



A new species of Bruchomyiinae (Diptera: Psychodidae) from Baltic amber

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Bruchomyiinae is one of seven subfamilies of Psychodidae. This small group comprises fewer than 60 extant species distributed mainly in tropical and sub-tropical regions (Wagner & Stuckenberg 2016). All life stages of these flies are closely tied to forest environment (Fairchild 1952; Stuckenberg 1962) and as a result, bruchomyiines are frequently preserved in fossil resins. The first fossil member of this subfamily was described from Baltic amber (45 Ma) (Meunier 1905) and Burmese amber (100 Ma) is the oldest fossil resin in which representatives of Bruchomyiinae have been found (Stebner *et al.* 2015; Wagner 2017; Skibińska *et al.* 2019). Due to the relative scarcity of this subfamily in Baltic amber, any new specimens are of great interest. Up till now, there are only 12 bruchomyiine species described from Baltic amber. Wagner (2017) completed a revision of fossil Bruchomyiinae and proposed the genus *Hoffeinsodes* to include the species having male genitalia with gonocoxites fused with hypandrium. In this genus, he classified six species reported exclusively from Eocene Baltic amber: *H. bifida* Wagner, 2017, *H. cubicula* Wagner, 2017, *H. longicauda* Wagner, 2017, *H. obtusa* Wagner, 2017, *H. reducta* Wagner, 2017 and *H. hoffeinsi* (Wagner, 2006) transferred from *Nemopalpus* (Wagner, 2006). Here, we describe a new species belonging to this genus.

The holotype specimen examined during this study is deposited in the collection of the Museum of Amber Inclusions, University of Gdańsk (MAIG). Jonas Damzen (Vilnius, Lithuania) found it among inclusions of Baltic amber mined on Sambian Peninsula, in Kaliningrad Region (Russia) and donated it to the MAIG. It was examined using a Leica MZFLII stereomicroscope equipped with a drawing tube and a Leica DFC 295 digital camera and with a Nikon SMZ25 stereomicroscope equipped with a Nikon DS-Ri2 digital camera. Photomicrographs of the specimen are focus stacks and were captured using these systems and processed using NIS-Elements Imaging Software; line drawings were based on traced photos. Interpretation of wing venation follows Byers (1989) and Krzemińska *et al.* (2009). General morphological terminology follows Cumming & Wood (2017). This published work and the nomenclatural acts it contains have been registered in ZooBank, the online registration system for the ICZN. The LSID for this publication is: urn:lsid:zoobank.org:pub:B8AE5632-644F-467D-AFF2-E680782E7151

Systematic palaeontology

Order: Diptera Linnaeus, 1758

Family: Psychodidae Newman, 1834

Subfamily: Bruchomyiinae Alexander, 1920

Genus: *Hoffeinsodes* Wagner, 2017

Type species. *Hoffeinsodes obtusa* Wagner, 2017: 102. Baltic amber, Eocene.

***Hoffeinsodes adamowiczi* sp. nov. (Figs. 1–2)**

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Etymology. The new species is dedicated to the late Paweł Adamowicz, ambassador of Baltic amber and promoter of related research, who served many years as the Mayor of the city Gdańsk until his assassination on 13 January 2019.

Diagnosis. The species is characterized by having cross-vein r-m close to the fork M_{1+2} (about 5/6 length of M_{1+2}); M_1 about 2 times longer than M_{1+2} ; epandrium with elongated epandrial lobes greatly extended at its ends; gonocoxite with two lobes. Female unknown.

Description. Male. Head broad with oval eyes (Fig. 1B); palpus four segmented (length in mm: 1/0.15; 2/0.23; 3/0.30; 4/0.63), last segment almost equal in length to the total length of the previous two (Figs. 1B, 2B); antenna with scape (0.04 mm long), pedicel (0.10 mm long) and 14 flagellomeres; flagellomeres long, tubular, decreasing in length (length in mm: 1/0.39; 14/0.12) (Figs. 1B, 2A). Wing length 4.3 mm; width 1.22 mm; Sc ending before half of a wing length and opposite to vein r-m; sc-r about its length before end of Sc; R_1 long, ends opposite about 3/4 length of R_2 ; fork of Rb into R_1 and R_s before fork of Mb into M_{1+2} and M_{3+4} ; R_{2+3} more than 2 times longer than R_s ; R_2 almost 3 times longer than R_s ; r-m located between R_3 and M_{1+2} ; M_{1+2} two times longer than Mb; M_1 about 2 times longer than M_{1+2} ; M_3 almost 11 times longer than M_{3+4} ; M_4 about 9 times longer than M_{3+4} ; opening of cells m_1 , m_2 and m_3 almost equal in width; Cu ends opposite fork of R_s ; m-cu located in fork of M_{3+4} ; A_1 quite long ends clearly after m-cu (Figs. 1C, 2C). Male genitalia. Gonocoxites fused with hypandrium, each with two lobes tapering to a point; compared to each other, lower gonocoxal lobe broad, slightly arched, upper lobe narrow; aedeagus not discernable; gonostyli simple, about twice as long as wide, sub-rectangular in lateral view, slightly narrowing to blunt apices, covered with setae; epandrium with symmetrical, elongated epandrial lobes clearly broadening at apices; proctiger tubular, elongate, extending clearly beyond epandrium; cerci ovate in lateral view (Figs. 1D, 2D, E, F).

Female. Unknown.

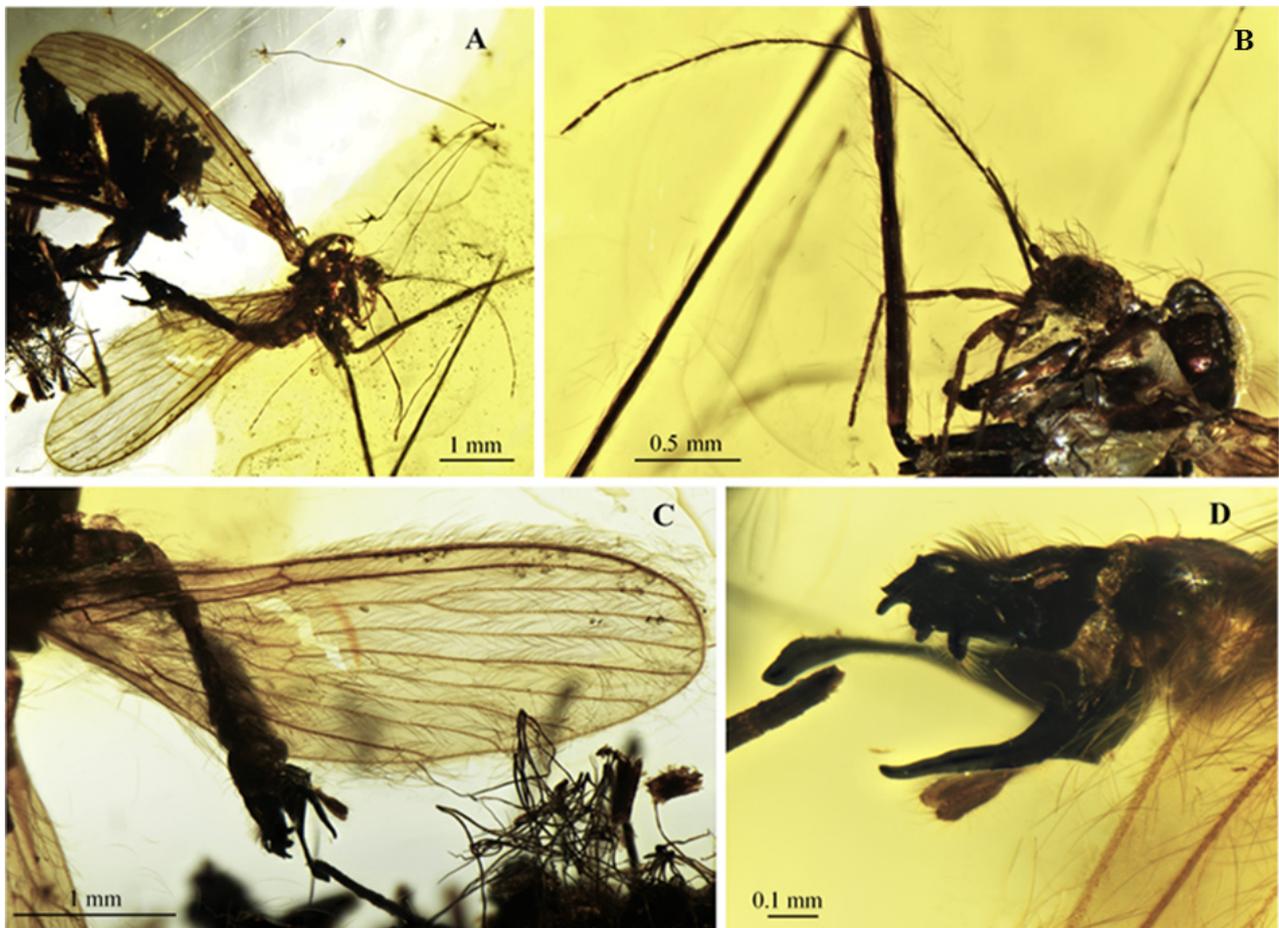


FIGURE 1. Photomicrographs of *Hoffeinsodes adamowiczi* sp. nov., holotype male no. MAIG 5945 A. whole specimen; B. head; C. wing; D. genitalia.

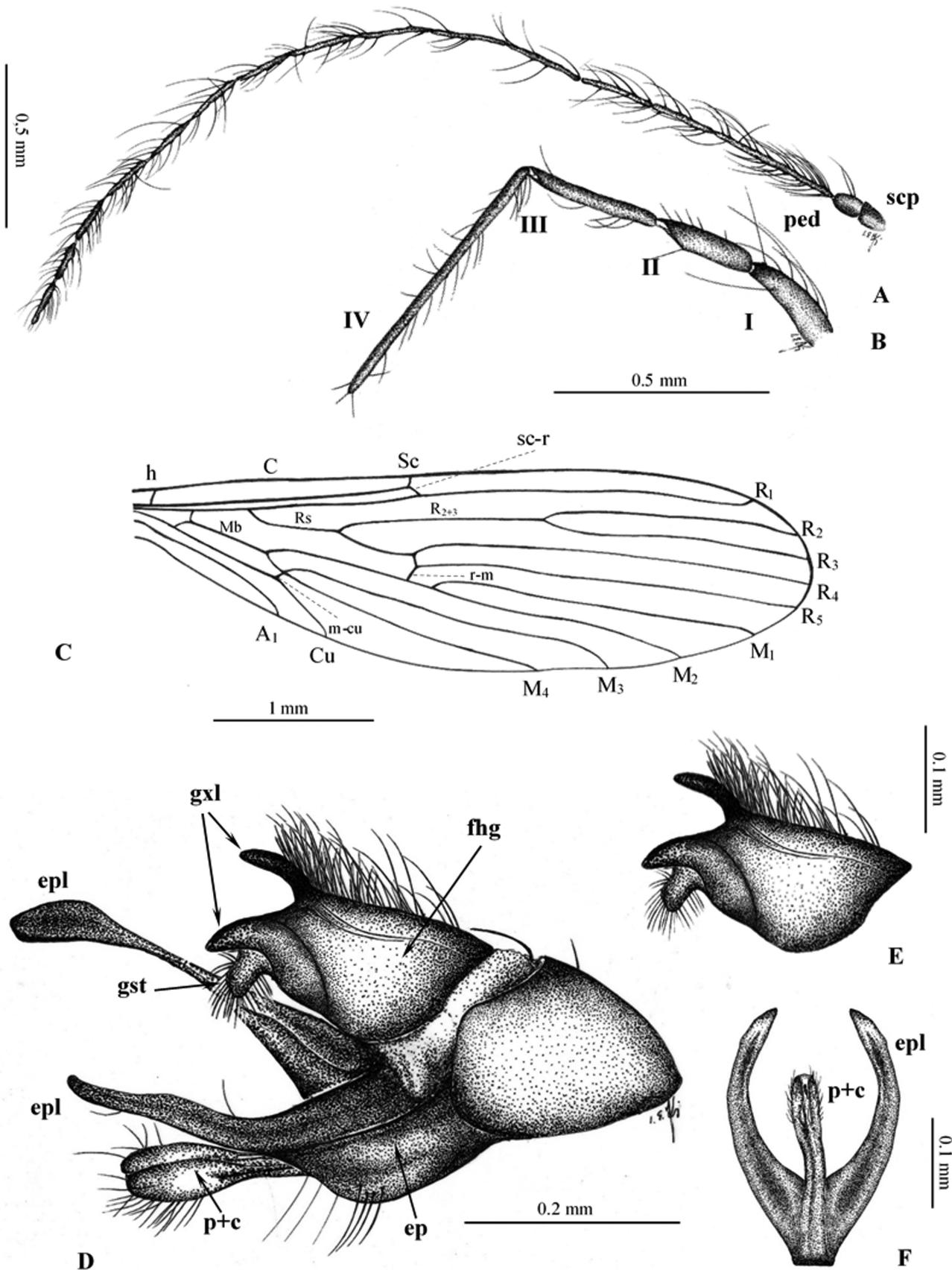


FIGURE 2. Line drawings of *Hoffeinsodes adamowiczi* sp. nov. holotype male. A. antenna; B. palpus; C. wing venation; D. genitalia, lateral view; E. gonostylus and gonocoxites fused with hypandrium; F. epandrium with cerci. Abbreviations: ep, epandrium; epl, epandrial lobes; fhg, fused hypandrium and gonocoxites; gst, gonostylus; gxl, gonocoxal lobe; p+c, proctiger with cerci.

Two genera of Bruchomyiinae are known from Baltic amber: *Palaeosycorax* Meunier, 1905 and *Hoffeinsodes*. The latter genus, now including seven species, is readily characterized by the fusion of gonocoxites and hypandrium but can also be recognized by an exceptionally large epandrium with elongated lobes. Regarding the wing venation, *H. adamo-wiczi* sp. nov. can be easily distinguished by location of cross-vein r-m (Fig. 2C) and proportions of radial and medial veins. Also, external morphology of the male genitalia is unique among described species, especially the epandrium with elongated and apically expanded epandrial lobes. Male genitalia of the new species bear some similarity to those of *Hoffeinsodes longicauda* from Baltic amber. In the latter species, however, gonocoxites and gonostyli are lacking divisions and gonocoxites have no lobes (Wagner 2017).

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