

# The cerambycids included in Baltic amber: current knowledge status with the description of new taxa (Coleoptera, Cerambycidae)

Francesco VITALI

**Abstract:** A synopsis of all cerambycid species recorded from Baltic amber until today is provided and analysed according to the current systematic and paleontological knowledge. Only eight species result to be valid. A further new species, *Encyclopidonia punctatissima* n.gen.n.sp. (Cerambycidae, Lepturinae, Rhagiini), is described. The new genus *Trichosieversia* for *Pseudosieversia europaea* VITALI, 2004 is instituted. The analysis of the cerambycid Baltic fauna strongly implies the presence of temperate environmental conditions and suggests therefore to date the Baltic amber at least to the Early Oligocene.

**Key words:** Coleoptera Cerambycidae, fossil, Baltic amber.

**Santrauka:** Pateikiama visų ūsuočių (Coleoptera, Cerambycidae) rūšių, kurios iki šiol aprašytos pagal Baltijos gintarsą, apžvalga. Šie vabzdžiai analizuojami, remiantis dabartinėmis sistematikos ir paleontologijos žiniomis. Tik aštuonios rūšys laikomos validžiomis. Aprašoma dar viena nauja rūšis *Encyclopidonia punctatissima* n.gen.n.sp. (Cerambycidae, Lepturinae, Rhagiini). Rūšis *Pseudosieversia europaea* VITALI, 2004 perkeliama į naujai aprašomą gentį *Trichosieversia* n.gen. Baltijos gintaro ūsuočių fauna akivaizdžiai rodo, kad gintarmedžių miškas augo vidutinio klimato sąlygomis; jis patvirtina, jog šis gintaras turi būti datuojamas bent jau ankstyvuoju oligocenu.

**Raktiniai žodžiai:** Coleoptera, Cerambycidae, fosilijos, Baltijos gintaras.

## Introduction

The Cerambycidae LATREILLE, 1802 are a family of Coleoptera Cerambycoidea widespread throughout all the world with nearly 30,000 species. The elegance of forms and the attractive aspect of most of them have made cerambycids one of the most popular family among collectors, while the long antennae characterising most species apparently render them easy to identify by the non-specialist, too. In particular, this characteristic has allowed to record cerambycids in amber since the onset of this study. Unfortunately, the fact that long antennae characterise also different families and the evolution of the taxonomy and the palaeontology occurred during the centuries has caused a big uncertainty regarding the real consistence of the fossil cerambycid fauna.

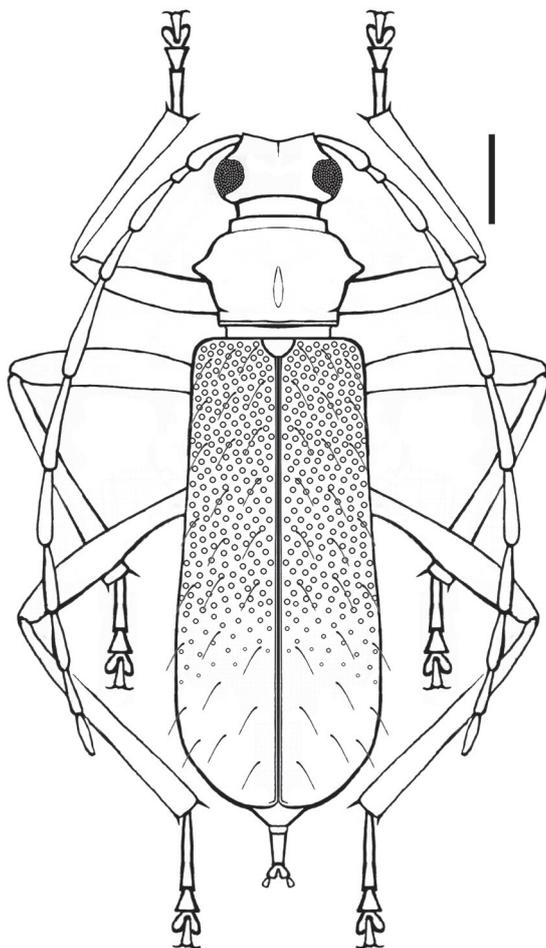
Actually, except for the paper written by Richard ZANG (1905), all other papers regarding this topic suffer from approximate taxonomic, biological and palaeontologic knowledge about this family. Hence, for some years the author of this paper has begun analysing fossil and sub-fossil cerambycids through several papers (VITALI 2004a, b, 2005, 2006a-e, 2007a-e, 2008), some

of them just focused on Baltic amber, but a lot of work is still in preparation or remains to be done. The goal of this paper is to present the actual knowledge status of the cerambycid fauna included in Baltic amber, to which a further new species is presently added.

## Material and Methods

Unfortunately, most of the cerambycids described from Baltic amber were conserved in European Museums that heavily suffered the dramatic consequences of WWII. The research done in these Museums has allowed to discover that the holotypes of the species once preserved in Danzig (2), Leipzig (1) and Paris (1) are today lost (dispersed or burnt), while only the types (mostly holotypes) preserved in Berlin (4) are still existing (ANDRÉ, BECHLY, MÜLLER, NEUMANN, REICH, SZADZIEWSKI, WEITSCHAT, in litt.). Other two species have been described on materials preserved in Hamburg (1) and London (1) after WWII, but it is actually about synonyms of a well-known species whose types are still existing. Finally, three holotypes, besides other specimens coming from Baltic amber, are present in the author's collection.

**Fig. 1:** Habitus of *Trichosieversia europaea* (VITALI, 2004); the black line represents 1 mm.



The following results are primarily based on the bibliography and some checked types. Other research about the remaining types conserved in Berlin will be part of further publications. Regarding the consulted bibliography, several papers and general catalogues (HANDLIRSCH 1907; STATZ 1938; LINSLEY 1961; ABDULLAH 1967; SPAHR 1981; HIEKE & PIETRZENIUK 1984; CARPENTER 1992; POINAR 1992) quote a lot of cerambycid genera (sometimes even mentioned as species) from Baltic amber. Nevertheless, it is about unchecked quotations of ancient approximate and often inexact records, already proved as erroneous in the past. Actually, the real amount of longhorn species included in Baltic amber is still exiguous.

## Observation on the recorded taxa

### Subfamily Lepturinae LATREILLE, 1802

#### Genus *Stenocorus* FABRICIUS, 1775

HOPE 1836, p. 142; SPAHR 1981, p. 24; POINAR 1992, p. 138.

This ancient, no longer confirmed, presence was cited by HOPE (1836) on material of DALMAN's collection, today partially preserved in Berlin. Actually, it seems to be very doubtful due to the large size and especially the

probable North American origin of this genus. This record is probably referable to some elongated Rhagiini, maybe *Pseudosieversia europaea*.

#### Genus *Pachyta* DEJEAN, 1821

KLEBS 1910, p. 328; STATZ 1938, p. 173; LINSLEY 1961, p. 54; ABDULLAH 1967, p. 147; LARSSON 1978, p. 156; SPAHR 1981, p. 23; POINAR 1992, p. 138.

This genus was cited by KLEBS (1910) from his own material, which was identified by Edmund REITTER. This presence seems very doubtful due to the large size of their representatives, and thus probably referable to some hitherto undescribed Rhagiini closely related to the genera *Evodinus* LECONTE, 1850 (MULSANT's "*Pachyta*") or *Acmaeops* LECONTE, 1850.

#### *Trichosieversia* n.gen.

The availability of further better conserved material has allowed to reconsider the taxonomic and systematic position of *Pseudosieversia europaea* VITALI, 2004, which is here attributed to a new genus.

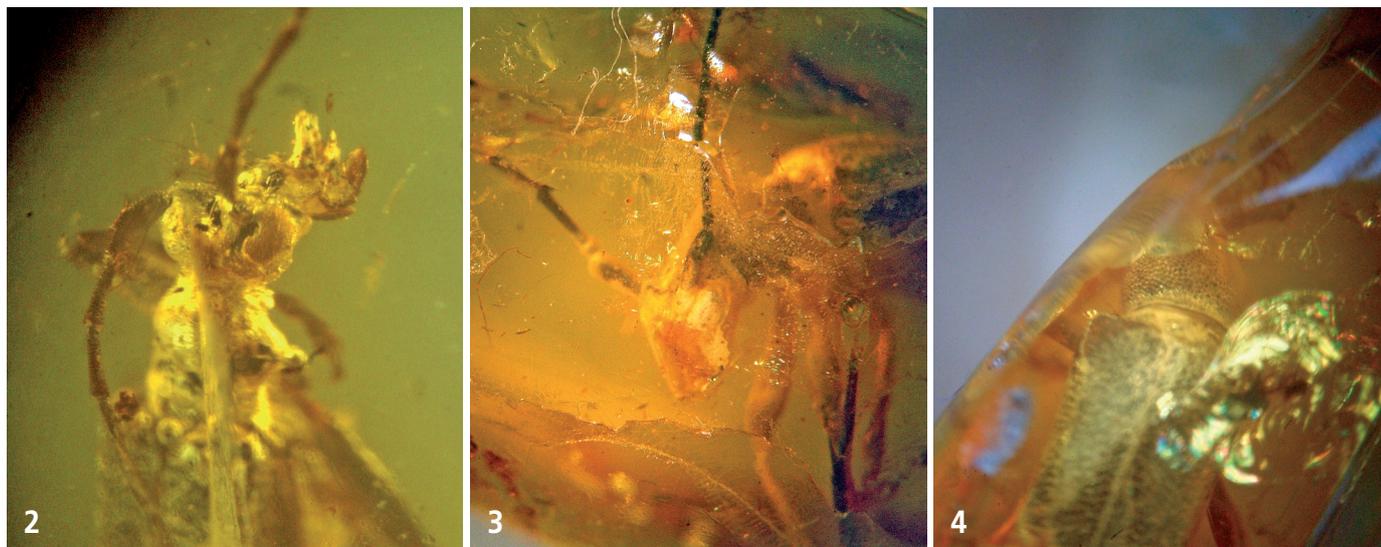
**Genotype:** *Pseudosieversia europaea* VITALI, 2004 (monobasic).

**Description:** Small (4.7-5.9 mm), elongated, convex above (Fig. 1).

Head convex; forehead largely grooved; antennal tubercles widely separated, elevated; cheeks short, shorter than under eye-lobes; temples prominent; neck distinct. Eyes relatively large, close to the basis of the mandibles, emarginate at upper side, uniformly convex at the under one, finely faceted. Last palpomere blade-shaped, as long as wide at the apex.

Antennae inserted between the eyes, reaching the elytral apex in female; scape bowed; pedicel elongated, one-half longer as broad; antennomere III scarcely longer than scape; antennomere IV scarcely shorter than scape; antennomere V five-third as long as scape; antennomere VI-IX progressively shortened; antennomere VI scarcely shorter than previous, antennomere VII one-fourth longer than scape; antennomere VIII scarcely longer than scape, antennomere IX scarcely shorter than scape, antennomere X three-fourth as long as scape; antennomere XI two-third as long as scape (proportions according to the formula: 1.3: 0.4: 1.4: 1.2: 2.1: 2.0: 1.6: 1.4: 1.2: 1.0: 0.9).

Prothorax little convex above; sides obtuse toothed at about two-third of their length from the base, grooved by two transversal furrows, one narrower, anterior and one wider, posterior; front and hind margins of the pronotum elevated, hind margin broadly enlarged at the outer angles; surface glabrous, extremely finely and densely punctured, except for a glabrous longitudinal



**Figs 2-5:** (2) *Trichosieversia europaea* (VITALI, 2004), specimen F514B14 author's coll., particular of the head; (3) *Encyclopidonia punctatissima* n.gen.n.sp., holotype, particular of the head; (4), dorsal side; (5), inclusion.



carina located on the basal half of the disc. Scutellum transverse, rounded posteriorly, unpunctuated.

Elytra 2.6 as long as wide at the humeri, clearly wider than prothorax, feebly enlarged posteriorly, apically suddenly convergent and separately rounded; suture very finely grooved; surface covered with some isolate long semi-recumbent black setae and with a strong, almost thick, regular punctuation becoming more confused and almost rugose to the apex.

Prosternum in lateral view making a distinct angle with the procoxae; procoxal cavities posteriorly open; intercoxal of prosternum extremely narrow; metasternum very finely, thick punctured and very finely pubescent; pygidium convergent-sides, truncate at apex, two times longer than other visible sternites, exceeding the elytral apex.

Legs long, femora slightly club-shaped, tibiae linear, armed with an apical tooth at the inner apex and another shorter at the outer one; surface very finely, thick punctured, tibiae carrying also some erect setae; tarsi long, metatarsus one-half as long as metatibia; metatarsomere I very long, three-fifth as long as tibia; tarsomere II one-third as long as I; tarsomere III one-sixth as long as I, bilobed, deeply incised, onychium one-third as long as tarsomere I.

Feminine genital armature with stylus apical, drop-shaped, rounded at the apex.

**Differential diagnosis:** *Trichosieversia* n.gen. essentially differs from *Pseudosieversia* PIC, 1902 and the related genera, with which it was originally confronted (*Sivana-Macropidonia-Pidonia*), in the short cheeks (Fig. 2). Such archaic character makes this species more closely related to *Encyclops* NEWMAN, 1838, which differs in the more elongated habitus and the advanced position of the antennal insertion. Moreover, this character makes *Trichosieversia* a possible link both between *Encyclops* and the group *Pseudosieversia-Sivana-Macropidonia-Pidonia*, as well as between *Encyclops* and *Cortodera*. Actually, the tribal assignment of some genera of Lepturinae (*Pidonia*, *Cortodera* and *Grammoptera*) is still uncertain, being attributed to either tribe on the basis of different adult or larval characters. Equally arguable is the value of the tribe Encyclopiini LE CONTE, 1873, which is either considered as a valid taxon or as synonym of different tribes. However, the long elytral setae of *Trichosieversia*, absent from all treated genera, are in all likelihood an autapomorphy that justifies the institution of a new genus. This character also suggests that *P. europaea* is not the direct ancestor of the quoted genera but a collateral dry branch.

***Trichosieversia europaea* (VITALI, 2004) n.comb.  
(Figs 1, 2)**

*Pseudosieversia europaea* VITALI, 2004a, p. 1-8, figs 1-4 (Holotype: coll. VITALI); VITALI 2005, p. 530-531, fig. 1; VITALI 2007b, p. 14, fig. 1.

***Encyclopidonia* n.gen.**

**Genotype:** *Encyclopidonia punctatissima* n.sp. (monobasic).

**Description:** Small, elongated, depressed above (Figs 5-6).

Head relatively long (Fig. 3); forehead apparently squared, even; antennal tubercles widely separated, fairly elevated; cheeks well developed, scarcely but apparently visibly longer than under eye-lobes; temples short, rounded, scarcely convergent backward, as long as the eye-lobes; neck long. Surface sculpture and mouth pieces not visible. Eyes relatively small, widely separated from the basis of the mandibles, relatively small, feebly emarginate at the upper side, uniformly convex at the under one, finely faceted.

Antennae inserted between the eyes, reaching the posterior fourth of the elytral length, glabrous, extremely finely and densely punctured; scape scarcely bowed, rounded at the apex; pedicel as long as broad, one-fourth as long as scape; antennomeres III-IV sub-equal, one-fifth longer than scape; antennomere V scarcely longer than previous; antennomere VI scarcely shorter than scape; antennomere VII three-fourth as long as scape; antennomeres VIII-IX equal, scarcely shorter than VII; antennomere X less than half as long as scape (proportions according to the formula: 1.6: 0.4: 1.8: 1.8: 1.9: 1.3: 1.2: 1.0: 1.0: 0.8: >0.5).

Prothorax feebly elongated, convex above, widely constricted at apex and at base, regularly rounded at sides; hind angles rounded; apex and basis finely grooved; disc without longitudinal furrow, everywhere covered with a coarse dense punctuation, equal in size but more serrate than that of elytra. Scutellum small, forming an equilateral triangle. Prosternum in lateral view making a distinct angle with the procoxae, procoxal cavities posteriorly open; metepisternum 2.5 times as long as wide.

Elytra long, 3 times as long as wide at the humeri, clearly wider than prothorax, depressed above, restricted after humeri, then parallel-sided, apically suddenly convergent and separately acutely rounded, apex pointed; suture very finely grooved; surface covered with a coarse, almost thick, irregular punctuation, apparently glabrous.

Legs long, femora slightly club-shaped, tibiae linear, rectilinearly truncated at the tip, extremely finely and densely punctured. A very minute stout spine is de-

tectable at the apex of the mesotibiae. Tarsi long; metatarsomere I as long as the following two together, tarsomere II slightly longer than III, onychium, as long as I.

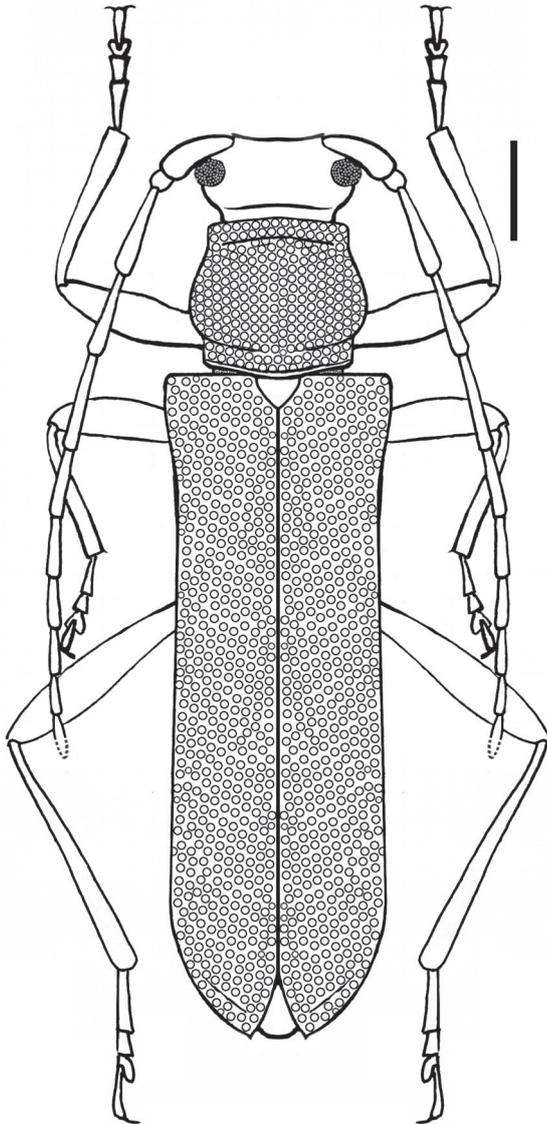
**Differential diagnosis:** The prosternal shape makes *Encyclopidonia* a member of the tribe Rhagiini, while the general habitus (long cheeks, antennae inserted between eyes, prothorax mutic and rounded at base) suggests a relation with the genera close to *Pidonia* MULSANT, 1863. Nonetheless, the group *Pseudosieversia-Sivana-Macropidonia* has stouter elytra and a tuberculated prothorax, while *Pidonia* has stouter elytra and a much less developed body punctuation. On the other side, the long elytra remind of the tribe Encyclopiini, which nevertheless includes genera with shorter cheeks, antennae inserted at the front margin of the eyes, and tuberculated prothorax. Some *Grammoptera*-species (especially of the subgenus *Neoencyclops* MATSUSHITA & TAMANUKI, 1940) also have a similar habitus but also shorter cheeks, a fact that suggests no relationship with this fossil. Moreover, *Encyclopidonia* shows a peculiar proportion of some antennomeres (article IV not shorter than III), which are absent from nearly all the previously quoted genera. This abnormal proportion, being only known in *Macropidonia* PIC, 1901 (among the Lepturinae of the Recent), the fossil *Paracorymbia antiqua* VITALI, 2005 and some Spondylidinae and Cerambycinae, is in all likelihood plesiomorphic. Further peculiar characters are the close dense punctuation of the pronotum (Fig. 4) and the pointed elytral apex (Fig. 6). In particular, the elytral apex, being unknown in both *Encyclops* and *Pidonia*, seems to be autapomorphic, suggesting that *Encyclopidonia* diverged from *Encyclops* without being an ancestor of *Pidonia* or of other genera of the Recent.

Finally, the black body colour can be found among Recent species in the melanic form of the Alleghenian *Pidonia ruficollis* (SAY, 1824), and many related genera (*Encyclops*, *Trichosieversia*, *Pseudosieversia*, *Macropidonia*, *Idiopidonia*, *Cortodera*, *Anoplodera*, *Grammoptera*). Probably, this was the original pattern of all species of this group; later, the adaptation to the life on flowers evolved more and more yellow patterns, analogously to other species living in the same habitat.

***Encyclopidonia punctatissima* n.sp. (Figs 3-6)**

**Holotype:** Baltic Coast, ex coll. P. CARDWELL A8137, author's coll. FS39B24. The insect is partially covered by turbidity and missing the apical part of the last right antennomere, the last five left antennomeres, the two last left protarsomeres, and a part of the posterior right leg in the knee region.

♀, length 9 mm, body and antennae black, legs apparently reddish brown. Characters of the genus.



**Fig. 6:** Habitus of *Encyclopidonia punctatissima* n.gen.n.sp.; the black line represents 1 mm.

### Genus *Grammoptera* AUDINET-SERVILLE, 1835 and "prope *Grammoptera* et *Strangalia*"

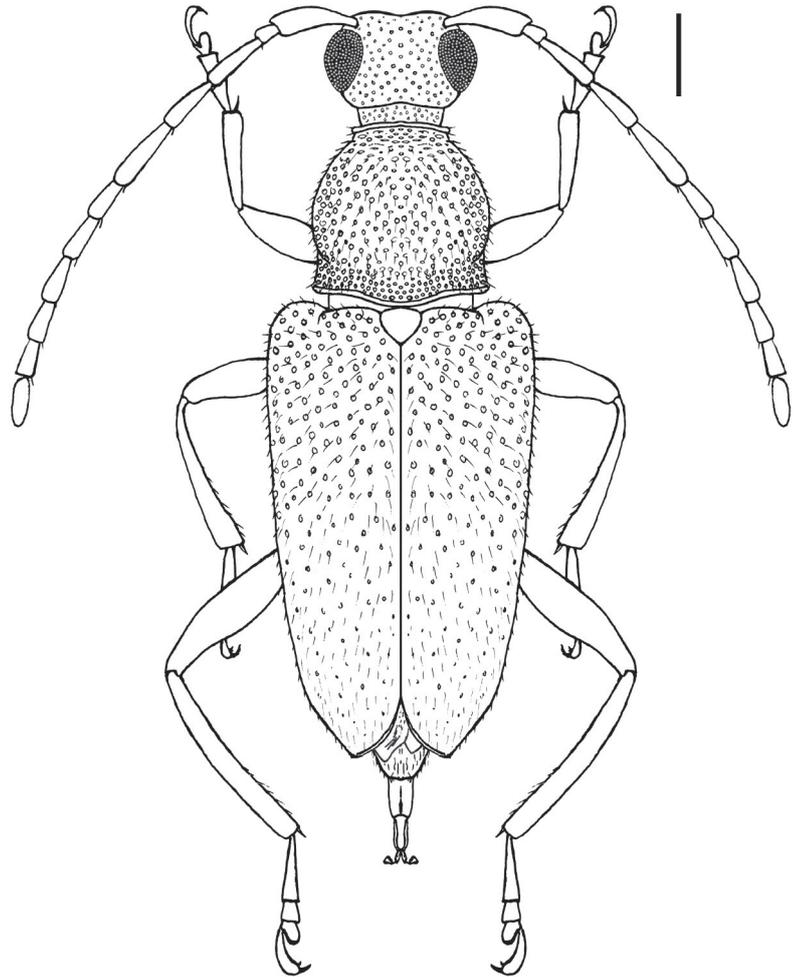
KLEBS 1910, p. 237-238; STATZ 1938, p. 173; LINSLEY 1961, p. 54; ABDULLAH 1967, p. 147; LARSSON 1978, p. 156; SPAHR 1981, p. 22; POINAR 1992, p. 138.

This presence was cited by KLEBS (1910), based on his own material identified by REITTER, but may possibly be referable to *Encyclopidonia punctatissima*.

### *Paracorymbia antiqua* VITALI, 2005 (Fig. 7)

VITALI 2005, p. 531-533, figs 2-5 (Holotype: coll. VITALI).

This fossil (Fig. 7), though classifiable in the genus *Paracorymbia* MIROSHNIKOV, 1998, shows some peculiar archaic characters (stout habitus, convex under margin of the eyes, short pubescence on the pronotum) that makes it a natural link with the close genus *Vadonia* MULSANT, 1846. However, as interbreeding between species of these



**Fig. 7:** Habitus of *Paracorymbia antiqua* VITALI, 2005; the black line represents 1 mm.

genera has been demonstrated to occur (PESARINI & SABBADINI 2004), their taxonomic position deserves to be revised.

### Genus *Leptura* LINNAEUS, 1758

HOPE 1836, p. 142; BERENDT 1845, p. 46-47, 56, 58; GIEBEL 1856, p. 132; MENGE 1856, p. 21; MOTSCHULSKY 1856, p. 28; SCUDDER 1885, p. 793; SCUDDER 1886, p. 73; SCUDDER 1891, p. 546; ZANG 1905, p. 243; HANDLIRSCH 1907, p. 787; LARSSON 1978, p. 156; SPAHR 1981, p. 23; POINAR 1992, p. 138.

To the specimen of BERENDT's collection mentioned by HOPE (1836), BERENDT (1845) added other two ones, which were mentioned by GIEBEL (1856) and finally examined by ZANG (1905). One of them effectively belonged to the Lepturini and was described as *Strangalia berendtiana*, while both remaining specimens were doubtfully identified as *Heteromera*.

Adults and one larva of MENGE's collection were mentioned by MENGE (1856), MOTSCHULSKY (1856), SCUDDER (1885, 1886, 1891), HANDLIRSCH (1907) and LARSSON (1978) but the material is lost. Though possi-

ble, the presence of the genus *Leptura* in Baltic amber is not supported by any known specimen yet.

### **Genus *Strangalia* AUDINET-SERVILLE, 1835**

KLEBS 1910, p. 238; STATZ 1938, p. 173; LINSLEY 1961, p. 54; ABDULLAH 1967, p. 147; LARSSON 1978, p. 156; SPAHR 1981, p. 24; POINAR 1992, p. 138.

This record, which KLEBS (1910) cited from his own material identified by REITTER, is very probably referable to *Strangalia berendtiana* since KLEBS did not mention ZANG's paper in his catalogue.

### ***Strangalia berendtiana* ZANG, 1905**

ZANG 1905, p. 243-244, fig. 3 (Holotype, coll. BERENDT, Berlin); HANDLIRSCH 1907, p. 787; LARSSON 1978, p. 156; SPAHR 1981, p. 24; HIEKE & PIETRZENIUK 1984, p. 305; VITALI 2004a, p. 1; VITALI 2005, p. 537, fig. 7.

A credible *Strangalia* with closer affinity to American congeners than to Asian ones.

### **Genus *Necydalis* LINNAEUS, 1758**

HOPE 1836, p. 143; BERENDT 1845, p. 56; GIEBEL 1852, p. 656; SCUDDER 1885, p. 793; HANDLIRSCH 1907, p. 787; SPAHR 1981, p. 23; POINAR 1992, p. 138.

This specimen, which HOPE (1836) recorded from BERENDT's authority, was no longer mentioned as such since the beginning of the past century. By considering the ancient taxonomy, it should be identified as the "*Molorchus*" of BERENDT's collection that ZANG (1905) finally recognised as "*Cantharis*". No other records are known; however, the genus *Necydalis*, today Vancouverian and Oriental, was in all likelihood absent from Tertiary Baltic forests.

## **Subfamily Spondylidinae AUDINET-SERVILLE, 1832**

### ***Nothorhina granulicollis* ZANG, 1905**

*Callidium* sp. I-IV BERENDT 1845, 46-47; ZANG 1905, p. 236. *Nothorhina prope muricata* HELM, 1886, p. 272; HELM 1896, p. 229; HANDLIRSCH 1907, p. 786; SPAHR 1981, p. 23.

*Nothorhina* sp. KLEBS 1910, p. 238; STATZ 1938, p. 173; ABDULLAH 1967, p. 147; HIEKE & PIETRZENIUK 1984, p. 305; POINAR 1992, p. 138; WEITSCHAT & WICHARD 2002, p. 166, fig. 63g.

*Nothorhina granulicollis* ZANG, 1905, p. 236-240, fig. 2 (Holotype and 4 paratypes, three of which still exist, coll. BERENDT, Berlin); HANDLIRSCH 1907, p. 787; LINSLEY 1961, p. 54; ABDULLAH 1967, p. 150; LARSSON 1978, p. 155; SPAHR 1981, p. 23; HIEKE & PIETRZENIUK 1984, p. 305.

*Palaeoasemum crowsoni* ABDULLAH, 1967, p. 149, figs. 1-3; ABDULLAH 1975, p. 397; SPAHR 1981, p. 23; CARPENTER 1992, p. 312.

*Palaeoasemum duffyi* ABDULLAH, 1967, p. 149-150, figs. 4-8; ABDULLAH 1975, p. 397; SPAHR 1981, p. 23.

*Nothorhina granulicollis* VITALI, 2006b, p. 30-41, figs. 1-11.

The most common cerambycid in Baltic amber,

closely related to the extant *Nothorhina muricata* (DALMAN, 1817) in habitus and body size. Taxonomic revision and probable biology in VITALI (2006b).

### ***Palaeoasemum duffyi* ABDULLAH, 1967**

ABDULLAH 1967, p. 149-150, figs. 4-8 (Holotype: No. 1461; Paratypes: No. 546 and No. 1556, ex coll. KLEBS, Hamburg); ABDULLAH 1975, p. 397; SPAHR 1981, p. 23; VITALI 2006b, p. 33-36.

### ***Palaeoasemum crowsoni* ABDULLAH, 1967**

ABDULLAH 1967, p. 149, figs. 1-3 (Holotype: No. 18796, ex coll. KLEBS, No. 533, London); ABDULLAH 1975, p. 397; SPAHR 1981, p. 23; CARPENTER 1992, p. 312; VITALI 2006b, p. 33-36.

Both species are evident synonyms of *Nothorhina granulicollis* (VITALI, 2006b). ABDULLAH described them on the basis of outdated North American keys, ignoring descriptions and types of cerambycids of Baltic amber and even extant European species. The new genus and species were claimed on the basis of typical sexual characters of *Nothorhina* (pronotal shape, body proportions) and well-known variable characters among cerambycids (body size, scutellar shape).

### **Genus *Tetropium* KIRBY, 1837**

KLEBS 1910, p. 238; STATZ 1938, p. 173; LINSLEY 1961, p. 54; ABDULLAH 1967, p. 147; LARSSON 1978, p. 155; SPAHR 1981, p. 24; POINAR 1992, p. 138; VITALI 2006b, p. 36.

This genus, which KLEBS (1910) cited from his own material identified by E. REITTER, remains to be verified but may possibly be valid (VITALI 2006b).

### **Genus *Spondylis* FABRICIUS, 1775**

SCUDDER 1885, p. 794, figs. 1025, 1025a; SCUDDER 1886, p. 73; SCUDDER 1891, p. 583; HANDLIRSCH 1907, p. 786; LARSSON 1978, p. 155; SPAHR 1981, p. 24; POINAR 1992, p. 138.

It is about the record of a larva; nevertheless, besides the incertitude due to the type of finding, *Spondylis* has currently an Eurasian, originally Vancouverian, distribution and was in all likelihood absent from Europe until the Pleistocene (VITALI, in prep.). This larva, if still existing, might be referred to one species belonging to the Asemini (LARSSON 1978), eventually, to *Nothorhina granulicollis*.

### ***Spondylis crassicornis* GIEBEL, 1856**

GIEBEL 1856, p. 127 (Holotype, Leipzig, lost); SCUDDER 1885, p. 793; HANDLIRSCH 1907, p. 785; LARSSON 1978, p. 155; SPAHR 1981, p. 24; VITALI 2006b, p. 36-37.

The morphological characters provided in the original description do not surely allow to identify this fossil as *Spondylis* but maybe as the oldest synonym of *Nothorhina granulicollis* (LARSSON 1978; VITALI 2006b). Nonetheless, this statement might open some practical problems, due also to the fact that the type is lost today.

This species should be deemed as *incertae sedis*, or better as *nomen oblitum*.

## Subfamily Cerambycinae LATREILLE, 1802

### Genus *Cerambyx* LINNAEUS, 1758

BERENDT 1830, p. 30; HOPE 1836, p. 141; MENGE 1856, p. 23; SCUDDER 1885, p. 794; SCUDDER 1886, p. 73; SCUDDER 1891, p. 488; ZANG 1905, p. 232-233; HANDLIRSCH 1907, p. 786; SPAHR 1981, p. 22; POINAR 1992, p. 138.

This specimen of BERENDT's collection, which HOPE (1836) had cited together with material of STRONG's collection (British Museum), was examined by ZANG (1905), who recognised a tiger beetle. This fossil was later studied by HORN (1906), who recognised the American *Tetracha carolina* (LINNAEUS, 1766). More recently, RÖSCHMANN (1999) deemed such species very closely related to, but not conspecific with, the Carolina tiger beetle.

MENGE (1856) also recorded a larva (cited by SCUDDER and HANDLIRSCH), whose identification is erroneous in all evidence (no *Cerambyx*-species lives in conifers). This record is maybe referable to some larvae of Cerambycinae Callidiini (VITALI, in prep.).

### Genus *Callidium* FABRICIUS, 1775

HOPE 1836, p. 141; BERENDT 1845, p. 46-47; GIEBEL 1856, p. 128; SCUDDER 1885, p. 793; ZANG 1905, p. 236; KLEBS 1910, p. 237; STATZ 1938, p. 173; LINSLEY 1961, p. 54; ABDULLAH 1967, p. 147; LARSSON 1978, p. 155; SPAHR 1981, p. 21; HIEKE & PIETRZENIUK 1984, p. 305; POINAR 1992, p. 138.

The six *Callidium*-specimens that BERENDT (1845) recorded and GIEBEL (1856) mentioned, were examined by ZANG (1905), who described five of them as *Nothorhina granulicollis* and recognised the last one as a representative of Cantharidae or Lampyridae. This last specimen should be the same "*Callidium*" which HIEKE & PIETRZENIUK (1984) recorded from BERENDT's collection, since ZANG did not mention other specimens.

HOPE's (DALMAN's collection) and KLEBS' records might be the same species or even the same specimen. KLEBS' specimen was identified by REITTER and is, in all likelihood, related to some still undescribed species of Callidiini, possibly *Semanotus* MULSANT, 1839. LARSSON (1978) also recorded a larva of *Callidium* from the Museum of Copenhagen. Actually, these records should not be related to *Callidium* since this genus has a Vancouverian-Manchurian distribution (LINSLEY 1961), which suggests an arrival in Eurasia since the Pleistocene and its consequent absence in Europe during the Tertiary (VITALI, in prep.). Other authors quoted *Callidium*-specimens from KLEBS' or undetermined collections.

### Genus *Gracilia* AUDINET-SERVILLE, 1834

KLEBS 1910, p. 237; STATZ 1938, p. 173; ABDULLAH 1967, p. 147; ABDULLAH 1967, p. 147; LARSSON 1978, p. 156; SPAHR 1981, p. 22; POINAR 1992, p. 138.

This presence, which KLEBS recorded from his own material identified by REITTER, is possible but not verified yet.

### Genus *Molorchus* FABRICIUS, 1792

BERENDT 1845, p. 56; GIEBEL 1856, p. 128; SCUDDER 1885, p. 793; ZANG 1905, p. 233; SPAHR 1981, p. 23; POINAR 1992, p. 138.

The specimen recorded by BERENDT and mentioned by other authors was finally examined by ZANG, resulting to be a *Cantharis*-species with damaged elytra.

### *Obrium prope testaceum* and *Obrium* sp.

BURMEISTER 1832, p. 635; GIEBEL 1856, p. 129; SCUDDER 1885, p. 793; HANDLIRSCH 1907, p. 786; KLEBS 1910, p. 238; STATZ 1938, p. 173; LINSLEY 1961, p. 54; ABDULLAH 1967, p. 147; LARSSON 1978, p. 156; POINAR 1992, p. 138.

The former species was recorded by BURMEISTER (1832), while the latter one was recorded by KLEBS (1910) from three specimens of his own collection. This latter record was later mentioned by all following authors but probably it is the same, as yet undescribed species. The presence of the genus *Obrium*, though possible, has not been confirmed yet.

### Genus *Clytus* LAICHARTING, 1784

HOPE 1836, p. 142; MOTSCHULSKY 1856, p. 28; SPAHR 1981, p. 22.

This genus was recorded from specimens of DALMAN's (HOPE 1836) and MENGE's (MOTSCHULSKY 1856) collection. This material, whose destiny is uncertain, might be referred to *Clytus pici*.

### *Clytus pici* PITON, 1940

*Clytus (Xylotrechus) pici* PITON, 1940, p. 63-64.

*Clytus pici* SPAHR, 1981, p. 22.

The holotype is lost today, so that only speculations about the description are possible.

PITON (1940) described this species on the basis of a single female, 15 mm long, blackish grey, having a cephalic carina, a silver short pubescence but no visible pattern. Among the Clytini currently living in Eurasia only the genus *Xylotrechus* CHEVROLAT, 1860 is characterised by a frontal carina; hence, no misidentification seems to be possible. Moreover, though no larva of the European species feeds on conifers (BENSE, 1995), some North American species – *X. annosus* (SAY, 1826), *X. sagittatus* (GERMAR, 1821) and *X. undulatus* (SAY, 1824) – have this biology (CRAIGHEAD, 1923). Therefore, the generic attribution seems to be correct and this species

might be transferred to *Xylotrechus*, according to author's intention.

Nonetheless, PITON also noticed a vague resemblance with *Xylotrechus cinereus* LAP., actually *Pseudosphegistes cinerea* (LAPORTE DE CASTELNAU & GORY, 1836), because the frontal carina looked feeble. In reality, such species has no frontal carina.

The disappearance of the type does not allow to solve the question; moreover, the attribution to *Xylotrechus* will open some taxonomic problems since *X. pici* is a still existing species. While waiting for further investigations, it should certainly be better to maintain the name *Clytus pici*.

### Genus *Anaglyptus* MULSANT, 1839

KLEBS 1910, p. 237; STATZ 1938, p. 173; LINSLEY 1961, p. 54; ABDULLAH 1967, p. 147; LARSSON 1978, p. 156.

This genus was recorded by KLEBS from one specimen of his own collection identified by E. REITTER. Though no Recent *Anaglyptus*-species bores conifers (LARSSON 1978), the presence of mixed forests during Baltic amber formation renders this occurrence possible.

Nonetheless, all European species have a Euro-Siberian or Euro-Caucasian distribution, while the genus is mainly Oriental. Hence, *Anaglyptus* should have colonised Europe from Asia only after the draining of the Turgai Sea at the end of Eocene. This presence is therefore very interesting regarding the amber dating and deserves to be verified. Finally, this record might also be referable to *Xylotrechus pici*.

### Subfamily Lamiinae LATREILLE, 1825

#### *Aenictosoma doenitzi* SCHAUFUSS, 1891

SCHAUFUSS 1891, p. 58-60 (Holotype: coll. HELM No. 87, Danzig, lost); HELM 1897, p. 89; HANDLIRSCH 1907, p. 788; KORSCHESKY 1939, p. 12; SPAHR 1981, p. 21; CARPENTER 1992, p. 312; POINAR 1992, p. 138; VITALI 2006a, p. 99-101.

The holotype belonged to HELM's collection and is lost today. The species was also mentioned several times by many authors without comments, but the characters provided in the original description (pentamerous tarsi, elbowed antennae, pointed palpi) clearly imply that it was actually a representative of the Scydmaenidae Mastiginae Clidicini (VITALI 2006a).

#### Genus *Saperda* FABRICIUS, 1775

HOPE 1836, p. 137, 141; BERENDT 1845, p. 47, 56; GIEBEL 1856, p. 132; MENGE 1856, p. 21; MOTSCHULSKY 1856, p. 28; SCUDDER 1885, p. 793, figs 1023, 1023a; SCUDDER 1886, p. 73; SCUDDER 1891, p. 577; ZANG 1905, p. 240-243; HANDLIRSCH 1907, p. 790; LARSSON 1978, p. 156; SPAHR 1981, p. 24; POINAR 1992, p. 138.

This genus was firstly recorded by HOPE (1836) about one specimen of BERENDT's collection. BERENDT

(1845) added other four specimens of his own collection, which were mentioned by GIEBEL (1856) and finally examined by ZANG (1905). Some of them are lost, others belong to strange Lamiinae, which ZANG preferred not to describe, and a last one was described as "*Dorcaschema succineum*".

Other specimens belonging to MENGE's collection were mentioned by subsequent authors (MOTSCHULSKY 1856; HANDLIRSCH 1907; LARSSON 1978) but are also lost today. SCUDDER (1885) recorded a larva that was later mentioned many times (SCUDDER 1886, 1891; HANDLIRSCH 1907; LARSSON 1978; SPAHR 1981); nonetheless, at least this record is surely taxonomically incorrect since *Saperda* does not feed on conifers (LARSSON 1978).

Actually, the presence of this genus in Baltic amber remains to be verified.

#### "*Dorcaschema succineum*" ZANG, 1905

*Saperda* sp. III BERENDT 1845, p. 47.

ZANG 1905, p. 240-243, fig. 6 (Holotype: coll. Berendt, Berlin); HANDLIRSCH 1907, p. 790; LINSLEY 1961, p. 53; LARSSON 1978, p. 156; SPAHR 1981, p. 22; KLAUSNITZER & SANDER 1981, p. 57, fig. 23; HIEKE & PIETRZENIUK 1984, p. 305; POINAR 1992, p. 138.

The characters provided in the original description do not agree with any Recent genus of Dorcaschematini (BREUNING 1949); hence, this species might belong to a new genus, possibly close to the North American *Dorcaschema* HALDEMANN, 1847.

#### *Parmenops longicornis* SCHAUFUSS, 1891

SCHAUFUSS 1891, p. 60-62 (Holotype: coll. HELM No. 40, Danzig, lost); HELM 1897, p. 89; HANDLIRSCH 1907, p. 788; KORSCHESKY 1939, p. 12, pl. 1, fig. 3a-b; SPAHR 1981, p. 23; CARPENTER 1992, p. 312; POINAR 1992, p. 138.

The original description implied a representative of the tribe Parmenini, but the original drawing, which the author had not published and KORSCHESKY (1939) provided only nearly 50 years later, suggests that this species was actually winged. The missing of the type and the current puzzling systematics of Lamiinae do not allow identifying even the tribe; nonetheless, this fossil seems somehow related to the tribe Apomecynini THOMSON, 1860.

#### *Pogonocherus jaekeli* (ZANG, 1905)

*Lamia* sp. I BERENDT 1845, p. 56.

*Pogonochaerus jaekeli* ZANG, 1905, p. 233-236, fig. 5 (Holotype: coll. BERENDT, Berlin); HANDLIRSCH 1907, p. 789; LINSLEY 1961, p. 53; LARSSON 1978, p. 156; HIEKE & PIETRZENIUK 1984, p. 305.

*Pogonocherus jaekeli* SPAHR 1981, p. 24; POINAR 1992, p. 138; VITALI 2007c, p. 15-16.

According to ZANG, this fossil was so similar to the extant *Pogonocherus ovatus* (GOEZE, 1777) in body size and aspect that it might be considered as its direct ancestor.

*P. ovatus* is actually a polyphagous species fairly rare in southern Europe but widespread in northern regions to Scandinavia, interesting facts in order to understand the climate related to the Baltic amber.

#### ***Dorcadionoides subaeneus* MOTSCHULSKY, 1857**

MOTSCHULSKY 1857, p. 27 (Holotype: coll. MENGE, lost); SCUDDER 1885, p. 793; HANDLIRSCH 1907, p. 789; LARSSON 1978, p. 156; SPAHR 1981, p. 21; CARPENTER 1992, p. 312; POINAR 1992, p. 138; VITALI 2007c, p. 15-16.

The characters provided in the original description (very minute size, long antennae) may suggest that this fossil was the oldest synonym of *Pogonocherus jaekeli*, described nearly 50 years later (VITALI 2007c). Nonetheless, the missing of the type and the very approximate description suggest to consider this species as a nomen oblitum.

#### **Genus *Acanthocinus* GUÉRIN DE MÉNEVILLE, 1826**

HOPE 1836, p. 142; SPAHR 1981, p. 21; POINAR 1992, p. 138.

This very ancient record of three specimens of DALMAN's collection was no longer mentioned by subsequent authors. However, the presence of *Acanthocinus* in Baltic amber is very suspect since this genus, which has the same distribution as *Callidium*, was in all likelihood absent from Europe during the Tertiary. In fact, the only credible fossil *Acanthocinus*-species of Europe is that described by SCHMIDT (1967) from Late Pliocene shales of Willershausen am Harz (Germany).

#### **Genus prope *Dorcadion* DALMAN, 1817**

*Saperda* sp. I BERENDT 1845, p. 47, 56; GIEBEL 1856, p. 132. ZANG 1905, p. 240; SPAHR 1981, p. 22.

ZANG (1905) recorded a species scarcely resembling this genus when examining a relatively large specimen of BERENDT's collection previously identified as "*Saperda*" (BERENDT, 1845). Actually, *Dorcadion* has never been recorded from Baltic amber.

#### **Genus *Lamia* FABRICIUS, 1775**

HOPE 1836, p. 142; BERENDT 1845, p. 56; SCUDDER 1885, p. 793; ZANG 1905, p. 233; SPAHR 1981, p. 22; POINAR 1992, p. 138.

This genus was first recorded by HOPE (1836) from material of DALMAN's collection and later by BERENDT (1845) from material of his own collection. The presence of *Lamia* in Baltic amber is obviously erroneous and this genus should be understood as Lamiinae sensu lato in both cases. Four of BERENDT's specimens were examined by ZANG (1905) and effectively proved to be Lamiinae.

One of them was described as *Pogonocherus jaekeli*, while the other three belonged to two very characteristic unknown species, which ZANG preferred not to describe.

## **Discussion**

The cerambycid fauna of Baltic amber lists today only 9 valid species: *Trichosieversia europaea* (VITALI, 2004); *Encyclopidonia punctatissima* n.sp.; *Paracorymbia antiqua* VITALI, 2005; *Strangalia berendtiana* ZANG, 1905; *Nothorhina granulicollis* ZANG, 1905; *Clytus pici* PITON, 1940; *Parmenops longicornis* SCHAUFUSS, 1891; *Dorcaschema succineum* ZANG, 1905 and *Pogonocherus jaekeli* (ZANG, 1905). Other species have been recognised as not belonging to Cerambycoidea (*Aenictosoma doenitzi* SCHAUFUSS, 1891), as synonyms of already described ones (*Palaeoasemum crowsoni* ABDULLAH, 1967 and *P. duffyi* ABDULLAH, 1967), or should be deemed as nomina oblita (*Spondylis crassicornis* GIEBEL, 1856 and *Dorcadionoides subaeneus* MOTSCHULSKY, 1857). These last species unfortunately belong to the most ancient descriptions of cerambycids in amber, but their rough diagnoses and the missing of the types make them absolutely unrecognisable.

The first analysis of the Baltic cerambycid fauna (HOPE 1836) underlined the presence of a "South American relationship" and of "considerably warm" climates. Nonetheless, the genera mentioned in order to sustain the former (*Saperda*, *Gyrinus*) and the latter claim (*Cerambyx*, *Clytus*, *Callidium*, *Acanthocinus*, *Lamia*, *Leptura*) reveal the complete groundlessness of both hypotheses.

Further analyses (ZANG 1905; KLEBS 1910; LARSSON 1978) rightly noticed the great abundance of Spondylidinae, relating it to habitats rich in conifers. LARSSON also considered *Nothorhina* as a Mediterranean genus and this mistake was recorded by subsequent authors (HIEKE & PIETRZENIUK 1984; POINAR 1992; WEITSCHAT & WICHARD 2002), contributing to sustain the idea of a relative warm climate. Actually, the extant *Nothorhina* have only a relict distribution in the Mediterranean, being primarily widespread in Siberia and in the Himalayan region, where they bore mountain pines (*Pinus sylvestris* L., *P. mugo uncinata* RAMOND, *P. nigra laricio* POIRET, *P. roxburghi* SARG.). On the other side, the claim that Lepturini are indicators of conifers (HIEKE & PIETRZENIUK 1984; WEITSCHAT & WICHARD 2002) is still not verified since the species described until today are not evidently related to such plants (VITALI 2005). In fact, though the hosts of *Trichosieversia* and *Encyclopidonia* are unknown, all genera morphologically related to them have larvae living on oaks and other broadleaf trees.

Actually, this first screening reveals that the Baltic fauna included genera typically related to temperate, or even cold, middle-European mixed forests (*Paracorymbia*, *Nothorhina*, *Pogonocherus*, possibly also *Trichosieversia* and *Encyclopidonia*), and other ones apparently related to taxa widespread in the tropics today (*Dorcaschema*, *Parmenops*).

Nonetheless, considering this latter group as a tropical element might be erroneous. Regarding *Dorcaschema succineum*, this fossil has uncertain relationships with American species. Though *Dorcaschematini* are today primarily tropical, the least specialised taxa (*Dorcaschema* HALDEMANN, 1847 and *Hetoemis* HALDEMANN, 1847), to which this fossil seems mostly related, live in temperate-cold habitats of North America, including Canada (BREUNING 1949). However, the presence of mostly tropical genera does not necessarily imply the existence of tropical habitats. In fact, the current genus *Anoplophora* HOPE, 1939, though primarily tropical, includes species that optimally live in habitats with cold winters as in Japan or in the surroundings of Milan, Italy (LINGAFELTER & HOEBEKE 2002).

Therefore, such apparently “tropical“ species were probably the more northern boreal representatives of taxa widespread in sub-tropical zones; possibly, they had their counterparts in taxa living in the temperate climates of the more southern zones of the Austral Hemisphere. VITALI (2008) identified in the Prioninae *Xyleconites proavus* HAUPT, 1950 from Geiseltal (Sachsen-Anhalt, Germany, Middle Eocene) the boreal counterpart of some genera of Macrotomini today widespread only in Madagascar and South Africa. Although Geiseltal is located more southerly than the main Baltic amber occurrences, analogue observations have been made by other authors (WHEELER 1914; HENNING 1964, 1965, 1966; BARONI URBANI 2000), especially regarding the Baltic ant *Prionomyrmex janzeni* BARONI URBANI, 2000 and the dipteran *Archiphora robusta* (MEUNIER, 1905), *Psosphyracephala succini* (LOEW, 1873) and *Paracorsomyza crassirostris* (LOEW, 1850).

Due to the well-known geographic reasons, unlike their Austral counterparts, the Baltic boreal taxa were not able to survive the ice ages of the early Pleistocene and became extinct, leaving the fauna that we can observe today. This fact explains why such “tropical“ elements are difficult to ascribe to current taxa or have been described as belonging to extinct genera, while the temperate elements are fairly similar to extant taxa.

Consequently, the impression of the Baltic cerambycids is that we face a fauna richer and more diversified than today but, however temperate, similar to that currently surviving in Korea or in Japan. This seems to con-

firm that the Baltic habitats were analogous to those we find in central Europe today, as studies on the Trichoptera (WICHARD 1988) and Isoptera (WEIDNER 1995) also pointed out.

Since the hypothesis that Baltic amber included species of different altitudes (HEER 1865) has been proved erroneous (WEITSCHAT 1997), the most logic explanation is that Baltic amber must be referred to ages much more recent than it is currently hypothesised. By observing the temperature curve based on oxygen isotope measurement (BUCHARDT 1978), the Baltic biocenosis should be dated at least to the Early Oligocene, as the first dating already indicated (NOETLING 1883, 1888). This younger dating of Baltic amber can also better explain the fact that many fossils still have a great resemblance with extant species.

## Zusammenfassung

Ein Verzeichnis aller bis heute in Baltischem Bernstein registrierten Bockkäfertaxa wird entsprechend der heutigen systematischen und paläontologischen Kenntnisse zusammengefasst und analysiert. Nur acht fossile Bockkäferarten erweisen sich als gültig. Eine weitere neue Art, *Encyclopidonia punctatissima* n.gen.n.sp. (Cerambycidae, Lepturinae, Rhagiini), wird beschrieben. Zudem wird eine neue Gattung, *Trichosieversia* n.gen. für *Pseudosieversia europaea* VITALI, 2004 eingeführt. Die Analyse der baltischen Bockkäferfauna deutet sehr auf das Vorherrschen von gemäßigten Umweltbedingungen hin. Es wird daher vorgeschlagen, den Baltischen Bernstein, aufgrund der zu der Zeit vorherrschenden klimatischen Bedingungen, zumindest dem Frühen Oligozän zuzuordnen.

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Address of author:

Francesco VITALI  
 Corso Torino 5/7  
 16121 Genova, Italy  
 E-Mail: vitalfranz@yahoo.de