

## Three Species of Drosophilidae from South Korea\*

By Toyohi Okada\*\* and Yong Jai Chung\*\*\*

*Amiota (Amiota) alboguttata*, forma *koreana* f. nov. (Fig. 1, A, B)

Male: Body black, about 3.5 mm in length. Antenna with 2nd joint dark reddish brown; 3rd elongate elliptical, dark brown, about 2.5 times as long as broad. Arista with about 8-9 long branches, fork apparently absent, ventral branches about 3-4, usually as long as the dorsal ones. Humerals 1 long and 2 minute. Cross distance of dorsocentrals about thrice the length distance. Legs yellow. 3rd costal section of the wing with heavy bristles on its basal 2/3, and about 25 minute wart-like bristles on its distal half.  $R_{4+5}$  and M weakly convergent distally, 4th costal section about 0.9 times as long as the posterior cross-vein. C-index about 1.8, 4V-index about 2.0, 4C-index about 1.4, 5x-index about 1.1 or less. 1st costal section with 1 long and 1 shorter apical spines.

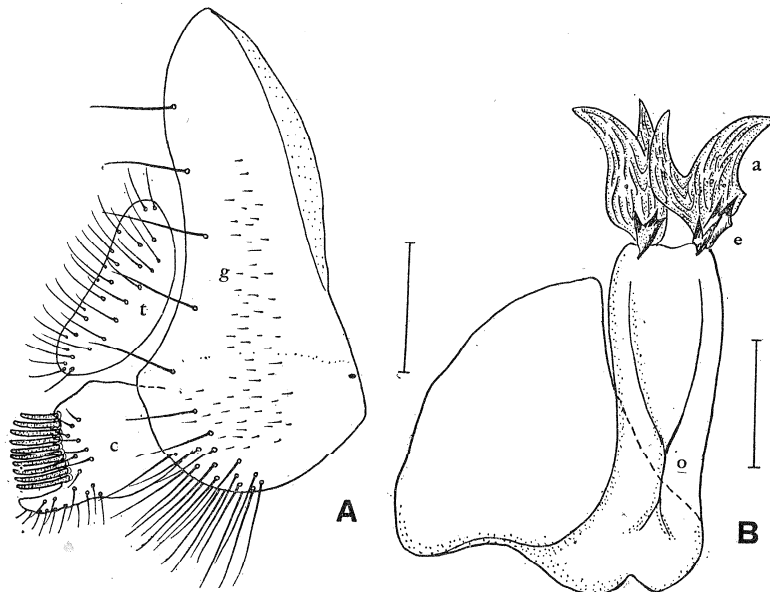


Fig. 1. *Amiota (Amiota) alboguttata*, forma *koreana*, f. nov.  
A. Periphallallic organs (lateral aspect). B. Phallic organs (dorsal aspect). a, anterior paramere; c, clasper; e, aedeagus; g, genital arch; o, apodeme of aedeagus; t, anal plate. Scale 0.1 mm.

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Periphallitic organs (Fig. 1, A): Genital arch black, narrowing above; heel low, rectangular; toe broad and rounded; upper margin with about 5, lower portion with about 20 hairs. Anal plate yellow, elliptical, pubescent and hairy. Clasper pale yellow, longer than broad, with minute hairs on outer, inner and ventral surfaces, lower caudal corner exceedingly projected like a finger; distally with about 10 long black teeth, arranged in a straight row, upper teeth slightly shorter.

Phallic organs (Fig. 1, B): Aedeagus minute, divided, each lobe with about 3 black pointed apices and closely apposed to the base of anterior paramere, which is black, striated, apically bifurcated in a thick V-shape. Apodeme of aedeagus pale brown, distally broaden like a fan.

Specimens examined: 1 male, Mt. Sul-Ak, Kang-Won Province, 16 VII 1959, collected at human eye (Chung).

Distribution: South Korea.

Remarks: Different from a European form of this species in having long ventral branches of arista, large V-shaped anterior parameres, ventrally broadened genital arch, and well developed finger-like process of the clasper. Different from the Japanese forms in having no stout setae on the outer surface of clasper, and in the structures of aedeagus and anterior parameres. It is tentatively treated as a forma of *A. alboguttata* (Wahlberg).

*Liodrosophila castanea* sp. nov. (Fig. 2, A-E)

Male and female: Body about 2 mm, glossy castaneous brown, with black abdomen. Head slightly broader than thorax. Eye dark red, rounded, and very sparsely pubescent. Antenna dark brown, 2nd joint paler at base, 3rd oval. Arista with about 8-9 rather long branches including a moderate fork, 2 long branches below it. Palpus slender, dark brown, with 1 long apical bristle. Ocellar triangle brownish black. Periorbits dark brown, glossy, caudally broaden to end slightly before the anterior margin of front. Labella dark brown. Front glossy dark brown, slightly bluish, flat, quadrate, slightly broader than the half head width at the level of ocellar triangle, and about twice as broad as median length. No frontal hairs. Face broad, brown, rounded at side view. Carina brown, high but short. Cheek brown, about 1/6 as broad as the greatest diameter of eye. Occiput brown.  $orb_3$  minute,  $orb_3$  about  $2/3 orb_1$ .  $orb_2$  situated just between  $orb_3$  and  $orb_1$ .  $orb_2$  about half the length of vibrissa.

Mesonotum glossy castaneous brown, highly convex, caudal half darker and bluish, without microtrichia. Scutellum dark brownish black. Thoracic pleura dark brown, ventrally darker, and somewhat paler below notopleurals, and with a dark longitudinal stripe running from propleura through the upper half of humerus to the notopleural region. Acrostichals in 6 rows. Cross distance of dorsocentrals slightly broader than twice the length distance. Anterior dorsocentrals about  $2/3$  length of the posterior ones. Anterior scutellars convergent (?), short, about  $3/5$  length of the posterior ones, and inserted rather near the base of scutellum. Sterno-index about 0.8. Legs pale yellowish brown, fore coxa and femur brownish black. Fore femur with

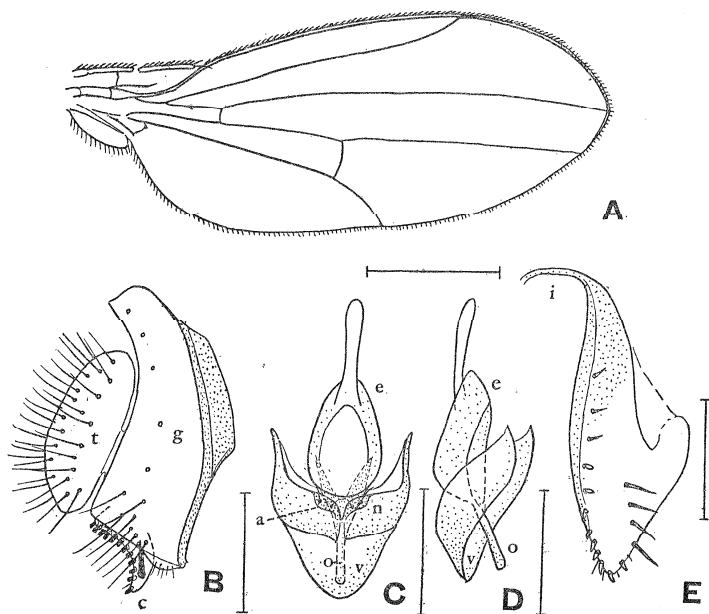


Fig. 2. *Liodrosophila castanea* sp. nov.  
 A. Wing. B.Periphallic organs (lateral aspect). C. Phallic organs (ventral aspect). D. ibid. (lateral aspect). E. Egg-guide. a, anterior paramere; c, clasper; e, aedeagus; g, genital arch; i, basal isthmus; n, novasternum; o, apodeme of aedeagus; t, anal plate; v, ventral fragma. Scale 0.5mm in A, 0.1mm in B-E.

about 10 black short bristles on the inner margin. Preapicals on all three tibiae, apicals on 2nd. Wings (Fig. 2, A) hyaline, somewhat slender and apically pointed, with dense microtrichia.  $R_{4+5}$  and M parallel, only slightly convergent at tips. Crossveins clear, posterior crossvein slightly convexed. Fore tibia with a few upright hairs on the anterior margin. Metatarsus subequal in length to the 3 succeeding tarsal joints taken together. C-index about 1.4, 4V-index about 2.0, 4C-index about 1.6, 5x-index about 1.6. 1st costal section with 2 apical stout setae, upper one shorter. 3rd costal section with heavy bristles on its basal 3/5. Halteres white.

Abdominal tergites entirely glossy black, somewhat purplish. Abdominal sternites with black and quadrate wplates.

Periphallic organs (Fig. 2, B): Genital arch brownish black, broader below; heel low and acute-angular; toe rectangular; ventral margin nearly straight; upper caudal margin with about 6 long hairs, lower portion with about 10. Clasper brownish black, crescent, with a large flat scaly spine near the apex on the inner surface, and distally with about 12 black truncate teeth arranged

in a concaved row. Anal plate brownish black, elliptical, hairy, obscurely contiguous with genital arch at middle.

Phallic organs (Fig. 2, C, D): Aedeagus yellowish brown, oval at ventral view, oblong at side view, apically with a hyaline elongate club-shaped process. Apodeme of aedeagus black, slender, much shorter than the aedeagus. Ventral fragma triangular, medially brown and marginally black. Novasternum brown, quadrate, lateral arm tapering; median notch shallow but acute. Anterior parameres minute, crescent, dark brown, fused with novasternum, and each paramere with 1 or 2 minute sensilla. Posterior parameres seem to be absent.

Egg-guides (Fig. 2, E): Lobe orange brown, basally greyish, lower margin dark brown, distally and proximally narrowing, somewhat pointed apically. Teeth orange brown, marginal teeth about 13-14, apical tooth longest; discal teeth about 3, long. Basal isthmus narrow and straight.

Holotype\*: Male, Huk-San Is., Chon-Nam Province, 15 VIII 1959, collected by fruit-trap (Chung).

Allotype\*: Female, collected together with the holotype.

Other specimens examined: 9♂♂, 9♀♀, collected together with the holotype.

Distribution: South Korea.

Relationships: Closely resembles *L. aerea* Okada from Japan especially in the structures of phallic organs and egg-guides and in the coloration of legs, but differs from the latter in the thoracic coloration and the shape of genital arch.

*Drosophila (Drosophila) raridentata* sp. nov. (Fig. 3, A-C)

Male: Body about 2.3 mm, yellowish brown, abdomen paler and with interrupted caudal black bands. Eye red, oval and somewhat pentagonal, roughly pubescent, with its longitudinal axis anteroventrally oblique to the head axis. Antenna with 2nd joint yellow, 3rd brown and exceedingly broaden below. Arista with about 7 rather short branches, 1 subapical below small fork. Palpus yellow, oval, thick, with 1 prominent subapical seta and a few shorter ventral setae. Ocellar triangle brownish black. Ocellars as long as  $orb_3$ . Periorbits paler than front, not reaching frontal margin, and with a few short hairs arranged along eye margin. Front very broad, flat, greyish brown, slightly narrower than half the head width at the level of ocellars, slightly narrowing below, and with a few prominent frontal hairs. Face yellowish grey, flat; carina flat. Cheek yellowish grey, about 1/5 as broad as the greatest diameter of eye. Occiput brownish black.  $orb_2$  about 1/3 length of  $orb_1$ ;  $orb_3$  as long as  $orb_1$  and situated inside  $orb_2$ , which is much nearer to  $orb_3$  than to  $orb_1$ ,  $or_2$  about 1/3 vibrissa,  $or_3$  as long as  $or_2$ .

Mesonotum yellowish brown, narrower than head in width, and exceedingly flat at side view. Scutellum yellowish brown. Thoracic pleura yellowish

\* The types are deposited at the Department of Biology, Tokyo Metropolitan University.

brown, with 3 diffuse longitudinal black stripes, median stripe broaden distally.

2 long humerals, subequal in length. Acrostichals in 6 rows. Anterior dosocentrals less than half length of posterior ones, cross distance of dorso-centrals over 1.5 times the length distance. Anterior scutellars divergent, less than half length of posterior ones, situated nearer to the base of scutellum than to the posterior scutellars. Sterno-index about 0.5. Legs yellow, metatarsus subequal in length to the 3 succeeding tarsal joints taken together. Preapicals on all 3 tibiae, apicals on 2nd. Wings hyaline,  $R_{4+5}$  and M nearly parallel. Costa weaken beyond tip of  $R_{4+5}$ . C-index about 2.1, 4V-index about 2.7, 4C-index about 1.5. 5x-index about 3.3. 1st costal section with 2 stout apical bristles, 3rd costal section with heavy bristles on its basal about half. Halteres yellow, stem with a black patch on its anterior margin.

Abdominal tergite pale yellowish brown, with a medially broadly interrupted caudal black band, which is narrowing above and broaden laterally. Abdominal sternite white.

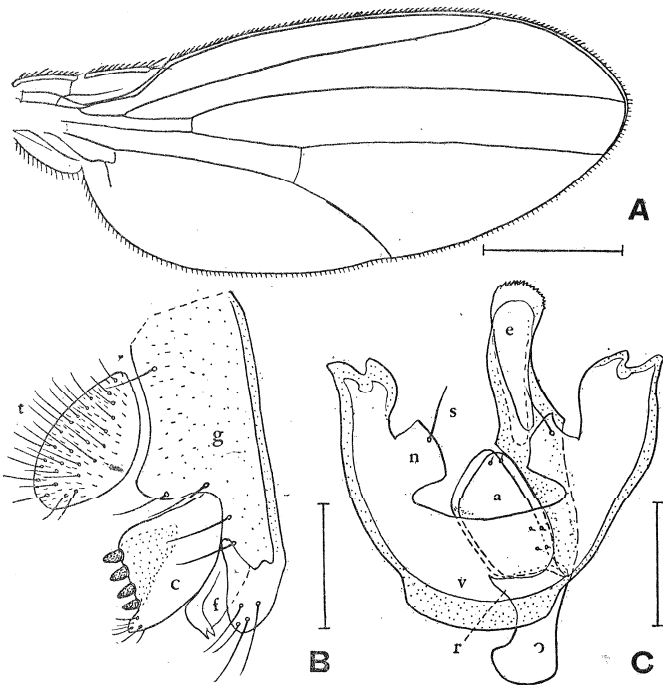


Fig. 3. *Drosophila (Drosophila) raridentata* sp. nov.

A. Wing. B. Periphallal organs (lateral aspect). C. Phallic organs (ventral aspect). a, anterior paramere; c, clasper; 3, aedeagus; f, finger-like appendage (2ndary clasper?); g, genital arch; n, novasternum; o, apodeme of aedeagus; r, vertical rod; s, submedian spine; t, anal plate; v, ventral fragma. Scale 0.5 mm in A, 0.1 mm in B, C.

Periphallalic organs (Fig. 3, B): Genital arch broad, black above, narrowing and whitish below, abruptly concaved at middle of the posterior margin at the insertion of clasper; upper caudal margin with about 4 hairs, lower tip finger-like and with several hairs. Between the finger-like process and the clasper there is an oblong whitish yellow apically curved process, which seems to correspond to the 2ndary clasper. Primary clasper large, quadrate, and with about 4 large black somewhat blunt teeth on the distal margin; caudoventral tip of clasper projected like a finger, which is pale, setigerous and longer than the teeth. Anal plate white, thick, fusiform, pubescent and hairy, and separated from the genital arch.

Phallic organs (Fig. 3, C): Aedeagus pale yellowish grey, slender, straight, medio-laterally swollen triangularly, apically hyaline, rounded, curved dorsally, and with fine serrations. Apodeme of aedeagus pale, thick, and about  $1/2.5$  length of aedeagus. Ventral fragma hyaline, semicircular, darker at margin, lateral arm bifid at tip. Novasternum or hypandrial plate hyaline, quadrate and with a long seta. Anterior parameres large, quadrate, pale, vertical to the ventral fragma, and each paramere with an apical and 2 basal sensilla on the ventral margin. Posterior parameres obscure. Vertical rod triangular, as long as apodeme of aedeagus, giving a base of attachment to the anterior parameres.

Holotype\*: Male, Mt. Sul-Ak, Kang-Won Province, 17 VII 1959, collected at a mushroom (Chung).

Distribution: South Korea.

Relationships: This species is characteristic in having combined features of the subgenera *Dorsilopha* and *Drosophila* s. str., resembling the former subgenus in broad and flat front, exceedingly oblique eye, flat meconotum, and broad head which is broader than thorax, and also resembling the latter subgenus in well developed preapicals on all tibiae, and in the general features of phallic organs. It also resembles subgenus *Hirtodrosophila* in having only 1 ventral branch of arista, and even genus *Micradrosophila* in having flat meconotum and comparatively anteriorly placed anterior dorsocentrals. It seems to be the best at present to place this species in the *quinaria* section of the subgenus *Drosophila*, chiefly judging from the structures of periphallalic and phallic organs.