

## Facultative termite nest occupancy by the Geissler's stingless bee

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**Subjects:** Geissler's stingless bee, *Tetragonula geissleri* (Insecta: Hymenoptera: Apidae);  
Termite, *Hospitalitermes umbrinus* (Insecta: Blattodea: Termitidae).

**Subjects identified by:** Zestin W. W. Soh (bee) & Foo Maosheng (termite).

**Location, date and time:** Singapore Island, Central Catchment Nature Reserve, Lower Peirce Reservoir Park; 7 August 2016; 1030 hrs.

**Habitat:** Mature secondary rainforest.

**Observer:** Zestin W. W. Soh.

**Observation:** Four nests of the stingless bee, *Tetragonula geissleri* (Cockerell, 1918) were observed within separate active mounds of the termite, *Hospitalitermes umbrinus* (Haviland, 1898) situated at the base of trees (Fig. 1). At one particular nest the bees could be seen setting up droplets of yellow resin around their nest entrance (Fig. 2 & 4), entangling several termites (Fig. 3 & 4) and deterring them from entering.

**Remarks:** A diverse range of bees is known to use active termite mounds as nesting sites (Roubik, 2006; Carrijo et al., 2012). A review of stingless bee nesting biology by Roubik (2006) lists several genera that have termite or ant associations, including *Aparatrigona*, *Paratrigona*, *Partamona*, *Plebeia*, *Scaura*, *Schwarzula*, *Sundatrigona*, *Trigona*. The genus *Tetragonula* however has not been well documented to nest in termite mounds, with apparently only one other record by Punith (2014) of *Tetragonula iridipennis* nesting with an unidentified termite species in India. This present record is thus potentially the second to document a *Tetragonula* species with a termite association.

By nesting within termite mounds, stingless bees likely receive the benefits of a nesting site without excessive moisture as well as shared protection by the termite soldiers from invaders, such as ants (Roubik, 2006; Carrijo et al., 2012). However, it is likely that the stingless bees present a cost to the termites as they take up viable nesting space. They may also harm the termites, as observed in this record. No exchange of materials between stingless bees and termites is known.

*Tetragonula geissleri* is likely to be a facultative (rather than obligate) termitophile, as the author has also observed this species nesting in a rock wall and within the cavity of a *Ficus* tree in the Singapore Botanic Gardens. *Tetragonula geissleri* was also observed nesting in trees by Eltz et al. (2003) in Borneo, but there was no mention of termite nesting.



Fig. 1. One of the termite mounds at the base of a Tembusu tree in which *Tetragonula geissleri* were observed nesting. Photograph by Zestin W. W. Soh

**References:**

- Carrijo, T. F., R. B. Gonçalves & R. G. Santos, 2012. Review of bees as guests in termite nests, with a new record of the communal bee, *Gaesochira obscura* (Smith, 1879) (Hymenoptera, Apidae), in nests of *Anoplotermes banksi* Emerson, 1925 (Isoptera, Termitidae, Apicotermitinae). *Insectes Sociaux*. 59 (2): 141-149.
- Eltz, T., C. A. Brühl, Z. Imiyabir & K. E. Linsenmair, 2003. Nesting and nest trees of stingless bees (Apidae: Meliponini) in lowland dipterocarp forests in Sabah, Malaysia, with implications for forest management. *Forest Ecology and Management*. 172 (2-3): 301-313.
- Punith, H. V., 2014. *Designing of suitable hives for rearing and multiplication of stingless bee, Tetragonula iridipennis* (Smith). MSc. Agriculture thesis, University of Agricultural Sciences, Bangalore. 59 pp.
- Roubik, D. W., 2006. Stingless bee nesting biology. *Apidologie*. 37 (2): 124-143.



Fig. 2. *Tetragonula geissleri* workers guarding their nest entrance in the termite mound, surrounded by termites.



Fig. 3. *Hospitalitermes umbrinus* termites (each about 3 mm) emerging from an active nest.

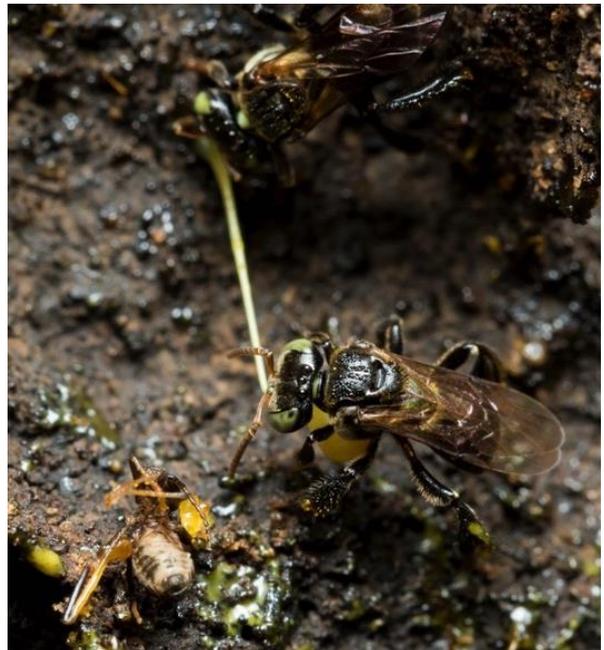


Fig. 4. Stingless bees (each about 4 mm) setting defensive sticky droplets at the nest entrance. Note entangled termite at bottom left corner.

Photographs by Zestin W. W. Soh