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A Revision of the Japanese Species of *Homoneura* (*Homoneura*) (Diptera, Lauxaniidae) Part 1*

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Synopsis The known Japanese species of *Homoneura*, s. str., have been revised. Six new species, *H. hymenophallus*, *panniculata*, *repanda*, *spinicauda*, *spinosa* and *yamagishii*, are described. Four species are synonymized, 3 of which hitherto have been assigned to the Tephritidae. The biology of 2 reared species, *euaresta* and *unguiculata*, is presented.

The genus *Homoneura* spreads widely in the world except New Zealand and South America (HARRISON, 1959; STUCKENBERG, 1971). It is a dominant genus of the family Lauxaniidae in the Oriental region and next to the genus *Sapromyza* in the Palaearctic region (CZERNY, 1932; SHEWELL, 1977).

The first species described from Japan and belonging to *Homoneura* was *Sapromyza euaresta* COQUILLETT (1898). Five additional species: *extera* CZERNY, *hirayamae* MATSUMURA, *interstincta* FALLÉN, *japonica* CZERNY and *unguiculata* KERTÉSZ have been recorded by MATSUMURA (1916), CZERNY (1932), SASAKAWA (1965), SHEWELL (1977), and IKEUCHI and SASAKAWA (1978), but *japonica* is considered to be a synonym of *unguiculata* as discussed below. Although the type-specimens are lost now, three tephritid species described by MATSUMURA (1916) and SHINJI (1939) will also belong to *Homoneura* as far as we understand from the original descriptions.

We were able to have a chance to examine materials, more than 2,000 specimens, which are preserved in some entomological institutions, for this study. We have had also the biological observation on a few species under laboratory condition. The present study is an attempt for further understanding of the Japanese *Homoneura* by a study of all material available to us and the presentation of descriptions and figures of the male and female genitalia.

Homoneura, s. str., can be subdivided into two groups by the plumosity of arista. In the present paper, redescriptions or diagnosis of three known species and nine newly recorded species, and descriptions of six new species belong to the first group which is provided with long-plumose arista, are given. We are going to treat of the second group and phylogeny in the next paper.

We wish to express our cordial thanks to Drs. T. KUMATA and M. SUWA of Hokkaido University, Dr. T. OKADOME of Meijo University, Dr. Y. HIRASHIMA,

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1. *Homoneura euaresta* (COQUILLETT)

Sapromyza euaresta COQUILLETT, 1898, Proc. U. S. Nat. Mus. **21**: 340.
Homoneura euaresta (COQU.): CZERNY, 1932, Die Flieg. palaearkt. Reg. **50**: 13; IKEUCHI & SASAKAWA, 1978, Akitu, *N. Ser.* 17: 1.
Tephritis hirayamae MATSUMURA, 1916, Thousand Insects Japan (Addit.) **2**: 424 (Pl. 23, Fig. 19). **N. syn.**
Euceriella flavopunctata SHINJI, 1939, Insect World **43**: 354 (Pl. 1, Fig. 9). **N. syn.**

Diagnosis. This grayish species is wide-spread throughout Japan, and can be easily separated from all other species by its brown wings marked with numerous whitish-hyaline spots, brown irregular spots or patches on thorax and 3 subtriangular flecks on abdominal tergites 2–6. Males have 3 spinose processes on surstyli.

Remarks. We have not examined the types of *Tephritis hirayamae* and *Euceriella flavopunctata* which are now evidently lost, but suspect that they are *euaresta* by the descriptions and figures of characteristic wings.

Specimens examined. Many males and females from Hokkaido, Honshu (Tochigi, Shiga, Kyoto, Wakayama, Okayama and Tottori Prefectures), Shikoku (Ehime Pref.) and Kyushu (Fukuoka Pref.) collected by ourselves.

Distribution. Japan.

Biology. Two generations in a year; flight period of adults begins in March and extends to October in Kyoto City, with peaks in mid-March and mid-October. The mean durations of egg, larval, pupal and adult periods are as follows: 4.3 (2–12), 11.0 (9–17), 12.4 (6–17) and 30.7 (21–43) days, respectively, under laboratory condition (25°C).

Characters of immature stages. The egg is netty on surface, and provided with 6 ridges running along long axis. The egg of *unguiculata* is also 6-carinated, but the area between ridges is covered with minute tubercles and appears to be striated perpendicularly to long axis as a whole. The pores of micropyle are slightly larger than others on the surface. Micropyle of *unguiculata* is consisted of 16 pores. The mouth hook of 3rd instar larva of *euaresta* has 1 terminal tooth, while in *unguiculata* a low and blunt tooth in addition to terminal one. Anterior spiracle of 3rd instar larva has 12 (10–14) spiracular openings, while in *unguiculata* 8 (7–10) openings.

2. *Homoneura quinquevittata* (DE MEIJERE)

Lauxania quinquevittata DE MEIJERE, 1910, Tijdschr. Ent. **53**: 135.
Sciomyza septemlineata BRUNETTI, 1913, Rec. Indian Mus. **8**: 178.

Diagnosis. This species is characterized by having the frontalia, 1st and 2nd antennal segments, palpus, 3 stripes on testaceous mesonotum and 2 stripes on whitish yellow pleura brown, and the wings distinctly maculated with dark brown.

Other main characters are as follows: Face with 2 brown spots near ventral margin; 3rd antennal segment yellow, about 1.5 times as long as wide, distinctly narrowing apically, arista with longest hair about 1/2 width of 3rd segment; legs whitish; abdominal tergites 2–6 largely dark brown except anterolateral spots yellowish.

Specimen examined. 1♀, Nagura, Ishigaki-jima, 9. IV. 1981, Y. YOSHIYASU.

Distribution. Formosa, India, Japan (Ryukyus), Java, Nepal, Philippines, Sumatra. New to Japan.

3. ***Homoneura hymenophallus*** SASAKAWA et IKEUCHI, n. sp.

Diagnosis. This slightly shining testaceous yellow species, with anteriorly darkened wings, is readily distinguishable from the Chinese *grahami* MALLOCH by having cross-vein r-m clear; males with processus longus being small and L-shaped.

Description. Body length 3.5–4.1 mm, wing length 3.4–4.0 mm. Ocellar triangle slightly brownish at middle; occiput ventrally and arista brown; parafacialia and gena whitish pruinose; thoracic pleura paler; wing with anterior margin pale brown, extending posteriorly anterior half of cell R_3 and apical cloud (1/4 of whole length of wing, sometimes paler at middle between apices of R_{4+5} and M_{1+2}), m-m distinctly clouded; coxae whitish; abdomen testaceous.

Frons as wide as long, almost 1.6 times as wide as eye, slightly diverging ventrally; *oc* longer than anterior *or*; gena 1/5 height of eye; 3rd antennal segment about twice as long as wide, narrowing apically; arista with longest hair 3/5–4/5 width of 3rd antennal segment.

Mesonotum with 0+3 *dc*, *acr* in 6 rows, *prsc* shorter than 1st *dc*. Costa with 2nd, 3rd and 4th sections in proportion of 30(28–32) : 10 : 5.5(5–6); r-m almost at middle of discal cell; ultimate section of M_{1+2} 1.5–1.9 times as long as the penultimate; ultimate section of M_{3+4} about 1/4 of penultimate. Fore femoral ctenidium weak, rather sparsely arranged; mid tibia with 2 spurs.

Genitalia: Epandrium blackish on each posteroventral corner, cerci brown, processus longus shiny brown, small and projected posteriorly; hypandrium of normal form; gonapophysis undeveloped; aedeagus largely membranous on ventral side, bearing a pair of spinose small sclerites, and with a pair of sclerites on dorsal side narrow and weakly bifurcated at posterior apices. Sixth abdominal sternite of male weakly concave on posterior margin; 9th sternite of female subquadrate; spermathecae 100 or 125 μ in diameter.

Distribution. Japan (Honshu).

Holotype ♂ (KPU 215), Ashiu, Kyoto Pref., 5. VI. 1977, O. MORIHARA. Paratypes: 2♂, 1♀, same locality as holotype, 4–6. VI. 1977, MORIHARA; 9♂, Hanase, Kyoto, 3–7. VII. 1977, IKEUCHI & MORIHARA; 3♂, Hanase, 14–17. VII. 1977, IKEUCHI; 1♂, Mt. Senjyozan, Daisen, Tottori Pref., 31. V. 1974, Y. SHIOZAWA.

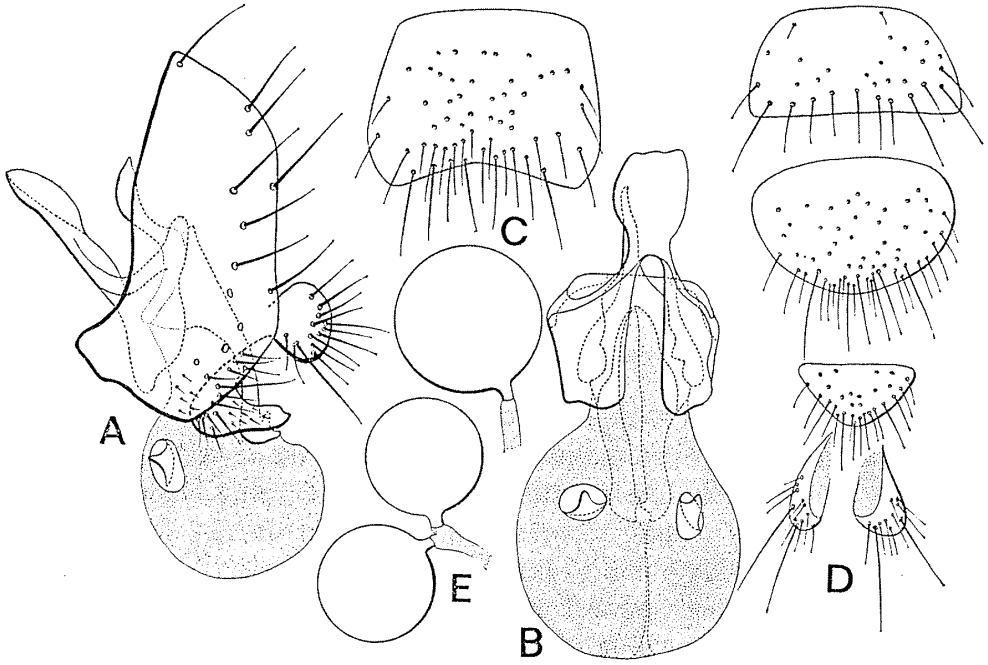

Fig. 1. Male and female genitalia of *Homoneura hymenophallus* n. sp. A, Epandrium and phallus, lateral view; B, hypandrium and phallus, ventral view; C, 6th abdominal sternite of male; D, 8–10th sternites of female; E, spermathecae.

4. *Homoneura striatifrons* (DE MEIJERE)

Lauxania striatifrons DE MEIJERE, 1924, Tijdschr. Ent. **67** (Suppl.): 52.

Diagnosis. This species is characterized by the four conspicuously large brown marks on the wing, a brown spot on each parafacialia on level of antennal bases and brown stripe along ventral margin of face.

Other main characters are as follows: Testaceous; 3rd antennal segment a little longer than wide, arista with longest hair about 1/2 width of 3rd antennal segment; mesonotum with median stripe between rows of *dc* divided into two by gray-dusted stripe, extending posteriorly scutellum, and lateral stripes extending from dorsal parts of humeri to bases of post-alar bristles; *acr* in 8 rows; wing 3.9–5.0 mm long; abdominal tergites 2–6 with posterior margins fuscous.

Genitalia: Epandrium projected roundly on each posteroventral corner, processus longus slender; hypandrium with side pieces narrow, broadened at base; aedeagus with lateral sclerites pointed apically; ejaculatory apodeme 90 μ long. Spermathecae 105 or 120 μ in diameter.

Discussion. Testaceous yellow frons has a pair of brown stripes along parafrontalia, but this character is commonly found in other species.

Specimens examined. AMAMI-OSHIMA: 1♀, Santaro-toge, 26. VII. 1954, S. MIYAMOTO & Y. HIRASHIMA; 6♂, 8♀, Mt. Yuwandake, 7–9. IV. 1956, 17. VII.,

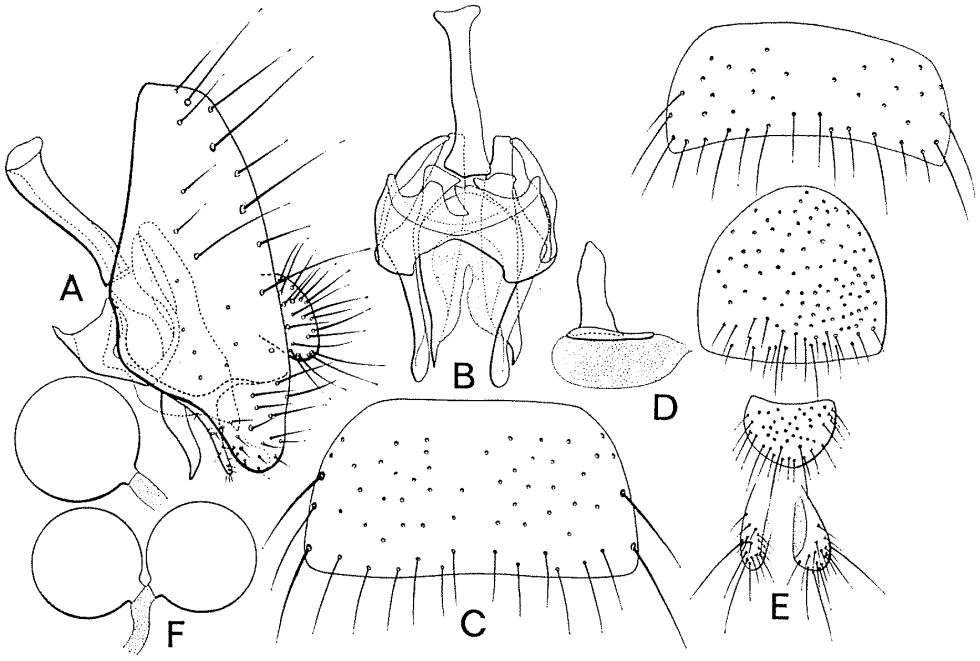

Fig. 2. Male and female genitalia of *Homoneura striatifrons* (DE MEIJERE). A, Epandrium and phallus, lateral view; B, hypandrium and phallus, ventral view: C, 6th abdominal sternite of male; D, ejaculatory apodeme; E, 8–10th sternites of female; F, spermathecae.

29–31. VII. & 6–7. VIII. 1963, 25. VI. 1971, S. MIYAMOTO, S. ITO, T. OKADA, M. T. CHUJO; 2♂, Hatsuno, 11. XI. 1962, A. AZIM & Y. MIYATAKE; 2♀, Ookawa, 22. VII. 1963, Y. KUROSAWA; 1♂, Nase, 3. VIII. 1963, T. OKADA; 1♀, 1♂, 27. IV. 1967, M. SUWA. OKINAWA-HONTO: 1♀, Yona, 16–18. VIII. 1958, T. HIDAKA; 1♂, Yona-Hedo, 14. XI. 1960, K. YASUMATSU; 1♂, Benoki, 15. IV. 1981, Y. YOSHIYASU.

Distribution. Japan (Ryukyus), Java. New to Japan.

5. *Homoneura albomarginata* CZERNY

Homoneura albomarginata CZERNY, 1932, Die Flieg. palaearkt. Reg. **50**: 11.

Diagnosis. This species is unique in the coloration of thorax, wing and palpus.

Main characters are as follows: Yellow to testaceous yellow; frons wider than long, a little less than twice as wide as eye; 3rd antennal segment twice as long as wide, arista with longest hair almost as long as width of 3rd segment; palpus with apical half dark brown; mesonotum quadrivittate, median pair of stripes (rarely united with each other) between rows of *dc* and lateral pair from dorsal margin of humeri to posterolateral corners of notum and another stripe along lower margin of notopleura; *acr* in 4–6 irregular rows. Wing 3.0–3.2 mm long; whitish except brown mark basally covering basal 1/2 of cell R_3 and posteriorly anterior 1/3 of discal cell, large apical spot on R_{2+3}, small preapical spot on R_{4+5}, broad transverse

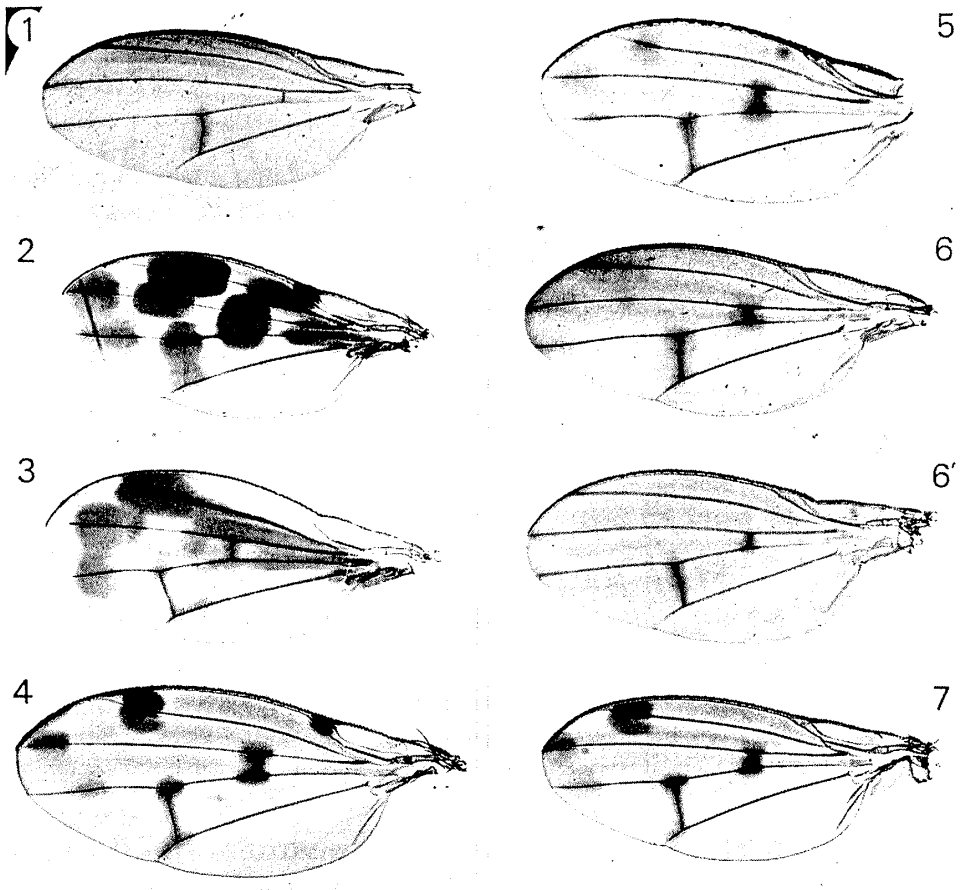

Fig. 3 (1–7). Wings. 1, *Homoneura hymenophallus* n. sp.; 2, *H. striatifrons* (DE MEIJ.); 3, *H. albomarginata* CZ.; 4, *H. stackelbergi* CZ.; 5, *H. brevicornis* (KERT.); 6 & 6′, *H. variinervis* (KERT.); 7, *H. spinicauda* n. sp.

preapical band extending beyond R_{4+5} and M_{1+2}, and mark around m-m; r-m beyond middle of discal cell. Spermathecae 60 or 75 μ in diameter.

Specimens examined. HOKKAIDO: 1♀, Onpetu, seaside, 31. VII. 1967, T. SAIGUSA; 3♀, Shari, seaside, Abashiri, 2. VIII. 1967, H. SHIMA; 1♀, Rubesu, Shibetsu, Nemuro, 25–28. VIII. 1971, K. YAMAGISHI. KURIL IS. — 1♀, Tiboi, Shikotan, 27. V. 1940, S. KUWAYAMA & Y. SUGIHARA; 3♀, Seseki, Kunashiri, 15. VIII. 1940, KUWAYAMA & SUGIHARA.

Distribution. Japan (Hokkaido), U.S.S.R. (Ussuri). New to Japan.

Remarks. The specimens from the Kuriles have a broad median stripe (not separated) between rows of *dc*; two lateral stripes are often connected with each other as a broad band.

6. *Homoneura hirayamae* (MATSUMURA)

Sapromyza hirayamae MATSUMURA, 1916, Thousand Insects Japan (Addit.) **2**: 425 (Pl. 23, Fig. 20).
Euceriella hemistriata SHINJI, 1939, Insect World **43**: 355 (Pl. 1, Fig. 8). **N. syn.**

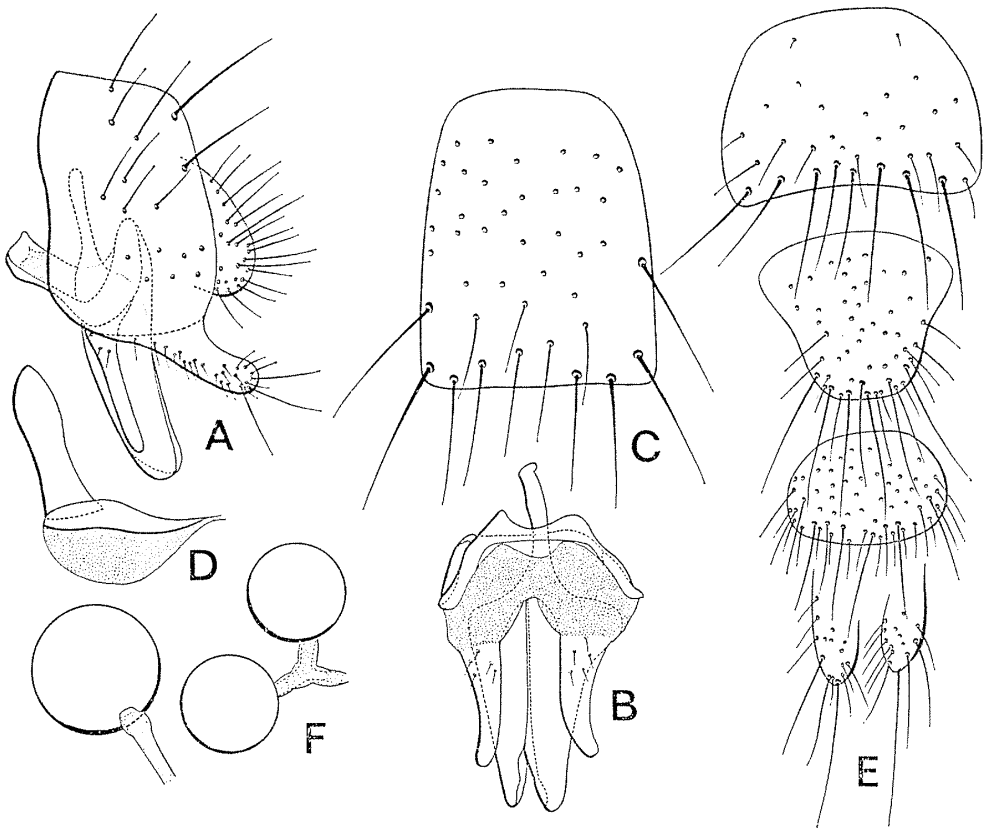

Fig. 4. Male and female genitalia of *Homoneura hirayamae* (MATSUMURA). Abbreviation: see Fig. 2.

Diagnosis. This large species can be distinguished by having the wing with median and apical broad bands. The males are unique in having entirely sclerotized aedeagus.

Redescription. Testaceous; face, gena, lateral sides of mesonotum and scutellum, and pleura yellowish; arista brown except base. Thorax and abdomen shining; abdominal tergites 2–5 usually with posterior margins narrowly fuscous. Wing pale brownish yellow cephalad of R_{4+5}, with spots on apices of Sc and R_1, R_{2+3}, R_{4+5} and M_{1+2}, apical 2nd and 3rd spots usually fused with each other, and a spot near base of R_{4+5} connected with cloud on m-m as a median oblique band and reaching posterior margin of wing; rarely clouded around r-m. Legs and halter testaceous yellow.

Frons as long as wide; *oc* longer than anterior *or*; arista with longest hair almost as long as width of 3rd antennal segment. Mesonotum with 0+3 *dc*, *acr* in 8 rows, all equal in length, *prsc* as long as 1st *dc*. Wing 5.0–5.6 mm long; r-m at or slightly before middle of discal cell, ultimate section of M_{1+2} 1.3–1.6 times as long as the penultimate. Mid tibia with 3 spurs.

Genitalia: Epandrium with surstylus distinctly projected, bearing 3 setae on

tip; hypandrium somewhat U-shaped; gonapophysis finger-like, with several setae near base; aedeagus entirely sclerotized; ejaculatory apodeme 130 μ long. Abdominal sternite 6 of male longer than broad; sternite 9 of female weakly constricted at middle; spermathecae 85 or 105 μ in diameter.

Types. Male, Takasago, and female, Ohokubo, 17. VII. (Hokkaido Univ.).

Specimens examined. 1♂, Nikko, 10. VIII. 1977, F. TAKAHASHI; 45♂, 64♀ Ashiu, Hanase & Midoroga-ike, Kyoto, 15. VI., 29. VI., 7–25. VII. & 8. X. 1978, SASAKAWA & IKEUCHI.

Distribution. Japan (Honshu).

Remarks. We have not examined the types of *Euceriella hemistriata* SHINJI which are now lost, but its description is agreeable with that of *hirayamae*.

7. *Homoneura bistriata* (KERTÉSZ)

Lauxania (*Minettia*) *bistriata* KERTÉSZ, 1915, Annals hist.-nat. Mus. natn. hung. **13**: 524.

Diagnosis. This species has a pair of brown stripes between each lateral two

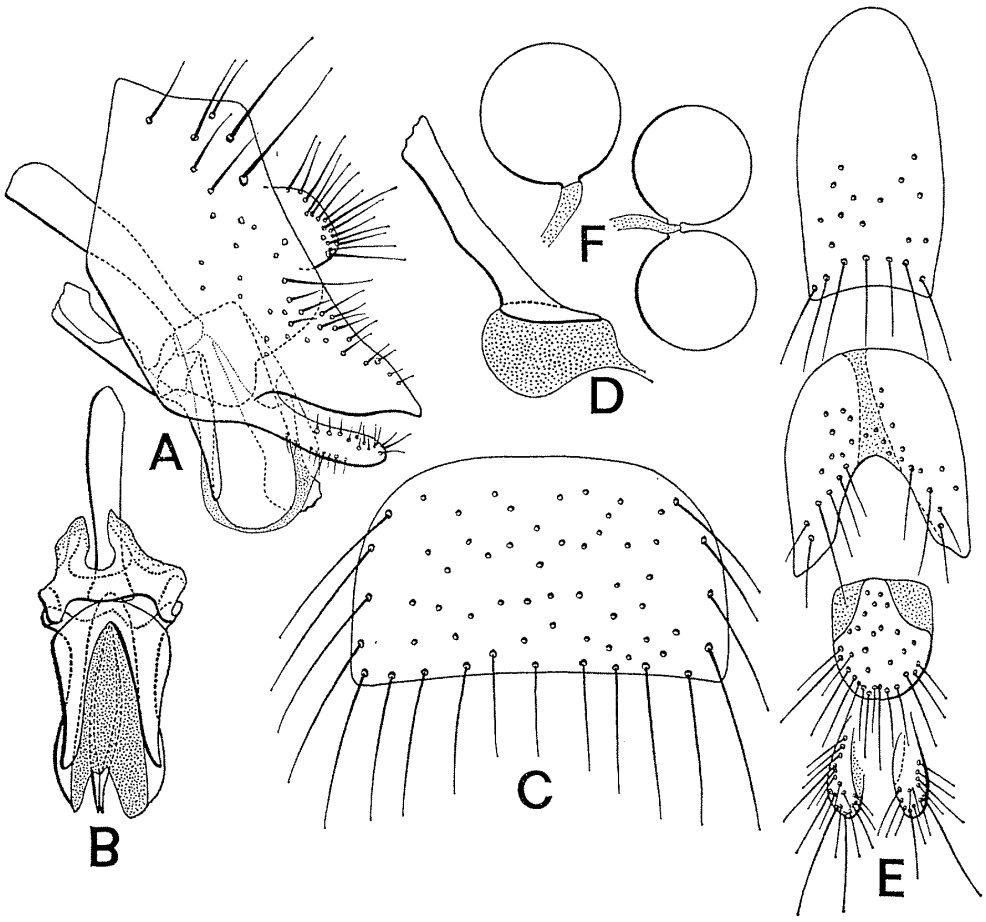

Fig. 5. Male and female genitalia of *Homoneura bistriata* (KERTÉSZ).

rows of acrostichal setae on the gray-dusted testaceous yellow mesonotum, preapical spot on R_{4+5}, connecting with apical spot on R_{2+3}, brown central stripe on abdominal tergites and black anteroventral processes before bases of projecting surstyli.

Other main characters are as follows: Frons and face flattened; antennae brown but ventral side of 1st segment, inner side of 2nd and base of 3rd paler; palpus with apical 1/3–1/2 brown. Legs yellow, hind knee narrowly brown.

Genitalia: Epandrium with ventral margin bifurcated into projecting surstylus and claviform process; hypandrium with side pieces very short and bifurcated anteriorly; gonapophysis rather long; aedeagus with lateral sclerites broad, dorsomedian sclerites broadened on distal half and weakly serrated on dorsal tips; ejacularoty apodeme 150 μ long. Eighth sternite of female is oblong, 9th deeply incised posteriorly and membranous along central line, 10th membranous lateroproximally; spermathecae 75 or 95 μ in diameter.

Discussion. The wing pattern of *bistriata* is similar to *striatifrons*, but *bistriata* lacks basal spot, and other spots are much smaller than those of *striatifrons*. In some specimens from the Ryukyus, preapical spot on R_{4+5} is isolated from apical spot on R_{2+3}, and apical spots on R_{4+5} and M_{1+2} are entirely separated from each other.

Specimens examined. 1♂, 3♀, Karimata, Miyako-jima, Ryukyus, 2. IX. 1958, T. HIDAKA & 19. X. 1963, S. UÉNO.

Distribution. Formosa, Japan (Ryukyus). New to Japan.

8. *Homoneura stackelbergi* CZERNY

Homoneura stackelbergi CZERNY, 1932, Die Flieg. palaearkt. Reg. **50**: 19.

Diagnosis. This species is separable from *bistriata* by lacking preapical spot on R_{4+5}, and by having short plumose arista (longest hair nearly 1/3 as long as width of 3rd antennal segment, while in *bistriata* as long as width of 3rd segment), broad gena (1/4 as high as eye, while in *bistriata* 1/6–1/8), and preapical spot at middle of ultimate section of M_{1+2}.

Other main characters are as follows: Ocellar triangle and occiput black, gray-pollinose; face with dorsal 2/3 and lateral margins linearly brown; 3rd antennal segment more or less brownish cephalad of insertion of arista; mesonotum with 5–6 pairs of median rows of acrostichals longer. Legs with coxae brown, femora more or less brownish but all knees yellow.

Genitalia: Surstylus projected backwards, with dorsal apex pointed; hypandrium with side pieces narrow; gonapophysis extended laterally; aedeagus with a ventral sclerite subtriangular and a pair of lateral sclerites pointed laterally at middle and dorsally on tip; ejaculatory apodeme 100 μ long. Sixth sternite of male is shallowly concave on posterior margin. Spermathecae are 60 or 70 μ in diameter.

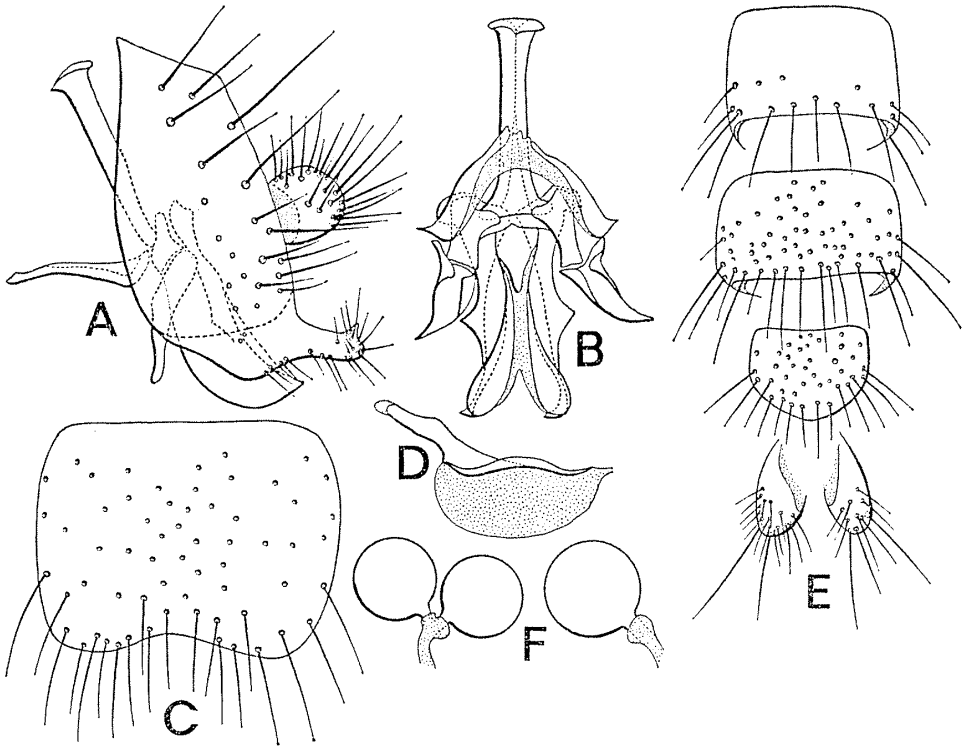

Fig. 6. Male and female genitalia of *Homoneura stackelbergi* CZERNY.

Discussion. This species is very similar to *brevicornis* KERTÉSZ, known from Formosa, but has 6 rows of acrostichals (4 rows in *brevicornis*) and longer wings, 3.5–4 mm. The brown stripes on the mesonotum and abdomen are usually opaque.

Specimens examined. 1♂, Tobira-toge, Nagano Pref., 23. VII. 1961, T. OKADOME: 4♂, 3♀, Kisokomagatake, Nagano Pref., 17–18. VI. 1967, T. KUNOU; 1♂, 2♀, Osaka (Hida), Gifu Pref., 6. V. 1972, K. YAMAGISHI; 1♂, Ashiu, Kyoto Pref., 5. VI. 1977, O. MORIHARA.

Distribution. Japan (Honshu), U.S.S.R. (Ussuri). New to Japan.

9. *Homoneura latifrons* MALLOCH

Homoneura latifrons MALLOCH, 1927, Ent. Mitt. **16**: 169.

Diagnosis. This testaceous-yellow species is characterized by having vein R_{4+5} with 3 brownish spots beyond cross-vein r-m in addition to apical one.

Male genitalia are characterized by the following: Epandrium with surstylus small, indistinctly notched at end; hypandrium H-shaped; gonapophysis small; aedeagus with lateral sclerites turned up at end; ejaculatory apodeme 45 μ long. Male 6th abdominal sternite is longer than broad; female 9th sternite is weakly projected on each posterolateral corner. Spermathecae are 75 or 110 μ in diameter.

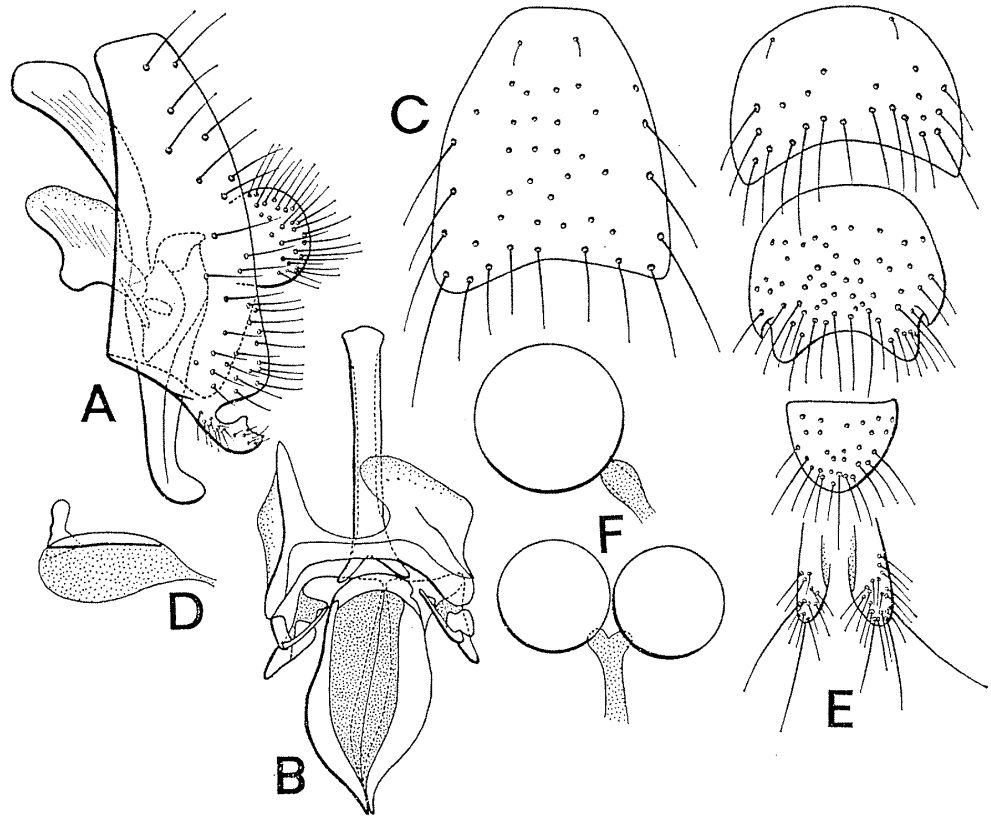

Fig. 7. Male and female genitalia of *Homoneura latifrons* MALLOCH.

Discussion. All the species in this group have 3 brownish spots on apices of veins R_{2+3}, R_{4+5} and M_{1+2} and around both cross-veins. Wings are 3.3–4.8 mm long, with apical spot on M_{1+2} rarely obscure or quite absent; halter with knob is darkened. Frons is distinctly wider than long as found in *brevicornis*, about 1.7 times as wide as eye; ventromost postgenal bristle stronger than others and peristomal setae; arista with longest hair as long as width of 3rd antennal segment as in *bistriata*; mid-tibia with 3 spurs.

Specimens examined. 1♀, Kagoshima, 14. VII. 1954, S. MIYAMOTO & Y. HIRASHIMA. YAKU-SHIMA I—2♀, Kurio, 11–12. IX. 1962, T. HIDAKA; 1♀, Kurio, 1–4. IV. 1971, K. YAMAGISHI; 1♂, 2♀, Miyanoura, 5. IV. 1971, T. MURATA; 1♀, Isso, 15. III. 1972, MURATA. AMAMI-OSHIMA I.—1♂, Yuwan-Shinmura, 22. VII. 1954, MIYAMOTO & HIRASHIMA; 3♀, Shinmura, 4–5. IV. 1956, MIYAMOTO; 1♂, 1♀, Shinmura, 9. XI. 1962, Y. MIYATAKE.

Distribution. Formosa, Japan (Kyushu). New to Japan.

10. *Homoneura brevicornis* (KERTÉSZ)

Lauxania (*Sapromyza*) *brevicornis* KERTÉSZ 1915, Annals hist.-nat. Mus. natn. hung. **13**: 525.

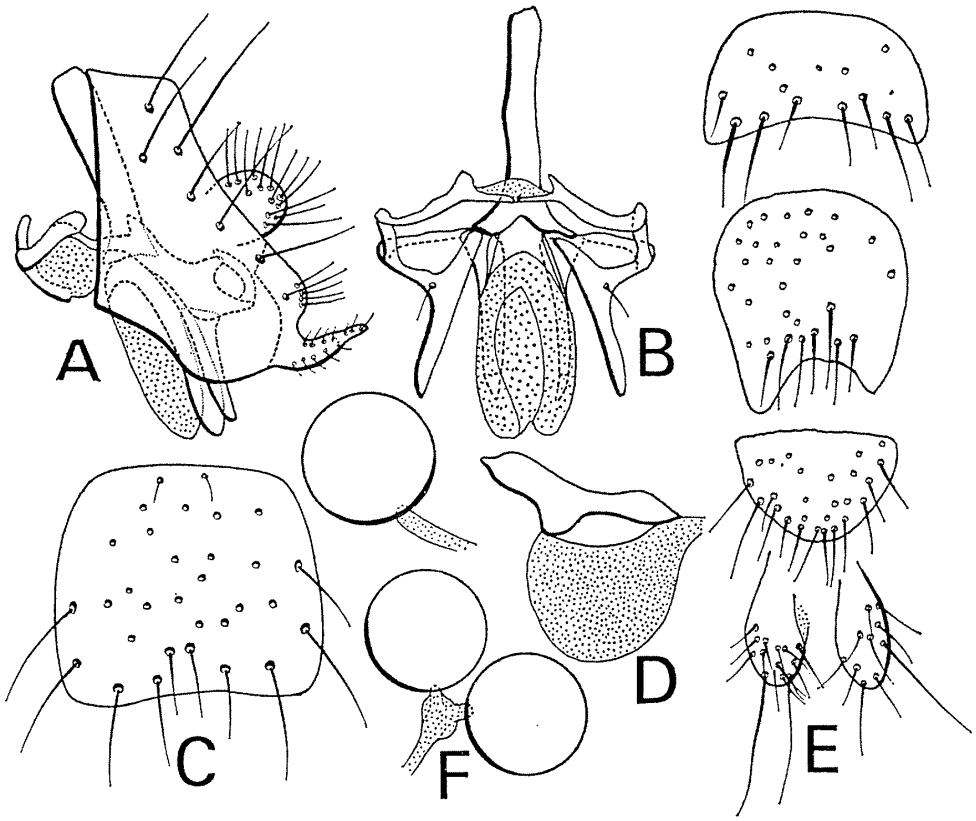

Fig. 8. Male and female genitalia of *Homoneura brevicornis* (KERTÉSZ).

Diagnosis. This yellowish species is distinct in having 4 rows of acrostichal setae (6 rows are common in this group) and fuscous apex of palpus.

Genitalia are characterized by the following: Epandrium small, with surstylus bluntly pointed on tip; hypandrium with side pieces very narrow; gonapophysis slender, bearing a seta near base; aedeagus with a pair of lateral sclerites elevated dorsally; ejaculatory apodeme 50 μ long. Female 9th abdominal sternite is concave in the posterior margin; spermathecae are 55 or 65 μ in diameter.

Discussion. This species can easily be separated from *latifrons* by its small size (wing length 2.3–3.1 mm), short hairs on arista (less than 1/2 width of 3rd antennal segment) and clear ultimate section of R_{4+5} except apex. Male genitalia are quite different from those of *latifrons*, but females are not readily distinguishable by the genitalic characters.

Specimens examined. TOKARA Is. — 2♂, 2♀, Takara-jima I., on seaside, 16–20. VII. 1964, H. SHIMA & A. TANAKA. AMAMI-OSHIMA I. — 1♂, 4♀, Akagina, 17. VII. 1954, S. MIYAMOTO & Y. HIRASHIMA. RYUKYUS — 1♀, Yona, Okinawa, 16–18. VIII. 1958, T. HIDAKA; 3♂, Yonehara-Hoshino, Ishigaki-jima I., 27. VIII. 1958, HIDAKA.

Distribution. Formosa, Japan (Ryukyus). New to Japan.

11. *Homoneura variinervis* (KERTÉSZ)

Lauxania (*Minettia*) *variinervis* KERTÉSZ, 1913, Annals hist.-nat. Mus. natn. hung. **13**: 527.

Diagnosis. This testaceous-yellow to testaceous species is recognized by having shiny mesonotum and a preapical spot on R_{4+5} on line between apex of R_{2+3} and m-m, usually connecting with apical spot on R_{2+3}.

Discussion. Wing pattern exhibits some variations: apical clouds on R_{2+3}, R_{4+5} and M_{1+2} fused with one another at wing margin, preapical spot on R_{4+5} rarely absent.

Genitalia are characterized by the following: Epandrium with surstylus elongated, rounded apically; processus longus strongly elongated and provided with spine-like processes on apex; gonapophysis undeveloped; aedeagus largely membranous on ventral side, with dorsal sclerites elevated longitudinally, bearing 2 small processes on lateroproximal and 2 sharp ones on distal parts, and with a pair of spinose small sclerites near ventral end; ejaculatory apodeme 75 μ long. Spermathecae 90–95 or 105 μ in diameter.

Specimens examined. HONSHU—Numerous males and females, from Aomori, Iwate, Niigata, Nagano, Gifu, Aichi, Mie, Kyoto, Osaka and Okayama Prefectures, May–August, collected by S. IKEUCHI, K. IOKI, O. MORIHARA, Y. MURAKAMI, T. OKADOME, M. SASAKAWA, N. UEDA and K. YAMAGISHI. RYUKYUS—1♂,

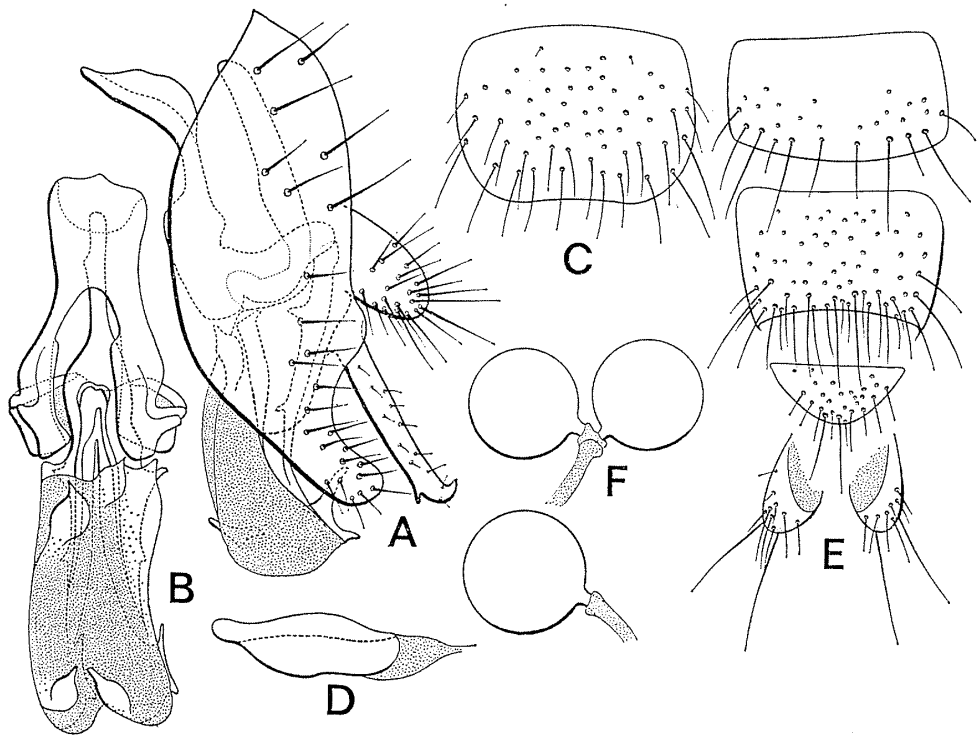

Fig. 9. Male and female genitalia of *Homoneura variinervis* (KERTÉSZ).

Yuwan, Amami-Oshima, 29. VII. 1963, Y. HIRASHIMA; 1♂, 1♀, Yona, Okinawa-Honto, 16–18. VIII. 1958, T. HIDAKA; 1♀, Yona-Hedo, Okinawa-Honto, 14. XI. 1960, K. YASUMATSU.

Distribution. Formosa, Japan (Honshu, Ryukyus). New to Japan.

12. ***Homoneura spinicauda*** SASAKAWA et IKEUCHI, n. sp.

Diagnosis. The wing pattern of *spinicauda* is similar to those of *brevicornis* and *horvathi* (KERT.) from New Guinea. However, *spinicauda* differs in having the entirely yellow palpus, black lines on lateral sides of face, a longitudinal median stripe on abdominal tergites 3–5, and distinctly projected surstylus. Male genitalia are similar to those of *discoglauca* in the shape of hypandrium, gonapophysis and aedeagus, but surstyli are quite different between them.

Description. Body length 3.6–5.0 mm, wing length 3.7–4.7 mm. Testaceous yellow to pale brown; frons with a pair of brown stripes along parafrontalia; ocellar triangle black, grayish pruinose; parafrontalia, postorbits, occiput and postgenae densely gray-dusted; face with black lines along lateral sides, running ventrally beyond vibrissal angles and not reaching dorsally antennal bases; antenna testaceous, 3rd segment somewhat darker, arista brown; palpus testaceous yellow. Mesonotum grayish pruinose except bases of setae and bristles, usually with central stripe between *dc*-rows distinctly darkened and broadened behind level of 2nd *dc*, and extending to scutellum; humerus with yellow spot at base of *h*; apical *sc* at edge of yellow lateral areas, lateral *sc* on yellow. Abdomen with brown central stripes on tergites 3–5 in addition to narrow fasciae on posterior margins of tegites 2–6. Wing with apical spot on M_{1+2} paler than spots on apices of R_{2+3} and R_{4+5}, apical spots on R_{2+3} and M_{1+2} slightly apart from extremities, both cross-veins clouded.

Frons as wide as or slightly broader than long, parallel-sided or slightly converging ventrally; *oc* longer than anterior *or*; gena about 1/5 height of eye; 3rd antennal segment slightly longer than wide, arista with longest hair slightly less than half width of 3rd antennal segment.

Mesonotum with 0+3 *dc*, *acr* in 6 rows, those on median 2 rows slightly longer than others; *prsc* shorter than 1st post-sutural *dc*. Costa with 2nd, 3rd and 4th sections in proportion of 26.5 : 10 : 5.5; r-m beyond middle of discal cell; ultimate section of M_{1+2} 1.5–1.9 times as long as the penultimate; ultimate section of M_{3+4} about 1/7 of penultimate. Mid tibia with 2–3 apical spurs.

Epandrium with surstylus projected backwards, curved on ventral side; hypandrium with side pieces narrow and bifurcated on anterior base; gonapophysis lobate, narrowing distally; aedeagus with 2 pairs of spinose processes which are directed backward and forward on lateral sclerites; ejaculatory apodeme 110 μ long. Ninth abdominal sternite of female trifurcated posteriorly, median plate elevated; spermathecae 80 or 100 μ in diameter.

Holotype ♂, Miyanoura, Is. Yakushima, Kagoshima Pref., 17. III. 1971, T.

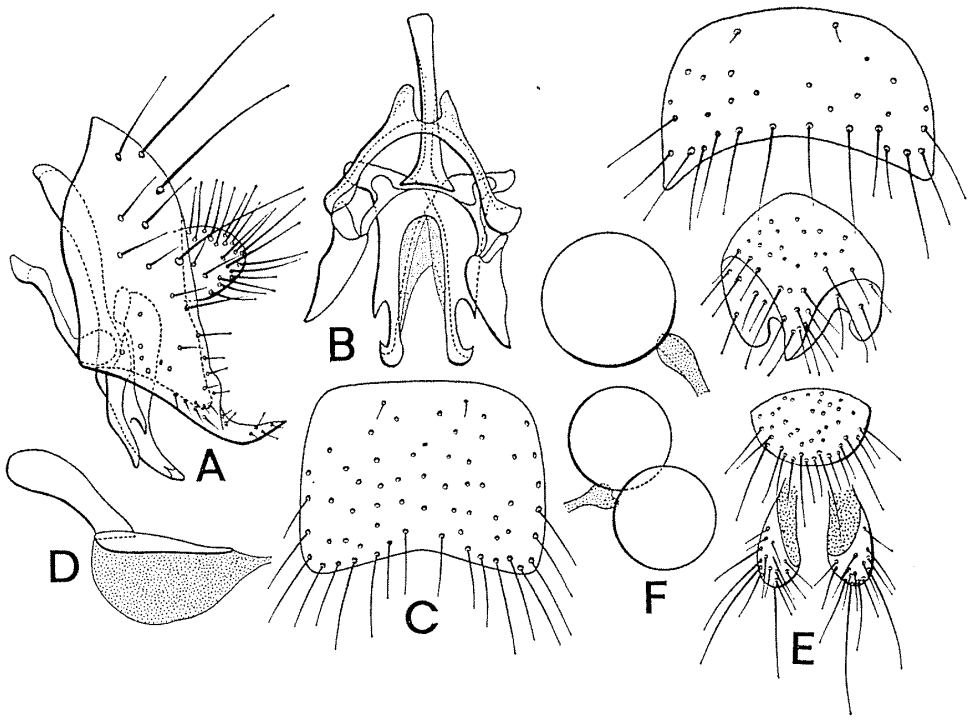

Fig. 10. Male and female genitalia of *Homoneura spinicauda* n. sp.

MURATA, deposited in collection of Entomological Laboratory, Meijo University, Nagoya. Paratypes: HONSHU — 1♀, Kisokoma-gatake, Nagano Pref., 17–18. VI. 1967, T. KUNOU; 1♂, Mt. Sanageyama, Toyota-shi, Aichi Pref., 29. IV. 1970, K. YAMAGISHI; 2♂, 2♀, Mt. Sanageyama, Aichi Pref., 2. V. 1971, T. MURATA; 1♀, Jyokoji, Seto, Aichi Pref., 13. V. 1970, T. OKADOME; 27♂, Mt. Sanage, Aichi Pref., 24. VI. 1973, S. NOMURA; 1♂, 1♀, Mt. Gozaisyo-dake, Mie Pref., 24–26. X. 1967, T. KUNOU; 1♂, Kamogawa, Is. Hachijo, 27. V. 1964, Y. HIRASHIMA & M. SHIGA. KYUSHU — 1♂, Mt. Inunakiyama, Fukuoka Pref., 26. V. 1962, T. SAIGUSA; 3♂, Mt. Hiko-san, Fukuoka Pref., 22–23. V. 1965, T. SAIGUSA; 1♀, Mt. Tara, Nagasaki Pref., 11. VIII. 1964, H. SHIMA; 1♂, Kaeta, Miyazaki Pref., 16. VIII. 1976, K. UEDA; 1♂, Mt. Takakuma, Kagoshima Pref., 15. VIII. 1967, K. KANMIYA; 2♂, 1♀, Mt. Shiroyama, Kagoshima, 6. V. 1973, H. MIYAHARA; 1♂, 1♀, same data as holotype; 2♂, Hinokuchi, Is. Yakushima, 27–30. III. 1971, K. YAMAGISHI; 1♂, 2♀, Kurio, Is. Yakushima, 10. VIII. 1964, T. OKADOME; 1♂, Kurio, Is. Yakushima, 1–4. IV. 1971, K. YAMAGISHI; 1♂, 1♀, Kusugawa, Is. Yakushima, 27. III. 1972, T. MURATA; 2♂, 5♀, Miyanohara, Is. Yakushima, 30. III. 1972, T. MURATA. RYUKYUS — 1♀, Full Kampire, Is. Iriomote, 25. VIII. 1962, M. T. CHUJO.

Distribution. Japan (Honshu, Kyushu, Ryukyus).

13. *Homoneura discoglauca* (WALKER)

Ochthiphila discoglauca WALKER, 1860, J. Proc. Linn. Soc. Lond., Zool. **4**: 147.
Lauxania viatrix DE MEIJERE, 1910, Tijdschr. Ent. **53**: 123.

Diagnosis. This fuscous and clear-winged species is distinct in having the whitish-gray head, a broad whitish-gray median stripe on mesonotum and scutellum, and yellow (whitish pruinose) central fasciae and posterior margins on abdominal tergites 2–6.

Other characters are as follows: Three narrow gray stripes just below level of *prs* and *sa*, along lower margin of notopleuron, and across mesopleuron; gena narrow, 1/7–1/8 height of eye; 3rd antennal segment nearly twice as long as broad, arista with dorsal hairs longer than ventral ones and longest hair about 1.5 times as long as width of 3rd segment; *acr* in 6–8 rows; wings 2.8–3.4 mm long; legs fuscous except tibiae and tarsi yellow.

Genitalia: Epandrium with surstylus small, somewhat foot-shaped; hypandrium with side pieces crescent in form; gonapophysis with 2 short setae on tip; lateral sclerites of aedeagus each with a spine at middle of ventrolateral side in addition to apical one; ejaculatory apodeme 50 μ long; 6th abdominal sternite of male with 3 pairs of long bristles on posterior margin. Spermathecae 80 or 85–90 μ in diameter.

Specimens examined. AMAMI-OSHIMA: 1♂, Tojyo-mura, 13. XI. 1962,

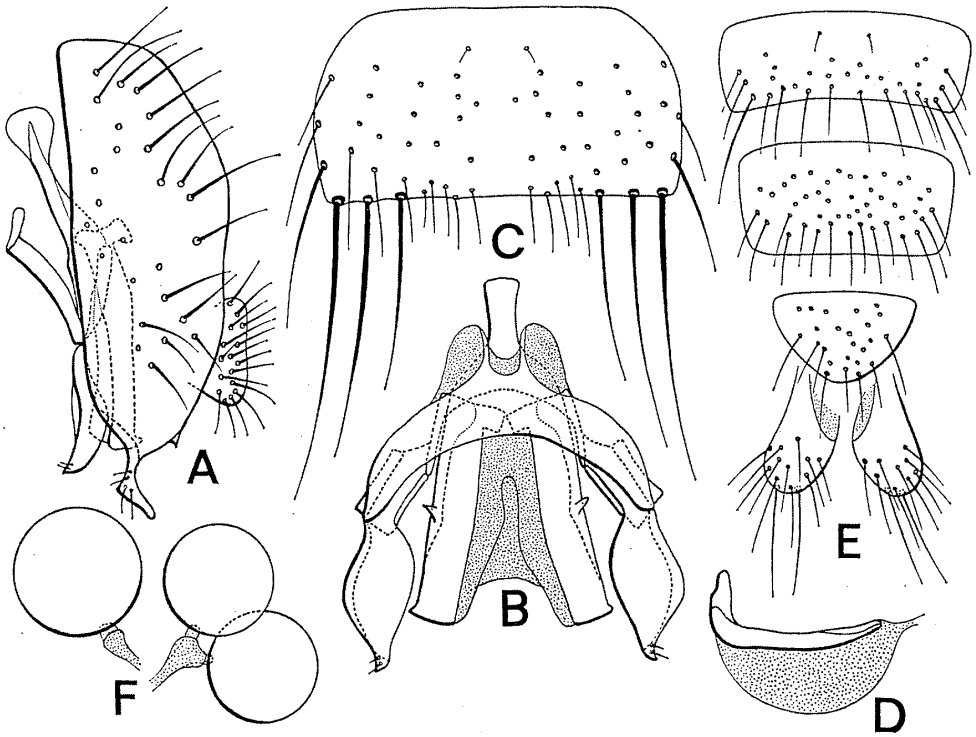

Fig. 11. Male and female genitalia of *Homoneura discoglauca* (WALKER).

Y. MIYATAKE. OKINAWA-HONTO: 1♂, 2♀, Yona, 26. IV. 1965, K. IHA & Y. HIRASHIMA.

Distribution. Celebes, Formosa, Japan (Ryukyus), Java, Krakatau, Lombok; Solomon Is. New to Japan.

14. ***Homoneura repanda*** SASAKAWA et IKEUCHI, n. sp.

Diagnosis. This clear-winged species may be distinguished by having dorsal half of frons, 3rd antennal segment, palpus and hind femur brown. The male genitalia of *repanda* are very similar to those of *unguiculata* (KERT.), but most noticeably the surstylus is broadened posteriorly and truncated at end in *repanda*, while claw-like in *unguiculata*.

Description. Body length 2.3–3.4 mm, wing length 2.5–3.5 mm. Testaceous yellow to testaceous; dorsal 1/3–1/2 of frons brown, extending posteriorly to occiput; parafacialia and occiput silverly pruinose; face slightly brownish dorsally; antenna testaceous yellow, 3rd segment brown distad from insertion of arista; arista and palpus brown. Thorax testaceous yellow to pale brown, subshining; mesonotum darkened mesally, sparsely whitish-gray pruinose; humerus, lateral sides of mesonotum and outer margin of scutellum yellowish; pleura darkened (rarely except notopleuron). Abdomen testaceous to pale brown. Wing hyaline; halter yellow. Legs yellow, coxae brownish basally, mid and hind femora brown except apical 1/4 (rarely obscure on mid femur).

Frons as wide as long, slightly wider than eye, parallel-sided or slightly divergent ventrally; *oc* as long as or slightly longer than anterior *or*; gena about 1/5 height of eye; 3rd antennal segment about 1.6 times as long as wide; arista with longest hair 1/2–3/5 width of 3rd segment.

Mesonotum with 0+3 *dc*, 1st post-sutural *dc* very close to transverse suture; *acr* in 6 rows, all equal in length; *prsc* absent, if present only slightly longer than *acr*. Wing with 2nd, 3rd and 4th costal sections in proportion of about 30 : 10 : 6, r-m at or slightly before middle of discal cell; ultimate section of M_{1+2} 1.4–1.7 times as long as penultimate; penultimate section of M_{3+4} 5–6 times as long as ultimate. Mid tibia with 2–3 apical spurs.

Genitalia: Epandrium small, with ventral margin protruded downwards just before base of surstylus; surstylus with distal end truncated; hypandrium with side pieces expanded laterally; gonapophysis with 3 minute processes apically; aedeagus with lateral sclerites expanded laterally on apical 1/3; ejaculatory apodeme 75 μ long. Spermathecae 70 or 80 μ in diameter.

Remarks. The specimens from the Ryukyus are somewhat darker than those from Kyushu Island, that is, frons is largely brown except triangular area along ventral margin yellow, occiput and dorsal 2/3 of postgenae brown, face brown except ventral 1/3, thorax dark brown except humeri and outer margin of scutellum, and abdomen brownish black.

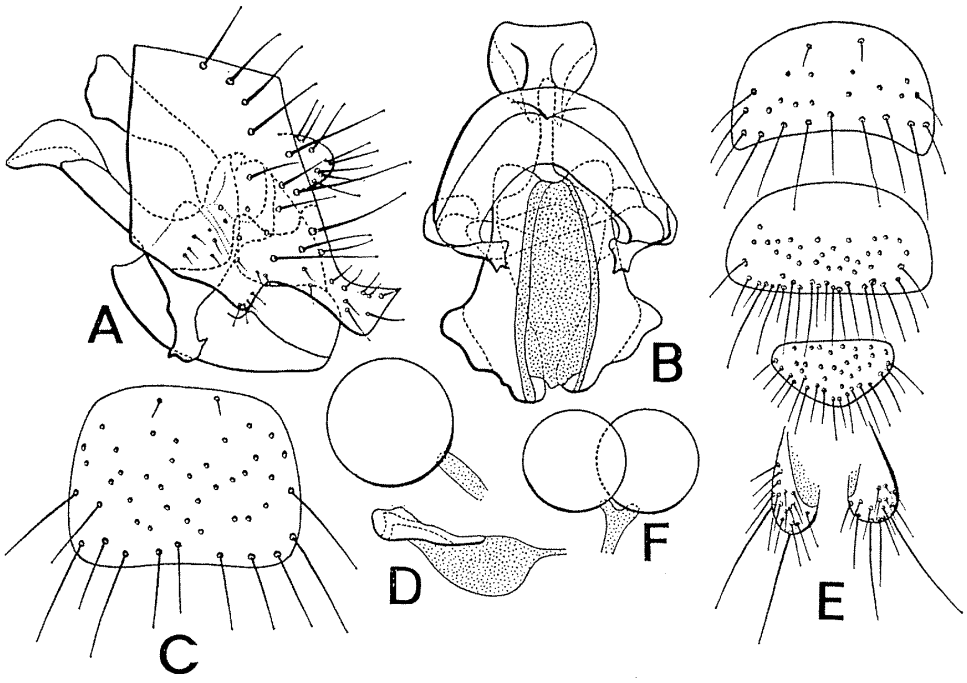

Fig. 12. Male and female genitalia of *Homoneura repanda* n. sp.

Holotype: ♂, Mt. Tachibana-yama, Fukuoka, Kyushu, 1. VI. 1974, K. YAMAGISHI, deposited in the collection of the Entomological Laboratory, Kyushu University, Fukuoka. Paratypes: KYUSHU — 27♂, 22♀, same locality as holotype, 7 & 19–20. VII. 1973, 8 & 26. VIII. 1973, 9. XII. 1973, 8. I. 1974, 3 & 21. III. 1974, 20. IV. 1974, 2 & 17. V. 1974, 1. VI. 1974, YAMAGISHI; 3♂, 4♀, Okinoshima, Chikuzen, 25–28. VII. 1958, Y. HIRASHIMA, Y. MURAKAMI & Y. MIYATAKE; 1♀, Mt. Inunaki-yama, Fukuoka Pref., 30. IV. 1967, T. SAIGUSA; 1♂, Mt. Inunaki-yama, 3. V. 1969, M. HONDA; 2♀, Mt. Wakasugi-yama, Sasaguri-cho, Fukuoka, 21. IV. 1962, T. SAIGUSA. RYUKYUS — 1♂, Mikyo, Tokuno-shima, 25. VII. 1963, S. ITO; 1♀, Kametsu, Tokuno-shima, 12. VIII. 1964, T. OKADA; 1♂, Yuwan, Amami-Oshima, 29. VII. 1963, Y. HIRASHIMA; 2♀, Omoto-dake, Ishigaki-jima, 14. X. 1963, Malaise trap, Y. HIRASHIMA; 1♂, Shirahama, Iriomote-jima, 18–19. X. 1963, S. MIYAMOTO; all Japan-U.S. co-op. Sci. Programme.

Distribution. Japan (Kyushu, Ryukyus).

15. *Homoneura unguiculata* (KERTÉSZ)

Lauxania (*Minettia*) *unguiculata* KERTÉSZ, 1913, Annals hist.-nat. Mus. natn. hung. **11**: 100.
Homoneura japonica CZERNY, 1932, Die Flieg. palaearkt. Reg. **50**: 15. **N. syn.**

Diagnosis. This clear-winged species is characterized by having the 3rd antennal segment darkened apically, arista plumose and 6 rows of acrostichal setae. Males are characterized by having glossy brown, unguiform surstylus and anterior

lobe of hypandrium, and not having gonapophysis.

Remarks. Seemingly CZERNY (1932) did not check the Oriental species when he described *japonica*. The male type of *japonica* (Misaki, Kiu Shiu, Japan, 24. VII. 1917, ROZHKOVSKIJ) has the peculiar genital features as described and illustrated by us (1978, as *japonica*, misident.).

Specimens examined. Many males and females from Honshu (Chiba, Shizuoka, Aichi, Kyoto, Wakayama and Tottori Prefectures), Shikoku (Kagawa Pref.), Kyushu (Fukuoka, Saga and Kagoshima Prefectures) and the Ryukyus (Okinawa-Honto, Ishigaki Is.) collected by T. HAYAOKA, Y. HIRASHIMA, S. IKEUCHI, T. KUNOU, H. MAKIHARA, M. SASAKAWA, M. SUWA, K. YAMAGISHI & K. YASUMATSU.

Distribution. Ceylon, China, Formosa, Japan (Honshu, Shikoku, Kyushu, Ryukyus), U.S.A. (immigrant).

Biology. The flies appear almost throughout the year (Jan. to Nov.), with collection records indicating that it is more common in summer (Aug.–Sept.). The females lay 1–2 eggs along margin on the underside of leaf. The mean duration of egg, larval, pupal and adult periods under laboratory condition (25°C) are as follows: 3.0 (2–3), 11.6 (9–15), 10.6 (10–11) and 36.2 (20–67), respectively. Characters of immature stages: see *euaresta*.

16. ***Homoneura panniculata*** SASAKAWA et IKEUCHI, n. sp.

Diagnosis. This species differs from the species of *unguiculata*-group by the presence of a patch of setulae on anteromesal extremity of mesonotum. *H. panniculata* can be separated from the closely related Oriental *diversa* (KERTÉSZ) by shape of the 3rd antennal segment and surstylus, and also from *filiola* CZERNY, known from Ussuri, by number of mid-tibial spurs.

Description. Body length 2.9–4.0 mm, wing length 3.0–3.5 mm. Head including antennae and palpi yellow to orangish yellow. Thorax and abdomen yellow to testaceous yellow, mesonotum shining, scutellum and pleura paler than notum. Wing hyaline, usually faintly clouded around m-m. Legs and halter pale yellow.

Frons almost as wide as long, 1.5 times as wide as eye, diverging ventrally; *oc* slightly longer than anterior *or*; gena about 1/7 height of eye; 3rd antennal segment oval, 1.6 times as long as wide, arista plumose, with longest hair almost 1/2 width of 3rd segment.

Mesonotum with 0+3 *dc*, 6 rows of *acr* which are all equal in length, a patch of setulae densely arranged in about 8 rows on anteromesal extremity of notum, *prsc* shorter than 1st *dc*. Wing with 2nd, 3rd and 4th costal sections in proportion of 28(26–33) : 10 : 5.5; r-m almost at middle of discal cell; ultimate section of M_{1+2} 1.5–2.0 times as long as the penultimate; ultimate section of M_{3+4} about 1/4 of penultimate. Mid tibia with 2 (rarely 3) apical spurs.

Genitalia: Epandrium blackish along posteroventral margins, with ventral margin rounded; processus longus rather small, with apex pointed dorsally; hyp-

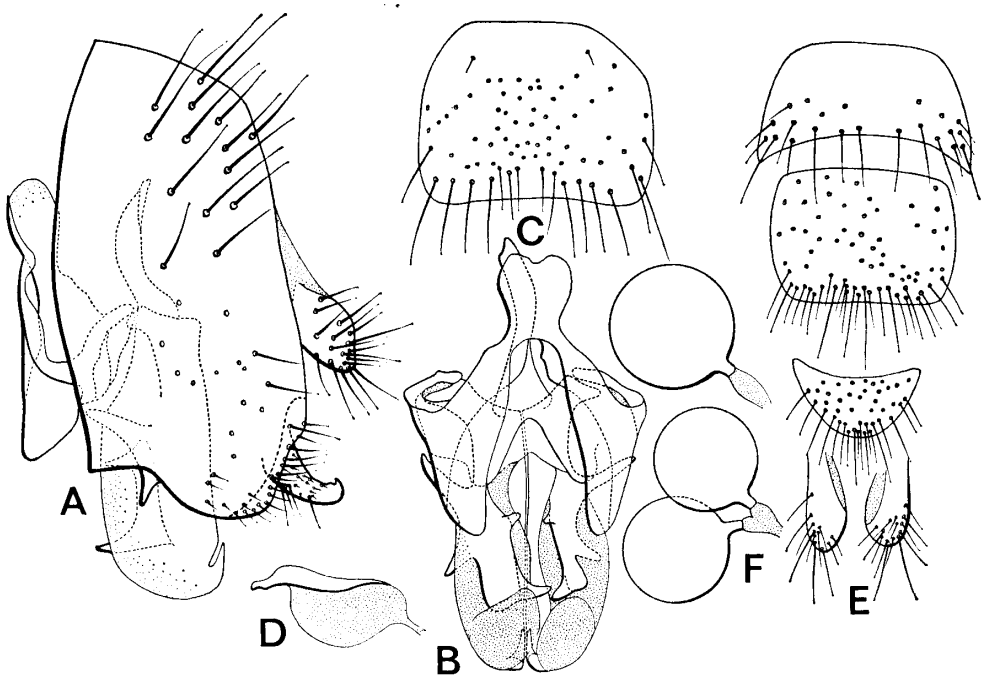

Fig. 13. Male and female genitalia of *Homoneura panniculata* n. sp.

andrium of normal form; ganapophysis undeveloped; aedeagus largely membranous, with a pair of sclerites bearing 2 pairs of spinose processes on dorsal and ventral sides, and a pair of processes which are directed anterodorsally on apex. Spermathecae with necks distinct, 95 or 110 μ in diameter.

Holotype ♂ (KPU 216), Hanase, Kyoto, 7. VII. 1977, S. IKEUCHI. Paratypes: 1♂, Mt. Makihata-yama (800–1,000 m), Niigata Pref., 3. VIII. 1971, K. YAMAGISHI; 1♀, Karuisawa, Nagano Pref., 20. VII. 1980, IKEUCHI; 1♀, Mt. Gozaisho, Mie Pref., 3–4. VI. 1967, T. OKADOME; 1♀, Mt. Inunaki-yama, Wakamiya, Fukuoka, 26. V. 1962, T. SAIGUSA.

Distribution. Japan (Honshu, Kyushu).

Remarks. One female taken at Mt. Gozaisho has an unusual wing pattern with infuscate clouds on apices of R_{2+3}, R_{4+5} and M_{1+2} and r-m in addition to cloud around m-m.

17. *Homoneura yamagishii* SASAKAWA et IKEUCHI, n. sp.

Diagnosis. This species is closely related to *spinosa*, but has shorter hairs on arista and denser rows of acrostichal setae. Males have distinctly projected surstylus and simple aedeagus.

Description. Body length 2.2–4.1 mm, wing length 2.6–3.8 mm. Head testaceous yellow, face, gena and postgena paler, ocellar triangle slightly brownish; antenna orangish yellow, arista brown; palpus yellow. Thorax and abdomen

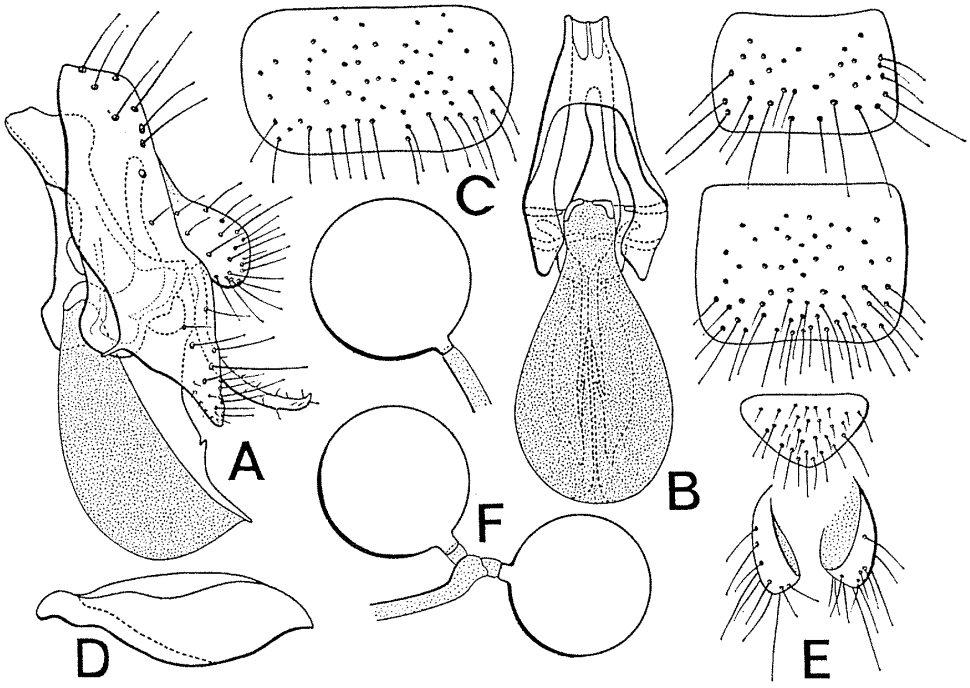

Fig. 14. Male and female genitalia of *Homoneura yamagishii* n. sp.

testaceous yellow to testaceous, shining; anterior abdominal tergites sometimes brownish anteriorly. Wing hyaline, faintly tinged with brownish yellow, rarely faintly clouded around cross-veins and on apices of R_{2+3}, R_{4+5} and M_{1+2}. Legs yellow.

Frons as wide as long, about 1.5 times as wide as eye, almost parallel-sided; *oc* longer than anterior *or*; gena 1/5–1/6 height of eye; 3rd antennal segment about 1.5 times as long as wide, arista plumose, with longest hair 1/2–3/5 width of 3rd segment.

Mesonotum with 0+3 *dc*, *acr* densely arranged in 6 rows, all equal in length, *prsc* shorter than 1st *dc*. Wing with 2nd, 3rd and 4th costal sections in proportion of 25(21–27) : 10 : 6(5–7); r-m at or slightly beyond middle of discal cell; ultimate section of M_{1+2} 1.3–2.4 times as long as the penultimate; ultimate section of M_{3+4} 1/4–1/5 length of penultimate. Mid tibia with 2 apical spurs.

Genitalia: Epandrium with surstylus projected downwards; processus longus long, arcuated; hypandrium of normal form; gonapophysis undeveloped; aedeagus largely membranous on ventral side, with a pair of dorsal sclerites which are smooth or minutely notched at middle. Ninth sternite of female rectangular; spermathecae 80 or 100 μ in diameter.

Holotype ♂ (KPU 217), Midoroga-ike, Kyoto, 15. VI. 1978, S. IKEUCHI. Paratypes: HOKKAIDO — 1♀, Kiyokawa, Ashoro, Tokachi, 23. VII. 1967, H. SHIMA; 2♀, Berabonai, Ashoro, 24. VII. 1967, A. NAKANISHI. HONSHU — 1♂, Fukaura, Nishitsugaru, Aomori Pref., 11. VII. 1968, T. OKADOME; 1♂, Mido,

Iwate Pref., 20. VI. 1975, K. YAMAGISHI; 1♂, Nakanogo, Daigoyama-Mitsune, Hachijo Is., 1. VI. 1964, Y. HIRASHIMA & M. SHIGA; 1♂, Kooridono, Ojiya, Niigata Pref., 24. V. 1972, YAMAGISHI; 1♂, Nisshin, Aichi Pref., 11. VI. 1972, YAMAGISHI; 1♂, 1♀, Kamiibo, Toyota, Aichi Pref., 28. VI. 1970, YAMAGISHI; 1♀, Oodaka, Aichi Pref., 28. VIII. 1965, T. KUNOU; 1♀, Mt. Gozaisho, Mie Pref., 3–4. VI. 1967, T. OKADOME; 30♂, 24♀, same locality as holotype, 13, 24 & 31. V., 7 & 15. VI., 7. VII., 1. VIII. 1978, IKEUCHI; 2♀, Takaraga-ike, 15–16. V. 1978, IKEUCHI; 1♂, 4♀, Omuro, Kyoto, 15. VI. 1977, IKEUCHI; 1♂, 4♀, Yamanaka, Higashi-tottori, Osaka Pref., 11. VI. 1975, K. YAMAGISHI. KYUSHU — 17♂, 7♀, Mt. Tachibana-yama, Fukuoka Pref., 1. VI., 7. VII., 20. VII., 8. VIII. & 26. VIII. 1973, 17. V. & 1. VI. 1974, K. YAMAGISHI; 1♂, Mt. Kurosan, Kurume-shi, 5. V. 1963, S. IDE; 1♀, Uchiyama–Tsutsu, Tsushima Is., 26. VII. 1930, HORI & CHO; 1♂, Ohe, Amakusa, 5. X. 1960, K. YANO; 4♀, Kamiozoegawa, Fuji, Saga Pref., 19. V.–16. VI. 1973, YAMAGISHI; 1♂, Mt. Shiroyama, Kagoshima, 6. V. 1973, H. MAKIHARA. RYUKYUS — 5♀, Yona, Okinawa-Honto, 26. IV. 1965, Y. HIRASHIMA.

Distribution. Japan (Hokkaido, Honshu, Kyushu, Ryukyus).

18. ***Homoneura spinosa*** SASAKAWA et IKEUCHI, n. sp.

Diagnosis. This small, clear-winged species is unique by having a pair of spinose processes on ventrolateral sides of aedeagus and spermathecae with necks striated.

Description. Body length 1.9–3.3 mm, wing length 2.0–3.3 mm. Similar to *yamagishii* in coloration and structures except genitalia.

Frons almost as wide as long, about 1.3 times as wide as eye, slightly diverging ventrally; gena 1/7 height of eye; 3rd antennal segment nearly twice as long as broad, arista with longest hair as long as width of 3rd segment; mesonotum with *acr* in 6 sparse rows, especially sparser behind level of 2nd *dc*; costal sections as 23 : 10 : 5.5; r-m almost at middle of discal cell.

Genitalia: Epandrium with surstylus weakly projected on ventroposterior corner; cerci brownish black; aedeagus membranous on ventral side, with a pair of oval sclerites bearing spinose processes on tips; ejaculatory apodeme 50 μ long. Ninth abdominal sternite of female rounded on anterior margin; spermathecae suborbicular, 90–95 or 115 μ in diameter.

Holotype ♂ (KPU 218), Ooe, Kyoto, 7. VIII. 1978, S. IKEUCHI. Paratypes: HONSHU — 1♀, Mt. Iwakiyama, Nakatsugaru, Aomori Pref., 9–10. VII. 1968, T. OKADOME; 1♂, Kisokoma-gatake, Nagano Pref., 11. VII. 1967, T. KUNOU; 1♂, Shiga-kogen, Nagano Pref., 2. VIII. 1980, IKEUCHI; 1♀, Abe-toge, Shizuoka Pref., 19. VIII. 1972, T. HATTORI; 1♀, Mt. Amagi, Shizuoka Pref., 30. VIII. 1966, M. SUWA; 4♀, Katsuraya, Yamakoshi, Niigata Pref., 27. VII. 1971, YAMAGISHI; 2♂, 4♀, Mt. Makihata-yama (800–1,000 m), Niigata Pref., 3. VIII. 1971, YAMAGISHI; 2♂, 3♀, Kooridono, Ojiya, Niigata Pref., 24. V. 1972, YAMAGISHI; 1♀, Mt.

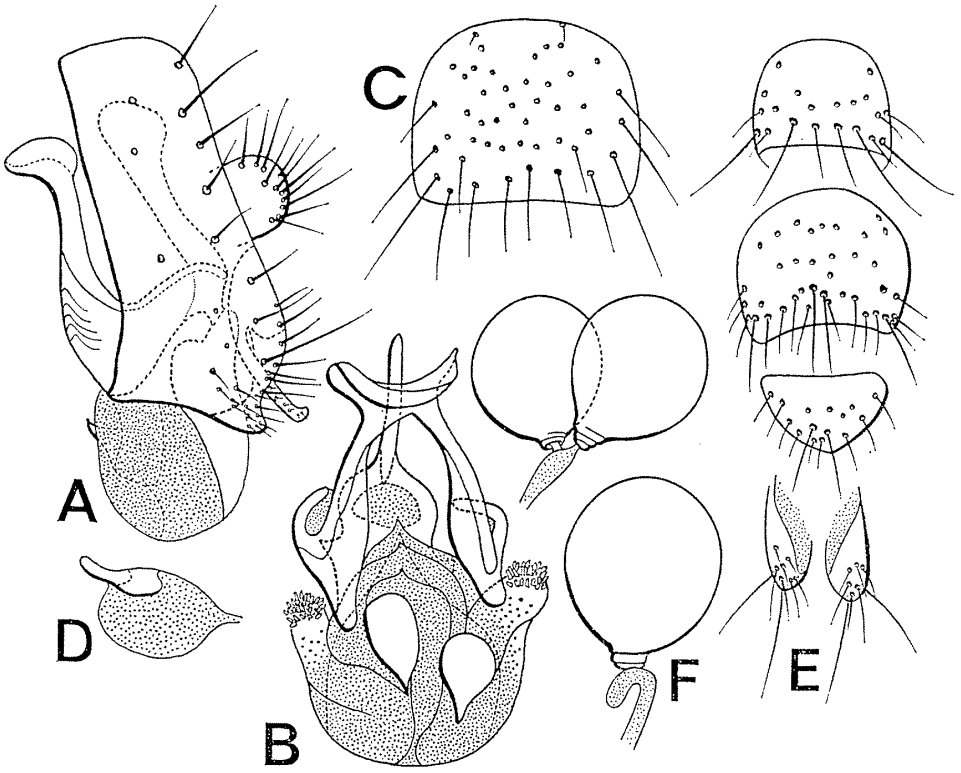

Fig. 15. Male and female genitalia of *Homoneura spinosa* n. sp.

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