Mesostena angustata (Fabricius, 1775) (Coleoptera: Tenebrionidae) from Semnan, Iran, feeding on ants of Messor intermedius Santschi, 1927 (Hymenoptera: Formicidae)

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Abstract: Mesostena angustata (Fabricius, 1775) (Coleoptera: Tenebrionidae) from Semnan in Iran, is herein recorded feeding on ants of Messor intermedius Santschi, 1927 (Hymenoptera: Formicidae). The observations were undertaken during the morning of 22 June 2011, at the Agricultural Centre Semnan (2nd building) of Semnan Province, Iran. This record appears to be the first of this tenebrionid species feeding on ants.

Key words: Coleoptera, Hymenoptera, Formicidae, Mesostena, Messor, Cataglyphis, Iran.

Introduction

Mesostena angustata (Fabricius, 1775) (Coleoptera: Tenebrionidae) is a typical black darkling beetle found in the deserts of the Middle East and northern Africa. During the last two decades, it has been collected from a number of localities within several countries including Sinai, Israel, Iran and Egypt (e.g. Krasnov & Ayal, 1995; Krasnov & Shenbrot, 1996a,b; Semida et al., 2001; Lillig & Pavlicek, 2003; Zalat et al., 2008; Gahhari et al., 2010a,b). Semida et al. (2001) found M. angustata living under stones in Egypt. Despite the general abundance and widespread distribution of this species, little appears to have been published on its ecology and behaviour. This record appears to be the first of this tenebrionid species feeding on ants and possibly the first record for the family.

Messor is a myrmicine genus of ants (Hymenoptera: Formicidae) with more than 100 species, all of which are harvester ants; the generic name comes from the Roman god of crops and harvest, Messor. The subterranean colonies of the various species tend to be found in open fields and near roadsides, openings are directly to the surface. The biology of North American species has been studied by Johnson (2000). Messor intermedius Santschi, 1927 (Formicidae) was recently listed in the first checklist of ants from Iran (Paknia et al., 2008).

Observations

Observations were undertaken during the morning (after sunrise) of 22 June 2011, near the Agricultural Centre, Semnan 2nd building of Semnan Province, in Iran. The weather conditions were hot and sunny, c. 30 degrees Celsius, with no wind. Under an unidentified tree, 12 adults of Mesostena angustata (Fabricius, 1775) (Fig. 1) were situated around the nest of the ant Messor intermedius Santschi, 1927 (Figs. 2 & 3). M. angustata beetles were observed grabbing the dead insects or other food items which were being transported to the nest by
individuals of *M. intermedius*. When the food supplies diminished, individuals of *M. angustata* suddenly attacked individuals of *M. intermedius*. A group of *M. intermedius* specimens retaliated and attacked the *M. angustata* beetles but the hard body of the beetles protected them from the ant attacks. No natural enemies of *M. angustata* were observed in the field. Some *M. intermedius* ants were attacked and eaten by individuals of another ant species, *Cataglyphis livida* (André 1881)(Figs. 4 & 5). One unknown Tenebrionidae larva (Fig. 6) was found in the nest of *M. intermedius*.

All specimens collected of the ants and beetles have been deposited in the collection of the first author.

**Discussion**

Tenebrionids are primarily scavengers, feeding on a wide variety of dead material of plant or fungal (rarely animal origin)(e.g. Lawrence & Britton, 1994). In a detailed study of Tenebrionidae inhabiting the shrub-steppe communities of southcentral Washington, United States of America, Rogers et al. (1988) found that 47 species of plants were utilized as food by 13 species of darkling beetles. Many tenebrionid larvae feed on rotting wood with the adults also feeding on the same wood species (e.g. Crowson. 1981; Lawrence & Britton, 1994). Some tenebrionid species may play a beneficial role in the control of fly populations in poultry houses where the beetles modify the dung on which the beetles feed, rendering it totally unsuitable for fly breeding (Wallace et al., 1985). The darkling beetles may also prey on the fly larvae and puparia (Despins et al., 1988).

The observations presented here are quite remarkable and appear to represent the first record of myrmecory by the family Tenebrionidae or at least by *Messor*. We have been unable to obtain any references dealing with tenebrionid beetle-ant predation. Hopefully further observations on this phenomenon will be undertaken and forthcoming from this interesting area of the world.

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**References**


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Fig. 1. *Mesostena angustata* (Fabricius, 1775), habitus, dorsal view (scale line = 3.0 mm).
Fig. 2. *Messor intermedius* Santschi, 1927, habitus, lateral view (scale line = 1.0 mm).

Fig. 3. *Messor intermedius* Santschi, 1927, head, front view (scale line = 1.0 mm).
Fig. 4. *Cataglyphis lividus* (André 1881), habitus, lateral view (scale line = 1.0 mm).

Fig. 5. *Cataglyphis lividus* (André 1881), head, front view (scale line = 0.7 mm).
Fig. 6. Tenebrionidae larva, dorsal view (scale line = 1.0 mm).