ASIAN MYRMECOLOGY Volume 6, 115–118, 2014
ISSN 1985-1944 © Michael Staab

SHORT COMMUNICATION

The first observation of honeydew foraging in army ants since 1933: *Aenictus hodgsoni* Forel, 1901 tending *Eutrichosiphum heterotrichum* (Raychaudhuri, 1956) in Southeast China

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Keywords: *Aenictus*, army ants, trophobiosis, honeydew, BEF-China

Army ants are a well-defined group of ants characterized by a set of behavioural and ecological adaptations including a nomadic life style with temporary bivouac nests, highly specialized mating systems, and mass raiding for arthropod prey (Gotwald 1995, Kronauer 2009). The monogeneric subfamily Aenictinae is restricted to tropical and subtropical ecosystems in the Old World and Australia (Guénard *et al*. 2010). As far as the trophic ecology of *Aenictus* is known, almost all species are specialized predators of other ants (Gotwald 1995, Kronauer 2009). In the present paper I report the first observation of army ants tending Hemiptera in Asia. On 7 October 2012 at 10:00 local time approximately 30 workers of *Aenictus hodgsoni* Forel, 1901 were observed and photographed collecting honeydew from around 50 *Eutrichosiphum heterotrichum* (Raychaudhuri, 1956) (Aphididae) on fresh shoots of a young 1.5 m high *Lithocarpus glaber* (Thunberg) Nakai, 1916 (Fagaceae) tree (Fig. 1). This unexpected observation was made only once during more than five months of surveying trophobiotic interactions in the field sites of the newly established BEF-China tree plantation experiment close to the village of Xingangshan, Jiangxi Province, in subtropical Southeast China (117° 55’49” E / 29° 5’ 13” N, Bruelheide *et al*. 2014). Ant and aphid specimens were identified with the keys provided by Jaitrong & Yamane (2011) and Blackman & Eastop (2012) respectively. Voucher specimens were lodged in the insect collection of the University of Freiburg. Close observation of single aphids revealed that the aphids were producing honeydew droplets, which were consumed by *A. hodgsoni* only moments after their appearance. Secretion of defense fluid from the aphid’s cornicles was not observed (Edwards 1966), suggesting ants were not preying on the aphids. The ants had a well-established foraging trail, with many foragers going back and forth between the site of the trophobiosis and a hole in the soil about 2 m away. The ants defended their mutualistic partners aggressively by stinging and biting the incautious observer.

Fig. 1. Photograph of *Aenictus hodgsoni* tending *Eutrichosiphum heterotrichum* on a young *Lithocarpus glaber* (Fagaceae) shoot in Southeast China.

Trophobiotic ants usually belong to the subfamilies Dolichoderinae, Formicinae, Pseudomyrmicinae, and Myrmicinae, but occasionally species from other subfamilies also collect honeydew (e.g. Blüthgen *et al*. 2004, Oliver *et al*. 2008, Blüthgen & Feldhaar 2010). Trophobioses involving army ants are extremely rare, with only two previous records published. Both involved African army ants; *Aenictus eugenii* Emery, 1895 at *Pseudococcus lilacinus* Cockerell, 1905 (Santschi 1933) and *Dorylus fulvus* (Westwood, 1839) at an unidentified Membracidae (Arnold 1915).

The *A. hodgsoni* trophobiosis was checked two, four and 24 hours after the first encounter. It persisted after two and four hours, but not on the next day when the aphids were tended by *Polyrhachis dives* Smith, 1857 the most common trophobiotic ant species in the study area (Staab, unpublished data). The low incidence of recorded observations might indicate that trophobioses involving army ants might be rather short lived, opportunistic associations, that do not result in the monopolisation of aphids over an extended time period. Nevertheless, being aggressive ants capable of mass recruitment, *Aenictus* possesses characteristics of suitable trophobiotic partner ants (Buckley & Gullan 1991), and it seems likely that army ants occasionally supplement their diet with honeydew. This might explain the surprisingly low δ 15N values found for *Aenictus* in a recent study in Borneo (Pfeiffer *et al*. 2014). The present observation proves that army ants have the behavioural ability to establish trophobioses, as shown by the active tending of aphids and aggressive defense of their mutualistic partners. Preying of *A. hodgsoni* on *E. heterotrichum* can be excluded, because aphids did not secrete defense fluids and the aggregation was alive on the next day but tended by a different ant species.

This is only the third observation of a trophobiosis in army ants, and more observations are needed to understand how and why specialized predators occasionally establish mutualistic interactions with honeydew producing insects. Scientists working with ant-trophobiont mutualisms should keep their eyes open for unusual ant species tending Hemiptera.

ACKNOWLEDGEMENTS

I would like to thank Nico Blüthgen, Alexandra-Maria Klein, and Tamar Marcus for constructive discussion on an earlier draft of the manuscript. Financial support by the German Research Foundation (DFG FOR 891/2 KL 1849/6-1) and logistical support by the BEF-China project is greatly acknowledged. Constructive comments by Yoshiaki Hashimoto and an anonymous reviewer improved the quality of the manuscript.

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