maastricht.

Material examined: Odisha, Sundargarh, 25 Km SE of Panposh Railway station, 10.xii.1971, 3 soldiers and 6 workers, Coll: P.K. Maiti.

Distribution: Afghanistan, Bangladesh, Iran, Nepal, Pakistan (Krishna *et al.*, 2013), India: Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Maharashtra, Punjab, Rajasthan, Uttar Pradesh (Krishna *et al.*, 2013), Odisha (New Record).

Family 2: Termitidae Latreille, 1802;

Subfamily Macrotermitinae Kemner, 1934;

Genus *Macrotermes* Holmgren, 1909

2. *Macrotermes gilvus* (Hagen, 1858) (Fig. 2)

Termes gilvus Hagen, 1858: Linn. Ent., 12: 148–151, Pl. 3 (Fig. 14). Im., Q, S maj., S min. Syntypes: In Coll. Selys Longchamps, Brussels, Mus. Vienna, Mus. Berlin.

Material examined: Arunachal Pradesh, Upper Siang, Jengging and around, 26.ii.2024, 1 soldier and 7 workers, Coll: Dilip Mondal; Arunachal Pradesh, Dibang Valley, Etalin, in and around Inspection bungalow, 26.ii.2024, 1 soldier and 10 workers, Coll: Rahul Mondal.

Distribution: Bangladesh, Indonesia (Krishna *et al.*, 2013), India: Assam, Meghalaya, Tripura (Krishna *et al.*, 2013) and Arunachal Pradesh (New Record).

Genus *Microtermes* Wasmann, 1902

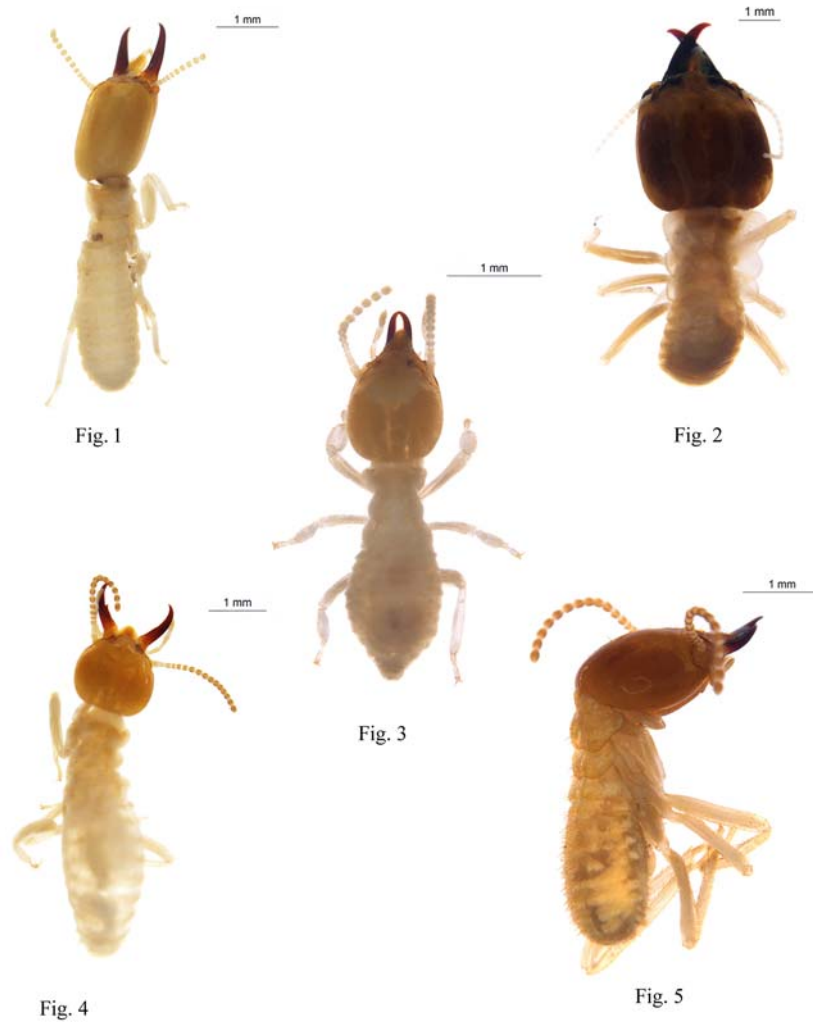
3. *Microtermes incertoides* Holmgren, 1913 (Fig. 3)

Microtermes incertoides Holmgren, 1913: J. Bombay nat. Hist. Soc., 22 (1): 113–114. S and W.

Material examined: Arunachal Pradesh, East Kameng, Upper Dekoria, Seijusa, 29.x.2014, 4 soldiers and 10 workers, Coll: N. Shah.

Distribution: India: Andhra Pradesh, Daman,

PLATE- I

Fig. 1 *Heterotermes indicola* (Wasmann, 1902)Fig. 2 *Macrotermes gilvus* (Hagen, 1858)Fig. 3 *Microtermes incertoides* Holmgren, 1913Fig. 4 *Odontotermes gurdaspurensis* Holmgren and Holmgren, 1917Fig. 5 *Odontotermes kapuri* Roonwal and Chhotani, 1962

Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh (Krishna *et al.* 2013) and Arunachal Pradesh (New Record).

Genus *Odontotermes* Holmgren, 1910

4. *Odontotermes gurdaspurensis* Holmgren and Holmgren, 1917 (Fig. 4)

Odontotermes gurdaspurensis Holmgren and Holmgren, 1917, Mem. Dept. agric. Sci., 5: 149-150.

Material examined: Odisha, Sambhalpur, Sonapali village, 23.xii.1971, 6 soldiers and 7 workers, Coll: P.K. Maiti; Odisha, Rampur forest, 26.xii.1971, 8 soldiers and 40 workers, Coll: P.K. Maiti; Odisha, Hathisilpara, 1km west of forest quarters, 30.xii.1971, 1 soldier and 15 workers, Coll: P.K. Maiti; Odisha, Sundargarh, Sabulia Khasra forest, 01.v.1973, 2 soldiers and 50 workers, Coll: P.K. Maiti.

Distribution: Pakistan (Krishna *et al.*, 2013),

India: Gujarat, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Maharashtra, Punjab, Haryana, Rajasthan, Uttarakhand, Uttar Pradesh, West Bengal (Krishna *et al.*, 2013) and Odisha (New Record).

5. *Odontotermes kapuri* Roonwal and Chhotani, 1962 (Fig. 5)

Odontotermes kapuri Roonwal and Chhotani, 1962: Proc. Natn. Inst. Sci. India, (B) 28 (4): 296, 352-356. S and W.

Material examined: Arunachal Pradesh, Dibang Valley, Etalin village, 27.ii.2024, 2 soldiers, Coll: Ravi Kushwaha.

Distribution: Bhutan (Krishna *et al.*, 2013), India: Manipur, Meghalaya, Tripura (Krishna *et al.*, 2013) and Arunachal Pradesh (New Record).

6. *Odontotermes vaishno* Bose, 1975 (Fig. 6)

Odontotermes vaishno Bose, 1975: Oriental Insects, 9 (2): 161-164. S and W.

Material examined: West Bengal, Jhargram, Binpur, Lalgargh Forest, 05.iv.2024, 2 soldiers and 1 worker, Coll: B. Baraik.

Distribution: India: Andhra Pradesh (Ranjith *et al.*, 2025), Haryana (Kumar *et al.*, 2023), Karnataka, Kerala (Krishna *et al.*, 2013) and West Bengal (New Record).

Subfamily Microcerotermitinae Holmgren, 1910

Genus *Microcerotermes* Silvestri, 1901

7. *Microcerotermes cameroni* Snyder, 1934 (Fig. 7)

Microcerotermes cameroni Snyder, 1934: Indian For. Rec., 20 (11): 21-22. Im and S. Holotype. Im in BM.

Material examined: Odisha, Sundargarh, Champajharan forest, 10.xii.1971, 5 soldiers and 25 workers, Coll: P.K. Maiti; Odisha, Sundargarh, 10.xii.1971, 5 soldiers and 30 workers, Coll: P.K. Maiti; Odisha, Kaira village, 15.xii.1971, 3 soldiers and 12 workers, Coll: P.K. Maiti; Odisha, Bolangir,

12 kms south west of Bolangir, 31.xii.1971, Coll: P.K. Maiti; Odisha, Sundargarh, Balijun village, 11.i.1972, 2 soldiers and 40 workers, Coll: P.K. Maiti

Distribution: India: Andhra Pradesh, Daman, Gujarat, Karnataka, Kerala, Madhya Pradesh, Sikkim, Tamil Nadu, West Bengal (Krishna *et al.*, 2013) and Odisha (New Record).

8. *Microcerotermes fletcheri* Holmgren and Holmgren, 1917 (Fig. 8)

Microcerotermes fletcheri Holmgren and Holmgren, 1917: Mem. Dep. Agric. India (Ent.), 5 (2): 170-171. S and W.

Material examined: Odisha, Balukh and Konark Wildlife sanctuary, 20.ix.2023, 6 soldiers and 14 workers, Coll: Tamal Mandal.

Distribution: India: Karnataka, Kerala, Tamil Nadu, Uttar Pradesh (Krishna *et al.*, 2013) and Odisha (New Record).

Subfamily Mirocapritermitinae Kemner, 1934 Genus *Pericapritermes* Silvestri, 1934

9. *Pericapritermes butenzorgi* (Holmgren, 1914) (Fig. 9)

Capritermes (*Capritermes*) *buitenzorgi* Holmgren, 1914: Zool. jb. (Syst.) 36 (2-3): 280 S. and W.

Material examined: Arunachal Pradesh, East Kameng, Rhino Camp, Seijusa, 30.x.2014, 2 soldiers and 8 workers, Coll: N. Shah.

Distribution: Indonesia, Malaysia (Krishna *et al.*, 2013), India: Andaman Islands (Maiti and Chakraborty, 1994; Krishna *et al.*, 2013) and Arunachal Pradesh (New Record).

10. *Pericapritermes tetraphilus* (Silvestri, 1922) (Fig. 10)

Capritermes (*Pericapritermes*) *tetraphilus* Silvestri, 1922: Rec. Indian Mus., 24 (4): 543-545.

Material examined: Odisha, Balukh and Konark Wildlife sanctuary, 20.ix.2023, 1 soldier Coll: Tamal Mandal.

PLATE- II

Fig. 6 *Odontotermes vaishno* Bose, 1975Fig. 7 *Microcerotermes cameroni* Snyder, 1934Fig. 8 *Microcerotermes fletcheri* Holmgren and Holmgren, 1917Fig. 9 *Pericapritermes buitenzorgi* (Holmgren, 1914)

Distribution: Bangladesh, Burma, China (Krishna *et al.*, 2013), India: Assam, Madhya Pradesh, Manipur, Sikkim, West Bengal (Krishna *et al.*, 2013) and Odisha (New Record).

Subfamily Nasutitermitinae Hare, 1937

Genus *Ampoulitermes* Mathur and Thapa, 1962

11. *Ampoulitermes wynaadensis* Mathur and Thapa, 1962 (Fig. 11)

Ampoulitermes wynaadensis Mathur and Thapa,

1962: Indian Forester, 88: 50-52. S and W.

Material examined: Tamil Nadu, Fern hill wild life sanctuary, 25.viii.2019, 3 soldiers and 6 workers, Coll: Dinesh, K; Tamil Nadu, Courtallam forest, 26.viii.2019, 2 soldiers and 5 workers, Coll: Dinesh, K. P.

Distribution: India: Kerala (Krishna *et al.*, 2013) and Tamil Nadu (New Record).

Genus *Hospitalitermes* Holmgren, 1912

12. *Hospitalitermes jepsoni* (Snyder, 1934) (Fig. 12)

PLATE- III



Fig. 10



Fig. 11



Fig. 12



Fig. 13

Fig. 10 *Pericapritermes tetraphilus* (Silvestri, 1922)

Fig. 11 *Ampoulitermes wynaadensis* Mathur and Thapa, 1962

Fig. 12 *Hospitalitermes jepsoni* (Snyder, 1934)

Fig. 13 *Nasutitermes emersoni* Snyder, 1934

Nasutitermes (*Hospitalitermes*) *jepsoni* Snyder, 1934: Indian For. Rec., 20 (11): 16.

Material examined: Tamil Nadu, Chinnar, 14.iii.2020, 4 soldiers and 4 workers, Coll: Dinesh, K.P.

Distribution: India: Assam (Krishna *et al.*, 2013) and Tamil Nadu (New Record).

Genus: *Nasutitermes* Dudley, 1890

13. *Nasutitermes emersoni* Snyder, 1934 (Fig. 13)

Nasutitermes emersoni Snyder, 1934: Indian For. Rec., 20 (11): 11-12.

Material examined: Arunachal Pradesh, Upper Siang, Jengging and around, 26.ii.2024, 4 soldiers and 4 workers, Coll: Dilip Mondal; Arunachal Pradesh, West Siang, Nyork village, 19.iii.2024, 6 soldiers and 3 workers, Coll: Dilip Mondal.

Distribution: Bangladesh (Krishna *et al.*, 2013), India: Bihar, Sikkim, Tripura (Krishna *et al.*, 2013) and Arunachal Pradesh (New Record).

The present study adds five termite species each to the known fauna of Arunachal Pradesh and Odisha, two species to Tamil Nadu, and one species to West Bengal. Among the four states, Tamil Nadu possesses the richest termite fauna, with 64 species

belonging to 27 genera, followed by West Bengal with 62 species across 25 genera, Arunachal Pradesh with 37 species in 17 genera, and Odisha with 30 species in 15 genera. Beyond representing the actual diversity, these numbers may largely reflect the extent of taxonomic exploration, as certain regions have been studied more extensively than others over time. For instance, despite Odisha's diverse physiographic features—ranging from luxuriant, dense forests to dry deciduous forests occurring in parts of the Chota Nagpur Plateau—the recorded termite fauna appears to be underrepresented.

Heterotermes indicola, a species with broad ecological tolerance, inhabits a wide range of habitats including arid and semi-arid zones, forested regions, and agricultural landscapes. Although widely distributed across India, the record from Odisha marks its first documentation from eastern India. Historically, this species was responsible for the complete destruction of the township of Shri Hargovindapur in Gurdaspur, Punjab, reducing it to a bombed-out ghost town (Roonwal, 1955). It is known from both the Oriental and Palearctic regions (Krishna, 2013). In the present study, *H. indicola* and *Odontotermes gurdaspurensis* Holmgren and Holmgren, 1917 are reported for the first time from the Eastern Ghats region of Odisha (Basak *et al.*, 2025).

The genus *Ampoulitermes*, which is endemic to India and previously known only from Kerala, is represented by two species, *A. wayanadensis* and *A. zacharia*, both restricted to the Western Ghats of Kerala. The present study reports *A. wayanadensis* from the Western Ghat region of Tamil Nadu, indicating a range extension. However, the species remains endemic to the Western Ghats as a whole. The open foraging species, *Hospitalitermes jepsoni* which was previously known only from the tropical forests of Assam, now documented from the Western Ghats of Tamil Nadu, indicating its extremely wide distributional range; evidence of its occurrence in intervening areas are yet to be discovered. The Indian endemic species *Microcerotermes cameroni*, is hereby reported from the Eastern Ghats region of

Odisha, for the first time. Another endemic species, *M. fletcheri*, is recorded from Konark Balukhand Wildlife Sanctuary, an area characterized by saline and sandy soils due to its coastal location along the Bay of Bengal. The soil dwelling species, *Pericapritermes butenzorgi* (Holmgren, 1914), previously known in India only from Andaman Islands (Maiti and Chakraborti, 1994), is now recorded for the first time from the mainland. Species like *O. vaishno* have wide distribution, exhibiting broad ecological tolerance. They occupy diverse habitats ranging from semi-arid zones and forested regions to agricultural landscapes, while *O. kapuri* is known only from north east India.

The present study thus highlights the scope for further exploration and documentation of termites, given the wide range of climatic conditions and diverse habitats found across India. Such comprehensive taxonomic studies provide essential baseline data not only for taxonomic and biodiversity research but also for ecological studies, as termites play a vital role in modifying soil conditions, which in turn influence the composition and distribution of both flora and fauna.

ACKNOWLEDGEMENTS

The authors are thankful to the Director, Zoological Survey of India, Kolkata for providing facilities and constant encouragement. Thanks, are also to Dr. Dinesh KP, ZSI, Pune, and Dr. Tamal Mondal and Rahul Mondal, ZSI, Kolkata for taking special efforts in collecting termite samples.

REFERENCES

- Abhirami A.S. and Prasad G. (2025) Termites (Isoptera) of Kerala: An updated checklist and comprehensive review of species diversity. ENTOMON 49 (4): 527–538. doi: 10.33307/entomon.v49i4.1342.
- Baraik B., Basak J., Sengupta R. and Rajmohana K. (2024) Fauna of India Checklist: Arthropoda: Insecta: Blattodea (Termites). Version 1.0 Zoological Survey of India, Kolkata. Available from: [http://doi.org/10.26515/Fauna/1/2023/Arthropoda:Insecta:Blattodea\(Termites\)](http://doi.org/10.26515/Fauna/1/2023/Arthropoda:Insecta:Blattodea(Termites)) (Accessed on 4 September, 2025).

- Baraik B., Basak J., Roy M., Konar B., Das S. and Rajmohana K. (in press) Fauna of India Checklist: Arthropoda: Insecta: Blattodea (Termites). Version 2.0. Zoological Survey of India, Kolkata.
- Basak J., Baraik B. and Rajmohana K. (2025) Insecta: Isoptera. In: *Faunal Diversity of Eastern Ghats, India* (Eds. Director), The Publication Division, Director, Zoological Survey of India, M-Block, New Alipore, Kolkata. pp545–556.
- Bignell D.E. and Eggleton P. (2000) Termites in ecosystems. In: *Termites: Evolution, Sociality, Symbioses, Ecology*. (Eds. Abe T. Bignell D.E. and Higashi M), Kluwer Academic Publishers, Dordrecht. pp363–387. doi: 10.1007/978-94-017-3223-9_17.
- Chhotani O.B. (1997) The fauna of India and the adjacent countries. Isoptera (Termites): (Family Termitidae). Zoological Survey of India, Calcutta. Vol. II. xx + 801pp.
- Hellemans S., Rocha M.M., Wang M., Arias J.R., Aanen D.K., Bagnères A.G., Buček A., Carrijo T.F., Chouvenc T., Cuzzo C., Constantini J.P., Constantino R., Dedeine F., Deligne J., Eggleton P., Evans T.A., Hanus R., Harrison M.C., Harry M., Josens G., Jouault C., Kalleshwaraswamy C.M., Kaymak E., Korb J., Lee C.Y., Legendre F., Li H.F., Lo N., Lu T., Matsuura K., Maekawa K., McMahon D.P., Mizumoto N., Oliveira D.E., Poulsen M., Sillam-Dussès D., Su N.Y., Tokuda G., Vargo E.L., Ware J.L., Šobotník J., Scheffrahn R.H., Cancellato E., Roisin E., Engel M.S., Bourguignon T. (2024) Genomic data provide insights into the classification of extant termites. *Nature Communications* 15 (1): 6724. doi: 10.1038/s41467-024-51028-y.
- Jones C.G., Lawton J.H. and Shachak M. (1994) Organisms as ecosystem engineers. In: *Ecosystem Management*. (Eds. Samson F.B. and Knopf, F.L.), Springer, New York. pp130–147. doi: 10.1007/978-1-4612-4018-1_14.
- Krishna K., Grimaldi D.A., Krishna V. and Engel M.S. (2013) Treatise on the Isoptera of the World. *Bulletin American Museum Natural History* 377: 1–200. <http://digitallibrary.amnh.org/dspace/handle/2246/6430>.
- Kumar A., Kalleshwaraswamy C.M., Sharma R. and Poonia A. (2023) Diversity and distribution of termites (Blattodea: Isoptera) in Bhiwani, Haryana, India. *Annals of Entomology* 41(2): 97–110. doi: 10.59467/AE.2023.41.97.
- Maiti P.K. and Chakraborti S. K. (1994) Termite fauna (Isoptera) of the Andaman and Nicobar Islands, Indian Ocean. *Records of the Zoological Survey of India, Occasional Paper No. 167*: 1–107.
- Ranjith M., Kalleshwaraswamy C.M., Meghana K.J. and Sandeep A. (2025) New records of *Odontotermes Holmgren* (Blattodea: Termitidae: Macrotermitinae) from Andhra Pradesh, India with an updated list of termites from the state. *International Journal of Tropical Insect Science* 45(4): 1111–1120. doi: 10.1007/s42690-025-01497-5.
- Roonwal M L. (1955) Termite ruining a township. *Zeitschrift für Angewandte Entomologie Berlin & Hamburg* 38(1): 103–104.
- Roonwal M.L. and Chhotani O.B. (1989) Fauna of India Isoptera (Termites). Director, Zoological Survey of India, Calcutta. xx + 672 pp.
- Sileshi G.W., Arshad M.A., Konaté S. and Nkunya P.O.Y. (2010) Termite-induced heterogeneity in African savanna vegetation: Mechanisms and patterns, *Journal of Vegetation Science* 21(5): 923–937. doi: 10.1111/j.1654-1103.2010.01197.x.

(Received July 21, 2025; revised ms accepted September 11, 2025; published September 30, 2025)