

Two Species of the Genus *Phasia* Latreille (Insecta: Diptera: Tachinidae) New to Korea

Dong-Jun Cha and Ho-Yeon Han*

Division of Biological Science and Technology, Yonsei University,
Wonju 220-710, Korea

ABSTRACT

As a result of an ongoing systematic study of the genus *Phasia* Latreille in Korea, we have discovered *P. aurigera* and *P. takanoi* for the first time in Korea. We here provide detailed redescriptions and illustrations with their diagnostic characters indicated. *Phasia aurigera* can be distinguished from other congeners by the combination of the following characteristics: 1) scutum with distinct yellow pruinose spot; 2) male abdominal tergite 5 posteromarginally with V-shaped yellow pruinosity; 3) distiphallus divided into anterior and posterior processes; 4) female sternite 7 short, as long as or slightly longer than sternite 6 (visible part); and 5) female sternite 8 (ovipositor) bent dorsally. *Phasia takanoi* can also be distinguished by the combination of the following characteristics: 1) abdominal tergites strongly shiny; 2) surstylus strongly bent upward; and 3) posterior margin of female sternite 7 straight in ventral view.

Key words: Diptera, Tachinidae, Phasiinae, taxonomy, *Phasia aurigera*, *Phasia takanoi*

INTRODUCTION

Phasia Latreille is one of the largest genera of the tribe Phasiini (subfamily Phasiinae). This genus currently includes 94 valid species from all zoogeographical regions as of November, 2009 (Thompson, The Diptera Site- <http://www.sel.barc.usda.gov/diptera>). They can be distinguished from other genera of Phasiinae by the combination of the following characteristics (Sun and Marshall, 2003): 1) vein M ending in R_{4+5} , petiole longer than vein r-m; 2) abdominal tergites without distinct marginal bristles; and 3) female with piercing ovipositor.

The taxonomic history of *Phasia* is confusing, especially about the type species (reviewed by Sun and Marshall, 2003). Among the most important treatments of *Phasia*, Draber-Mońko (1965) recognized seven subgenera and 21 species from Palaearctic region including 10 new species. Herting (1984) catalogued two subgenera and 21 valid species in the Palaearctic region. More recently, Sun and Marshall (2003) redefined the genus *Phasia*, and recognized 75 species (excluding Neotropical species) under six species groups. In this publication, they described 31 additional new species.

Kim's (1981) report of *P. hemiptera* (Fabricius) (as *P. vitata* (Girschner)) from South Korea was the first recording of the genus *Phasia* in Korea. Since then, Kim (1996) reported *P. albopunctata* (Baranov) (as *Allophora albopunctata* Ba-

ranov) from South Korea, and Draber-Monko (2008) reported *P. auralans* Meigen from North Korea.

As a result of an ongoing systematic study of the genus *Phasia* in Korea, we have discovered two species, *P. aurigera* (Egger) and *P. takanoi* (Draber-Mońko), for the first time in Korea. We here provide detailed redescriptions and illustrations with their diagnostic characters indicated.

MATERIALS AND METHODS

The morphological terminology and interpretations follow McAlpine (1981). The two lengths and six ratios used in the descriptions were modified from Han and Norrbom (2005): body length (anterior margin of head excluding antenna to posterior margin of abdomen); wing length (anterior margin of tegular to apex of vein R_{4+5}); eye ratio (shortest eye diameter/longest eye diameter); gena-eye ratio (genal height/longest eye diameter); arista-antenna ratio (length of arista/length of antenna excluding arista); wing-mesonotum ratio (wing length/mesonotum length); petiole ratio (length of petiole of wing cell r_{4+5} /length of crossvein R-M); and vein M ratio (distance along vein M between crossveins R+M and DM-Cu/distance between crossveins R-M and BM-Cu).

All the specimens used in this study are deposited in the Division of Biological Science and Technology, Yonsei University, Wonju Campus, Korea.

*To whom correspondence should be addressed
Tel: 82-33-760-2254, Fax: 82-33-760-2183
E-mail: hyhan@yonsei.ac.kr

SYSTEMATIC ACCOUNTS

Order Diptera Linnaeus, 1758

Family Tachinidae Robineau-Desvoidy, 1830

Genus *Phasia* Latreille, 1804

¹***1. *Phasia aurigera* (Egger, 1860) (Figs. 1, 3A-F)**

Alophora aurigera Egger, 1860: 796 (type-locality: Austria, Wien; holotype ♂, Naturhistorisches Museum Wien, Wien [Vienna], Austria).

Phasia urnifera von Roser, 1840: 57 (type-locality: Baden-Württemberg, Germany; Staatliches Museum Für Naturkunde, Stuttgart, Germany) nomen oblitum.

Alophora bonaparteana: Rondani, 1861: 217 (type-locality: Parma, Italy); Baer, 1921: 128; Stein, 1924: 258; Rhodendorf, 1933: 713.

Alophora kriebbaumeri Schiner, 1869b: 841 (type-locality: Austria, Tirol: Sill falls near Innsbruck).

Hyalomya helleri Palm, 1876: 420 (type-locality: Austria, Tirol: Innsbruck).

Alophora (Hyalomyia) bonaparteana: Girsher, 1887: 22; Bezzi und Stein, 1907: 579; Rohdendorf, 1947: 86.

Halophora subcoleoptrata (Linnaeus) of Pandellé, 1894: 88 (misidentification).

Alophora aurigera: Wenfurer, 1906: 8-9; Dupuis, 1949: 501.

Brumtallophora aurigera: Dupuis, 1952: 27; Dupuis, 1963: 106 (host).

Alophora (Brumtallophora) aurigera: Draber-Moňko, 1965: 140 (redescription).

Phasia (Phasia) aurigera: Herting, 1984: 168 (in Palaearctic catalog); Herting and Dely-Draskovits, 1993: 409 (in Palaearctic catalog).

Phasia aurigera: Sun and Marshall, 2003: 71 (redescription); O'hara, 2009: 135 (in Chinese catalog).

Material examined. KOREA: Gangwon-do: Hongcheon-gun, Nae-myeon, Mt. Maenghyeonsan, from Bangnae-ri to 1213.8 m peak, 23-X-1998 (H.-Y. Han and K.-E. Ro), 1♂; ditto, 10-X-2002 (H.-Y. Han and K.-E. Ro), 3♂♂, 5♀♀; ditto, 12-X-2002 (H.-Y. Han and K.-E. Ro), 19♂♂, 14♀♀; ditto, 22-X-2002 (D.-S. Choi and H.-W. Byun), 1♂; ditto, 3-X-2003 (H.-Y. Han et al.), 2♂♂, 3♀♀; ditto, 15-X-2003 (H.-W. Byun and H.-S. Lee), 2♀♀; ditto, 8-X-2004 (H.-W. Byun et al.), 2♂; ditto, 6-X-2005 (D.-S. Choi and H.-W. Byun), 3♂♂, 4♀♀; ditto, 11-X-2009 (S.-W. Suk et al.), 4♂♂, 5♀♀; Pyeongchang-gun, Jinbu-myeon, Mt. Odaesan, from Bukdaesa to Sangwangbong (1491 m), 20-X-2006 (H.-W. Byun and H.-S. Lee), 1♀; Jeongseon-gun,

Gohan-eup, Mt. Hambaeksan, from Manhangjae to 1573 m peak, 29-IX-2007 (H.-W. Byun and H.-S. Lee), 4♀♀.

Diagnosis. This species can be distinguished from congeners by the combination of the following characteristics (modified from Sun and Marshall, 2003): 1) male scutum with a distinct yellow pruinose spot (Fig. 1A); 2) male tergite 5 posteromarginally with V-shaped yellow pruinosity (Fig. 1A); 3) divided into anterior and posterior processes (Fig. 3C); 4) female sternite 7 short, as long as or slightly longer than sternite 6 (visible part; Fig. 3E).

Redescription of Male. Body length 9.9-12.7 mm; wing length 8.0-10.6 mm. Head (Fig. 1A-C, G, H) compressed anteriorly without most macrosetae; eye ratio 0.48-0.65; gena-eye ratio 0.21-0.31; arista-antenna ratio 1.27-1.43; eyes separated by distance wider than single ocellus but narrower than ocellar triangle; ocellar triangle black with black setulae; occiput flattened, yellow pruinose, with yellowish white setulae; frontal vitta blackish brown, anteriorly as wide as ocellar triangle; fronto-orbital plate yellowish pruinose with roughly 3 irregular rows of setulae, outer margin bare; lunule black, shiny; antennal scape black; pedicel black with 1 black seta; flagellomere 1 black; arista black; face yellowish brown in ground color with gray pruinosity; lower margin of face perpendicular, not projecting; facial ridge yellowish brown with gray pruinosity, setulose on lower 4/5; parafacial brown with gray pruinosity; vibrissa short, slightly longer than nearby setulae; gena brownish yellow with gray pruinosity, with yellowish white setulae; mouthparts with palpus brown. Thorax (Fig. 1A-C) black in ground color with fine black and whitish setulae; scutum with broad yellow pruinose rectangular spot with pair of black longitudinal vittae ending at posterior half of postsutural area of scutum; 2 postpronotal setae; notopleuron with gray pruinosity, with black setulae; 2 notopleural setae; 0+1 acrostichal seta; 0+1(2) dorsocentral seta; 0+1 intra-alar seta; 1+1 supra-alar setae; postalar callus with gray pruinosity with 2 postalar setae; scutellum with grey pruinosity; 1 basal and 1 subapical scutellar setae; pleuron strongly gray pruinose with dense yellowish white setulae; 1 proepisternal, 1 proepimeral, 2(1)+1 katepisternal setae; 7-9 brown to black meral setae; katatergite and anatergite bare with gray pruinosity; subscutellum faintly with gray pruinosity. Wing (Fig. 1A, B) with wing-mesonotum ratio 2.19-2.42; vein M ratio 0.57-0.62; petiole ratio 1.60-1.75; tegula black; basicosta brown; vein M meeting R₄₊₅ at acute angle; halter brown; cells c and sc pale yellow; cells r₁, r₂₊₃, r₄₊₅ excluding median area, and area along vein DM-Cu brown; alula brown; upper calypter pale yellow, lower calypter brown. Legs (Fig. 1B): entirely black with gray pruinosity, black setae and black to yellowish

¹*노랑점뚱보기생파리(신칭)

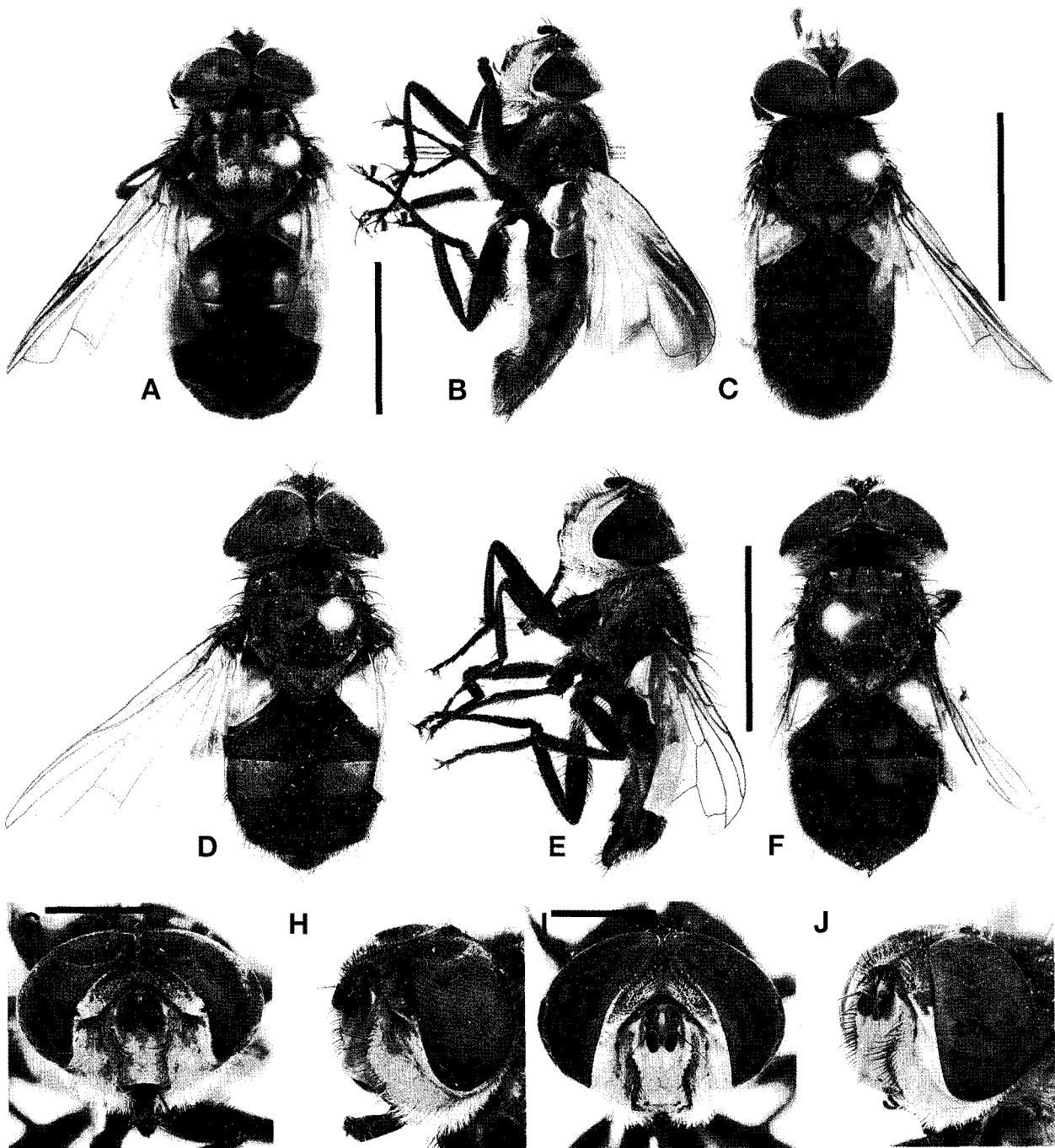


Fig. 1. *Phasia aurigera*. A-C, G, H male; D-F, I, J female. Scale bars=5 mm (A-F), 2 mm (G-J).

wish white setulae; fore coxa anteriorly with gray pruinosity, sparsely with yellowish white setulae on basal 1/4 to 1/3, posteriorly bare; mid and hind coxae brownish black; trochanter brownish black; fore and midfemur ventrally and posteriorly with dense yellowish white setulae; hind femur dorsally with dense black setulae, posteriorly bare; fore

tibia with 1 dorsal and 1 posterior setae; midtibia medially with 1 anterodorsal and 1 ventral seta, apically with 1 dorsal, 1 anterodorsal, 1 anterior, 1 anteroventral, 1 ventral, 1 posteroventral and 1 posterior setae; hind tibia with 3-5 anterodorsal and 3-5 posterodorsal setae; tarsus ventrally with brown longitudinal band; claws brown with back apex; pul-

villus yellowish brown. Abdomen black in ground color with purplish tinge; tergite 1+2 posterolaterally with yellow spots in varying size (Fig. 1A-C; spots missing altogether in a few individuals); tergite 3 anterolaterally with narrowly transverse yellow spots in most individuals; tergite 4 entirely black; tergite 5 posteromarginally with V-shaped yellow pruinosity; tergite 6 with yellow pruinosity. Genitalia (Fig. 3A-D) dark brown in ground color; cercus apically with shallow notch; surstylus strongly bent dorsally; postgonite gently bent ventrally, sharply pointed; pregonite dorsally with sparse hairs; phallus longer than hypandrium, divided into anterior and posterior processes, posterior process apically bifurcate.

Female (Figs. 1D-F, I, J; 3E, F) usually smaller than males with clear wings; eyes separated by a distance narrower than single ocellus; thorax without yellow pruinose spot; posterolateral margin of tergite 1+2 and anterolateral margin of tergite 3 with or without small brown spots; sternite 7 (ovipositor sheath) short, as long as or slightly longer than sternite 6, wrinkles ventrally, bent dorsally; sternite 8 (ovipositor) bent dorsally. Lengths and ratios: body length 9.40-10.30 mm; wing length 7.10-8.10 mm; eye ratio 0.57-0.63; gena-eye ratio 0.21-0.32; arista-antenna ratio 1.19-1.29; wing-mesonotum ratio 2.09-2.38; petiole ratio 1.80-2.00; vein M ratio 0.58-0.63.

Distribution. Korea, Russian Far East, Southern France, Southern Germany, Southern Poland.

Host. Sun and Marshall (2003) listed their host including *Coreus marginatus* (L.), *Conocerus juniper* (H.S.) and *G. acuteangulatus* (Goeze) of Coreidae, and *Palomena prasina* (L.) and *Rhaphigaster nebulosa* (Poda) of Pentatomidae.

Remarks. In Korea, adult flies of *P. aurigera* and *P. takanoi* are rarely seen in general insect collections. Interestingly, most specimens we used had been collected on the flowers of *Chrysanthemum boreale* Makino in September, 2002 at Mt. Maenghyeonsan (Gangwon-do, Hongcheon-gun). Along with these species, we collected over thousand flies of *Phasia*, *Ectophasia*, and *Gymnosoma* species at the same spot. We returned to this locality later, but have never observed such a dense aggregation of Phasiini. According to Dupuis (1963, 1985), European adults emerge May-June and September-October. In the field, adult of this species can survive 15 days and disperse 250-900 m. In addition, this species overwinter in the host's body as a first or second instar larva.

¹*2. *Phasia takanoi* (Draber-Moňko) (Figs. 2, 3G-L)

Alophora (*Brumptalophora*) *takanoi* Draber-Moňko, 1965: 147 (type-locality: Primorskij Kraj, Naturschutzgebiet Su-

dzuch, Ta Tschingouz, Russia; holotype ♂ Zoological Museum, University of Moscow).

Phasia (*Phasia*) *takanoi*: Herting 1984: 169 (in Palaearctic catalog); Herting and Dely-Draskovits 1993: 412 (in Palaearctic catalog).

Phasia takanoi: Sun and Marshall 2003: 109 (redescription).

Material examined. KOREA: Gangwon-do: Wonju-si, Heungeop-myeon, Maeji-ri, Yonsei Univ. Campus, 7-XI-1999 (D.-S. Choi and C.-H. Park), 3♂♂; ditto, 8-XI-1999 (C.-H. Park), 1♂; Hongcheon-gun, Nae-myeon, Mt. Maenghyeonsan, from Bangnae-ri to 1213.8 m peak, 12-X-2002 (H.Y. Han and K.E. Ro), 10♂♂, 4♀♀; ditto, 13-X-2008 (D.-J. Cha et al.), 1♂; ditto, 11-X-2009 (S.-W. Suk et al.) 1♂.

Diagnosis. This species can be distinguished from congeners by the combination of the following characteristics (modified from Sun and Marshall, 2003): 1) abdominal tergites strongly shiny (Fig. 2A, C); 2) scutellum with gray pruinosity (Fig. 2A, C); 3) surstylus strongly bent upward (Fig. 3H); and 4) posterior margin of female sternite 7 straight in ventral view (Fig. 3L).

Redescription of Male. Body length 8.60-9.75 mm; wing length 6.70-8.80 mm. Head (Fig. 2E, F) compressed anteriorly without most macrosetae; eye ratio 0.47-0.59; gena-eye ratio 0.23-0.49; arista-antenna ratio 1.19-1.40; eyes separated by distance as wide as ocellar triangle; ocellar triangle black with black setulae; occiput flattened, gray pruinosity, with yellowish white setulae; frontal vitta black, anteriorly twice as wide as ocella triangle; fronto-orbital plate gray pruinose with 3 irregular rows of setulae, outer margin bare; lunule black, shiny; antennal scape black; pedicel black with 1 black seta; flagellomere 1 black; arista black; face brown to black with gray pruinosity; lower margin of face perpendicular, not projecting; facial ridge yellowish brown with gray pruinosity, setulose on lower 4/5; parafacial brown with gray pruinosity; vibrissa short, slightly longer than nearby setulae; gena brownish yellow with gray pruinosity, with yellowish white setulae; mouthparts with palpus brown. Thorax (Fig. 2A, B) black in ground color with fine black and whitish setulae; scutum faintly with gray pruinosity; 1-2 postpronotal setae; notopleuron gray pruinose with black setulae; 2 notopleural, 0+1 acrostichal, 0+1 dorsocentral, 0+1 intra-alar, 1+1 supra-alar setae; postalar callus gray pruinose with 2 postalar setae; scutellum with strongly grey pruinosity; 1 basal, 1 subapical scutellar setae; pleuron strongly gray pruinose with yellowish white setulae; 1 proepisterna, 1 proepimeral, 1+1 katapisternal setae; 5-7 brown to black meral setae; katatergite and anatergite bare with gray

¹*광택뚫보기생파리 (신칭)

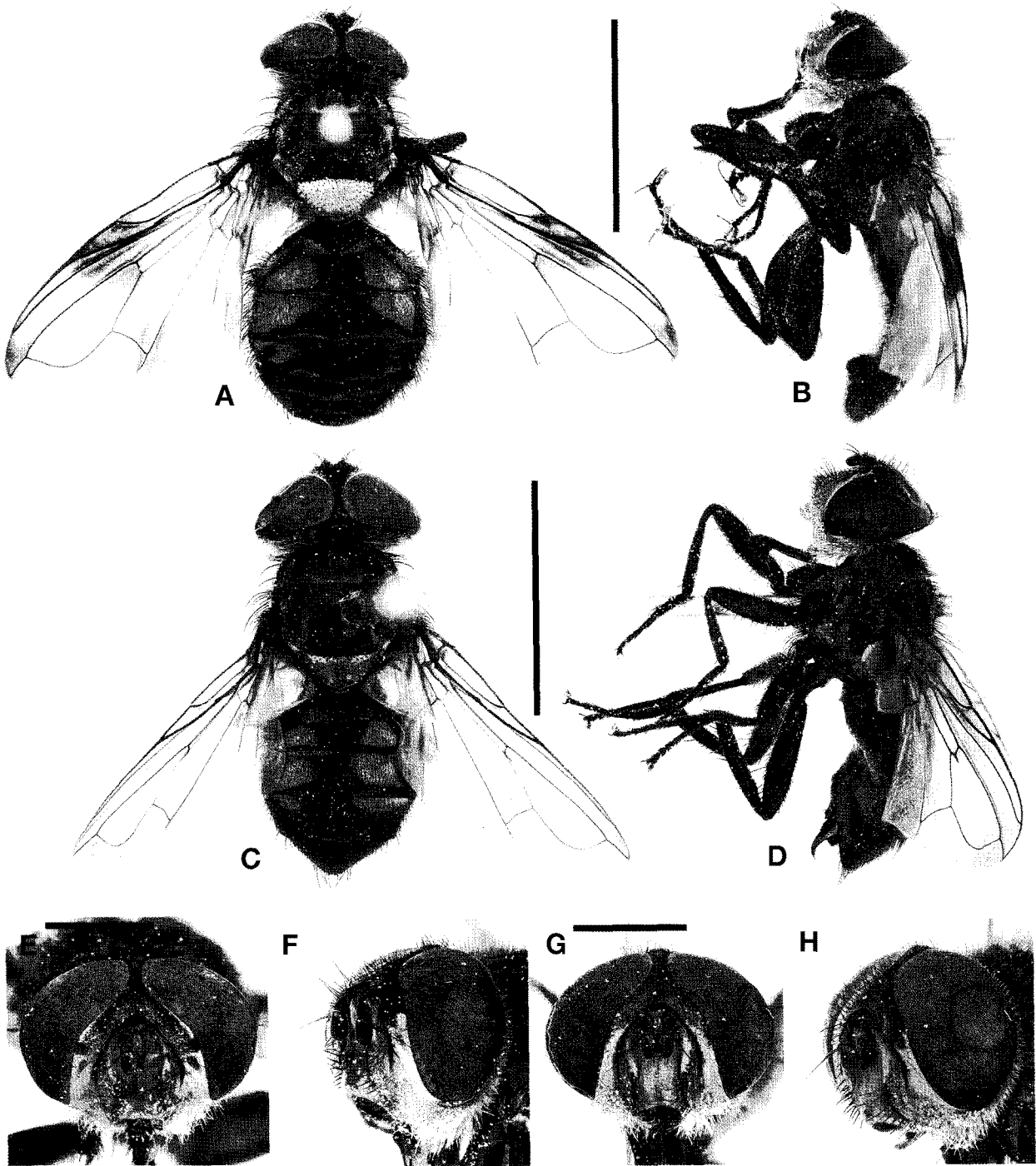


Fig. 2. *Phasia takanoi*. A, B, E, F male; C, D, G, H female. Scale bars=5 mm (A-D), 2 mm (E-H).

pruinosity; subscutellum with gray pruinosity; Wing (Fig. 2A) with wing-mesonotum ratio 2.09-2.59; vein M ratio 0.68-0.79; petiole- R_{4+5} ratio 2.12-2.69; tegula black; basicoستا yellowish brown; M meeting R_{4+5} at acute angle; halter brown; cell c pale yellow; cells sc , r_1 (basal 1/2), r_{2+3} (ba-

sal 1/2 and apical 6/1), r_{4+5} (basal 1/4), and area along vein DM-Cu (lower part) brown; Legs (Fig. 2B) entirely black with gray pruinosity, black setae and black to yellowish white setulae; fore coxa anteriorly with gray pruinosity, sparsely with yellowish white setulae on basal 1/4 to 1/3, poste-

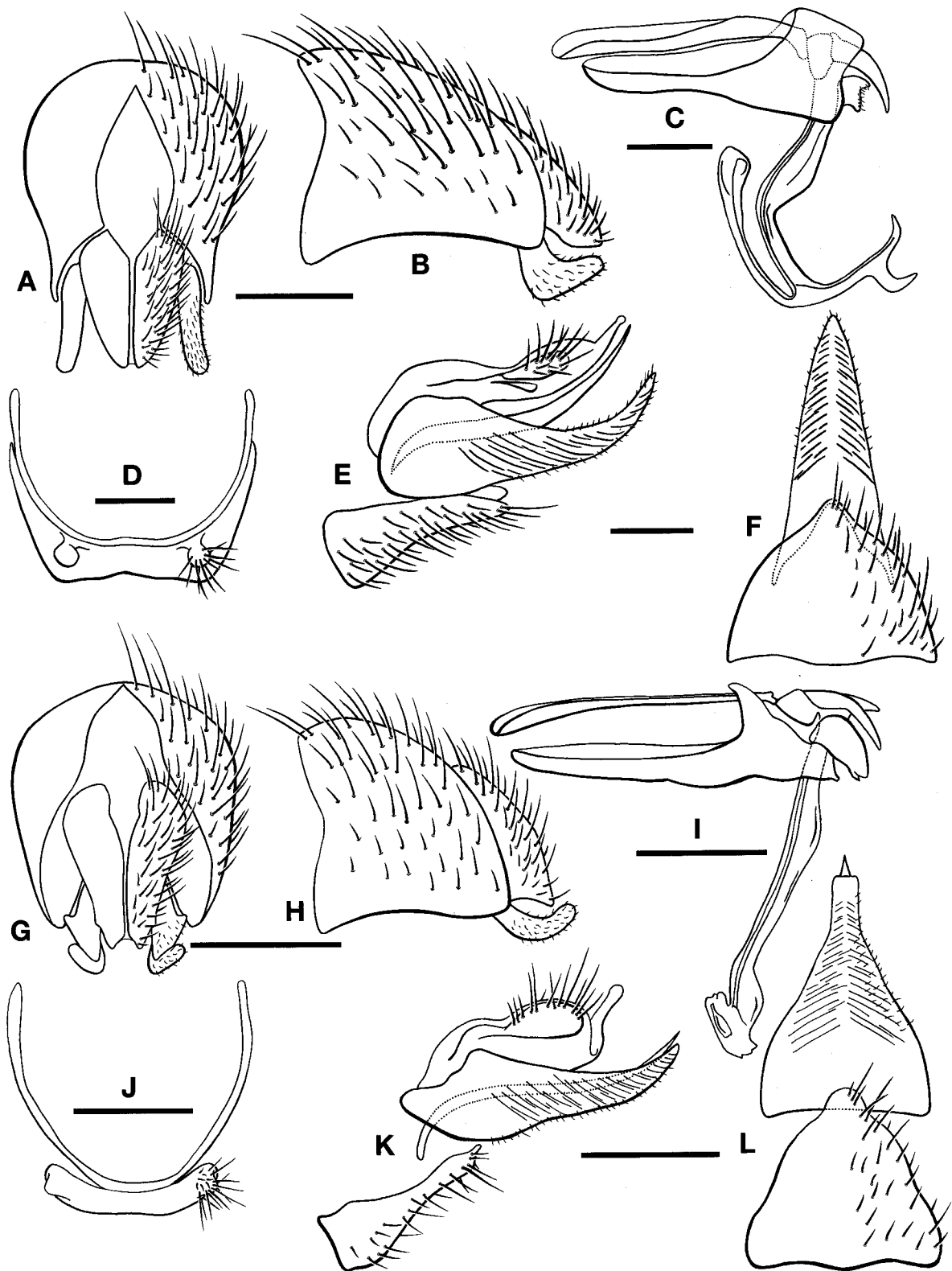


Fig. 3. *Phasia aurigera*. A, male epandrial complex, caudal view; B, ditto, lateral view; C, male hypandrial complex, lateral view; D, male sternite 5-6; E, female terminalia, lateral view; F, ditto, ventral view. *Phasia takanoi*. G, male epandrial complex, caudal view; H, ditto, lateral view; I, male hypandrial complex, lateral view; J, male sternite 5-6; K, female terminalia, lateral view; L, ditto, ventral view. Scale bars=0.5 mm.

riorly bare; mid and hind coxa black; trochanter brownish black; fore femur ventrally and laterally with yellowish white setulae; midfemur ventrally and posterodorsally yellowish white setulae on basal 1/3; hind femur black, dorsally with dense black setulae, with whitish yellow setulae on basal 1/3; fore tibia apically with 1 dorsal seta; midtibia black, medially with 1 anterodorsal and 1 ventral setae, and apically with 1 dorsal, 1 anterodorsal, 1 anterior, 1 anteroventral, 1 ventral, 1 posteroventral and 1 posterior setae; hind tibia black with 5 anterodorsal and 5 posterodorsal setae; tarsus ventrally with brown longitudinal band; claws brownish black with back apex; pulvillus yellowish brown. Abdomen (Fig. 2A, B) black, strongly shiny; tergite 1 except middorsal depression and lateral areas of tergites 2-4 with gray pruinosity; tergite 5 laterally with yellow pruinosity; tergite 6 with yellow pruinosity. Genitalia (Fig. 3D-F, J) dark brown in ground color; syncercus apically with strong notch; surstylus strongly bent dorsally; hypandrium as long as phallus; epiphallus, pregonite well developed; postgonite pointed, bent ventrally; distiphallus strongly bent ventrally.

Female (Figs. 2C, D, G, H; 3K, L) usually smaller than male with clear wings; sternite 7 (ovipositor sheath) longer than sternite 6, abruptly tapered, posterior margin straight in ventral view, with linear wrinkles ventrally, and bent dorsally; sternite 8 (ovipositor) bent dorsally. Lengths and ratios: body length 8.40-8.75 mm; wing length 6.70-7.40 mm; eye ratio 0.56-0.57; gena-eye ratio 0.31-0.32; arista-antenna ratio 1.40-1.42; wing-mesonotum ratio 2.28-2.31; petiole ratio 2.80-2.90; vein M ratio 0.71-0.78.

Distribution. Russia, Korea and Japan

Host. Shima (1999) reported their host species *Medina scotti* Puton of Pentatomidae.

Remarks. See remarks of *P. aurigera*.

ACKNOWLEDGEMENTS

We appreciate K.-E. Ro, D.-S. Choi, H.-W. Byun, S.-K. Kim, H.-S. Lee, O.-Y. Lim, S.-W. Suk, J.-S. Lim, J.-M. Jung, Y.-B. Lee and H.-S. Lee for their assistance to collect Korean *Phasia* specimens deposited in Yonsei University, Wonju Campus. This study was supported by the Korean Ministry of Environment (the Eco-technopia 21 Project and the Project on Survey and Excavation of Korean Indigenous Species, NIBR).

REFERENCES

- Baer, W., 1921. Die Tachinen als Schmarotzer der schädlichen Insekten. Ihre Lebensweise, wirtschaftliche Bedeutung und systematische Kennzeichnung (Schluß). Zeitschrift für angewandte Entomologie, 7: 349-423.
- Bezzi, M. and P. Stein, 1907. Cyclorhapha Aschiza. Cyclorhapha Schizophora. In Becker, T., M. Bezzi, K. Kertész and P. Stein, eds., Katalog der Palaarktischen Dipteren, Budapest, 3: 1-828.
- Draber-Mońko, A., 1965. Monographie der palaarktischen Arten der Gattung *Alophora* R.-D. (Diptera, Larvaevoridae). Annales Zoologici, 23: 69-194
- Draber-Mońko, A., 2008. State of knowledge of the tachinid fauna of Eastern Asia, with new data from North Korea, Part I. Phasiinae. Fragmenta Faunistica, 51(2): 119-137.
- Dupuis, C., 1949a. Contributions à l'étude des Phasiinae cimicophages-VI. Notes synonymiques et systématiques sur les Phasiinae (Diptères Larvaevoridae). Bulletin du Muséum National d'Histoire Naturelle, 21: 243-247, 553-557.
- Dupuis, C., 1952. Contributions à l'étude des Phasiinae cimicophages-VIII. Notes biologiques et de orphologie larvaire sur la sous-tribu Allophorina. Annales de parasitologie humaine et compare, 24: 503-546.
- Dupuis, C., 1963. Essai monographique sur les Phasiinae. Mémoires Muséum National d'Histoire Naturelle, A(26): 1-461.
- Dupuis, C., 1985. Capacités de déplacement et longévité dans la nature de trios Phasiinae (Diptera: Tachinidae). Israel Journal of Entomology, 19: 55-59.
- Egger, J., 1860. Beschreibung neuer Zweiflügler. Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien, 10: 795-802.
- Girschner, E., 1887. Die europäischen Arten der Diptere ngattung *Alophora*. Zeitschrift die gesammten Naturwissenschaften, 60: 375-426.
- Han, H.Y. and A.L. Norrbom, 2005. A systematic revision of the New World species of *Trypeta* Meigen (Diptera: Tephritidae). Syst. Entomol., 30: 208-247.
- Herting, B. 1984. Catalogue of Palearctic Tachinidae (Diptera). Stuttgarter Beiträge zur Naturkunde, (A) 369: 1-228.
- Herting, B. and Á. Dely-Draskovits, 1993. Tachinidae. In Soós, Á. and L. Papp, eds., Catalog of Palearctic Diptera. Anthomyiidae-Tachinidae, Vol. 13. Hungarian Natural History Museum, Budapest, pp. 118-458.
- Kim, J.I., 1981. The faunistic study on the insects from Sundong-myeon, Namyangju-gun, Gyeonggi-do, Korea. Bulletin of the Korean Association for Conservation of Nature, Series III, pp. 329-367.
- Kim, J.I., 1996. Insects fauna of Coleoptera and Diptera from Mt. Pangtae in summer season. Department of Biology, Sungshin Women's University, 35: 163-180.
- Latreille, P.A., 1804. Tableau méthodique des Insectes. In: Nouveau dictionnaire d'histoire naturelle, appliqué aux arts, principalement à l'agriculture et à l'économie rurale et domestique, 24 (sec.3). Tableaux méthodiques d'histoire naturelle, Deterville, Paris, pp. 129-200.
- McAlpine, J.F., 1981. Morphology and terminology: adult, In McAlpine, J.F. et al., coordinators, Manual of Nearctic

- Diptera. Vol. 1. Research Branch, Agriculture Canada, Ottawa, pp. 9-63.
- O'hara, J.E., 2009. Annotated catalogue of the Tachinidae (Insecta: Diptera) of China. *Zootaxa*, 2190: 1-236.
- Palm, J., 1876. Beitrag zur Dipteren-Fauna Oesterreichs. Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien, 25: 411-422.
- Rohdendorf, B.B., 1933. Opredelitel much. Phasiinae. In Herausgegeben von A.A. Stackelberg, Opredelitel much evropejskoj casti SSSR, Leningrad, pp. 705-713.
- Rohdendorf, B.B., 1947. A short guide for determining the Dipterous parasites of *Eurygaster* and other Pentatomid bugs. In Fedotov, D.M., ed., *Vrednaya tsherepashka*, 2: 85-100 (in Russian).
- Rondani, C., 1862. Dipterologiae Italicae prodromus. Species Italicae ordinis dipterorum in genera characteribus definite, ordinatim collectae, method analitica distinctae, et novis vel minus cognitis descriptis. Pars quarta: Muscodae Phasiinae-Dexinae-Muscinae-Stomoxidinae. *Parmae*, 5: 1-239.
- Schiner, J.R., 1869b. *Alophora Kriechbaumeri* eine neue Phasien-Art aus Tyrol. Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien, 19: 841-842.
- Stein, P., 1924. Die verbreitetsten Tachiniden Mitteleuropas nach ihren Gattungen und Arten. *Archiv für Naturgeschichte*, 90: 1-271.
- Sun, X. and S.A. Marshall, 2003. Systematics of *Phasia* Latreille (Diptera: Tachinidae). *Zootaxa*, 276: 1-320.

Received November 9, 2009
Accepted November 4, 2009