New fossil spider beetles from Baltic amber
(Coleoptera Ptinidae)

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Summary - Two new fossil spider beetles, *Sucinoptinus sucini* **nov. gen. nov. sp.** and *Ptinus (Gynopterus) inclusus* **nov. sp.**, included in Baltic amber (Late Eocene) are described. Remarks on these species, on their relationships with the extant Ptinidae, and on their possible association with coniferous forests, are provided.

Zusammenfassung - Zwei neuen fossilen Ptiniden, *Sucinoptinus sucini* **nov. gen. nov. sp.** und *Ptinus (Gynopterus) inclusus* **nov. sp.**, vom baltischen Bernstein (Obereozäne) werden beschrieben. Manche Beobachtungen über diese Diebskäferarten, ihre Beziehungen mit den rezenten verwandten Arten und ihre möglichen Verbindungen mit Nadelwäldern werden besprochen.

Key-words - Coleoptera, Ptinidae, Ptininae, Ptinini, Baltic amber, Eocene, new genus, new fossil species.

Introduction

At present, the family Ptinidae (spider beetles) includes about 70 genera and some 700 extant species (BELLÉS, 1991, see also LAWRENCE and REICHARDT, 1969; PHILIPS, 2000) distributed throughout the major regions of the world but being particularly abundant in the drier parts of the subtropical and temperate areas (HOWE, 1959). Spider beetles are mainly scavengers and both larvae and adults can feed equally readily on vegetal or animal materials. This explains why a number of species have become pests of stored products and have a practically cosmopolitan distribution as a consequence of man-associated travelling (HINTON, 1941; HOWE, 1959). Spider beetles are small-sized, the length ranging from 0.9 mm (*Pitnus longicornis* Bellés, 1992, from the Lesser Antilles) to 5.1 mm (*Ptinus pyrenaeus* Pic, 1987, from Southern Europe). Minute size is in all likelihood related to their scarcity among stone fossils.

The first fossil Ptinids were described by HEYDEN (1859) and HEYDEN & HEYDEN (1866) as belonging to the genus *Ptinus* Linnaeus, 1767, from Late Oligocene brown-coal samples from Salzburg (Austria) and Rott (Rheinland, Germany), respectively. One century later, HAUPT (1956) described two species assigned to *Niptus* Boieldieu, 1856, from Middle Eocene brown-coal samples from

Geiseltal (Sachsen-Anhalt, Germany). One of them, namely *N. denserugosus*, was unfortunately destroyed during the study and the description (HAUPT, 1956).

More recently, SPILMAN (1976) reported a new subfossil *Ptinus* - in all likelihood a still existing species - from Late Pleistocene American rat nests, while MADDY *et alii* (1994) and FIELD *et alii* (2000) mentioned unclassified *Ptinus*-species from Middle Pleistocene deposits in England and France, respectively. Indeed, the exact taxonomic position of most of these species is fairly uncertain due to type conditions and ambiguities of the findings.

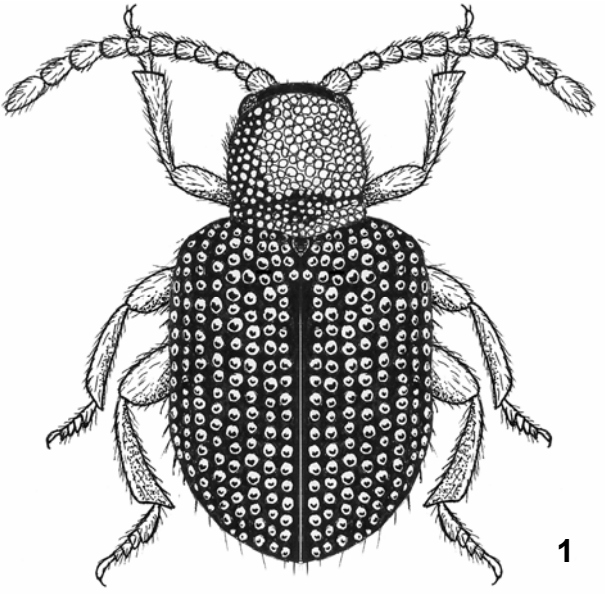
Spider beetles have been mentioned from Baltic amber for more than a century and a half ago (MENGE, 1856; HELM, 1886; 1896). Some of the specimens were identified at generic level as belonging to *Ptinus* (BERENDT, 1845; GIEBEL, 1852; 1856a; 1856b; SCUDDER, 1885; HANDLIRSCH, 1907; KLEBS, 1910; BACHOFEN-ECHT, 1949; LARSSON, 1978), whereas some others were labelled as *Niptus* (KLEBS, 1910; BACHOFEN-ECHT, 1949; LARSSON, 1978). Nonetheless, no spider beetles have been identified or described yet at species level. According to HIEKE & PIETRZENIUK (1984) spider beetles are rare in Baltic amber, representing only 0.4% of the beetles preserved in representative museums. The present paper reports the first descriptions of new Baltic amber fossil species belonging to Ptinidae.

The geochronological data used in this work are based on the GeoWhen Database of the Physics Department, University of California at Berkeley. It is in accordance with the 2004 time scale endorsed by the International Commission on Stratigraphy.

Taxonomic descriptions

Sucinoptinus nov. gen. (Figs. 1-4)

Description. Small sized (ca. 2 mm). Subparallel-sided in both sexes.
Head vertical, interantennal space narrow but flat; labrum subtriangular; eyes hemispherical but not very prominent. Antennae eleven-segmented.
Prothorax subcylindrical. Pronotum subparallel-sided, practically not constricted near the base, slightly convex at the disk, transversally depressed in the posterior third. Prosternal process narrow (narrower that the diameter of a procoxa) and long (reaching the mesosternum). Mesosternum short, mesosternal process as wide as the diameter of a mesocoxa. Metasternum transverse, flat and without longitudinal furrow, space between metacoxae long, as long as the length of the metafemur.
Legs short and robust, femora club-shaped; tibiae apically enlarged, obliquely truncated at the apex; tarsi five-segmented in all legs. Scutellum triangular and well apparent.
Elytra robust, with marked humeri, parallel-sided in both sexes; longitudinally punctato-striated and pubescent.



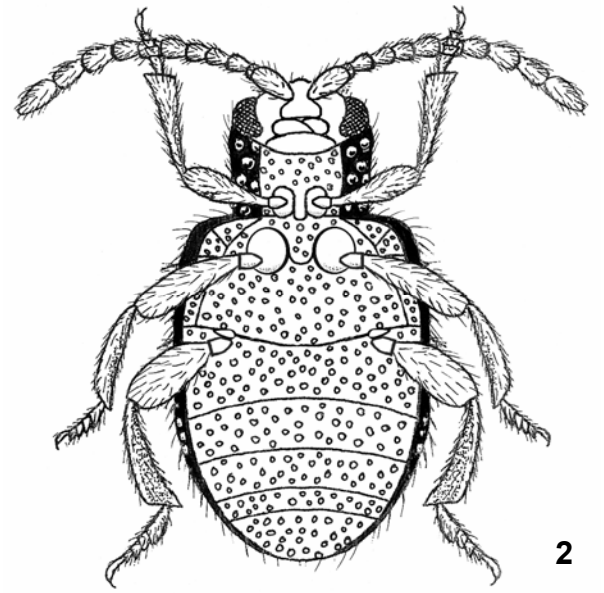


Fig. 1: *Sucinoptinus sucini* **nov. gen.**, **nov. sp.**, habitus, dorsal view. **Fig. 2**: ditto, ventral view.

Abdomen with five visible sternites, the first, second, third and fifth subequal in length, the fourth shorter, approximately half the length of the others.

Type species. *Sucinoptinus sucini* nov. sp.

Etymology. The name derives form the composition of the Latin word *sucinum* (= amber) and the generic name *Ptinus*. Gender masculine.

Discussion. The basic morphological characters and the general shape (eyes quite prominent, antennae relatively slender, scutellum well apparent, elytra parallel-sided, etc.) correspond to a *Ptinus*-like Ptinidae, and the new genus should be included in the tribe Ptinini.

However, a number of characters of the new genus are quite special among the Ptinini. For example, the interantennal space flat and relatively large occurs very rarely in this tribe, for example in the genus *Xylodes* Waterhouse, 1876 from Madagascar and adjacent islands (BELLÉS, 1988; 1991). Nevertheless, the particular pronotal structure of *Xylodes* (see BELLÉS, 1988; 1991) readily distinguishes it from *Sucinoptinus*.

The pronotum of the new genus, subcylindrical and practically not constricted near the base, is also very characteristic. Among the Ptinini, it reminds that of the genus *Prosternoptinus* Bellés, 1985 from North-Eastern South America (BELLÉS, 1985). The genus *Prosternoptinus*, however, has a very particular prosternum, enlarged and excavated in the anterior part, in such a manner that it conceals the base of the head (BELLÉS, 1985). Conversely, *Sucinoptinus* has a simple prosternum and free articulated head.

Finally, there are other characters, like the notable separation between the metacoxae, and the robustness of the legs, with club-shaped femora and sub-trapezoidal tibiae, that remind of some *Niptus*-like genera, and which places *Sucinoptinus* as a very particular and well characterised genus of Ptinini.

Sucinoptinus sucini nov. sp. (Figs. 1-4)

Holotype. ♀, Poland, Baltic Coast, ex. coll. A. Gorski, FV collection. Age: Late Eocene (37.2-33.9 Myr BP) (Fig. 3).

Paratype. Possibly ♂, Russia, Jantarny (formerly Palmnicken), ex. coll. P. Rüdel B-1335, XB collection. Age: Late Eocene (37.2-33.9 Myr BP). Specimen (Fig. 4) with the right antennomeres V-XI, the left antennomeres II-XI and the scutellum lost. The legs, folded under the body, are not visible from the dorsal side. Moreover, a white foam-like material covers the apex of the elytra. Probably, the specimen was already dead when included in amber. The occurrence of remnants of a spider net in the same sample, suggests that the spider beetle might have fallen and died in it before being included in the resin.

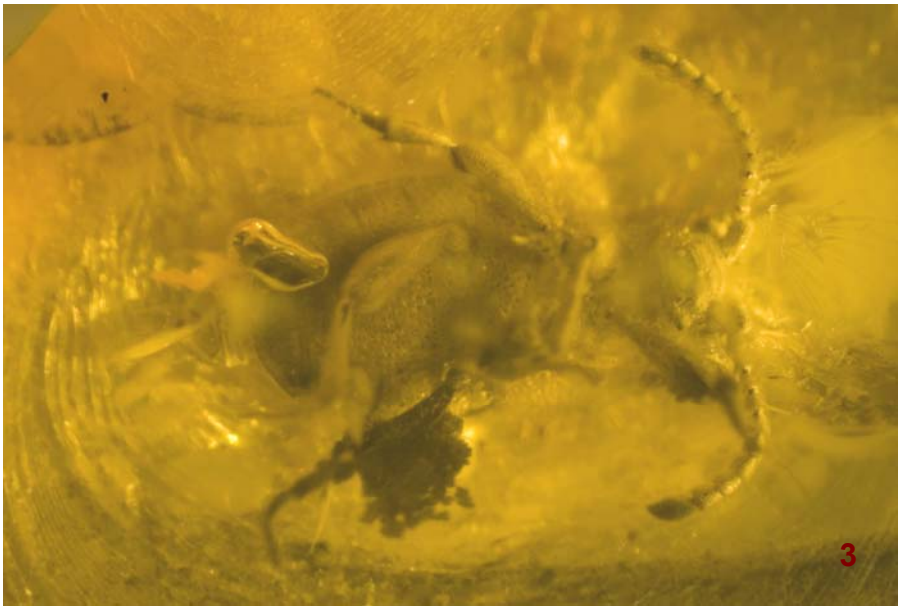


Fig. 3: *Sucinoptinus sucini* **nov. gen.**, **nov. sp.**, Holotype. **Fig. 4**: ditto, Paratype.

Description. Length: 1.8 (holotype) - 2.1 (paratype) mm. Robust, parallel-sided; colour brownish-piceous.
Head finely punctuated and pubescent; interantennal space narrow (as narrow as the width of the first protarsal segment) but flat; eyes hemispherical, not very prominent and finely facetted. Antennae eleven-segmented, short and robust, reaching the basal third of the elytra, covered with dense recumbent pubescence; antennomere proportions according to the formula: 8-2-3-3-3-3-4-4-5-5-7.
Pronotum as long as wide, scarcely wider than a single elytron; apical margin widely convex anteriorly and covering the head, grooved with a wide transversal furrow on the apical fourth; subparallel; practically not constricted near the base, slightly convex at the disk, and showing a feeble and transversal depression in the posterior third; surface with dense round tubercles coarser than facets of eyes; pubescence mainly formed by short semi-recumbent hairs evenly distributed.
Legs short and robust, covered with short recumbent pubescence; trochanter short; femora club-shaped; tibiae feebly bowed, apically enlarged, obliquely truncated at the apex. Tarsi relatively long, nearly as long as tibiae; metatarsomere I as long as the following two together; metatarsomere II and III sub-equal; metatarsomere IV slightly shorter and narrower than previous two; onychium slightly shorter than metatarsomere I, with simple claws. Scutellum triangular, as long as wide, well apparent.
Elytra subparallel; humeri well marked; surface regularly punctuated by round-shaped strial punctures, with the diameter similar to the width of the intervals; pubescence formed by moderately long semierect golden setae inserted on the intervals.

Etymology. The specific name is derived from the Latin word for amber, as in the generic name.

Discussion. At present, *Sucinoptinus sucini* nov. sp. is the sole species of the genus.

Ptinus (Gynopterus) inclusus nov. sp. (Figs. 5-7)

Holotype. Possibly ♀, Russia, Jantarny (formerly Palmnicken), ex. coll. P. Rüdel B-1189, FV collection. Age: Late Eocene (37.2-33.9 Myr BP).

Description. Length: 1.9 mm. Elongate, subparallel-sided; colour brownish-piceous.
Head finely punctuated; antennal insertions very close each other, leaving an interantennal space narrow and acute; eyes hemispherical and finely facetted. Antennae eleven-segmented, fairly long, reaching the apical third of the elytra; apex of each antennomere covered with semirecumbent setae; antennomere proportions according to the formula: 6-2-3.5-4-4.5-5-5-5-5-6-9.

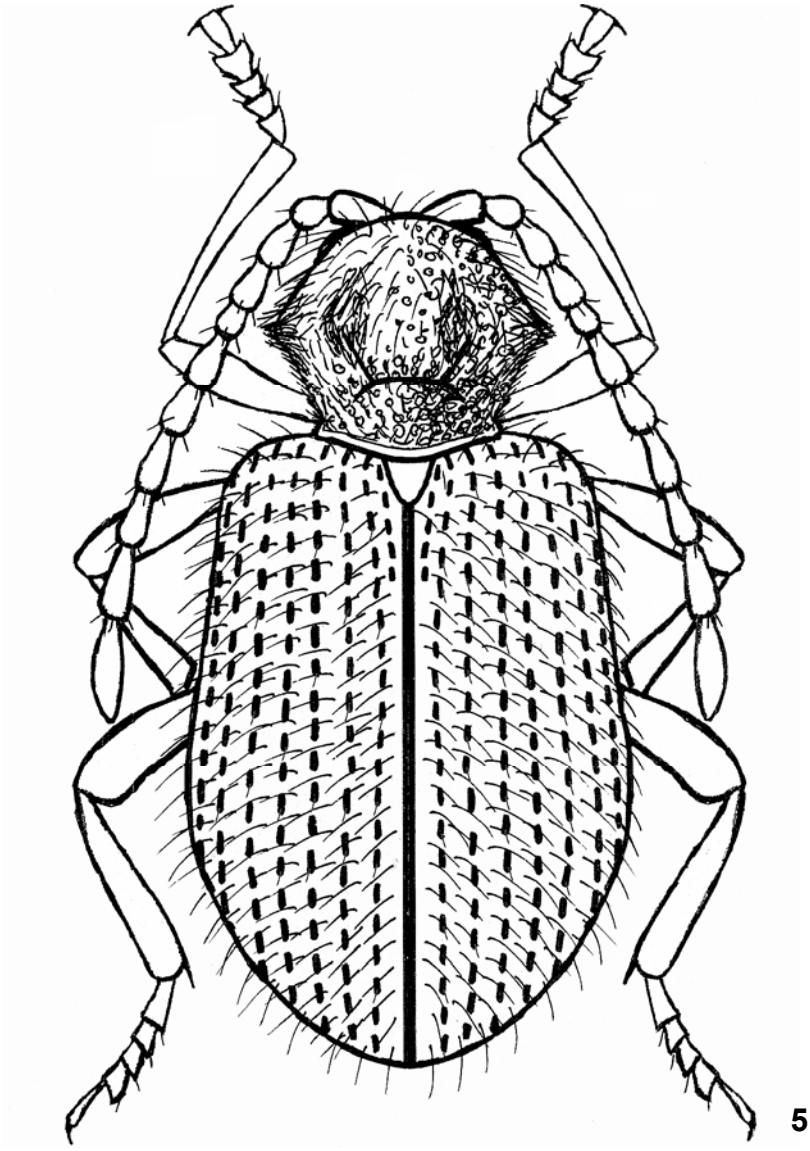


Fig. 5: *Ptinus (Gynopterus) inclusus* **nov. sp.**, habitus, dorsal view.

Fig. 6: *Ptinus (Gynopterus) inclusus* **nov. sp.**, Holotype. **Fig. 7**: ditto, ventral side.

Pronotum somewhat longer than wide, wider than a single elytron; apical margin widely convex anteriorly and partially covering the head, finely furrowed along the margin; sides showing a moderately prominent, pointed and pubescent protuberance at the middle; at the anterior third, sides are convergent towards the head, and at the posterior third, sides are almost parallel, showing only a slight constriction just before the base; disk convex in the middle and concave at the posterior third; surface with moderately dense low tubercles coarser than facets of eyes; pubescence mainly formed by semirecumbent setae, especially abundant in the anterior part and in the lateral protuberances.
Legs relatively long, robust, with five segments in all tarsi. Scutellum subtriangular and well apparent.
Elytra subparallel, although feebly enlarged posteriorly; humeri well marked; surface regularly punctuated by line-shaped strial punctures, which are much narrower than the intervals; pubescence formed by moderately long semierect golden setae on the intervals, and short, recumbent golden hairs on the strial punctures.

Etymology. The specific name is derived from the *locus typicus*, the Baltic area.

Discussion. The general shape and basic morphological features of the specimen available fit with those of a female of the genus *Ptinus*, subgenus *Gynopterus* Mulsant & Rey, 1868 (see BOIELDIEU, 1856), showing moderately convex eyes, relatively robust appendages and elytra subparallel but slightly enlarged towards the apex. However, it does not belong to any of the species described of this subgenus.

The most particular character of *P.* (*G.*) *inclusus* is the structure of the pronotum, with the posterior sides almost parallel, showing only a slight constriction just before the base, and the disk convex in the middle and concave at the posterior third. This pronotal shape is unique among the *Gynopterus*, and reminds those of the genera *Trigonogenius* Solier, 1849 and *Africogenius* Borowsky, 2000 (see BOROWSKY, 2000).

Indeed, the particular combination of *Trigonogenius*-like features of the pronotum with general *Ptinus*-like shape would perhaps justify the proposal of a new genus for this fossil species. However, having only a specimen available, it seems more prudent to place it in the highly diverse and probably polyphyletic subgenus *Gynopterus*.

Natural history remarks

The finding of the species described herein in Baltic amber deserves some natural history comments. As stated above, spider beetles are mainly scavengers and are rarely observed on trees, showing xylophagous tendencies. Although a number of representatives have been recorded on decaying wood, few of them can be

considered as typical forestry species. *Ptinus* (*Gynopterus*) *dubius* Sturm, 1837 is one of the examples more narrowly associated to coniferous forests, currently living on *Pinus halepensis* Miller, *P. pinaster* Aiton (= *P. maritima* Lam.) and *P. sylvestris* L., trees in present Europe (see, for example CAILLOL, 1914). However, *P.* (*G.*) *dubius* feeds on the flower cones, and is not a true xylophagous. The best example of xylophagy in the family is that of *Ptinus* (*Pseudoptinus*) *lichenum* Marsham, 1802, which has been observed boring extensive galleries in old *Juniperus* trees in Minorca island (BELLÉS, 1980). But the case of this *Pseudoptinus* is rather an exception. Indeed, CROWSON (1967) proposed that loss of wood-boring was a fundamental factor conditioning the divergence of the Ptinidae with respect to their sister-family Anobiidae, most of whose members are efficient wood-borers.

The external morphology does not help to infer the feeding regime of *P.* (*G.*) *inclusus* and *S. sucini*. Nevertheless, spider beetles are rare in Baltic amber; as stated above, about 0.4% of Baltic amber beetles preserved in representative museums are Ptinidae, whereas about 16.6% are Anobiidae (HIEKE & PIETRZENIUK, 1984). At least in the case of *S. sucini*, the fact that two specimens of the same species have been found in Baltic amber sampling might suggest that this species was ecologically associated to coniferous forests in late Eocene Central Europe.

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