



Genera of Gymnodamaeidae (Acari: Oribatida: Plateremaeoidea) of Canada, with notes on some nomenclatorial problems

DAVID EVANS WALTER

Invertebrate Zoology, Royal Alberta Museum, 12845 - 102 Avenue, Edmonton, Alberta, Canada T5N 0M6.

E-mail: David.Walter@gov.ab.ca

Abstract

The taxonomy of the North American Gymnodamaeidae is currently intractable, because (1) the adults are covered in a thick, ornamented cerotegument that provides useful characters, but that obscures the cuticle; (2) many descriptions appear to be based on newly moulted or cleared specimens and are incomplete or contain misinterpretations; and (3) there is considerable disagreement in the literature about valid genera and generic limits, leading some authors to sink some or all of the North American genera into *Gymnodamaeus* s.l. Several nomenclatorial problems have added to the confusion. In this paper I use new diagnoses to demonstrate that seven previously described genera based on North American species can be separated from *Gymnodamaeus* s.s. and provide a key to distinguish them. I clarify the correct publication dates for Paschoal's genera and after consultation with the original author, propose replacements for two of these generic names that are preoccupied: *Donjohnstonella* nom. nov. for *Johnstonella* Paschoal and *Roynortonella* nom. nov. for *Nortonella* Paschoal. New Canadian provincial distribution records are provided for *Gymnodamaeus* cf. *ornatus* Hammer (AB), *Jacotella quadricaudicula* (Jacot) (AB, ON), *Joshuella agrosticula* Paschoal (AB, YK), and *Pleodamaeus plokosus* (Woolley & Higgins) (AB). Finally, I discuss the similarity between the cerotegumental pustules in the Gymnodamaeidae and the epicuticular wax crystalloids on the leaves of plants such as the water lotus (*Nelumbo nucifera* Gaertn.) and suggest that they may have a similar water repellent "Lotus-effect".

Key words: homonym, cerotegument, Lotus-effect, epicuticular wax, *Adrodamaeus*, *Gymnodamaeus*, *Nortonella*, *Pleodamaeus*, *Johnstonella*, *Joshuella*, *Jacotella*

Introduction

The Gymnodamaeidae is one of up to 10 currently recognized families in the Plateremaeoidea (Norton & Behan-Pelletier 2009) and the only diverse plateremaeoid family in Canada (Marshall *et al.* 1987, Behan-Pelletier & Eamer 2004). Gymnodamaeid mites are characteristic of dry sites including grasslands, alpine and tundra soils, and dry patches of soil, litter, and moss in more mesic environments. Fossils are known from the Late Cretaceous (Labandeira *et al.* 1997) and gymnodamaeids and their relatives are generally considered one of the early derivative lineages of "higher oribatids" (i.e. the Brachypylina or Circumdehiscentiae) (Norton & Behan-Pelletier, 2009).

Adult gymnodamaeid mites are well sclerotized and completely coated, including the setae (Figs. 24, 32), in a layer of cerotegument with irregular arrays of minute (typically 1–6 µm in diameter) waxy pustules with a crystal-like structure of repeated arrays of mostly hexagonal units (e.g. Figs. 3, 28, 35). The thick, pustulate, cerotegument makes light microscopic examination of the surface difficult and has led to misinterpretations in the literature. Some authors seem to have used strong clearing agents that remove much of the cerotegument or to have relied on recently moulted adults as type specimens. Thus, when confronted with a typical adult in a collection, the descriptions in the literature may be of little use. For example, *Adrodamaeus*