**Paleomorphus hirsutimarginatus** Shockley, A New Genus and Species of Endomychidae (Coleoptera: Cucujoidea) in Amber from the Dominican Republic

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**Abstract**

*Paleomorphus hirsutimarginatus* Shockley (Coleoptera: Cucujoidea: Endomychidae), a new genus and new species of fossil endomychid embedded in amber, is described from the Dominican Republic. Because of its unique morphology, initial phylogenetic analyses were unable to place this new species into any of the current twelve extant subfamilies suggesting that it may represent a previously undescribed, extinct subfamily of Endomychidae.

**Introduction**

Strohecker (1953) listed six species in three subfamilies of Endomychidae that have been described from amber, but, of those, all were embedded in Baltic amber and shared at least one morphological synapomorphy linking them to the extant fauna and making it possible to assign them to recognizable subfamilies. Thus far, the vast majority of endomychid fossils have been from genera of the subfamily Lycoperdinae (formerly Endomychinae).

An extensive literature search suggests that this is the first species description of an endomychid from Dominican amber. Dominican amber forms as the result of hardening of the resin of the flowering plant Protera (Lepismatinae: Cucurbitaceae), a tree found in the West Indies. The exact age of this amber is unknown, but it has been estimated that most Dominican amber dates back to the mid-Miocene, approximately 15-20 million years ago (Iliarrelle-Virent and Maupher, 1996).

**Paleomorphus hirsutimarginatus** Shockley, new genus

**Type Species:** *Paleomorphus hirsutimarginatus* Shockley

**Description:** Body form (Figs. 1A–B, 3A) convex, subglobose, tomentose. Color reddish brown. Head: From finely punctate. Clypeus bicolored anteriorly with median constriction along the margin (Fig. 3B). Antennae (Figs. 2A, 3B–C) with 11 segments; basal segment apically expanded, with long erect setae on anterior side, antennomeres 2-7 bradilike and only as long as wide; club 3-segmented and somewhat serrated externally, all segments tomentose. Pronotum: Prosternal disc weakly convex, covered in long yellowish setae, regularly punctate (Fig. 2B). Anterior margin straight; antennal angles strongly produced, broadly rounded; lateral margins widely flattened and slightly reflexed, widest at middle; posterior angles right angled or weakly acute. Elytra: Surface smooth. Elytra: Shape convex, subglobose. Lateral margins widely flattened, widest at 1/3 of length from base; medial margin with submarginal sria extending the entire length (Fig. 2C). Legs: Claws on all legs appendiculate (Fig. 2D); tarsus simple and 4-segmented on all legs (Fig. 3C–E); tarsomeres 1-3 narrowly extended underneath each subsequent segment, tarsome 4 much reduced, consisting almost entirely of the pretarsal claws.

**Remarks:** The genus *Paleomorphus* is unique in that it represents the first endomychid to be described from Dominican amber. The lobed clypeus, presence of long setae on all body segments, and the wide flattened margins on the pronotum and elytra combine to distinguish *Paleomorphus* as unique among endomychids.

**Etymology.** The stem of this word comes from the Greek root morph- meaning “form”. The genus is masculine in gender.

**Methods**

Initial observations of the specimens were made using a Leica Wild M10 stereo microscope. Because of the orientation of the beetle inside the amber, immersion in clear mineral oil was necessary. Mineral oil has the same refractive index as amber so immersion often removes obstructive facets in the amber that may make it difficult to view the specimen. It is often also helpful to use clear glass beads as a substrate because it allows more precise positioning of the specimen to maximize light penetration without manually holding the specimen in place.

The specimen was then serially reconstructed using X-ray tomography to confirm morphological features difficult to see using the stereo microscope. A SkyScan Micro-CT X-ray tomography machine (Micro Photonics Inc., 4972 Medical Center Circle, PO Box 3129, Allencontro, PA 18106-0129) was used to gather the data and reconstruct the fossil. Similar to a CAT scan, this instrument uses x-ray images taken at 180 degrees to develop a 3D x-ray image by reconstructing individual cross-sections via tomography.

**Discussion**

Although amber specimens often can be viewed in sufficient detail to include them in phylogenetic analyses, none of the previously described fossil endomychids have been analyzed to confirm their in-group status and to define possible extant sister groups. In a preliminary phylogenetic analysis, seventeen informative characters were recovered from the specimen and analyzed using data from Tomaszewska (2000) allowing for successful placement clearly within Endomychidae, but not within any extant subfamilies suggesting it may belong to an extinct subfamily.

My preliminary analysis clearly demonstrates that *Paleomorphus* is an endomychid, but it remains unclear what *Paleomorphus*’s sister-group association is to the extant taxa. Morphologically, it has numerous features of several different subfamilies within the Endomychidae, as well as some more commonly found in other Cerylonidae-Series cucujoid families. Overall, *Paleomorphus* seems likely to be related to the Anomaphinae, but in the absence of more robust phylogenetic hypotheses, I am hesitant to assign it to that family, nor am I willing to erect a new subfamily for it without further analysis including additional taxa and characters.

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**References**

