

Scientific Note

***Metrius* Eschscholtz (Carabidae: Paussinae) is not a millipede specialist**

Carabidae, commonly known as ground beetles, are terrestrial members of the beetle suborder Adephaga. Feeding habits within this family are diverse. Adults of most species prey opportunistically on other arthropods, but some species are facultative specialists that have morphological and/or behavioral adaptations that allow them to eat specific prey items when they are available. For example, some species of *Leistus* Frölich, 1799 and *Loricera* Latreille, 1802 prey on Collembola which they capture in a basket formed by spines on the gula and setae on the antennae (Bauer 1982, Bauer 1985, Hintzpeter & Bauer 1986). Cychrine beetles eat snails using strong mandibles to open the shells like a can opener, and have a narrow head and prothorax to reach inside the shells (Thiele 1977, Digweed 1993). Adults of the genus *Promecognathus* Chaudoir, 1846 and tribe Peleciini eat millipedes. *Promecognathus* adults have been reported to eat millipedes from the head posteriorly, after first plunging their long thin mandibles down around the neck to sever or crush the ventral nerve cord (LaBonte 1983, Parsons et al. 1991).

Over 50 years ago, MacSwain & Garner (1956) published a report that adults and larvae of *Metrius contractus* Eschscholtz, 1829 specialize on the millipede *Xystocheir francisca* Chamberlin, 1949. This paper has been widely cited in the carabid literature (for example, Bousquet 1986, Laroche & Larivière 2003, Geiselhardt et al. 2007). However, given that the larvae of *Metrius* and *Promecognathus* were first described thirty years after MacSwain & Garner's report (Bousquet 1986, Bousquet & Smetana 1986), that we have never observed *Metrius* feeding on millipedes, and that adults and larvae do not have obvious morphological characteristics that would aid them in this specialized feeding strategy, we considered the possibility that this report might have been in error. Our suspicions were supported by a review of Garner's unpublished PhD dissertation (1954). The dissertation contains detailed descriptions of the feeding behavior of "*Metrius*" and "*Promecognathus*," but the illustrations and descriptions of the larvae upon which the observations were based are both misidentified pterostichine carabids, most likely members of *Pterostichus* (*Hypherpes*) Chaudoir, 1838.

In order to address the question more directly, we examined the gut contents of 5 adult specimens of *Metrius explodens* Bousquet & Goulet 1990 from Montana and ten adult specimens of *Metrius contractus* from widely separate localities in California and Oregon. We did not find any discernable remains of millipedes in the guts. Instead, we found a diversity of small pieces of cuticle including a large number of ant heads and mandibles. The ant remains were identified as belonging to a variety of subfamilies, including Formicinae and Myrmicinae. In addition, eight specimens of *Metrius explodens* (3 females, 5 males) were collected with adults and larvae of *Formica neorufibarbis* Emery, 1893 (Formicinae) under the same rock in Montana (Ravalli County), and remnants of the same ant species were discernable within the *Metrius explodens* gut contents. *Metrius* is classified in the tribe Metriini within the subfamily Paussinae. While most species classified in the tribes Paussini and Protopaussini prey exclusively on ants, species classified in the Metriini have not

been reported to be associated with them. The discovery that adult *Metrius* sometimes eat ants indicates that an opportunistic association with ants may be more common within the Paussinae than we have formerly thought.

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