



Digging down under: Australian Bolboceratini, their habits and a list of species (Coleoptera: Scarabaeoidea: Geotrupidae)

HENRY HOWDEN¹, ANNE HOWDEN¹ & GEOFFREY HOLLOWAY²

¹Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, ON, K1P 6P4, Canada

²The Australian Museum, Sydney, New South Wales, Australia

Abstract

The adult habits of the ten genera of Australian Bolboceratini (Scarabaeoidea, Geotrupidae: Bolboceratinae) are briefly discussed, mentioning at least one species in each genus. Morphological variation, food, and/or predation are described for some species. The eggs and larvae of *Bolborhachium annea* Howden are discussed and pictured. A picture of one of the fungi used for adult food is included and one of push-ups marking burrows. The Australian species of Bolboceratini described through 2006 are listed.

Key words: Australia, Bolboceratini, natural history, checklist

Introduction

Studying the habits and life cycle of an insect can be challenging. This is particularly true for burrowing insects that spend much of their time underground, *e.g.*, the Bolboceratinae (Scarabaeoidea, Geotrupidae).

In general, species of Bolboceratinae occur on all continents except Antarctica, but almost none are found on oceanic islands. From a conservative point of view, there are two tribes in the Bolboceratinae: Athyreini and Bolboceratini. The Athyreini occur in South America, Africa, and in a narrow band to northern India. The Bolboceratini are essentially worldwide and are found mostly in areas with sandy or light clay soils; they are the only tribe in the family occurring naturally (not introduced) in Australia.

For many years the geotrupids have been called dung beetles, although the epithet does not apply to all geotrupids. This usage started when some species of European *Geotrupes* Latreille were discovered using dung for their larval cells, and they and others were attracted to dung as adults. This carried over to the Australian species, particularly when Carne (1965), in his revision of the genus *Elephastomus* Macleay, stated that he found specimens using cow dung. Years later Dr. Carne told us that he found burrows beside and through piles of dung, but had not excavated the burrows to verify that the dung was used as food. Subsequently we dug many burrows of *Elephastomus* near Atherton, Queensland (Qld). In some pastures, burrows were indeed beside or through piles of dung, but no dung was found in the burrows. We could only conclude that in cases where the burrow went through the dung, it was deposited after the burrow was started!

To our knowledge, the Australian species of Bolboceratini are not even occasional dung feeders. If a common name is needed, we suggest a term sometimes used in Western Australia (WA): “musician beetles,” named for their ability to stridulate when disturbed. Some large species can be heard for some distance when collected; occasionally one can be heard “complaining” when disturbed by a straw shoved into its burrow.

Each species of bolboceratine seems to have a particular niche, but some generalities about adult habits can be made. In eight of the ten genera occurring in Australia, the adults are nocturnal, the flight period begin-