The first Eocene species of *Bacanius* (Coleoptera: Histeridae: Dendrophilinae) from Rovno amber

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At present, 20 fossil histerid species are described [Heer, 1862; Theobald, 1935; Chatzimanolis et al., 2006; Caterino et al., 2015; Caterino, Maddison, 2018; Poinar et al., 2009; Alekseev, 2016; Degalier et al., 2019; Zhou et al., 2019; Jiang et al., 2020]. Several extinct species are reported, but not described [Klebs, 1910, Duncan et al., 1998]. Systematical position of some species in taxonomical system of the family is disputable. The earliest them belong to mid-Cretaceous (Burmese amber), the later of the remains from different ages before the Pliocene.

The species described below belongs to nominative genus of Bacaniini. It includes 158 species, of which about five sixth are from tropical regions. Bacaniini are very small beetles with uniform habitus, belonging to the ecological group of microhisterids. They inhabit trees of varying degrees of decomposition and decaying vegetation, more than 10 troglobionts are described (nearly half of its in subtropical regions), some species are collected in nests of ants and termites. Most of them feed on fungal spores [Kovarik, Caterino, 2016]. Fossil representatives of the tribe never have been named; one specimen was determined as *Bacanius*? by Edmund Reitter [Klebs, 1910], but the collection of Klebs was mostly lost in the time of Second World War. At present, 20 fossil histerid species are described [Heer, 1862; Theobald, 1935; Chatzimanolis et al., 2006; Caterino et al., 2015; Caterino, Maddison, 2018; Poinar et al., 2009; Alekseev, 2016; Degalier et al., 2019; Zhou et al., 2019; Jiang et al., 2020]. Several extinct species are reported, but not described [Klebs, 1910, Duncan et al., 1998]. Systematical position of some species in taxonomical system of the family is disputable. The earliest them belong to mid-Cretaceous (Burmese amber), the later of the remains from different ages before the Pliocene. The species described below belongs to nominative genus of Bacaniini. It includes 158 species, of which about five sixth are from tropical regions. Bacaniini are very small beetles with uniform habitus, belonging to the ecological group of microhisterids. They inhabit trees of varying degrees of decomposition and decaying vegetation, more than 10 troglobionts are described (nearly half of its in subtropical regions), some species are collected in nests of ants and termites. Most of them feed on fungal spores [Kovarik, Caterino, 2016]. Fossil representatives of the tribe never have been named; one specimen was determined as *Bacanius*? by Edmund Reitter [Klebs, 1910], but the collection of Klebs was mostly lost in the time of Second World War.

Material and methods

Illustrations were prepared with digital camera Canon EOS 6d and microscope Zeiss AxioScope A1. Measurements are abbreviated as follows: PEL — length.
between anterior angles of pronotum and apices of elytra, PL — pronotal length, EL — length of elytron along suture line, APW — pronotal width across anterior angles, PPW — width between posterior angles of pronotum, EW — maximal width between outer margins of elytra, H — distance from metaventrite to maximal high of elytra, measured in lateral position. Numbers in brackets equal the distances between punctures (in their diameters). The piece was mined in Rovno region, most probably in Klesov or Vladimirets and Zarechnoje districts [see Martynova et al., 2019], e.g. Veselukha floodplaine [see Lyubarsky, Perkovsky, 2020]. Holotype is housed in the amber collection of the I.I. Schmalhausen Institute of Zoology, Kiev (SIZK).

Figs 1–3. Bacanius kirejtskhi sp. n.: 1, 3 — habitus, ventral and dorsal view; 2 — head, lateral view.
Рис. 1–3. Bacanius kirejtskhi sp. n.: 1, 3 — габитус, снизу и сверху; 2 — голова, сбоку.
Bacanius kirejtshuki Sokolov et Perkovsky, sp.n.
Figs 1–5.

MATERIAL. Holotype SIZK UA-28067.

DESCRIPTION. Habitus as illustrated (Figs 1–5). PEL = 1.2 mm. H = 0.6 mm. Colour dark brown. Dorsal surface without microsculpture. Broadly oval, moderately convex. Widest at elytral humeri. Head retracted in thorax, relatively big, form typical for the tribe Bacaniini (Figs 2, 4). Frons and epistoma with uniform punctures coarse and sparse (2–3). Frons separate from epistoma by distinct stria, arcuate inwardly to vertex. First antennal segment poorly distinguishable, rest parts of antenna retracted in thorax.

PL = 0.38 mm. PPW = 0.9 mm. APW = 0.8 mm. PPW = 0.9 mm. Small part of pronotum visible only, impossible define features of punctures on the disc (Figs 2, 4). Lateral surface with fine and sparse (2–4) punctures. Marginal pronotal stria complete laterally and anteriorly. Antescutellar stria absent. Scutellum not visible.

EW = 1.0 mm. Elytral punctures fine and sparse (2–4), distinguishable partly from middle to apex. Impossible to discern punctures in basal part of elytra and along suture. Outer subhumeral stria well impressed, complete, prolong to base. Epipleural stria distinct, situated closer to subhumeral striae. Prosternal lobe broad and prominent, with conspicuous sparse punctures (Figs 1, 5). Mesometasternal suture looks like line of coarse punctures. Punctures of meso- and metasternum invisible mostly. Lateral parts of metasternum with various punctures, relatively dense (1.0–1.5). Hind edge of metaventrite arcuate to abdomen. There are outer and inner striae of 1st abdominal ventrite. Its surface coarsely punctured laterally and along anterior margin, rest part finely punctured. Probably pygidium smooth or with very weak punctures.

Legs of typical form for Bacaniini. Foretibia broadened with unique tooth near distal angle. Mesotibia and metatibia narrowed, not strongly broadened apically, mesotibia only with several fine spurs on the apex.

COMPARATIVE REMARKS. The described species belongs to Bacaniini by not truncate elytra that covered exposed tergites, dorsal striae absent. Generic system of Bacanius is developed not so good now, many extant genera of Bacaniini consist with species of former Bacanius sensu stricto. Nonetheless new species has all key characters for attribute it to genus Bacanius. In 1984 Slawomir Mazur established subgenus Gomyister Mazur, 1984, distributed mostly in tropical areas of the Old and New World [Mazur, 1984]. They can be recognized by complete subhumeral stria and absence of antescutellar stria. Bacanius kirejtshuki has that features, so we suppose to place it close to recent Gomyister.

ETYMOLOGY. The new species is dedicated to coleopterist Dr. Sc. Alexander G. Kirejtshuk.

Discussion

Among 158 species of the tribe Bacaniini only 13 species reach the regions with the warm temperate climate [Mazur,
2011]. Moreover, five sixth of all these species are restricted by tropical regions in the distribution. Thus, with high probability we can assign the new species to a group of taxa which had the northern distribution boundary at the late Eocene lying along the southern coast of the Subparathetys [Perkovsky, 2018; Dubovikoff et al., 2020; Legalov et al., 2018, 2019, and references therein]. Many thermophilic insects have the same northern boundary of the distribution. It explains the absence of species shared by both, Rovno and Baltic amber, within the families of the Rovno amber fauna with high portion of the thermophilic taxa, e.g. among 14 bethylid species registered in Rovno amber one species only from extant Chilean genus *Lytopsenella* Kieffer, 1911 was recorded also in the Baltic amber [Perkovsky, 2018; Colombo et al., 2020; our unpublished data], and many of these bethylid genera are strongly thermophilic [Colombo et al., 2020].

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**References**

Alekseev V.I. 2016. Description of two clown beetles (Coleoptera: Staphyliniformia: Hydrophiloidea: Histeridae) from Baltic amber (Cenozoic, Paleogene, Eocene) // Baltic Journal of Coleopterology. Vol.16. No.1. P.27–35.

Caterino M.S., Maddison D.R. 2018. An early and mysterious histerid inquiline from Cretaceous Burmese amber (Coleoptera, Histeridae) // ZooKeys. Vol.733. P.119–129.

Caterino M.S., Wolf-Schwemminger K., Bechly G. 2015. *Cretonthophilus tuberculatus*, a remarkable new genus and species of hister beetle (Coleoptera: Histeridae) from Cretaceous Burmese amber // Zootaxa. Vol.4052. P.241–245.

Chatzimanolis S., Caterino M. S., Engel M. S. 2006. The first fossil of the subfamily Trypaeinae (Coleoptera: Histeridae): a new species of *Trypanaenus* in Dominican amber // Coleopterists' Bulletin. Vol.60. P.333–340.

Colombo W.D., Gobbi F.T., Perkovsky E.E., Azevedo C.O. 2020. Synopsis of the fossil Pristocerinae (Hymenoptera, Bethylidae), with description of two new genera and six species from Burmese, Taimyr, Baltic and Rovno ambers // Historical Biology. DOI: 10.1080/08912963.2020.1733551.

Degalier N., Garrouste R., Nel A. 2019. New and poorly known Cenozoic clown beetle compressions from France (Insecta: Coleoptera: Histeridae) // Annales de la Société entomologique de France (N.S.). Vol.55. No.6. P.471–481.

Dubovikoff D.A., Dlussky G.M., Perkovsky E.E., Abakumov E.V. 2020. A new species of the genus *Protaneuretus* Wheeler (Hymenoptera, Formicidae) from Bitterfeld amber (Late Eocene), with a key to the species of the genus // Paleontologicheskii Zhurnal. No.4. P.67–69 [in Russian, translated: Paleontological Journal. Vol.54. No.4. in press].

Duncan I.J., Briggs D.E.G., Archer M. 1998. Three-dimensionally mineralized insects and millipedes from the Tertiary of Riverleigh, Queensland, Australia // Palaeontology. Vol.41. P.835–851.

Heer O. 1862. Beiträge zur Insektenfauna Oonomens. Coleoptera-Geodephagen, Hydrocantharien, Gymnid, Brachelytren, Clavicornen, Lamellicornen und Buprestiden. Naturkundige Verhandelingen van de Hollandsche maatschappij der Wetenschappen te Haarlem. Ser.2. Vol.16. S.1–90.

Jiang R., Song W., Yang H., Shi C., Wang S. 2020. Discovery of the first *Onthophilus* species from mid-Cretaceous Burmese amber (Coleoptera: Histeridae) // Cretaceous Research. Vol.111. 104443. https://doi.org/10.1016/j.cretres.2020.104443.

Klebs R. 1910. Über Bernsteinensclüsse in allgemeinen und die Coleopteren meiner Bernsteinsammlung // Schriften der Physikalisch-ökonomischen Gesellschaft zu Königsberg. Bd.51. H.3. S.217–242.

Kovarik P., Caterino M.S. 2016. Histeridae Gylenhal, 1808 // R.G. Beutel, R.A.B. Leschen (eds.). Handbook of zoology. Pt.38. Coleoptera. Vol.1. Morphology and Systematics. 2nd ed. Berlin: Walter De Gruyter. P.281–314.

Legalov A.A., Nazarenko V.Yu., Perkovsky E.E. 2018. A new genus of fungus weevils (Coleoptera: Anthribidae) in Rovno amber // Fossil Record. Vol.21. P.207–212.

Legalov A.A., Nazarenko V.Yu., Perkovsky E.E. 2019. New weevils (Coleoptera: Curculionidae) from Rovno amber // Paleontol. J. Vol.53. No.10. P.1054–1059.

Lyubarsky G.Yu., Perkovsky E.E. 2020. First Rovno amber species of the genus *Telmatophilus* (Coleoptera: Clavicornia: Cryptophagidae) from Veselukha floodplain // Invert. Zool. Vol.17. No.1. P.25–35. doi: 10.15298/invertzool.17.1.03.

Martynova K.V., Perkovsky E.E., Olmi M., Vasilenko D.V. 2019. New records of Upper Eocene chrysidoid wasps (Hymenoptera: Chrysididae) from basins of Stryr and Stokhid rivers (Rovno amber) // Paleontol. J. Vol.53. No.10. P.998–1023.

Mazur S. 1984. A world catalogue of Histeridae // Polskie Pismo Entomologiczne. Vol.54. Nos 3–4. P.1–376.

Mazur S. 2011. A concise catalogue of the Histeridae (Coleoptera). Warsaw: Warsaw University of Life Sciences — SGGW Press. 332 p.

Perkovsky E.E. 2018. Only a half of species of Hymenoptera in Baltic amber // Fossil Record. Vol.21. P.207–212.

Poinar G., Brown A.E. 2009. *Pantostictus burmanicus*, a new genus and species of Cretaceous beetles (Coleoptera, Hydrophiloidea, Histeridae) in Burmese amber // Proceedings of the Entomological Society of Washington. Vol.111. P.38–46.

Theobald N. 1935. Taxonomic names, in *La faune entomologique de l’Cambodge*. Bulletin. Vol.60. P.333–340.

Wheeler G.A. 1911 was record-