https://doi.org/10.59893/bjc.25(1).006
Baltic J. Coleopterol. 25(1) 2025
ISSN 1407 – 8619

First representative of *Cacotemnus* LeConte (Coleoptera: Ptinidae) from Eocene fossil resin

Vitalii Alekseev, Andris Bukejs

Alekseev V., Bukejs A. 2025. First representative of *Cacotemnus* LeConte (Coleoptera: Ptinidae) from Eocene fossil resin. *Baltic J. Coleopterol., 25(1): 69 – 76.*

A new fossil deathwatch beetle, *Cacotemnus succinophilus* sp. nov., is described on the basis of a single adult inclusion in Baltic amber. The new species is compared with morphologically similar anobiine species from this fossil resin and with closely related extant beetles.

Keywords: Anobiinae, palaeodiversity, Cenozoic, Paleogene, beetles, new species

Vitalii Alekseev. Immanuel Kant Baltic Federal University, Nevskogo 14, Kaliningrad 236016, Russia; e-mail: alekseew0802@yahoo.com;
ORCID: 0000-0003-4390-5443

Andris Bukejs. Institute of Life Sciences and Technologies, Daugavpils University, Parādes 1A – 101, Daugavpils LV-5401, Latvia; e-mail: carabidae@inbox.lv;
ORCID: 0000-0001-7165-3023

INTRODUCTION

Established by LeConte (1861) the anobiine genus *Cacotemnus* has considerably difficult taxonomic history. For a long time representatives the genus were included in the subgenus *Hadrobregmus* Thomson, 1859 within the genus *Anobium* Fabricius, 1775 (Toskina 2004). Lloyd Vernon Knutson (1963) confirmed the validity of the genus *Cacotemnus* and many recent studies follow his concept (Toskina 2004; Zahradník & Háva 2014a; present paper). White (1965) suggested the differences between *Hemicoelus* LeConte, 1861 and *Cacotemnus* unreliable and proposed *Cacotemnus* as a synonym of *Hemicoelus*. The opinion was accepted by many subsequent authors (e.g. Logvinovskij 1985; White 1974, 1982; Arango & Young 2012).

The Holarctic genus *Cacotemnus* LeConte, 1861 comprises 13 extant species (Knutson 1963; Toskina 2004; Zahradník 2007, 2015) and can be externally characterized by the not pronounced prothoracic gibbosity (strongly pronounced in *Hemicoelus*, with steep lateral slopes), stretched elytral apices and absence of deep anterior excavation of metasternum (rounded or truncate elytral apices, and usually deep, excavate metasternal cavity in the genus *Anobium*). Additional differences between genera *Cacotemnus* and *Hemicoelus* can be found by observing wing venation and genital structures (see Knutson 1963; Toskina 2004).

The deathwatch beetles subfamily Anobiinae is fairly well represented in Baltic amber: twelve Baltic amber species from eight anobiine genera have been described so far (Alekseev & Bukejs 2023): *Nicobium* LeConte (1 sp.), *Trichodesma* LeConte (4 spp.), *Microbregma* Seidlitz (2 spp.), '*Anobium*' Fabricius (1 sp.), *Hemicoelus*

LeConte (1 sp.), *Hadrobregmus* Thomson (1 sp.), *Gastrallus* Jacquelin du Val (2 spp.), and *Falsogastrallus* Pic (1 sp.). There are no certain reports of the genus *Cacotemnus* from this or another fossil resin. A deathwatch beetle that appeared belonged to the extant genus *Cacotemnus* was first reported from Baltic amber by Hermann Burmeister almost a century ago and the report is *verbatim* as follows: "Nicht selten dagegen find Deperditoren, namentlich Formen wie *Anobium pertinax* Lin. und *An. rufipes* Fabr." [On the contraty, I found pests, namely forms like *Anobium pertinax* Lin. and *A. rufipes* Fabr. not seldom] (Burmeister 1832: 635). This report has been later cited by authors of different catalogues (e.g. Spahr 1981; Zahradník & Háva 2014b) as *Anobium* aff. *rufipes* F. and can be interpreted as a single specimen-based report of the genus *Cacotemnus* from Baltic amber due to current systematic position of Recent European species *Cacotemnus rufipes* (Fabricius, 1792).

In the present paper, the new extinct Cenozoic species, *Cacotemnus succinophilus* sp. nov., is described and illustrated from Eocene Baltic amber. It is the first verifiable report of the genus from the European Eocene.

MATERIAL AND METHODS

The palaeontological material examined in the present study (the holotype) is deposited in the collection of the Kaliningrad Regional Amber Museum (Russia) [acronym KRAM, prefix KAM] and was purchased by the museum from the private collection of Mr. Konstantin V. Andrushchenko (Kaliningrad) in October 2024. The amber piece was polished manually with emery papers of different grit sizes, allowing improved views of the included specimen, and not subjected to any supplementary fixation. Measurements of the holotype were made using an ocular micrometer in a stereoscopic microscope MBS-9. Photographic documentation was performed using a Canon EOS 4000D camera mounted on a Zeiss microscope. Extended depth of field at high magnifications was achieved by combining multiple images from a range of focal planes using Helicon Focus v.8.2.2 software, and the resulting images were edited to create figures using Adobe Photoshop CC 2017.

The following references were used for the taxonomic placement and comparison with extant and extinct taxa and congeners that are presumed to be phylogenetically allied with the fossil material: Knutson (1963), Kuśka (1992), Toskina (2004), Hawkeswood et al. (2009), Zahradník & Háva (2014b), Bukejs & Alekseev (2015), Zahradník (2015), Bukejs et al. (2017).

SYSTEMATIC PALEONTOLOGY

Family Ptinidae Latreille, 1802
Subfamily Anobiinae Fleming, 1821
Tribe Anobiini Fleming, 1821
Genus *Cacotemnus* LeConte, 1861

Type species: *Anobium errans* Melsheimer, 1846

Taxonomic assignment. The inclusion examined shows a combination of external characters corresponding to the genus *Cacotemnus* within the tribe Anobiini: (1) distinctly clubbed 11-segmented antennae with antennomeres 9–11 longer than the preceding five antennomeres combined and antennomeres 5–8 not serrate; (2) procoxae distinctly separated; (3) elytra striate-punctate, lacking long pubescence; (4) metaventrite with shallow anterior impression not reaching its middle; (5) elytral apices truncated, slightly stretched; (6) pronotal gibbosity not pronounced, gradually convex, lacking deep lateral symmetrical impressions; and (7) all abdominal ventrite sutures distinct throughout length, ventrite 1 slightly longer then ventrite 3.

***Cacotemnus succinophilus* sp. nov.**

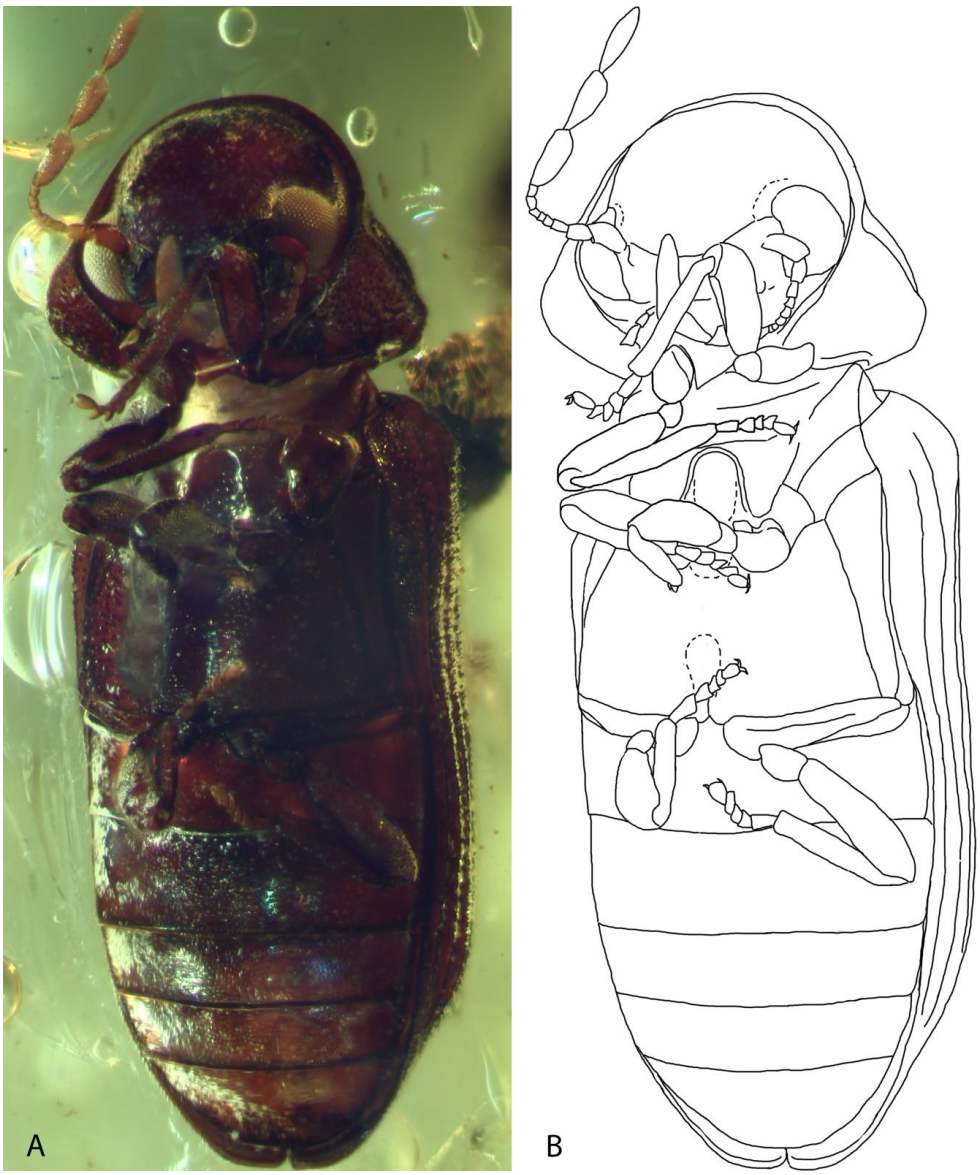

Fig. 1. *Cacotemnus succinophilus* sp. nov., holotype, No KAM 8932 [KRAM], habitus in ventral view: A – macrophotograph; B – schematic drawing. Scale bar = 1.0 mm.

Type material. Holotype: No KAM 8932 [KRAM]; "*Holotype / *Cacotemnus* / *succinophilus* /* sp. nov. / Alekseev et Bukejs / des. 2025" [red handwritten label]; adult, sex unknown. Complete beetle included in a small, prismatic, transparent, yellow amber piece with dimensions of 21 × 8 × 6 mm; preserved without supplementary fixation.

Syninclusions: one specimen of Ceratopogonidae (Diptera: Nematocera), and many small fragments of decayed wood.

Locus typicus. Yantarny settlement (formerly Palmnicken), Sambian (Samland) Peninsula, Kaliningrad Region.

Fig. 2. *Cacotemnus succinophilus* sp. nov., holotype, No KAM 8932 [KRAM], habitus: A – dorsal view; B – left lateral view. Scale bars = 1.0 mm.

Stratum typicum. Baltic amber, most probable from the Eocene amber-bearing layers of *Blaue Erde* (Blue Earth) within the Prussian Formation; estimated age: middle-late Eocene.

Description. Measurements: total body length 3.43 mm, body maximum width 1.29 mm; pronotum length 0.88 mm, pronotum maximum width 1.14 mm; elytra length 2.55 mm, elytra maximum combined width 1.29 mm.

Body shape cylindrical, elongate oval in dorsal outline, convex dorsally and ventrally; integument uniformly brown (as preserved); dorsum apparently glabrous, with extremely short and fine pubescence discernible on lateral elytral sides.

Head hypognathous, turned downwards and not visible in dorsal view, evenly and weakly convex dorsally, finely and densely punctate; frons weakly convex, without tubercles or carinae. Compound eyes oval, convex, entire, with distinct small facets, without ommatidial setae; distance between compound eyes nearly equal to 1.75× vertical diameter of one eye. Antennae 11-segmented, with 3-segmented club; scape subcylindrical, weakly thickened; pedicel oval, 0.5× length of scape; antennomere 3 cylindrical, shorter than pedicel; antennomeres 4–8 small, nearly as long as wide; antennomeres 9–11 elongate, flattened, equal in length. Relative length ratios of antennomeres 1–11 equal to 20-12-6-3-3-4-4-4-30-30-30. Apical maxillary palpomere flattened, truncated apically, about 1.5× as long as penultimate palpomere.

Pronotum weakly transverse, about 1.3× as wide as long, about as wide as elytral base region; covered with fine, dense punctation. Anterior margin arcuate, posterior margin weakly convex; lateral margins convex in dorsal view, lateral edge entire. Posterior pronotal angles widely rounded, indistinct; anterior angles rounded. Pronotum with gradually convex gibbosity, lacking symmetrical impressions or longitudinal median furrow. Prosternal intercoxal process triangular, wide, about as wide as diameter of procoxa. Proxocal cavities open behind.

Elytra subparallel, elongate, about 1.97× as long as combined width, 2.9× as long as pronotum; elytral apices truncated, slightly stretched. Elytral punctures round, middle-sized, arranged in regular striae. Each elytron with 10 striae plus shortened scutellar stria, striae distinct throughout entire length of elytron, distance between strial punctures equal to 0.3–1.0× diameter of one puncture, elytral striae on disc not grouped in pairs; interstrial intervals transversely shagreened, interstriae 8–10 weakly convex, distance between striae about 1.0–1.5× diameter of one strial puncture. Mesoventrite finely and sparsely punctuate; with deep longitudinal medial elongately oval impression, and with two subtriangular impressions at anterior margin (anterior to mesocoxae); impressions delimited by sharp carinae. Metaventrite convex, with fine punctures, distance between punctures about 1.0–1.5× diameter of one puncture; with shallow, semicircular transverse impression in anterior portion (joined to impression of mesoventrite), about 0.2× of metaventrite length (medially); with elongately oval impression in posterior portion in area of discrimen. Metepisternum about 4.3× as long as wide, finely punctate, widest in anterior part and gradually narrowed posteriad.

Legs moderately short. Procoxae oval, distinctly separated by distance about 0.7× procoxal maximum length; mesocoxae globose, separated by comparatively wide distance about 1.0× mesocoxal diameter; metacoxae narrow, transverse, with groove for reception of metafemora. Trochanters subglobose. Femora almost straight, short, weakly dilated apicaly. Tibiae straight, nearly as long as femora. Tarsi slender, tarsal formula 5-5-5. Tarsomeres 3–4 shortes, tarsomeres 1 and 5 longest. Claws free, falcate, thickened basally.

Abdomen with five visible, finely punctuate ventrites; abdominal sutures distinct throughout length. Relative length (medially) ratios of ventrites 1–5 equal to 17-16-11-10-11. Intercoxal process of abdominal ventrite 1 triangular, with acute anterior angle.

Differential diagnosis. *Cacotemnus succinophilus* sp. nov. differs from extant species in combination of following characters: (1) pronotum nearly as wide as elytral base, (2) procoxae separated by

comparatively wide triangular prosternal process, (3) length of antennomere 9 less than length of antennomeres 2–8 combined, (4) mesocoxae separated by distance about one coxal diameter, (5) dorsal pubescence not discernible in elytral disc, (6) prothoracic gibbosity without longitudinal furrow, and (7) lateral margin of pronotum not emarginated.

Four fossil species of the tribe Anobiini have previously been described from Baltic amber (Kuśka 1992; Hawkeswood et al. 2009; Bukejs & Alekseev 2015; Bukejs et al. 2017): '*Anobium' jacquelinae* Hawkeswood et al.2009; *Microbregma sucinoemarginatum* (Kuśka, 1992); *M. waldwico* Bukejs & Alekseev, 2015; and *Hemicoelus favonii* Bukejs et al. 2017. The newly described extinct species, *Cacotemnus succinophilus* sp. nov., can be distinguished from the previously described anobiine species by the pronotal sculpture (non pronounced gibbosity without paired lateral or median impressions with simple convex lateral sides), and by the body length (3.4 mm, in contrast to 3.8–4.6 mm in *M. waldwico*, and 3.0 mm in *A. jacquelinae*, or 1.8 mm in *H. favonii*).

Derivatio nominis. The specific epithet *succinophilus* is a compound adjective formed after the Latin *succinum* (amber) and the latinized Old Greek suffix *–philus* (having an affinity, attraction, preference of something).

DISCUSSION

Cacotemnus is a Holarctic genus with representatives occurring in Eurasia and North Amercia today. The Recent fauna includes 13 valid extant species (Knutson 1963; Toskina 2004; Zahradník 2007; Zahradník 2015): *C. aldai* Zahradník, 2015 (Asia: Kazakhstan), *C. carinatus* (Say, 1823) (North America: eastern USA and Canada), *C. caucasicus* Zahradník, 2015 (Europe: North Caucasus), *C. defectus* (Fall, 1905) (North America: northern USA, Canada), *C. demokidovi* Toskina, 2004 (Europe: North Caucasus), *C. kompanzevi* (Logvinovskiy, 1979) (Asia: Kirghizia), *C. laticollis* (Fall, 1905) (North America: USA: California), *C. panfllovi* Toskina, 2004 (Europe: South Russia), *C. parfentievi* Toskina, 2004 (Asia: Uzbekistan), *C. rufipes* (Fabricius, 1792) (widely distributed in Palaearctic), *C. thomsoni* (Kraatz, 1881) (Europe, Asia: Siberia), *C. umbrosus* (Fall, 1905) (North America: USA, Canada), and *C. zavadskiyi* Toskina, 2004 (Asia: Azerbaijan). Species of *Cacotemnus* have been recorded from a variety of deciduous (both hardwood and softwood) as well as conifer trees species, however the bionomy of the extant species is more or less sufficiently studied for the most common and wide distributed species only. Unfortunately, temperature preference cannot be specified for fossil *Cacotemnus succinophilus* sp. nov. because wide distribution of the genus in temperate regions of Recent and not detailed studied distribution limits of the species; host association either with coniferous or deciduous trees cannot be specified for the Baltic amber *Cacotemnus succinophilus* sp. nov. in the light of absence of detected clear feeding preference in modern representatives of the genus.

ACKNOWLEDGEMENTS

Two anonymous reviewers are thanked for their helpful comments and efforts to improve our manuscript.

REFERENCES

Alekseev V.I., Bukejs A. 2023. The first Paleogene record of *Hyperisus* Mulsant and Rey (Coleoptera: Ptinidae) with

description of a new species and an attempt of biogeographic analysis of ptinid assemblage in Baltic amber. *Historical Biology*, *37 (2): 203–207.*

Arango R.A., Young D.K. 2012. *Death-watch and spider beetles of Wisconsin—Coleoptera: Ptinidae. General Technical Report FPL-GTR-209. U.S. Department of Agriculture, Forest Service, Forest Products Laboratory, Madison, 158 pp.*

Bukejs A., Alekseev V.I. 2015. A second Eocene species of death-watch beetle belonging to the genus *Microbregma* Seidlitz (Coleoptera: Bostrichoidea) with a checklist of fossil Ptinidae. *Zootaxa*, *3947 (4): 553–562.*

Bukejs A., Alekseev V.I., Cooper D.M.L., King G.A., McKellar R.C. 2017. Contributions to the palaeofauna of Ptinidae (Coleptera) known from Baltic amber. *Zootaxa, 4344 (1): 181–188.*

Burmeister H., 1832. *Handbuch der Entomologie. Bd. 1*, Berlin: Reimer, 696 S.

Hawkeswood T.J., Makhan D., Turner J.R. 2009. *Anobium jacquelinae* sp. nov., a new wood-boring beetle (Coleoptera: Anobiidae) from Baltic Amber. *Giornale Italiano di Entomologia*, *12: 181–187.*

Knutson L.V. 1963. Revision of the genus *Hadrobregmus* of North America (Coleoptera: Anobiidae). *Proceedings, Entomological Society of Washington*, *65: 177–195.*

Kuśka A. 1992. Three new species of beetles (Coleoptera: Cantharidae, Anobiidae, Curculionidae) from the Baltic amber. *Annals of the Upper Silesian Museum—Entomology*, *3: 107–113.*

LeConte J.L. 1861. Classification of the Coleoptera of North America. Prepared for the Smithsonian Institution. Part I. *Smithsonian Miscellaneous Collections*, *136: 1–214.*

Logvinovskij V.D. (1985) Family Anobiidae. *In*: Skarlato, O.A (Ed.), *Fauna SSSR. Coleoptera, XIV (2)*. *Nauka, Leningrad, pp. 1–175. [in Russian]*

Spahr U. 1981. Systematischer Katalog der Bernstein- und Kopal-Käfer (Coleoptera). *Stuttgarter Beiträge zur Naturkunde*, *Series B*, *80: 1–107.*

Toskina I.N. 2004. About genera *Anobium* Fabricius, 1775, and *Cacotemnus* LeConte, 1861 (Coleoptera: Anobiidae). *Russian Entomological Journal*, *13 (1–2): 53–68.*

White R.E. 1965. Taxonomic and distribution notes on Anobiidae (Coleoptera). *The Coleopterists Bulletin*, *19: 113–116.*

White R.E. 1974. Type-species for world genera of Anobiidae. *Transactions of the American Entomological Society*, *99: 415–475.*

White R.E. 1982. *A Catalog of the Coleoptera of America North of Mexico. Family Anobiidae.* U.S. Department of *Agriculture, Washington, D.C., 58 pp.*

Zahradník P. 2007. Family Ptinidae. *In*: Löbl, I. & Smetana, A. (Eds.), *Catalogue of Palaearctic Coleoptera. Vol. 4. Apollo Books, Stenstrup, pp. 328–362.*

Zahradník P. 2015. Ptinidae, Bostrichidae and Endecatomidae (Coleoptera: Bostrichoidea) from Aldo Olexa´s collection. *Folia Heyrovskyana. Series* A, 23 (1): 115–139.

Zahradník P., Háva J. 2014a. Catalogue of the world genera and subgenera of the

superfamilies Derodontoidea and Bostrichoidea (Coleoptera: Derodontiformia, Bostrichiformia). *Zootaxa*, *3754 (4), 301–352.*

Zahradník P., Háva J. 2014b. New Ptinidae (Coleoptera: Bostrichoidea) from Baltic amber with a list of known fossil species. *Studies and Reports, Taxonomical Series*, *10, 629–646.*

Received:18.08.2025.
Accepted: 01.12.2025.