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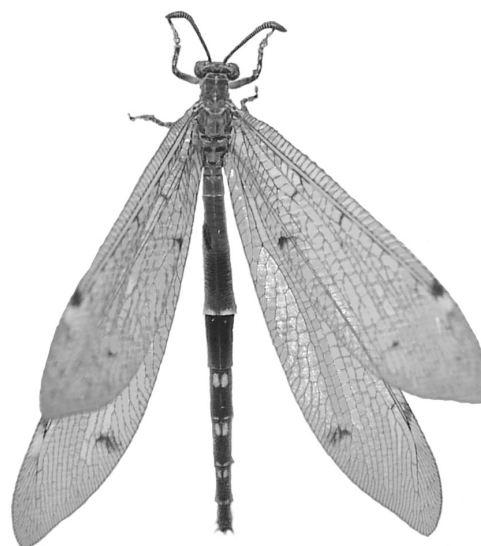


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Peloroepodinae (Diptera: Dolichopodidae) from Baltic amber Peloroepodinae (Diptera: Dolichopodidae) в балтийском янтаре

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Key words: Diptera, Dolichopodidae, *Palaemedeterus*, Baltic amber, new synonym, key.

Ключевые слова: Diptera, Dolichopodidae, *Palaemedeterus*, балтийский янтарь, новый синоним, определительная таблица.

Abstract. The Baltic amber genus *Palaemedeterus* Meunier, 1894 (Diptera: Dolichopodidae) is redescribed and assigned to the subfamily Peloroepodinae. The genus *Gheynia* Meunier, 1899, **syn. n.** is placed in synonymy with *Palaemedeterus*. *Palaechrysotus ignavus* Meunier, 1907 is designated as the type species of *Palaemedeterus*. The previous designation of “*Tipula culiciforme* Meunier, 1899” (nomen nudum) as the type species of *Palaemedeterus* is considered invalid. In addition, the names *Dolichopus soccata* Meunier, 1899 and *Diaphorus fernandi* Meuffels et Grootaert, 1999 are also considered nomina nuda. *Palaemedeterus bifurcatus* (Meunier, 1907), **comb. n.** (from *Gheynia*), *P. ignavus* (Meunier, 1907) and *P. lassatus* (Meunier, 1907) are redescribed. The genus *Palaemedeterus* is similar to the extant genera of the subfamily Peloroepodinae, but it does not demonstrate any apomorphic character established for the extant genera. A key for males of seven species of *Palaemedeterus* known from Baltic amber (Eocene / Oligocene) is given.

Резюме. Известный из балтийского янтара (эоцен / олигоцен) род *Palaemedeterus* Meunier, 1894 (Diptera: Dolichopodidae) переописан и помещен в современное подсемейство Peloroepodinae. Ископаемый род *Gheynia* Meunier, 1899, **syn. n.** из того же янтара сведен в синонимы к *Palaemedeterus*. *Palaechrysotus ignavus* Meunier, 1907 обозначен типовым видом рода *Palaemedeterus*. Прежнее обозначение «*Tipula culiciforme* Meunier, 1899» (nomen nudum) в качестве типового вида *Palaemedeterus* признано недействительным. Названия *Dolichopus soccata* Meunier, 1899 и *Diaphorus fernandi* Meuffels et Grootaert, 1999 признаны nomina nuda. Переописаны *Palaemedeterus bifurcatus* (Meunier, 1907), **comb. n.** (из *Gheynia*), *P. ignavus* (Meunier, 1907) и *P. lassatus* (Meunier, 1907). Род *Palaemedeterus* наиболее близок к современным родам Peloroepodinae, но не обнаруживает апоморфных признаков, установленных для современных родов. Составлен определитель по самцам семи видов *Palaemedeterus*, известных из балтийского янтара.

Introduction

The subfamily Peloroepodinae was created by Robinson [1970] with the type genus *Peloroepodes* Wheeler, 1890. Now 17 extant genera are considered in this subfamily [Grichanov, 2017a]. It can be distinguished from other subfamilies by the following combination of characters: wing discal cell fused with 2nd basal cell; vertex not excavated; wing vein M₂ absent; antennal scape without setae on dorsal surface; posterior mesonotum distinctly flattened and slightly depressed, from 1/3 to 1/2 of surface between dorsocentral setae, and distinct from curved anterior mesonotum; mid and/or hind femur with distinct anterior or anterodorsal preapical seta. Selivanova and Negrobov [1997] suggested the placement of two extinct genera in this subfamily, monotypic *Gheynia* Meunier, 1899 and *Palaemedeterus* Meunier, 1894 with seven described species. Grichanov [2000] recorded *Palaemedeterus* for the Ukrainian amber (from the Rovno Region).

Several pieces with inclusions of *Gheynia bifurcata* Meunier, 1907, and also with two *Palaemedeterus* species of Baltic amber are recently studied. This paper aims to redescribe the known taxa with taxonomical notes and to give a key to species of *Palaemedeterus* from Baltic amber including *P. bifurcatus* (Meunier, 1907), **comb. n.**

Material and methods

The specimens studied are housed at the collection of the Paleontological Institute of the Russian Academy of Sciences (PIN, Moscow, Russia). They were studied and illustrated with ZEISS Discovery V-12 stereomicroscope and AxioCam MRc5 camera. Morphological terminology follows Grichanov and Brooks [2017]. The relative lengths of the antennomeres and podomeres should be regarded as representative ratios and not measurements. Body length is measured from the base of the antenna to the tip of abdominal segment 6. Antenna length is measured from the frons to the stylus apex. Wing length is measured from the base to the wing apex.

Systematic palaeontology

Genus *Palaeomedeterus* Meunier, 1895

Palaeomedeterus Meunier, 1895: 175; 1907: 199 (as synonym of *Palaeochrysotus* Meunier, gen. nov.).

Gheynia Meunier, 1899b: 322, **syn. n.** Type species: *Gheynia bifurcata* Meunier, 1907, by subsequent monotypy in Meunier [1907: 199] (as "*Gheynius bifurcatus*").

Palaeochrysotus Meunier, 1907: 199; Evenhuis, 1994: 366 (as synonym of *Palaeomedeterus* Meunier, 1895). Type species: *Palaeochrysotus horridus* Meunier, 1907, by subsequent designation of Spahr [1985: 36].

Type species: *Palaeochrysotus ignavus* Meunier, 1907: 210, here designated.

Redescription. This generic description is mainly based on males of the type species *Palaeochrysotus ignavus*, males and females of *Palaeomedeterus bifurcatus* **comb. n.** and a male of *P. lassatus* (Meunier, 1907) studied by the authors of this paper.

Length 1.5–3 mm; body dark, metallic, with dark setae; dorsal part of postcranium slightly concave; pair of strong and long ocellar bristles; face without setae, relatively broad, slightly narrowed downward, at clypeus about as wide as postpedicel height; clypeus small, slightly convex; facial suture distinct at eye margins; antenna with scape and pedicel small; scape glabrous, with angular inner apex; pedicel globular, with cirlet of apical setulae of approximately equal length, with one apicodorsal seta strong; postpedicel much larger than pedicel; arista-like stylus dorsal to dorsoapical, filiform, pubescent, with its 1st segment short; proboscis short, setose; palpus moderately large, haired, with one strong seta; posterior third of mesonotum distinctly flattened; acrostichals distinct; six dorsocentrals; two notopleurals; scutellum with two strong bristles and two lateral hairs; fore and mid coxae with anterior and apical setae; hind coxa with one bristle at middle; legs simple, with simple setae and bristles; mid and hind femora with strong anterior subapical bristle; tibiae with strong apical setae; mid and hind tibiae with strong anterodorsal and posterodorsal bristles, with some short ventral setae; hind tibia with rod of short dorsal setae in apical half, with strong dorsal subapical bristle; hind tarsus simple, with some short ventral setae; wing distinctly shorter than body, relatively broad; costa reaching M_1 ; R_1 ending far before level of $dm-m$; R_{2+3} and R_{4+5} gradually diverging to wing apex, R_{2+3} , R_{4+5} and M_1 almost straight; R_{4+5} and M_1 subparallel behind $dm-m$; M_1 joining costa right behind wing apex; distal section of M_1 2–3 times longer than $dm-m$; alula not developed; lower calypter distinct, with setae; halter with well-developed rounded knob, which shorter than halter stem; male abdomen with well-developed setose terga 1–5 and sterna 2–4; tergum 6 small, bare, mostly concealed; segment 7 small, with tergum and sternum; segment 8 large, covered with setae; female similar to male; processes of postpedicel short.

Remarks. The genus *Palaeomedeterus* was proposed by Meunier [1895] with none included species and without description of characters of generic significance. This author supposed close relationship of fossil species of the genera *Palaeomedeterus*, *Chrysotus* Meigen, 1824 (Diaphorinae), *Medetera* Fischer von Waldheim, 1819 (Medeterinae), and *Oppenheimiella* Meunier, 1893 (now in Opetiidae), and he pointed out a great variability of shape of the antennal postpedicel and position of the arista-like stylus on this segment in the *Palaeomedeterus*. Validating the name, Meunier provided his proposal with line drawings of antenna for six different unnamed *Palaeomedeterus* species (thus the name *Palaeomedeterus* is available according to the article 12.2.7 of International Code of Zoological Nomenclature [1999]). The authors of

this paper suppose that the Meunier's schematic drawings could be associated with different dolichopodid genera with extinct species known to Meunier [1907, 1908a, b].

Meunier mentioned the name *Palaeomedeterus* in several of his papers and short notes published between 1895 and 1907, giving no additional characters to the generic concept. One of these papers [Meunier, 1899a] was recently used for establishing new nomenclatural acts [Evenhuis, 1994; Meuffels, Grootaert, 1999]. Thus, Evenhuis [1994] designated the type species for *Palaeomedeterus*, "*Tipula culiciforme*" Meunier, 1899, "by subsequent monotypy"; and Meuffels and Grootaert [1999] proposed a new replacement name *Palaeomedeterus meunieri* for "*Tipula culiciformis* Meunier, 1899" (nec Linnaeus, 1767). However, despite its title ("Revision of fossil dipteran types of Loew deposited in the Königsberg Provincial Museum"), the work of Meunier [1899a] contains a list of the Loew's museum identification labels reprinted with a number of errors and misprintings, with each label accompanied usually with Meunier's notes on taxonomical position of the particular inclusion. For example, the name "*Tipula culiciforme*, Löw", was repeated twice (p. 174), each time for different taxa (according to Meunier). Reading carefully original monograph of Loew [1850], we cannot find the species name "*Tipula culiciforme*". At the same time, we can find there an outdated classification of nematoceran Diptera, including "die Familie der *Tipularia culiciformia*" (p. 29), "*Tipularia fungicola*" (p. 32), "*Tipularia terricola*" (p. 35), etc. The authors suppose that Meunier [1899a] erroneously reprinted these names from Loew's labels as "*Tipula culiciforme*", "*Tipulidae fungicola*", "*Tipula terricola*" (p. 174), having no intention to name the flies. Also, Meunier usually did not provide his notes under the listed species and other taxa with diagnostic characters, making them nomina nuda (if they were not published before).

Regarding "*Tipula culiciforme*" (No 14515), Meunier's note contains two common characters (large postpedicel and bristled hind basitarsus) of the genus *Dolichopus*, a member of the subfamily Dolichopodinae, distinguishing the latter genus from *Palaeomedeterus*, and general remark on a great variability of the antenna within *Palaeomedeterus*. The authors hope that nobody considers this note as a species description of "*Tipula culiciforme*". It is worth noting here that "*Tipula terricola*, Löw" was also mentioned by Meunier as a member of *Palaeomedeterus* (p. 174) without both description and diagnostic character. Therefore, both "*Tipula culiciforme*, Löw" and "*Tipula terricola*, Löw" (sensu Meunier) must be considered at most nomina nuda, and the designation of *Tipula culiciforme* as the type species for *Palaeomedeterus* "by subsequent monotypy" [Evenhuis, 1994] must be considered invalid.

The same publication [Meunier, 1899a] contained also the list of the Loew's materials labeled as members of the family Dolichopodidae (p. 179). One specimen labeled as "Dolichopodidae L[oeuw]" was referred to the genus *Chrysotus* (Diaphorinae). Two specimens labeled as "2. *Psilopus*" (now the name *Psilopus* Meigen, 1824 is a synonym of *Sciapus* Zeller, 1842, Sciapodinae) had the following remark: "Dans des travaux antérieurs, j'ai fait connaître les genres suivants: *Palaeoargyra*, *Palaeomedeterus*, *Medetera* et *Argyra*" [Meunier, 1899a: 179], i.e. Meunier

was uncertain in association of the material with one of the four genera belonging now to Diaphorinae, Medeterinae and Peloroepodinae. One inclusion labeled as “*Dolichopus soccatus*, Löw” had no Meunier’s remark despite the obvious impossibility of finding the extant Canadian *Dolichopus soccatus* Walker, 1849 (currently an unrecognized species) in the Baltic amber. Finally, one specimen labeled as “*Diaphorus*. ♂. Löw” and printed by Meunier as “1. *Dolichopus soccata* ? *Diaphorus*. ♂. Löw” had the following remark [Meunier, 1899a: 179]: “Ce *Dolichopodidae* dont le troisième article des antennes est conique et assez allongé, est referable au genre cité. Je ne puis admettre, avec Löw, que c’est un *Diaphorus*, car le troisième article des diptères de ce genre est ‘*scheibenrand*.’” It means that Meunier did not accept Loew’s identification of this specimen as *Diaphorus* sp., placing this fly in the genus *Dolichopus* (sensu Loew) on the base of the non-rounded postpedicel shape of the specimen. The name “*Dolichopus soccata*” [Meunier, 1899a] had no any diagnostic character and should be considered nomen nudum, but it was listed by Evenhuis [1994] within the genus *Diaphorus* Meigen, 1824 and was renamed as *Diaphorus fernandi* by Meuffels and Grootaert [1999]. We here consider the latter name as an unjustified new name for an invalid name.

Meunier [1899b] proposed also a new genus *Gheynia* with none included species, without description, but with a reference to a picture of antenna of unnamed fossil species [Meunier, 1894]. He noted close relationship of *Gheynia* and *Palaeomedeterus* differing from each other in the shape of the postpedicel. Meunier [1907, 1908b] published a short description of *Gheynia bifurcata* Meunier, 1907 (as “*Gheynius bifurcatus*”), adding three more line drawings of the postpedicel. A male postpedicel pictured [Meunier, 1908b: Fig. 81] is almost identical to that published in Meunier [1894]. Figs 83 and 84 [Meunier, 1908b] demonstrate individual variability of female postpedicel in this species. It is interesting that the Fig. 84 [Meunier, 1908b] is quite similar to the Fig. II [Meunier 1895] illustrating one of the *Palaeomedeterus* species. Ulrich and Schmelz [2001] published a photo of the female *Gheynia bifurcata* (along with a possible prey, enchytraeid worm), which added some important diagnostic characters to the original description of the species.

Included species
(all from Baltic Amber, Eocene / Oligocene)

Palaeomedeterus bifurcatus (Meunier, 1907), **comb. n.**

Gheynia bifurcata Meunier, 1907: 199; 1908b: 58 (as *Gheynius bifurcatus*); Ulrich, Schmelz, 2001: 89; Evenhuis, 1994: 366.

Palaeomedeterus fessus (Meunier, 1907)

Palaeochrysotus fessus Meunier, 1907: 210; 1908b: 55.
Palaeomedeterus fessus (Meunier, 1907): Evenhuis, 1994: 366.

Palaeomedeterus hirsutus (Meunier, 1907)

Palaeochrysotus hirsutus Meunier, 1907: 210; 1908b: 49.
Palaeomedeterus hirsutus (Meunier, 1907): Evenhuis, 1994: 366.

Palaeomedeterus horridus (Meunier, 1907)

Palaeochrysotus horridus Meunier, 1907: 210; 1908b: 47.
Palaeomedeterus horridus (Meunier, 1907): Evenhuis, 1994: 366.

Palaeomedeterus ignavus (Meunier, 1907)

Palaeochrysotus ignavus Meunier, 1907: 210; 1908b: 50.
Palaeomedeterus ignavus (Meunier, 1907): Evenhuis 1994: 366.

Palaeomedeterus languidus (Meunier, 1907)

Palaeochrysotus languidus Meunier, 1907: 210; 1908b: 54.
Palaeomedeterus languidus (Meunier, 1907): Evenhuis 1994: 366.

Palaeomedeterus lassatus (Meunier, 1907)

Palaeochrysotus lassatus Meunier, 1907: 210; 1908b: 55.
Palaeomedeterus lassatus (Meunier, 1907): Evenhuis 1994: 366.

Palaeomedeterus lentus (Meunier, 1907)

Palaeochrysotus lentus Meunier, 1907: 210; 1908b: 52.
Palaeomedeterus lentus (Meunier, 1907): Evenhuis 1994: 366.

Remarks. This species was described with the dorsal arista-like stylus, but was pictured with the apical stylus [Meunier, 1908b: Fig. 70]. We consider the stylus position to be dorsal because Meunier [1908b: 9] used the latter character in his generic key for all species of *Palaeochrysotus*.

Unavailable names

Palaeomedeterus culiciformis (Meunier, 1899).

Tipula culiciformis Meunier, 1899a: 174 (as “*Tipula culiciforme*, Löw”, nec Linnaeus, 1767), nomen nudum.

Palaeomedeterus culiciformis Evenhuis, 1994: 366 (as “*Palaeomedeterus culiciformis* Meunier, 1899”). Unavailable name; replacement proposed for an unavailable species-group name.

Palaeomedeterus meunieri Meuffels et Grootaert, 1999: 291 (nom. nov. for “*Tipula culiciformis* Meunier, 1899”, nec Linnaeus, 1767). Unavailable name; a new name proposed for an unavailable species-group name.

Redescriptions

Palaeomedeterus bifurcatus (Meunier, 1907)
(Figs 1–8)

Material. Seven completely preserved males and two females have been selected for the redescription from amber pieces labelled: “Baltic Amber, Upper Eocene – Lower Oligocene *Gheynia bifurcata* Meunier, det. O. Negrobov & O. Selivanova 1996 *Palaeomedeterus bifurcatus* (Meunier), det. I. Grichanov 2017, with the numbers 93, 97, 209, 343, 467, 492, 514 (males), 151, 236 (females)” (PIN).

Redescription. Male. General coloration of head, thorax and abdomen dark, weakly shining. Pollinosity is virtually indistinguishable. Major bristles dark.

Head: vertex not excavated; vertical bristle strong and long, located at upper corner of frons; short postvertical seta as a linear

continuation of postocular setal row; one pair of strong ocellar bristles (adjacent hairs invisible); single row of short dark simple postoculars of about equal length; eyes with microscopic hairs between facets; upper and lower facets about equal in size; face shining, under antenna nearly twice as wide as postpedicel height, narrowing towards clypeus; clypeus small and narrow, nearly as high as wide; antenna about as long as eye height, dark; scape and pedicel small, simple; scape vaselike, glabrous, with angular inner apex; pedicel globular, with cirlet of apical setulae of approximately equal length, with one dorsal seta strong; postpedicel swollen at base, flattened laterally, with two drawn-out apices, longer than high at base (12 : 10), long haired; ventral process of postpedicel usually longer than dorsal process; arista-like stylus inserted in apical incision, filiform, pubescent, with its 1st segment being very short. Length ratio of scape to pedicel to postpedicel to arista-like stylus, 6 : 6 : 12 : 48. Palpus and proboscis dark, small, sparsely haired; palpus as long as clypeus, ovate, with strong apical bristle.

Thorax: with posterior third of mesonotum distinctly flattened; two regular rows of 6 strong dorsocentrals decreasing in length anteriorly; acrostichals biserial, distinct, reaching posterior depression of mesonotum; few hairs on anterior slope of mesonotum; 1 pair of strong scutellars, as long as posterior dorsocentrals, and two lateral hairs, adjacent to median bristles; postnotum small; 1 strong proepisternal bristle just above fore coxa; proepimeron without strong setae.

Legs including coxae dark, simple, evenly covered with ordinary setulae, with strong bristles; fore coxa with short simple hairs and several subapical setae anteriorly; mid and hind coxae with 1 strong lateral bristle at middle; claws and pulvilli on all legs small; mid trochanter with 1 dorsal seta; mid and hind femora with strong anterior preapical bristle, as long or slightly longer than femur height; fore tibia with at most 1 weak dorsal, with 2–3 short apical setae; mid tibia with 2 pairs of antero- and posterodorsals including strong and long upper anterodorsal bristle, with or without additional short anterodorsal at base, with 4 strong apicals; hind tibia with 1–2 pairs of short antero- and posterodorsal setae in basal half, dorsal row of short dorsal setae in distal half, with strong dorsal subapical bristle, with 2–3 short ventral setae, with 3–4 apical setae; tarsomeres of all legs with very short apical setae; fore leg length ratio (from femur to tarsomere 5): 51 : 51 : 24 : 13 : 10 : 8 : 8, mid leg: 59 : 65 : 25 : 15 : 11 : 7 : 7, hind leg: 64 : 78 : 15 : 20 : 11 : 9 : 7.

Wing: hyaline, with dark veins; R_1 ending far before level of $dm-m$; R_{2+3} and R_{4+5} gradually diverging to wing apex, R_{2+3} , R_{4+5} and M_1 almost straight; R_{4+5} and M_1 subparallel behind $dm-m$; M_1 joining costa right behind wing apex; ratio of part of costa between R_{2+3} and R_{4+5} to this between R_{4+5} and M_1 to $dm-m$ to distal part of M_1 , 25 : 18 : 15 : 36; crossvein $dm-m$ nearly straight, forming right angles with M_1 and with M_4 longitudinal veins, as long as maximum distance between R_{4+5} and M_1 veins; anal wing distinct, almost reaching wing margin; anal lobe developed; anal angle obtuse; lower calypter light, with long dark setae; halter light, with well-developed rounded knob, shorter than halter stem.

Abdomen: conoid, covered with hairs, with short marginal tergal setae and sparse sternal hairs on segments 2–5; sterna 2–4 well sclerotised; tergum 6 small and bare; segment 7 small, with distinct tergum and sternum; segment 8 large, positioned left basodorsally, covered with setae; epandrium globular; hypandrium raised from middle of epandrium, projected, bilobate, with lobes gradually broadened apically, rounded at apex; phallus thick, with small ventral hook at apex; distoventral epandrial lobe broad, slightly projected, fused with epandrium, with one long and 1–2 short ventral setae; surstylus bilobate, with short subequal in length lobes, bearing short setae at apex, with ventral lobe narrower, than dorsal lobe of surstylus; postgonite projected, bilobate, with hooked pointed lobes, cercus small, rounded, covered with short cilia.

Length (mm): body without antennae 2–2.25, antenna 0.6, wing 1.9 : 0.7.

Female. Similar to male; postpedicel (including short ventral process) as long as high (9 : 9), dorsal process of postpedicel weakly pronounced; hemitergite each with at least 3 short thick setae; body length 2–2.25 mm, wing length 2 mm.

Remarks. *Palaeomedeterus bifurcatus* is a rather common species in Baltic amber. Meunier [1907, 1908b] listed inclusions with 45 males and 38 females of the species. He gave quite general species description and noted a certain extent of postpedicel variability in both males and females. Nevertheless, the line drawings provided by the author for male hind tarsus and male antennae allow making reliable association of the inclusions studied with *P. bifurcatus*. Recently, Ulrich and Schmelz [2001] found a female of this species with a possible prey, enchytraeid worm, in a single piece of Baltic amber.

Palaeomedeterus lassatus (Meunier, 1907)
(Figs 9–15)

Material. One completely preserved male partly covered with milky-white decay coating in a piece of amber labelled: “Baltic Amber, Upper Eocene – Lower Oligocene *Palaeomedeterus lassatus* (Meunier), det. I. Grichanov 2017” (PIN).

Redescription. Male. General coloration of head, thorax and abdomen dark, weakly shining. Body and legs discolored in places due to original conservation conditions. Pollinosity is virtually indistinguishable. Major bristles dark.

Head: vertex not excavated; vertical bristle strong and long, positioned at upper corner of frons; short postvertical seta as linear continuation of postocular setal row; one pair of strong ocellar bristles (adjacent hairs invisible); single row of short dark simple postoculars of about equal length; eyes with microscopic hairs between facets; upper and lower facets about equal in size; face (poorly visible) moderately broad; eyes distinctly separated; antenna about as long as eye height, dark; scape and pedicel small, simple; scape vaselike, glabrous, with angular inner apex; pedicel globular, with cirlet of apical setulae of approximately equal length, with 1 dorsal seta strong; postpedicel flattened laterally, with small pointed ventral projection at apex, higher than long (9 : 5), haired; arista-like stylus inserted in subapical emargination, filiform, pubescent, with its 1st segment being very short; length ratio of scape to pedicel to postpedicel to arista-like stylus, 4 : 4 : 5 : 43; palpus and proboscis small, sparsely haired; palpus with strong apical bristle.

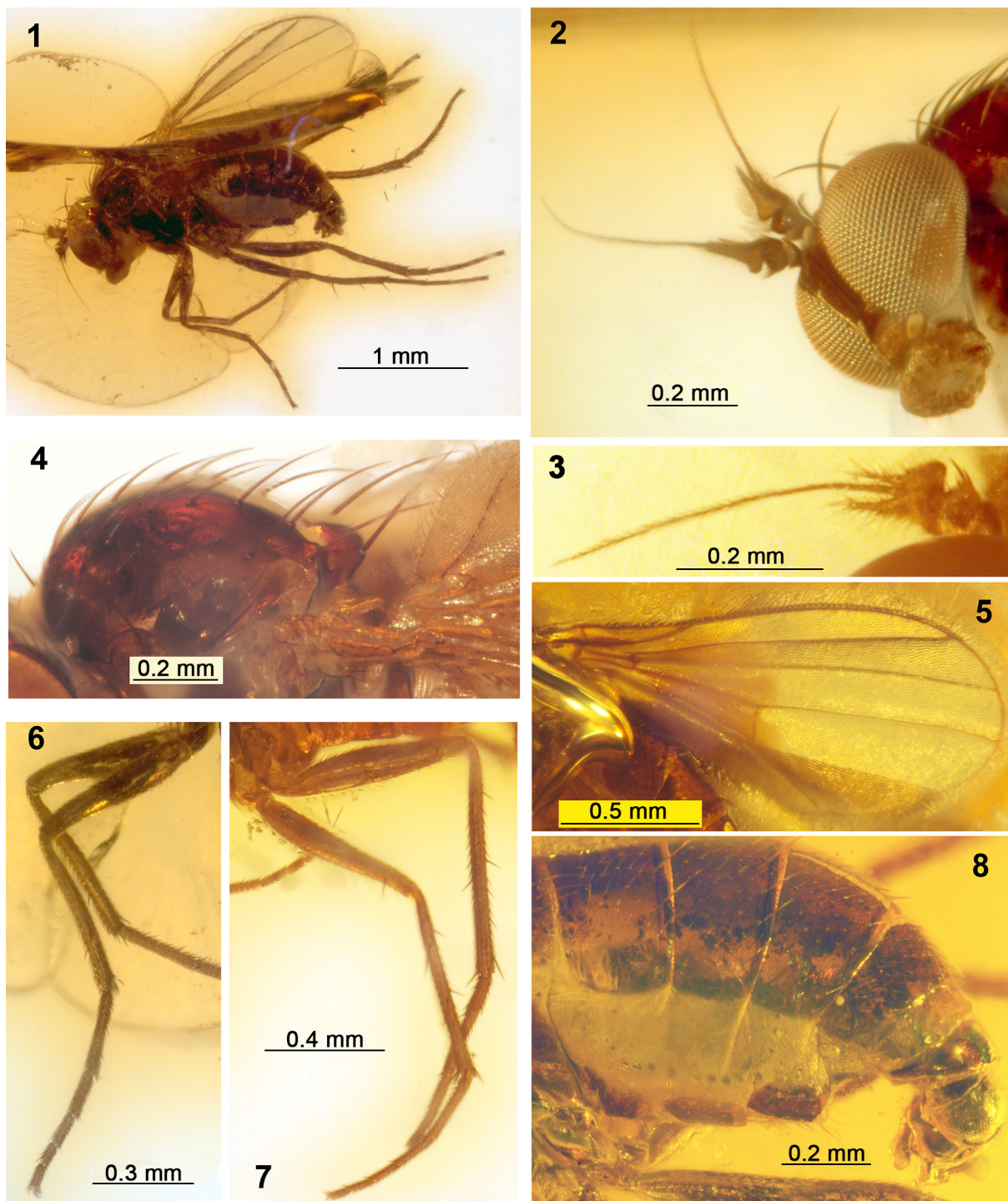
Thorax: with posterior third of mesonotum distinctly flattened; two regular rows of 6 strong dorsocentrals decreasing in length anteriorly; acrostichals biserial, distinct, reaching posterior depression of mesonotum; few hairs on anterior slope of mesonotum; one pair of strong scutellars, as long as posterior dorsocentrals, and two lateral hairs, adjacent to median bristles; postnotum small; one strong proepisternal bristle just above fore coxa; proepimeron without strong setae.

Legs including coxae simple, evenly covered with ordinary setulae, with strong bristles; fore coxa with short simple hairs and several subapical setae anteriorly; mid and hind coxae with one strong lateral bristle at middle; claws and pulvilli on all legs small; mid trochanter with one dorsal seta; mid and hind femora with strong anterior preapical bristle, as long as or slightly longer than femur height; fore tibia with at most one weak dorsal, with 2–3 short apical setae; mid tibia with two pairs of antero- and posterodorsals including subequal in length anterodorsal bristles, with or without additional short anterodorsal at base, with four strong apicals; hind tibia with 1–2 pairs of short antero- and posterodorsal setae in basal half, dorsal row of short dorsal setae in distal two-thirds, with dorsal subapical bristle which not stronger than apicoventral bristle, with 2–3 short ventral setae, with 3–4 apical setae; tarsomeres of all legs with very short apical setae;

fore leg length ratio (from tibia to tarsomere 5): 42 : 16 : 8 : 6 : 5 : 6, mid leg: 53 : 21 : 11 : 8 : 6 : 7, hind leg: 60 : 15 : 18 : 11 : 7 : 7.

Wing: hyaline, with dark veins; R_1 ending far before level of $dm-m$; R_{2+3} and R_{4+5} gradually diverging to wing apex, R_{2+3} , R_{4+5} and M_1 almost straight; R_{4+5} and M_1 subparallel behind $dm-m$; M_1 joining costa right behind wing apex; ratio of part of costa

between R_{2+3} and R_{4+5} to this between R_{4+5} and M_1 to $dm-m$ to distal part of M_4 ; 22 : 13 : 11 : 35; crossvein $dm-m$ nearly straight, forming right angles with M_1 and with M_4 longitudinal veins, as long as maximum distance between R_{4+5} and M_1 veins; lower calypter light, with long setae; halter light, with well-developed rounded knob, shorter than halter stem.

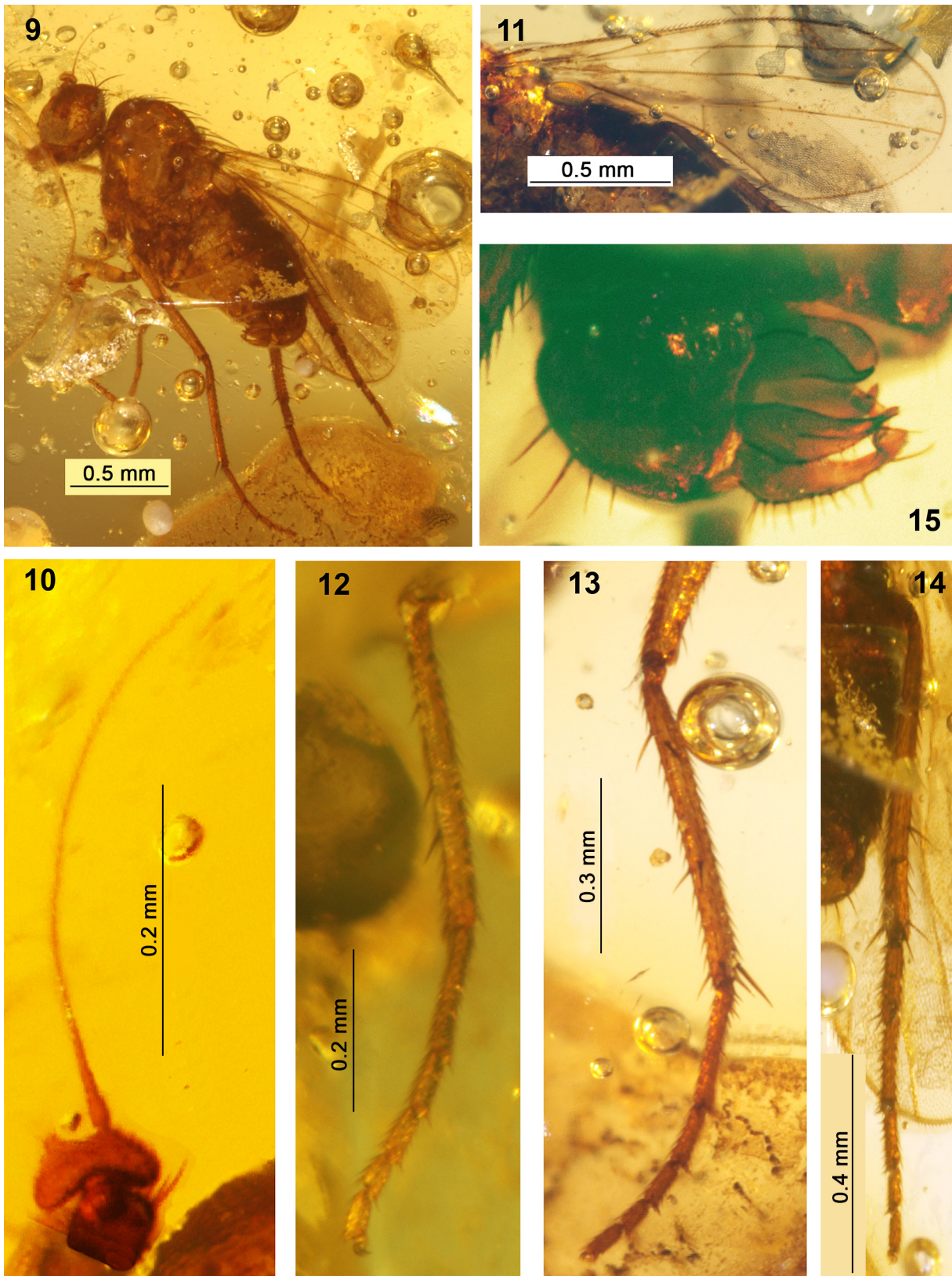


Figs 1–8. *Palaeomedeterus bifurcatus* (Meunier, 1907), male.

1 – habitus; 2 – head; 3 – antenna; 4 – thorax; 5 – wing; 6 – fore leg; 7 – mid and hind legs; 8 – abdomen.

Рис. 1–8. *Palaeomedeterus bifurcatus* (Meunier, 1907), самец.

1 – внешний вид; 2 – голова; 3 – усик; 4 – грудь; 5 – крыло; 6 – передняя нога; 7 – средняя и задняя ноги; 8 – брюшко.



Figs 9–15. *Palaeomedeterus lassatus* (Meunier, 1907), male.
 9 – habitus; 10 – antenna; 11 – wing; 12 – fore leg; 13 – mid leg; 14 – hind leg; 15 – hypopygium.

Рис. 9–15. *Palaeomedeterus lassatus* (Meunier, 1907), самец.

9 – внешний вид; 10 – усик; 11 – крыло; 12 – передняя нога; 13 – средняя нога; 14 – задняя нога; 15 – гипопигий.

Abdomen: conoid, covered with hairs, with short marginal tergal setae and sparse sternal hairs on segments 2–5; sterna 2–4 well sclerotised; tergum 6 small and bare; segment 7 small, with distinct tergum and sternum; segment 8 large, positioned left basodorsally, covered with setae; epandrium globular; hypandrium raised from middle of epandrium, projected, bilobate, with lobes gradually broadened apically, rounded at apex; phallus poorly visible, projected, somewhat broadened at apex; distoventral epandrial lobe concealed, not visible; surstylus with only one large lobe visible, elongate-triangular, with narrow curved ventrally apex, with two small ventral preapical tubercles, without distinct setae; postgonite projected, rhomboid, nearly half as long as cercus; cercus long, swollen at base, narrow distally, with flattened and slightly enlarged apex, covered with short cilia, with long dorsal preapical bristle.

Length (mm): body without antennae 1.75, antenna 0.55, wing 1.65 : 0.63.

Female. Similar to male (according with Meunier [1907, 1908b]).

Remarks. Meunier [1907, 1908b] described only postpedicel and hind tarsus, with mention of the body length 1.5 mm for both males and females. Nevertheless, the line drawings of the male antenna, hind tarsus and hypopygium [Meunier 1907, 1908b] allow reliable association of the inclusion studied with *Palaeomedeterus lassatus*.

Palaeomedeterus ignavus (Meunier, 1907)
(Figs 16–20)

Material. Two completely preserved males partly covered with milky-white decay coating in two pieces of amber labelled: “Baltic Amber, Upper Eocene – Lower Oligocene *Palaeomedeterus ignavus* (Meunier), det. I. Grichanov 2017” (PIN).

Redescription. Male. Similar to *Palaeomedeterus lassatus* in all respects except as noted.

Head: face moderately broad, under antennae about as wide as postpedicel height, slightly narrowed towards clypeus; postpedicel flattened laterally, with ventral projection at apex, subtriangular, longer than high (10 : 7), haired; arista-like stylus inserted in dorsoapical emargination, filiform, pubescent; length ratio of scape to pedicel to postpedicel to arista-like stylus, 5 : 5 : 7 : 49.

Legs: fore leg length ratio (from tibia to tarsomere 5): 61 : 29 : 17 : 9 : 9 : 8, mid leg: 86 : 42 : 23 : 17 : 10 : 9, hind leg: 96 : 21 : 33 : 19 : 14 : 10.

Wing: ratio of part of costa between R_{2+3} and R_{4+5} to this between R_{4+5} and M_1 to $dm-m$ to distal part of M_4 , 36 : 20 : 18 : 42.

Abdomen: epandrium globular; hypandrium raised from middle of epandrium, strongly projected beyond apex of surstylus, bilobate, with narrow band-like lobes, rounded at apex; phallus invisible; distoventral epandrial lobe broad, projected, with pointed distal apex bearing pedunculate seta, with one long ventral seta at base; surstylus located distoventrally, with only one large lobe visible, elongate-triangular, narrow distally, with curved ventrally apex, with one or two small inner preapical tubercles, without distinct setae; postgonite strongly projected, bilobate, with hooked pointed lobes, slightly longer than cercus; cercus long, narrow, with rounded apex, densely covered with short cilia.

Length (mm): body without antennae 2.5, antenna 0.65, wing 2.3 : 0.9.

Female. Similar to male, being somewhat smaller than male (according with Meunier [1907, 1908b]).

Remarks. Meunier [1907, 1908b] gave quite general species description based on rather numerous material. The body size varied between 1.75–2.5 mm in females and 2.5–3 mm in males. Nevertheless, the line drawings

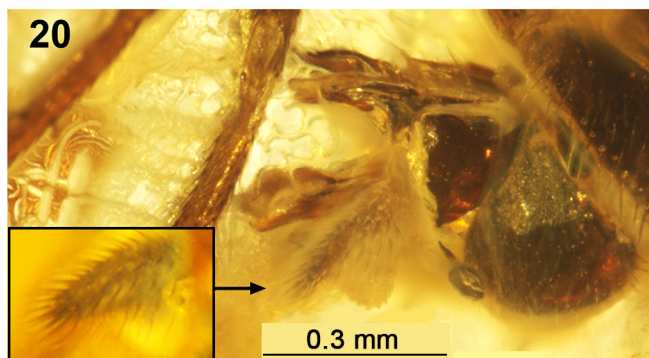
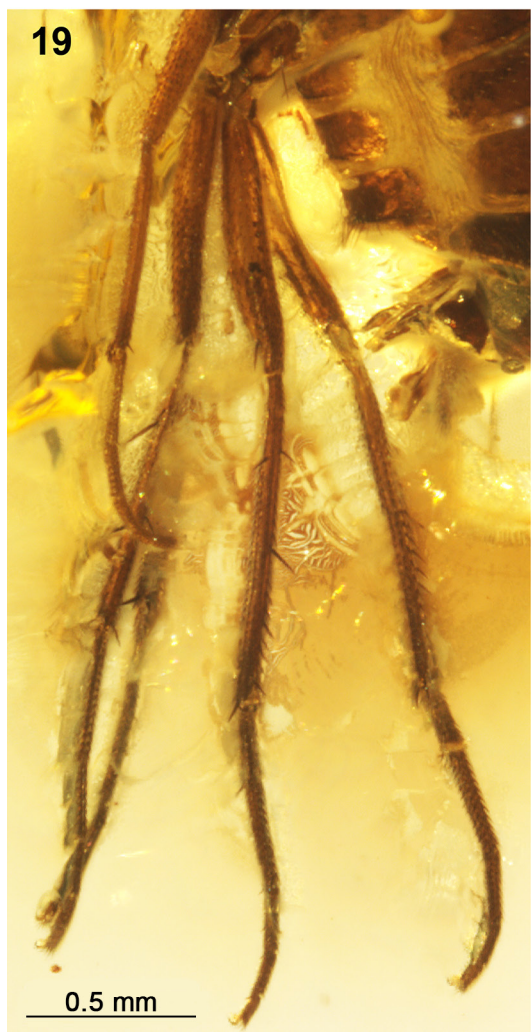
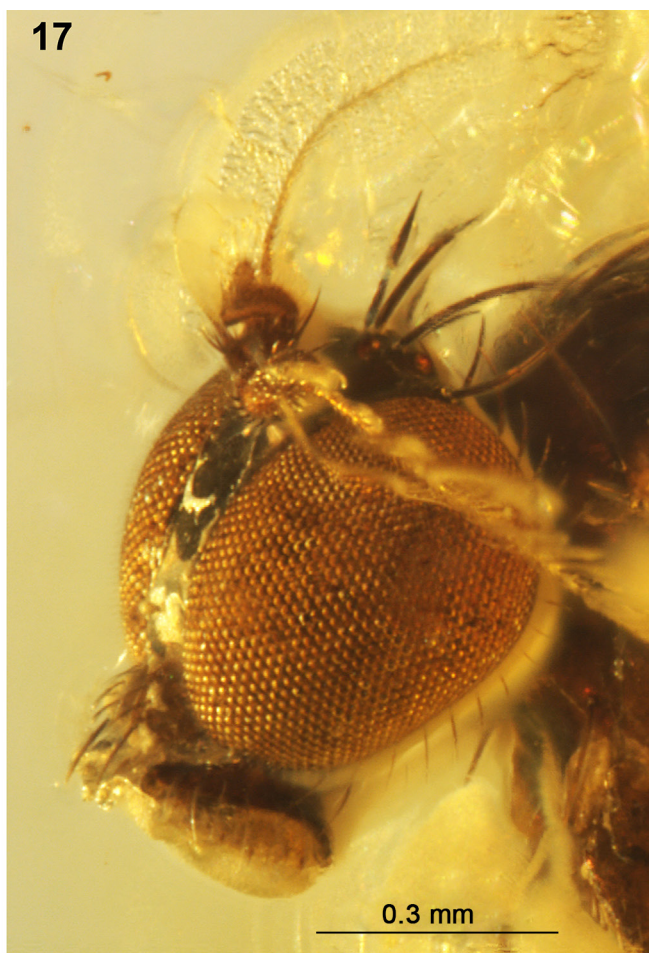
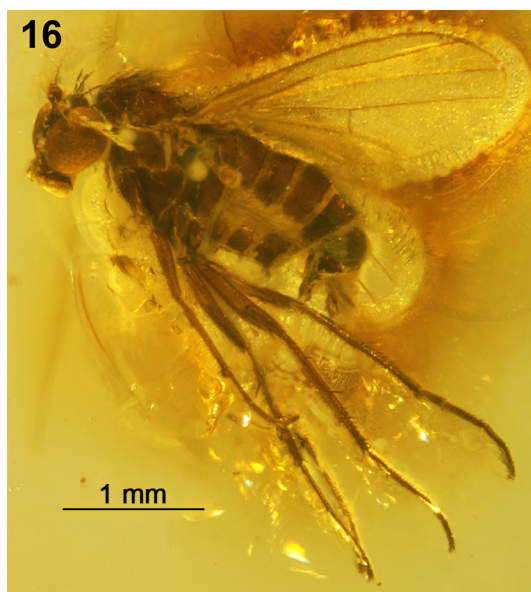
provided by the author for the male antenna, fore and hind tarsus and hypopygium allow reliable association of the inclusions studied with *Palaeomedeterus ignavus*.

**Key to species of *Palaeomedeterus*
(males; modified after Meunier [1908b])**
(*Palaeomedeterus fessus* described by females
is not included)

1. Arista-like stylus apical, inserted in deep slit of postpedicel; body length 2–2.25 mm; wing length 2 mm
..... *P. bifurcatus*
- Arista-like stylus dorsal, at most inserted in small notch of postpedicel 2
2. First two segments of hind tarsus subequal in length; body length 3 mm; wing length 2 mm *P. horridus*
- Hind basitarsus distinctly shorter than next segment 3
3. Postpedicel reniform, distinctly higher than long; hind basitarsus half as long as next segment; body length 2 mm; wing length 2 mm *P. lentus*
- Postpedicel about as long as high, with distinct apex; hind basitarsus more than half as long as next segment 4
4. Hypopygium clavate; cercus with several long cilia at apex; surstylus lanceolate; phallus long and cylindrical; body length 2 mm; wing length 1 mm [Meunier, 1908b] *P. languidus*
- Another combination of characters; cercus with short hairs at apex 5
5. Cercus stalk-like, much shorter than surstylus; surstylus narrow, straight almost to apex; body length 3 mm; wing length 2 mm *P. hirsutus*
- Cercus about as long as surstylus 6
6. Cercus swollen at base, narrow distally, with flattened and slightly enlarged apex; postgonite projected, rhomboid, nearly half as long as cercus; body length 1.5–1.75 mm; wing length 1–1.65 mm *P. lassatus*
- Cercus ribbon-like, with rounded apex; postgonite strongly projected, with hooked pointed lobes, slightly longer than cercus; body length 2.5–3 mm; wing length 2–2.3 mm *P. ignavus*

Discussion

The subfamilies Peloroepodinae with 17 extant genera and Sympycninae with 38 extant genera are very close each to other [Grichanov, 2017a]. As currently defined, peloroepodines are characterized by the posterior mesonotum distinctly flattened and slightly depressed, from 1/3 to 1/2 of surface between dorsocentral setae, and sympycnines differ from the former in the posterior mesonotum not flattened, or at most only slightly flattened immediately anterior of scutellum [Grichanov, 2011]. Most of those 55 genera are closely related to several large genera, such as *Chrysotimus* Loew, 1857, *Micromorphus* Mik, 1878, *Nepalomyia* Hollis, 1964, and *Peloroepodes* Wheeler, 1890 (Peloroepodinae), *Campsicnemus* Haliday in Walker, 1851, *Chaetogonopteron* De Meijere, 1913, *Sympycnus* Loew, 1857, *Syntormon* Loew, 1857, and *Teuchophorus* Loew, 1857 (Sympycninae), being distinguished by remarkable apomorphies or by male secondary sexual characters (MSSC). However, most species of the listed genera are



Figs 16–20. *Palaeomedeterus ignavus* (Meunier, 1907), male.

16 – habitus; 17 – head; 18 – wing; 19 – legs; 20 – hypopygium, with inset showing cercus.

Рис. 16–20. *Palaeomedeterus ignavus* (Meunier, 1907), самец.

16 – внешний вид; 17 – голова; 18 – крыло; 19 – ноги; 20 – гипопигий, на врезке показана церка.

also characterized by more or less pronounced MSSC on at least some podomeres.

Palaeomedeterus is assigned to the subfamily Peloroepodinae due to the following synapomorphic character states: eyes distinctly separated; face slightly narrowed downward with small clypeus; posterior third of mesonotum distinctly flattened; antennal pedicel with 1 strong apicodorsal seta; postpedicel much larger than pedicel; mid and hind femora with strong anterior subapical bristle; tibiae with strong bristles; R_1 short; distal section of M_4 longer than *dm-cu*; segment 7 small.

Keeping in mind that 2 million years is an optimal period for rapid species radiation [Goodman et al., 2016; Grichanov, 2017b], and at least some extant dolichopodid genera (as they presently recognized) appeared up to 12 m.y.a. [Goodman et al., 2016], it is little wonder that the *Palaeomedeterus* species from Baltic amber (30–50 million years old) lack such apomorphies of extant peloroepodine genera as ornamented legs. The arista-like stylus insertion in apical notch of the postpedicel in both sexes is a striking modification of the *P. bifurcatus* antenna. Somewhat similar modification can be observed in some extant species of several genera from different subfamilies (e.g. *Acropsilus* Mik, 1878, *Chrysotus*, *Nepalomyia*), having no generic significance to our knowledge. Most probably, we deal with an example of recurrent evolution of the character that could independently appear within remote taxa.

Palaeomedeterus species are remarkably similar to the *Sympycnites primaevus* Grimaldi et Cumming [1999], described by one female from the much older Lebanese amber (125–135 million years old). Up to date, *Sympycnites* Grimaldi et Cumming, 1999, is not known from Baltic and other younger amber sources. According to current classification, it must be considered in the subfamily Sympycninae. Both *Palaeomedeterus* and *Sympycnites* well differ from the fossil Medeterinae and Diaphorinae in the presence of strong anterior preapical bristles on mid and hind femora. Recently, extant *Neomedetera* Zhu, Yang et Grootaert, 2007 and *Udzungwomyia* Grichanov, 2018, have been put to Medeterinae despite presence of a distinct anterior preapical seta on the mid and hind femora [Zhu et al., 2007; Grichanov, 2018]. Nevertheless, these genera well differs from *Palaeomedeterus* and other genera of the subfamily Peloroepodinae in such characters, as postpedicel about as large as pedicel, semiglobular, with indistinct apex; stylus preapical; legs with rather short major bristles; hind basitarsus much shorter than next segment; postabdomen nearly symmetrical, with epandrial foramen positioned basally.

Palaeomedeterus differs from fossil Dolichopodinae, Sciapodinae and Sympycninae in flattened posterior mesonotum mainly. At present, it is the only recognized genus of Peloroepodinae in Baltic amber. Eight species are here included into this genus, and three of them are redescribed and illustrated in this paper. Meunier [1907, 1908b] provided the line drawing of the hypopygium for one more species of *Palaeomedeterus*, *P. hirsutus*. Four more species, *P. fessus* (only females available), *P. horridus* (no pictures available), *P. languidus* and *P. lentus* were inadequately described and illustrated by Meunier [1907, 1908b]. Their taxonomic link with *Palaeomedeterus* can

be confirmed, if the type specimens are found and studied (in the Geowissenschaftlicher Zentrum der Georg-August-Universität Göttingen, Germany). Regarding the three species studied in this paper, *P. bifurcatus*, *P. ignavus* and *P. lassatus*, they have rather similar overall habitus except for the difference in the antennal postpedicel shape. Globular epandrium, reduced sterna 5 and 6, reduced segment 7, and projected bilobate hypandrium with rounded apex are present in males of all species. Nevertheless, the hypopygial surstylus, cercus and postgonite are different in each species (including *P. hirsutus*).

As a result of this study, the Baltic amber fauna of long-legged flies contains now 8 extinct genera with 37 described species belonging to five subfamilies represented in the recent fauna as well. About 30 species placed by Meunier in the extant genera need to be revised. It is worth noting that Ulrich [2003] also doubted the assignment of most Baltic amber species to the modern genera.

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References

- Evenhuis N.L. 1994. Catalogue of the fossil flies of the world (Insecta: Diptera). Leiden: Backhuys Publ. VIII + 600 p.
- Goodman K.R., Evenhuis N., Bartošová-Sojková P., O'Grady P.M. 2016. Multiple, independent colonizations of the Hawaiian Archipelago by the family Dolichopodidae (Diptera). *PeerJ*. 4: e2704.
- Grichanov I.Ya. 2000. Notes on Dolichopodidae (Diptera) from Ukrainian and Baltic amber. *An International Journal of Dipterological Research*. 11(3): 129–131.
- Grichanov I.Ya. 2011. An illustrated synopsis and keys to Afrotropical genera of the epifamily Dolichopodidae (Diptera: Empidoidea). *Priamus*. Suppl. 24: 1–99.
- Grichanov I.Ya. 2017a. Alphabetic list of generic and specific names of predatory flies of the epifamily Dolichopodidae (Diptera). 2nd ed. *Plant Protection News, Supplements*. 23: 1–563.
- Grichanov I.Ya. 2017b. Speciation of *Mascaromyia* Bickel (Diptera: Dolichopodidae) on Réunion Island. *Israel Journal of Entomology*. 47: 9–18.
- Grichanov I.Ya. 2018. A new genus and species of subfamily Medeterinae (Diptera: Dolichopodidae) from Tanzania. *Far Eastern Entomologist*. 350: 9–16.
- Grichanov I.Ya., Brooks S.E. 2017. 56. Dolichopodidae (long-legged dance flies). *In: Manual of Afrotropical Diptera*, Volume 2. Nematocerous Diptera and lower Brachycera. *Suricata* 5: 1265–1320.
- Grimaldi D.A., Cumming J. 1999. Brachyceran Diptera in Cretaceous ambers and Mesozoic diversification of the Eremoneura. *Bulletin of the American Museum of Natural History*. 239: 1–124.
- International Code of Zoological Nomenclature. 4th ed. International Trust of Zoological Nomenclature. 1999. London. xxix + 306 p.
- Loew H. 1850. Über den Bernstein und die Bernsteinfauna. *Programm der Königlichen Realschule zu Meseritz*. 1: 3–44.
- Meuffels H.J.G., Grootaert P. 1999. New names in the family Dolichopodidae (Diptera). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Entomologie*. 69: 289–292.
- Meunier F. 1894. Note sur un singulier Dolichopodidae de l'ambre tertiaire. *Annales de la Société entomologique de France*. 63: CXI–CXII.
- Meunier F. 1895. Les Dolichopodidae de l'ambre tertiaire. *Annales de la Société scientifique de Bruxelles (Mém.)*. 19: 173–175.

- Meunier F. 1899a. Révision des diptères fossiles types de Loew conservés au Musée Provincial de Koenigsberg [part]. *Miscellanea Entomologica*. 7: 169–182.
- Meunier F. 1899b. Note sur les Dolichopodidae de l'ambre tertiaire [Dipt.]. *Bulletin de la Société entomologique de France*: 322–323.
- Meunier F. 1907. Monographie des Dolichopodidae de l'ambre de la Baltique. *Le Naturaliste. 2e Série*. 29: 197–199, 209–211, 221–222, 233–235, 245–246, 260–262, 269–271, 281–282.
- Meunier F. 1908a. Monographie des Dolichopodidae de l'ambre de la Baltique. *Le Naturaliste. 2e Série*. 30: 7–9, 21–23, 29–30, 45–46, 57–59.
- Meunier F. 1908b. Monographie des Dolichopodidae de l'ambre de la Baltique. *Publications du Journal Le Naturaliste*: 1–100.
- Robinson H. 1970. The subfamilies of the family Dolichopodidae in North and South America (Diptera). *Papéis Avulsos do Departamento de Zoologia (São Paulo)*. 23(6): 53–62.
- Selivanova O.V., Negrobov O.P. 1997. Fauna of Dolichopodidae (Diptera) in the Baltic Amber. *In: Mesto i rol' dvukrylykh nasekomykh v ekosistemakh: Sbornik nauchnykh trudov 6-go Vserossiyskogo simpoziuma dipterologov, posvyashchennogo 100-letiyu so dnya rozhdeniya A.A. Shtakel'berga* [The place and role of Diptera in ecosystems: Proceedings of the 6th All-Russian symposium of dipterologists dedicated to the 100th anniversary of A.A. Stackelberg (St. Petersburg, Russia, 21–25 April 1997)]. St. Petersburg: Zoological Institute of the Russian Academy of Sciences: 115–116 (in Russian).
- Spahr U. 1985. Ergänzungen und Berichtigungen zu R. Keilbachs Bibliographie und Liste der Bernsteinfossilien – Ordnung Diptera. *Stuttgarter Beiträge zur Naturkunde (B)*. 111: 11–46.
- Ulrich H. 2003. How recent are the Empidoidea of Baltic amber? *Studia dipterologica*. 10: 321–327.
- Ulrich H., Schmelz R.M. 2001. Enchytraeidae as prey of Dolichopodidae, recent and in Baltic amber (Oligochaeta; Diptera). *Vonner Zoologische Beiträge*. 50(1–2): 89–101.
- Zhu Y., Yang D., Grootaert P. 2007. *Neomedetera*, a new genus in the subfamily Medeterinae (Diptera: Dolichopodidae) from China. *Annales Zoologici*. 57(2): 227–230.

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