

A new cantacaderid lace bug from Baltic amber,  
and a key to fossil Cenozoic species of the family Tingidae  
(Insecta: Heteroptera)

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With 4 figures

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**Abstract**

An new fossil lace bug, *Intercader velteni* n. sp. belonging to the small subfamily Cantacaderinae (Tingidae) is described from the Baltic amber (Eocene), and its relationship is discussed. This new species is the second known species of the extinct genus *Intercader* GOLUB & POPOV, 1998 of the tribe Phatnomini (Tingidae: Cantacaderinae) which shares also some morphological features of the tribe Cantacaderini. A key of 13 already well studied species from Eocene-Miocene is given. They belong to 9 genera of both subfamilies Cantacaderinae (Cantacaderini and Phatnomini) and Tinginae.

**Zusammenfassung**

In vorliegender Arbeit wird aus dem Baltischen Bernstein (Eozän) *Intercader velteni* n. sp. der Unterfamilie Cantacaderinae (Fam. Tingidae) beschrieben und abgebildet. Sie ist erst die zweite bisher bekannt gewordene Art der fossilen Gattung *Intercader* GOLUB & POPOV, 1998, welche in das Tribus Phatnomini gestellt wurde, wenngleich sie auch Merkmale des Tribus Cantacaderini aufweist. Ein Bestimmungsschlüssel für 13 fossile Arten aus neun Gattungen der Unterfamilien Cantacaderinae und Tinginae wird vorgestellt.

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## I. Introduction

About 35 fossil species of Tingidae are known to date (DRAKE & RUHOFF, 1965; GOLUB & POPOV, 2000), 12 of them considered to be of the Eocene period. Eight of these 12 species and some other taxa of a still unclear systematic position belong to the subfamily Cantacaderinae. Of the four Eocene taxa described earlier as Tinginae, only *Archeopopovia yurii* GOLUB (2001) is most probably a real Tingid. The systematic position of the other three (*Tingis* sp. BERENDT, 1845; *Celantia* (?) *seposita* COCKERELL, 1921; and Tinginae of tribe inc.sed. NEL, 1992) require further studies.

As a result of the examination of the amber inclusions belonging to the Geological-Palaeontological Institute and Museum, University of Hamburg (Germany), which were made available for study through the kindness of Dr. Wolfgang WEITSCHAT and Mr. Jürgen VELTEN, a new species from Baltic amber Tingid (Eocene) belonging to the genus *Intercader* GOLUB & POPOV (1998) was discovered.

GOLUB & POPOV (1998) were the first authors to publish a key to the six Eocene species of Tingidae of Baltic amber origin. Now, after the description of the Miocene *Eocader babirussus* GOLUB & POPOV (2000a), *Leptopharsa poinari* GOLUB & POPOV (2000b), *L. evsyunini* GOLUB & POPOV (2000b), *Dictyonota petrifacta* GOLUB & POPOV (2000b), *Derephysia penalveri* GOLUB & POPOV (2000b), and two Eocene species – *Archeopopovia yurii* GOLUB (2001) and *Intercader velteni* n. sp. described in this paper, the number of well defined fossil Cenozoic species increased to thirteen. Since the descriptions of some fossil taxa are published elsewhere, we give a key to those thirteen most thoroughly studied species of Eocene-Miocene age, belonging to nine genera of the subfamilies: Cantacaderinae (tribe Cantacaderini and Phatnomini) and Tinginae.

## II. Systematic descriptions

Suborder Heteroptera

Infraorder Cimicomorpha

Family Tingidae LAPORTE, 1832

Subfamily Cantacaderinae STAL, 1873

Tribe Phatnomini DRAKE & DAVIS, 1960

Genus *Intercader* GOLUB & POPOV, 1998

Type species: *Intercader weitschati* GOLUB & POPOV, 1998

*Intercader velteni* n. sp.

(figs. 1-4)

Holotype: Male from Baltic amber (figs. 1-4); Yantarnyi, Kaliningrad Region, Samland Peninsula, Russia, coll. Geological-Palaeontological Institute and Museum, University of Hamburg, Germany, Typ.Kat.no.4295; ex coll. Jürgen. VELTEN, Idstein (near Frankfurt).

Derivato nominis: Patronym for the collector Jürgen VELTEN (IDSTEIN), member of the Amber-Working-Group at the Geological-Palaeontological Museum University of Hamburg.

State of preservation: The specimen is well preserved in a small clear piece of amber.

Description: Small, shorter than 2 mm. Body oval, 1.87 times longer than wide; dorsal and ventral side of body dark-brownish, legs yellow-brownish; vesicula, carinae and paranota of pronotum, costal area, longitudinal carinae and elevated transversal veins of hemelytra of lighter colour.

Head with elongate proorbital part, 1.17 times as wide as long; eyes strongly protruding laterally and touching anterior margin of pronotum, punctated from above, almost flattened, distinctly pressed on level of anterior margin of eyes; with seven short spine-like tubercles: one single clypeal and paired, jugal-, frontal and occipital tubercles. Clypeal tubercle is a conical projection with wide base and directed forwards almost reaching anterior margin of clypeus. Jugal tubercles are small elongated tubercles which are distinctly visible in lateral view and also from below. Frontal and occipital tubercles are spherical tubercles, of which frontal tubercles are larger than the very small occipital ones. Antennae thin and moderately long. Rostrum reaching middle of 3<sup>rd</sup> (2<sup>nd</sup> visible) abdominal sternite.

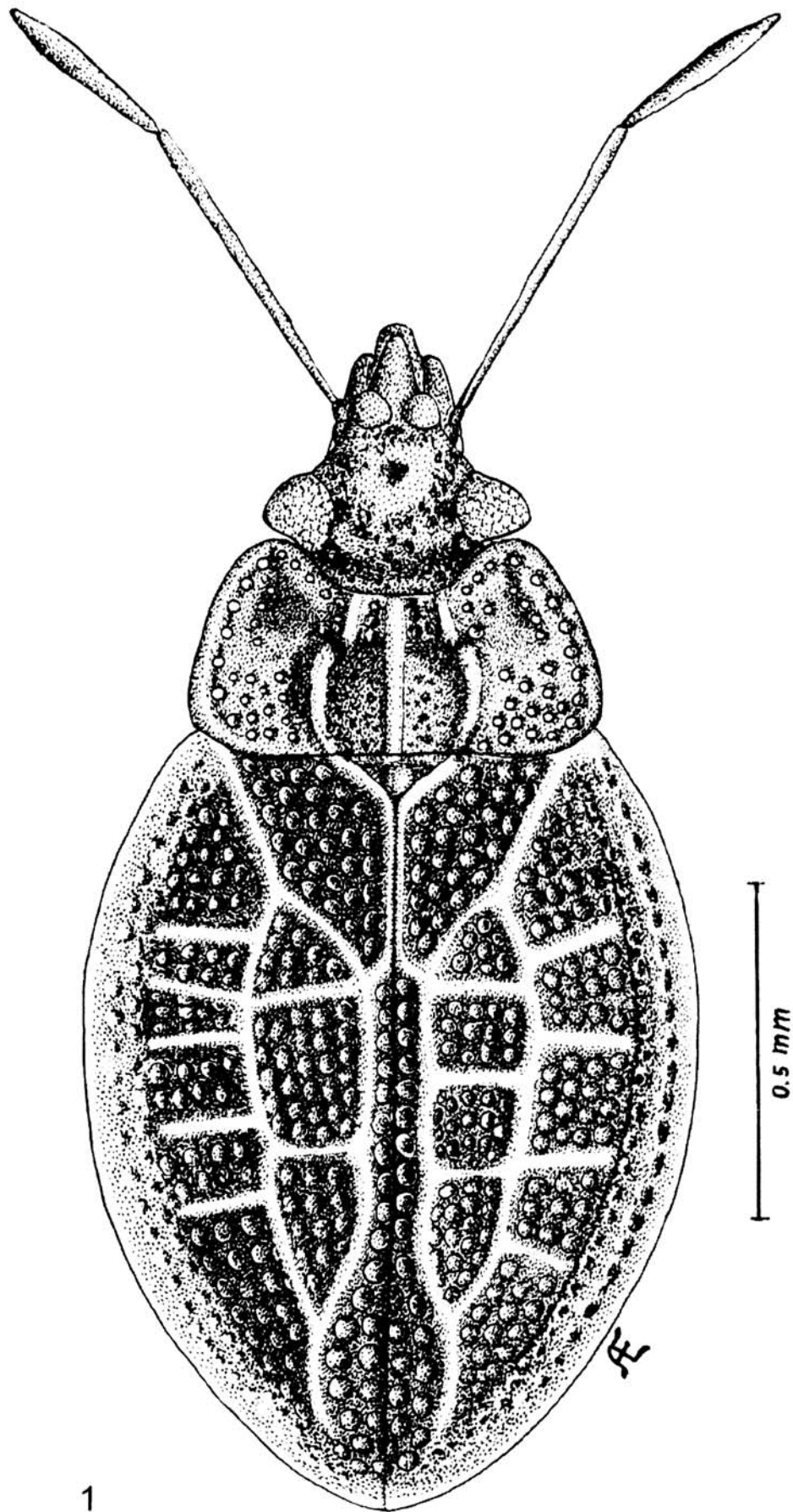
Pronotum short and rather wide, 2.06 times wider than long. Anterior margin medially concave and weakly elevated, anterolateral angles rounded. Vesicula finely areolate with three cells on both sides of median carina. Pronotal disc with 3 low carinae without cells. Lateral carinae interrupted on calli, consisting of two parts: a short anterior one which is very low, hardly elevated above vesicular surface and a long (nearly twice as long) posterior part which is curved, its anterior end is closer to median carina than posterior one. Lateral margins of pronotum moderately rounded. Paranota rather narrow with one row of small cells along its length. Surface of pronotum finely areolate on its posterior part; diameter of cells as of hemelytra. Posterior margin without triangular projection, slightly concave. Scutellum small, triangular with elevated knob-like apex.

Hemelytra (submacropterous form) distinctly surpassing apex of abdomen, flattened, with strongly carinate veins, separating the areolate areas with small circular cells. Lateral margins evenly rounded. Costal area not very wide, with 2 rows of cells, only basal and apical part with one row. Subcostal area distinctly wider than costal one, with 4-5 strongly elevated transversal veins, and with 4 rows of cells. Discoidal area rather long and wide, of fusiform shape with 2-3 strongly elevated transverse veins and about 5 irregular rows of cells. Sutural (inner) area straight, touching, but not overlapping each other. Clavus fused with corium but separated from it by the weakly elevated Cu vein (claval commissure absent), with 4-5 rows of cells in the widest part.

Peritreme of scent glands distinctly expressed, widely oval.

Dimensions in mm: Body length 1.69, width 0.9; length of head (from apex of clypeus to posterior margin of eyes) 0.3, width 0.35; width of vertex 0.127; ratio of antennomeres 1-4 as 0.07 : 0.05 : 0.31 : 0.143; length of pronotum 0.29, width 0.6; length of fore leg: femur 0.31, tarsus 0.09; length of middle leg: femur 0.26, tibia 0.29, tarsus 0.09; length of hind leg: femur 0.31, tibia 0.29.

Comparison: The new species is close to *Intercader weitschati* GOLUB & POPOV (1998) earlier described from Baltic amber and distinguished from it by the characters given in the key.



**Fig. 1:** *Intercader velteni* n. sp., holotype, male from Baltic amber, ; coll. Geological-Palaeontological Institute and Museum University of Hamburg; Typ.Kat.no. 4295; ex coll. J. VELTEN (Idstein). General dorsal view.

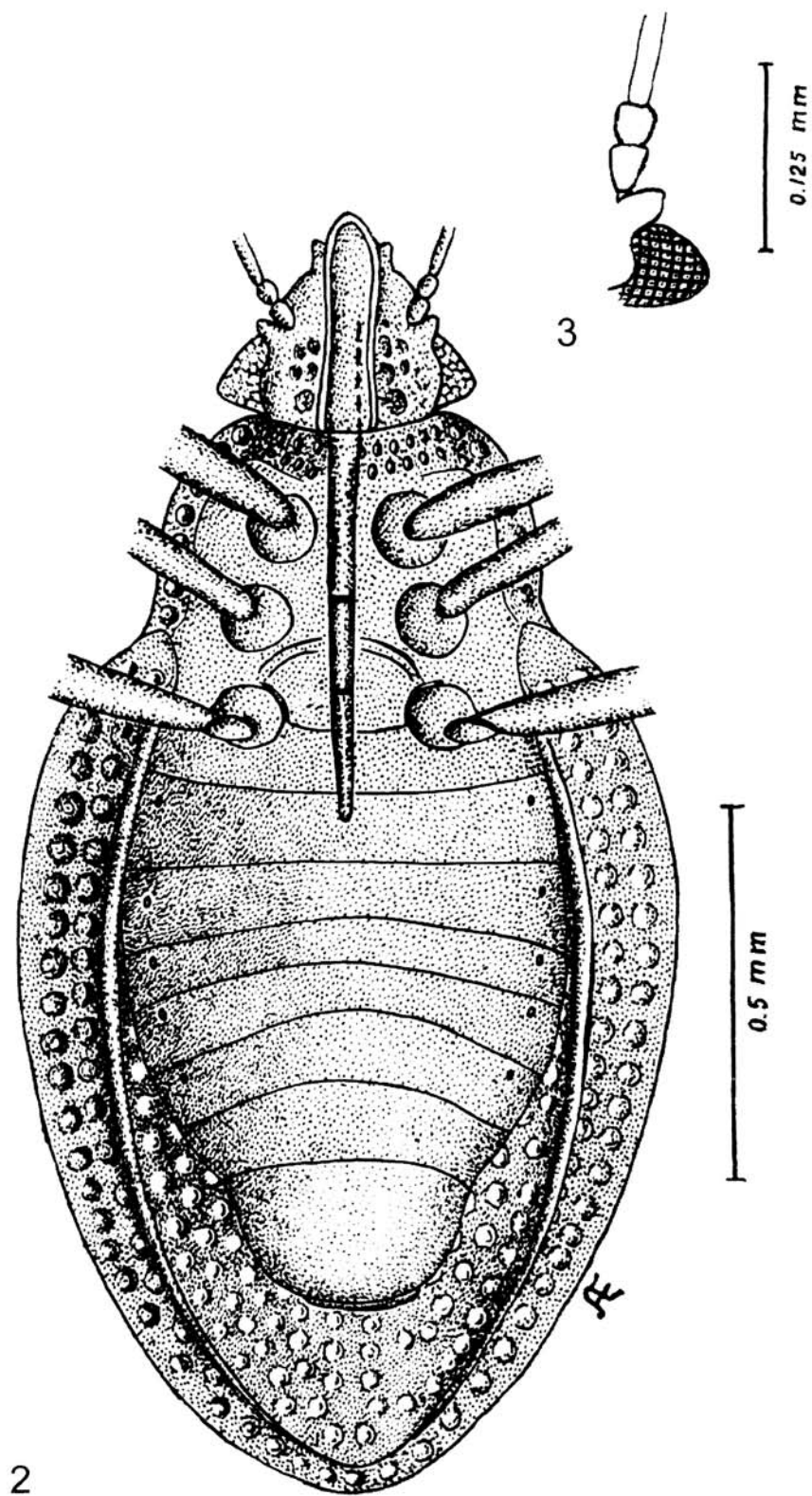


Fig. 2-3: *Intercader velteni* n. sp., holotype, male from Baltic amber; coll. Geolical-Palaeontological Institute and Museum University of Hamburg; Typ.Kat.no. 4295; ex coll. JÜRGEN VELTEN (Idstein); 2: General ventral view; 3: Base of antenna.

### III. Key to Cenozoic Tingidae (Eocene – Middle Miocene)

1(16) Posterior margin of pronotum straight, slightly concave or only weakly convex, never with a posterior triangular projection. Clavi of hemelytra entirely visible. (Subfamily Cantacaderinae).

2(5) Hemelytra with stenocostal area clearly seen at least on ventral side as a narrow groove between veins C and Sc. Head without unpaired medial spines, only with paired spines which do not have secondary spines in form of branches (Tribe Cantacaderini).

3(4) Pronotum slightly narrowing anteriorly: its maximum width 1.3-1.6 times wider than width of anterior margin of pronotum; the latter 1.1-1.3 times larger than width of head. 3<sup>rd</sup> antennal joint 2 times longer than width of head (measurements made in accordance with the first description of DRAKE, 1950 and the corresponding drawing of FROESCHNER, 1996, fig. 10). Widest part of discoidal area of hemelytra with 5-6 rows of cells. Length 3.0-3.9 mm. Middle Europe, Baltic amber (Eocene)..... *Paleocader avitus* (DRAKE)

4(3) Pronotum strongly narrowing anteriorly, its maximum width 1.9-2.2 the width of anterior margin and about 0.8-0.9 times the width of head. 3<sup>rd</sup> antennal joint 3 times as long as width of head. Widest part of discoidal area with 10 rows of cells. Length 3.9-4.2 mm. Middle Europe, Baltic amber (Eocene)..... *P. strictus* GOLUB & POPOV

5(2) Hemelytra without stenocostal area. Head with 1 or 2 unpaired medial spines or tubercles. If absent each of the longest paired spines bears several shorter secondary (additional) spines, looking branched (Tribe Phatnomini).

6(15) Head with 1 or 2 unpaired medial spines. These spines are unbranched and rather short. Lateral margins of paranota and hemelytra without spines.

7(10) Pronotum with 5 longitudinal carinae: one median and two pairs of lateral carinae.

8(9) Paranota along greater part of their length with 2 rows of cells. 3<sup>rd</sup> antennal joint 2.75 times longer than 4<sup>th</sup>. Length 1.8 mm. Middle Europe, Baltic amber (Eocene).....  
..... *Intercader weitschati* GOLUB & POPOV

9(8) Paranota along their full length with 1 row of cells and a second row on anterior 1/3. 3<sup>rd</sup> antennal joint 2.15 times longer than 4<sup>th</sup>. Length 1.7 mm. Middle Europe, Balticamber, (Eocene)..... *I. velteni* n. sp.

10(7) Pronotum with 3 longitudinal carinae.

11(12) Head with 5 spines: unpaired clypeal and paired jugal and frontal ones. All areas of hemelytra rather narrow: costal area along whole length with 2 rows of cells, with 1-2 cells of 3<sup>rd</sup> row anteriorly; widest part of subcostal and discoidal areas with 4 rows of cells. Lateral borders of paranota slightly sinuate. Smaller, about 1.85 mm. Central America, Dominican amber (Lower-Middle Miocene)..... *Eocader babyrussus* GOLUB & POPOV

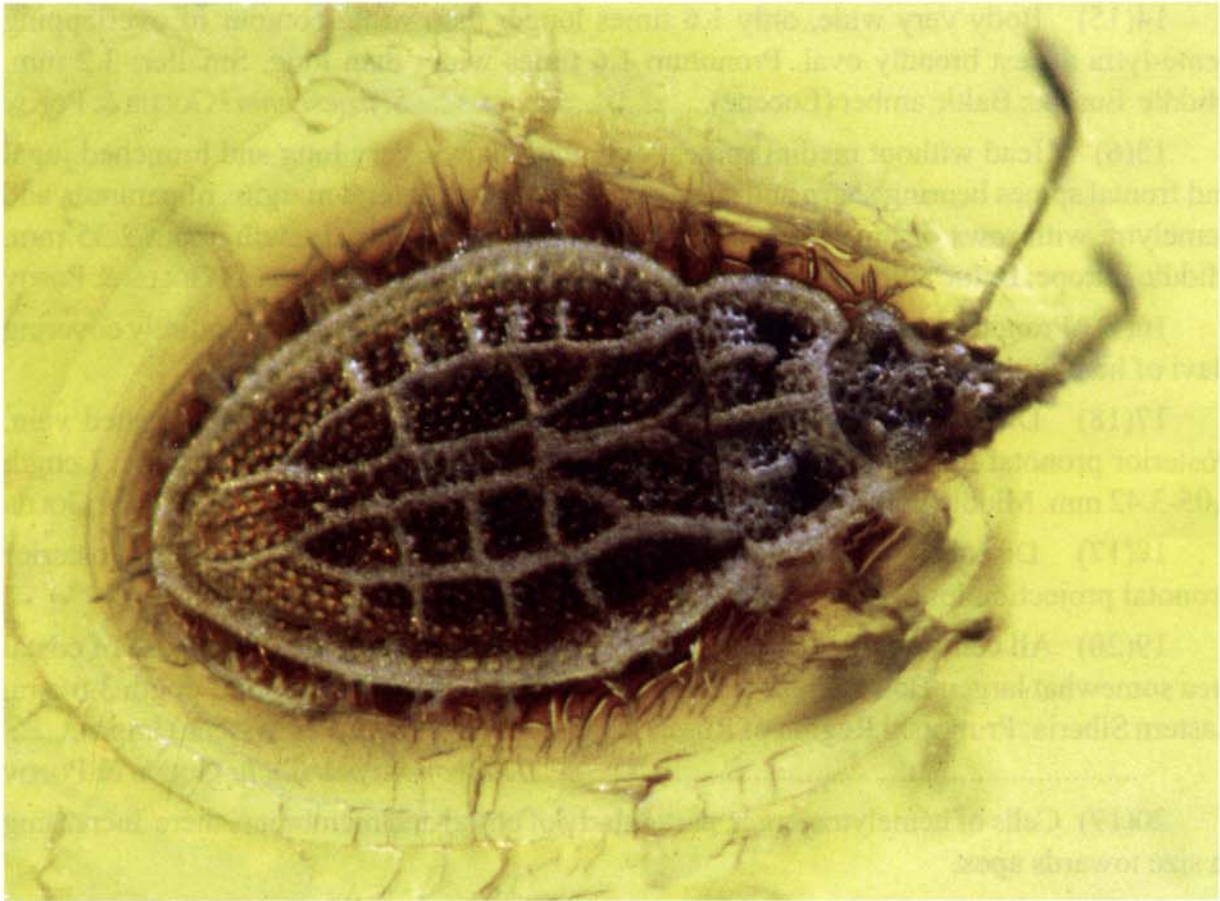
12(11) Head with 8 spines: unpaired medial, clypeal and dorsomedial (unpaired frontal) and paired jugal, frontal and occipital ones. All areas of hemelytra broad: costal area at widest with 4-5 rows of cells or even with single cells of a 6<sup>th</sup> row; subcostal and discoidal areas with 6-7 and 9-10 rows of cells. Lateral borders of paranota strongly sinuate. Larger: 3 mm.

13(14) Body distinctly elongate, 2.0-2.2 times longer than wide; contour of overlapping hemelytra at rest elongate oval. Pronotum 1.25-1.35 wider than long. Larger: 3.4-4.0 mm. Middle Europe, Baltic amber, (Eocene)..... *Sinalda baltica* (DRAKE)

- 14(15) Body very wide, only 1.6 times longer than wide; contour of overlapping heme-lytra at rest broadly oval. Pronotum 1.6 times wider than long. Smaller: 3.2 mm. Middle Europe: Baltic amber (Eocene)..... *S. froeschneri* GOLUB & POPOV
- 15(6) Head without medial spines, only with paired very long and branched jugal and frontal spines bearing sharp and shorter lateral spines. Lateral margins of paranota and hemelytra with rows of long acute spines bearing apical chaeta. Length about 2.35 mm. Middle Europe: Baltic amber (Eocene)..... *Tingicader cervus* GOLUB & POPOV
- 16(1) Pronotum with posterior triangular projection, partly or almost entirely covering clavi of hemelytra (Subfamily Tinginae).
- 17(18) Discoidal area of hemelytra with one additional transverse elevated vein. Posterior pronotal projection comparatively short, covering almost half of clavi. Length 3.05-3.42 mm. Middle Europe: Baltic amber (Eocene)..... *Archeopovia yurii* GOLUB
- 18(17) Discoidal area of hemelytra without additional transverse vein. Posterior pronotal projection long, covering almost the whole clavi.
- 19(20) All cells of hemelytra including membrane of same size, only those of costal area somewhat larger. Body length (excluding head, missing in holotype). Length 3.6 mm. Eastern Siberia: Primorski Region of Russia (Upper Oligocene-Lower Miocene) imprint.....  
..... *Dictyonota petrifacta* GOLUB & POPOV
- 20(19) Cells of hemelytra larger, particularly of costal and membrane, there increasing in size towards apex.
- 21(22) Antennae comparatively short and thickened, their 3<sup>rd</sup> joint hardly longer than width of head. Hemelytra shorter, posteriorly projecting over abdomen by ½ of its length. Body rather wide, about 1.8 times longer than wide. Length about 3.4 mm. Southern Europe: Spain ( Lower Miocene, Aragon ); imprint..... *Derephysia penalveri* GOLUB & POPOV
- 22(23) Antennae very long and thin, their 3<sup>rd</sup> joint approximately 3.5 times longer than width of head. Hemelytra very long, posteriorly projecting over abdomen by nearly its full length. Body narrow and long, 2.8 –2.86 times longer than wide.
- 23(24) Lateral borders of paranota slightly sinuate at middle with 2 rows of cells. Larger, length about 4.25 mm. Central America: Dominican amber, (Lower-Middle Miocene)..... *Leptopharsa poinari* GOLUB & POPOV
- 24(25) Lateral borders of paranota evenly rounded with 2, anteriorly 3 rows of larger cells. Smaller: 3.2 mm. Central America Dominican amber, (Lower-Middle Miocene).....  
..... *L. evsyunini* GOLUB & POPOV

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**Fig. 4:** *Intercader velteni* n. sp., holotype, male from Baltic amber, Yantarnyi, Kaliningrad Region, Samland Peninsula, Russia.; coll. Geological-Palaeontological Institute and Museum University of Hamburg; Typ.Kat.no. 4295; ex coll. J. VELTEN (Idstein); general dorsal view, body length 1.7 mm.

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