

Integrative taxonomy: Combining chemical, morphological and molecular data for delineation of the parthenogenetic *Trhypochthonius tectorum* complex (Acari, Oribatida, Trhypochthoniidae)

Heethoff, M.¹, Laumann, M.², Weigmann, G.³ & Raspotnig, G.¹

¹Institute of Zoology, Karl-Franzens University Graz, Universitätsplatz 2, 8010 Graz, Austria, e-mail: michael@heethoff.de, guenther.raspotnig@uni-graz.at

²Institute for Evolution and Ecology, University Tübingen, Auf der Morgenstelle 28E, 72076 Tübingen, Germany, e-mail: michael.laumann@email.de

³Institute of Zoology, Free University Berlin, Koenigin-Luise-Straße 1-3, 14195 Berlin, Germany, e-mail: weigmann@zedat.fu-berlin.de

There is a long-standing controversial about how parthenogenetic species can be defined in absence of a generally accepted species concept for this reproductive mode. An integrative approach was suggested, combining molecular and morphological data to identify distinct entities, and propose them as distinct taxa. Using this approach, speciation of parthenogenetic lineages was recently demonstrated for groups of bdelloid rotifers and oribatid mites. We investigated Austrian populations of the parthenogenetic oribatid mite *Trhypochthonius tectorum*. Besides morphological and molecular data, we included the chemical composition of complex exocrine gland secretions in our analyses. This is the first attempt to combine these three types of data for a delineation of parthenogenetic oribatid mites.

We show that Austrian *T. tectorum* underwent a parthenogenetic radiation and now consists of three distinct lineages, each separated by morphology including morphometry, gland secretion profiles and mitochondrial *cox1* sequences. This diversification happened in the last ten million years.