

Korean Species of the Subgenus *Ophina* (Diptera: Tachinidae)

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ABSTRACT

We recognized *Linnaemya microchaetopsis* Shima, *L. picta* (Meigen) and *L. zachvatkini* Zimin in Korean *Linnaemya* subgenus *Ophina* Robineau-Desvoidy and the latter two are reported for the first time in Korea. The subgenus *Ophina* shares the following morphological characteristics (sensu Shima): 1) the male tergite 6 is fused mid-dorsally with sternite 7+8; 2) the female tergite 6 and tergite 7 are almost always divided longitudinally into two hemitergites; 3) the female tergite 6 is always longer than the tergite 7; 4) circus parallel-sided in caudal view; 5) epiphallus present; and 6) pteropleural seta long, reaching posterior margin of lower calypter. We provide a key to the included Korean species, as well as descriptions and illustrations with their diagnostic characters indicated.

Keywords: taxonomy, Diptera, Tachinidae, *Linnaemya*, *Ophina*, *haemorrhoidalis*

INTRODUCTION

Robineau-Desvoidy (1830) erected the genus *Linnaemya* based on the type-species, *L. silvestris* Robineau-Desvoidy. World fauna of this genus currently includes 149 valid species, with 51 Palearctic (Herting, 1984), 42 Oriental (Shima, 1986), seven Nearctic (O'Hara and Wood, 2004), five Australian (Cantrell and Crosskey, 1989), and 64 Afrotropical species (Crosskey, 1980). Among these species, 20 species are known to occur in more than one region.

The genus *Linnaemya* is currently divided into three subgenera based on their male genitalic structures (Herting, 1961; Shima, 1986): *Homoeonychia* Brauer et Bergenstamm, *Ophina* Robineau-Desvoidy, and *Linnaemya* Robineau-Desvoidy. As a result of an ongoing study of Korean *Linnaemya*, we here report three nominal species of the subgenus *Ophina* [= *haemorrhoidalis* group of the subgenus *Bonellomyia* by Herting (1961)]. This subgenus shares the following morphological characteristics (Shima, 1986): 1) the male tergite 6 is fused mid-dorsally with sternite 7+8; 2) the female tergite 6 and tergite 7 are almost always divided longitudinally into two hemitergites; 3) the female tergite 6 is always longer than tergite 7; 4) circus parallel-sided in

caudal view; 5) epiphallus present; and 6) pteropleural seta long, reaching posterior margin of lower calypter. For the three Korean species, we provide a key, descriptions and illustrations with their diagnostic characters indicated.

MATERIALS AND METHODS

The terminology and morphological interpretations used in this paper follow McAlpine (1981) and Wood (1987), but those of male terminalia follow Shima (1986). In addition, we used the following ten ratios (modified from Han and Norrbom, 2005): vertex-head ratio (vertex width/head width); eye ratio (shortest eye diameter/longest eye diameter); frons-head ratio (narrowest width of frons in dorsal view/width of head); gena-eye ratio (genal height/longest eye diameter)-genal height is the distance between the ventral eye margin and the ventral genal margin anterior to the genal seta; parafacial-flagellomere1 ratio (parafacial middle width/flagellomere1 middle width); flagellomere1-pedicel ratio (length of flagellomere 1/length of pedicel); arista-antenna ratio (arista length/antennal length); vein R₄₊₅ ratio (distance along vein R₄₊₅ between cross vein R-M and vein R₄₊₅ apex/distance

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between cross vein R-M and basal node of vein R₄₊₅); vein M ratio (distance along vein M between cross veins R-M and DM-Cu/distance between cross veins R-M and BM-Cu); subcosta-costa ratio (length of pterostigma/length of costal cell, both measured along vein C); wing-thorax ratio (wing length/thorax length).

All the Korean specimens examined in this study are deposited in the Division of Biological Science and Technology, Yonsei University, Wonju-si, Gangwon-do, Korea (YSUW). Abbreviations of the other institutions mentioned in the text are as follows: Biosystematics Laboratory, Graduate School of Social and Cultural Studies, Kyushu University, Fukuoka, Japan (BLKU); Muséum National d'Histoire Naturelle, Paris, France (MNHN); National Museum of Natural History [formerly United States National Museum], Smithsonian Institution, Washington, District of Columbia, USA (USNM); Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (ZIN).

SYSTEMATIC ACCOUNTS

Order Diptera Linnaeus, 1758
 Family Tachinidae Robineau-Desvoidy, 1830
 Genus *Linnaemya* Robineau-Desvoidy, 1830
 Subgenus *Ophina* Robineau-Desvoidy, 1863

Key to the Korean species

of the subgenus *Ophina* Robineau-Desvoidy

1. Frontal vitta parallel-sided (Figs. 1C, G, 3C, G); fore claw and pulvillus of male shorter than 5th tarsomere; male with strong outer vertical seta (Figs. 1C, D, 3C, D); male with prevertical seta; tibiae reddish brown; surstylus with 2 spines (Fig. 4B, J); cercus apically straight in lateral view 2
- Frontal vitta widened anteriorly (Fig. 2C, G); fore claw and pulvillus of male longer than 5th tarsomere; male with fine outer vertical seta or absent (Fig. 2C, D); male without prevertical seta (Fig. 2C, D); tibiae reddish yellow; surstylus with single spine (Fig. 4F); apex of cercus strongly bent posteriorly in lateral view (Fig. 4F) *L. picta*
2. Wing vein R₁ setulose dorsally at base; male with proclinate orbital setae (Fig. 1C, D); scutum with yellowish white pruinosity; sternite 1 posteriorly with whitish setulae *L. microchaetopsis*
- Wing vein R₁ bare; male without proclinate orbital setae (Fig. 3C, D); scutum without yellowish white pruinosity; sternite 1 posteriorly with brownish black setulae *L. zachvatkini*

^{1*}*Linnaemya microchaetopsis* Shima, 1986

(Figs. 1A-H, 4A-D, 5A, B)

Linnaemya microchaetopsis Shima, 1986: 35 (type locality: Japan, Kyushu, Fukuoka City, Mt. Aburayama, holotype ♂, BLKU).

Material examined. Holotype, Japan: 1♂, Kyushu, Aburayama, Fukuoka, 29 Apr 1966, Shima H (BLKU). Paratype, Japan: 1♂, Mingno, Saitama, 8 Apr 1973, Hara K; 1♀, Otaki, Saitama, 6 Oct 1974, Hara K (USNM: identified as *L. microchaetopsis* by Shima H); Korea: Chungcheongnam-do: 1♀, Jingwan-ri, 10 Sep 1983, Han HY; Gangwon-do: 2♀, Hoengseong-gun, Sheongil-myeon, Yupyong-ri, Seomgang river-side, 12 Oct 2002, Byun et al.; 1♂, Hongcheon-gun, Naemyeon, Bangnae-ri, Mt. Maenghyeonsan, 10 Oct 2002, Han HY, Ro KE; 1♀, ditto, Mt. Gachilbong from Sambongyaksu to 1,240 m peak, 12 Aug 2003, Choi DS, Soh JS; 1♂1♀, ditto, North Valley of Mt. Gyeongbongsan, 14 Aug 2005, Han et al.; 1♂, Inje-gun, Girin-myeon, Mt. Jeombongsan from Jindong-ri to 1,424 m, 16 Jun 2004, Byun et al.; 1♂, ditto, 4 Aug 2006, Choi et al.; 1♀, Jeongseon-gun, Jeongseon-eup, Mt. Gariwangsan from Mahangchi to 1,561 m peak, 26 Sep 2002, Han HY, Ro KE; 1♂, Jeongseon-gun, Nam-myeon, Mt. Mindungsan from Yupyong-ri to 1,119 m peak, 29 Aug 2000, Han HY, Ro KE; 1♀, ditto, 2 Aug 2001, Han HY, Ro KE; 1♂, ditto, 9 Aug 2001, Han HY, Ro KE; 2♂2♀, ditto, 4 Aug 2004, Han et al.; 1♂1♀, ditto, 4 Aug 2005, Han et al.; 1♂1♀, ditto, 13 Aug 2005, Han et al.; 1♂1♀, ditto, 29 Aug 2005, Han et al.; 1♀, Pyeongchang-gun, Jinbu-myeon, Mt. Odaesan, 12 Aug 1984, Han HY, Ro KE; 16♂1♀, ditto, Pangadari, Mt. Odaesan, 7 Sep 1985, Han HY, Ro KE; 1♀, Wonju-si, Buron-myeon, Beopcheon-ri, Namhangang river-side, 11 Oct 2002, Choi et al.; 1♀, ditto, Daean-ri, 25 Sep 2005, Byun HW; 1♀, Wonju-si, Heungeop-myeon, Maejiri, Yonsei Univ. Campus, 25 Sep 2002, Lim JS; 1♂, ditto, 16 Sep 2004, Byun HW, Soh JS; 1♀, ditto, 14 May 2005, Byun HW, Hwang SMR; 1♀, ditto, 15 May 2005, Hwang SMR; 1♀, ditto, 16 May 2005, Byun HW; 1♂, ditto, 19 May 2005, Byun HW; 1♂, ditto, 25 Jun 2005, Byun HW; 1♀, ditto, 10 Jul 2005, Byun HW; 1♀, Wonju-si, Panbu-myeon, Seogok-ri, Mt. Baekunsan from Yongsu-gol to 1,087 m peak, 5 Jun 2005, Han HY, Lee HS; Gyeonggi-do: 1♀, Mt. Chungnyeongsan, 18 Sep 1983, Han HY; 1♀, ditto, 2 Jun 1985, Han HY, Ro KE; 1♀, ditto, 25 May 1983, Han HY; 1♀, Gwangjeon-ri, 10 Sep 1983, Han HY; 1♂, Gwangju-si, Docheok-myeon, Mt. Taehwasan from Eungoksa to 612.8 m peak, 25 Aug 2006, Han et al.; Jeollanam-do: 1♀, Haenam-gun, Samsan-myeon, Mt. Duryunsan from Daeheungsa to 703 m peak, 9 Aug 2003, Han et al.; Gyeongangbuk-do:

Korean name: ^{1*}딱부리기쟁파리

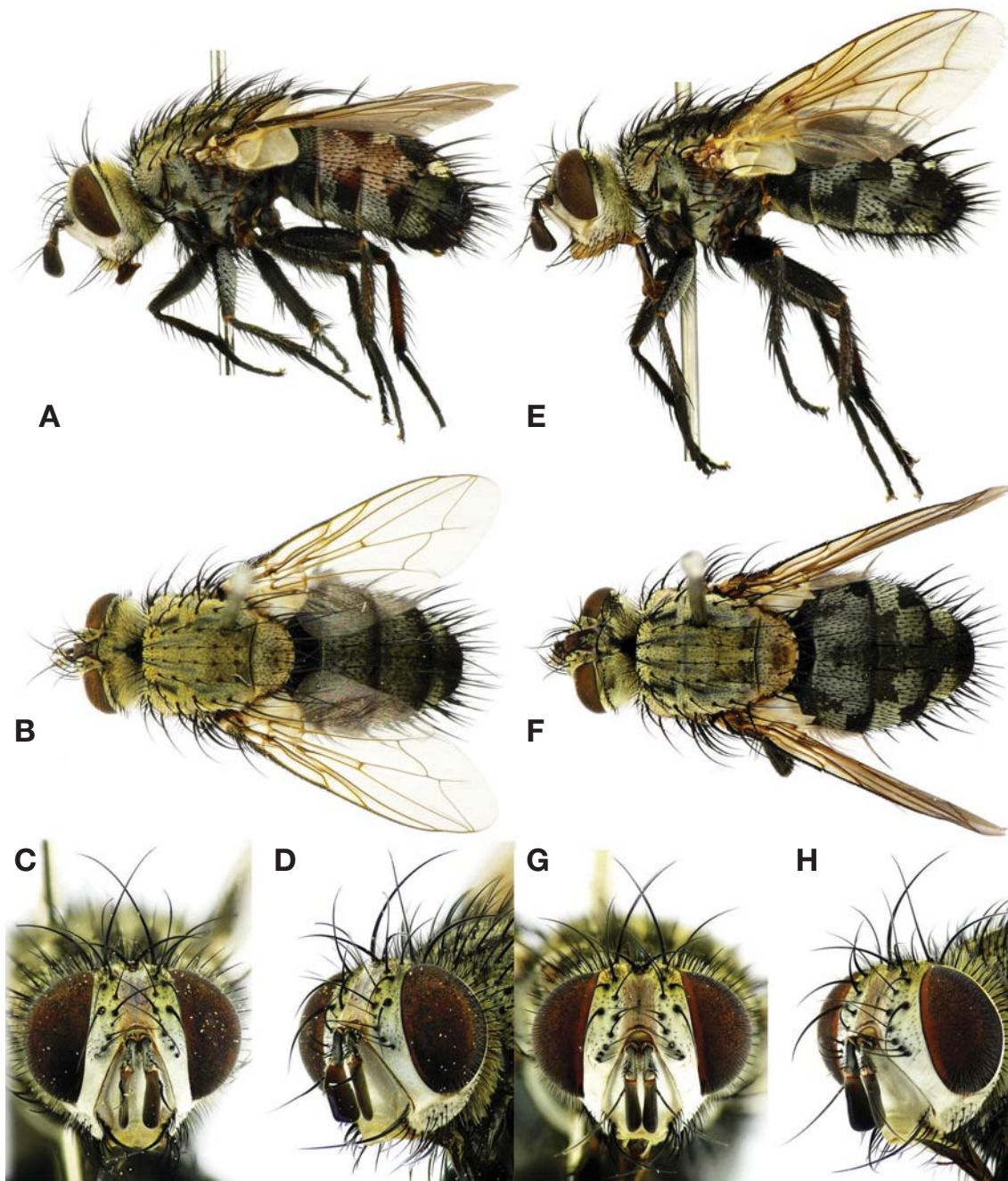


Fig. 1. *Linnaemya microchaetopsis*. A-D, Male; E-H, Female.

1 ♀, Mt. Juhulsan, 7 Jun 1986, Han HY, Ro KE.

Diagnosis. This species can be readily distinguished from other *Linnaemya* species by the following combination of characteristics; 1) single prevertical seta in male; 2) two proclinate orbital setae present in male; 3) vein R_1 setulose dorsally; and 4) claw pulvillus of male shorter than 5th tarsomere; and 5) sternite 1 with whitish setulae in both sexes.

This species closely resembles *L. microchaeta*, but can be distinguished by the above character 5.

Redescription of male. Body length 10.3–12.6 mm; wing length 8.3–9.6 mm. Head with vertex-head ratio 0.32–0.34, frons-head ratio 0.33–0.35, eye ratio 0.56–0.6, gena-eye ratio 0.21–0.24, parafacial-flagellomere1 ratio 0.55–0.64, flagellomere1-pedicel ratio 1.67–2.22, arista-antenna ratio

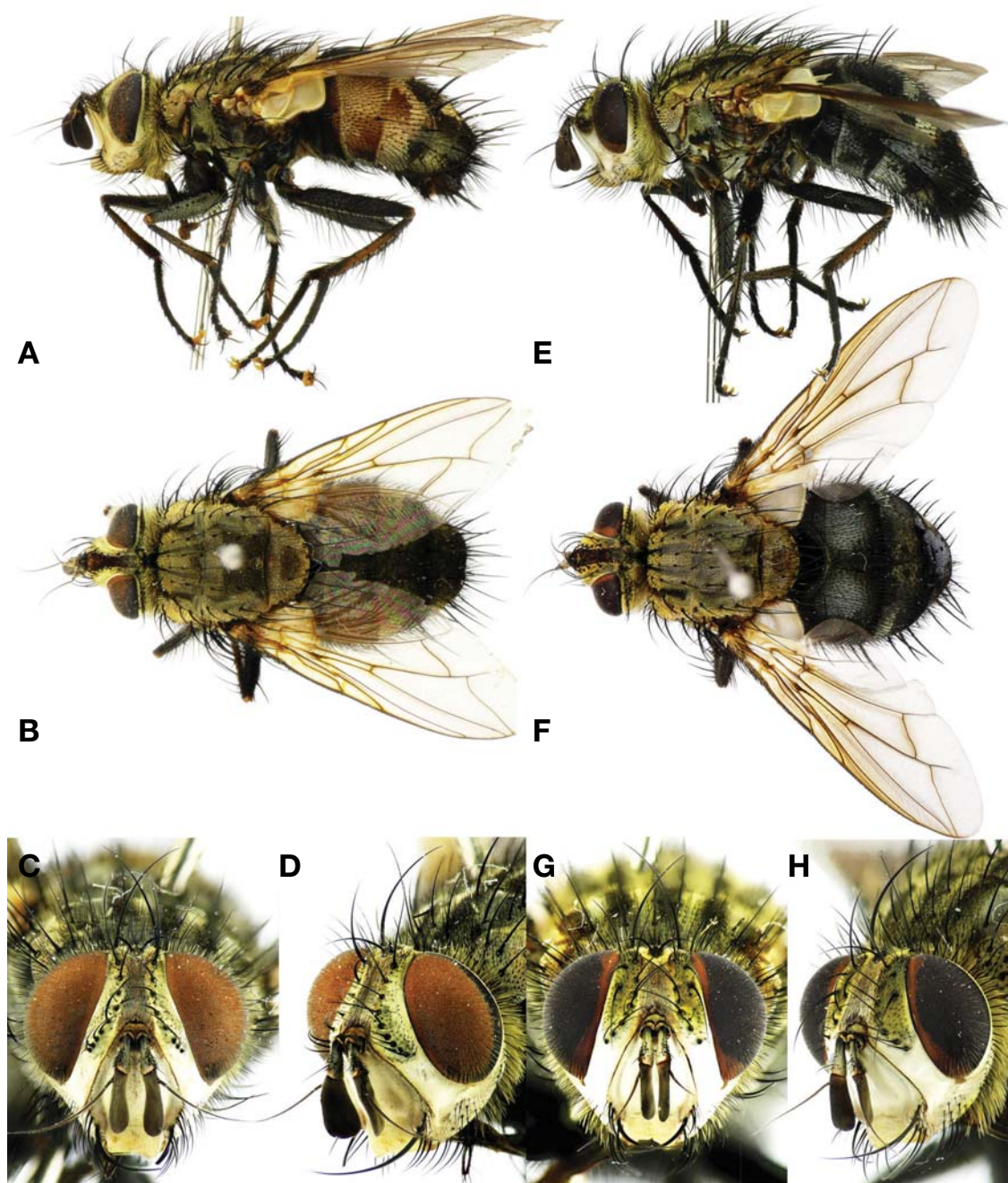


Fig. 2. *Linnaemya picta*. A–D, Male; E–H, Female.

0.97–1.06; vertex black with yellowish gray pruinosity; occiput black with yellowish white pruinosity; eye densely covered with fine yellowish white setulae; with 1 prevertical seta; 1 strong reclinate inner vertical seta; 1 outer vertical seta strong, $0.67\text{--}0.71 \times$ as long as inner vertical seta; 1 strong ocellar seta; 1 postocellar seta; 1 paraverticilar seta; ocellar triangle dark brown with yellowish gray pruinosity; orbital

plate with yellowish gray pruinosity; 1 reclinate orbital seta and 4–7 frontal setae; 2 proclinate orbital seta; frontal vitta brown and wide (parallel-side); antenna predominantly dark brown with anterior apex of pedicel reddish brown, pedicel without wart-like process; flagellomere 1 basally reddish yellow; arista dark brown; parafacial yellowish white; vibrissa strong with 3–4 supravibrissal setae and 8–10 subvibrissal

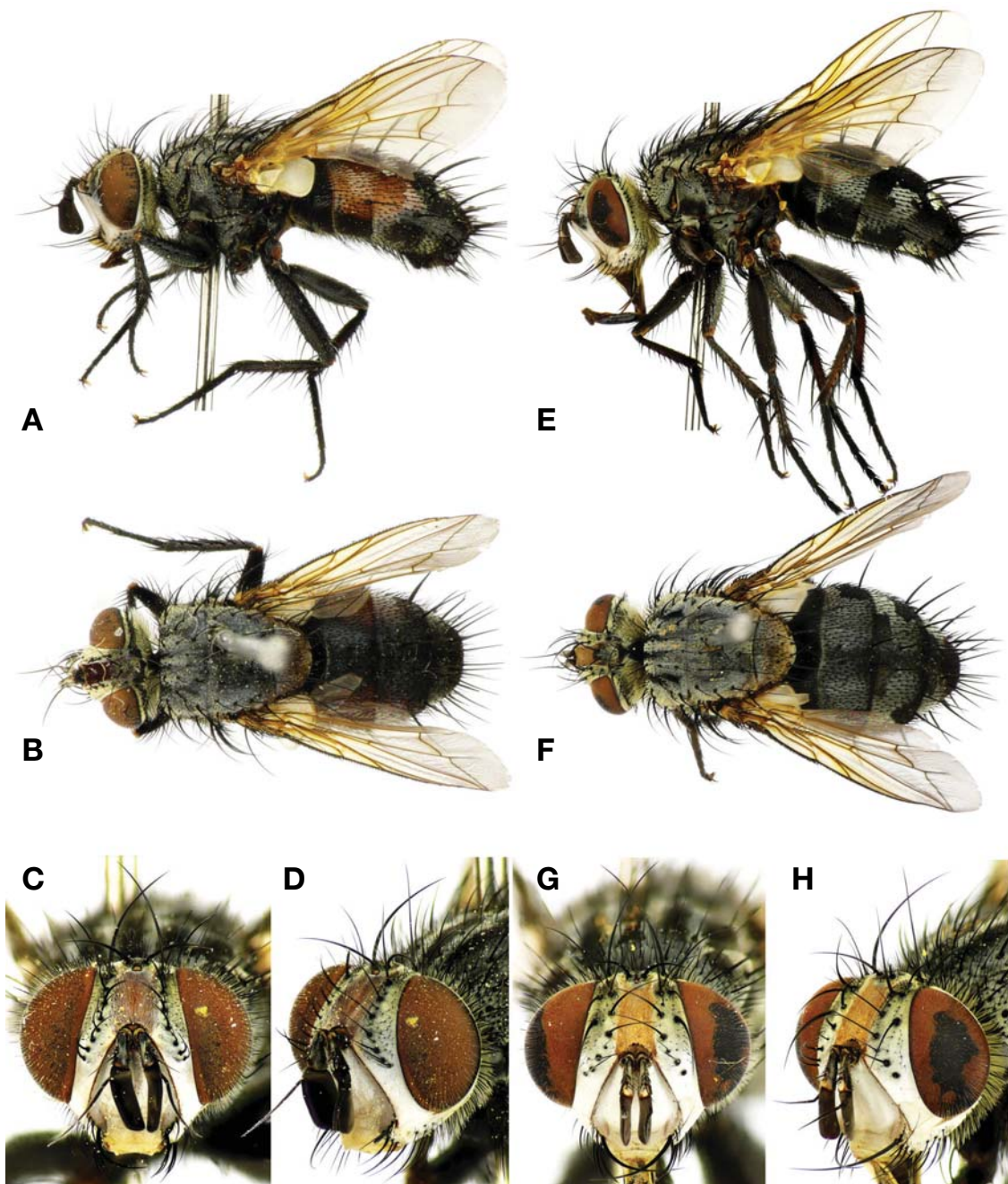


Fig. 3. *Linnaemya zachvatkini*. A–D, Male; E–H, Female.

setae; gena yellowish white with sparse strong setulae; palpus reddish dark brown, slightly shorter than pedicel. Thorax black in ground color; scutum densely covered with fine black setulae, grayish to yellowish white pruinosity with 2 narrow longitudinal dark vittae; prosternum bare; postpronotal lobe, notopleuron, intra-alar, supra-alar regions and postalar callus reddish yellow; postpronotal lobe with 2 short anterior

setae and 3 long posterior setae; 2 posthumeral setae; notopleuron reddish dark brown with 2 setae; 1 presutural, 1 pre-alar, 3+3 acrostichal (rarely 4+3), 3+3 dorsocentral, 3 intra-alar, 2 supra-alar, 2 postalar setae present; pro-episternum dark brown with grayish white pruinosity, with 2 strong and 2 fine setae; pro-epimeron dark brown with 2 strong setae and 1 fine seta underneath; katepisternum with 3 setae; an-

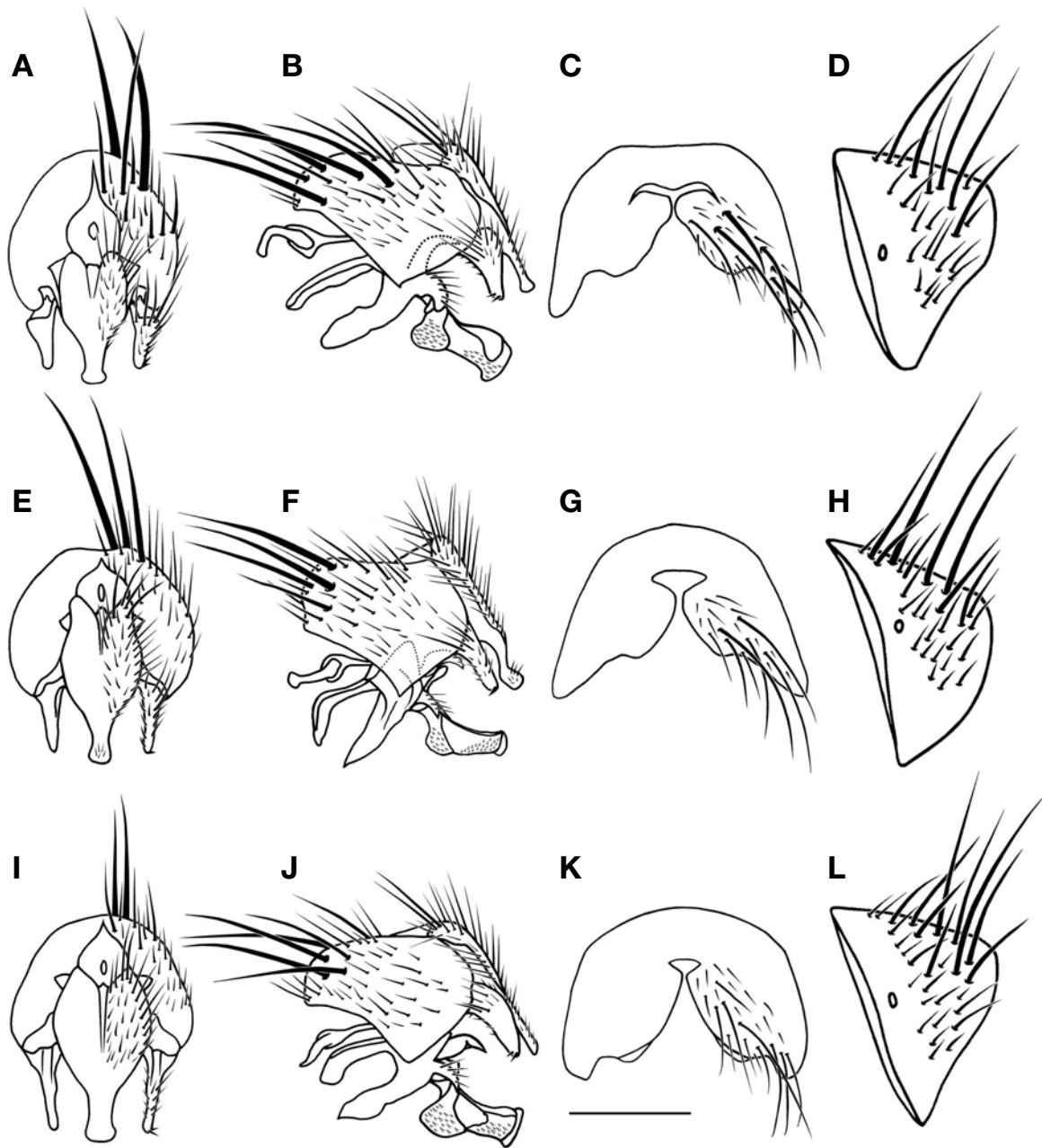


Fig. 4. Male genitalia, sternite 5 and tergite 6 of *Linnaemya* species. A–D, *L. microchaetopsis*. A, Male genitalia, caudal view; B, Male genitalia, lateral view; C, Male sternite 5; D, Male tergite 6. E–H, *L. picta*: E, Male genitalia, caudal view; F, Male genitalia, lateral view; G, Male sternite 5; H, Male tergite 6. I–L, *L. zachvatkini*: I, Male genitalia, caudal view; J, Male genitalia, lateral view; K, Male sternite 5; L, Male tergite 6. Scale bar=0.6 mm.

pimeron with single long seta extending beyond middle of lower calyter, densely covered with black setulae; katepimeron bare; anepisternum with vertical row of 7–8 strong setae, dense black setulae only; meron with 5–6 black setulae; scutellum with basal setae parallel, first lateral setae parallel, second lateral setae divergent (rarely with 1 additional

pair of lateral setae), subapical setae divergent, apical setae cross, discal setae convergent. Legs predominantly dark brown with black setae; coxae, trochanters and femora black, with black setulae; fore femur with 7 dorsal, 6–8 posterodorsal, 8–12 posteroventral setae, posteriorly with pale grayish white pruinosity; fore tibia yellowish brown with 8–11 ant-

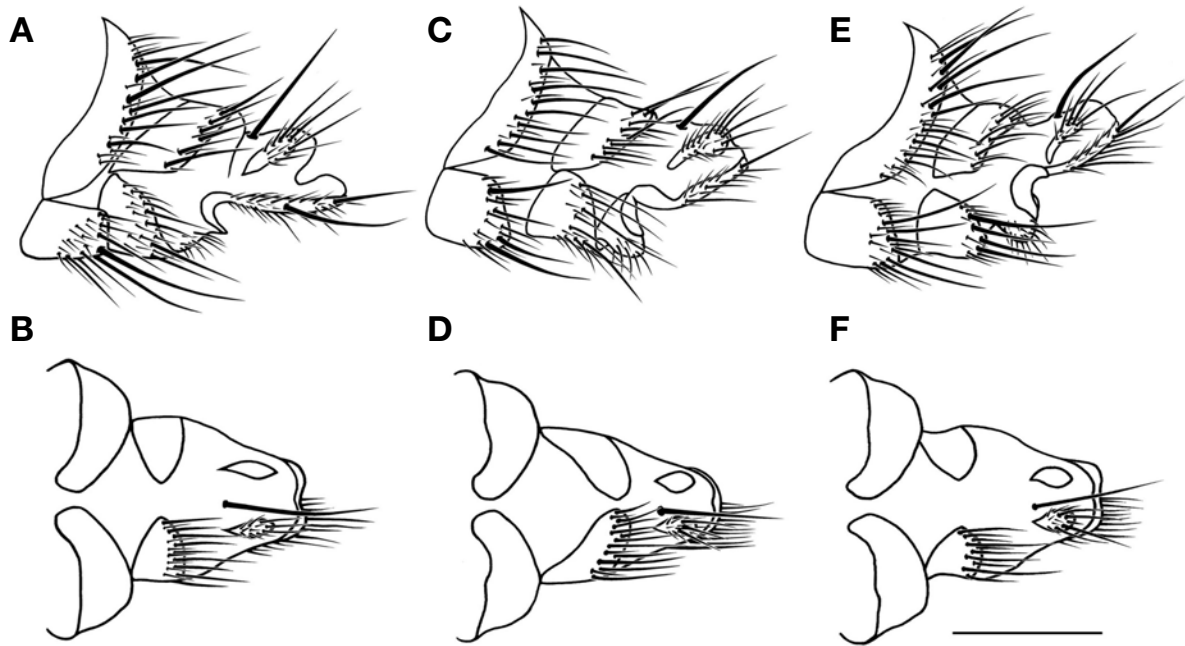


Fig. 5. Female genitalia of *Linnaemya* species. A, B, *L. microchaetopsis*: A, Female genitalia, lateral view; B, Female genitalia, caudal view; C, D, *L. picta*: C, Female genitalia, lateral view; D, Female genitalia, caudal view; E, F, *L. zachvatkini*: E, Female genitalia, lateral view; F, Female genitalia, caudal view. Scale bar=0.5 mm.

erodorsal, 7–8 posterodorsal, 3–5 posterior setae; fore claw and pulvillus slightly shorter than 5th tarsomere; midfemur with rows of anteroventral and posteroventral setae, and with 5 anterior setae, 1 posterior and 2 posterodorsal setae; mid-tibia with 8–9 anterodorsal, 3–5 posterodorsal, 3–5 posterior and 1 ventral setae; hind femur with rows of anterodorsal, anteroventral and posteroventral setae, and with 3 dorsal, 7–11 anterodorsal and 1 posterodorsal setae; hind tibia with 7–10 anterodorsal, 4–6 posterodorsal and 3 anteroventral setae. Wing hyaline with brownish tinge; veins brown; wing-thorax ratio 1.96–2.05; vein R_{4+5} ratio 2.29–2.69; vein M ratio 0.95–1.28; subcostal-costal ratio 0.52–0.61; basicosta pale yellowish white; tegula dark brown; base of R_{4+5} with 5–11 black setulae; vein R_1 with black setulae. Abdomen with black ground color; grayish pruinosity on tergites 3 and 4, and basal 1/3 of tergite 5; with lateral reddish brown band of tergite 3 and 4; venter of abdomen shiny dark brown with black setulae; tergite 1+2 with 1 lateral marginal seta; tergite 3 with 1 median marginal, 1 lateral marginal and 1 median discal setae, usually without lateral discal seta; tergite 4 with 1 strong lateral discal, 2 weak and 2 strong median discal setae; sternite 1 with whitish setulae. Genitalia reddish brown to dark brown; sternite 5 reddish dark brown with dense setulae; cercus in caudal view gradually narrowed toward slightly

widened and blunt apex; surstylus slightly shorter than cercus, with 2 apical spines; pregonite short and curved ventrally, with several setulae; postgonite slightly curved ventrally and longer than pregonite; epiphallus present.

Female. Similar to males except for the following characteristics: orbital plate and frontal plate in anterior view wider than in male; 5–7 frontal setae; meron with 5–8 setae; base of R_{4+5} with 6–9 black setulose; abdomen without reddish brown lateral bands; abdominal tergites 6 and 7 each divided into 2 hemitergites; hemitergite 6 much wider than hemitergite 7. Lengths and ratios: body 9.3–12.7 mm; wing 8.1–10.1 mm; vertex-head ratio 0.33–0.35, frons-head ratio 0.35–0.38, eye ratio 0.55–0.58, gena-eye ratio 0.2–0.24, parafacial-flagellomere1 ratio 0.75–0.89, flagellomere 1-pedical ratio 1.78–1.91, arista-antenna ratio 0.97–1.06, wing-thorax ratio 1.96–2.28, vein R_{4+5} ratio 2.24–2.47, vein M ratio 0.93–1.02, subcostal-costal ratio 0.52–0.63.

Distribution. South Korea, China, Taiwan, Central Asia, Japan, Russia.

¹**Linnaemya picta* (Meigen, 1824)

(Figs. 2A–H, 4E–H, 5C, D)

Tachina picta Meigen, 1824: 261 (type locality: not given (Europe, from “Baumhauerischen Museum [=collection]”),

Korean name: ¹*큰딱부리기생파리 (신칭)

type(s) ♀, MNHN).

Linnemya retroflexa Pandellé, 1895: 350 (type locality: France, Hautes-Pyrénées [Tarbes] and Landes [Dax], syntypes ♂, MNHN).

Material examined. Switzerland: Canton de Vaud: 1 ♂, Cudrefin 435 m, 30 Jun 1979, Paul H. Arnaud Jr (USNM); 1 ♂, ditto, Cudrefin, 25 Jul 1984 (USNM); 2 ♀, Cudrefin, Bois du village, 31 Aug 1984, Paul H. Arnaud Jr (USNM; identified as *L. picta* by Tschorsnig) (at flower *Heracleum*); Korea: Gangwon-do: 1 ♂, Hoengseong-gun, Dunnae-myeon, Mt. Cheongtaesan, Sapgyo-ri to 1,200 m peak, 27 Jul 2002, Lim OY, Lee HS; 1 ♀, Jeongseon-gun, Gohan-eup, Mt. Hambaegsan from Manhang-jae 1,574 m peak, 29 Aug 2000, Han HY, Ro KE; 1 ♀, ditto, Nam-myeon, Mt. Mindungsan from Yupyeong-ri to 1,119 m peak, 25 Sep 2003, Han et al.; 1 ♀, ditto, 29 Aug 2005, Han et al.; 1 ♀, Wonju-si, Heung-eop-myeon, Maeji-ri from Hoechon to 960 m peak, 6 Aug 1999, Choi et al.; 1 ♂, Wonju-si, Panbu-myeon, Mt. Baegun-san from Yongsu-gol to 1,087.1 m peak, 2 Jul 2000, Han HY, Choi DS; 1 ♂, ditto, 10 Jul 2004, Byun HW; 2 ♀, Yeongwol-gun, Seo-myeon, Ssangyong-ri, 29 Sep 2002, Han et al.; Gyeonggi-do: 1 ♀, Mt. Kumdansan, 22 Sep 1984, Han HY, Ro KE; Gyeongsangbuk-do: 1 ♀, Mt. Songnisan, 18 Sep 1982, Han HY, Ro KE.

Diagnosis. This species can be readily distinguished from other *Linnaemya* species by the following combination of characteristics; 1) 2 lateral scutellar setae; 2) male circus subapically bent forward in lateral view; and 3) male sternite 5 with black setulae.

Redescription of male. Body length 12.2–13.3 mm; wing length 10.2–11.5 mm. Head with vertex-head ratio 0.34–0.37, frons-head ratio 0.33–0.36, eye ratio 0.53–0.60, gena-eye ratio 0.25–0.30, parafacial-flagellomere1 ratio 0.69–0.83, flagellomere1-pedicel ratio 2.00–2.50, arista-antenna ratio 1.03–1.05; vertex black with yellowish white pruinosity; occiput black with yellowish white pruinosity; eye densely covered with fine yellowish white setulae; without prevertical seta; 1 strong reclinate inner vertical seta; 1 outer vertical seta fine, 0.45–0.48 × as long as inner vertical seta; 1 strong ocellar seta; 1 postocellar seta (rarely absent); 1 paraverticlar seta; ocellar triangle dark brown with yellowish white pruinosity; 1 reclinate orbital seta and 6–10 frontal setae; without proclinate orbital seta; frontal vitta reddish dark brown and strongly widened anteriorly; antenna predominantly dark brown with anterior apex of pedicel reddish yellow, pedicel without wart-like process; arista dark brown; vibrissa strong with 3–4 supravibrissal setae and 10–12 subvibrissal setae; gena yellowish white with sparse strong setulae; palpus longer than pedicel. Thorax black in ground color; scutum with dense fine black setulae, yellowish white prui-

nosity with 2 narrow longitudinal dark vittae; prosternum bare; postpronotal lobe with 2 short anterior setae and 3 long posterior setae; 2 posthumeral setae; notopleuron reddish dark brown with 2 setae; 1 presutural, 1 pre-alar, 3+3 acrostichal (rarely 4+3), 3+3 dorsocentral, 3 intra-alar, 2 supra-alar, 2 postalar setae present; pro-episternum black with grayish white pruinosity, with 4 setae; pro-epimeron with 3–4 setae; katepisternum with 3 setae; anepimeron with single long seta extending beyond middle of lower calyter, with dense black setulae; katepimeron bare; anepisternum with vertical row of 8–9 strong setae, densely covered with black setulae only; meron with 7–8 black setae; scutellum with basal setae convergent, 2 lateral setae divergent, subapical setae divergent, apical setae cross, discal scutellar setae convergent. Legs predominantly black with black setae; coxae, trochanters and femora black, with black setulae; fore femur with 7–8 dorsal, 8–10 posterodorsal, 13–15 posteroventral setae, posteriorly with pale grayish white pruinosity; fore tibia reddish yellow with 6–7 anterodorsal, 8–11 posterodorsal, 3 posterior setae; fore claw and pulvillus slightly longer than 5th tarsomere; midfemur with rows of anteroventral and posteroventral setae, and with 5 anterior setae, 1 posterior and 2 posterodorsal setae; midtibia with 4–5 anterodorsal, 3 posterior, 1 ventral, a row posterodorsal setae; hind femur with rows of anterodorsal, anteroventral and posteroventral setae, and with 2–3 dorsal, 6–11 anterodorsal and 1–2 posterodorsal setae; hind tibia with 6–7 anterodorsal, 3–4 posterodorsal and 3 anteroventral setae. Wing hyaline with brownish tinge; veins brown; wing-thorax ratio 2.08–2.21; vein R_{4+5} ratio 2.68–3.00; vein M ratio 1.13–1.27; subcostal-costal ratio 0.57–0.65; basicosta pale yellowish white; tegula black; base of R_{4+5} with 6 black setulae; vein R_1 bare. Abdomen with black ground color; grayish pruinosity on tergites 3 and 4, and basal 1/3 of tergite 5; with lateral reddish brown band from posterior 1/3 of tergite 1+2 to tergite 4; venter of abdomen shiny dark brown with black setulae; tergite 1+2 with 1 lateral marginal seta; tergite 3 with 1 median marginal, 1 lateral marginal and 1 median discal setae, usually without lateral discal seta; tergite 4 with strong lateral discal, 1 strong median discal setae, usually without lateral discal seta; sternite 1 brownish black setulae. Genitalia reddish brown to dark brown; sternite 5 reddish dark brown with dense setulae; cercus in caudal view gradually narrowed toward slightly widened and blunt apex, in lateral view of cercus strongly flexed anteriorly at apex; surstylus slightly shorter than cercus, with 1 apical spine; pregonite short and curved ventrally, with several setulae; postgonite slightly curved ventrally and longer than pregonite; epiphallus present.

Female. Similar to males except for the following characteristics: orbital plate and frontal plate in anterior view wider than in male; 6–7 frontal setae; 2–4 supravibrissal setae; scu-

tum yellowish pruinosity; postpronotal lobe, notopleuron, intra-alar, supra-alar region and postalar callus yellowish brown; anepisternum with 7–11 setae; meron with 7–10 setae; abdominal tergites 6 and 7 each divided into 2 hemitergites. Lengths and ratios: body 12.7–14.3 mm; wing 11.2–12.1 mm; vertex-head ratio 0.27–0.31, frons-head ratio 0.30–0.32, eye ratio 0.57–0.61, gena-eye ratio 0.25–0.28, parafacial-flagellomere1 ratio 1.00–0.20, flagellomere 1-pedical ratio 1.69–1.92, arista-antenna ratio 1.00–1.16, wing-thorax ratio 2.07–2.12, vein R_{4+5} ratio 2.32–2.68, vein M ratio 0.94–1.13, subcostal-costal ratio 0.54–0.60.

Distribution. South Korea, China, Taiwan, Europe (except Northern Europe), Japan, Russia (all), Transcaucasia, India, Nepal, Thailand.

¹**Linnaemya zachvatkini* Zimin, 1954

(Figs. 3A–H, 4I–L, 5E, F)

Linnaemyia (sic) *zachvatkini* Zimin, 1954: 276 (type locality: Russia, Primorskiy Krai, Okeanskaya, holotype ♂, ZIN).

Material examined. Korea: Gangwon-do: 1 ♀, Hongcheon-gun, Nae-myeon, Mt. Gyeongsan from Unduryeong to 1,577 m peak, 12 Aug 2003, Byun HW, Lim OY, Lee HS; 1 ♀, Inje-gun, Girin-myeon, Mt. Jeombongsan from Jindong-ri to 1,424 m, 10 Aug 2001, Han et al.; 1 ♀, Jeongseon-gun, Gohan-eup, Mt. Hambaegsan from Manhang-jae 1,574 m peak, 3 Oct 1999, Choi DS, Kim SK, Park CH; 2 ♀, ditto, 29 Aug 2000, Han HY, Ro KE; 1 ♂, Jeongseon-gun, Nam-myeon, Mt. Mindungsan from Yupyong-ri to 1,119 m peak, 29 Aug 2000, Han HY, Ro KE; 2 ♀, Pyeongchang-gun, Jinbu-myeon, Mt. Odaesan, 12 Sep 1982, Han HY, Ro KE; 1 ♀, ditto, 11 Aug 1984, Han HY, Ro KE; 7 ♂, ditto, Doam-myeon, Hoenggye-ri, Daegwallyeong Samyang pasture, 7 Oct 2004, Han HY, Ro KE, Byun HW; 1 ♀, Wonju-si, Heungeop-myeon, Maeji-ri, Yonsei Univ. Campus, 19 Jul 2005, Byun HW; 1 ♂, ditto, 25 May 2006, Lee HS; 1 ♂, ditto, 19 Oct 2005, Hwang SMR; Gyeonggi-do: 1 ♀, Mt. Chungnyeongsan, 18 Sep 1983, Han HY, Ro KE; Gyeongsangbuk-do: 1 ♀, Mt. Songnisan, 18 Sep 1982, Han HY, Ro KE.

Diagnosis. This species can be readily distinguished from other *Linnaemya* species by the following combination of characteristics; 1) 2 lateral scutellar setae; 2) single strong outer vertical seta in male; 3) frontal vitta wider than parafacial, parallel sided; and 4) claw and pulvillus of male slightly shorter than 5th tarsomere.

Redescription of male. Body length 9.0–10.8 mm; wing length 7.0–8.3 mm. Head with vertex-head ratio 0.32–0.34, frons-head ratio 0.33–0.35, eye ratio 0.52–0.56, gena-eye ratio 0.29–0.22, parafacial-flagellomere1 ratio 0.46–0.60,

flagellomere1-pedical ratio 1.80–2.00, arista-antenna ratio 0.84–0.88; vertex black with grayish white pruinosity; occiput black with grayish white pruinosity; eye densely covered with fine yellowish white setulae; prevertical seta absent; 1 strong reclinate inner vertical seta; 1 outer vertical seta strong, 0.50–0.65 × as long as inner vertical seta; 1 strong ocellar seta; 1 postocellar seta; 1 paraverticilar seta; ocellar triangle dark brown with grayish white pruinosity; orbital plate with grayish white pruinosity; 1 reclinate orbital seta and 5–7 frontal setae; proclinate orbital seta absent; frontal vitta reddish brown and wide; antenna predominantly dark brown with anterior apex of pedicel reddish yellow, pedicel without wart-like process; arista dark brown; parafacial yellowish brown; vibrissa strong with 2–3 supravibrissal setae and 8–10 subvibrissal setae; gena yellowish white with sparse strong setulae; palpus reddish dark brown, subequal to pedicel. Thorax black in ground color; scutum with dense fine black setulae, grayish white pruinosity with 2 narrow longitudinal dark vittae; prosternum bare; notopleuron black to reddish dark brown with 2 setae; 1 presutural, 1 pre-alar, 3+3 acrostichal (rarely 4+3), 3+3 dorsocentral, 3 intra-alar, 2 supra-alar, 2 postalar setae present; pro-episternum black with grayish white pruinosity, with 4 setae; pro-epimeron black brown with 2–3 strong setae (rarely with 2 strong setae and 1 fine seta); katapisternum with 3 setae; anepimeron with single seta extending beyond middle of lower calyter, densely covered with black setulae; katepimeron bare; anepisternum with vertical row of 6–8 strong setae and dense black setulae; meron with 4–7 black setulae; scutellum with basal setae convergent, lateral setae divergent, subapical setae divergent, apical setae crossed in middle, discal setae convergent. Legs predominantly black with black setae; coxae, trochanters black, femora with black setulae; fore femur posteriorly with pale grayish white pruinosity; fore femur with 4–6 dorsal, 5–7 posterodorsal, 10–13 posteroventral setae; fore tibia reddish brown with 6–8 anterodorsal, 5–6 posterodorsal, 2–3 posterior setae; fore claw and pulvillus subequal as long as 5th tarsomere; midfemur with rows of anteroventral, posteroventral, 3–7 downward anterior setae, 1 posterior and 2 posterodorsal seta; midtibia with 5–7 anterodorsal, 4–5 posterodorsal, 3 posterior and 1 ventral setae; hind femur with rows of anterodorsal, anteroventral and posteroventral, 2–3 dorsal, 5–7 anterodorsal and 1 posterodorsal setae; hind tibia with 5–10 anterodorsal, 3–5 posterodorsal and 2–3 anteroventral setae. Wing hyaline with brownish tinge; veins brown; wing-thorax ratio 1.95–2.15; vein R_{4+5} ratio 2.14–2.83; vein M ratio 1.03–1.31; subcostal-costal ratio 0.47–0.62; basicosta pale yellowish white; tegula dark brown; base of R_{4+5} with 6–10 black setulae. Abdomen with black ground

Korean name: ¹*산딱부리기생파리 (신칭)

color; grayish pruinosity on tergites 3 and 4, and basal 1/2 of tergite 5; with lateral reddish brown band from tergite 3 to tergite 4; venter of abdomen shiny dark brown with black setulae; tergite 1+2 with 1 lateral marginal seta; tergite 3 with 1 median marginal, 1 lateral marginal and 1 median discal setae, without lateral discal seta; tergite 4 without lateral discal seta; Sternite 1 with black setulae. Genitalia reddish brown to dark brown; sternite 5 reddish dark brown with dense setulae; cercus in caudal view gradually narrowed toward slightly widened and blunt apex; surstylus with 2 apical spines; pregonite short and curved ventrally, with several setulae; postgonite slightly curved ventrally and longer than pregonite; epiphallus present.

Female. similar to males except for the following characteristics: Head with 1 outer vertical seta stronger than in male; 1 ocellar seta thicker and longer than in male; with 1 prevertical seta; orbital plate and frontal plate in anterior view wider than in male; flagellomere 1 slightly narrower than in male; 6–8 frontal setae; fore claw and pulvillus slightly shorter than 5th tarsomere; anepisternum with vertical row of 7–10 strong setae; meron with 7–8 setae; base of R₄₊₅ with 5–9 black setulose; abdominal tergites 6 and 7 each divided into 2 hemitergites; hemitergite 6 much wider than hemitergite 7. Lengths and ratios: body 11.9–12.5 mm; wing 9.5–10.1 mm; vertex-head ratio 0.34–0.37, frons-head ratio 0.37–0.38, eye ratio 0.53–0.57, gena-eye ratio 0.20–0.22, parafacial-flagellomere1 ratio 1.13, flagellomere 1-pedical ratio 1.38–1.54, arista-antenna ratio 0.85–0.94, wing-thorax ratio 1.98–2.07, vein R₄₊₅ ratio 2.32–2.50, vein M ratio 1.04–1.08, subcostal-costal ratio 0.53–0.56.

Distribution. South Korea, China, Europe (except Northern Europe), Japan, Mongolia, Russia.

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