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Fossil soldier beetles from Baltic amber of the Anders Damgaard amber collection (Coleoptera Cantharidae)

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In this paper, the authors describe and illustrate four new fossil genera and fifteen new fossil species of soldier beetles from Baltic amber belonging to the collection of Anders Damgaard: *Eridanula* **n. gen.**, *Noergaardia* **n. gen.**, *Juratelacrima* **n. gen.**, *Palmnickeneoceras* **n. gen.**, *Cacomorphocerus bentifabrici* **n. sp.**, *Cacomorphocerus madseni* **n. sp.**, *Eridanula susannaebierae* **n. sp.**, *Noergaardia dinae* **n. sp.**, *Cantharis* (*Cyrtomoptila*) *mikkelsenorum* **n. sp.**, *Juratelacrima ballingi* **n. sp.**, *Palmnickeneoceras ejersboi* **n. sp.**, *Podistra* (*Absidia*) *kloevedali* **n. sp.**, *Rhagonycha* (*s. str.*) *nielsenae* **n. sp.**, *Themus* (*Haplothemus*) *bennyianderseni* **n. sp.**, *Malthinus* (*s. str.*) *rifbjergi* **n. sp.**, *Malthodes* (*s. str.*) *henningseni* **n. sp.**, *Malthodes* (*s. str.*) *moellehavei* **n. sp.**, *Kuskaella bajerae* **n. sp.**, and *Autosilis annisettaekoppelae* **n. sp.** The presence of the genus *Themus* Motschulsky, 1858 in Eocene Baltic amber allows assumptions to be made about the origin of the genus or the age of amber. The genera *Eridanula* and *Norgaardia* belong to the recently established tribe Cacomorphocerini Fanti & Kupryjanowicz, 2018 based on having the same shape of the antennae but with more antennomeres (17-19). Furthermore, *Podistra kloevedali* is the first described fossil species of the genus, until now known only at the generic level.

Key words: Cantharidae, new genera, new species, paleoentomology, Baltic, amber.

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INTRODUCTION

The family Cantharidae, with more than 5,000 species (Bouchard et al. 2009) and around 150 genera, is widespread all over the world and in all continents except Antarctic, including small oceanic islands, mountain areas, deserts (Konstantinov et al. 2009) and cold areas such as North Greenland (Böcher 1995) and Northern Alaska (Matthews & Telka 1997). It is quite common even as fossils, 53 species being recently recorded in a catalogue (Fanti 2017a) and 12 species subsequently described (Fanti 2017b, 2017c; Fanti & Castiglione 2017; Fanti & Kupryjanowicz 2017, 2018; Fanti & Vitali 2017; Fanti et al. 2018; Fanti & Michalski

2018; Fanti & Pankowski 2018). The vast amber collection of fossil soldier beetles of Anders Damgaard (Holstebro, Denmark) has already provided two new genera and species from Burmese amber (Fanti et al. 2018). Therefore, the purpose of this work is to study the numerous taxa from Baltic amber. The collection has proven to be particularly rich in species and also has two new genera related to the newly established tribe of the Cacomorphocerini Fanti & Kupryjanowicz, 2018. Therefore, the Eocene subtropical forests, as well as the current ones of Southeast Asia and South America, were populated by many species and genera of Cantharidae, with many interesting Eocene lineages now believed to be extinct.

MATERIALS AND METHODS

The amber specimens come from a quarry near Yantarny in the Kaliningrad region, Russia. Baltic amber is traditionally considered to be of Eocene age: Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY) but sometimes also Oligocene (*e.g.* Noetling 1883; Jeannel 1949; Laurentiaux 1953; Vitali & Damgaard 2016). All amber specimens were re-polished in order to highlight dorsal and ventral views, examined with a Nikon SMZ 745T stereomicroscope and photographed with a camera Imaging Source DFK 72AUC02 attached to a trinocular microscope. The holotypes are housed in the amber collection of Anders Damgaard (ALDC) and subsequently will be deposited in the Zoological Museum, University of Copenhagen, Denmark (ZMUC). Subfamilies, tribes, genera and species are listed in systematic alphabetical order.

SYSTEMATIC PALEONTOLOGY

Class Insecta Linnaeus, 1758
Order Coleoptera Linnaeus, 1758
Superfamily Elateroidea Leach, 1815
Family Cantharidae Imhoff, 1856 (1815)
Subfamily Cantharinae Imhoff, 1856 (1815)
Tribe Cacomorphocerini Fanti & Kupryjanowicz, 2018
Genus *Cacomorphocerus* Schaufuss, 1892

***Cacomorphocerus bentifabrici* n. sp.**
(Fig. 1ABC)

Holotype. Female, in Baltic amber, accession No. ALDC0057/ALD.Ba.Can.8

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. The genus *Cacomorphocerus* is known for three species in Baltic amber: *C. cerambyx* Schaufuss, 1892, *C. jantaricus* (Kuśka & Kania, 2010) and *C. wiszniewskii* Fanti & Kupryjanowicz, 2018 and cited, at the generic level, also for the coeval Rovno amber (Kazantsev & Perkovsky 2014). It is characterised by antennae 12-segmented with antennomeres III-IX dilated and saucer-shaped. This genus seems to be very uniform in the habitus and only the pronotal shape seems to be, in some cases, quite diagnostic. In fact, *C. cerambyx* shows a quadrate pronotum, with apical margin narrower, all angles roundish and surface with longitudinally impression, while *C. jantaricus* shows a rectangular pronotum, concave to the sides, with basal angles slightly protruding laterally and a small denticle near the apical angles. Furthermore, the surface is rough with deep punctation and two oblong tubercles (Schaufuss 1892; Kuśka & Kania 2010). Finally, *C. wiszniewskii* shows a subrectangular pronotum with concave sides from after the base to the apical third and with a small denticle. The new species herein described, instead, has a pronotum slightly longer than wide, with apical margin and strongly rounded sides in the anterior part, and the surface is rough with two oblong thickenings in the middle. In addition, *C. bentifabrici* n. sp. is entirely dark brown,

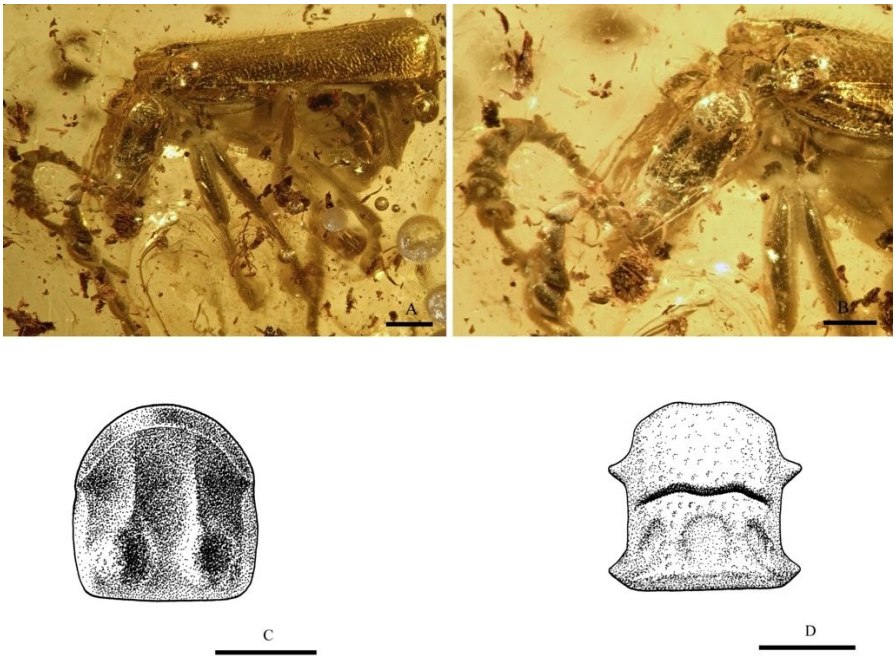

Fig. 1. ABC: *Cacomorphocerus bentifabrici* n. sp. in Baltic amber. A: Holotype, dorso-lateral view, bar = 1.0 mm; B: Holotype, detail of head and pronotum, bar = 300 µm; C: Drawing of pronotum, bar = 500 µm; D: *Cacomorphocerus madseni* n. sp. in Baltic amber. Drawing of pronotum, bar = 500 µm.

while *C. jantaricus* has black-brown elytra with yellow elongate spots on humeri and pale brown margin at apex (Kuśka & Kania 2010), *C. cerambyx* is probably entirely black (Schaufuss 1892) and *C. wiszniewskii* is dark brown with blackish sternites (Fanti & Kupryjanowicz 2018).

Description. Adult, winged, robust and stocky habitus, female, entirely dark brown. Body length 8 mm (from front margin to elytral apex). Head rounded, very slightly narrower than pronotum and posteriorly strongly covered by pronotum, surface with shallow punctation. Eyes mediocre, roundish, strongly prominent. Maxillary palps 4-segmented with last palpomere securiform. Antennae short, few pubescent, reaching only the basal third of the elytra, 12-segmented, inserted in the inner anterior part at short distance from the eyes; scape elongated, stout, club-shaped; pedicel very short and cylindrical, about one-third as long as scape; antennomeres III-VI stout, slightly saucer-shaped and asymmetrically inflated; antennomere VII saucer-shaped; antennomere VIII strongly saucer-shaped and asymmetrically dilated; antennomere IX slightly narrower than antennomeres VII-VIII, subquadrate; antennomeres X-XII elongated and filiform. Pronotum slightly longer than wide; surface with setae and shallow punctation; angles roundish; lateral and particularly the apical margin strongly round and protruding to covering the head, two evident and parallel thickenings in the posterior half and close to the basal margin, which is flat. Scutellum triangular, elongated and with roundish apex. Elytra long, surpassing the last abdominal segments, parallel-sided, with rounded apex, as wide as the pronotum, covered with numerous and short setae and with rugose surface. Posterior wings covered by elytra. Sternum and abdomen pubescent (covered by milky emulsion); last ventrite wide and not triangular. Legs slender and fairly short; coxae massive; trochanters elongated; femora slightly enlarged and cylindrical with apex thin and

completely fitted with short pubescence; tibiae with pubescence, cylindrical slightly longer than femora. Tarsi 5-segmented, short and massive; first tarsomere elongated; second about 1.5 times shorter than first tarsomere; third and fourth tarsomere triangular and shorter than second; fifth elongated and thin; claws simple, not well visible but probably with a delicate denticle at base.

Etymology. This new species is named in honour of the Danish musician Bent Fabricius-Bjerre, internationally known as Bent Fabric, in recognition of his career as a pianist and composer.

Syninclusions. Numerous wood remains (also botanical masses), stellate trichomes, and some air bubbles.

Remarks. The specimen is a female based on the relatively short antennae compared with other *Cacomorphocerus* species, and particularly for the last ventrite that is large and not triangular.

The piece of amber (that measures 37 x 28 x 9 mm) is not particularly transparent (lacquered). The inclusion is ventrally strongly covered by a white cotton-like cloud (emulsion, milky substance) making it impossible to get a clear vision of the ventral side of the beetle.

***Cacomorphocerus madseni* n. sp.**
(Figs. 1D - 2)

Holotype. Male, in Baltic amber, accession No. ALDC0390/ALD.Ba.Can.15

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Fig. 2. *Cacomorphocerus madseni* n. sp. in Baltic amber. A: Holotype, dorsal view, bar = 1.0 mm; B: Holotype, ventral view, bar = 1.0 mm; C: Holotype, detail of pronotum, bar = 500 µm.

Differential diagnosis. *Cacomorphocerus madseni* n. sp**.** has the pronotum with deep transversal incision, not present in any other *Cacomorphocerus* or fossil soldier beetles (*Cacomorphocerus cerambyx* Schaufuss, 1892 has the longitudinal incision). It is also characterised by the extremely shorts protibiae and the pronotum with two strong expansions at sides.

Description. Adult, winged, robust and stocky habitus. Male, based on the triangular and narrow last ventrite. Body length 6 mm. Entirely blackish. Head slightly wider than pronotum, rounded, posteriorly covered by pronotum. Eyes roundish, strongly prominent. Maxillary palps 4-segmented with last palpomere securiform. Labial palps 3-segmented with the last segment elongated and slightly globular and pointed. Antennae short, slightly surpassing the humeri, 12-segmented; scape elongated, stout; pedicel extremely short and roundish; antennomeres III-VI stout, slightly saucer-shaped and asymmetrically inflated; antennomeres VII-VIII strongly dilated and saucer-shaped, with antennomere VIII wider than antennomere VII; antennomere IX slightly narrower than antennomere VIII; antennomeres X-XII elongated and filiform. Pronotum convex, as wide as elytra, with in the middle a deep and sinuous transversal incision; basal margin straight; apical margin slightly sinuous; sides with two strong denticles - expansions rounded at apex, one near the basal angles and another one just above the median incision; surface with punctation. Scutellum very wide, elongated, with roundish apex. Elytra very long, surpassing the last abdominal segments, parallel-sided, with rounded apex, covered with numerous short setae. Posterior wings completely covered by elytra. Sternum and abdomen pubescent, with last ventrite triangular and very narrow. Legs short, slender, only the posterior long; coxae massive; trochanters triangular, very narrow; femora slightly enlarged fitted with short pubescence; protibiae extremely short, meso- and metatibiae long and cylindrical with pubescence. Tarsi 5-segmented; first tarsomere elongated; second about 2.5 times shorter than first tarsomere; third tarsomere triangular; fourth discoidal with anterior margin straight; fifth elongated and thin; claws simple, not well visible but seemingly with a denticle at base.

Etymology. This new species is named in honour of the Danish novelist Svend Åge Madsen, in recognition of his writings.

Syninclusions. Stellate trichomes, a big air bubble and a few small wood remains.

Remarks. The piece of amber is transparent, roundish drop-shaped and measures 15 x 11 x 5 mm. The legs of the inclusion are present, but some of them are curled up and the right mesotibia is broken and detached almost at the beginning. The head and partially the pronotum are covered by a white emulsion, and the pronotum is also damaged. The last article of the right antenna is missing.

Genus *Eridanula* n. gen.

Type species. *Eridanula susannaebierae* n. sp. The genus is at present monotypic.

Etymology. The genus name derives from Eridanos (Greek = Eridanσs; Latin = Eridanus), derived from Ancient Greek *"Ηριδανός*" "Amber" + the Latin suffix *-ula* (diminutive) = small. This epithet refers to the name of the major river of Baltica: Fenno-Sarmatia (Eridanos River), which carried and deposed the Baltic amber (Bijlsma 1981; Overeem et al. 2001; Gibbard & Lewin 2016). Gender: feminine.

Diagnosis. The unequal maxillary palpomeres, with the last segment securiform and the pronotum without modified lateral margins, places this new genus in the subfamily Cantharinae. *Eridanula* n. gen. is characterised by long elytra covering the abdomen; pronotum slightly longer than wide, with parallel lateral margins and narrower than elytra; head globular, very large, dorsally telescopic and with evident

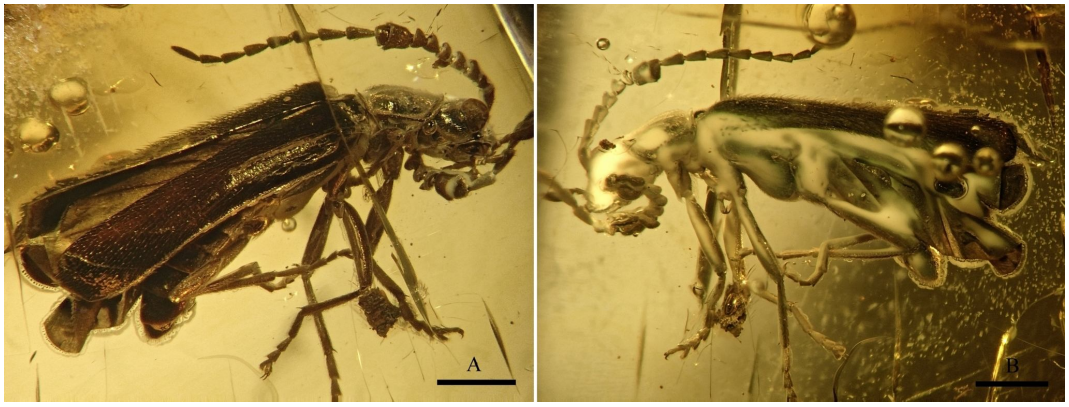

Fig. 3. *Eridanula susannaebierae* n. gen. et n. sp. in Baltic amber. A: Holotype, dorso-lateral view, bar = 1.0 mm; B: Holotype, lateral view, bar = 1.0 mm.

Fig. 4. *Eridanula susannaebierae* n. gen. et n. sp. in Baltic amber. A: Holotype, detail of head and pronotum, bar = 200 µm; B: Holotype, detail of antennae, bar = 400 µm; C: Holotype, detail of last tergites, bar = 500 µm.

big eyes; claws simple without denticle (with a small denticle in the other related genera) and antennae with 17 articles: the antennomeres III-VIII dilated and slightly saucer-shaped (notably, the antennomere VIII is very saucer-shaped), the antennomere IX subquadrate and the other articles filiform and slightly enlarged (which is unknown in any extant and fossil genera).

***Eridanula susannaebierae* n. sp.**
(Figs. 3 - 4)

Holotype. Female, in Baltic amber, accession No. ALDC0396/ALD.Ba.Can.19
Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).
Differential diagnosis. Given the similarity with the *Cacomorphocerus* lineage, the number of antennomeres and the shape of antennae are important diagnostic characters (see the next genus in this article). The only genus with the same number of antennomeres is *Michalskantharis* Fanti, 2017 which has the articles filiform and inflated but unmodified, and the antennae are also longer. Furthermore, *Michalskantharis* shows a pronotum totally convex, with apical and basal margins raised, and head not laterally enlarged (Fanti 2017c).

Description. Adult, winged, elongate. Female, defined on the basis of the shape of last sternite not narrowed, and relative short antennae. Body length 6 mm. Entirely blackish with legs, particularly the posteriors, slightly paler. Head almost completely exposed, wider than pronotum, large as elytra at humeri, laterally very enlarged and globular, dorsally telescopic, ventrally long and extruded, surface slightly rugose covered with very sparse and short setae. Eyes in the lateral-dorsal part of head, extremely wide, evident, strongly convex, roundish. Mandibles not well visible, seems very wide at base and thin at apex. Unequal maxillary palps, 4-segmented, with the last palpomere securiform. Antennae 17-segmented, rather short and reaching almost half of the elytra, equipped with short pubescence and inserted in the upper and inner part of the eyes and not close to the eyes; scape very robust, elongated and cylindrical; pedicel short; antennomeres III-VII dilated and slightly saucer-shaped; antennomere VIII saucer-shaped and wide; antennomere IX short but large and subquadrate; antennomeres X-XVI filiform slightly enlarged and not particularly long, antennomere XVII filiform. Pronotum much narrower than elytra, slightly longer than wide; lateral margins parallel; surface with shallow punctation and recumbent pubescence, gibbous in the basal part and flat in the apical part; apical and basal margins rather raised. Scutellum wide at base and elongated apically, where it is roundish. Elytra very long, narrow, covering the last abdominal segments, parallel-sided; apex almost straight and slightly rounded, surface smooth without evident punctation and covered with short setae. Posterior wings dark brown, almost completely covered by elytra. Sternum and abdominal segments dark brown - blackish with short pubescence, last tergite very short and roundish and last ventrite not narrow. Legs of medium length, covered with dense and numerous setae; coxae massive, elongated and globular; trochanters elongated and rounded at apex; femora enlarged and slightly curved, pro- and mesofemurs about 1.3 times longer than tibiae, metafemora slightly longer than metatibiae; tibiae thin, cylindrical, short, apically equipped with spur. Tarsi 5-segmented; first tarsomere elongated and cylindrical, about 1.7-1.8 times longer than second; second tarsomere short; third tarsomere shorter than second and more enlarged; fourth strongly bilobed; fifth elongated and flat, thinner than others; claws simple without denticle at base.

Etymology. This new species is named in honour of the Danish film director Susanne Bier, to thank her for her films and to recognize her for the awards she has earned.

Syninclusions. Air bubbles, botanical mess, very small wood remains, and a small mite.

Remarks. The amber piece (measures 15 x 14 x 6 mm) is extremely transparent and allows an accurate dorsal view. Only the left side is covered by a white cotton-like cloud (emulsion, milky substance).

Genus *Noergaardia* n. gen.

Type species. *Noergaardia dinae* n. sp. The genus is at present monotypic.

Etymology. This genus is named in honour of the Danish author, journalist, debater and scriptwriter Lise Nørgaard + the Latin suffix -*ia*, as congratulation for her 100th birthday (1917-2017) and in honour of her decades of contributions to the Danish cultural treasure chest. She is a pioneer in consumer journalism, has fought for women's rights and equality and, with her strong personality, has influenced and impacted Danish culture. Gender: feminine.

Diagnosis. Long elytra covering the abdomen, pronotum without modified lateral margins, legs with 5-segmented tarsi and with the pretarsal claws equipped by small denticle, and unequal maxillary palpomeres with the last segment securiform, are typical of the subfamily Cantharinae. This genus is also characterised by 19-segmented antennae, antennal articles III-VIII dilated and saucer-shaped, IX rectangular-elongated and the others filiform (unknown in any extant and fossil genera).

***Noergaardia dinae* n. sp.**
(Figs. 5 - 6)

Holotype. Sex undetermined, in Baltic amber, accession No. ALDC0055/ALD.Ba.Can.6

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. Easily distinguishable from all other soldier beetles by the 19-segmented antennae with saucer-shaped segments III-VIII. Other similar genera with dissimilar antennae are *Palmnickeneoceras* n. gen. (11 articles, antennomeres III-V dilated, antennomere VI subrectangular), *Cacomorphocerus* Schaufuss (12 articles, III-IX saucer-shaped), *Sucinocantharis* Kuśka & Kania (16 articles, III-X dilated to saucer-shaped) and *Eridanula* n. gen. (17 articles, III-VII dilated, VIII saucer-shaped, IX slightly dilated). *Electronycha* Kazantsev (15 filiform antennal articles and only the VI-IX swollen) and *Michalskantharis* Fanti (17 antennal articles but filiform inflated and not modified) could also be added to this group (Schaufuss 1892; Kuśka & Kania 2010; Kazantsev 2013; Fanti 2017c).

Description. Adult, winged, flattened, elongate. Sex undetermined. Body length 8.0-8.5 mm and difficult to assess because the head is folded. Entirely dark brown-blackish. Head globular, not well visible, almost completely exposed and equipped with some setae. Eyes rounded. Maxillary palpomeres unequal; first segment very short; second elongated and third along almost one-half as long as the second; the last securiform and very rounded at apex, typical of the subfamily Cantharinae. Antennae 19-segmented; scape elongated and much enlarged; second very short, strongly globular and the smallest of all; antennomeres III-VII dilated and saucer-shaped; antennomere VIII dilated, saucer-shaped/trapezoidal and more elongated of the articles III-VII; antennomere IX rectangular elongated and slightly rounded; antennomeres X-XIX filiform with the first five more swollen at apex; antennomere XIX about one-half as long as the previous. Pronotum strongly transverse and slightly convex with parallel sides and apical margin very reflanged, shiny, hairless, and with very small not impressed punctation. Scutellum triangular with

Fig. 5. *Noergaardia dinae* n. gen. et n. sp. in Baltic amber. ABC: Holotype, dorsal views (different angulations), bars = 1.0 mm; D: Holotype, lateral view, bar = 1.0 mm.

Fig. 6. *Noergaardia dinae* n. gen. et n. sp. in Baltic amber. Holotype, detail of antenna, bar = 1.0 mm.

Fig. 7. *Cantharis* (*Cyrtomoptila*) *mikkelsenorum* n. sp. in Baltic amber. A: Holotype, dorsal view, bar = 1.0 mm; B: Holotype, ventral view, bar = 1.0 mm; C: Holotype, lateral view, bar = 1.0 mm; D: Holotype, detail of elytra, bar = 1.0 mm.

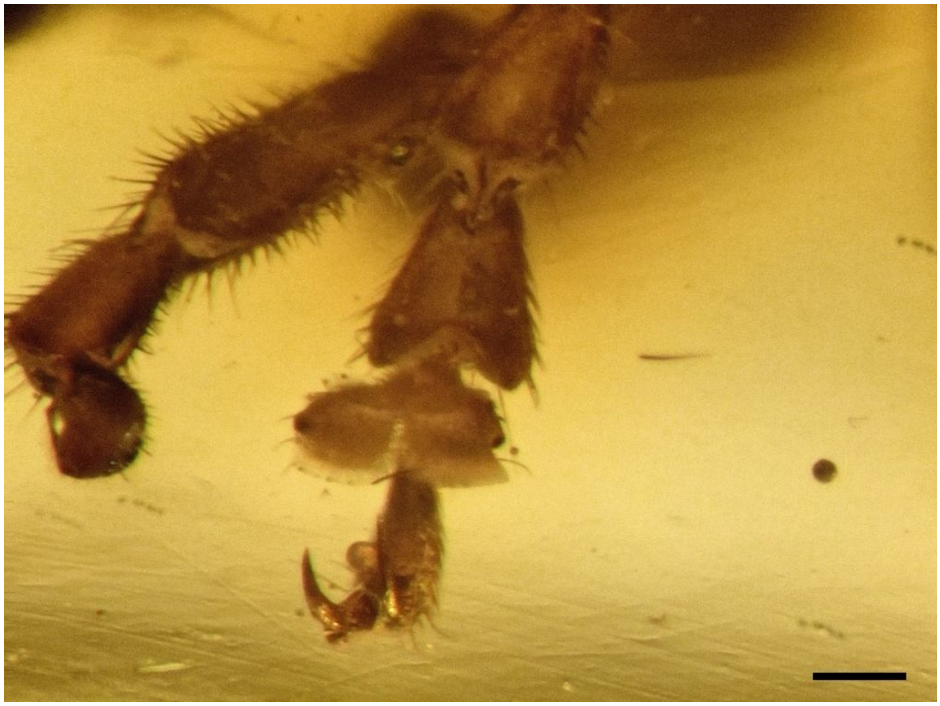

Fig. 8. *Cantharis* (*Cyrtomoptila*) *mikkelsenorum* n. sp. in Baltic amber. Holotype, detail of claws, bar = 400 µm.

the base enlarged and concave and the apex rounded. Elytra long, slightly exceeding the last abdominal segment, as wide as the pronotum, rounded at apex but not narrowed, with the surface very granulose and equipped by long setae. Sternites dark brown and tergites sub-squared with the last segment small in the lobe-shape. Coxae massive; trochanters triangular-elongated shaped with apex rounded; femora strongly curved and cylindrical-globular with the metafemora more tapered from mid-length and almost twice as long as the mesofemora; tibiae very fine and cylindrical with metatibiae very long, twice as long as the mesotibiae. Tarsi 5-segmented equipped by setae; first segment long; second almost one-half as long as the first; third one-half as long as the first and not bilobed at sides; fourth elongated and rounded at apex; fifth thin, very elongated; claws simple with pretarsal claws equipped by a rounded denticle.

Etymology. The species is named in honour of Dina Pallari, mother of the first author (Fanti), for her constant support and encouragement of his research and entomological studies.

Syninclusions. A few air bubbles and wood remains, some pyrite.

Remarks. The amber piece measures about 31 x 18 x 9 mm and is very clear, enabling an optimal dorsal view of the inclusion.

Tribe Cantharini Imhoff, 1856 (1815)
Genus *Cantharis* Linnaeus, 1758
Subgenus *Cyrtomoptila* Motschulsky, 1860
***Cantharis* (*Cyrtomoptila*) *mikkelsenorum* n. sp.**
(Figs. 7 - 8)

Holotype. Male, in Baltic amber, accession No. ALDC0388/ALD.Ba.Can.13

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. *Cantharis mikkelsenorum* n. sp. is characterised by the last palpomere elongated and little securiform, pronotum transverse subrectangular with sinuous lateral margins and with ripples in the middle. The other *Cantharis* in Baltic amber - *Cantharis* (*s. str.*) *sucinonigra* Kuśka, 1992 and *C.* (*Cyrtomoptila*) *sucinokotejai* (Kuśka, 1996) - are much smaller (6 mm) and show different coloration and pronotal shape (Kuśka 1992, 1996; Kazantsev 2013). Other remains of fossil *Cantharis*, known at an undetermined level, come from Baltic amber, Randecker Maar (Germany) and Puy-Saint-Jean near Clermont-Ferrand (France), with other extant species from the Pleistocene of the United Kingdom. Furthermore, other species have been described from the Early Miocene of Radoboj in Croatia, the Upper-Middle Miocene of Oeningen in Germany, and the Oligocene of Rott (Siebengebirge) in Germany (Fanti 2017a).

Description. Adult, winged, flattened. Male, defined on the basis of the shape of last sternite, which is short and vaguely triangular, and for the aedeagus in part visible. Body length 10.5 mm (prothorax to abdomen 8 mm, head ~2.5 mm). Entirely blackish-dark brown with reddish-brownish legs. Head almost completely exposed, covered with numerous small granules and with long setae on the forehead. Eyes very large, rounded and strongly convex. Mandibles long, black, without tooth and very sharp at apex. Maxillary palps with the last segment elongated, cylindrical, slightly enlarged in the lower part and rounded at apex. Antennae inserted very near and in the upper part of the eyes, 11-segmented, short and not surpassing the elytral half, filiform, with thick interspersed setae and other longer; scape long, cylindrical, narrowed from middle to the base; pedicel short, one-third as long as scape; antennomeres III-IV cylindrical feebly inflated, as long as scape, antennomeres V-XI filiform subequal in length and very long. Pronotum transverse, subrectangular, equipped

with a short pubescence and with blows, ripples in the middle, with the reflanged basal margin and sinuous lateral margins. Scutellum reddish-brown, triangular with roundish base and pointed apex. Elytra wider than pronotum, long, surpassing the last abdominal segments, covered by numerous setae, parallel-sided and with rounded apex. Posterior wings dark and folded between the tergites and elytra. Sternum and abdominal segments dark-brown; last tergite large and rounded; last sternite small, vaguely triangular. Legs covered with pubescence; coxae short and massive; trochanters triangular; femora enlarged, particularly the metafemora which are also curved; pro- and mesotibiae thin and cylindrical, ~1.5 times as long as femora; metatibiae elongated, ~1.7 times as long as metafemora. Tarsi 5-segmented equipped with setae; first segment slightly elongated and enlarged; second 0.7 times as long as the first; third evidently bilobed at sides; fourth segment triangular inverted with the tip toward the third segment; fifth thin and elongated; claws simple without tooth at the base. Aedeagus extruded in part.

Etymology. This new species is named in honour of the Danish actors Lars Dittmann Mikkelsen and Mads Dittmann Mikkelsen, in recognition of their contribution to the television, theatre and film industries.

Syninclusions. Wood remains (of which two are wooden frustules), stellate trichomes, pyrite, mite.

Remarks. The amber piece, with almost semi-circular shape, measures approximately 24 x 17 x 5.5 mm. The new species herein described is inserted in the subgenus *Cyrtomoptila* for the claws simple (Fig. 8), without tooth at the base (in males, however, the tooth tend to be very small but present, though sometimes missing). The rounded remains visible at the apex of the fifth tarsomere and on the dorsal part of the claw are probably wood fragments.

Genus *Juratelacrima* n. gen.

Type species. *Juratelacrima ballingi* n. sp. The genus is at present monotypic.

Etymology. From the name of Goddess (sometimes described as a mermaid or undine) Jūratė (Jurata in Polish), of the Lithuanian (and Baltic) legend/tale, plus the Latin noun (in apposition) *"lãcrima"* = tear, crying, resin (understood here as a tear of Goddess Jūratė). The Goddess lived under the Baltic Sea in a beautiful amber castle, when a young fisherman named Kastytis was disturbing the peace and catching a lot of fish, and Jūratė decided to punish him but instead fell in love. Thus, Perkūnas, the thunder god, furious that an immortal goddess had fallen in love with a mortal man, destroyed the amber castle (in other variations Perkūnas kills Kastytis). Therefore, the amber pieces found would be the remains of the castle or the tears of Jūratė, saddened by the death of Kastytis. Gender: feminine.

Diagnosis. The new genus is characterised by the third tarsomere straight at apex and not bilobed, claws simple with a small denticle at the base, the pronotum gibbous, which is anteriorly not narrow and with straight sides and expanded apical margin, and head slightly elongated behind eyes. The unequal maxillary palpomeres, with the last segment securiform, clearly make this new genus attributable to the subfamily Cantharinae.

***Juratelacrima ballingi* n. sp.**
(Fig. 9)

Holotype. Male, in Baltic amber, accession No. ALDC0458/ ALD.Ba.Can.22

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. The new genus is similar to *Rhagonycha*, from which it differs in the pronotum not anteriorly narrowed and in the claws simple instead of bifid at the apex. The third tarsomere, straight at apex, not bilobed, is also present in the members of the tribe Podabrini Gistel, 1856, but they have the head distinctly constricted behind the eyes and the pronotum mostly truncate anteriorly (Pelletier & Hébert 2014). Furthermore, the fossil genus *Sucinorhagonycha* Kuśka, 1996 has 12 antennomeres and claws simple, without denticles or lobes (Kuśka 1996; Kubisz 2000; Fanti 2017a).

Description. Adult, winged, slender. Male, defined on the basis of the long antennae and last sternite narrow. Body length ~7.2 mm; elytra 6.0 mm; antennal length ~6.3-6.4 mm. Entirely blackish. Head not completely exposed, wider than pronotum, roundish, slightly elongated backwards the eyes, surface slightly rugose and with small punctation and setae, frons concave. Eyes wide, lateral on head, rounded, covering around half of the temples, interocular distance ~1.2 times greater than eye diameter. Mandibles smooth without denticles, wide at base and thin at apex. Maxillary palps unequal, 4-segmented, with the last palpomere securiform. Labial palps 3-segmented, with long articles and the last palpomere elongated and pointed. Antennae 11-segmented, filiform, very elongated, reaching almost the apex of the elytra and almost the last abdominal segment, inserted in proximity to the eye and in its central-anterior part; scape very robust, elongated and cylindrical, slightly enlarged in the middle; pedicel thin, short and ~2.3 times shorter than scape; antennomere III filiform, elongated and 2.8 times longer than pedicel; antennomeres IV-IX filiform, subequal, very elongated and slightly longer than third; antennomere X filiform, slightly shorter than previous; antennomere XI thin and as long as IV; all articles equipped with short setae on the sides. Pronotum narrower than elytra, longer than wide; lateral margins parallel; surface with erected pubescence, gibbous with two longitudinal thickenings in the basal part and parts near the apical and basal margins transversely concave; apical margin extended. Scutellum triangular. Elytra elongated, covering the last abdominal segments, parallel-sided; apex rounded; surface smooth covered with erected and scattered setae. Posterior wings dark brown, almost completely covered by elytra. Sternum and abdominal segments with short pubescence; last sternite and tergite elongated, narrow, with long setae. Legs elongated, covered with dense and numerous setae; coxae massive, elongated and globular; trochanters elongated; femora cylindrical, slightly enlarged, not curved; tibiae thin, cylindrical, slightly longer than femora. Tarsi 5-segmented; first tarsomere elongated, about 1.8 times longer than second; second tarsomere straight at margin; third tarsomere shorter than second, not bilobed at sides; fourth short, bilobed; fifth elongated, thinner than others; claws simple with small and obtuse lobe at base.

Etymology. This new species is named in memory of the Danish film and TV director Erik Balling (Nyborg, 29 November 1924 - Gentofte, 19 November 2005).

Syninclusions. Wood remains.

Remarks. The amber piece is very transparent, rounded and measures 24 x 22 x 6 mm. The inclusion is complete, except for the left antenna that is preserved until the antennomere II.

Genus *Palmnickeneoceras* n. gen.

Type species. *Palmnickeneoceras ejersboi* n. sp. The genus is at present monotypic.

Etymology. From Palmnicken (now Yantarny) the old name of the locality of the amber deposits, the word-forming element "eo" = earliest, derived to Greek *"eos"* = dawn, morning, daybreak (in reference to Eocene, the second Epoch to the Tertiary Period) and *"ceras"*, the simple Latin transliteration of the Greek *"keras"* = horn, antenna. Gender: neuter.

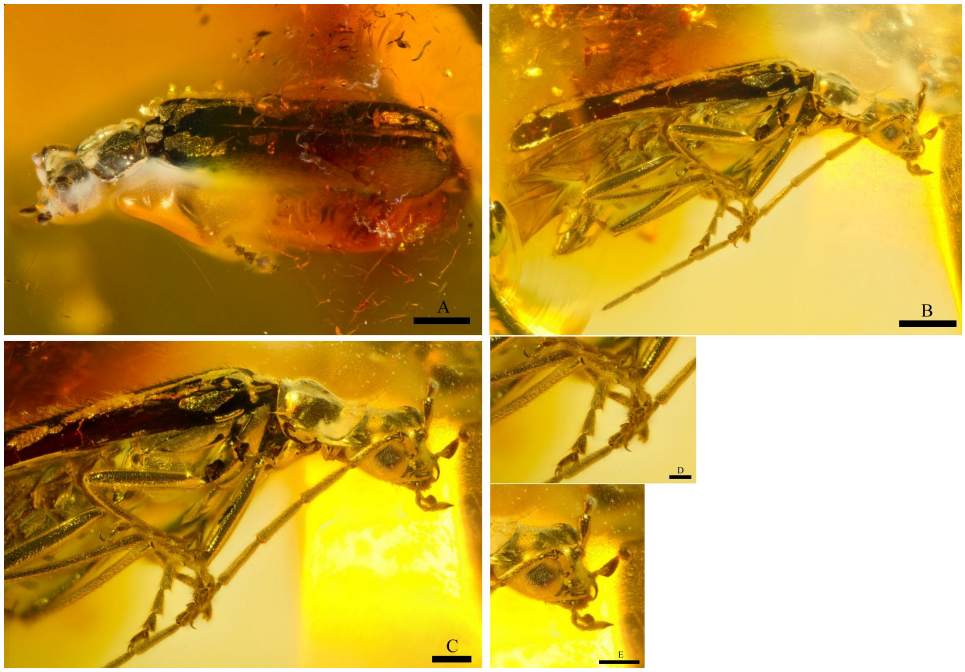

Fig. 9. *Juratelacrima ballingi* n. gen. et n. sp. in Baltic amber. A: Holotype, dorsal view, bar = 1.0 mm; B: Holotype, lateral view, bar = 1.0 mm; C: Holotype, detail of head and pronotum, bar = 500 µm; D: Holotype, detail of tarsomere and claws, bar = 100 µm; E: Holotype, detail of palps, bar = 100 µm.

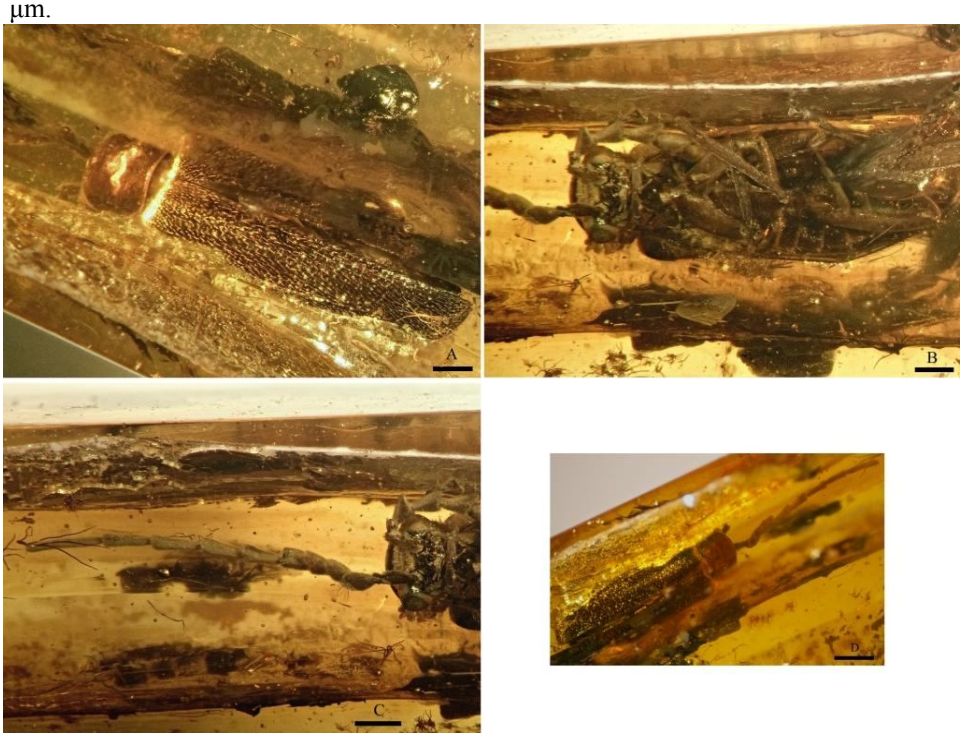

Fig. 10. *Palmnickeneoceras ejersboi* n. gen. et n. sp. in Baltic amber. A: Holotype, dorsal view, bar = 500 µm; B: Holotype, ventral view, bar = 500 µm; C: Holotype, detail of antennae, bar = 500 µm; D: Holotype, dorsal view, bar = 1.0 mm.

Diagnosis. The new genus is characterised by long elytra covering the last abdominal segments; pronotum transverse with parallel sides and basal margin slightly bordered; 11 antennal articles; antennomeres III-V dilated/ inflated and very slightly saucer-shaped (similar to *Cacomorphocerus* where the "central" antennomeres are saucer-shaped); antennomere VI subrectangular to slightly basally elongated and the others filiform. Furthermore, the maxillary palps are very elongated and seem slightly securiform, which makes the assignment to the subfamily Cantharinae uncertain and is here tentatively included in the tribe Cantharini.

***Palmnickeneoceras ejersboi* n. sp.**
(Fig. 10)

Holotype. Sex undetermined, in Baltic amber, accession No. ALDC0392/ALD.Ba.Can.17

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. *Palmnickeneoceras ejersboi* n. sp. is distinguishable by the palps elongated and slightly securiform, and by the shape of antennae, unknown in any other fossil species. The other fossil genera of the same lineage show more antennomeres. Furthermore, extant and fossil members of the subfamily Malthininae with long elytra, *Malthinus* (*Indomalthinus*) Brancucci in Wittmer & Brancucci, 1978, *Inmalthodes* Pic, 1938, *Macrocerus* Motschulsky, 1845, *Mimomalthinus* Pic, 1931, *Mantimalthinus* Fanti & Castiglione, 2017 and *Kuskaella* Fanti & Kupryjanowicz, 2017 - show a different surface of elytra, different palps or a different pronotal shape (Fanti & Castiglione 2017; Fanti & Kupryjanowicz 2017).

Description. Adult, winged, robust habitus. Sex undetermined (last sternites are not well visible). Body length 5 mm. Pronotum reddish - orange, elytra dark brown blackish, antennae and legs testaceous - brown. Head pale brown, as large as pronotum. Eyes small and elongated-subspherical, interocular dorsal distance ~4.2 times greater than eye diameter. Mandibles small, little visible but seemingly without tooth. Maxillary palpomeres unequal with last segment very elongated and slightly securiform, without appendix at apex. Antennae inserted near and on the inner part of the eyes, long, reaching the apical third of the elytra, 11-segmented, covered with dense and very short setae; scape elongated and cylindrical; pedicel very short and about six times shorter than scape; antennomeres III-V dilated; antennomere VI rectangular; antennomeres VII-XI filiform, antennomeres XI extremely elongated, much more than scape. Pronotum strongly transverse, parallel-sided; basal margin very slightly bordered; surface smooth with some small setae. Scutellum wide at base and elongated at apex, that is roundish. Elytra slightly wider than pronotum with rugose surface and numerous setae, elongated, covering the last abdominal segments; apex slightly roundish. Posterior wings covered by elytra. Sternum and abdominal segments dark brown and covered with numerous setae. Legs equipped with numerous short setae; coxae small and short; trochanteres elongated and roundish; profemora curved, very dilated and cylindrical, meso- and metafemora slender and longer; tibiae cylindrical very thin and long. Tarsi 5-segmented; first tarsomere slightly elongated; second tarsomere about one-half as long as the first, third tarsomere very small and bilobed at sides; fourth triangular; fifth long and scale-shaped; claws simple, long and robust.

Etymology. The species is named in memory of the Danish journalist and writer Jakob Ejersbo (Rødovre, 6 April 1968, Aalborg, 10 July 2008).

Syninclusions. Numerous stellate trichomes and wood remains (also botanical masses and pollen grains), pyrite, one Trichoptera, two Diptera, one mite.

Remarks. The piece of amber of rectangular shape, measures 24 x 10 x 5 mm. The left antenna is folded along the body, the antennomeres VIII-X are not well visible and even all legs are curled up. It is not possible to observe if the claws have a tooth at the base.

Genus *Podistra* Motschulsky, 1839
Subgenus *Absidia* Mulsant, 1862

***Podistra* (*Absidia*) *kloevedali* n. sp.**
(Fig. 11)

Holotype. Female, in Baltic amber, accession No. ALDC0457/ALD.Ba.Can.21

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. No fossil *Podistra* has been described until now (Fanti 2017a). *Podistra kloevedali* n. sp. is tentatively assigned to the subgenus *Absidia* for the claws with tooth at the base, because claws are simple in the subgenera *Pseudoabsidia* Wittmer, 1969 and *Hemipodistra* Ganglbauer, 1922. The new species is distinguishable from *Cantharis* (*s. str.*) *sucinonigra* Kuśka, 1992 by the larger size (10 mm instead of 6 mm), coloration, different antennomeres, in particular, the pedicel almost three times shorter than III (twice shorter than III in *C. sucinonigra*), and by the pronotum straight laterally instead of rounded. It is also distinguishable from *Cantharis* (*Cyrtomoptila*) *sucinokotejai* (Kuśka, 1996), which is the most similar species, by the different coloration, the larger size and eyes, and by the claws with tooth at base (without lobe or tooth in *C. sucinokotejai*). Finally, it differs from *Cantharis* (*Cyrtomoptila*) *mikkelsenorum* n. sp. in the different colour, claws, pronotum without ripples in the middle and straight at sides, and in the palps typically securiform.

Description. Adult, winged, flattened. Female, defined on the basis of the shape of last urites that are very wide and on short antennae. Body length 10 mm. Entirely reddish-dark brown except for the black head. Head completely exposed, pubescent, elongated and covered with numerous granules. Eyes extremely large, roundish and strongly convex. Mandibles not visible. Maxillary palps 4-segmented with the last palpomere securiform. Labial palps 3-segmented with the last palpomere elongated and securiform. Antennae inserted very near and in the upper part of the eyes, 11-segmented, short and slightly surpassing the humeral zone of elytra, filiform, with scattered long setae; scape robust, long and cylindrical; pedicel short, one-third as long as scape; antennomeres III-VIII filiform, subequal, and slightly shorter than scape; antennomeres IX-XI filiform, thin, subequal in length and slightly shorter than the previous. Pronotum longer than wide, rectangular (typical of *Podistra*), as wide as the head and equipped by a short pubescence; basal surface convex and middle-anterior part flat; margins bordered and sides straight; propleura roundish. Scutellum reddish-brown, triangular, elongated and with slightly pointed apex. Elytra much wider than pronotum, elongate, covering the last abdominal segments, equipped by long and sparse setae and several short setae, parallel-sided and with rounded apex. Posterior wings covered by elytra. Abdominal segments large and rectangular with short pubescence. Legs very pubescent; coxae short and massive; trochanters elongated and enlarged; femora robust; pro- and mesotibiae thin, short and cylindrical, equipped by two spurs, metatibiae very long. Tarsi 5-segmented; first segment slightly elongated and enlarged; second slightly shorter than first (in the metatarsi the second is one-half length of the first); third segment bilobed at sides; fourth segment strongly bilobed at sides with lobes thinner and longer than lobes of the third segment; fifth thin and elongated; claws simple with very thin and slightly elongated tooth at the base (posterior claws simple, without denticle).

Etymology. This new species is named in honour of the Danish pioneer, longtime sailor,

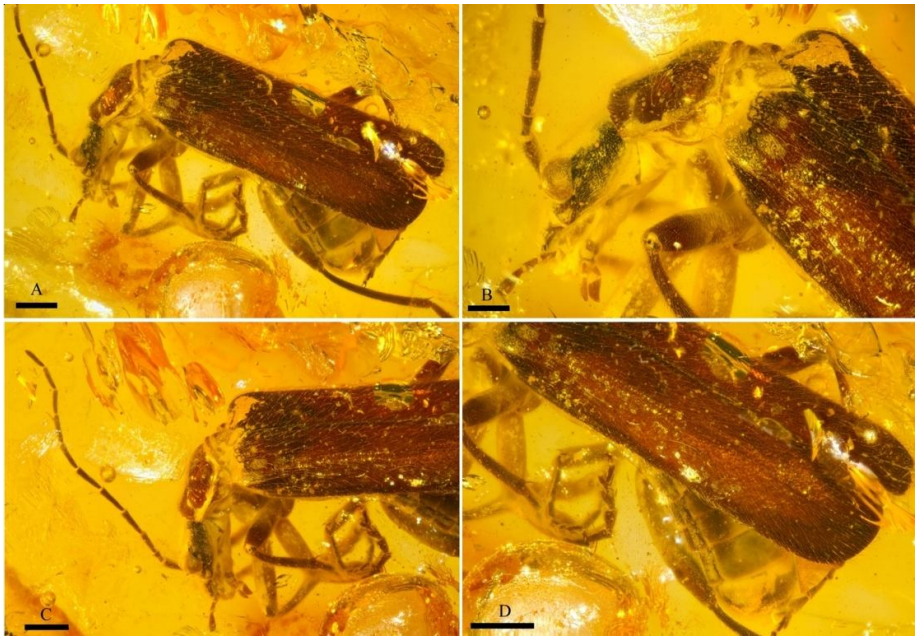

Fig. 11. *Podistra* (*Absidia*) *kloevedali* n. sp. in Baltic amber. A: Holotype, dorsal view, bar = 1.0 mm; B: Holotype, detail of head and pronotum, bar = 500 µm; C: Holotype, detail of antenna, bar = 800 µm; D: detail of tergites and apex of elytra, bar = 1.0 mm.

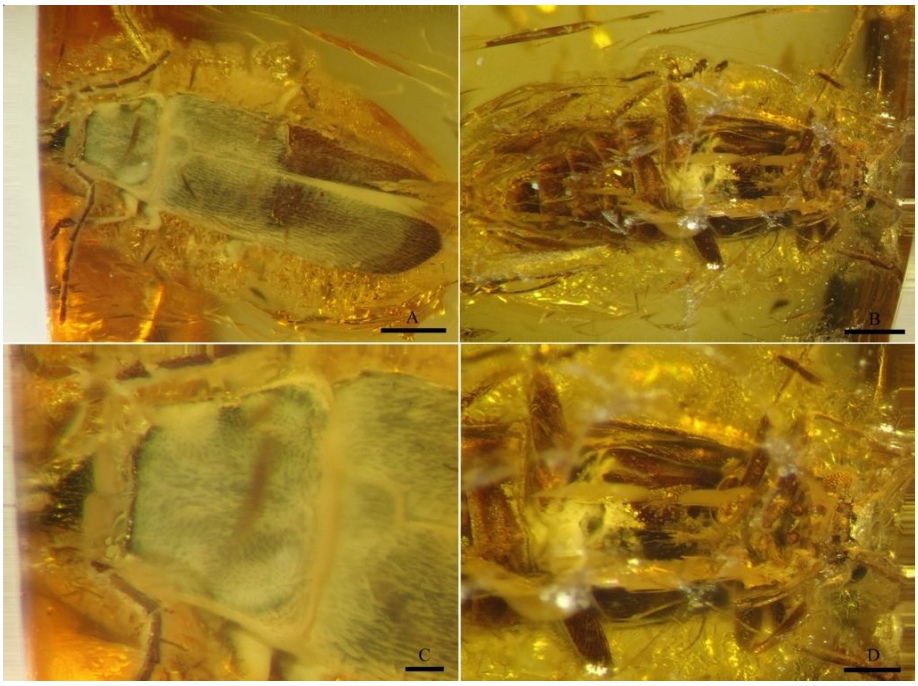

Fig. 12. *Rhagonycha nielsenae* n. sp. in Baltic amber. A: Holotype, dorsal view, bar = 500 µm; B: Holotype, ventral view, bar = 500 µm; C: Holotype, detail of pronotum, bar = 100 µm; D: Holotype, detail of sternum, bar = 200 µm.

author and lecturer Troels Kløvedal (born Troels Beha Erichsen), in recognition of his trips with the Nordkaperen ship.

Syninclusions. Air bubbles, wood remains, one Diptera, and one small leg (probably of midge).

Remarks. The rectangular amber piece measures 20 x 46 x 5.5 mm. The inclusion is ventrally and laterally covered by a white cotton-like cloud (emulsion, milky substance).

Genus *Rhagonycha* Eschscholtz, 1830
Subgenus *Rhagonycha* Eschscholtz, 1830

***Rhagonycha* (*s. str.*) *nielsenae* n. sp.**
(Fig. 12)

Holotype. Female, in Baltic amber, accession No. ALDC0053/ALD.Ba.Can.4

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. Only two species of *Rhagonycha* are actually known from amber deposits: *Rh. kryshtofovichi* (Yablokov-Khnzorian, 1960), which differs from *Rh. nielsenae* n. sp. in larger size (7 mm) and different length of the antennomeres, and *Rh. sucinobaltica* Poinar & Fanti, 2016, which differs in the blackish-dark brown colour, the pronotum with much more concave sides and in the different last abdominal segment (Yablokov-Khnzorian 1960; Kazantsev 2013; Poinar & Fanti 2016). Other members of the genus *Rhagonycha* are known from Eocene of Florissant (USA), Miocene of Oeningen (Germany) and Radoboj (Croatia), and from Pliocene of Lac Chambon, France (Fanti 2017a). All show different colour and body size.

Description. Adult, winged. Female, defined on the basis of the short antennae, massive habitus and on the large last ventrite. Body length ~3.3 mm; elytra 2.5 mm. Entirely dark brown except for the black head. Head completely exposed, elongated, pubescent. Eyes large and roundish, interocular ventral distance about two times greater than eye diameter. Mandibles not visible. Maxillary palps 4-segmented with the last palpomere elongated-securiform and stout. Labial palps 3-segmented with the last segment securiform. Antennae filiform, 11-segmented, short and slightly surpassing the humeral zone of elytra, equipped with short setae; scape robust, long and cylindrical; pedicel short, one-third as long as scape; antennomere III similar in length to the pedicel; antennomeres IV-VI very elongated and subequal in length; antennomeres VII-XI subequal in length, shorter and more robust than the previous. Pronotum trapezoidal, slightly wider than long and larger than head, equipped by a dense short pubescence and small punctation, large at base and gradually steadily narrower towards the apex; basal angles strongly rounded; apical margin bordered. Scutellum strongly rounded and pubescent. Elytra elongated and covering the last abdominal segments, stout, very slightly broader than base of pronotum, parallel-sided; apex narrow and slightly rounded; surface equipped with many setae. Posterior wings completely covered by elytra. Sternum dark brown, trapezoidal, equipped with scattered setae; ventrites short and wide with the last rounded and large. Legs short and pubescent; coxae massive; trochanters elongated with rounded apex; femora robust; tibiae thin, cylindrical, as long as femora. Tarsi 5-segmented; first segment slightly elongated; second and third shorter than first and straight at apex; fourth segment slightly bilobed at sides; fifth thin and elongated; claws bifid but not well visible.

Etymology. This new species is named in memory of Nielsine Mathilde Nielsen (Svendborg, 10 June 1850 - Copenhagen, 8 October 1916), the first female academic and physician in Denmark.

Syninclusions. Wood remains.

Remarks. The amber piece is yellow and quite flattened and measures around 15 x 9 mm. The inclusion is complete with the ventral side not optimally visible, and dorsally covered with a superficial cotton-like emulsion.

Genus *Themus* Motschulsky, 1858
Subgenus *Haplothemus* Wittmer, 1973
***Themus* (*Haplothemus*) *bennyianderseni* n. sp.**
(Fig. 13)

Holotype. Sex undetermined, in Baltic amber, accession No. ALDC0054/ALD.Ba.Can.5

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. Large size and long cheeks are quite typical of the genus *Themus* and the rounded sides of the pronotum are present only in the subgenus *Haplothemus* (Švihla 2008). *Themus bennyianderseni* n. sp. is distinguishable from *Th.* (*Haplothemus*) *pristinus* Kazantsev, 2013, the only other congener in amber, by sides and apical margin of the pronotum strongly rounded, without blunt and noticeable angles (Kazantsev 2013). As indicated in Fanti (2017a), other *Themus* fossils are known for the Middle Miocene of Shandong, Shanwang, Linqu County in China (Zhang 1989; Zhang et al. 1994).

Description. Adult, winged, very robust and stocky habitus. Sex undetermined. Body length 15 mm; width at humeri ~3.5 mm. Real colour difficult to determine but head and pronotum are probably bluish-grey, elytra dark testaceous-grey, knees and tibiae black. Head exposed and strongly elongated, narrower than pronotum, without punctation but with small granules and some long setae, parallel-sides behind eyes, and with long cheeks. Eyes roundish, small and very convex; interocular distance about 3.8 times greater than eye diameter. Mandibles short, massive and powerful. Maxillary palpomeres unequal; first segment very short; second elongated and strongly globular; third small; last securiform. Antennae 11-segmented, filiform, hairless except for a tuft at the apex of each segment, placed away from the apical part of the eyes toward the clypeus, posteriorly reaching the metafemurs; antennomeres subequal in length except for the second and third, which are slightly shorter. Pronotum with very small and not impressed granulate punctation, with short setae, very rounded apical margins and sides (unknown in any extant and fossil congeners), basal margin perfectly straight. Scutellum blackish, triangular with largely rounded apex. Elytra long, very slightly broader than pronotum, slightly widened at the basal third, with roundish apex, granulose with scarce and small raised setae. Posterior wings completely covered by elytra. Legs two-tone; trochanters short and roundish except for the metatrochanter, which is elongated; femora short and massive with setae; tibiae relatively fine and ~2 times longer than femora, equipped by numerous small and short setae; metatibiae curved. Five tarsomeres; the first very elongated and swelled after half-length; second one-half as long as the first; third and fourth about two-thirds as long as the second; fifth tarsomere and claws not well visible.

Etymology. This new species is named in honour of the Danish songwriter, poet, author, composer and pianist Benny Andersen, in recognition of his long, successful career.

Syninclusions. Wood remains, stellate trichomes, some air bubbles, pyrite, some Diptera, parts of a spider.

Remarks. The rectangular (rounded at apex) piece of amber (lacquered) measures around 38 x 27 x 12 mm, with the surface showing a

shallow fracture that does not reach the inclusion. Right metatarsus is not conserved.

Subfamily Malthininae Kiesenwetter, 1852
Tribe Malthinini Kiesenwetter, 1852
Genus *Malthinus* Latreille, 1806
Subgenus *Malthinus* Latreille, 1806

***Malthinus* (*s. str.*) *rifbjergi* n. sp.**
(Fig. 14)

Holotype. Male, in Baltic amber, accession No. ALDC0510/ALD.Ba.Can.24

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. Fossil records of *Malthinus* are known from Baltic amber as various specimens at the generic level (Fanti 2017a) and only one described species, *M. danieli* Kuśka & Kania, 2010. *Malthinus rifbjergi* n. sp. differs in the brown legs, pronotum and elytra and the yellow head (pronotum yellow with a longitudinal black spot on the basal half, tibiae yellow-brown and femora dark in *M. danieli*) (Kuśka & Kania 2010). Furthermore, the new species has a different length of antennomeres, the second article being as long as third, and fourth and fifth articles longer, while in *M. danieli* the second is shorter and the antennomeres III-XI are subequal in length. The body length of *M. danieli* is 3.2 mm, while *M. rifbjergi* n. sp. is 4.0 mm.

Description. Adult, winged, slender. Female, defined on the basis of the short antennae and large last ventrite. Body length 4.0 mm. Head yellow and pronotum, elytra, antennae and legs brown. Head completely exposed, strongly triangular behind eyes, wider than pronotum, very wrinkly and equipped with impressed punctation. Eyes large, round, convex. Maxillary palps 4-segmented, with palpomeres unequal in length, with the terminal globular, elongated and distally pointed. Labial palps 3-segmented with the last segment globular and pointed. Antennae 11-segmented, filiform, surpassing the half of elytra; scape very elongated, club-shaped and enlarged at apex; pedicel ~1.5 times shorter than scape; antennomeres III-VI as long as pedicel; antennomeres VII-X slightly shorter than III; antennomere XI as long as III, slightly enlarged from middle to apex which is slightly pointed; all antennomeres equipped with many short setae. Pronotum transverse, slightly narrowed anteriorly, equipped with scattered pubescence, apical and basal margins straight and strongly bordered; sides sinuous; angles slightly rounded; surface not flat. Scutellum short and rounded. Elytra slightly narrower than head, wider than pronotum, short and not covering the last abdominal segments, parallel-sides, slightly narrowed from half length; apex strongly rounded; surface covered with impressed punctation ordered in lines and equipped with setae; apex without yellow rounded marks. Posterior wings dark, long and very surpassing the elytra and the abdominal segments. Sternum and abdominal segments pubescent; last tergite very short and rounded at apex. Legs slender; coxae massive; trochanters elongated; femora very enlarged; tibiae cylindrical, thin, longer than femora. Tarsal formula 5-5-5; tarsomere I long and ~2 times longer than second; tarsomere III short, tarsomere IV bilobed; tarsomere V slender; claws simple.

Etymology. This new species is named in memory of the Danish writer Klaus Rifbjerg (Copenhagen, 15 December 1931 - Copenhagen, 4 April 2015).

Syninclusions. Wood remains, oak inflorescence, stellate trichomes, some Diptera (Empididae and other undetermined family).

Remarks. The amber piece measures 19.5 x 14.5 x 9 mm and weighs 2.4 grams. The inclusion is complete and well visible.

Fig. 13. *Themus* (*Haplothemus*) *bennyianderseni* n. sp. in Baltic amber. A: Holotype, detail of head and pronotum, bar = 1.0 mm; B: Holotype, dorsal view, bar = 1.0 mm; C: Holotype, global aspect of the amber specimen with the inclusion (this photo is also found in FANTI 2017a), bar = 5.0 mm.

Tribe Malthodini Böving & Craighead, 1931
Genus *Malthodes* Kiesenwetter, 1852
Subgenus *Malthodes* Kiesenwetter, 1852

***Malthodes* (*s. str.*) *henningseni* n. sp.**
(Fig. 15)

Holotype. Male, in Baltic amber, accession No. ALDC0459/ALD.Ba.Can.23

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).
Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. The habitus, size and lobe-shaped last tergite could make it similar to the *M. brevicollis* group (Liberti

Fig. 14. *Malthinus rifbjergi* n. sp. in Baltic amber. A: Holotype, dorsal view, bar = 1.0 mm; B: Holotype, detail of head and pronotum, bar = 500 µm.

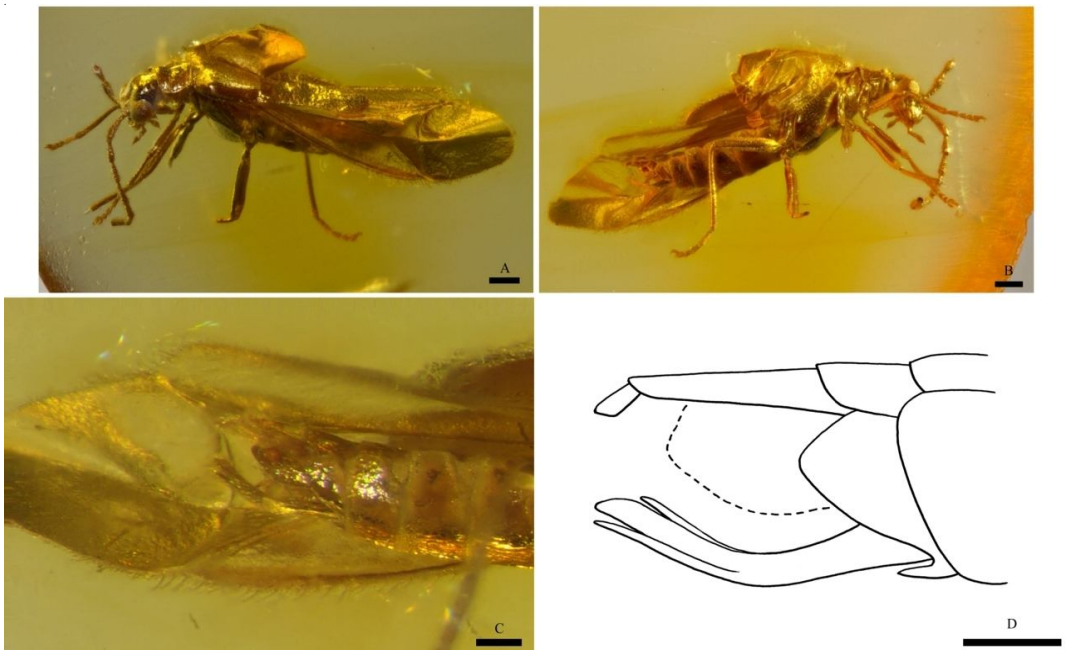

Fig. 15. *Malthodes henningseni* n. sp. in Baltic amber. A: Holotype, dorso-lateral view, bar = 200 µm; B: Holotype, ventro-lateral view with detail of urites, bar = 200 µm; C: Holotype, detail of urites, bar = 100 µm; D: Reconstruction of last abdominal segments, bar = 100 µm.

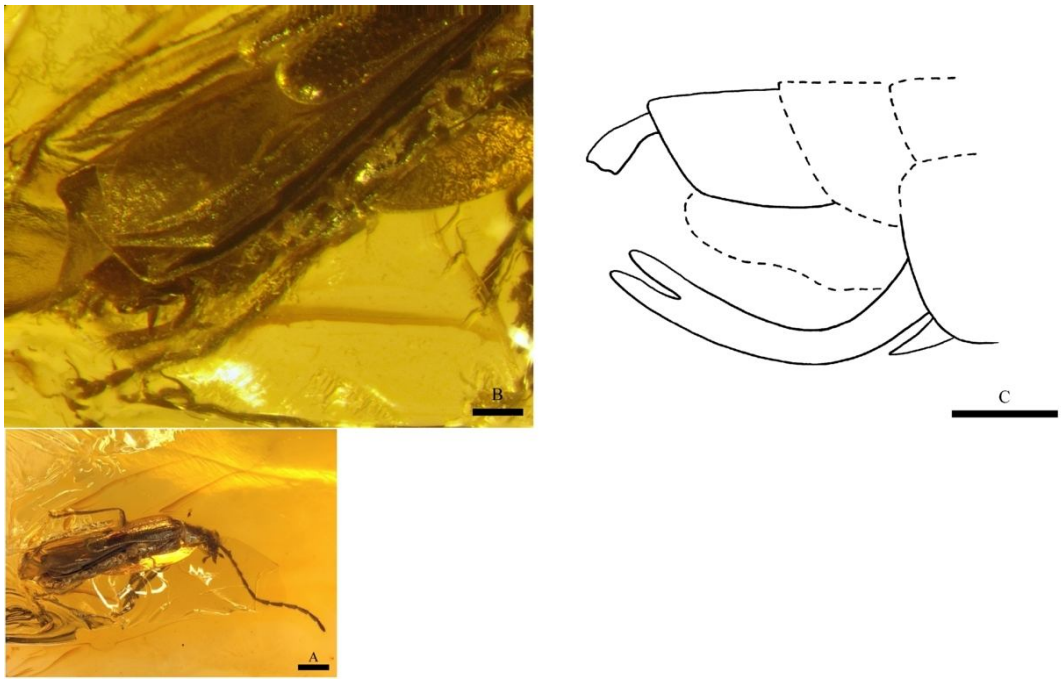

Fig. 16. *Malthodes moellehavei* n. sp. in Baltic amber. A: Holotype, dorso-lateral view, bar = 500 µm; B: Holotype, detail of last abdominal segments, bar = 200 µm; C: Reconstruction of last abdominal segments, bar = 100 µm.

2016), but the last sternite shows a peculiar form, unknown in any fossil and Central European (and Italian) *Malthodes*.

Description. Adult, winged, robust. Male, based on the last urites modified. Body length 2.5 mm. Entirely brown without yellow spots on elytra. Head completely exposed, strongly rounded and convex, as wide as pronotum, equipped with scattered and strong punctation and with short setae. Eyes very large, round, convex and very prominent. Maxillary palps 4-segmented, unequal in length, with the first small, second elongated and apically enlarged, third robust, terminal one globular and distally very pointed. Labial palps 3-segmented with the last segment globular and pointed. Antennae filiform (the antennomeres are not completely preserved, but we assume to be 11 articles as for all species of the genus), scape extremely elongated, club-shaped and swollen from half length to apex; pedicel filiform and about 1.7 times shorter than scape; antennomeres III-VI filiform and robust; antennomeres pubescent. Pronotum transverse, equipped with a shallow punctation and scattered pubescence; apical margin straight and slightly bordered; sides sinuous and bordered; angles rounded; surface concave in the middle. Scutellum triangular. Elytra slightly wider than pronotum, long and reaching the middle of urite VII, wide at base and narrowed after half the length with roundish apex, surface rugose and pubescent. Posterior wings wide, long and evidently surpassing the elytra and the abdominal segments, dark and equipped with setae along the edges. Legs slender; coxae robust and very elongated; trochanters roundish and only slightly elongated; femora enlarged; tibiae cylindrical, very thin, longer than femora. Tarsal formula 5-5-5; tarsomere I long and robust; second flat and shorter than first; third triangular and about 1.2 times shorter than second; tarsomere IV bilobed; tarsomere V slender; claws simple. Penultimate tergite (tg9) elongated and not particularly transverse; last tergite (tg10) lobe-shaped and elongated with straight apex; last sternite (st9) long, curved from half length, apically flat and rounded and with an appendix (lamina) on each side which develops just after the curvature; sternal surface of abdomen and urites punctate and with pubescence.

Etymology. This new species is named in memory of the Danish author, critic, architect and designer Poul Henningsen (Ordrup, 9 September 1894 - Hillerød, 31 January 1967), in recognition of his cultural contributions.

Syninclusions. A few wood remains and two stellate trichomes.

Remarks. The amber piece measures 9 x 17 x 3 mm. The inclusion has damaged antennae, the right one preserved up to the second article (and a small part of the third) and the left one preserved until the antennomere VI, and also has three missing legs from tarsi, or tibiae and tarsi.

***Malthodes* (*s. str.*) *moellehavei* n. sp.**
(Fig. 16)

Holotype. Male, in Baltic amber, accession No. ALDC0052/ALD.Ba.Can.3

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. *Malthodes moellehavei* n. sp. shows intermediate size and characters of extant species of both *brevicollis*-group and *minimus*-group (Liberti 2016). Concerning the fossil species (Kuśka & Kupryjanowicz 2005; Kuśka & Kania 2010; Fanti 2017ab; Fanti & Vitali 2017), it differs from *M. ceranowiczae* Kuśka & Kupryjanowicz, 2005 in how the last tergite (tg10) is more elongated and with apical tips, and in the more curved last sternite (st9); from *M. michalskii* Fanti, 2017 in the longer,

narrower and more deeply apically incised last sternite and in the longer last tergite with sinuous apex, and in particular, from *M. sucini* Kuśka & Kania, 2010 in the wider penultimate tergite (tg9) and in the apically sinuous last tergite (tg10). Furthermore, it differs from *M. henningseni* n. sp. in the tg10 sinuous at apex and st9 apically forked, while it is not forked but with lateral appendages near the apex in *M. henningseni* n. sp.

Description. Adult, winged, slender. Male, based on the last urites modified and the long antennae. Body length 3 mm; antennae 2.1-2.2 mm. Entirely dark brown-blackish without yellow spots on elytra. Head completely exposed, rounded, slightly larger than pronotum, equipped with shallow punctation and pubescent. Eyes rounded, convex and prominent. Maxillary palps 4-segmented, unequal in length, with the terminal one globular - roundish, stout and distally very pointed. Labial palps 3-segmented with the last segment globular and pointed. Antennae filiform, 11-segmented, very long, surpassing the elytra and almost reaching the last abdominal segments; scape very elongated, not club-shaped and only slightly enlarged apically; pedicel filiform, about one-half as long as the scape; antennomere III as long as the pedicel; antennomeres IV-XI filiform, elongated, subequal in length, slightly longer than second or third antennomere; all antennomeres with scattered setae. Pronotum small, slightly transverse, narrower anteriorly, equipped with dense shallow punctation, basal margin straight, sides concave and angles rounded, surface undulate. Scutellum triangular, with very elongated and slightly rounded apex. Elytra slightly wider than pronotum, short, slender, reaching about the abdominal half, wide at base and very narrowed in the apical half, with largely roundish apex; surface slightly wrinkled and pubescent. Posterior wings wide and long, dark, surpassing the elytra and the abdominal segments. Legs slender; coxae robust; trochanters elongated; femora enlarged; tibiae cylindrical, very thin, strongly longer than femur. Tarsal formula 5-5-5 and tarsomeres robust; tarsomere I long and more than two times longer than second; tarsomere III robust and shorter than second; tarsomere IV bilobed; tarsomere V slender; claws simple. Penultimate tergite (tg9) transverse and wide with sides slightly bent; last tergite (tg10) lobe-shaped and elongated, narrower than tg9, with sinuous apex and apical tips; last sternite (st9) long, strongly curved, apically deeply forked (V-shaped) with the lobes narrow and rounded at apex; sternal surface of abdomen punctate and with pubescence.

Etymology. This new species is named in honour of the Danish priest, author and lecturer Johannes Volf Møllehave, to thank him for his work and to further recognize him for the awards that he has earned.

Syninclusions. A few wood remains and one stellate trichome.

Remarks. The rectangular piece of amber measures 28 x 11 x 4 mm and the inclusion is perfectly conserved (especially the crucial character of the last tergites and sternites), with the left antenna aligned along the body and the legs huddled.

Tribe *incertae sedis*
Genus *Kuskaella* Fanti & Kupryjanowicz, 2017

***Kuskaella bajerae* n. sp.**
(Figs. 17 - 18)

Holotype. Male, in Baltic amber, accession No. ALDC0050/ALD.Ba.Can.1

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. This specimen is tentatively attributed to the extinct genus

Kuskaella, based on the habitus, characters and the very similar long and enlarged apically terminal appendix. But in this new species, it is not completely clear whether this is the last sternite or instead, a part of the aedeagus. The only other known species of this genus - *Kuskaella macroptera* Fanti & Kupryjanowicz, 2017 - shows a different length of antennomeres and particularly, a different shape of sternites. The penultimate is short and slightly transverse and the last is elongated and roundish (Fanti & Kupryjanowicz 2017).

Description. Adult, winged, small and slender. Male, based on the last long sternite and for the visible part of aedeagus. Body length 3.9 mm; antennal length 3.0 mm. Entirely brown-testaceous. Head exposed, globular, convex, as wide as pronotum, equipped with strong punctation. Eyes large, roundish, convex. Mandibles not visible. Maxillary palpomeres unequal; first segment very short, second elongated and globular; third small and short; last globular and equipped with a thin and short apical appendix. Labial palps 3-segmented with the last article globular and pointed. Antennae 11-segmented, filiform, long, reaching the half of the elytral length; scape very long, inflated; pedicel robust and more than two times shorter than scape; antennomere III robust and longer than pedicel; antennomere IV more robust and longer than III; antennomeres V-XI, filiform, thinner than others and subequal in length; all antennomeres covered with short and sparse setae. Pronotum transverse, large at base and narrowed from half length to apex, with strongly bordered basal angles; apical margin very slightly curved; basal margin straight; surface irregular and equipped with long pubescence and shallow punctation. Scutellum triangular, short, wide and with strongly rounded apex. Elytra long, slender, slightly wider than base of pronotum, and surpassing the last abdominal segments, parallel-sided with rounded apex, equipped with short setae and rugosity. Posterior wings opaque and slightly longer than elytra and abdominal segments. Sternum quadrangular, abdominal segments strongly transverse and short. Aedeagus (?) with a very elongate lobe, narrow, and apically enlarged and roundish. Legs robust; coxae massive; trochanteres elongated and roundish at apex; femora robust, enlarged; tibiae stout, cylindrical, slightly enlarged apically and slightly longer than femora. Tarsal formula 5-5-5; first tarsomere elongated, widened apically and approximately 1.3 times longer than second; second and third tarsomere elongated and widened apically; fourth short and bilobed; fifth elongated, robust, wide and flat; claws simple without denticle.

Etymology. This new species is named in memory of the Danish women's rights activist and pacifist Pauline Matilde Theodora Bajer (Frederikseg - Herlufmagle Sogn, 4 January 1840 - Copenhagen, 4 March 1934).

Syninclusions. Air bubbles and wood remains.

Remarks. The amber piece is yellow-reddish in colour and measures 27 x 9 x 5 mm. The inclusion is well visible and almost complete except for the lack of an anterior leg and a mesothoracic leg conserved until the second tarsomere. The left antenna is folded and a little rolled up along the body.

Subfamily Silinae Mulsant, 1862
Tribe Silini Mulsant, 1862
Genus *Autosilis* Kazantsev, 2011

***Autosilis annisettaekoppelae* n. sp.**
(Fig. 19)

Holotype. Male, in Baltic amber, accession No. ALDC0456/ALD.Ba.Can.20

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, amber quarry near Yantarny (previously known as Palmnicken).

Type horizon. Middle Eocene (Lutetian) (47.8-41.2 MY) to Late Eocene (Priabonian) (37.8-33.9 MY).

Differential diagnosis. Concerning the fossil records of the genus *Autosilis*, only one

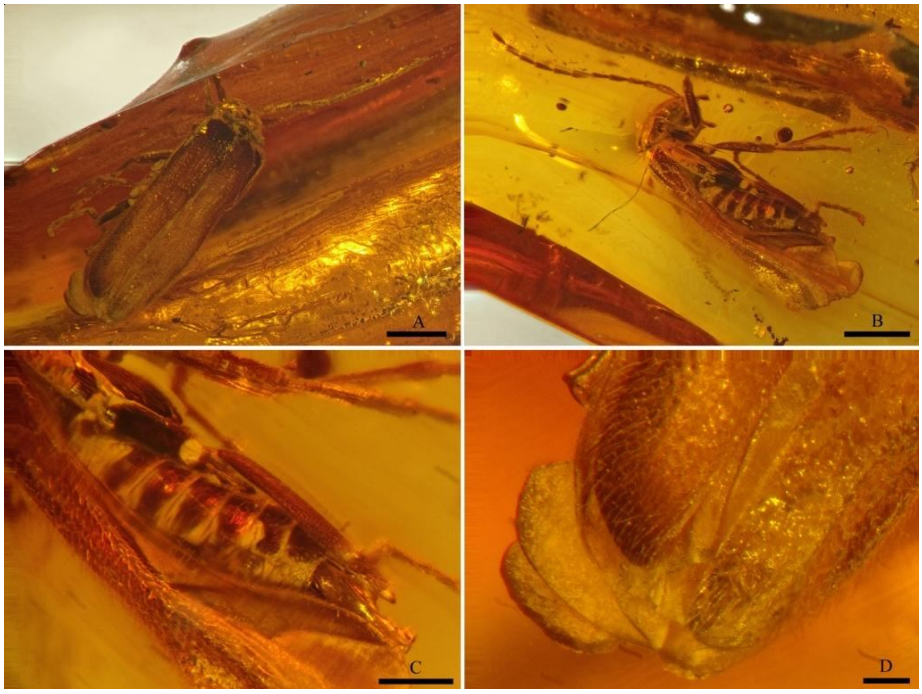

Fig. 17. *Kuskaella bajerae* n. sp. in Baltic amber. A: Holotype, dorsal view, bar = 1.0 mm; B: Holotype, ventro-lateral view, bar = 1.0 mm; C: Holotype, detail of last ventrites, bar = 500 µm; D: Holotype, detail of apex of elytra, bar = 200 µm.

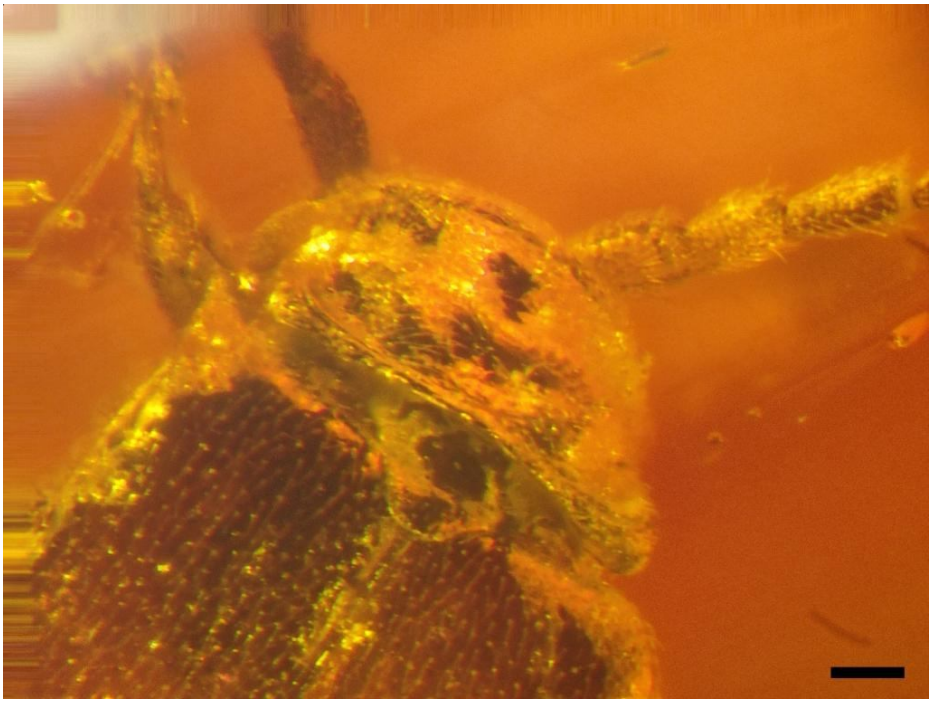

Fig. 18. *Kuskaella bajerae* n. sp. in Baltic amber. Holotype, detail of pronotum, bar = 200 µm.

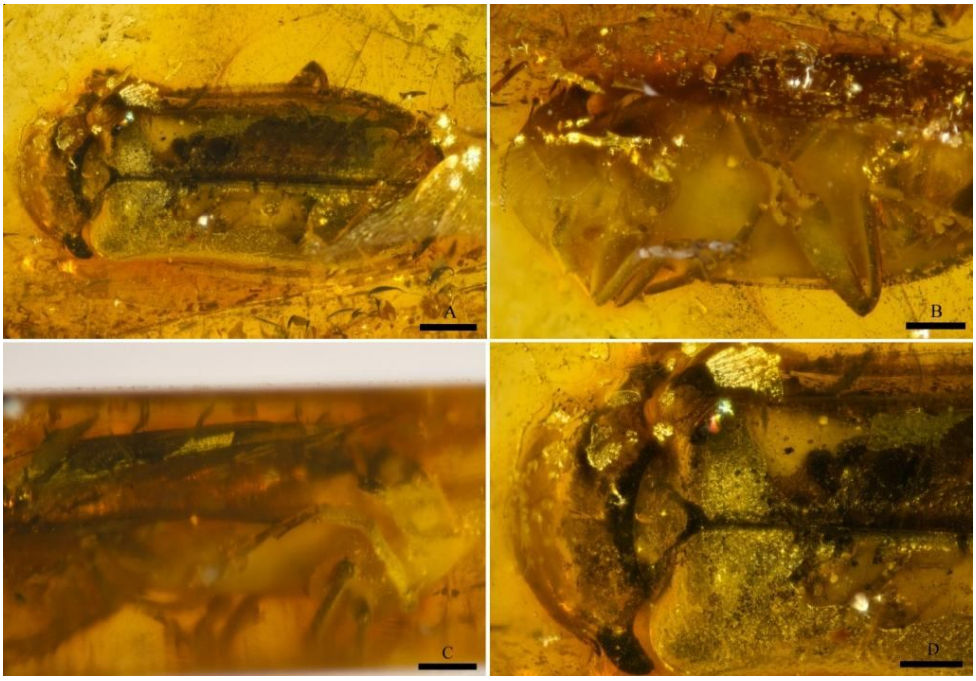

Fig. 19. *Autosilis annisettaekoppelae* n. sp. in Baltic amber. A: Holotype, dorsal view, bar = 1.0 mm; B: Holotype, ventral view, bar = 1.0 mm; C: Holotype, lateral view, bar = 1.0 mm; D: Holotype, detail of scutellum and humeral zone of elytra, bar = 500 µm.

fragment strictly related to the extant (cfr.) *A. nitidula* (Fabricius, 1792) from the Tertiary strata of Aix-en-Provence, France, is known (Serres 1843; Pictet 1854; Fanti 2017a). Other remains, such as *Silis* sp., are known from Eocene Baltic amber (Klebs 1910; Bachofen-Echt 1949; Fanti 2017a), but given the past confusion between the two genera, they also could be members of *Autosilis*. One specimen of *Silis ruficollis* (Fabricius, 1775) is also known from the Holocene (5200-5100 y/o) deposit of Sweet Track, United Kingdom (Girling 1979). The new species here described shows a coloration (dark brown) different from that of *A. nitidula*, which is completely black in males and black with orange-red pronotum in females. The genus *Autosilis* is characterized by glabrous pronotum in the anterior half and without deep cavities (Kazantsev 1994).

Description. Adult, winged. Male, defined on the basis of pronotum with modified sides. Body length ~8 mm but difficult to be certain because the head is folded and unobtrusive. Entirely dark brown. Head small and roundish. Eyes subspherical. Maxillary palpomeres unequal; first segment very short; second elongated; third with intermediate length between the first and the second; last segment securiform. Labial palps 3-segmented. Antennae inserted far away from the eyes, slightly surpassing the metafemurs, 11-segmented, filiform, covered with small setae; scape globular, massive and elongated; pedicel extremely short; antennomere III twice longer than pedicel; antennomeres IV-VI subequal elongated with small expansion at sides; antennomeres VII-XI filiform, very elongated. Pronotum rounded, smooth, without deep cavities, flat except for the basal part which is slightly concave, with the lower process at sides very large and the upper process at sides very thin, slightly pointed and about one-half as long as the lower process. Scutellum very wide at base and elongated at apex, which is roundish. Elytra as wide as pronotum (considering the end

of the lower process) with microsculpture rugose and some setae, elongated and covering the last abdominal segments; apex strongly rounded. Posterior wings covered by elytra. Sternum and abdominal segments covered with numerous setae. Legs short and pubescent; coxae roundish; trochanters elongated and triangular with roundish apex; femora very robust and massive; tibiae short as femora, cylindrical, thin and with a spur at apex. Tarsal formula 5-5-5; first segment elongated and slightly enlarged apically; second shorter than first; third segment subequal to second; fourth segment very bilobed at sides; fifth very elongated; claws simple with tooth at base on the inner claws.

Etymology. This new species is named in honour of the Danish singer Annisette Koppel (born Hansen), in recognition of her long career.

Syninclusions. Air bubbles, several wood remains (particles), pyrite.

Remarks. The amber piece measures 10 x 28 x 5 mm and shows numerous internal cracks. The inclusion is probably complete but ventrally, it is covered by a white cotton-like cloud (emulsion, milky substance), which does not allow a good view of some parts. In fact, the head is folded and the left antenna is partially visible.

DISCUSSION

Eridanula n. gen. and *Noergaardia* n. gen., as well as *Sucinocantharis* Kuśka & Kania, 2010 and *Cacomorphocerus* Schaufuss, 1892, are clearly strictly related to the same lineage and therefore, all belong to the recently established tribe Cacomorphocerini (Fanti & Kupryjanowicz 2018). This currently completely extinct tribe is characterised by saucer-shaped "central" and supernumerary (12 to 19) antennomeres (Fanti & Kupryjanowicz 2018). In contrast, *Palmnickeneoceras* n. gen. is assigned to the tribe Cantharini for showing 11 antennomeres, little dilated and very slightly saucer-shaped, while *Juratelacrima* n. gen. on the other hand, it has also an aspect similar to some Podabrini Gistel.

Cantharis seems rare in amber, with only three species (included *C. mikkelsenorum* n. sp.) known until now (Fanti 2017a). This is probably related to their quite large body size but also to the fact that this genus usually visits and eats upon flowers, while *Malthodes* and *Malthinus* search for their prey on leaves of trees and bushes and thus are more easily trapped in the resin. The body size of these last genera is minute, generally below 3-4 mm (to ~5.5 mm in *Malthinus*), so that 12 species of *Malthodes* (included *M. henningseni* n. sp. and *M. moellehavei* n. sp.) and two *Malthinus* (included *M. rifbjergi* n. sp.) are known in Baltic amber, Rovno amber and Brunstatt brown coals of Alsace (Förster 1891; Kuśka & Kupryjanowicz 2005; Kazantsev 2010; Kuśka & Kania 2010; Kazantsev & Perkovsky 2014; Fanti 2017b; Fanti & Vitali 2017; Fanti & Michalski 2018). The body size could also influence the difficulty to find members of the genus *Rhagonycha* Eschscholtz.

Podistra (*Absidia*) *kloevedali* n. sp. is the first species of this genus described as a fossil; in fact, previously, *Podistra* was known only at generic level (Klebs 1910; Bachofen-Echt 1949; Fanti 2017a). The genus usually lives on mountains, and currently, only three extant species of the subgenus *Absidia* are known (Kazantsev & Brancucci 2007).

The discovery of two species of the genus *Themus* (*Th. pristinus* and *Th. bennyianderseni* n. sp.) in Baltic amber allows some assumptions to be made about the origin of the genus and the age of the amber. Currently, *Themus* is widespread in Iran, Kyrgyzstan, Tajikistan, Pakistan, Afghanistan, India, Nepal, Bhutan, China, Kuril, Japan, Indochina, Sumatra, Java and Borneo (Švihla 2008; Fanti & Ghahari 2016) and is not present in Europe (Kazantsev & Brancucci 2007). Because Europe was

separated from Asia by the Turgai Strait-Turgai Sea during the Eocene, it is possible that *Themus* is older and originated in the Cretaceous or the Early Paleocene, when Europe and Asia where connected. Otherwise, if the Baltic amber dates back to Eocene, *Themus* reached Asia in the Oligocene following the climate cooling due to the draining of the Turgay Sea. The other possible hypothesis is that the Baltic amber is more recent, dating back to the Oligocene, and that *Themus* reached Europe from Asia.

The attribution of *Kuskaella bajerae* n. sp. to the subfamily Malthininae is clear from the habitus, the globular and pointed last maxillary palpomere and various other characters. Nonetheless, the mandibles are not visible and the tribe remains *incertae sedis* (Fanti & Kupryjanowicz 2017).

The subfamily Silinae is rare in Europe, where only the genera *Silis* and *Autosilis* are present, while it is particularly numerous in Asia and America, and seems to be very diversified in the Baltic Eocene.

The Anders Damgaard amber collection, also contains other soldier beetles, such as two specimens of *Cacomorphocerus* sp. (ALDC0056/ALD.Ba.Can.7 and ALDC0058/ ALD.Ba.Can.9), whose photos were shown in Fanti (2017a), and a female of *Malthodes* sp. (ALDC0051/ALD.Ba.Can.2).

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