

Continuous transfer of subterranean mealybugs (Hemiptera, Pseudococcidae) by Pseudolasius spp. (Hymenoptera, Formicidae) during colony fission?

Abstract

In West- and East-Malaysian lowland rainforests, three *Pseudolasius* spp. are found in trophobiotic relationship with a total of eight scale insect species in six genera feeding at the roots of plants. Intimate associations going beyond pure trophobiosis could be discovered with five species of root mealybugs: *Planococcoides* sp., *Maconellicoccus multipori* (Takahashi) and three species of *Rhizoecus*. All three *Pseudolasius* species carry their pseudococcids 1. when disturbed, 2. during nest movements, and 3. to feeding sites. Moreover, the *Pseudolasius* species under discussion permanently keep adults and immature instars of their mealybug partners within their nests.

Pseudolasius spp. are highly polydomous, which results in an extremely decentralized colony structure. Numerous small nest chambers were either widely distributed in the top soil (*Pseudolasius* sp. 2 and sp. 3) or predominantly in small decaying twigs (*Pseudolasius* sp. 1). *Pseudolasius* sp. 1 and *Pseudolasius* sp. 2 are polygynous. Of *Pseudolasius* sp. 3 we found only one queen, but polygyny is highly probable as well. Mealybug-carrying or phoresis during mating flights could not be observed. Nevertheless, *Pseudolasius* sp. 1 was found associated with *Rhizoecus* sp. #21, being widely distributed in the humus layer from 600 m a.s.l. up to 1140 m a.s.l. (at Mt. Kinabalu, Sabah, East-Malaysia). In 81.7% of the nests, *Rhizoecus* sp. #21 was present. Preferences for certain mealybug species were detected for *Pseudolasius* sp. 1, *P.* sp. 2 and *P.* sp. 3 in West-Malaysia as well. Consequently the question arises how the simultaneous distribution of both partners is achieved.

For the co-dispersal of *Pseudolasius* spp. and their pseudococcids we suppose queen adoption and permanent colony fission take place, possibly combined with claustral colony foundation and the help of independently gained root trophobionts.