

## New species of Mezirinae (Hemiptera: Heteroptera: Aradidae) in Miocene Dominican amber

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### Abstract

Six species of Aradidae belonging to three subfamilies have been described from inclusions in Dominican amber to date. Two new species, *Mezira legorskyi* sp.n. and *Mezira amberdominica* sp.n., are described and illustrated. In addition, the record of a female is reported, most probably belonging to the fossil *Mezira scheveni* HEISS, 2000 of which only the male is known.

Key words: Hemiptera, Heteroptera, Aradidae, Mezirinae, Miocene, Dominican amber, new species.

### Zusammenfassung

Der miozäne Bernstein von der Dominikanischen Republik ist reich an Insekteninkluden, von denen bisher nur ein geringer Teil wissenschaftlich bearbeitet ist. Von der Heteropterenfamilie Aradidae sind bisher nur sechs Arten beschrieben, welche den Unterfamilien Carventinae (4 Arten), Calisiinae (1 Art) und Mezirinae (1 Art) zugeordnet werden. Zwei neue Arten, *Mezira legorskyi* sp.n. und *Mezira amberdominica* sp.n. werden nachstehend beschrieben und abgebildet. Außerdem wird das vermutete Weibchen der nur vom männlichen Holotypus bekannten *Mezira scheveni* HEISS, 2000 dokumentiert.

### Introduction

Miocene Dominican amber contains a great number of biota, and about 400 families comprising 1500 species of insects are estimated to occur in the rich collections of American (e.g. American Museum of Natural History, New York; Smithsonian Institution, Washington) and European (e.g., Natural History Museum, London; Staatliches Museum für Naturkunde, Stuttgart) museums and institutions (GRIMALDI & ENGEL 2005). Only about 400 of these insects species have been described to date (ARILLO & ORTUÑO 2005).

In Miocene Dominican amber the flat bugs (family Aradidae) are represented by six species so far, of which four belong to the subfamily Carventinae (*Acaricoris robertae*, *Carventus bechlyi*, *Nesoproxius latocanus* and *Proneoproxius cornutus*, all described by HEISS & POINAR 2012), one to Calisiinae (*Calisiopsis brodzinskyorum* FROESCHNER, 1992), and one to Mezirinae (*Mezira scheveni* HEISS, 2000). New inclusions now available for study contain two new species of Mezirinae and a presumable female of *Mezira scheveni*.

## Material and methods

The amber inclusions in this study are deposited in the collection of the Staatliches Museum für Naturkunde Stuttgart (MSG) and the collection of the author at the Tiroler Landesmuseum Ferdinandeum Innsbruck.

The photos are taken through an Olympus SZX10 binocular microscope with an Olympus E3 digital camera and processed with Helicon Focus 4.3 software and using Adobe Photoshop and Lightroom 2.3.

Due to their position in the block as well as the impurities, cracks and air bubbles in the stone, not all parts of the insects are visible. Furthermore the ventral side is mostly obscured and in *Mezira legorskyi* sp.n. part of the terminal segments was damaged during cutting and polishing.

Measurements were taken with a micrometer eyepiece, 40 units = 1 mm. Abbreviations used: deltg = dorsal external laterotergite (connexivum), mtg = mediotergite, pe-angles = posterolateral angles of deltg.

## Taxonomy

### *Mezira* AMYOT & SERVILLE, 1843

*Mezira* is the species-richest genus of Neotropical Aradidae, with more than 100 species described (KORMILEV & FROESCHNER, 1987) of which a limited number occurs also in the Caribbean. However, only *Mezira scheveni* HEISS, 2000 has been recorded so far from the rich Dominican amber deposits. Two new species are now added.

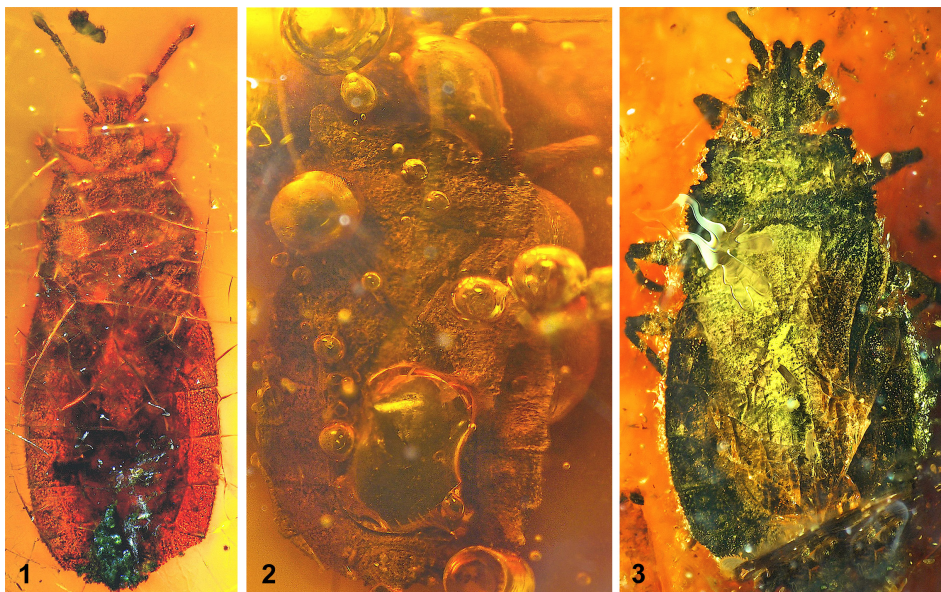
### *Mezira legorskyi* sp.n. (Figs. 1, 5)

**Etymology:** It is a great pleasure to dedicate this interesting species to the well known coleopterologist and honorary president of the Arbeitsgemeinschaft Österreichischer Entomologen Franz J. Legorsky in occasion of his 90<sup>th</sup> birthday.

**Holotype:** Macropterous (most probably) female in a honey-coloured transparent oval piece of Dominican Amber (18 × 15 × 5 mm); ventral and dorsal sides are visible, however the latter partly obscured by shallow surface cracks and rugosities. The specimen is designated as the holotype and deposited in the collection of the author in the Tiroler Landesmuseum, no. DB-Mez-3.

**Diagnosis:** Small, subparallel species of reddish-brown colouration; surface of body and appendages granular; postocular lobes spine-like, reaching outer margin of eyes; midlateral area of tergal plate exposed, claws without pulvilli. It differs from *M. scheveni* and *M. amberdominica* sp.n. by several characters – see “Discussion”.

**Description:** Head about as wide as long (33/32). Genae flat, margins dentate, apically truncate leaving a cleft at middle, reaching apex of antennal segment I. Clypeus longitudinally elevated, shorter than genae. Antenniferous lobes diverging anteriorly with acute apex. Antennae 1.53× as long as width of head (50.5/33); segment I thickest and constricted at base; II shortest and tapering toward base; III longest and thinnest, slightly tapering toward base; IV fusiform, with pilose apex; length of antennal segments I/II/III/IV = 13/11/15/11.5. Eyes large, oval. Vertex with median granular ridge and 2 (1+1) lateral ovate depressions. Postocular lobes spine-like, reaching outer margin of eyes, then converging straightly to constricted collar. Rostrum arising from a slit-like atrium, shorter than head.



Figs. 1 - 3: (1) *Mezira legorskyi* sp.n., holotype, (2) *Mezira amberdominica* sp.n., holotype; (3) *Mezira* cf. *scheveni*.

Pronotum wider than long (64/34); lateral margins finely crenulate, subparallel at humeri, sinuately converging anteriorly to rounded, not produced anterolateral angles; anterior margin nearly straight; disk flat, surface irregularly rugose with 2 (1+1) ovate smooth callosities on anterior lobe; posterior margin slightly concave at middle. Scutellum triangular, wider than long (36/30); lateral margins straight, apex narrowly rounded; disk with a feeble longitudinal elevation on anterior two thirds.

Hemelytra: Corium short, not reaching posterior margin of deltg III. Clavus distinct. Membrane covering the median part of tergal plate, reaching to tergite VII.

Abdomen: Lateral margins subparallel at middle, converging on deltg II+III and VI, finely crenulate, pe-angles not produced. Right posterior part of deltg VII damaged and missing. Tergal plate consisting of mtg III-VI with exposed areas bearing two midlateral apodemal impressions on each segment; deltg II+III fused, showing only a trace of a suture laterally. The outline of the damaged terminal segments seems most likely that of a female specimen.

Venter: Pro-, meso and metasternum flat at middle, separated by transverse sutures. Sternites I+II fused; sternites III-VII separated by transverse sutures. Spiracles III-VII ventral, as far as recognizable. Legs: Femora slightly incrassate, beset with distinct tubercles; tibiae straight; tarsi two-segmented; claws without pulvilli.

Measurements: Length 5.1 mm; width of abdomen (across tergite IV) 2 mm.

Discussion: *Mezira legorskyi* sp.n. differs from *Mezira scheveni*, the only recorded Mezirinae in Dominican amber so far, by smaller size, a more subparallel abdomen and different shape of pronotum. *Mezira amberdominica* sp.n., described below, is much larger and wider and its anterolateral angles of pronotum are roundly produced anteriorly (comp. Figs. 4 - 6).

***Mezira amberdominica* sp.n.** (Figs. 2, 4)

**Etymology:** Named after its origin from Dominican amber.

**Holotype:** Macropterous male in a honey-coloured oval piece of Dominican amber ( $19 \times 12 \times 5$  mm) with rounded surface; air bubbles partly obscure dorsal and most ventral structures. This specimen is designated as the holotype and deposited in the collection of the Staatliches Museum für Naturkunde, Stuttgart (SMG), no. Do-5436-H.

**Diagnosis:** Medium sized species with wide abdomen and roundedly projecting anterolateral angles of pronotum. These characters distinguish this new taxon from both other Mezirinae in Dominican amber, *Mezira scheveni* and *Mezira legorskyi* sp.n.

**Description:** Surface of body irregularly rugose; colouration brown. Some measurements given could not be determined exactly and are thus marked with a question mark. Head slightly longer than wide (52/48?). Genae diverging and expanded anterolaterally, with rounded apex, leaving a deep cleft at middle. Antenniferous lobes diverging, with subacute apex, reaching about midlength of antennal segment I. Antennae long, about twice as long as width of head; segment I thickest and constricted at base; II shortest and tapering toward base; III longest and thinnest; IV fusiform; length of antennal segments I/II/III/IV (right side) = 25/20/27?/24?. Eyes large, oval. Postocular lobes projecting laterally; apex acute reaching slightly beyond outer margin of eyes; strongly converging posteriorly to constricted collar. Rostrum arising from slit-like atrium, as long as head.

Pronotum distinctly wider than long (118?/46); lateral margins rounded at humeri, then sinuately converging anteriorly; anterolateral angles produced, laterally raised and rounded; anterior margin straight; disk roughly granulate, posterior lobe slightly elevated; posterior margin concave at middle. Scutellum triangular, wider than long; lateral margins straight; apex rounded; disk with longitudinal median elevation highest on anterior margin.

**Hemelytra:** Corium short, reaching posterior margin of deltg III. Membrane obscured by large air bubble, posteriorly slightly surpassing anterior margin of tergite VII.

**Abdomen** wide, with rounded lateral margins; pe-angles of deltg V and VI slightly produced; deltg II+III fused, but fusion line visible laterally; pygophore ovate; paratergites VIII rounded, shorter than pygophore.

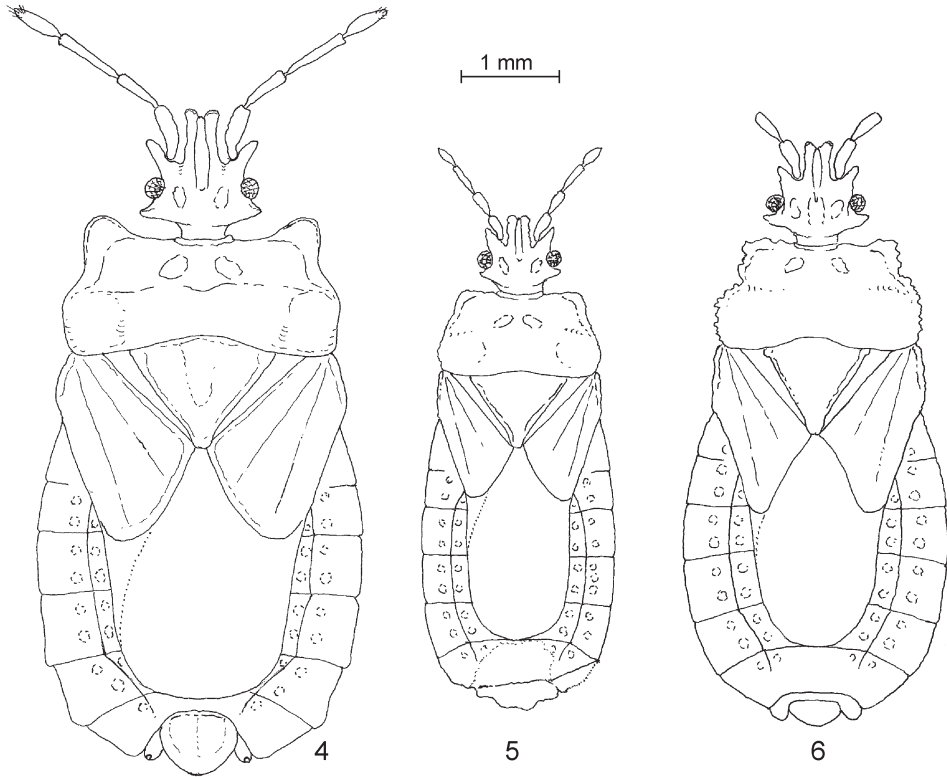
**Venter:** Sternites II-VII separated by transverse sutures. Spiracles III-VI ventral, VII and VIII not clearly discernible. Legs long and slender, unarmed, surface granulate.

**Measurements:** Length 7.1 mm; width of abdomen (across tergite IV) 3.4? mm.

**Discussion:** Although many structures are obscured by air bubbles, the visible characters show that this species is different from both other Mezirinae known so far from Dominican amber. It is therefore described as a new taxon. Resemblance to extant Neotropical Mezirinae reflects only the generic relationship; however, no Miocene insect taxon has yet been assigned to an extant species (ARILLO & ORTUÑO 2005, POINAR & POINAR 1999).

***Mezira* cf. *scheveni* HEISS, 2000** (Figs. 3, 6)

**Material examined:** A macropterous female specimen in a reddish-brown oval piece of Dominican amber ( $22 \times 19 \times 4$  mm). This inclusion is preserved in the collection of the author, no. DB-Mez-2.



Figs. 4 - 6: Reconstruction of Dominican amber Mezirinae: (4) *Mezira amberdominica* sp.n.; (5) *Mezira legorskyi* sp.n.; (6) *Mezira* cf. *scheveni*.

**Description:** The specimen shares essential characters as the general habitus, structure of head, pronotum and scutellum of *Mezira scheveni* HEISS, 2000, also recorded from Dominican amber.

**Measurements:** Length 6.0 mm; width/length of head 42/44; width/length of pronotum 84/38; width/length of scutellum 48/40; length of antennal segments I/II = 17/16 (III and IV missing); width of abdomen (across tergite IV) 2.8 mm.

**Discussion:** Although characters of the venter are obscured by impurities and not visible, colouration is blackish, not brown, and postocular acute lobes are slightly more produced, it seems reasonable to assume that this specimen represents the female of *Mezira scheveni*, described on a single male specimen.

#### Acknowledgements

I thank G. Bechly (Stuttgart) for the opportunity to study his Dominican amber inclusions, Stefan Heim (Tiroler Landesmuseum) for the photos, and the editors and H. Zettel (Natural History Museum Vienna) for the invitation to contribute to this special issue for F.J. Legorsky.

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Autor(en)/Author(s): Heiss Ernst

Artikel/Article: [New species of Mezirinae \(Hemiptera: Heteroptera: Aradidae\) in Miocene Dominican amber. 73-78](#)