

# Occurrence of scarab beetles inside rodent burrows in some parts of Iran

(Coleoptera: Scarabaeidae)

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**Abstract.** The scarab beetles *Ateuchetus armeniacus* (Ménétries, 1832) and *Gymnopleurus flagellatus* (Fabricius, 1787) (Coleoptera, Scarabaeidae) are recorded for the first time inside burrows of two *Spermophilus* species (Mammalia). The observations concern nests of *Spermophilus fulvus* (Lichtenstein, 1823) in eastern, northwestern and western Iran, and *Spermophilus xanthoprimum* (Bennet, 1835) in northwestern Iran. Neither of these beetles was known to be associated, not even occasionally, with burrows of small mammals.

**Key words.** Biology, ethology, pholeophily, new record, Iran, Middle East.

## Introduction

Scarab pholeophily, that is to say their dependency on the burrows of small vertebrates, is one of the least investigated behaviours in Palaearctic scarabaeology, despite its being known worldwide for some time, especially in the Nearctic region where it has been studied by American authors in an exhaustive and satisfactory way. Most of the West Palaearctic Scarabaeoidea known to live in the burrows of small mammals and to feed on their droppings belong to the tribes Aphodiini (Aphodiidae) and Onthophagini (Scarabaeidae) (ZIANI 2003). Almost all these species are relatively small, less than 10 mm long. No data are available regarding their egg laying and nesting behaviour. According to the degree of their dependency on mammal burrows, pholeophile species can be divided into pholeobionts, those that are strictly dependent on burrows for feeding and breeding, pholeophils (in the strict sense), if they are preferentially but non-exclusively dependent on burrows, and pholeoxens, those that use burrows of small mammals only occasionally (FALCOZ 1912, HALFFTER & MATTHEWS 1966, ZINCHENKO 2002). Generally, from a bionomic and functional point of view, the greater part of the Aphodiini species can be considered as “dwellers” (endocoprid nesters), eating and laying eggs inside the dung mass, whereas Onthophagini are mainly “small tunnelers” (paracoprid nesters), i.e. they lay their eggs directly in a food mass packed into the blind end or a branch of a burrow dug under the food source. According to ZUNINO & HALFFTER (2008), *Onthophagus*, and pholeophil coprophagous beetles generally, are attracted to burrows for the more constant temperature and humidity they can find inside. Burrows allow them to live in unfavourable environmental conditions, such as aridity and lack of excrement in the southern Palaearctic or climates with cold periods in high mountains.

During field research by one of the authors (M.M.) on the burrows of two species of rodents, the Yellow Ground Squirrel, *Spermophilus fulvus* (Lichtenstein, 1823), and the Asian