

TWO NEW EAST PALAEARCTIC *RHAMPHOMYIA* (*PARARHAMPHOMYIA*) (DIPTERA: EMPIDIDAE)¹

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ABSTRACT: *Rhamphomyia* (*Pararhamphomyia*) *pachymeriae* sp. n. (Russia: Primorskiy Province, Amur Province) and *R. (P.) pilositibia* sp. n. (Russia: Amur Province) are described and illustrated. A key to East Palaearctic groups of *Pararhamphomyia* with at least biserial dorsocentrals, black legs and entirely black setose body is provided.

KEY WORDS: Empididae, *Rhamphomyia*, *Pararhamphomyia*, new species, Russia, East Palaearctic, key to groups

Rhamphomyia Meigen is a large genus of the family Empididae comprising about 350 described species in the Palaearctic Region (Barták et al., 2007), however, many new species are still awaiting description, especially in the South and East parts of this region. The subgenus *Pararhamphomyia* includes about 120 Palaearctic species, of these approximately 80 are known in eastern parts of Palaearctic region. All species of the genus are predators at least in larval stage, and adults of several species are important pollinators in high mountains and in boreal environments. Studying materials deposited in the Zoological Museum of Moscow State University, we found two still undescribed species differing from all known groups of *Pararhamphomyia* species inhabiting this area. This necessitates a compilation of a key to East Palaearctic groups of *Pararhamphomyia* species with at least biserial dorsocentrals, black legs, and entirely black setose body.

METHODS

The material studied is deposited in the following collections: CULSP (Czech University of Life Sciences, Prague – former Czech University of Agriculture) and ZMMU (Zoological Museum of Moscow State University).

The genitalia were macerated in 10% KOH (24 hours, room temperature) and stored together with specimens in plastic microvials with glycerine. The morphological terms used here follow those of Merz and Haenni (2000) and Sinclair (2000). Abbreviations: T11, T21, T31 = length of fore, mid, hind tibia; B11, B21, B31 = length of fore, mid, hind basal tarsomere; B1w, B2w, B3w = width of fore, mid, hind basal tarsomere; M2/D = length of vein M2: greatest length of discal medial cell; M3/Db = length of apical: preapical sections of vein CuA₁; lw: ww = greatest length of wing: greatest width of wing. Ratio of antennal segments = length of 1st: 2nd: 3rd: style (in 0.01 mm scale).

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SYSTEMATIC ENTOMOLOGY

Rhamphomyia (Pararhamphomyia) pachymeriae NEW SPECIES

Figures 1-2

Male. Eyes holoptic, facets in ventral half of eye smaller than in dorsal half. Frons brownish-black, grey microtrichose, setulae absent. Ocellar setae black, half as long as frons, ocellar triangle with two pairs of additional short setae. Face brown, grey microtrichose, about 0.12 mm broad ventrally and 0.17 mm long, without setulae. Occiput brownish-black, grey microtrichose, rather sparse and long black setose, postocular row complete. Antenna black, both basal segments slightly lighter than 3rd antennomere, ratio of antennal segments = 5: 6: 19: 6, both basal antennomeres rather short setose (the longest setae about 0.07 mm long). Labrum brown, lustrous, half as long as head is high. Palpus brown, short, with several short setae. Gena narrow and microtrichose, clypeus microtrichose. Thorax brownish-black, mesoscutum finely grey microtrichose, rather subshining and without stripes, pleurae microtrichose. All setae black. Chaetotaxy: 5-7 setae on proepisternum; prosternum bare; proepisternal depression with 0-1 seta; about 12 biserial, moderately strong acrostichals; 9 biserial dorsocentrals slightly longer than acrostichals (0.18 mm long in middle of rows), ending in row of 3 prescutellars; 1 intrahumeral somewhat longer than dorsocentrals; 1 strong posthumeral (4-6 additional setae on presutural area laterad of dorsocentrals); 1 long postpronotal and several much shorter setae; 3 notopleurals (2-3 setae on anterior part of notopleuron); 1 supraalar and 1-3 prealar setae; 1 strong postalar; altogether 2 scutellars and 0-2 much shorter setae; laterotergite with black setae. Legs including coxae brown, microtrichose, black setose. Long seta in comb at tip of hind tibia absent. Fore femur with anteroventral setae as long as femur is deep, posteroventral setae slightly longer. Fore tibia with uniform posterodorsal setation slightly longer than tibia is deep, ventral setae short. Mid femur with spinose anteroventral setae about 1/3 as long as femur is deep, posteroventrals longer, on apical third nearly 1.5 times as long as femur is deep, dorsal setae short. Mid tibia with 1 submedian long and strong anterodorsal seta (0.30 mm long) and similar but shorter posterodorsal setae on basal third (sometimes absent), preapical setae relatively short, remaining setae short, ventral rows of spiny setae short. Hind femur with short anteroventrals near base and just before tip (about 2/3 as long as femur is deep), similar posteroventrals and anterodorsals about as long as femur is deep. Hind tibia straight and rather thickened apically, dorsally with setae nearly as long as tibia is deep, ventral setae shorter. Basal tarsomeres of fore and mid legs thin and short setose, T11: B11 = 2.3-2.6, B11: B1w = 5.4-6.0, T21: B21 = 2.3-2.8, B21: B2w = 5.0-5.8; basal tarsomere of hind leg slightly swollen, with dorsal setae as long as or slightly longer than its diameter, T31: B31 = 2.2-2.4, B31: B3w = 3.7-4.3. Wing clear, stigma yellowish, radial veins yellowish-brown, remaining veins pale, anal vein (A1) absent in apical part. Costal seta present, axillary angle right. M2/D = 1.3-1.5,

M3/Db = 1.9-2.0, lw: ww = 2.4-2.8. Halter yellow, calypter brownish-yellow with dark fringes. Abdomen brown, rather light grey microtrichose, setae dark. Hind marginal setae on sides of tergites 2-4 subequally long as segments, on segments 5-6 shorter than their corresponding segments, discal setae on segments 2-4 slightly shorter than marginals, dorsum of tergites with somewhat shorter setae. Pregenital segments modified: tergite 5 slightly enlarged, with small projection on hind margin ventrally; tergite 6 desclerotized in lower distal portion; tergite 7 excised in proximal portion ventrally (see Fig. 2). Terminalia as in Fig. 1: epandrium axe-like broadened apically; cercus of very complicated structure: C-shaped, anterior arm with small ventral process and posterior lobe with two additional internal processes, anterior one forked; subepandrial sclerite in form of three long and thin rods; phallus very thin, seta-like, with subbasal swelling; hypandrium narrow and strip-like, but phallus connected to additional membranous, very broad and axe-like structure (? hypertrophied membrane connecting hypandrium to 8th sternite). Length of body 2.9-3.1 mm (without genitalia), wing 3.4-3.6 mm.

Female. Unknown.

Differential diagnosis: *Rhamphomyia pachymeriae* sp. n. belongs to species rich group of *Pararhamphomyia* with multiserial dorsocentral setae, black legs and entirely black setose body (see the appended key). The male of this new species can be readily recognized due to its quite unique epandrium resembling some species of *Empis* (*Pachymeria*).

Holotype Male: Russia, Yuzhnoe Primorie, Kamenushka, 13.vi.1984, A. Shatalkin leg. (ZMMU).

Paratype: Amurskaya oblast, Zeya, 10.vii.1981, 1 male, A. Shatalkin leg. (CULSP).

Distribution: Russia (Primorskiy Province, Amur Province).

Dates of occurrence: June-July.

Derivatio Nominis: the species name alludes to the similarity of epandrium with *Empis* subgenus *Pachymeria*.

***Rhamphomyia* (*Pararhamphomyia*) *pilositibia* NEW SPECIES**

Figure 3

Male. Eyes holoptic, facets in ventral half of eye much smaller than in dorsal half. Frons black, grey microtrichose, without setulae. Ocellar setae black, fine, half as long as frons, ocellar triangle with 2-4 additional short setae. Face brownish-black, grey microtrichose dorsally and lustrous ventrally, 0.20 mm broad ventrally and 0.15 mm long, bare. Occiput brownish-black, largely microtrichose but lustrous ventrally, just behind oculi, black setose, postocular row incomplete. Both basal antennal segments brown, remaining parts black, ratio of antennal segments = 9: 8: 30: 19, both basal antennomeres short setose (longest setae 0.12 mm long). Labrum brown, lustrous, 1.2 times as long as head is high. Palpus brown, short, with several rather long (0.25 mm) setae. Gena narrow and mostly

lustrous, clypeus mostly lustrous. Thorax brownish-black, brownish-grey microtrichose, mesoscutum with two short lustrous to sublustrous stripes between rows of acrostichals and dorsocentrals and two lustrous stripes laterad of dorsocentrals (running from posthumeral setae to postalar calli). All setae black. Chaetotaxy: 6-8 setae on proepisternum; prosternum and proepisternal depression bare; about 16-20 biserial acrostichals; 11-18 biserial dorsocentrals, ending in 2-3 prescutellars; both acrostichals and dorsocentrals fine and short (about 0.12 mm long in middle of their rows); 1 intrahumeral; 1 posthumeral (6-8 setae laterad of dorsocentrals in presutural area); 1 long postpronotal and numerous shorter setae; 3-4 notopleurals, (0-1 seta on anterior part of notopleuron); 1 supraalar, (0-1 prealar setae); 1 long and 1 short postalars; 2 long and 2 shorter (1/3 as long) scutellars; laterotergite with black setae. Coxae brownish-black, microtrichose, black setose. Legs brown, all femora and tibiae and even most of tarsi lustrous to sublustrous. Legs entirely dark setose. One long seta present in comb at tip of hind tibia. Fore femur with row of anteroventral setae half as long as femur is deep and more regular row of posteroventrals slightly longer than anteroventrals. Fore tibia with almost uniform fine setation nearly as long as tibia is deep, ventral setae short. Mid femur with row of anteroventral setae shorter than femur is deep and row of posteroventrals slightly longer than femur is deep. Mid tibia with 4-5 anterodorsal setae and 5-7 posterodorsal setae on apical half (nearly 3 times as long as tibia is deep) and 2 rows of ventral setae as long as tibia is deep. Hind femur rather densely covered with uniform fine setation as long as femur is deep proximally, and shorter distally, posteroventrals slightly shorter than corresponding anteroventrals. Hind tibia with 2 rows of setae dorsally (3-6 in one row) nearly twice as long as tibia is deep, ventral setae short, posteroventral area (on proximal 2/3) with peculiar fine "pilosity" lacking setae. Basal tarsomere of foreleg short, with dorsal setae slightly longer than diameter of this tarsomere, T11: B11 = 2.5-2.7, B11: B1w = 3.5-3.6, basal tarsomere of mid leg short and slightly swollen, dorsal setae twice as long as diameter of this tarsomere, T21: B21 = 2.5-2.6, B21: B2w = 3.5-4.0, basal tarsomere of hind leg slightly swollen, with several dorsal setae slightly longer than diameter of this tarsomere, T31: B31 = 1.8-1.9, B31: B3w = 4.5-5.0. Wing clear, stigma brown, veins brown, anal vein (A1) depigmented in apical part, however, its tip distinct. Costal seta present, axillary angle slightly acute. M2/D = 1.4-1.5, M3/Db = 1.7-2.0, 1w: ww = 2.8-3.0. Halter brown, calypter brown with dark fringes. Abdomen brown, mostly lustrous, dorsum of tergites, 1st segment, apical part of enlarged 7th sternite and ventral part of 8th sternite microtrichose. All setae dark. Hind marginal setae on sides of tergites 2-6 subequally long as their corresponding segments, discal setae shorter than marginals. Dorsum of tergites short setose. Sternite 7 elongated, longer than 8th sternite, the latter sternite strongly sclerotized and folded upwards but lacking teeth. Terminalia as in Fig. 3: epandrium and cercus unmodified; hypandrium reduced to two narrow lateral stripes, membranous ventrally; phallus simply bowed. Length of body 3.7-4.4 mm (without genitalia), wing 4.1-4.8 mm.

Female. Similar to male but with the following exceptions. Eyes broadly dichoptic, dorsalmost facets smaller than ventral ones. Frons 0.19 mm broad and 0.21 mm long, with several short setae on each side. Face 0.23 mm broad in middle and subequally long. Ocellar setae strong, subequally long as frons. Ratio of antennal segments = 10: 7: 27: 21. Thorax as in male, only setae slightly shorter (dorsocentrals about 0.10 mm long). Legs similarly colored as in male. Fore femur and tibia and mid tibia as in male, only setae slightly shorter. Mid tibia with several anteroventral, posteroventral, anterodorsal and posterodorsal setae scarcely differentiated in one paratype and somewhat better developed in the second paratype and about as long as tibia is deep. Hind femur as in male, but setae slightly shorter. Hind tibia with two rows of setae dorsally (4-6 setae in one row) nearly as long as tibia is deep, ventral setae short, tibia with similar microtrichose area in posteroventral position as in male but less conspicuous. Basal tarsomeres of fore and mid legs thin and short setose, T1l: B1l = 2.6-2.7, B1l: B1w = 4.4-4.6, T2l: B2l = 2.3, B2l: B2w = 5.0-5.4, basal tarsomere of hind legs slightly swollen, short setose, T3l: B3l = 2.0, B3l: B3w = 5.0. Wing light brown, stigma equally brown, veins dark brown. M2/D = 1.4-1.6, M3/Db = 1.5-1.7, lw: ww = 2.7-2.9. Abdomen brown, lateral parts of tergites 2-6 and irregular spots on sides of sternites 2-5(6) lustrous to sublustrous, other parts rather thinly grey microtrichose. Hind marginal setae on tergites 1/3 - 1/4 as long as their corresponding segments, discal setae shorter than marginals. Length of body: 4.1-4.3 mm, wing 4.4-4.6 mm.

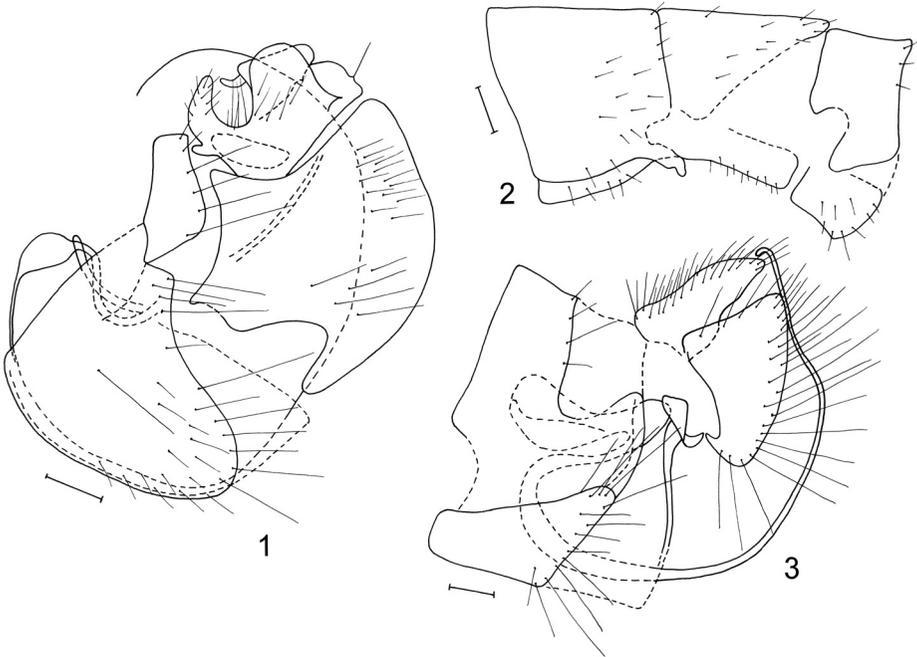
Differential Diagnosis: *Rhamphomyia (P.) pilositibia* sp. n. is a single known Palearctic *Pararhamphomyia* with the following combination of characters: biserial dorsocentrals, dark setose body, dark halteres and lustrous stripes between rows of scutal setae. Moreover, microtrichose posteroventral area on hind tibia in both sexes is another striking feature of this species. The most allied species are probably those of *R. subsultans* group, however, they differ in many characters (e.g. uniserial dorsocentrals or at least partly white setose body or yellow halteres). *Rhamphomyia subpusilla* Frey, 1951 probably has also elongated 7th abdominal segment, however, the description is so short that almost nothing can be stated about this species but it most likely differs from *R. pilositibia*. Nearctic *Rhamphomyia otiosa* Coquillett, 1895 with similar microtrichose area on hind tibia has quite different terminalia, and it belongs to different group of *Pararhamphomyia*.

Holotype Male: Russia, Amurskaya oblast, Zeya, 11.vii.1981, leg. A. Shatalkin (ZMMU).

Paratypes: same locality as the holotype, 7.vii.1981, 1 male; same locality, 8.vii.1981, 1 female; same locality, 10.vii.1981, 1 female; same locality, 13.viii.1981, 1 male; same locality, 14.viii.1981, 2 males, 1 female; all leg. A. Shatalkin (ZMMU and CULSP).

Distribution: Russia (Amur Province).

Dates of Occurrence: July-August.



Figures 1-2. *Rhamphomyia* (*Pararhamphomyia*) *pachymeriae* sp. n. 1. Male (paratype) terminalia (macerated), lateral view, scale 0.1 mm, 2. Male (paratype) abdominal segments 5-7, scale 0.1 mm. Figure 3. *R. (P.) pilositibia* sp. n. 3. Male (paratype) terminalia (macerated), lateral view, scale 0.1 mm.

Derivatio Nominis: The species is named after the peculiar microtrichose area on hind tibia in both sexes.

KEY TO GROUPS OF EAST PALAEARCTIC *PARARHAMPHOMYIA* WITH, AT LEAST, BISERIAL DORSOCENTRALS, BLACK LEGS, AND ENTIRELY BLACK SETOSE BODY (BASED ON MALES)

Note: "Additional characters" are useful for distinguishing keyed groups from other species groups (e.g. West Palearctic ones); all scutellar setae are counted. The number of species in most groups is not complete because several undescribed East Palearctic species are known to us in most groups. The key may be useful for grouping most West Palearctic species as well as many Nearctic species (especially rich in species are Nearctic members of: *multisinuosa*, *obscura*, *longestylata*, *pusilla*, *fuscipennis*, *transversipyga*, and *albipennis*

- Phallus straight in basal part or at most slightly curved8

8 (7) Phallus rather thick. (Additional characters: 2 scutellar setae, sometimes with additional two very short setae; halter pale yellow; *helleni* Frey, 1922)**caesia group**

- Phallus very thin, usually seta-like9

9 (8) Mesoscutum subpolished black to polished, at most acrostichals and dorsocentrals situated on narrow pruinose stripes10

- Mesoscutum entirely pruinose11

10 (9) Epandrium about four times as long as broad (several undescribed spp.)**longestylata group**

- Epandrium at most twice as long as broad (Additional character: halter pale yellow, several undescribed spp.)**atra group**

11 (9) Halter dark brownish black. (*macrura* Loew, 1871; *aversa* Frey, 1950)**pusilla group** (part)

- Halter pale yellow12

12 (11) Epandrium strongly tapered, with dorsal subapical process (bifurcated apically) and with short black spines near apex (several undescribed spp.)**fuscipennis group**

- Epandrium equally broad towards apex or narrowed but without black spines13

13 (12) Epandrium about twice as long as broad, gradually narrowing apically. Phallus rather thick (several undescribed spp.)**tibiella group**

- Epandrium at least three times as long as broad, with subapical constriction. Phallus extremely thin, seta-like, subequally thick to marginal abdominal setae (*lamnifera* Saigusa, 1963; *lamniferella* Saigusa, 1964; *triseta* Saigusa, 1963)**sareptana group**

14 (6) Halter clear yellow15

- Halter brownish yellow to black18

15 (14) Epandrium axe-like broadened apically (as in several species of *Empis*

- (*Pachymeria*). Phallus extremely thin, hair-like, hidden under membrane of 8th sternite and dilated parts of epandrial lamellae (*pachymeriae* sp. nov.)
***pachymeriae* group**
- Epandrium differently shaped16
- 16 (15) Phallus thickened on extreme base, strongly upturned back (cranially) just beyond thickening and thereafter forming 1 simple loop (*proclinata* Frey, 1950; *uzbekistanica* Barták 2000).....***transversipyga* group** (part)
- Phallus of another shape, if broadened about base, then without sharp angle between swollen and thin parts, never strongly upturned cranially17
- 17 (16) Vein A1 indistinct in apical half. Epandrium slightly elongated, at least twice as long as high, with tip covered with short black spines and lacking polished “hook” at apex. Tergite 7 longer than tergite 8 (several undescribed spp.).....***albigennis* group**
- Vein A complete, at most slightly weakened about middle. Epandrium shorter, nearly as long as high, often with polished “hook” at apex and without short black spines. If polished “hook” absent, then tergite 7 shorter than tergite 8 (*breviventris* Frey, 1913; *truncata* Frey, 1922; *baicalensis* Frey, 1950)
***breviventris* group**
- 18 (14) Cercus with a fingerlike projection dorsally near base. (Additional characters: posterior cercus absent, usually 6 or more scutellars, vein A1 almost complete and propleura setose; *ozernajensis* Frey, 1922; *longiseta* Saigusa, 1964; *nipponalpina* Saigusa, 1964).....***hirtula* group**
- Cercus without any fingerlike projection dorsally19
- 19 (18) Mesoscutum with four polished stripes. Hind tibia with posteroventral surface covered with silvery “pilosity” (*pilositibia* sp. nov.)
***pilositibia* group**
- Mesoscutum uniformly grey pruinose. Hind tibia without silver “pilosity”
20
- 20 (19) Phallus forming one preapical loop. Vein A1 complete. Six scutellar setae (*alpiniformis* Frey, 1950).....***alpina* group** (part)
- Phallus not forming loop. Remaining characters in different combination..21
- 21 (20) Phallus rather long, forming broad bow. Epandrium without clusters of

- setae and without strong setae at tip or dorsally. Posterior cercus absent. Hind femur with a single row of setae ventrally (*ryongaksanensis* Barták, 1997)***ryongaksanensis* group**
- Different combination of characters22
- 22 (21) Six scutellar setae. Dorsocentrals multiserial. Epandrium elongated, almost perpendicular to body axis. Slender part of phallus at least 5 times longer than basal swollen part (*transversipyga* Frey, 1950; *bernhardi* Barták, 2000)***transversipyga* group** (part)
- Different combination of characters.....23
- 23 (22) Phallus at least partly downcurved. Epandrium with a tuft of setae dorsally near apex (*chibinensis* Frey, 1922).....***chibinensis* group**
- Phallus straight in middle or curved as usually (= upcurved). Epandrium without tuft of setae dorsally near apex24
- 24 (23) Two scutellar setae (rarely with 2 very small additional setae). Abdominal tergites 5-6 with short hind marginals and with short but dense setae in apicolateral corner. (Additional character: epandrium broad tipped, with two very strong setae subdorsally; *psychomorpha* Saigusa, 1964)***psychomorpha* group**
- Four-six scutellar setae. Abdominal tergites with unmodified setation (*pusilla* Zetterstedt, 1838)***pusilla* group** (part)

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LITERATURE CITED

- Barták, M., M. C. Çiftçi, and A. Hasbenli.** 2007. A new species of *Rhamphomyia* (s. str.) Meigen (Diptera, Empididae) from southern Anatolia, Turkey. *Entomological News* 118 (2): 143-147.
- Barták, M. and S. Kubík.** 2008. New peculiar East Palaearctic *Rhamphomyia* (Diptera: Empididae). *Entomological News* 119 (4): 338-344.
- Frey, R.** 1956. Empididae, *Rhamphomyia*. In, E. Lindner (Editor). *Die Fliegen der Paläarktischen Region IV*, 4: 422-584.

- Merz, B. and J.-P. Haenni.** 2000. Morphology and terminology of adult Diptera. pp. 21-51. *In*, L. Papp and B. Darvas (Editors). Contributions to a Manual of Palaearctic Diptera. Volume 1. Science Herald. Budapest, Hungary. 978 pp.
- Sinclair, B.** 2000. Morphology and terminology of Diptera male terminalia. pp. 53-74. *In*, L. Papp and B. Darvas (Editors). Contributions to a Manual of Palaearctic Diptera. Volume 1. Science Herald. Budapest, Hungary. 978 pp.