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OBSERVATIONS ON THE RELATIONSHIP BETWEEN ANTS (HYMENOPTERA:FORMICIDAE:MYRMICINAE, DORYLINAE) AND *ARAEOSCHIZUS* (COLEOPTERA:TENEBRIONIDAE)

William H. Clark
Museum of Natural History
College of Idaho
Caldwell, ID 83605
and Paul Blom
Department of Plant, Soil and Entomological Sciences
University of Idaho
Moscow, ID 83843

ABSTRACT—We report on associations of *Araeoschizus airmeti* Tanner and *A. antennatus* Blaisdell (Coleoptera:Tenebrionidae) with the ants *Pogonomyrmex salinus* Olsen and *Neivamyrmex nigrescens* (Cresson) (Hymenoptera:Formicidae:Mymicinae, Dorylinae) at the Idaho National Environmental Research Park and Baja California Norte, Mexico, respectively.

Araeoschizus spp. are small elongated beetles (Fig. 1) collected in association with a variety of ant species (Tanner 1945, Lavigne 1969, Wheeler and Wheeler 1973, Snelling 1976, Papp 1981, Clark et al. 1986, Stafford et al. 1986). *Araeoschizus* spp. have also been collected from situations apparently unassociated with ants (Andrews et al. 1979, Papp 1981). The relationship between ants (Hymenoptera:Formicidae) and beetles of the genus *Araeoschizus* (Coleoptera:Tenebrionidae) is uncertain and has been much debated (Papp 1981, C.S. Papp, personal communication, 5 January 1989). We offer additional observations which suggest a close relationship between ants and *Araeoschizus* spp.

The Idaho National Environmental Research Park (INERP) is located in the cold desert of southeastern Idaho. Excavation by PEB of a *Pogonomyrmex salinus* Olsen nest on 7 June 1986 revealed three individuals of *Araeoschizus airmeti* Tanner (Fig. 1) in seed chambers about 9-10 cm below the soil surface. The *A. airmeti* were similar in size and general appearance to seeds found in the chambers of the ant nest. This presence is similar to observations of *A. armatus* Horn with *P. occidentalis* (Cresson) in Wyoming (Lavigne 1969). Two of these beetles were maintained alive for several hours in a petri dish with 10 *P. salinus* workers. Both beetles and ants ran around the dish periphery, resulting in many ant-beetle encounters. Upon frontal encounters the beetle froze while the ant antennated the beetle's dorsum. Following antennation the ant moved off and the beetle resumed its activity. On several occasions an ant used its mandibles to clasp a beetle around its elytra, lifted it into the air, and carried it out of the peripheral activity to a point near the center of the petri dish.

The ant would then set the beetle down and resume its peripheral run. After the ant's departure the beetle returned to wandering. However, if the beetle was overtaken from behind, it would normally continue its attempt to run and appear to struggle against the ant. On several occasions the ant responded by becoming more aggressive, even attempting to sting the beetle.

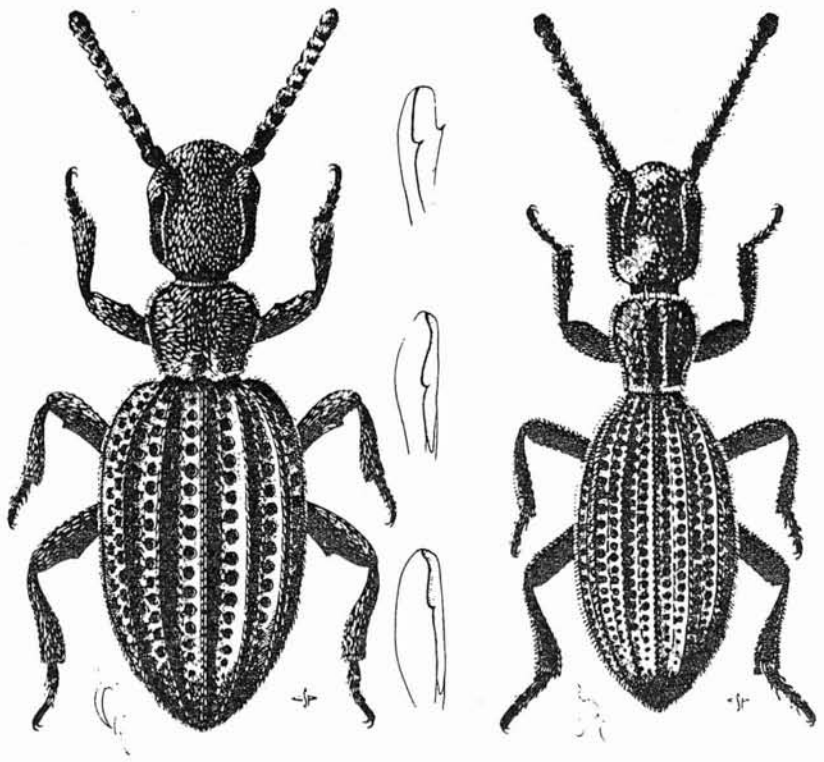

Fig. 1. *Araeoschizus airmeti* Tanner (left) and *A. antennatus* Blaisdell (right). (From Papp 1981). Scale: body length *A. airmeti* is about 4.5 mm.

Additional INERP records include discovery of over 50 *A. airmeti* in the hollow of a pronghorn (*Antilocapra americana* Ord) horn lying near a *P. salinus* nest, within the area the ants cleared of vegetation (F.W. Merickel, personal communication, 1989). Stafford et al. (1986) indicate the beetle's occurrence as unusual at INERP (up to 15 specimens), encountering it in pitfalls and general collecting.

On June 17, 1979, WHC collected several individuals of a new subspecies of *Araeoschizus antennatus* (presently being described by C.S. Papp) from columns of *Neivamyrmex nigrescens* (Cresson) in the Catavina region of the Central Desert, 9 km NW of Rancho Santa Ines, Baja California Norte, Mexico (Lat. 29° 46'N, Long. 114° 46'W, elevation 550 m). The collections were made between 1930 and 2200 hours (PDT). The column of *N. nigrescens* was estimated at 7000 workers, plus the queen. Approximately 25 individuals of this *A. antennatus*, an elongated dark-colored fast moving beetle (Fig. 1), were observed at the trailing "end" of the ant column. The beetles were keeping pace with the ant column. Workers would antennate each beetle they came in contact with for a few seconds and then move on in the column.

Araeoschizus antennatus Blaisdell has been reported from the Catavina region in Baja California (Papp 1981, Clark et al. 1986). We have collected the beetles at this site both in association with ants (Clark et al. 1986) and in pitfall traps (some of which also contained *N. nigrescens*). *Araeoschizus* has not previously been collected in association with army ants (Papp 1981). Wheeler and Wheeler (1973), in their biological notes on *Pheidole grallipes* Wheeler, reported *Araeoschizus* spp. "running with the ants". The intimacy of interaction between Araeoschizus and ants we have observed, as well as that of Wheeler and Wheeler (1973) and Lavigne (1969), suggests to us a definite and regular association. At the same time, the presence of the beetle in pitfall traps and on substrates outside of the nest infers the myrmecophily is not continuous. Much study is needed to describe the life history of these beetles and thus delineate the nature of their relationship with ants. For example, the larvae of the beetles are unknown.

Voucher specimens of the ants (PEB #1527 and WHC #7226) and of *Araeoschizus* are deposited in the Orma J. Smith Museum of Natural History, College of Idaho, Caldwell 83605 (CIDA), the William F. Barr Entomological Museum, University of Idaho, Moscow 83843 (UICM), and Universidad Nacional Autonoma de Mexico, Coyoacan (UNAM).

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