



The fossil mite family Archaeorchesidae (Acari, Oribatida) I: redescription of *Strieremaeus illibatus* and synonymy of *Strieremaeus* with *Archaeorcheses*

EKATERINA A. SIDORCHUK¹ & ROY A. NORTON²

¹Paleontological Institute, Russian Academy of Sciences, Moscow 117997, Russia. E-mail: e.a.sidorchuk@gmail.com

²State University of New York, College of Environmental Science and Forestry, Syracuse, N.Y., U.S.A. E-mail: ranorton@esf.edu

Abstract

Strieremaeus is one of several oribatid mite genera proposed by Max Sellnick based on adult specimens preserved in Eocene Baltic amber. The original specimens of its type-species—*S. illibatus* Sellnick, 1918—were lost and the genus has received no further empirical study. For many years *Strieremaeus* was included in the family Eremaeidae, but recently this placement was questioned. Herein we redescribe *S. illibatus* based on the study of 31 non-type adult specimens from both Baltic and Rovno ambers. Among these are four Baltic specimens identified by Sellnick and currently deposited in the Kaliningrad Museum of Amber (KMA), which we designate as neotype (KMA 197-36) and paraneotypes (KMA 197-34, 197-35, and 197-37). Six immature specimens were associated with this species, of which three—one deutonymph, two tritonymphs—could be studied in detail and their characters are included in the redescription. The type specimens of a second species of *Strieremaeus* proposed by Sellnick—*S. cordiformatus* Sellnick, 1918—are also lost and two non-type specimens in the KMA seem to have been misidentified by Sellnick; therefore, we treat *S. cordiformatus* as a *species inquirenda*. A new diagnosis of *Strieremaeus* is presented, and the Cretaceous fossil genus *Archaeorcheses* is considered a junior subjective synonym, based on examination of the holotype of the type-species, *A. minguezae* Arillo & Subías, 2000. As a consequence, *Strieremaeus* is currently the sole genus in Archaeorchesidae. *Strieremaeus minguezae* (n. comb.) is only tentatively maintained as a distinct species, as no certain distinguishing traits could be found. Two families are reported from the fossil record for the first time: Zetomotrichidae from Baltic amber and Zetorchesidae from Rovno amber. In ancillary discussion we note how the specialized tarsal structure of *S. illibatus* is consistent with its likely arboreal habitat. We also discuss preservation properties and artifacts, note the dimensional discrepancy between cuticular remnants of the mite and its larger imprint in amber, and strongly recommend measuring more than the cuticular remnants themselves. Further, we provide information on different methods to observe amber inclusions, and for the first time report birefringence of fossil cuticular remnants in thin, airless preparations.

Key words: Oribatida, Archaeorchesidae, Zetorchesidae, Zetomotrichidae, Eremaeidae, *Strieremaeus illibatus*, *Strieremaeus cordiformatus*, *Archaeorcheses minguezae*, Eocene, Baltic amber, Rovno amber, fossil, neotype, new combination, new synonymy, cuticular birefringence

Introduction

The large majority of oribatid mite fossils known from Eocene amber was described or identified in two papers by the German acarologist Max Sellnick, who worked exclusively with Baltic amber material. In the first (Sellnick 1918) he proposed seven new genera. One of these—*Mulvius*—was synonymized with the extant genus *Scapheremaeus* in his second paper (Sellnick 1931), but the other six genera long have remained poorly known. Recently, Norton (2006) demonstrated that *Embolacarus* was a member of Collohmanniidae, very similar to *Collohmannia* and possibly a synonym. Sidorchuk & Norton (2010) then redescribed *Scutoribates*; it is a genus of Unduloribatidae and a senior synonym of two extant genera (*Koreoribates* and *Kunstella*). The remaining four fossil genera—all members of the cohort Brachypylina—have not been reinvestigated, but appear to have no extant species; they include: *Gradidorsum*, *Tectocymba*, *Platigeocranus* and *Strieremaeus*.

Our main purpose is to redescribe the type species of the latter genus—*Strieremaeus illibatus* Sellnick, 1918—using methods that allow us to examine external morphology in much greater detail than did Sellnick, including