

N O T E

Assessment of Three Bait Trap Designs in Attracting *Microtermes obesi* (Isoptera: Termitidae)

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Live-wood-eating termites (Isoptera: Termitidae) are major insect pests in tea plantations in northeast India (Roy et al. 2020, Int. J. Trop. Insect Sci. 40: 435–440), causing crop losses of 20–25% (Debnath et al. 2012, Two Bud 59: 35–38). Until recently, these termites were restricted mainly to the north bank of Brahmaputra, Barak Valley, and Tripura (Debnath et al. 2012), but now they are regularly reported from Terai, Dooars, and the south bank of Brahmaputra (Biswa and Mukhopadhyay 2013, Int. J. Bio-Resource Stress Manag. 4: 404–407). A field survey conducted for 3 yr (October 2019 to September 2022) by the Department of Entomology at the Tocklai Tea Research Institute, with the assistance of the Zoological Survey of India, identified five species of termites infesting live tissue of tea plants: *Microtermes obesi* (Holmgren), *Ancistrotermes pakistanicus* (Ahmad), *Odontotermes parvidens* (Holmgren), *Odontotermes obesus* (Rambur), and *Odontotermes feae* (Wasmann), with *M. obesi* being the most common (Bayen et al. 2024, J. Entomol. Sci. doi: 10.18474/JES23-94). Management of these pests can be cost prohibitive and labor intensive (Roy et al. 2020). Here we report a comparison of three bait trap designs in attracting *M. obesi* in tea plantations with a goal of developing a monitoring and management tool.

The study was conducted at the Oating Tea Estate (26°26'8.80"N, 93°58'30.61"E) in Golaghat District, Assam. The belt transect method of Jones and Eggleton (2000, J. Appl. Ecol. 371: 191–203) was used to establish locations of the baiting stations in the plantation. As per Debelo and Degaga (2014, Agric. Biol. J. N. Am. 5: 123–134), a 25 × 25 m area infested with termites was first identified. Then three 25 × 1.2 m transects were established; each transect was subdivided

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into 10 small blocks containing two or three tea plants each. Individual bait traps were placed in the small plots with a separation distance of two tea plants.

The three trap types differed in construction, composition, and bait material. The maize stalk bait trap of Debelo and Degaga (2014) used a pair of approximately 25-cm-long maize stalks that were buried to one-half their length in the soil. For the second trap, a bucket measuring 20 cm in diameter and 30 cm deep was tightly filled with moist cardboard (Biswa 2018, Ph.D. Diss., Univ. of North Bengal, Raja Rammohunpur, West Bengal). Surfaces of the buckets were perforated with 10-mm-diameter holes, buried in the soil, and covered with lids. The third trap was constructed with perforated plastic boxes (23 cm length, 15 cm width, 6 cm height). The boxes were filled with pieces of wood, sugarcane pulp, and tissue paper and buried in the soil with the top even with the soil surface.

The traps were observed for termite infestation at regular intervals for up to 3 wk after placement of the traps. From these observations, we determined that a mean (\pm SD) of 30% \pm 26% of the maize stalk traps became infested with *M. obesi* termites. Likewise, 35% \pm 26% of the wood–sugarcane pulp–tissue paper traps became infested. The traps with the moistened cardboard were not infested. Comparison of the numbers of termites in the two infested traps on day 3 versus day 21 showed a significant increase in numbers over time in both trap types (paired *t* test; $P \leq 0.05$).

From these results, the maize stalk traps and the wood–sugarcane pulp–tissue paper traps were more effective than the moistened cardboard bait in attracting *M. obesi* under field conditions. There are, however, some drawbacks with the use of the maize stalk as bait, including lack of availability, storage, attraction of other herbivores, and fast degradation in the soil. These issues were not seen with the traps using wood–sugarcane pulp–tissue paper as the bait. Furthermore, once these bait boxes are buried under the soil surface, they are more secure from foraging by other herbivores or large animals. These two bait traps should be given further attention for possible development as monitoring or management tools for *M. obesi* in tea plantations in India.