

Reliquantha eocena sp. nov., first tertiary representative of an extant genus of Anthomyzidae (Diptera)

Jindřich ROHÁČEK

Silesian Museum, Nádražní okruh 31, CZ-746 01 Opava, Czech Republic; e-mail: rohacek@szm.cz

Abstract. *Reliquantha eocena* sp. nov. (Diptera: Anthomyzidae), male only, is described from a Baltic amber inclusion (Tertiary: Middle Eocene, 38–50 mya) and its relationship is discussed. Based on analysis of morphological characters it is affiliated with *Reliquantha* Roháček, 2013 and is thus the first fossil species of Anthomyzidae belonging to an extant genus. The diagnosis of *Reliquantha* is slightly modified and its relationship to fossil *Lacrimyza* Roháček, 2013 (also from Baltic amber) is confirmed. A key to fossil (all Tertiary) genera and species of the subfamily Anthomyzinae is presented.

Key words. Diptera, Anthomyzidae, *Reliquantha eocena* sp. nov., taxonomy, relationships, Tertiary, Eocene, Baltic amber

Introduction

All known fossil Anthomyzidae (Diptera) have recently been treated by ROHÁČEK (2013a). According to this study, a total of 12 ancient Tertiary species have been recognized, with one being known from Dominican amber (Mid Miocene, 17–20 mya) and the remaining 11 species from Baltic amber (Middle Eocene, 38–50 mya). Systematically, the majority of these taxa belong to an exclusively fossil subfamily Protanthomyzinae Roháček, 1998 represented by the single genus *Protanthomyza* Hennig, 1965 with nine (eight named, one unnamed) species, all described from Baltic amber inclusions. The remaining three species are affiliated with the subfamily Anthomyzinae Czerny, 1903 which otherwise comprises all extant taxa of Anthomyzidae. One of these three fossil species belongs to the genus *Grimalantha* Roháček, 1998 (Dominican amber) and two are members of *Lacrimyza* Roháček, 2013 (Baltic amber). It is to be stressed that before the study of ROHÁČEK (2013a) only two fossil anthomyzids were known, viz. *Protanthomyza collarti* Hennig, 1965 and *Grimalantha vulnerata* Roháček, 1998 (HENNIG 1965, ROHÁČEK 1998). The description of ten Eocene amber fossil species by ROHÁČEK (2013a), based on material recently acquired by German amber collectors Christel and Hans Werner Hoffeins and Michael von Tschirnhaus, was thus a very important addition to the knowledge of ancient Anthomyzidae. Based on these

findings ROHÁČEK (2013a) discussed the unexpected diversity of species of the family in Baltic amber forests (11 species represented by 18 specimens in 15 amber samples) and stated that “almost every (surely every second) additional piece of amber with an anthomyzid inclusion yielded another new species”. This was confirmed by the study of an additional Baltic amber specimen purchased recently by Christel Hoffeins which was found not only to represent an unnamed species, but also another genus of the subfamily Anthomyzinae formerly unknown from Baltic amber deposits. The careful study of this fossil revealed that although this new species is undoubtedly related to *Lacrimyza* it cannot be placed in that genus because it lacks some diagnostic synapomorphies. Surprisingly, it was subsequently found to be most closely allied (and even congeneric) with the recently described extant genus *Reliquantha* Roháček, 2013 (whose relationship to *Lacrimyza* was discussed by ROHÁČEK 2013b). This new fossil species of *Reliquantha* is described below. Its affiliation with the latter genus also necessitates slight modification of the diagnosis of *Reliquantha* whose relationship to *Lacrimyza* is confirmed. A key to the identification of all known fossil Anthomyzinae taxa is provided.

Material and methods

The amber sample examined (Fig. 1) originates from the collection of C. and H. W. Hoffeins, Hamburg, Germany; it will subsequently be deposited in the Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (SDEI). It was prepared (cut, ground and polished and then embedded in artificial resin) for examination by H. W. Hoffeins following the method described by him (HOFFEINS 2001). One side of this anthomyzid inclusion is completely obscured by a milky coating (Fig. 2), the other side is clear.

The fly amber inclusion was examined, drawn and measured using two types of stereoscopic microscopes (Reichert, Olympus) and photographed by means of a digital camera (Canon EOS 60D) with a macro lens (Canon MP-E 65 mm 1–5×) and macro ring flash (Canon MR-14EX). Some structures were drawn on squared paper using a binocular microscope (Reichert) with an ocular screen, other drawings were prepared from macrophotographs in which details were inked based on direct observation at higher magnification under a binocular microscope.

Morphological terminology follows that used in ROHÁČEK (2006, 2009) including terms of the male postabdomen and genitalia. That of the male genitalia is largely based on the “hinge” hypothesis of the origin of the eremoneuran hypopygium, re-discovered and documented by ZATWARNICKI (1996).

Abbreviations of morphological terms used in text and/or figures:

A ₁ – anal vein	f ₁ , f ₂ , f ₃ – fore, mid, hind femur
ac – acrostichal (setulae)	gs – gonostylus
C – costa	hu – humeral (= postpronotal) (seta)
ce – cercus	M – media
Cs ₂ , Cs ₃ , Cs ₄ – 2nd, 3rd, 4th costal sector	npl – notopleural (setae)
CuA ₁ – cubitus	oc – ocellar (seta)
dc – dorsocentral setae	ors – fronto-orbital (setae)
dm – discal medial cell	pa – postalar (seta)
dm-cu – discal medial-cubital (= posterior, tp) cross-vein	pk – preapical kink on R ₁
ep – epandrium	ppl – propleural (= proepisternal) (seta)
	prs – presutural (seta)

pvt – postvertical (seta)	Sc – subcosta
R ₁ – 1st branch of radius	stpl – sternopleural (= katepisternal) (seta)
R ₂₊₃ – 2nd branch of radius	T1–T7 – abdominal terga
R ₄₊₅ – 3rd branch of radius	t ₁ , t ₂ , t ₃ – fore, mid, hind tibia
r-m – radial-medial (= anterior, ta) cross-vein	vi – vibrissa
S1–S8 – abdominal sterna	vte – outer vertical (seta)
sa – supraalar (seta)	vti – inner vertical (seta)
sc – scutellar (seta)	

Results

Reliquantha Roháček, 2013

Reliquantha Roháček, 2013b: 795. Type species: *Reliquantha variipes* Roháček, 2013b: 802 (original designation).

Revision of diagnosis. Numbering of characters is in agreement with that in the original diagnosis.

(1) **Head** slightly to distinctly higher than long. (7) Antenna geniculate between pedicel and 1st flagellomere but not strongly directed ventrally. (14) None to several medial microsetulae in front of frontal triangle.

Thorax. (19) Scutellum slightly to strongly convex, postscutellum well developed. Thoracic chaetotaxy: (24) ac microsetae in 4 rows, ending beyond level of anterior dc. Legs: (28) Femora variegated (yellow and brown) or completely dark brown; (29) tibiae brown in the middle and yellow on apices or uniformly dark brown; (32) male f₃ with posteroventral row of short and thick setae, 4–8 distal of which shortened and thickened. Wing: (36) R₂₊₃ long, slightly sinuate, bent parallel to C, ending slightly to distinctly farther from apex of R₄₊₅ than M; (37) R₄₊₅ very slightly bent (recurved); (39) CuA₁ ending near or distinctly in front of wing margin, A₁ far from wing margin; (40) anal lobe and alula well developed, narrow to relatively broad.

Male abdomen. (46) S6 short, strongly asymmetrical, band-like tapered on both sides, with longest middle part separated horizontally to obliquely from S7.

Male genitalia. (49) Epandrium of moderate size, setose, with a pair of longer setae or without them. (52) Cercus relatively large, pale- or dark-pigmented. (53) Gonostylus simply elongate, with rounded or blunt apex and external surface covered by micropubescence.

Discussion. The inclusion of *R. eocena* sp. nov. in the genus *Reliquantha* required minor modification of its diagnosis as is done above. The new fossil species appears to be externally somewhat intermediate between *Reliquantha variipes* Roháček, 2013 and the two fossil species of the genus *Lacrimyza*, viz. *L. lacrimosa* Roháček, 2013 and *L. christelae* Roháček, 2013. It resembles the latter two species mainly with its dark legs and shorter wings (cf. Figs 4, 5). However, *R. eocena* sp. nov. differs distinctly from *Lacrimyza* spp. by several structural characters diagnostic of *Lacrimyza* which prevented its placement in the latter genus (see below). Nevertheless, the examination of external characters of *R. eocena* sp. nov. seems to confirm the supposition of ROHÁČEK (2013b) about the close relationship of *Reliquantha* and *Lacrimyza*, despite the majority of their shared features being plesiomorphic. However, at least (27) the small number of ventral setae on the sternopleuron and (50) the very reduced anal fissure of the epandrium are considered synapomorphies demonstrating the sister-group relationship of these two genera. It is interesting that all Baltic amber taxa of the subfamily

Anthomyzinae, i.e. *Lacrimyza* and *Reliquantha* species, have the fore femur lacking the ctenidial spine. Because the presence of the ctenidial spine is considered a ground-plan character of Anthomyzidae (ROHÁČEK 1998, 2006, 2013a), it is presumed that the ctenidial spine was lost independently many times in various lineages of the family, including even some species of the fossil subfamily Protanthomyzinae (see ROHÁČEK 2013a). However, *Lacrimyza* and *Reliquantha* seem to belong to a common clade in which the ctenidial spine disappeared.

Species included. *Reliquantha variipes* (extant, Great Britain) and *R. eocena* sp. nov. (Baltic amber fossil, described below).

Reliquantha eocena sp. nov.

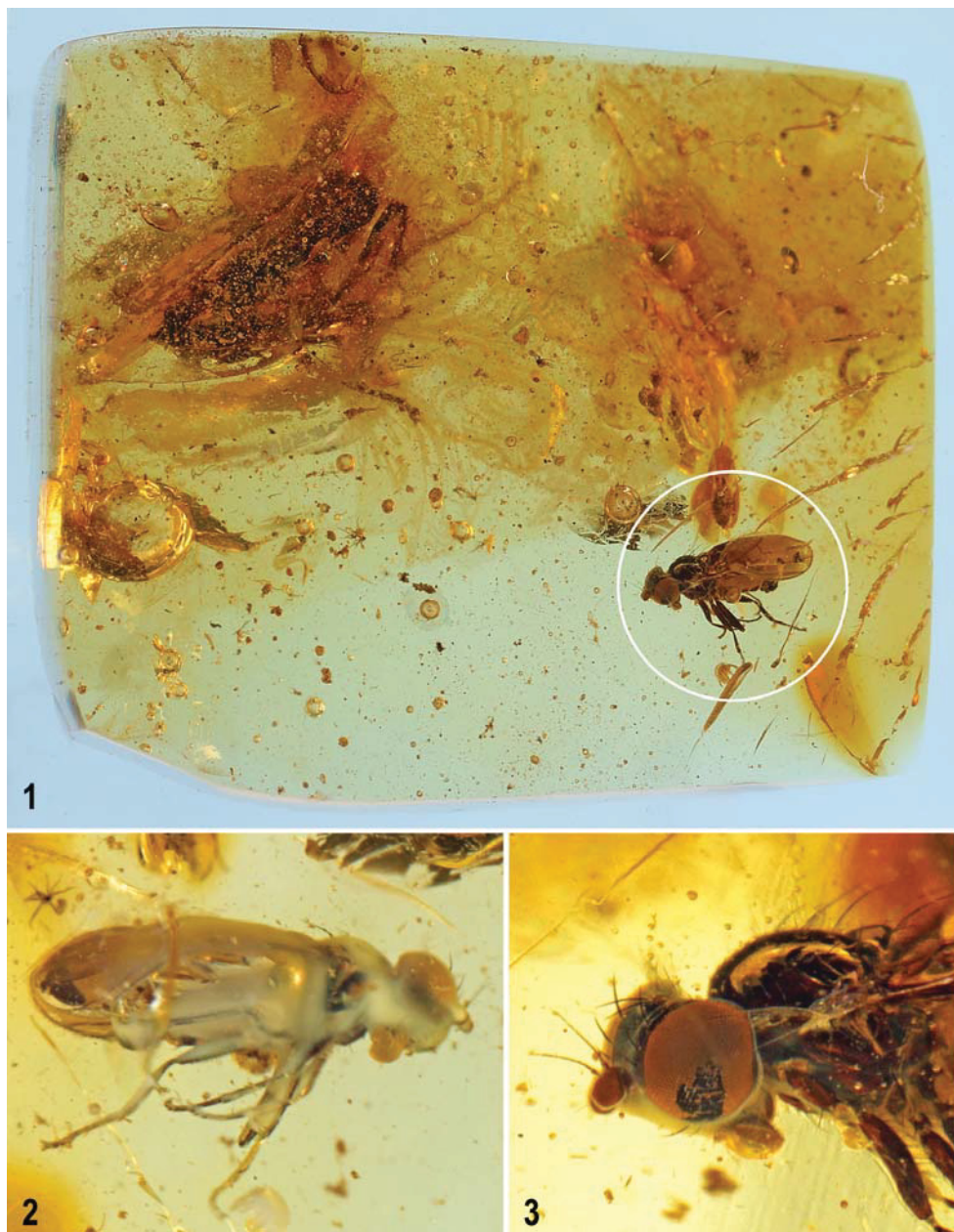
(Figs 1–4, 6–12)

Type material. HOLOTYPE: ♂, labelled: '1734-1, Baltic amber (purchased from Dr. Andrey Krylov, Kaliningrad, Russia)' and 'HOLOTYPUS ♂, *Reliquantha eocena* sp.n., J. Roháček det. 2014' (red label), embedded in polyester resin, size 18.3 × 15.8 × 7.5 mm (Fig. 1), deposited in the collection of C. and H. W. Hoffsins, Hamburg, Germany. Syninclusions: 1 Cicadina adult, 1 Collembola cf. Hypogastruridae, 2 Acarina larvae, several stellate hairs of different shapes.

Etymology. The species is named *eocena* referring to the age of its Baltic amber deposit.

Description. Male. Total body length 2.3 mm; general colour blackish brown; legs largely brownish; thorax and abdominal sclerites probably more or less shining (Fig. 4).

Head (Figs 3, 6) somewhat higher than long (not precisely measurable), dorsally slightly broader than thorax; dorsal part of occiput distinctly concave. Head largely blackish brown and mostly shining including occiput. Frons moderately broad, slightly tapering anteriorly, entirely brown to blackish brown (anteriorly slightly paler). Orbit brown, indistinctly separate from rest of frons. Frontal triangle delimited by a narrow marginal line, relatively long but narrow, reaching to anterior third of frons, concolourous with other parts of frons. Ocellar triangle distinctly elevated and ocelli large. Frontal lunule not visible in the specimen. Face (prae-frons), parafacialia, gena and postgena completely milky coated and hence undescribed. Cephalic chaetotaxy: pvt small, short and slightly convergent; vti distinctly shorter than vte (longest cephalic seta), oc and posterior ors; 3 relatively short ors, the hindmost ors longest (about as long as oc), the middle distinctly shorter, the foremost small (about half of middle ors); there is 1 orbital microsetula in front of the foremost ors (visible on left side only!) but no microsetulae medially; post-ocular setulae (only 5–6 in dorsal part observable) in a single row, none of them enlarged; postgena with 2 (1 slightly longer) longer ventral setae; vi relatively short (about as long as middle ors) and also subvibrissa distinct (although only half length of vi); peristomals not visible due to milky coating. Eye large, covering most of head in profile, with longest diameter subvertical to slightly oblique and only about 1.15–1.20 times as long as shortest diameter. Gena low; its height less than 0.1 times as long as shortest eye diameter (not precisely measurable). Palpus not visible. Mouthparts brownish, finely setulose. Antenna slightly geniculate, with pedicel brown and distinctly darker than 1st flagellomere, the latter orange-ochreous, strongly laterally compressed and densely, very shortly pale pubescent. Arista ochreous to brown, only 1.6 times as long as antenna, with small and paler basal segment and darker brown terminal section being very shortly ciliate.



Figs 1–3. *Reliquantha eocena* sp. nov., male holotype. 1 – Baltic amber sample 1734-1 with the holotype (circled) in situ (length of sample 18.3 mm); 2 – male holotype, the milky-coated right side; 3 – male holotype, left side of head and thorax. Length of holotype 2.30 mm. Photo by J. Roháček.



Figs 4–5. Baltic amber fossil Anthomyzidae. 4 – *Reliquantha eocena* sp. nov., male holotype, left laterally (body length 2.30 mm). 5 – *Lacrimyza lacrimosa* Roháček, 2013, male holotype, left laterally (body length 2.22 mm) (adopted from ROHÁČEK 2013a: Fig. 13A). Photo by J. Roháček.

Thorax slightly narrower than head, uniformly blackish brown, including pleurae (Fig. 3). Mesonotum obviously rather shining but with some microtomentum developed (visible only in parts covered by fine air layer). Thoracic chaetotaxy: 1 relatively short hu (distinctly shorter and weaker than posterior npl), 2 npl (anterior distinctly longer), 1 relatively short sa (distinctly shorter than pa), 1 relatively long pa (as long as anterior dc), 1 distinct but relatively short prs (only as long as sa); 2 long dc (both postsutural), anterior about half length of posterior, the latter very long and strong; 7–8 dc microsetae in front of anterior dc; ac microsetae small, not very dense, in 4 regular rows, reaching posteriorly to level of posterior dc; 2 sc, apical strong and slightly longer than posterior dc (hence longest of thoracic setae), laterobasal much shorter and weaker, shorter than scutellum length; 1 minute hair-like upcurved ppl; 2 relatively long stpl (posterior distinctly longer and more robust) and 1 microseta (poorly visible) in front of them; only 2 short curved setae on ventral corner of sternopleuron. Scutellum rounded triangular and somewhat convex dorsally; postscutellum well developed, blackish brown.

Legs dark (as in *Lacrimyza* species, cf. Fig. 5), entirely brown (including all coxae, trochanters and tarsi); femora and tibiae somewhat darker brown although lighter than thorax. Femora relatively slender (in contrast to those of *Lacrimyza* species). f_1 without ctenidial spine (Fig. 8), with only usual rows of fine and relatively sparse posterodorsal and posteroventral setae; f_2 simply setulose; f_3 (Fig. 7) in distal half with posteroventral row of about 10 short, more or less thickened and erect setae, two most distal of which are small to minute. t_1 and t_3 uniformly short-setulose; t_2 with 1 short ventroapical seta and 2 (or 3?) smaller adjacent setulae. Tarsi simple, slender; fore and hind basitarsi with 2 slightly longer proximoventral setulae; claws relatively long.

Wing (Fig. 10) not very long and moderately wide, hyaline, but with membrane and veins distinctly brownish tinged. C with thicker (but not longer and thus rather indistinct) sparse setulae among usual fine hairs on Cs_2 and (partly) Cs_3 . Sc fused with R_1 apically to form a distinct preapical kink (Fig. 9). R_{2+3} somewhat sinuous, subparallel to C and apically slightly upcurved to C, ending distinctly farther from wing apex than does M. R_{4+5} slightly bent (recurved), and distally somewhat convergent to M. Discal (dm) cell moderately long and narrow, slightly widened distally behind r-m; anterior cross-vein (r-m) situated slightly in front of the middle of discal cell. CuA_1 not reaching wing margin, A_1 ending far from it. Terminal section of CuA_1 about 1.1–1.2 times as long as posterior cross-vein (dm-cu). Alula small and relatively narrow. Wing measurements: length 2.10 mm, width 0.79 mm, $Cs_3 : Cs_4 = 1.91$, r-m/dm-cu : dm-cu = 2.39. Haltere with brownish knob; stem probably paler.

Abdomen with blackish brown and probably rather shining sclerites. All preabdominal terga obviously sparsely and shortly setose (poorly visible). T1 dorsally distinctly separate, laterally only shortly fused with T2. T2–T5 large but not very broad and reaching far laterally (pleural membrane large, Fig. 11). Preabdominal sterna brown and moderately to distinctly broad. S1 paler brown than S3–S5, probably short. S2 not visible due to air bubble. S3–S5 almost subequal in length but becoming strongly wider posteriorly. S3 slightly transverse, S4 markedly wider than long. S5 largest, more than twice as broad as long, strongly transverse and trapezoidal (posteriorly wider). S3–S5 simply shortly setulose (Fig. 11).

Postabdomen (Figs 11, 12) with sclerites heavily sclerotized and dark-pigmented. T6 not visible. S6, S7 and S8 partly fused but their borders distinct. S6 the shortest, strongly asymmet-

rical, tapered to band-like on left and right side (Fig. 12); S7 longer, slightly asymmetrical, situated on left lateral side of postabdomen, blackish brown. Both S6 and S7 without setae. S8 longest, dark and heavily sclerotized, slightly asymmetrical (longer on left side) and situated dorsally, with sparse setae in posterodorsal half.

Genitalia. Epandrium (Figs 11, 12) not very large, globose, definitely wider than high (Fig. 12), shining blackish brown, with single pair of enlarged setae, otherwise rather sparsely shorter setose (but probably only some of setae visible). Anal fissure greatly reduced, unusually low (as in *R. variipes* and in fossil *Lacrimyza* species); cercus well developed, relatively large (about half length of gonostylus) and dark pigmented, laterally somewhat flattened, finely setose (Fig. 11). Gonostylus (Figs 11, 12) brown as cercus, relatively simple, shorter than epandrial height, slender and elongate, wider proximally and gradually tapered apically, with apex blunt and inclinate. Outer convex side of gonostylus micropubescent and bearing only very small setulae at posterior margin. Setae on inner concave side of gonostylus not observable. Basal part of hypandrium (Fig. 11) too poorly visible to be described in any detail.

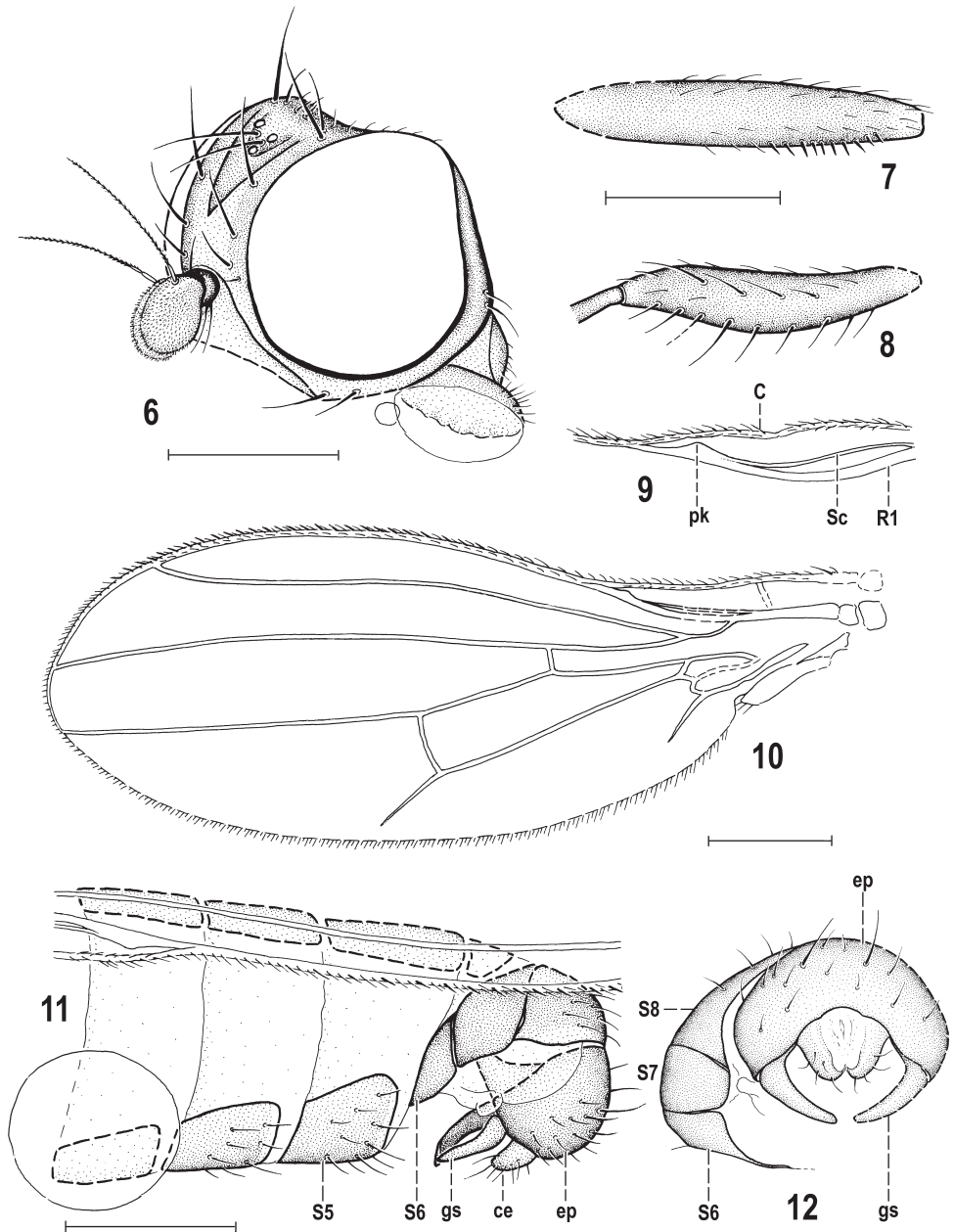
Female. Unknown.

Discussion. Apart from its only extant congener, *R. variipes*, this new fossil species externally most resembles the two species of another Eocene (Baltic amber) genus *Lacrimyza*. However, *R. eocena* sp. nov. cannot be included in the latter group because it lacks most of the synapomorphies on which *Lacrimyza* was based, viz. the oc arising close to each other and peculiarly erect; ac microsetae in two medial rows situated close to each other; stpl setae arising close to each other; male f_3 thickened; male cercus reduced. However, *Reliquantha* (both species) also differs distinctly from *Lacrimyza* species in the construction of the antenna where *Lacrimyza* has the 1st flagellomere directed strongly ventrally (cf. on Figs 4, 5).

The affiliation of *R. eocena* sp. nov. with the genus *Reliquantha* is largely based on shared plesiomorphic characters (cephalic and thoracic chaetotaxies, formation of the male gonostylus and cercus), mostly because the majority of apomorphic features of *Reliquantha* are of internal structures of the male and female genitalia (cf. ROHÁČEK 2013b) which cannot be studied in fossils as a rule. Despite this fact, there are a few apomorphies indicating that *R. eocena* sp. nov. is most closely related to *R. variipes*, e.g. the completely bare male S6 and S7.

The new fossil *Reliquantha* differs from its extant congener *R. variipes* distinctly in a number of colour and structural characters, viz. the frons completely dark (also anteriorly), the antennal pedicel brown, the legs (including femora and tibiae) brown, not variegated, the male f_3 with spine-like setae in posteroventral row shorter and more numerous (Fig. 7), the wing shorter with the R_{2+3} shorter, the CuA_1 not reaching the wing margin and the alula narrower (see Fig. 10), the gonostylus very slender with the apex inclinate and the male cercus dark-pigmented (Figs 11, 12). *Reliquantha eocena* sp. nov. can be distinguished from all other fossil species of the subfamily Anthomyzinae with the key below.

Notes on the habitat and distribution. The extant *R. variipes* (although known from only two specimens from Great Britain: Wales, England) is associated with woodland habitat, and the label data of the female paratype indicate the species may be associated with (tree) fungi, see ROHÁČEK (2013b). This habitat association could also be true for the fossil *R. eocena* sp. nov. because the holotype was caught in the tree resin of the Eocene “amber forest” (TSCHIRNHAUS & HOFFEINS 2009, WEITSCHAT & WICHARD 2010). The composition of syninclusions found together with the holotype (particularly the presence of Collembola and Acarina specimens,



Figs 6–12. *Reliquantha eocena* sp. nov., male holotype. 6 – head dorsolaterally; 7 – right hind femur, posteriorly; 8 – left fore femur, posteriorly; 9 – venation in basal part of wing (different view than in Fig. 10); 10 – left wing; 11 – abdomen laterally (left side); 12 – postabdomen with genitalia, ventrocaudally. Reconstructed parts in dashed lines. All scales = 0.3 mm. For abbreviations see text (p. 774).

see above under Type material) indicate that this amber was possibly formed close to the forest floor. The Middle Eocene Baltic amber forest is characterized as warm (subtropical) montane rainforest dominated by oak and pine (WEITSCHAT & WICHARD 2010) in which also beeches (*Fagus*), maples (*Aceraceae*), elms (*Ulmaceae*) and a number of other trees occurred (LARSSON 1978). Thus, it seems that there could be some tree components shared with those growing in recent woodland where *R. variipes* was found in Great Britain (ROHÁČEK 2013b).

The holotype of *R. eocena* sp. nov. originates from Samland Peninsula (Kaliningrad vicinity), Russia. However, it is known that the Eocene amber is never found in primary deposits in the original forest floor but has been re-deposited through lateral transport by streams (LARSSON 1978) and, more importantly, by glaciers during the Pleistocene. The present range of Baltic amber deposits extends from Fennoscandia eastwards to Russia, westwards to the Netherlands and the English coast and southwards to Germany (Bitterfeld deposit) and Ukraine (Rovno deposit) – these borders agree well with the distribution of glacial till (WEITSCHAT & WICHARD 2010). The original Baltic amber forest in the Middle Eocene covered a vast territory probably ranging from Fennoscandia to Ukraine or more southeasterly (WEITSCHAT & WICHARD 2010) but its exact distribution remains unknown as a result of these massive re-depositions of amber. However, it is presumed that in the Eocene most areas of Europe (wherever there was sufficient humidity) were covered by forests (LARSSON 1978) so that the woodland fauna could spread throughout the continent. Considering these facts, it is not impossible that *R. variipes* could really represent a relic of the Tertiary woodland fauna of Anthomyzidae as ROHÁČEK (2013b) suggested.

Key to fossil (all Tertiary) taxa of the subfamily Anthomyzinae

- 1 Orbit with only 2 ors long. Mesonotum with both dc macrosetae situated close to scutellum (ROHÁČEK 1998: Fig. 8). f_1 with ctenidial spine short but distinct (ROHÁČEK 1998: fig. 11). Wing narrow and terminal section of CuA_1 long (ROHÁČEK 1998: Fig. 10). Female T4–T7 ochreous to yellow, each with transverse dark brown posterior band (ROHÁČEK 1998: Fig. 11); female preabdominal sterna very broad (ROHÁČEK 1998: Fig. 12). ***Grimalantha vulnerata*** Roháček, 1998 (Dominican amber)
- Orbit with 3 ors long (Fig. 6). Mesonotum with both dc macrosetae postsutural, situated more anteriorly (Figs 4, 5). f_1 without ctenidial spine (Fig. 8). Wing wider and terminal section of CuA_1 short (Fig. 10). Preabdominal terga uniformly dark brown and female preabdominal sterna narrower (ROHÁČEK 2013a: Fig. 15C). 2
- 2(1) Antenna with 1st flagellomere strongly bent ventrally (ROHÁČEK 2013a: Fig. 14E; Fig. 5). Frons with oc setae erect and mesonotum with two medial rows of ac microsetae situated very close to each other; also stpl setae arising close to each other (ROHÁČEK 2013a: Fig. 14A). Male cercus reduced, very small (ROHÁČEK 2013a: Fig. 15B). [***Lacrimyza*** Roháček, 2013]. 3
- Antenna with 1st flagellomere less bent ventrally (more porrect) (Figs 4, 6). Frons with oc setae normal (Fig. 6) and mesonotum with 4 ac rows regularly arranged; distance between stpl setae normal. Male cercus large and brown pigmented (Figs 11, 12). ***Reliquantha eocena* sp. nov.** (Baltic amber)

- 3(2) 1st antennal flagellomere whitish yellow to white, with long marginal pilosity; frons wider and paler anteriorly (ROHÁČEK 2013a: Fig. 14A). Parafacialia and gena whitish yellow and silvery white microtomentose. Wing narrower (ROHÁČEK 2013a: Fig. 14C), more than 3 times as long as wide. Male preabdomen with S3 the largest sternum. Gonostylus without setae on apex (ROHÁČEK 2013a: Fig. 15A).
 *Lacrimyza lacrimosa* Roháček, 2013 (Baltic amber)
- 1st antennal flagellomere orange-yellow, with very short marginal pilosity; frons narrower and darker anteriorly (ROHÁČEK 2013a: Fig. 16A). Parafacialia and gena ochreous-yellow and golden microtomentose. Wing wider (ROHÁČEK 2013a: fig. 16E), less than 2.9 times as long as wide. Male preabdomen with S4 the largest sternum. Gonostylus with a few longer setae on apex (ROHÁČEK 2013a: Fig. 16B).
 *Lacrimyza christelae* Roháček, 2013 (Baltic amber)

Acknowledgements

I would particularly like to thank Mrs. C. Hoffeins and Mr. H. W. Hoffeins (Hamburg) who kindly enabled me to study the amber specimen with the inclusion of *Reliquantha eocena* under their care and kindly commented upon an early draft of this paper. My sincere gratitude is further expressed to K. N. Barber (Sault Ste. Marie, Canada) for critical review of the manuscript and many helpful comments and corrections. It is an agreeable duty to acknowledge Journal of Systematic Palaeontology for permission to reproduce the photograph of *Lacrimyza lacrimosa* first published in ROHÁČEK (2013a, p. 460, Fig. 13A). This study was financially supported by the Ministry of Culture of the Czech Republic by institutional financing of long-term conceptual development of the research institution (the Silesian Museum, MK000100595), internal grant of the Silesian Museum No. IGS201401/2014.

References

- HENNIG W. 1965: Die Acalyptratae des Baltischen Bernsteins und ihre Bedeutung für die Erforschung der phylogenetischen Entwicklung dieser Dipteren-Gruppe. *Stuttgarter Beiträge für Naturkunde* **145**: 1–215.
- HOFFEINS H. W. 2001: On the preparation and conservation of amber inclusions in artificial resin. *Polskie Pismo Entomologiczne* **70**: 215–219.
- LARSSON S. G. 1978: *Baltic Amber – a Paleobiological Study. Entomonograph 1*. Scandinavian Science Press, Klampenborg, Denmark, 192 pp.
- ROHÁČEK J. 1998: Taxonomic limits, phylogeny and higher classification of Anthomyzidae (Diptera), with special regard to fossil record. *European Journal of Entomology* **95**: 141–177.
- ROHÁČEK J. 2006: A monograph of Palaearctic Anthomyzidae (Diptera). Part 1. *Časopis Slezského zemského Muzea, Opava (A)* **55 (Supplement 1)**: 1–328.
- ROHÁČEK J. 2009: A monograph of Palaearctic Anthomyzidae (Diptera). Part 2. *Časopis Slezského Zemského Muzea, Opava (A)* **58 (Supplement 1)**: 1–180.
- ROHÁČEK J. 2013a: New amber fossil Anthomyzidae (Diptera): an unexpected Eocene diversity. *Journal of Systematic Palaeontology* **11**: 431–473.
- ROHÁČEK J. 2013b: *Reliquantha variipes* gen. & sp. nov., a peculiar new taxon of Anthomyzidae (Diptera) from Great Britain with uncertain relationships. *Acta Entomologica Musei Nationalis Pragae* **53**: 793–814.

- TSCHIRNHAUS M. VON & HOFFEINS C. 2009: Fossil flies in Baltic amber – insight in the diversity of Tertiary Acalypratae (Diptera, Schizophora), with new morphological characters and a key based on 1,000 collected inclusions. *Denisia* **26**: 171–212.
- WEITSCHAT W. & WICHARD W. 2010: Chapter 6. Baltic Amber. Pp. 80–115. In: PENNEY D. (ed.): *Biodiversity of fossils in amber from the major world deposits*. Siri Scientific Press, Manchester, 304 pp.
- ZATWARNICKI T. 1996: A new reconstruction of the origin of eremoneuran hypopygium and its implications for classification (Insecta: Diptera). *Genus* **7**: 103–175.