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THE FIRST GEOGARYPID (PSEUDOSCORPIONES, GEOGARYPIDAE) IN ROVNO AMBER (UKRAINE)

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The First Geogarypid (Pseudoscorpiones, Geogarypidae) in Rovno Amber (Ukraine). Henderickx H., Perkovsky E. E. — The first *Geogarypus* found in Rovno amber appears to be conspecific with *Geogarypus gorskii* Henderickx 2005, a species known from Eocene Baltic amber.

Key words. Pseudoscorpiones, Geogarypidae, Rovno amber, Ukraine.

Первая геогарипида (Pseudoscorpiones, Geogarypidae) в ровенском янтаре (Украина). Хендерикс Х., Перковский Е. Э. — Первый *Geogarypus*, обнаруженный в ровенском янтаре, оказался конспецифичным с *Geogarypus gorskii* Henderickx 2005 — видом, известным из эоценового балтийского янтаря.

Ключевые слова. Pseudoscorpiones, Geogarypidae, ровенский янтарь, Украина.

Introduction

Rovno amber has been industrially collected on the Klesov and Volnoje (near Dubrovitsa). These deposits represent part of the vast amber distribution in the north of the Rovno and Zhitomir regions (Ukrainian Polesye) (Perkovsky et al, 2003). All inclusions, published from Rovno amber in last 30 years, were found in Klesov (major part) and in the Dubrovitsa and Vladimirets districts on the left bank of the Goryn river.

No definite conclusion has been reached about the botanical source of the resin that poduced Rovno and Baltic amber (succinite), despite decades of study. It is clear that the amber is not derived from modern species of *Pinus*, but there are mixed signals from suggestions of either an araucarian *Agathis*-like or a pinaceous *Pseudolarix*-like resin-producing tree (Langenheim, 2003). Araucarian (*Agathis*-like) has the same labdane polymer as the fossil resin, whereas the structure of *Pseudolarix*-like (Pinaceous) is based on enantio polylabdanes, thus succinite could not be directly derived from *Pseudolarix*. Also, modern *Pseudolarix* is not known to produce massive amounts of resin, and no *Pseudolarix* remains have been recorded in the amber. However, no succinite has been found in araucarian wood, while it has been found in some pinaceous woods. (Langenheim, 1995;Anderson, LePage, 1995).

The evidence appears to lean more toward a pinaceous source, and an extinct deciduous ancestral tree is the only solution.

The fossil invertebrate fauna of Rovno amber compared to Baltic amber indicates a geographically independent origin of both ambers, but the same Late Eocene age (Perkovsky et al., 2007, 2010). More than 160 new species, many new genera and one new tribe were described from Rovno amber in eleven years. Still important fauna elements are common in both Rovno and Baltic ambers. From 64 Rovno amber ant species (Perkovsky, 2011) more than 35 species are also known from Baltic amber, including 17 abundant species. That comprises 85.4 % of all Rovno amber ants from the collection of Schmalhausen Institute of Zoology of National Academy of Sciences of Ukraine, Kiev (SIZK) (Dlussky, Rasnitsyn, 2009).

The pseudoscorpion fauna of Rovno amber fauna was only known from a few undetermined specimens (Cheliferidae Risso, 1826; ? Chernetidae Menge, 1855) (Perkovsky et al., 2010). In this publication a fossil geogarypid pseudoscorpion in Rovno amber from the collection of SIZK (inventory number ZH-13) was studied and compared to Baltic *Geogarypus* specimens.

Material and methods

The fossil pseudoscorpion examined originates from the Zhovkini locality, about 80 km N of Rovno (Ukraine). The fossil specimen is embedded in a yellow-reddish, rounded, somewhat kidney-shaped amber matrix (Plate I: fig. 1, *a*). The dimensions of the piece are: 6 × 12 × 10 mm, 0.9 g. The stone shows flowlines, round tension cracks and a reddish discoloration around the major inclusion, typical for amber. It also contains stellate plant hairs, commonly found in succinite ambers. One of these hair structures is well visible at the tip of the right pseudoscorpion chela (Plate I: fig. 1, *b, c*). A part of the left hand and the fingers of the left hand are missing, probably lost in the grinding and polishing process. The ventral side of the inclusion is obscured by cracks and bubbles. Due to the absence of a flat surface, the inclusion had to be photographed in a viscous liquid with a coverglass, purified acacia honey was used in this case. Measurements were carried out using a Canon MP-E 65 mm (magnification on chip 3x, working distance 51 mm) objective and a ZEISS 5+100/00 grid, digital photography was optimised with multi picture stacking, using ZERENE STACKER (a focus stacking program of ZERENE SYSTEMS LLC).

After the examination the amber was sealed in a airtight bag of nylon-polyethylene. However, it is advisable that it would be coated or embedded in a high quality epoxy, f. i. araldite 2020, for conservation.

All measurements are in millimetres; (length = L: width = W), the ratio (indicated between brackets on fig. 2, *a, b*) is the length/width index of an article.

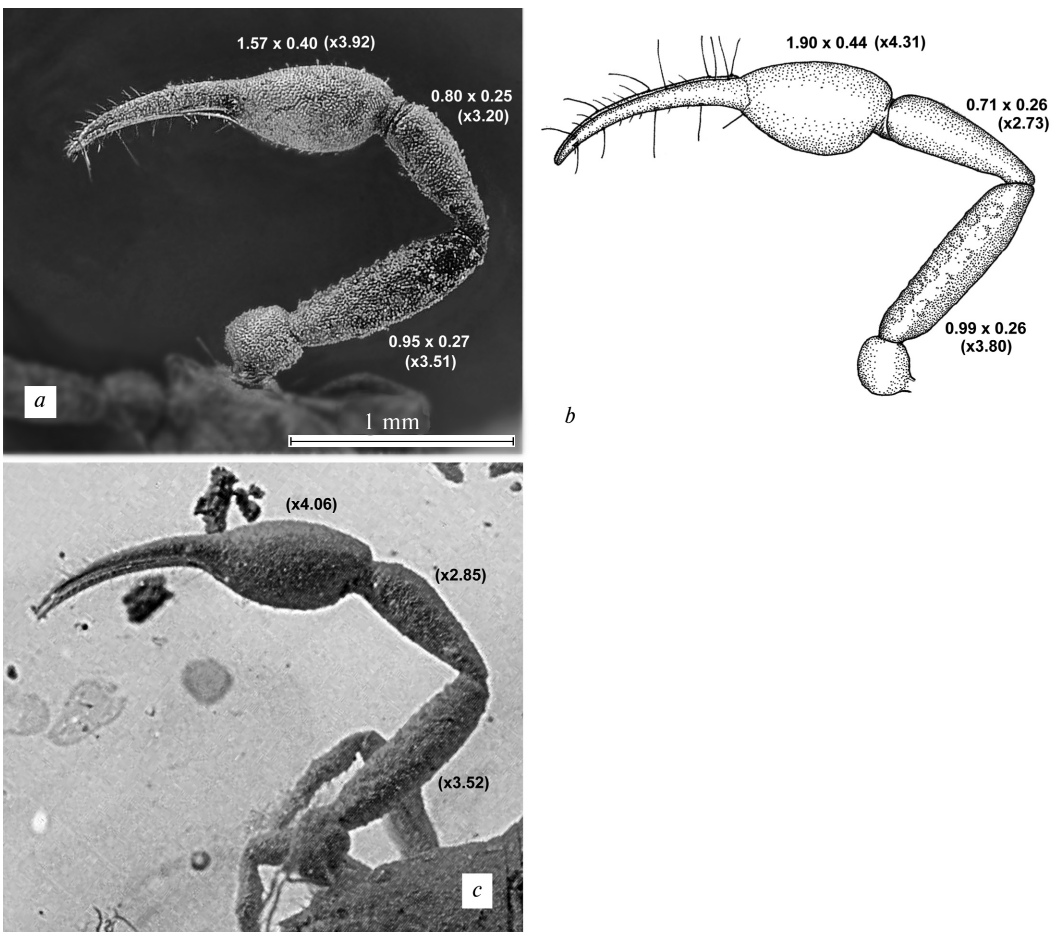

Fig. 2 : *a* — *G. gorskii,* specimen illustrated in Kobbert (2005), p. 172, Baltic amber, right chela with L/W indexes; *b* — *G. gorskii* (same specimen as Plate I: fig. 1, *d*, coll. Henderickx), Baltic amber, right chela with measurements.

Рис. 2 : *a* — *G. gorskii,* изображенный Коббертом (Kobbert, 2005), с. 172, балтийский янтарь, правая клешня с индексами отношения длины к ширине; *b* — *G. gorskii*, (тот же экземпляр, что и на Plate I: рис. 1, *d*, coll. Henderickx), балтийский янтарь, правая клешня с промерами.

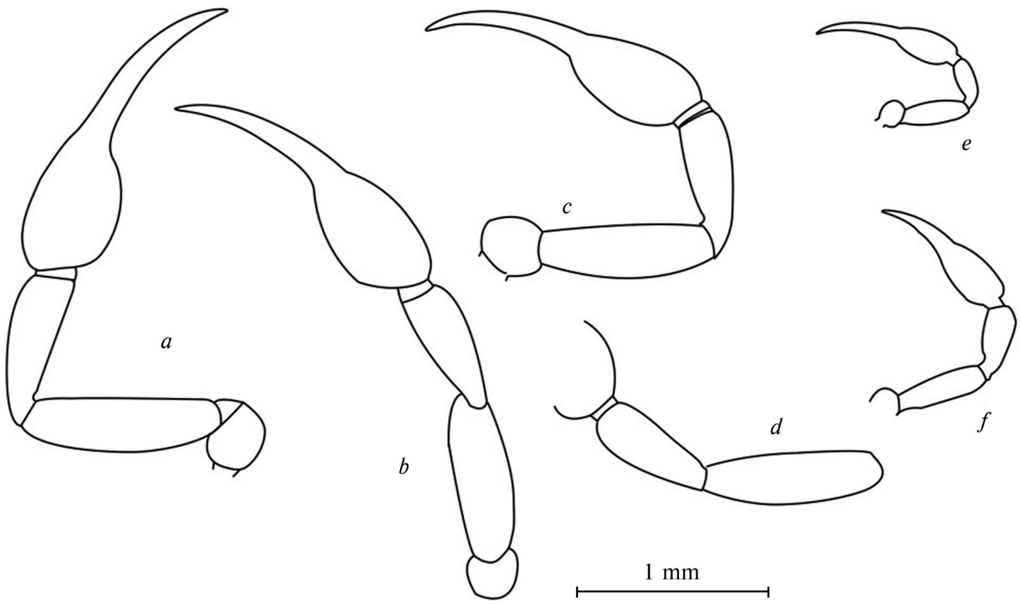

Fig. 3 : *a* — *G. gorskii,* holotypus, Baltic amber, left pedipalp; *b* — *G. gorskii* (same specimen as fig. 1, *d*, coll. Henderickx) Baltic amber, right pedipalp; c — *G. gorskii*, Rovno amber, right pedipalp; *d* — *G. gorskii,* Rovno amber, left pedipalpal femur and patella; *e* — *G. macrodactylus*, Baltic amber (after Beier, 1937); *f* — *G. major*, Baltic amber (after Beier, 1937).

Рис. 3 : *a* — *G. gorskii,* голотип, балтийский янтарь, левая педипальпа; *b* — *G. gorskii* (тот же экземпляр, что и на рисунке 1, *d*, coll. Henderickx), балтийский янтарь, правая педипальпа; c — *G. gorskii*, ровенский янтарь, правая педипальпа; *d* — *G. gorskii,* ровенский янтарь, бедро и колено левой педипальпы; *e* — *G. macrodactylus*, балтийский янтарь (по Beier, 1937); *f* — *G. major*, балтийский янтарь (по Beier, 1937).

Fossil Geogarypidae

Geogarypidae Chamberlin, 1930 can easily be recognised by the 4 eyes on short ocular tubercles situated away from the anterior margin of the carapace, the narrow cucullus with furrow and the ovoid epistosoma. Very determinative is the row of alternating accessory teeth on the pedipalpal hand. The genus *Geogarypus* is not uncommon in Baltic amber, *G. macrodactylus* Beier, 1937 (fig. 3, *e*) and *G* (?). *maior* Beier, 1937 (fig. 3, *f*) were first described (Beier, 1937) followed by *G. gorskii* Henderickx, 2005 (Henderickx, 2005) (fig. 3, *a*). There are currently several Baltic fossil *Geogarypus* specimens under study, but most of them can not be identified because they are only partially preserved or not adult.

The Rovno specimen: diagnosis

A striking characteristic of the Rovno specimen (Plate I: fig. 1*, a, b, c*; fig. 3, *c, d*) is its size: the pedipalpal femur is 0.95 and the body length without chelicera is 2.62. Only the Baltic fossil *Geogarypus gorskii* is that large (holotype: pedipalpal femur 0.99 and body length 2.81) and together with the other characteristics this species will appear conspecific with the Rovno specimen.

The giant *G. gorskii* is well known in Baltic amber. After the description of the holotypus its description in 2005 several more Baltic *G. gorskii* specimens have been found, three of which are illustrated here (Plate I: fig. 1, *d, e*; fig. 2 *a, b, c*).

One well preserved specimen is illustrated by Max Kobbert (Kobbert, 2005) (fig. 2, *a*) and he notes on the plates legend (P. 172): “mit 3 mm Körpergrцsse gehört dieser Pseudoscorpion zu der Riesen unter seinesgleichen. ”

More conspecific characteristics of *G. gorskii* and the Rovno amber specimen are visible on the pedipalps: the dimensions of the pedipalps are in the same range (fig. 2) and the femur and patella have clear large pustules. The first 13–14 teeth in the distal half of the movable chelal finger are pointed; the other teeth are reduced to small projections proximally, exactly as in the Baltic *G. gorskii.* Marginal teeth are visible (Plate I: fig. 1, *c*) but cannot be counted precisely due to distortion. Several trichobothria are missing (broken off) or obscured, the position of **t** and **st** on the movable finger corresponds with Baltic *G. gorskii.* The chaetotaxy of the tergites and sternites is not discernable on this fossil, the celicera are deep in the amber and no details cold be observed due to optical distortion. There are no important differences in the shape or size of the subtriangular carapace (0.90 × 1.07 in the Rovno specimen, 1.02 × 1.14 in the Baltic holotype), the cucullus length (0.25 in the Rovno specimen, 0.23 in the Baltic amber holotype) or the position or size of the eyes. The left patella measurements of the Rovno specimen (0.77 × 0.27 differs somewhat from the right patella (0.69 × 0.25), optical distortion in the amber might be the cause of this, but the length/width index of both patellas (right: 2.85x, left: 2.76x) is well within the range of *G. gorskii.* This index is 2.73x on the *G. gorskii* holotypus (left pedipalps), 2.85x on the *G. gorskii* specimen illustrated in Kobbert (2005) (right pedipalps) and 2.91x on a *G. gorskii* specimen from coll. Henderickx (Plate I: fig. 1, *e*; fig. 2, *b*; 3, *b*) (right pedipalps). The minor differences in the pedipalpal indexes must be interpreted as intraspecific variation within the species *G. gorskii* or because of gender differences or due to measurement difficulties in amber.

We conclude that the Rovno specimen and all Baltic specimens illustrated here are conspecific.

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