Zootaxa 2269: 1–31 (2009)
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

Comparative morphological and biometrical studies on *Trhypochthonius* species of the *tectorum* species group (Acari: Oribatida: Trhypochthoniidae)

GERD WEIGMANN[1,3] & GÜNTHER RASPOTNIG[2]

[1]*Institute of Zoology, Free University Berlin, Koenigin-Luise-Str. 1–3, D-14195 Berlin, Germany.*
E-mail: weigmann@zedat.fu-berlin.de
[2]*Institute of Zoology, Karl-Franzens-University, Universitätsplatz 2, A-8010 Graz, Austria. E-mail: guenther.raspotnig@uni-graz.at*
[3]*Corresponding author*

Table of contents

Accepted by H. Schatz: 29 Sept. 2009; published: 21 Oct. 2009

Abstract

Three European taxa of the *Trhypochthonius-tectorum* complex are differentiated and described: *Trhypochthonius tectorum* (Berlese) s. str., *T. silvestris europaeus* **n. subsp.** and *T. japonicus* **n. forma** *occidentalis*. These taxa are compared with *T. americanus* (Ewing), *T. silvestris* Jacot and *T. japonicus* Aoki. Because of the high similarity among these species, a biometrical analysis is performed which confirmed three species groups with disjunct distributions: *Trhypochthonius tectorum* in Europe with *T. tectorum americanus* (**n. comb.**) in North America, *T. silvestris* in North America with *T. s. europaeus* n. subsp. in Europe, *T. japonicus* in Japan with *T. japonicus* n. forma *occidentalis* in Europe. The relationships of further Palaearctic species of this complex are discussed and we propose taxonomical changes: *Trhypochthonius tectorum fujinitaensis* Fujikawa (**n. comb.**) and *T. t. stercus* Fujikawa (**n. comb.**); *T. silvestris misumaiensis* Fujikawa (**n. comb.**) and *T. s. septentrionalis* Fujikawa (**n. comb.**). The disjunct biogeographical distribution of the members of the three species leads to the assumption of a relative high geological age of the parthenogenetic species-complex of "*T. tectorum* s. lat.". A key for the Central European species of *Trhypochthonius* is presented.

Key words: New subspecies, taxonomy, phylogeny, biogeography, Europe, North America, oribatid mites

Introduction

The oribatid mite genus *Trhypochthonius* was proposed by Berlese (1904) with the type species *Hypochthonius tectorum* Berlese, 1896. In the original description of the species (Berlese 1896: AMS 78.8) Berlese included it in the genus *Hypochthonius* because of an erroneous interpretation of a transverse suture on the notogaster (actually an artefact, see van der Hammen 1959). Compared to topotypical specimens and several others from northern Italy deposited in the Berlese collection, "the identity of this common species is certain" as remarked by van der Hammen (1959). *Trhypochthonius tectorum* is reported from Holarctic, Oriental and Neotropic regions (Subías 2004). Redescriptions with figures which we regard as referring to Berlese's species have been published e.g. by Warburton & Pearce (1905: England), Willmann (1931: Germany), Pérez-Iñigo 1968 (Spain), and Weigmann (2006: Germany and Austria). In other text-books and articles, e.g. Balogh (1972), Gilyarov & Krivolutsky (1975), Balogh & Mahunka (1983) and Seniczak (1992), the identity of the redescribed species with *T. tectorum* is questionable, as will be discussed below. The Japanese *Trhypochthonius* species of the *tectorum*-type—species with partly large and plumose notogastral setae—have been studied in more detail than the European species. Aoki (1970) described *T. japonicus*; Fujikawa (1995) restudied the original Italian material of *T. tectorum* from the Berlese-collection and described *T. septentrionalis*; later she described *T. fujinitaensis* Fujikawa, 2000, *T. misumaiensis* Fujikawa, 2000, and *T. stercus* Fujikawa, 2000.

Results of preliminary studies by one of us (G. R.) on the opisthonotal gland compounds of "*Trhypochthonius tectorum"* from Austria suggested that the material was heterogeneous. Further chemical and morphological studies on different populations indicated the existence of a *Trhypochthonius tectorum* species complex from Central Europe probably consists of three distinct taxa. This hypothesis is currently being tested by means of molecular-genetic studies by Michael Heethoff (M. H.) and coworkers (Tübingen). Therefore, three different methodologies are being applied at first to the three distinct taxa of this species complex: (1) chemical differentiation of the secretion profiles of the opisthonotal gland (G. R.), (2) molecular-genetic characters (M. H.) and (3) morphological-biometric characters (G. W.). The common goal is to recognize systematic and phylogenetic relations within the *tectorum* species group and within the Trhypochthoniidae.

This first publication redescribes *Trhypochthonius tectorum* Berlese, with intraspecific variability studied by comparison of distinct populations, and describes two new European taxa within the species complex. One of these is considered a subspecies of *T.silvestris Jacot, 1937*, the other a new form of *T. japonicus*; both represent new European records of the respective species. Furthermore, we present a comparative biometrical study of these European taxa, *T. silvestris* Jacot, 1937 from North America, and *T. japonicus* and *T. americanus* from Japan and North America, respectively.