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# DELPHACIDAE OF TAIWAN (II)

(Homoptera: Fulgoroidea)

*Chung Tu Yang*

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NSC Special Publication No. 6

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National Science Council



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## ABSTRACT

This paper, being the Part II of *Delphacidae of Taiwan*, mainly deals with Subfamilies Stenocraninae and Delphacinae [following Asche, M. 1985] and several new materials of Tribe Tropidocephalini are supplemented here. Among the total of 130 species belonging to 64 genera, 16 genera and 54 species are new to science, 28 species are newly recorded in this area, and 48 species have been recorded previously. Among the 48 known species in Taiwan, 3 species are new combinations, 29 old species are redescribed and illustrated, 19 species which have not been collected by the author are also listed and reproduced for the sake of completeness, of 17 species fifth instar nymphs are described and illustrated. Each genus (except for *Dicranotropis* Fieber, *Delphacodes* Fieber, and *Phyllodinus* Van Duzee) is redefined not only by the external morphological characters but also by the male genitalia. For some genera, the definition of the male genitalia is based on Taiwanese species only. Keys to the genera, species, and nymphs of species are given.

## I. INTRODUCTION

The Family Delphacidae is one of the largest family of Fulgoroidea. According to Asche [1984] almost 2000 species in 280 genera were described so far. Because their closely resemblance and their systematic features are so hardly to be secured that make species always difficult to identify.

This work was begun about four years ago and emphasis to this paper is on the characters of male genitalia which have long been considered as the most important character in this family. Those characters were described and illustrated as detail as possible and tried to define genus even base on Taiwanese species only. The author is especially interested in suspensorium, transverse-plate in *Sogata*, rod-like in *Peregrinus*, inverse Y-shaped in *Sardia*, and ring-like with a stem in many genera, which may be a valuable basis for a future analysis of the mutual affinities of those genera.

Only 62 delphacid species had been recorded in Taiwan before, reaching to 161 species belonging to 72 genera now. Part II deals with 130 species belonging to 64 genera, among them 16 genera and 54 species are new to science, 28 species are newly recorded in Taiwan, and 48 species are known ones. Among the 48 known species, 29 species are redescribed and illustrated, while 19 species have not been collected by the author are also listed.

Fifth instar nymphs are also described and illustrated as many as possible. *Nymphs of Delphacidae from Taiwan* (Part I), published in 1985, is not incorporated here.

Keys to the genera, species, and nymphs of species are given.



## II. HISTORICAL RESUME

Historical resume of Taiwanese Stenocraninae and Delphacinae are simplified as listed below.

1. *Cemus nigropunctatus* (Matsumura)  
 = *Dicranotropis granulipennis* Matsumura<sup>8</sup>  
 = *Phyllodinus nigropunctatus* (Motschulsky)<sup>14</sup>  
 = *Jamiphax nigropunctata* Matsumura (nec Motschulsky)<sup>13</sup>
2. *Cemus nigromaculosus* (Muir)  
 = *Phyllodinus nigromaculosus* Muir<sup>14</sup>
3. *Cemus punctatus* (Muir)  
 = *Phyllodinus punctatus* Muir<sup>5, 11, 14.</sup>
4. *Cemus sauteri* (Muir)  
 = *Phyllodinus sauteri* Muir<sup>5, 11, 14.</sup>
5. *Coronacella sinhalana* (Kirkaldy)  
 = *Coronacella kirkaldyi* (Muir)<sup>15</sup>  
 = *Kelisia kirkaldyi* Muir<sup>5</sup>
6. *Delphacodes esakii* Matsumura et Ishihara<sup>12, 14.</sup>
7. *Delphacodes kotonis* (Matsumura)<sup>14.</sup>  
 = *Liburnia kotonis* Matsumura<sup>13.</sup>
8. *Dicranotropis botelensis* Matsumura<sup>13, 14.</sup>
9. *Dicranotropis fumosa* Matsumura<sup>1, 2, 11, 14.</sup>
10. *Dicranotropis jamiana* Matsumura<sup>13, 14.</sup>
11. *Euidella albipennis* (Matsumura)<sup>14.</sup>  
 = *Toyoides albipennis* Matsumura<sup>10, 11.</sup>
12. *Harmalia heitensis* (Matsumura et Ishihara)  
 = *Sogata heitensis* Matsumura et Ishihara<sup>12, 14.</sup>
13. *Hadeodelphax pluto* Kirkaldy  
 = *Sardia pluto* (Kirkaldy)<sup>5, 12, 14.</sup>
14. *Horcoma colorata lacteipennis* (Muir)  
 = *Delphacodes lacteipennis* Muir<sup>5, 14.</sup>
15. *Laodelphax striatellus* (Fallén)  
 = *Delphacodes striatella* (Fallén)<sup>11, 12, 14.</sup>
16. *Nilaparvata bakeri* (Muir)<sup>7.</sup>
17. *Nilaparvata lugens* (Stål)<sup>12, 14.</sup>  
 = *Liburnia oryzae* Matsumura<sup>13</sup>  
 = *Nilaparvata oryzae* Esaki et Ishihara<sup>11.</sup>  
 = *Hikona formosanus* Matsumura<sup>9, 11.</sup>
18. *Numata muiri* (Kirkaldy)  
 = *Numata sacchari* (Matsumura)<sup>11, 12, 14.</sup>  
 = *Dicranotropis muiri* Kirkaldy<sup>5.</sup>  
 = *Stenocranus sacchari* Matsumura<sup>1, 2.</sup>  
 = *Unkana sacchari* (Matsumura)<sup>10.</sup>



19. *Peregrinus maidis* (Ashmead)<sup>11, 12, 14.</sup>
20. *Perkinsiella saccharicida* Kirkaldy<sup>4, 11, 12, 14.</sup>
21. *Perkinsiella sinensis* Kirkaldy<sup>4, 11, 12, 13, 14.</sup>
22. *Perkinsiella vastatrix* (Breddin)<sup>11, 14.</sup>  
 = *Delphacodes vastatrix* Breddin<sup>2.</sup>  
 = *Delphacodes (Dicranotropis) vastatrix* Breddin<sup>1.</sup>
23. *Phyllodinus affinis* (Schumacher)<sup>14.</sup>  
 = *Pundaluoya affinis* Schumacher<sup>2, 3, 11.</sup>
24. *Phyllodinus aritainoides* (Schumacher)<sup>14.</sup>  
 = *Pundaluoya aritainoides* Schumacher<sup>2, 3, 11.</sup>
25. *Phyllodinus kotoshonis* (Matsumura)<sup>14.</sup>  
 = *Jamiphax kotoshonis* Matsumura<sup>13.</sup>
26. *Rhombotoya pseudonigripennis pseudonigripennis* (Muir)  
 = *Delphacodes nigripennis* Muir<sup>5, 11, 14.</sup>
27. *Saccharosydne procerus* (Matsumura)<sup>8, 11, 12, 14.</sup>
28. *Sardia rostrata* Melichar<sup>2, 3, 11, 12, 14.</sup>
29. *Sogata arisana* (Matsumura)  
 = *Hosunka arisana* (Matsumura)<sup>14.</sup>  
 = *Unkana arisana* Matsumura<sup>9.</sup>  
 = *Unkanella arisana* (Matsumura)<sup>11.</sup>
30. *Sogata dohertyi* Distant<sup>2, 3, 11, 14.</sup>
31. *Sogata heitonis* (Matsumura)  
 = *Hosunka heitonis* (Matsumura)<sup>14.</sup>  
 = *Unkana heitonis* Matsumura<sup>9.</sup>  
 = *Unkanella heitonis* (Matsumura)<sup>11.</sup>
32. *Sogata hyalipennis* (Matsumura)  
 = *Hosunka nigrifacies hyalipennis* (Matsumura)<sup>14.</sup>  
 = *Unkana nigrifacies hyalipennis* Matsumura<sup>9.</sup>  
 = *Unkanella nigrifacies* forma *hyalipennis* (Matsumura)<sup>11.</sup>
33. *Sogata jamiana* Matsumura<sup>13, 14.</sup>
34. *Sogata nigrifrons* (Muir)  
 = *Hosunka nigrifacies* (Matsumura)<sup>1, 4.</sup>  
 = *Stenocranus nigrifrons* Muir<sup>5, 11, 14.</sup>  
 = *Unkana nigrifacies* (Matsumura)<sup>9.</sup>  
 = *Unkanella nigrifacies* (Matsumura)<sup>11.</sup>
35. *Soata pallidula* (Matsumura)  
 = *Hosunka pallidula* Matsumura<sup>10, 11, 14.</sup>
36. *Sogata taiwanella* (Matsumura)  
 = *Hosunka taiwanella* (Matsumura)<sup>14.</sup>  
 = *Unkana taiwanella* Matsumura<sup>10.</sup>  
 = *Unkanella taiwanella* (Matsumura)<sup>11.</sup>
37. *Sogatella vibix* (Haupt)  
 = *Sogatella longifurcifera* Esaki et Ishihara
38. *Sogatella furcifera* (Horváth)  
 = *Delphax furcifera* Horváth<sup>1, 2.</sup>  
 = *Megamellus furcifera* (Horváth)<sup>5.</sup>  
 = *Sogata furcifera* (Horváth)<sup>11, 12, 13, 14.</sup>

39. *Sogatellana pusana* (Distant)  
 = *Sogata formosella* Matsumura<sup>12,14</sup>.  
 = *Unkana formosella* (Matsumura)<sup>10</sup>.  
 = *Unkanella formosella* (Matsumura)<sup>11</sup>.
40. *Stenocranus formosanus* Matsumura<sup>9,11,14</sup>.
41. *Stenocranus hopponis* Matsumura<sup>9,11,13,14</sup>.
42. *Tarophagus colocasiae* (Matsumura)  
 = *Delphacodes? colocasiae* (Matsumura)<sup>11</sup>.  
 = *Liburnia (Delphax) colocasiae* Matsumura<sup>6</sup>.  
 = *Megamellus proserpina* Kirkaldy<sup>11,14</sup>.  
 = *Tarophagus proserpina* (Kirkaldy)
43. *Terthron albovittata* (Matsumura)  
 = *Delphacodes albovittata* (Matsumura)<sup>12,14</sup>.  
 = *Liburnia albolineata* Matsumura<sup>13</sup>.  
 = *Sogata albovittata* Matsumura<sup>11</sup>.
44. *Thymalopsis anderida* (Kirkaldy)<sup>16</sup>.
45. *Toya attenuata* Distant<sup>2,3,11</sup>.  
 = *Delphacodes attenuata* (Distant)<sup>14</sup>.
46. *Toya propinqua* (Fieber)  
 = *Delphax propinqua* Fieber<sup>1,2</sup>.  
 = *Delphax graminicola* Matsumura<sup>2</sup>.  
 = *Delphacodes propinqua* (Fieber)<sup>11,14</sup>.  
 = *Delphacodes graminicola* (Matsumura)<sup>11,14</sup>.
47. *Toya tuberculosa* (Distant)  
 = *Delphacodes terryi* Muir<sup>5,12,14</sup>.

1: Matsumura, 1910  
 2: Schumacher, 1915a  
 3: Schumacher, 1915b  
 4: Matsumura, 1917  
 5: Muir, 1917a  
 6: Matsumura, 1920  
 7: Muir, 1923a  
 8: Kato, 1933

9: Matsumura, 1935a  
 10: Matsumura, 1935b  
 11: Esaki et Ishihara, 1943a  
 12: Matsumura et Ishihara, 1945  
 13: Matsumura, 1940  
 14: Ishihara, 1949  
 15: Fennah, 1956a  
 16: Fennah, 1965

### III. MATERIALS AND METHODS

The delphacid materials available for this study were collected by the author himself and his students. Eighteen species were borrowed from Taiwan Agricultural Research Institute.

The terminology used in this report mostly follows previous workers except the width of vertex at base which means distance between ends of lateral carinae of vertex at hind margin. The terminology for nymph follows Wu and Yang [1985]. Number and arrangement of pits on meso- and metanotum and wing pads typical means on inner and outer sides of lateral carinae of mesonotum, outer sides of lateral carinae



of metanotum each with a pit respectively, and along each lateral margin of anterior wing pad with 3 pits, distances between these pits are symbolized as  $W_1 : W_2 : W_3$ .

The following acronyms are used for depository institutions: NCHU (National Chung Hsing University) and TARI (Taiwan Agricultural Research Institute).

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## V. SYSTEMATIC ACCOUNTS

### Key to the genera of Delphacidae of Taiwan

1. Post-tibial spur subulate, circular or angulate in cross section, acute at apex, devoid of teeth laterally (see part I) . . . . . *Asiracinae*
  - Post-tibial spur cultrate or laminate, thick, convex on each side or concave on inner surface with or without teeth on hind margin . . . . . 2
2. Post-tibial spur cultrate, solid . . . . . 3
  - Post-tibial spur laminate or foliaceous, sometimes tectiform, with or without teeth along posterior margin . . . . . 5
3. Post-tibial spur with apical tooth; apical margin of vertex not rounded . . . . . 4
  - Post-tibial spur without recognizable apical tooth; apical margin of vertex rounded . . . . . *Mestus* Motschulsky
4. Anal segment of male only produced at left lateroapical angle; vertex quadrate . . . . . *Malaxa* Muir
  - Anal segment of male with lateroapical angles not produced; vertex triangular . . . . . *Tropidocephala* Stål
- 5(2). Aedeagus with developed phallobase; phallobasal processes slender, curved; phallus slender, rod-like . . . . . 6
  - Aedeagus without phallobase . . . . . 7
6. Phallus fused with phallobase; suspensorium with a process; saw-case of female not broad . . . . . *Preterkelisia* n.gen.
  - Phallus not fused with phallobase; suspensorium without process; saw-case of female very broad, concealing ventral part of pygofer . . . . . *Stenocranus* Fieber
7. Male genitalia without distinct suspensorium . . . . . 8
  - Male genitalia with distinct suspensorium . . . . . 9
8. Aedeagus rudiment; diaphragm indistinct . . . . . *Saccharosydne* Kirkaldy
  - Aedeagus with phallus extremely long, twice as wide of pygofer; diaphragm prominent . . . . . *Prodelphax* n. gen.
9. Frons with two submedian carinae; phallus reflected at apex forming a ventrad directed lobe, armed with small teeth; pronotum with lateral carinae attaining hind margin . . . . . *Yanunka* Ishihara



- Frons with single median carina, simple or forked . . . . . 10
- 10. Submedian carinae of vertex converging apically, continuing separated from each other onto frons where they unite (median carina of frons forked) . . . . . 11
  - Submedian carinae uniting on vertex, union sometimes indistinct, continuing onto frons as a single carina . . . . . 33
- 11. Antennae with first segment flattened . . . . . *Perkinsiella* Kirkaldy
  - Antennae with first segment cylindrical . . . . . 12
- 12. Femora and tibiae of fore and middle legs compressed or foliaceous . . . . . 13
  - Femora and tibiae of fore and middle legs normal . . . . . 16
- 13. Femora and tibiae of fore and middle legs compressed but not foliaceous . . . . 14
  - Femora and tibiae of fore and middle legs foliaceous . . . . . *Peliades* Jacobi
- 14. Anal segment of male with apical margin transverse, lateroapical angles not produced or produced medially in a spinose projection . . . . . *Indozurriel* Fennah
  - Anal segment of male with apical margin not transverse, lateroapical angles each produced into a spinose process . . . . . 15
- 15. Phallus reflected cephalad at apex in a flagellum . . . . . *Cemus* Fennah
  - Phallus simple, armed with teeth; pygofer in profile very high . . . . . *Cemopsis* Fennah
- 16(12). Diaphragm wide, knob-like, produced caudad; head including eyes as wide as pronotum; length of tegmen 4.40 mm . . . . . *Euidopsis* Ribaut
  - Diaphragm not knob-like . . . . . 17
- 17. Pygofer with distinct medioventral process or processes . . . . . 18
  - Pygofer without or with weak process . . . . . 25
- 18. Pygofer with single medioventral process . . . . . 19
  - Pygofer with 3 medioventral processes . . . . . 23
- 19. Post-tibial spur with more than 30 teeth; first tarsal segment of hind leg as long as the other 2 combined; tegmina ♂ about 5 mm . . . . . *Kakuna* Matsumura
  - Post-tibial spur with 25 teeth or less; first tarsal segment of hind leg shorter than the other 2 combined; tegmina ♂ less than 4 mm . . . . . 20
- 20. Frons 1.7 times as long as widest part; medioventral process of pygofer widening to apex . . . . . *Neodicranotropis* n.gen.
  - Frons 2 times as long as widest part; medioventral process narrowing to apex . 21
- 21. Medioventral process of pygofer in ventral view rounded at apex; diaphragm membranous . . . . . *Thymalops* Fennah
  - Medioventral process of pygofer in ventral view narrowed, and truncate at apex . . . . . 22
- 22. Post-tibial spur with about 14 teeth; phallus slender . . . . . *Neoconon* n.gen.
  - Post-tibial spur with about 25 teeth; phallus stout . . . . . *Paraconon* n.gen.
- 23(18). Pygofer with median medioventral process simple . . . . . 24
  - Pygofer with median medioventral process moderately or deeply incised at apex; suspensorium Y-shaped, stem very small . . . . . *Garaga* Anufriev
- 24. Lateral medioventral processes smaller than median one, all pointed at apex . . . . . *Nycheuma* Fennah
  - Lateral medioventral processes of pygofer wider than median one, truncate (in the Taiwanese species) at apex . . . . . *Tarophagus* Zimmerman
- 25(17). Pronotum with lateral carinae strongly incurved posteriorly, attaining hind



- margin . . . . . 26
- Pronotum with lateral carinae diverging posteriorly, not attaining hind margin . . . . . 27
26. Suspensorium rod-like; anal segment of male with each lateroapical angle not produced into process . . . . . *Peregrinus* Kirkaldy
- Suspensorium Y-shaped; anal segment of male with lateroapical angles each produced into a small process . . . . . *Eunycheuma* n.gen.
27. Phallus narrower in apical half, distinctly bent ventrad apically . . . . . *Falcotoya* Fennah (partim)
- Phallus not narrower in apical half, not bent ventrad apically . . . . . 28
28. Phallus not reflected at apex . . . . . 29
- Phallus reflected at apex . . . . . 30
29. Suspensorium U-shaped; phallus armed with rather large teeth . . . . . *Hagamiodes* Fennah
- Suspensorium ring-like ventrally; phallus armed with many small teeth . . . . . *Horcoma* Fennah
30. Pygofer in profile with laterodorsal angles strongly produced; phallus stout, reflected cephalad at apex but not forming a flagellum . . . *Muellerianella* Wagner
- Pygofer in profile with laterodorsal angles not strongly produced; phallus reflected at apex in a flagellum . . . . . 31
31. Phallus with flagellum overlying phallus, surpassing its base . . *Numata* Matsumura
- Phallus with flagellum not surpassing its base . . . . . 32
32. Genital styles sinuate; anal segment collar-shaped . . . . . *Sinolacme* Fennah
- Genital styles forked at middle; anal segment ring-like . . . . . *Ecdelphax* n.gen.
- 33(10). Frons 1.3 times as long as widest part or less; body flattened . . *Eoeurysa* Muir
- Frons 1.6 times as long as widest part or more; body not flattened . . . . . 34
34. Phallus with dorsobasal half stratified . . . . . *Opiconsiva* Distant
- Phallus with dorsobasal half not stratified . . . . . 35
35. Phallus sickle-shaped, with many teeth on apical third . . . . . *Falcotoya* Fennah (partim)
- Not as above . . . . . 36
36. Vertex markedly produced beyond eyes . . . . . 37
- Vertex not markedly produced beyond eyes . . . . . 38
37. Spinal formula of hind leg 5-8-4; suspensorium ring-like; post-tibial spur with more than 30 teeth . . . . . *Hadeodelphax* Kirkaldy
- Spinal formula of hind leg 5-7-4; suspensorium inverse Y-shaped; post-tibial spur with about 20 teeth . . . . . *Sardia* Melichar
38. Genital styles slender, both margins parallel, reaching to laterodorsal angles of pygofer; body mostly green or greenish color . . . . . *Chloriona* Fieber
- Not as above . . . . . 39
39. Pygofer with developed medioventral process, long, directed dorsad, distinctly surpassing dorsal margin of diaphragm . . . . . *Neoterthrona* n.gen.
- Pygofer without developed medioventral process, if present, short, directed caudad . . . . . 40
40. First tarsal segment of hind leg with one or more spines laterally . . . . . *Nilaparvata* Distant
- First tarsal segment of hind leg without tooth laterally . . . . . 41



41. Anal segment of male with apical margin strongly produced at middle . . . . . 42  
 – Anal segment of male without production or produced at both lateroapical angles . . . . . 43
42. Frons longer in middle line than wide at widest part about 3:1; pygofer with rod-like process at each side of dorsal margin of diaphragm . . . . *Neometopina* n.gen.  
 – Frons longer in middle line than wide at widest part about 1.3-2.1:1; pygofer without rod-like structure . . . . . *Parametopina* n.gen.
43. Anal segment of male with lateroapical angles each produced into a short, stout process, toothed . . . . . *Tsaurus* n.gen.  
 – Anal segment of male without process, if process present, not toothed . . . . . 44
44. Pygofer in profile with posterior margin produced caudad in a lobe . . . . . 45  
 – Pygofer in profile posterior margin without production . . . . . 45
45. Frons widest at level of ocelli; pygofer without medioventral process . . . . .  
 . . . . . *Unkanodes* Fennah  
 – Frons widest at apex; pygofer with medioventral process . . . . *Neunkanodes* n.gen.
46. Phallus apically decurved ventrad at 90° angle . . . . . 47  
 – Not as above . . . . . 48
47. Vertex as long submedially as wide at base; phallus toothed . . . . .  
 . . . . . *Onidodelphax* n.gen.  
 – Vertex distinctly longer submedially than wide at base; phallus not toothed . . . . .  
 . . . . . *Sogata* Distant
48. Spinal formula of hind leg 5-6-4; post-tibial spur with 12-17 teeth, each tooth with single seta . . . . . *Diodelphax* n.gen.  
 – Spinal formula of hind leg 5-7-4 . . . . . 49
49. Phallus with rhomboidal posterior opening . . . . . *Rhombotoya* Fennah  
 – Phallus without posterior rhomboidal opening . . . . . 50
50. Genital styles broad, tapering to apex, inner margin with small process medially (for 2 Taiwanese species only) . . . . . *Matutinus* Distant  
 – Not as above . . . . . 51
51. Phallus protruding at medioventral portion into a rod-like or triangular process . . . . .  
 . . . . . *Terthron* Fennah  
 – Phallus simple, not as above . . . . . 52
52. Anal segment with four processes . . . . . *Sogatellana* Kuoh  
 – Anal segment with two processes . . . . . 53
53. Pygofer in profile with laterodorsal angle strongly produced; suspensorium with dorsal portion triangular . . . . . *Harmalia* Fennah  
 – Not as above . . . . . 54
54. Pygofer in profile with posterior margin acutely incised at middle . . . . .  
 . . . . . *Laodelphax* Fennah  
 – Pygofer in profile with posterior margin not incised . . . . . 55
55. Diaphragm with dorsal margin produced medially into a rather long process, longer than wide at base about 1.5:1 . . . . . *Syndelphax* Fennah  
 – Diaphragm with dorsal margin concave, if produced, the lobe as long or shorter than wide at base . . . . . 56

56. Pygofer distinctly beset with granulations along lateral margin of opening for aedeagus . . . . . *Coronacella* Metcalf  
 – Pygofer without granulations along lateral margin of opening for aedeagus . . . 57
57. Anal segment of male with lateral portions sclerotized and pigmented; suspensorium membranous, emarginate at ventral margin . . . . . *Formodelphax* n.gen.  
 – Not as above . . . . . 58
58. Anal segment of male with each lateroapical angle produced in a rather short, stout process . . . . . *Ulaner* Fennah  
 – Anal segment of male with each lateroapical angle produced in a spinose process . . . . . 59
59. Pygofer in ventral view with dorsal margin shallowly incised; lateral margins of opening with small projection . . . . . *Taidelphax* n.gen.  
 – Pygofer in ventral view with dorsal margin not incised . . . . . 60
60. Phallus compressed laterally, with 2 more or less complete rows of teeth, one obliquely on left side, another on right side . . . . . 61  
 – Phallus tubular, short and stout, with or without teeth . . . . . 62
61. Diaphragm with dorsal margin concave, usually with a pair of peg-like process . . . . . *Sogatella* Fennah  
 – Diaphragm with dorsal margin straight or distinctly produced dorsad . . . . . *Sogatodes* Fennah
62. Head including eyes as wide as pronotum . . . . . *Smicrotatodelphax* Kirkaldy  
 – Head including eyes narrower than pronotum . . . . . *Toya* distant
- \**Dicranotropis* Fieber, *Delphacodes* Fieber and *Phyllodinus* Van Duzee are excluded here.

### Key to the nymphs of Delphacidae of Taiwan

1. Frons each side with more than 20 sensory pits; pronotum each side with 16 pits; abdominal tergites IV-VIII each side with 5-8-9-8-10 pits; abdominal pleura V-VIII each side with 5-3-3-3 pits; rostrum 4-segmented; between eye and lateral carina of frons with 23 pits . . . . . *Ugyops tripunctatus* (Kato)\*\*  
 – Frons each side with no more than 8 visible sensory pits; pronotum each side with no more than 9 pits; abdominal tergite IV each side with no more than 3 pits; abdominal pleura absent; rostrum 3-segmented; between eye and lateral carina of frons with no more than 7 pits . . . . . 2
2. Pronotum each side with 8 or 9 sensory pits; between eye and lateral carina of frons with 7 pits . . . . . 3  
 – Pronotum each side with 7 pits or less; between eye and lateral carina with 5 pits or less . . . . . 5
3. Pronotum each side with 9 pits; abdominal tergites IV-VIII each side with 1-3-4-4-4 pits; interfrons distinctly narrower than laterofrons at level of lower margin of eyes . . . . . *Stenocranus agamopsyche* Kirkaldy  
 – Pronotum each side with 8 pits; abdominal tergites IV-VIII each side with 0-1-3-3-3 pits; interfrons about as wide as laterofrons at level of lower margin of eyes . . . . . 4



4. Submedian carinae attaining hind margin of vertex at same points of lateral carinae; general color brown dorsally, white ventrally; relative distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 2.6:1 . . . . . *Kakuna mira* n.sp.  
 – Submedian carinae attaining hind margin of vertex submedially; general color green; relative distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 1.4:1 . . . . . *Kakuna albipennis* (Matsumura)\*
5. Abdominal tergite IV each side with 3 pits; antennae large, surface of basal segment distinctly ridged . . . . . *Purohita taiwanensis* Muir\*\*  
 – Abdominal tergite IV each side with 0-2 pits; antennae small, surface of basal segment not ridged . . . . . 6
6. Abdominal tergite IV each side with 1-2 pits . . . . . 7  
 – Abdominal tergite IV without pit . . . . . 13
7. Abdominal tergite IV each side with 2 pits; interfrons distinctly wider than laterofrons at level of lower margin of eyes . . . *Chloriona tateyamana* Matsumura\*  
 – Abdominal tergite IV each side with 1 pit; interfrons if present, distinctly narrower than laterofrons at level of lower margin of eyes . . . . . 8
8. Body depressed; frons without median carina; pronotum each side with 7 pits . 9  
 – Body not depressed; frons with 2 distinct median carinae; pronotum each side with 5 or 6 pits . . . . . 10
9. Relative distance of inner 3 pits of pronotum about 1:1; spinal formula of hind leg 5-8-4 . . . . . *Eoeurysa flavocapitata* Muir\*  
 – Relative distance of inner 3 pits of pronotum about 2:1; spinal formula of hind leg 5-7-4 . . . . . *Eoeurysa arundina* Kuoh
10. Abdomen each segment with 2 pairs lateral carinae; abdominal tergite VIII with laterocaudal angles strongly produced caudad . . . . . *Tropidocephala saccharivorella* Matsumura  
 – Abdomen each segment without lateral carina; abdominal tergite VIII with laterocaudal angles not produced . . . . . 11
11. Vertex with median carina distinct; lowest pit of frons lies near frontoclypeal suture, distance about 2 diameters of pit . . . *Tropidocephala grata* Yang et Yang\*\*  
 – Vertex with median carina feeble; lowest pit of frons far away from frontoclypeal suture, distance about 5 diameters of pit or more . . . . . 12
12. Head between eyes narrower at narrowest part than long in middle line about 1:2.6; general color pale yellow . . . . . *Tropidocephala sinuosa* Yang et Yang  
 – Head between eyes narrower at narrowest part than long in middle line about 1:1.4; general color milky white . . . . . *Tropidocephala brunnipennis* Signoret\*\*
13. Abdominal tergite V each side with 2 pits . . . . . 14  
 – Abdominal tergite V each side with 1 pit . . . . . 16
14. Frons longer in middle line than wide at widest part about 1.6:1 or more . . . 15  
 – Frons as wide as or shorter than wide at widest part . . . . . 16
15. Frons longer in middle line than wide at widest part about 1.6:1; lateral areas of abdomen dark brown . . . . . *Unkanodes sapporona* (Matsumura)  
 – Frons longer in middle line than wide at widest part about 2.5:1; general color green . . . . . *Saccharosydne procerus* (Matsumura)\*



16. Frons shorter in middle line than widest part about 1:1.3; lower of lower pits deposite laterally; lower of upper pits not lower than upper of median pits . . . . .  
*Epeurysa sinobambusae* Yang et Yang\*\*  
 – Frons nearly as long in middle line as widest part; lower of lower pits deposite normally; lower of upper pits lower than upper of median pits . . . . .  
*Arcofaciella verrucosa* Fennah\*\*
17. Between eye and lateral carina of frons with 3 or 5 pits . . . . . 18  
 – Between eye and lateral carina of frons with 4 pits . . . . . 19
18. Between eye and lateral carina of frons with 3 pits; abdominal tergites each with a pair of lateral carinae; 2 median carinae of frons strongly raised . . . . .  
*Arcofacies fullawayi* Muir\*\*  
 – Between eye and lateral carina of frons with 5 pits; abdominal tergites each without lateral carinae; 2 median carinae of frons not strongly raised . . . . .  
*Bambusiphaga taiwanensis* (Muir)\*\*
19. Submedian carinae of vertex attaining anterior margin of eyes; rostrum with third segment as long as widest part . . . . . *Malaxa bakeri* Muir\*\*  
 – Submedian carinae of vertex attaining hind margin of vertex; rostrum with third segment longer than widest part . . . . . 20
20. Distance between  $W_1$  to  $W_2$  about 2.3 times as long as  $W_2$  to  $W_3$  or less . . . . 21  
 – Distance between  $W_1$  to  $W_2$  about 3 times as long as  $W_2$  to  $W_3$  or more . . . . 28
21. Distance between  $W_1$  to  $W_2$  about 1.1 times as long as  $W_2$  to  $W_3$ ; antennae with basal segment longer than wide . . . . . *Tarophagus colocasiae* (Matsumura)\*  
 – Distance between  $W_1$  to  $W_2$  about 2 times as long as  $W_2$  to  $W_3$ ; antennae with basal segment as long as wide or wider than long . . . . . 22
22. Vertex with lateral carinae ending at lateral margin; lower of upper pits overlapping at level of dorsal margin of higher of median pits . . . . .  
*Perkinsiella thompsoni* Muir  
 – Vertex with lateral carinae ending at hind margin . . . . . 23
23. Dorsal margin of lower of upper pits same as higher of median pits; length of body about 1.91 mm . . . . . *Cemus sauteri* (Muir)  
 – Dorsal margin of lower of upper pits distinctly higher than higher of median pits . . . . . 24
24. Abdominal tergite III distinctly narrower than tergite V; vertex with basal compartment distinctly wider than greatest length . . . *Harmalia commelinae* n.sp.  
 – Abdominal tergite III nearly as wide as tergite V . . . . . 25
25. Interfrons narrowed at base . . . . . 26  
 – Interfrons parallel throughout . . . . . 27
26. Each side of 7th abdominal segment with a black marking . . . . .  
*Sogata mukaensis* n.sp.  
 – Each side of 7th abdominal segment without black marking. . . . .  
*Sogata nigrifrons* (Muir)\*
27. Head between eyes wider at narrowest part than long in middle line; post-tibial spur with 18-25 teeth . . . . . *Peregrinus maidis* (Ashmead)  
 – Head between eyes longer in middle line than wide at narrowest part; post-tibial spur with about 12 teeth . . . . . *Neoconon incersa* n.sp.

28. Apical margin of abdominal tergite VII nearly as wide as tergite VI; lower of upper pits overlapping at level of dorsal margin of higher of median pits . . . . .  
 . . . . . *Taidelphax chishanensis* n.sp.  
 – Apical margin of abdominal tergite VII distinctly narrower than tergite VI . . . 29
29. Lower of upper pits distinctly higher than level of dorsal margin of higher of median pits . . . . . 31  
 – Lower of upper pits overlapping at level of dorsal margin of higher of median pits . . . . . 30
30. Rostrum relative length of each segment about 1.1:1.2:1 . . . *Toya bridwelli* (Muir)  
 – Rostrum relative length of each segment about 1.4:1.5:1 . . . . .  
 . . . . . *Toya propinqua* (Fieber)
31. Laterofrons at level of lower margin of eyes about 2 times as interfrons . . . . 32  
 – Laterofrons at level of lower margin of eyes less than 1.5 times as interfrons . . 33
32. Frons longer in middle line than wide at widest part about 1.7:1; frons pale black . . . . .  
 . . . . . *Yanunka incerta* n.sp.  
 – Frons nearly as long in middle line as wide at widest part; frons with basal third brown . . . . .  
 . . . . . *Smicrotatodelphax maritimus* n.sp.
33. Head between eyes longer in middle line than width at narrowest part; vertex with basal compartment wider at hind margin about 1.9 times as long as greatest length . . . . .  
 . . . . . *Sogatella vibix* (Haupt)\*  
 – Head between eyes wider at narrowest part than long in middle line; vertex with basal compartment wider at hind margin about 3.3 times as long as greatest length . . . . . 34
34. Post-tibial spur with 20-25 teeth; spur as long as first tarsal segment . . . . .  
 . . . . . *Nilaparvata lugens* (Stål)\*  
 – Post-tibial spur with 10-11 teeth; spur distinctly shorter than first tarsal segment . . . . .  
 . . . . . *Laodelphax striatellus* (Fallen)\*

\*\*Published in Part I.

\*Published in *Jour. Taiwan Mus.*, 38(2): 95-112.

## Subfamily Stenocraninae Wagner

### 1. Genus *Stenocranus* Fieber s. lat.

*Stenocranus* Fieber, 1866, *Verh. Zool. Bot. Ges. Wien.*, 16: 519.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2: 23.

–: Ding, 1983, *Econ. Ins. Fauna China*, 27: 88.

Head including eyes narrower than pronotum. Vertex fairly oblong, longer in middle line than wide at base, about 1.8:1, submedian carinae uniting at apex, Y-shaped carina distinct or obscure. Frons longer in middle line than wide at widest part, more than 2:1, widest at middle, median carina simple. Antennae short, reaching frontoclypeal suture. Ocelli present. Rostrum reaching meso-trochanters. Pronotum with lateral carinae attaining hind margin. Spinal formula of hind leg 5-7-4.

Anal segment of male ring-like, lateroapical angles each produced into process or



not. Pygofer without medioventral process. Aedeagus with phallobase, distinct, phallobasal process slender, curved, phallus slender, rod-like. Suspensorium various. Diaphragm rather broad. Genital styles moderately long.

Type species: *Fulgora minuta* Fabricius  
(type by subsequent designation by Oshanin, 1912).

### Key to the species of *Stenocranus*

1. Frons between carinae not black ..... *matsumurai* Metcalf  
– Frons between carinae black ..... 2
2. Median carina of frons basal third black; tegmina hyaline, with apical veins mostly infuscated and more broadly infuscated towards margin, length including tegmina ♂ 4.5 mm; ♀ 5 mm ..... *hopponis* Matsumura  
– Median carina of frons entirely not black ..... 3
3. Width of head including eyes much less than length of vertex and pronotum combination about 1:1.6; frons and clypeus between carinae and genae below eyes black; length of tegmen ♂ 3.5 mm.; ♀ 4.0 mm ..... *nigrifrons* Muir  
– Width of head including eyes about equal to length of vertex and pronotum combination ..... 4
4. Tegmina with membrane between  $M_2$  and  $M_3$  black ..... *planus* n.sp.  
– Tegmina with membrane without marking ..... 5
5. General color entirely testaceous; length including tegmina ♂ 5.5 mm.; ♀ 6 mm ..  
..... *formosanus* Matsumura  
– General color pale yellowish white; length including tegmina ♂ 5.0 mm .....  
..... *agamopsyche* Kirkaldy

### (1) *STENOCRANUS MATSUMURAI* Metcalf

Fig. 1.

*Stenocranus matsumurai* Metcalf, 1943, *Gen. Cat. Hem. fasc. IV, Fulgoroidea, Part.*, 3: 172.

–: Ding, 1983, *Econ. Ins. Fauna China*, 27: 101.

*Stenocranus breviceps* Matsumura, 1935, *Ins. Matsum.*, 9: 15.

–: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 15.

–: Matsumura et Ishihara, 1945, *Mushi*, 16:68.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:27.

General color yellowish brown. Intercarinal areas of frons, pronotum and sub-lateral areas of apical half of vertex brown to dark brown, meta-pleura each with a large rounded black spot, last tibiae black, femora and tibiae with black longitudinal stripes. Abdomen light black. Tegmina hyaline, veins dark brown to black, hind margin near end of claval suture and ends of apical veins black.

Vertex longer submedially than wide at base, about 1.3:1, distinctly narrower at apex than at base, basal compartment of vertex wider at hind margin than greatest

length about 1.5:1. Frons in middle line longer than wide at widest part, about 2.8:1, as wide at base than at apex, lateral carinae very shallowly convex, median carina with

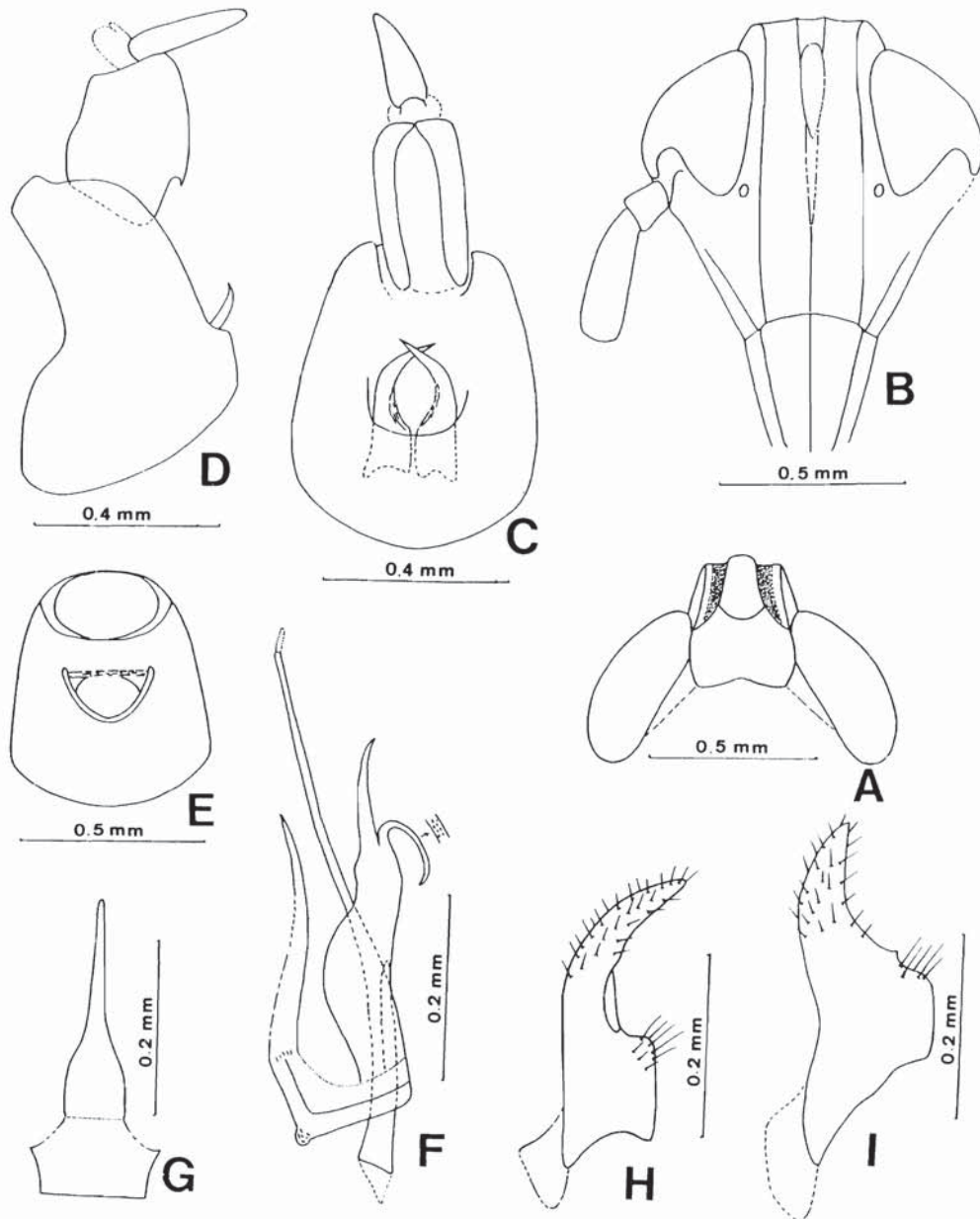


Fig. 1. *Stenocranus matsumurai* Metcalf A, head, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, the same, left side; E, diaphragm of pygofer; F, aedeagus, left side; G, suspensorium, dorsal view; H, genital style, posterior view; I, the same, posterolateral view.



shallowly elongate concave at basal third. Postclypeus at base wider than frons at apex. Antennae surpassing frontoclypeal suture, first segment nearly as long as wide, shorter than second about 1:3. Post-tibial spur with 20-23 teeth.

Anal segment of male rather long, apical margin contiguous, produced at basal third, directed ventrad in a small, pointed process. Pygofer in profile much longer ventrally than dorsally, basal margin strongly concave medially, apical margin produced below genital styles, in posterior view margins not very prominent. Phallus very long, rod-like process arising from left at base, directed dorsocaudad, phallobase lobe-like, apex with two processes, right one straight, slight decurved apically, left one turned left near base then directed right apically, latter one armed with very small spines. Suspensorium L-shaped at lateral view, very large, in dorsal view somewhat divided subbasally, connected with anal segment with single rod-like process. Diaphragm very broad. Genital styles moderately long, contiguous at base for rather long distance, then attenuated and recurving mesad, pointed at apex.

Female genitalia: saw-case broadened.

Male (macropterous)

Length of body (includ.teg.): 3.23-3.33 mm.

Length of tegmen: 4.07-4.33 mm.

Female (macropterous)

Length of body (includ.teg.): 3.66-3.83 mm.

Length of tegmen: 4.73-5.00 mm.

Specimens examined: 7 ♂♂, 5 ♀♀, Tienlun, Taichung Hsien, 13-XII-1981, C.T. Yang.

Host plant: *Phragmites communis* Trinius.

Distribution: Taiwan (new record), Mainland China, Japan.

## (2) *STENOCRANUS AGAMOPSYCHE* Kirkaldy

Fig. 2.

*Stenocranus agamopsyche* Kirkaldy, 1906, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 1(9):4-9.

—: Kirkaldy, 1907, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 3:138.

—: Muir, 1916, *Philip. Jour. Sci.*, 11:381.

—: Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:322.

—: Fennah, 1956, *Ins. Micronesia*, 6(3):113.

—: Ding, 1983, *Econ. Ins. Fauna China*, 27:94.

*Stenocranus philippinensis* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:323.

General color pale yellowish white with intercarinal areas of frons and postclypeus, stripe along genal carinae, small rounded spots near lateral margin of pronotum and on pleura, lines on femora and genital styles black. Tegmina hyaline, veins of whole apical third black except Sc<sub>2</sub> which only black at end.

Vertex longer submedially than wide at base about 1.7:1, nearly as wide at apex as at base, lateral margins straight, apical margin very slightly convex, Y-shaped carina distinct, basal compartment slightly narrower than greatest length about 1:1.1. Frons in middle line longer than widest part about 3.1:1, widest at apex, lateral carinae

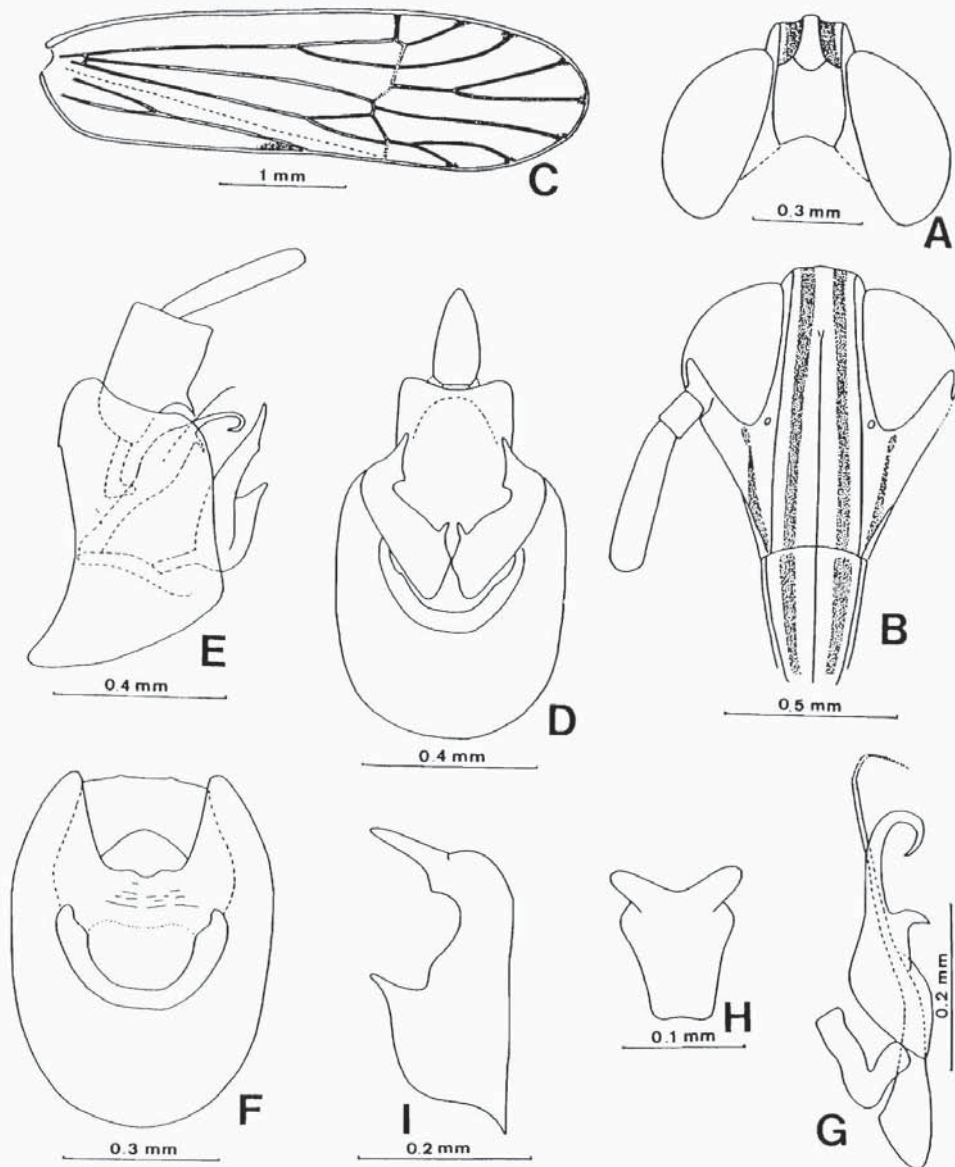


Fig. 2. *Stenocranus agamopsyche* Kirkaldy A, head, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, aedeagus, left side; H, suspensorium, dorsal view; I, genital style, posterolateral view.

nearly straight, median carina simple, feeble at base. Postclypeus at base slightly wider than frons at apex, longer in median line than wide at base about 1.4:1. Rostrum reaching to meta-coxae, apical segment shorter than subapical. Antennae slender, surpassing frontoclypeal suture, basal segment short, slightly longer than wide, shorter than second segment about 1:4. Post-tibial spur with 20 teeth.

Anal segment of male quadrate cylindrical, lateral margins each with a short, strong process medially, anal style very long, longer than height of anal segment. Pygofer in profile wider ventrally than dorsally, dorsal margin somewhat concave medially, anterior margin concave medially, posterior margin nearly straight, in



posterior view opening longer than wide, lateral margins slightly convex, ventral margin shallowly concave. Phallus very long and slender, wide at base and tapering to apex, apical portion very weak, phallobase about half length of phallus, at left side with a strong tooth at middle, directed ventrad, forming a semicircular process, at right with a indistinct process at basal half. Suspensorium in profile L-shaped, short and stout. Diaphragm moderately broad, dorsal margin sinuately incised medially. Genital styles moderately large, divergent, broad at base, slightly narrowed apically, lateral margin nearly straight, outer angle rounded, inner angle with slender process apically and a small one subapically, basal angle with small process, directed dorsad.

Female genitalia: saw-case broadened.

Male (macropterous)

Length of body (includ.teg.): 5.00 mm.

Length of tegmen: 4.10 mm.

### **Fifth instar nymph (Fig. 3)**

General color dirty white, dorsal aspect of head, thorax and wing pads somewhat pale black, abdomen each side with pale black ring, frons, postclypeus and genae each side with longitudinal pale black stripe respectively.

Head between eyes narrower at narrow part than long in middle line, about 1:1.5, moderately protruding beyond level of eyes, length of eye longer than length between level of eyes and lateral point of frons, about 4:1, width of head including eyes wider than width of basal compartment at hind margin, about 3.6:1, submedian carinae attaining hind margin of vertex submedially, basal compartment wider at hind margin than greatest length, about 1.1:1. Frons longer in middle line than wide at widest part, about 2.3:1, widest at level of lower margin of eyes, lateral carinae slightly convex, with 2 median carinae, separated, parallel. Interfrons narrower than laterofrons. Number and arrangement of sensory pits typical, each side with 3 extra pits, lowest pit lies far away from frontoclypeal suture, distance between dorsal level of lower pits and ventral level of median pits much shorter than former to frontoclypeal suture about 1:2.1, lower of upper pits much higher than higher of median pits. Between eye and lateral carina with seven pits, lowest one lies below middle of eye. Frontoclypeal suture slightly arched upward medially. Antennae long, basal segment as long as wide, shorter than second about 1:4.6. Rostrum moderately long, surpassing mesotrochanters, relative length of each segment about 1.5:1.4:1, third segment longer than wide about 2.4:1.

Pronotum each side with 9 pits, 2 medial, 7 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, relative distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 1.2:1. Anterior wing pad protruding not reaching to level of hind one, latter reaching to anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, metatibia longer than three tarsi combined about 1.2:1, spur shorter than first tarsal segment, with about 16 teeth.

Abdominal tergite IV: bears 1 pit on each side; V: 3; VI-VIII: 1+3 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge shallowly incised medially, lateral lobes cylindrical, pits lie near apex, in lateral view strongly produced near base, with anal comb relatively large, in caudal view widest near dorsal.

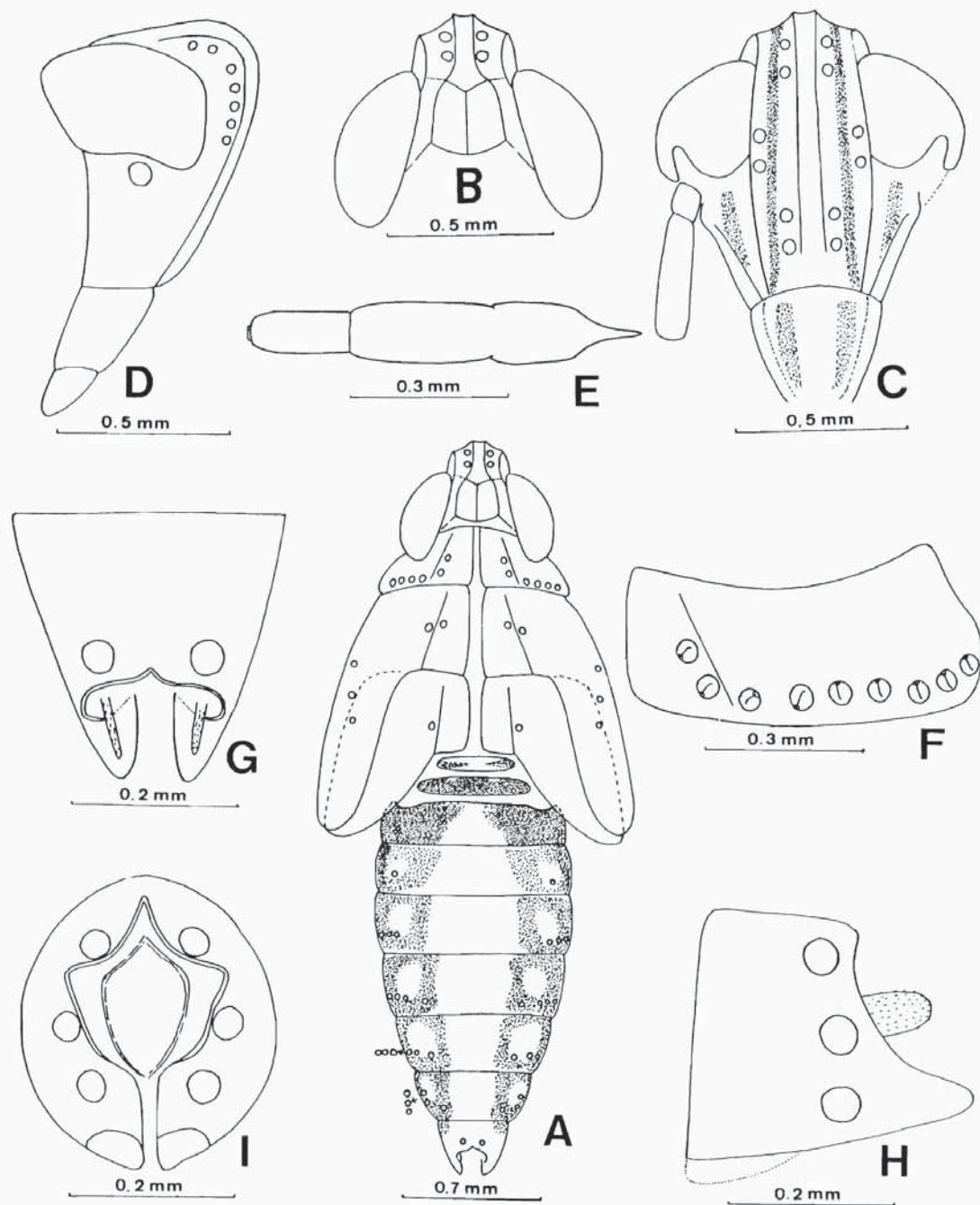


Fig. 3. Nymph of *Stenocranus agamopsyche* Kirkaldy A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.



Length of body: 3.70 mm.  
 Width of head including eyes: 0.80 mm.  
 Length of anterior wing pad: 1.81 mm.  
 Length of antenna: 0.45 mm.

Specimen examined: 1 ♂, Kuantzuling, Tainan Hsien, 26-X-1984, C.T. Yang.  
 Nymphal specimen examined: Fifth instar nymph: 1, Yuching, Tainan Hsien, 5-IV-1986, C.T. Yang.

Host plant: *Phragmites communis* Trinius.

Distribution: Taiwan (new record), Mainland China, Philippines, Queensland, South Mariana Is., Western Caroline Is.

### (3) *STENOCRANUS PLANUS* n.sp.

Fig. 4.

General color pale yellowish brown. Dorsal aspect of thorax with white stripe, frons with areas between carinae pale brown to black. Ocelli dark brown. Abdomen with dorsal aspect and pygofer pale black, anal style black. Tegmina hyaline with ends of apical veins black, veins without granules, membrane with area between  $M_2$  and  $M_3$  black, wings concolorous with tegmina.

Vertex longer submedially than wide at base about 1.8:1, lateral carinae straight, submedian carinae not uniting at apex, apical margin transverse, slightly produced medially, basal compartment about as wide at base as greatest length. Frons in middle line longer than wide at widest part about 3:1, widest below level of ocelli, median carina forked at base, lateral carinae nearly straight below ocelli, postclypeus at base slightly wider than frons at apex, longer than wide at base. Antennae reaching to frontoclypeal suture, basal segment slightly longer than wide, shorter than second about 1:3. Post-tibial spur with 21 teeth. Tegmina longer than widest part about 3.7:1.

Anal segment of male short, lateroapical angles without spinose process. Pygofer in profile very wide, distinctly longer ventrally than dorsally, in posterior view with opening slightly longer than wide, lateral margins weakly defined. Phallobase with process apically, turned ventrad and curved laterad. Phallus moderately long. Suspensorium circular and with two dorsal arms. Diaphragm very broad, dorsal margin straight. Genital styles broad at base, attenuate and turned inward at apical two-fifths, pointed apically, in profile caudodorsal angle with curved process, caudobasal portion with quadrate plate, caudal margin sinuate.

The name *planus* is Latin adjective, means plane.

Male (macropterous)

Length of body (includ.teg.): 4.90 mm.  
 Length of tegmen: 3.83 mm.

Holotype: Male, Kuantzuling, Tainan Hsien, 30-IV-1985, C.T. Yang, In NCHU.

Host plant: Unknown.

Distribution: Taiwan.

This new species resembles *Stenocranus longicapitis* Ding but differs from the latter in anal segment without process; shape of the aedeagus and the pygofer.



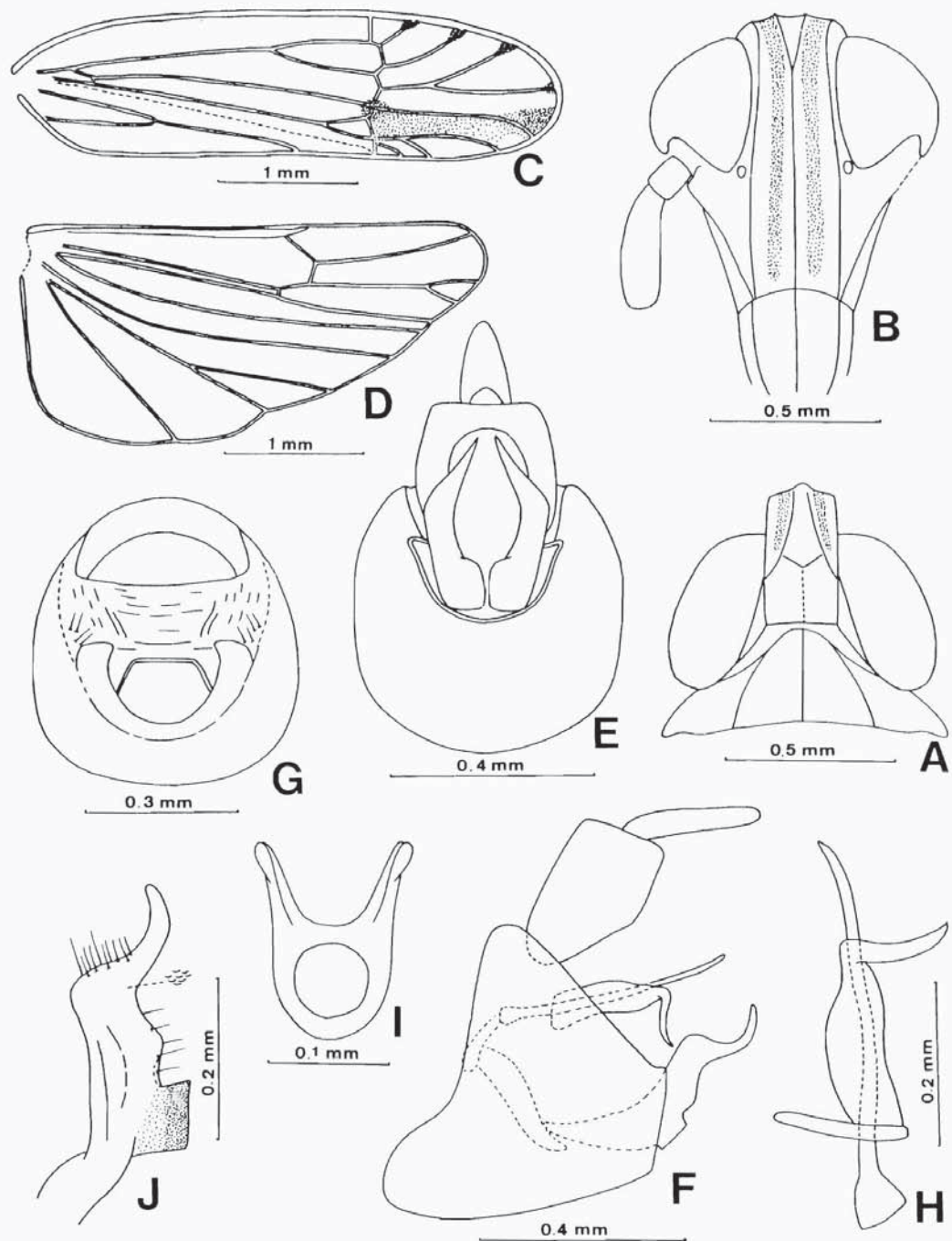


Fig. 4. *Stenocranus planus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, aedeagus, left side; I, suspensorium; J, genital style, left side.

(4) *STENOCRANUS FORMOSANUS* Matsumura

*Stenocranus formosanus* Matsumura, 1935, *Ins. Matsum.*, 9:128.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 16.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:29.

The description is reproduced from Matsumura [1935].

Closely allied to *S. fallax* Mats.; but differs from the latter in the following points:

Body long, testaceous; vertex seen from side much shorter; face black, longitudinal veins at the apices broaderly fuscous. ♂ genital segment pale testaceous, at the base ventrally black, at the middle of the lower margin with a small protuberance, the claspers fuscous, broad, undulate, strongly diverging upwardly, at the apices reddish brown, very slender, somewhat incurving. ♀ genital cushions pale testaceous, the anal tube and stylus fuscous, the latter being twice so long as the former.

Length — ♂ 5.5 mm, ♀ 6 mm. (to the apices of tegmina).

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

(5) *STENOCRANUS HOPPONIS* Matsumura

*Stenocranus hopponis* Matsumura, 1935, *Ins. Matsum.*, 9:129.

—: Matsumura, 1940, *Ins. Matsum.*, 15:36.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 16.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:29.

The description is reproduced from Matsumura (1935).

Testaceous, beneath and legs paler; vertical, pronotal and mesonotal fascia running percurrently white; face black, keels whitish, the medial keel at the basal one third black, the lateral keels at the extreme edges fuscous; clypeus at the base black; tegmina hyaline, veins granulated, veins at the membrane mostly infuscated, becoming broader towards the margin; abdomen reddish ochraceous, at the back with fuscous markings; ♂ genital segment whitish testaceous, at the lower margin obtusely engulfed, the claspers somewhat infuscated, in the middle paler, strongly horn-like upturned, at the base robust, at the apical 1/3 slender, being acute at the apices, and somewhat downwardly curved; in the female abdomen concolorous with the body, at the venter whitish, genital cushions concolorous with the body, the anal tube and stylus short, the latter being infuscated.

Length — ♂ 4.5 mm., ♀ 5 mm. (to the apices of tegmina).

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.



## 2. Genus *Preterkelisia* n. gen.

Head including eyes narrower than pronotum. Vertex longer in middle line than wide at base, submedian carinae not uniting at apex. Frons longer in middle line than wide at widest part, about 2.5:1, median carina forked at basal third. Ocelli present. Antennae cylindrical, short, reaching to frontoclypeal suture. Pronotum with lateral carinae reaching to hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 15 teeth. Tegmina longer than widest part about 4:1, wings not incised near end of  $A_1$ .

Anal segment of male large, ring-like, processes asymmetrical. Aedeagus with distinct phallobase, the latter with terminal needle-like appendages. Phallus slender, with a rudimentary membranous apical part. Phallus fused with phallobase. Suspensorium moderately long, with a small process. Diaphragm with dorsal margin extremely wide. Genital styles moderately long. Saw-case of female normal, not very broad, concealing ventral part of pygofer.

Type species: *Stenocranus magnispinosus* Kuoh  
(here designated)

This new genus differs from *Stenocranus* Fieber in phallus fused with phallobase; suspensorium with a process.

### (6) *PRETERKELISIA MAGNISPINOSA* (Kuoh)

Fig. 5.

*Stenocranus magnispinosus* Kuoh, 1981, *Acta Zootaxonomica Sinica*, 6(1): 79.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:94.

General color dark brown to black. Broad white stripe percurrent from vertex, thorax, ended at apex of clavus. Second segment of antennae, rostrum and legs pale yellowish brown. Abdomen with dorsal aspect somewhat reddish. Tegmina opaque, black, apical half with 5 semicircular white areas anteriorly, and 3 posteriorly.

Vertex longer in middle line than wide at base about 1.7:1, widest at middle, narrowing to apex, Y-shaped carina feeble, basal compartment with wide at base nearly as long as greatest length. Frons longer in middle line than wide at widest part about 2.6:1, widest at level of ocelli, distinct narrower at base than at apex, median carina forked at basal third. Postclypeus as wide at base as frons at apex, distinctly narrower at base than long in middle line. Rostrum reaching to meso-trochanters. Antennae with basal segment as long as wide, shorter than second about 1:3. Pronotum with median carina feeble at anterior half. Post-tibial spur with about 15 teeth. Tegmina with apical margin roundly acute.

Anal segment of male ring-like, in dorsal view asymmetrical, in anterior view deeply cleft, central lobe tongue-shaped, in caudal view lateroapical angles each produced in a extremely long (left) and very stout (right) processes, longer one reaching near base of genital style, into a triangular sac, right one about half length of left, but right sac still as complete as left. Aedeagus with phallus rod-like,

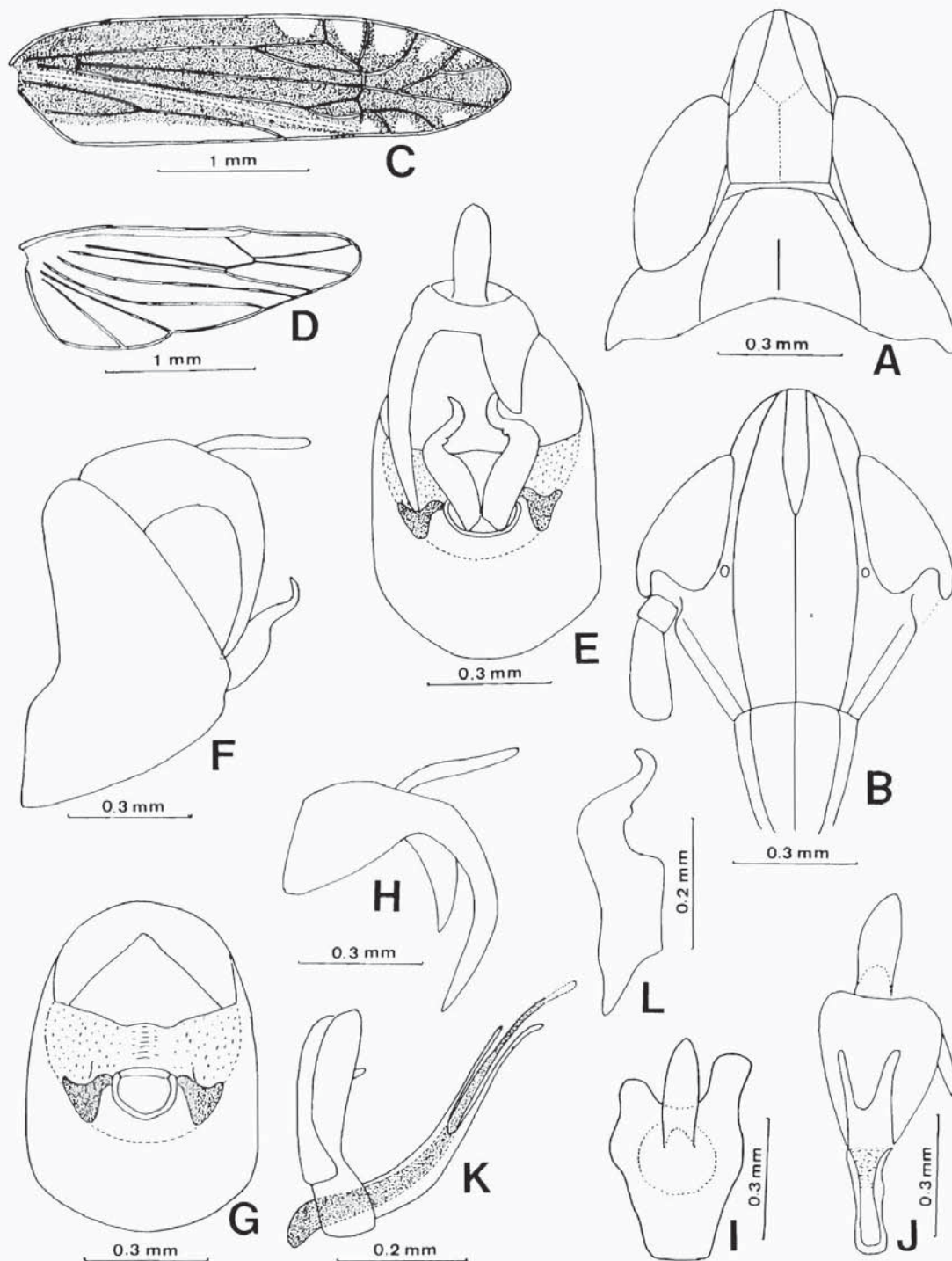


Fig. 5. *Preterkelisia magnispinosa* (Kuoh) A, head and pronotum, dorsal view; B, frons and post-clypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, the same, dorsal view; J, anal segment and suspensorium, anterior view slightly left; K, aedeagus and suspensorium, left side; L, genital style, lateral view.



membraneous at apex. Phallobase produced 2 processes, upper one slender, lower one slightly curved at apex, longer than upper one. Suspensorium very long in anterior view with long U-shaped sclerotized and pigmented ring, membraneous between arms dosally, in lateral view at basal third with a distinct process, situated at central membraneous area. Diaphragm broad, dorsal margin extremely wide, reaching nearly lateral margin, roundly produced dorsally at center. Genital styles divergent at apex, narrowed and sinuated at apical half, inner side apical third with a small process.

**Male (macropterous)**

Length of body (includ.teg.): 4.33 mm.

Length of tegmen: 3.46 mm.

**Female (macropterous)**

Length of body (includ.teg.): 5.13 mm.

Length of tegmen: 4.06 mm.

Specimens examined: 1 ♂, Chiapaotai, Taichung Hsien, 11-VII-1987, C.T. Yang;  
1 ♀, Hsenping, Kaohsiung Hsien, 11-VII-1984, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China.

## Subfamily Delphacinae

### Tribe Tropidocephalini

#### 3. Genus *Malaxa* Melichar

##### Key to the species of *Malax*

The key to the species of *Malaxa* given in Part I was not completed, so a key provides here to substitute former one and *M. herioca* has been added.

1. Antennae short, reaching to frontoclypeal suture, second segment about half length of frons ..... 2
  - Antennae long, reaching over apex of postclypeus, second segment as long or longer than frons ..... 3
2. Tegmina with basal half black; face bicolor, areas around eyes and postclypeus dark brown to black ..... *herioca* n.sp.
  - Tegmina with brownish line along cross veins; face unicolor ..... *bakeri* Muir
3. Tegmina without marking; vertex with submedian carinae uniting near apex; genital styles and paired medioventral processes asymmetrical .....
  - ..... *aurunca* Yang et Yang
  - Tegmina with apical half marked; vertex with submedian carinae uniting near middle ..... 4
4. Second antennal segment distinctly longer than frons; tegmina with apical half marked dorsally ..... *fusca* Yang et Yang
  - Second antennal segment as long as frons; tegmina with apical half marked ventrally ..... *semifusca* Yang et Yang

(7) *MALAXA HERIOCA* n.sp.

## Fig. 6.

Vertex, frons, genae below level of ocelli yellowish white. Pronotum with margins and area between lateral carinae yellowish white but beset with small black markings. Anteclypeus, rostrum and legs yellowish. Antennae with first segment dark brown, second yellowish each with a brown stripe marking. Genae above level of ocelli, postclypeus, areas outer lateral carinae of pronotum, mesonotum, fore and mid-coxae and abdomen dark brown to black except ventral aspect of abdomen somewhat reddish. Tegmina with basal half black.

Vertex longer submedially than wide at base about 1.4:1, apex distinctly protruding in front of eyes, apical margin truncate, lateral carinae convex laterad medially, submedian carinae uniting slightly before apex, Y-shaped carina distinct, basal compartment at base as wide as greatest length. Frons in middle line longer than wide at widest part about 2.8:1, widest at apex, lateral carinae evenly concave medially, median carina simple. Rostrum with apical segment shorter than subapical, as wide as long. Antennae reaching to frontoclypeal suture, basal segment slightly longer than wide about 1.3:1, shorter than second about 1:3.2. Tegmina rounded at apex, longer than widest part about 2.6:1.

Anal segment of male ring-like, left lateroapical angle strongly produced into a very long process which surpasses base of genital styles. Pygofér in profile very wide, wider ventrally than dorsally, slightly produced caudad near base, in posterior view opening longer than wide, without medioventral process. Phallus slender, very long, apical two-thirds bent ventrad, sinuate. Phallobase and process membranous, indistinct. Genital styles moderately long, broad at base, narrowing to apex, in profile pointed at apex, strongly concave at anterior margin.

The name *herioca* is Latin adjective, means heroic.

## Male (macropterous)

Length of body (includ.teg.): 3.66 mm.

Length of tegmen: 3.00 mm.

Holotype: Male, (dissected) Wushe, Nantou Hsien, 23-VI-1981, K.S. Lin & W.S. Tang. In TARI

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from all known species of *Malax* from Taiwan in having short antennae; extreme long process of anal segment and shape of aedeagus.



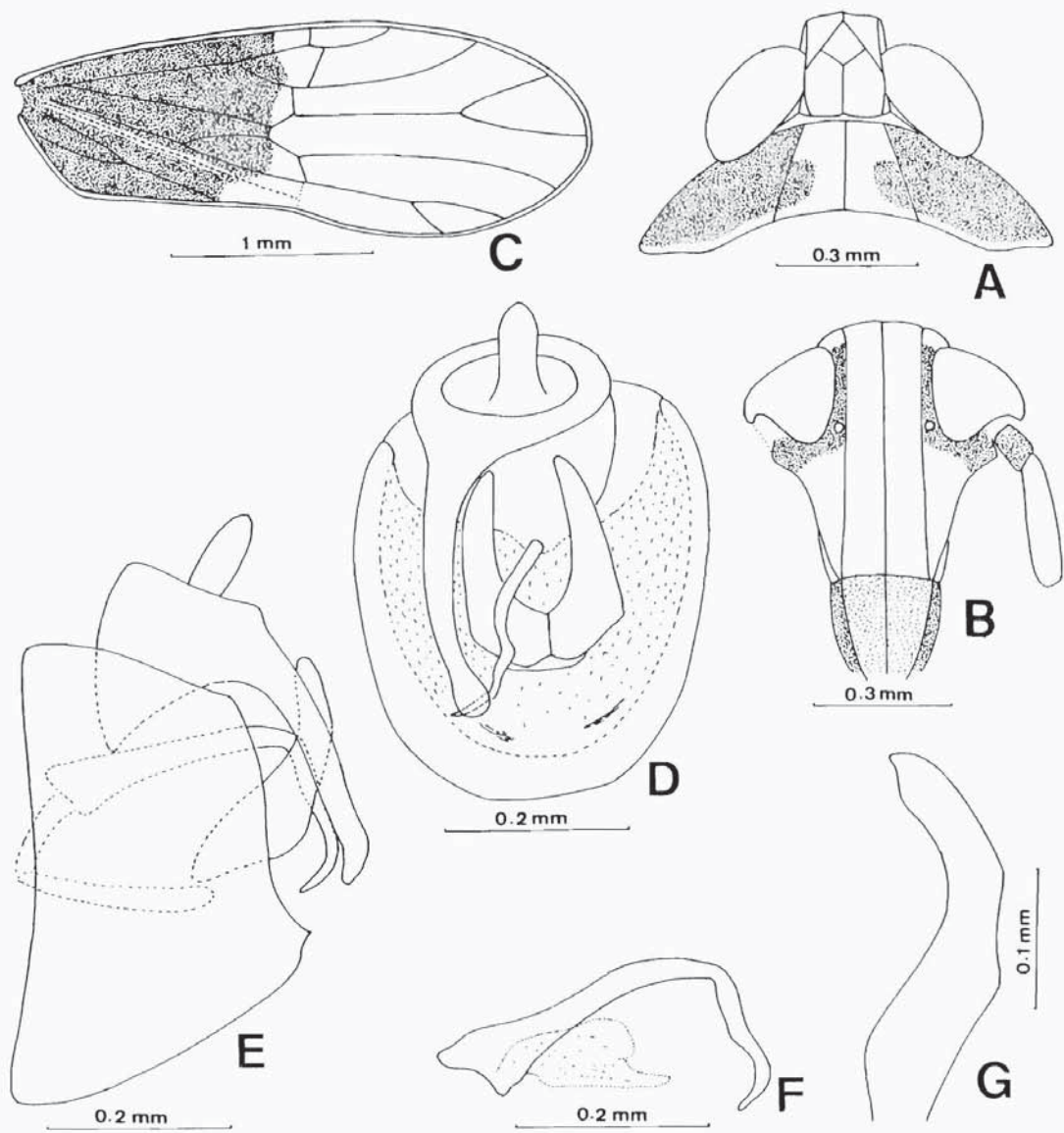


Fig. 6. *Malaxa herioca* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, aedeagus, left side; G, genital style, lateral view.

#### 4. Genus *Tropidocephala* Stål

##### (8) *TROPIDOCEPHALA FLAVOVITTATA* Matsumura Fig. 7.

*Tropidocephala flavovittata* Matsumura, 1907, *Ann. Mus. Nat. Hungarici*, 5:63.

—: Schumacher, 1915, *Mitt. Zool. Mus. Berlin*, 8:133.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 9.

—: Esaki et Ishihara, 1943, *Syst. Stud. Jap. Araeopid.*, 6.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:14.

—: Yang et Yang, 1986, *Taiwan Mus. Spec. Publ.*, 6:16.

(misinterpreted)

General color pale reddish. Median line of vertex, pro-, mesothorax and commissural suture white which more wider at vertex and bordered with black line anteriorly. Antennae dirty white, with 3 black rings. Tegmina without any knob-like elevation, with a black marking at apicoventral angle and brown line across Sc+R.

Vertex longer in middle line than wide at base about 2:1, longer than pronotum about 2.3:1, conicle at apex, median carina distinct at basal third only. Frons longer in middle line than wide at widest part about 3:1, widest at level of ocelli, lateral carinae slightly convex medially, median carina forked at basal half. Frontoclypeal suture arched. Rostrum with apical segment longer than wide. Antennae reaching to frontoclypeal suture. Pronotum with median carina distinct at posterior half only. Spinal formula of hind leg 5-6-4. Tegmina longer than widest part about 2.5:1.

Anal segment of male small, ring-like. Pygofer in profile wide, wider ventrally than dorsally, basocaudal angle strongly produced caudad, in posterior view with opening wider than long, in ventral view median portion strongly produced forward, deeply incised at apex, with a small medioventral process medially. Aedeagus with phallus slender, at right side. Phallobase large, at right side forming a ring at base, characterized at apex, slightly produced downward medially. Genital styles long, divergent, slightly sinuate.

Male (macropterous)

Length of body (includ.teg.): 4.10 mm.

Length of tegmen: 3.10 mm.

Specimens examined: 1 ♂, Chiasien, Kaohsiung Hsien, 10-13, V-1981, C.C. Chan & C.C. Pan; 1 ♀, Lanyu, Taitung Hsien, 13-18, IV-1981, K.S. Lin.

Host plant: Unknown.

Distribution: Taiwan.

In Part I the author had cited this species from Kuoh (1983). Examining the specimens from Chiasien and Lanyu, the author found those specimens are more agreeable with the original description. The author believes that the Chinese species



should be under another name, if not identical with any other of the described Oriental *Tropidocephala*-species. Dr. Asche informed the author that "The late Dr. Fennah has restored the genus *Orchesma* Melichar from synonymy (in press in a paper on Africa Delphacidae). If applied in your paper, *T. flavovittata* Matsumura should be placed in *Orchesma*: *Orchesma flavovittata* (Matsumura) comb.nov.). Now the author retains this species as above, until the further information is available.

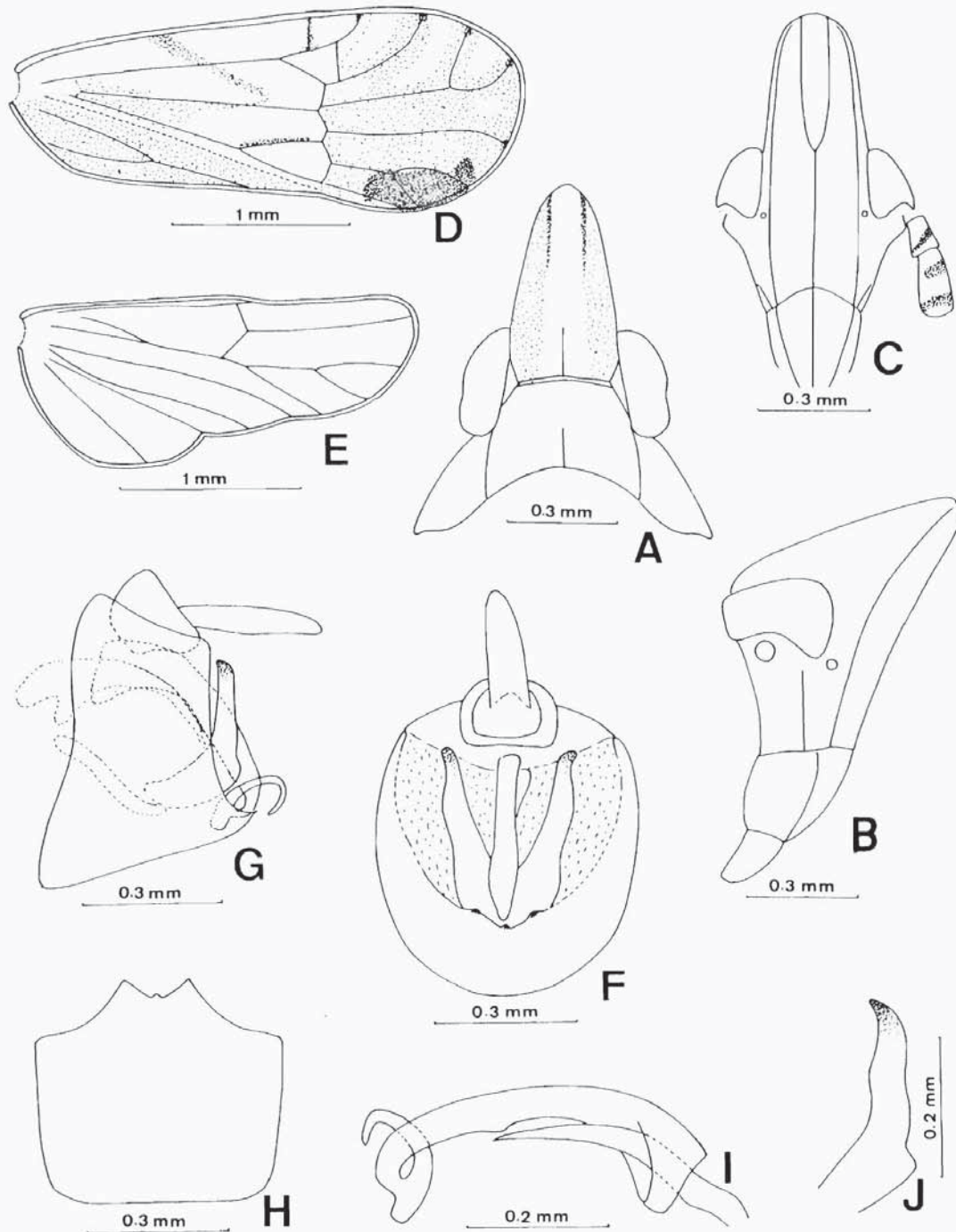


Fig. 7. *Tropidocephala flavovittata* Matsumura A, head and pronotum, dorsal view; B, head, left side; C, frons and postclypeus; D, tegmen; E, wing; F, male genitalia, posterior view; G, the same, left side; H, pygofer, ventral view; I, aedeagus, right side; J, genital style, left side.

(9) *TROPIDOCEPHALA MACULOSA* Matsumura

## Fig. 8.

*Tropidocephala maculosa* Matsumura, 1907, *Ann. Mus. Nat. Hungarici*, 5:65.

- : Schumacher, 1915, *Mitt. Zool. Mus. Berlin*, 8:133.
- : Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 9.
- : Esaki et Ishihara, 1943, *Syst. Stud. Jap. Araeopid.*, 67.
- : Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:14.

General color uniformly pale yellowish brown. Antennae with basal segment with half ring black marking, second with oblique line. Vertex with each side of median carina at apex black. Tegmina with 3 knob-like elevations, apicoventral area with large black marking.

Vertex longer in middle line than wide at base about 2.6:1, longer than pronotum about 2.7:1, rounded at apex. Frons longer than wide at widest part about 2.6:1, widest at level of upper margin of eyes. Postclypeus tricarinate. Antennae reaching to frontoclypeal suture. Spinal formula of hind leg 5-6-4.

Anal segment of male long, anal style very long. Pygofer in profile slightly wider ventrally than dorsally, caudal margin distinctly produced caudad at base of genital style, in posterior view with opening longer than wide, lateral margins well defined at ventral half, in ventral view medioventral process slender, simple. Aedeagus with phallus slender, phallobase ring-like at base, apical two-thirds abruptly bent down at right angle, right process indistinct. Genital styles sinuated at apical half, rounded at apex, basal angles each produced in a process.

## Male (macropterous)

Length of body (includ.teg.): 3.50-3.70 mm.

Length of tegmen: 2.36-2.50 mm.

Specimens examined: 1 ♂, Kenting, Pingtung Hsien, 24-28, VI-1981, T. Lin & C.C. Pan; 1 ♂, Oulampi, Pingtung Hsien, 27-VI-1981, T. Lin & C.C. Pan; 1 ♂, Oulampi, Pingtung Hsien, 15-III-1984, K.C. Chou & C.C. Pan.

Host plant: Unknown.

Distribution: Taiwan.

Specimens had not been collected before the publication of the Part I. Fortunately three male specimens are available for the present study. The author doubts that this species probably is a color form of *T. nigra* Matsumura of Japan, because shape of head and male genitalia in caudal view are very resemble Esaki's figures (Esaki et Ishihara, 1943b, Tab.I,d; Tab.III, d,e). The author wants to retain the present species for the time being until specimen of *T. nigra* is compared.



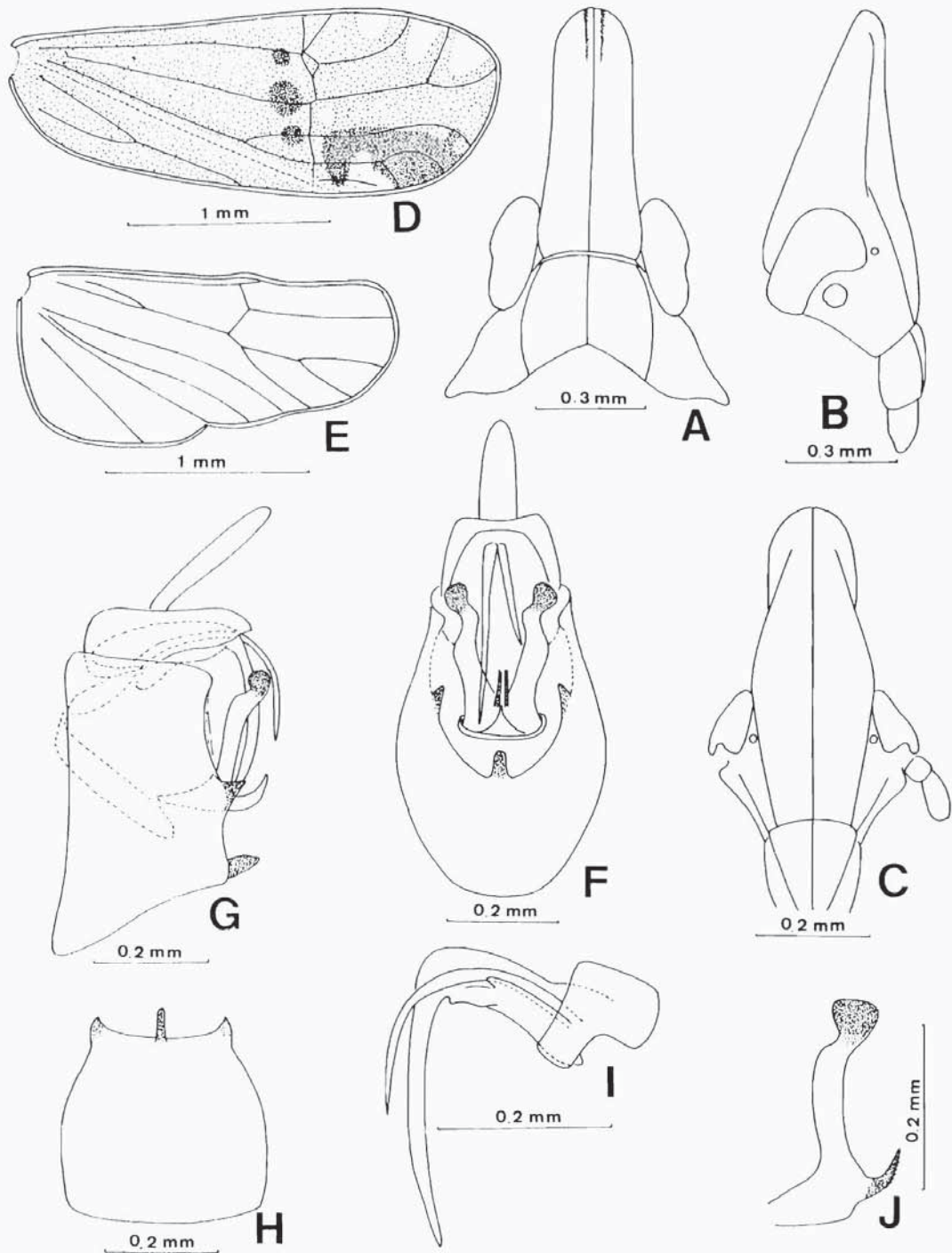


Fig. 8. *Tropidocephala maculosa* Matsumura A, head and pronotum, dorsal view; B, head, left side; C, frons and postclypeus; D, tegmen; E, wing; F, male genitalia, posterior view; G, the same, left side; H, pygofer, ventral view; I, aedeagus, right side; J, genital style, left side.

(10) *TROPIDOCEPHALA INSPERATA* n.sp.

## Fig. 9.

Vertex, frons and genae above ocelli somewhat green, genae below ocelli black, postclypeus brown, anteclypeus and rostrum yellowish. Antennae yellowish each segment with a black ring. Areas between lateral carinae of pro- and mesonotum brown, outer yellowish, median carina of vertex, pro- and mesonotum white, inner side of lateral carinae of pronotum white. Legs yellowish except meta-femura and tibiae brown. Abdomen brown. Tegmina as figured, with 3 elevations, characteristically with transparent areas at base.

Vertex longer in middle line than wide at base about 1.4:1, longer than pronotum about 1.3:1, rounded at apex. Frons longer in middle line than wide at widest part about 2.1:1, widest above level of ocelli, lateral carinae strongly convex medially, median carina with small cell at extreme base. Postclypeus in profile lower and angulating to frons. Rostrum short, apical segment longer than wide. Antennae short, reaching to frontoclypeal suture. Spinal formula of hind leg 5-6,7-4,5.

Anal segment of male small, anal style relatively long. Pygofer in profile as wide ventrally as dorsally, in posterior view opening longer than wide, lateral margins not well defined, in ventral view medioventral process single, rounded at apex. Aedeagus with phallus slender, at right side. Phallobase forming ring at base, phallobasal process with apical two-thirds curved downward, rounded at apex. Genital styles long, slender, slightly divergent apically, outer margin produced laterad medially, inner angle with process subapically.

The name *insperata* is Latin adjective, means unexpected.

## Male (macropterous)

Length of body (includ.teg.): 3.40-3.60 mm.

Length of tegmen: 2.53-2.70 mm.

## Female (macropterous)

Length of body (includ.teg.): 3.83-3.90 mm.

Length of tegmen: 3.00 mm.

Holotype: Male, Fuli, Hualien Hsien, 9-11, XI-1982, K.C. Chou & S.P. Huang.  
In TARI.

Paratypes: 20 ♂♂, 5 ♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species resembles *T. baguioensis* Muir and *T. andunna* Kuoh. It differs from *T. baguioensis* in the shape of the genital styles, from *T. andunna* in having the vertex longer than the pronotum about 1.3:1 (in *andunna* as long as pronotum); the laterocaudal margin of the pygofer not projected caudad.



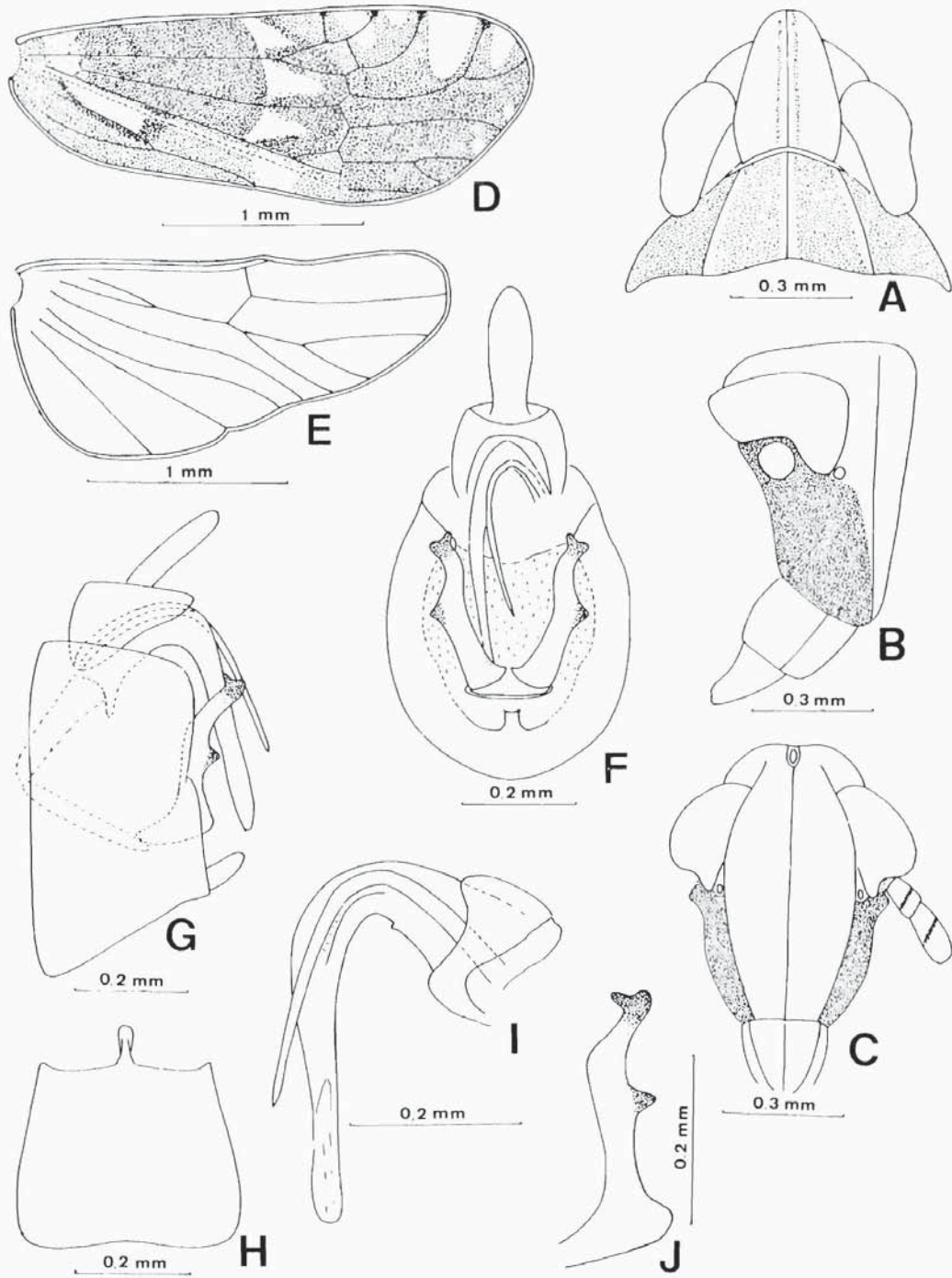


Fig. 9. *Tropidocephala insperata* n.sp. A, head and pronotum, dorsal view; B, head, left side; C, frons and postclypeus; D, tegmen; E, wing; F, male genitalia, posterior view; G, the same, left side; H, pygofer, ventral view; I, aedeagus, right side; J, genital style, left side.

**TROPIDOCEPHALA GRATA** Yang et Yang

*Tropidocephala grata* Yang et Yang, 1986. *Taiwan Mus. Spec. Publ.*, 6:26.

**Fifth instar nymph (Fig. 10)**

General color pale yellowish brown scattered with brown markings.

Head between eyes narrower at narrowest part than long in middle line about 1:1.4, strongly protruding in front of eyes, truncately protruding at apex, lateral carinae strongly foliate, convex, median carina distinct, submedian carinae absent. Eyes parallel, length of eye shorter than length between high level of eyes and median point of apex about 1:1.1, no sensory pit visible from above. Frons longer in middle line than wide at widest part about 1.3:1, widest slightly below level of antennae, lateral carinae strongly convex roundly below antennae, with 2 median carinae, separated, parallel except narrowed at extreme base. Interfrons narrower than laterofrons at widest part. Number and arrangement of pits typical, each side with 3 extra pits, lower pit lies near frontoclypeal suture, distance about two diameters of pit, distance between dorsal level of lower pits and ventral level of median pits shorter than former to frontoclypeal suture about 1:1.4, lower of upper pits higher than higher of median pits. Between eye and lateral carina with 4 pits in line, lowest one lies at middle of eye. Frontoclypeal suture straight. Antennae very short, not reaching to frontoclypeal suture, basal segment wider than long, shorter than second about 1:3.5. Rostrum reaching to mesotrochanters, relative length of each segment about 1.3:1.4:1, third segment longer than wide about 2.1:1.

Pronotum each side with 6 pits, 2 at inner side of lateral carina and one outer, one at inner side of lateral keel and 2 outer. Number and arrangement of pits on meso-, metanotum and wing pads typical, distance between  $W_1$  to  $W_2$  longer than  $W_2$  to  $W_3$  about 2.1:1. Anterior wing pad protruding over hind one, reaching to anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, spur shorter than first tarsal segment.

Abdominal tergites III-VIII with distinct median carinae, each lateral side with another 2 respectively, which not reaching anterior margin. Tergite IV-V: bear 1 pit on each side respectively; VI: 2; VII-VIII: 3 respectively; tergite VIII protruding caudad at middle roundly; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal view with median carina protruding caudad roundly, lateral lobes somewhat cylindrical, pits at middle, anal combs large, in lateral view strongly produced caudad below middle, in caudal view with opening wider at middle.

Length of body: 2.81 mm.

Width of head including eyes: 0.51 mm.

Length of anterior wing pad: 1.03 mm.

Length of antenna: 0.17 mm.

Specimen examined: Fifth instar nymph: 1, Kautyulin, Nantou Hsien, 17-XII-1986, C.T. Yang.



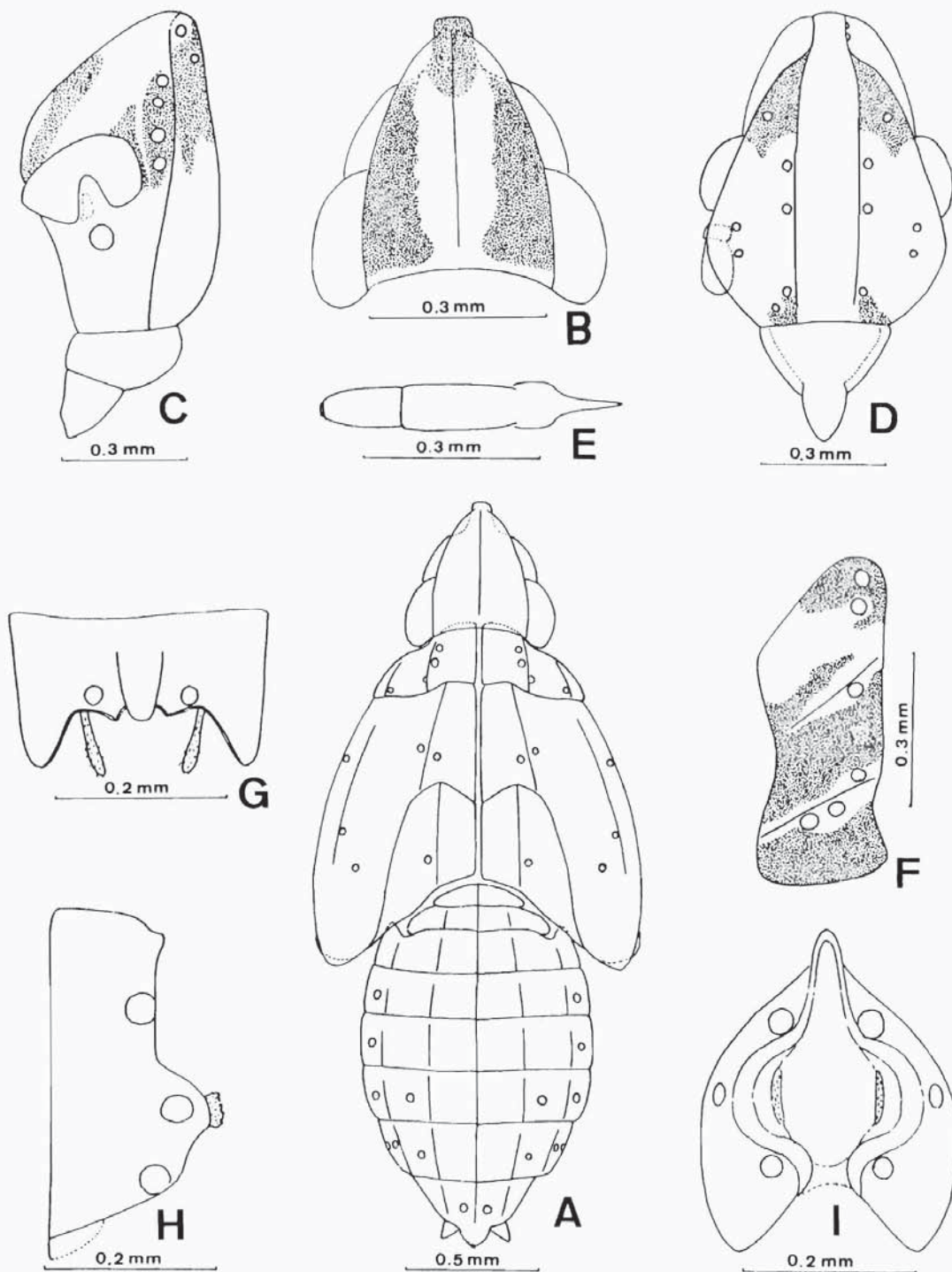


Fig. 10. Nymph of *Tropidocephala grata* Yang et Yang A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.

*TROPIDOCEPHALA BRUNNIPENNIS* Signoret

*Tropidocephala brunnipennis* Signoret, 1860, *Ann. Soc. Ent. France*, 8:185.

**Fifth instar nymph (Fig. 11.)**

General color milky white scattered with irregular, pale black small markings throughout dorsal aspect.

Head between eyes narrower at narrowest part than long in middle line about 1:1.4, strongly protruding in front of eyes, roundly protruding at apex, lateral carinae straight, oblique, strongly foliate, median and submedian carinae absent. Eyes parallel, length of eye slightly longer than length between high level of eyes and median point of apex about 1.15:1, no sensory pit visible from above. Frons from ventral with eyes invisible, longer in middle line than wide at widest part about 1.1:1, widest above level of antennae, lateral carinae strongly convex, with 2 median carinae, separated, parallel except narrowed at extreme base. Interfrons narrower than laterofrons at widest part. Number and arrangement of pits typical, each side with 3 extra pits, lower pit lies far away from frontoclypeal suture, distance about 5 diameters of pit, lower of median pits lower than higher of lower pits, lower of upper pits higher than higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies at middle of eye. Frontoclypeal suture slightly arched. Antennae short, not reaching to frontoclypeal suture, basal segment wider than long, shorter than second about 1:3. Rostrum short and stout, reaching to mesocoxae, relative length of each segment about 1.7:2.1:1, third segment as long as wide.

Pronotum each side with 5 pits, 2 at inner side of lateral carina and one outer, one at inner side of lateral keel and one outer. Number and arrangement of pits on meso-, metanotum and wing pads typical, distance between  $W_1$  to  $W_2$  longer than  $W_2$  to  $W_3$  about 3:1. Anterior wing pad protruding not over hind one, reaching to middle of tergite III. Spinal formula of hind leg 5-6-4, spur shorter than first tarsal segment.

Abdominal tergites III-VIII with distinct median carinae, each lateral side with another 2 respectively, which not reaching anterior margin. Tergites IV-V: bear 1 pit on each side respectively; VI: 2; VII-VIII; 3 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal view with median carina protruding caudad roundly, lateral lobes somewhat cylindrical, pits near middle, anal combs large, in lateral view hind margin nearly straight except produced caudad at base, in caudal view with opening wider at middle.

Length of body: 2.59 mm.

Width of head: 0.51 mm.

Length of anterior wing pad: 0.84 mm.

Length of antenna: 0.16 mm.

Specimen examined: Fifth instar nymph: 1, Taichung, 5-VI-1987, C.T. Yang.



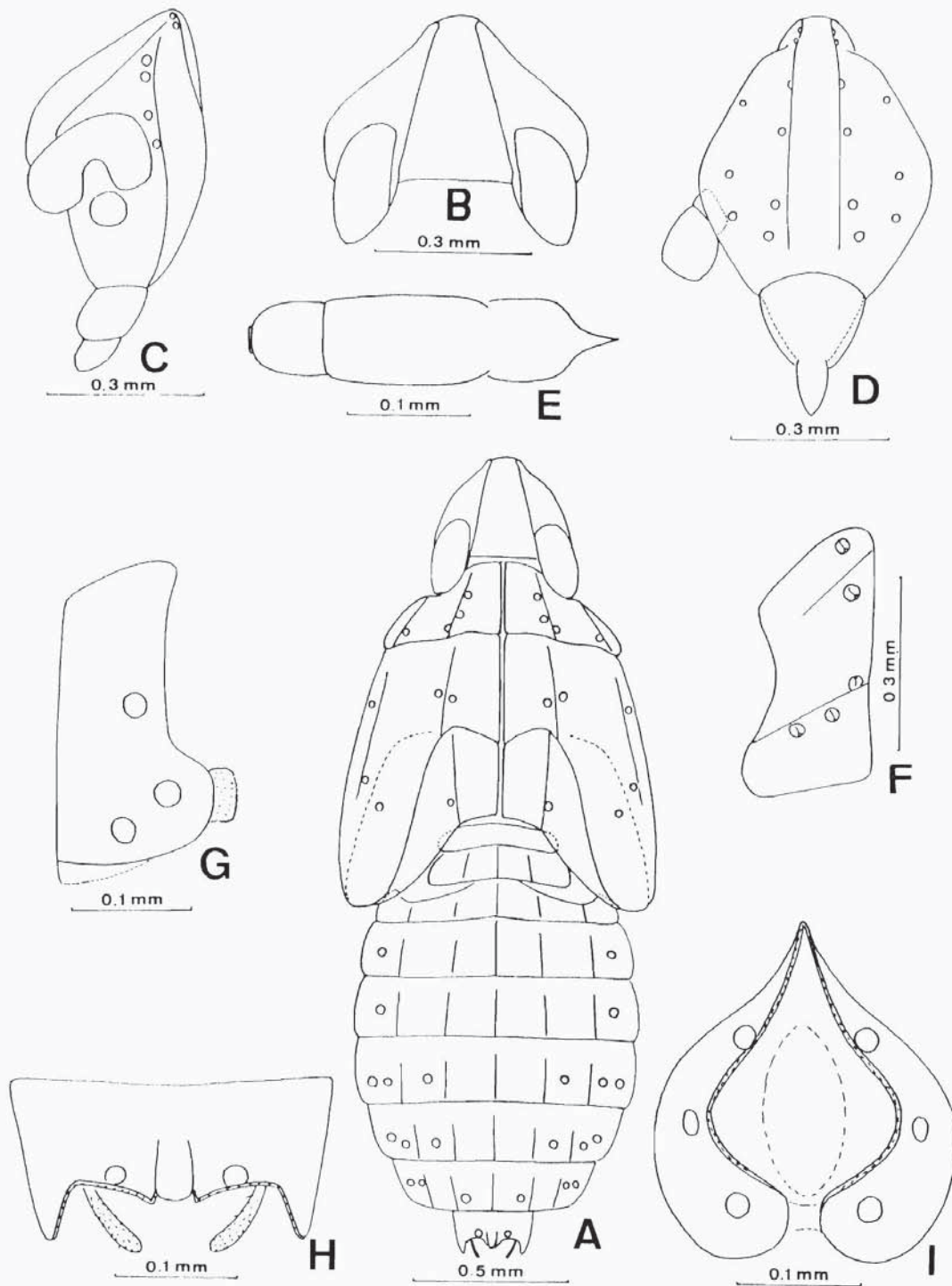


Fig. 11. Nymph of *Tropidocephala brunnipennis* Signoret A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, lateral view; H, the same, dorsal view; I, the same, caudal view.

## Tribe Saccharosydniini Vilbaste

### 5. Genus *Saccharosydne* Kirkaldy

*Saccharosydne* Kirkaldy, 1907, *Bull. Hawaiian Sugar Pl. Assoc.*, 3:139.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:81.

–: Tian, 1983, *Econ. Ins. Fauna China*, 27:124.

The generic characters outlined by Kirkaldy [1907] and Ishihara [1949] are modified as follows.

Head including eyes narrower than pronotum. Vertex longer submedially than wide at base, about 2:1, strongly protruding in front of eyes, apical margin rounded, submedian carinae uniting far before apex, Y-shaped carina obsolete. Frons divergent towards apex, longer in middle line than wide at widest part more than 2:1, widest at apex. Postclypeus wider at base than frons at apex. Rostrum reaching to meso-trochanters, third segment short, as long as wide. Ocelli present. Antennae cylindrical, short, reaching to base of postclypeus, basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae attaining hind margin. Spinal formula of hind 7-8-4. Post-tibial spur with about 20 teeth.

Anal segment of male ring-like, lateroapical angles not produced. Pygofer in profile as long ventrally as dorsally, medioventral process single, rounded at apex. Aedeagus rudimental. Suspensorium absent. Diaphragm indistinct. Genital styles long, simple.

Type species: *Delphax saccharivora* Westwood  
(original designation)

#### (11) *SACCHAROSYDNE PROCERUS* (Matsumura)

Fig. 12.

*Saccharosydne procerus* Matsumura, 1917, *Applied Ent. form. ser.*, 382.

–: Esaki, 1932, *Iconogr. Ins. Jap.*, 1782, f.3522.

–: Kato, 1933, *Three Col. Illustr. Ins. Jap.*, 4.

–: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 38.

–: Matsumura et Ishihara, 1945, *Mushi*, 16:74.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:82.

–: Tian, 1983, *Econ. Ins. Fauna China*, 27:124.

*Oxycranus procerus* Matsumura, 1906, *List. Injur. Ins. Jap.*, 14. (nom. nud.)

General color light green except claws, apical teeth of tarsi and stripes on antennae black.

Vertex longer submedially than wide at base about 2.8:1, acutely rounding into frons, narrower at apex than at base, apical margin truncate, with submedian carinae weakly prominent, submedian carinae uniting some distance from apex of vertex, basal compartment of vertex narrower at hind margin than greatest length about 1:2. Frons in middle line longer than wide at widest part about 3.1:1, lateral carinae feeble near frontoclypeal suture, frontoclypeal suture strongly arched upward medially. Post-



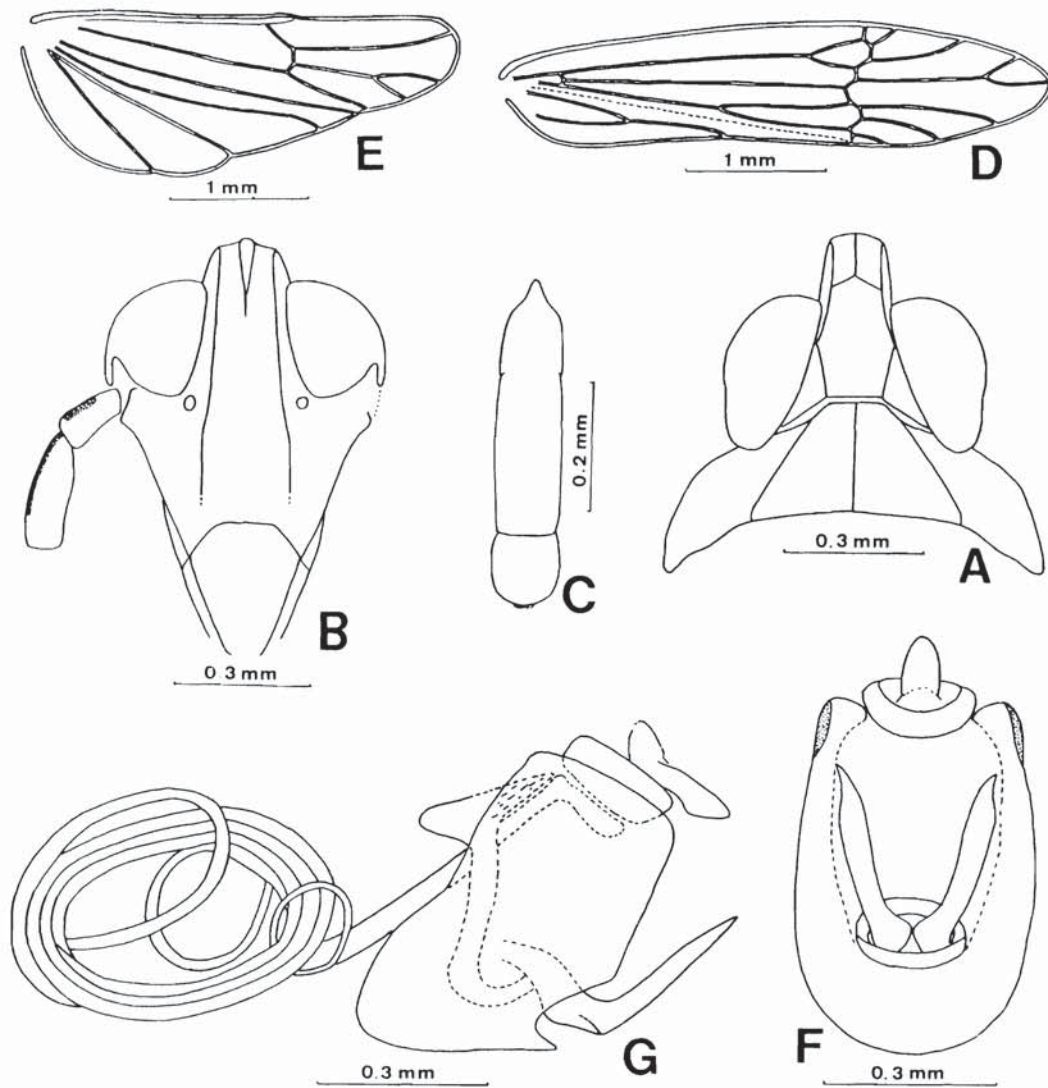


Fig. 12. *Saccharosydne procerus* (Matsumura) A, head and pronotum, dorsal view; B, frons and postclypeus; C, rostrum, ventral view; D, tegmen; E, wing; F, male genitalia, posterior view; G, the same, left side.

clypeus much wider at base than frons at apex. Antennae with basal segment longer than wide about 2:1, shorter than second about 1:1.6. Post-tibial spur with about 21 teeth. Tegmina longer than widest part about 4.8:1, wings with M and Cu<sub>1</sub> completely fused.

Pygofer in profile slightly longer ventrally than dorsally, hind margin deeply concave near base, in posterior view with opening longer than wide, laterodorsal angles somewhat produced, inflected mesad, lateral margins indistinct. Phallus short, tubular, rectangulate at middle, at base with very long filament which curved in circle. Diaphragm with dorsal margin indistinct. Genital styles divergent, tapering near apex.

Male (macropterous)

Length of body (includ.teg.): 5.05-5.22 mm.

Length of tegmen: 4.33-4.50 mm.

Female (macropterous)

Length of body (includ.teg.): 5.55-5.89 mm.

Length of tegmen: 4.83-5.17 mm.

Specimens examined: 10 ♂♂, 16 ♀♀, Puli, Nantou Hsien, 10-VIII-1984, C.T. Yang.

Host plant: *Zizania aquatica* Hack.

Distribution: Taiwan, Mainland China, Japan, Korea, USSR, Maritime Territory.

## Tribe Delphacini

### 6. Genus *Prodelphax* n. gen.

Head including eyes narrower than pronotum. Vertex as long submedially as wide at base, submedian carinae not uniting at apex, Y-shaped carina with stem feeble. Frons longer in middle line than wide at widest part about 2.2:1, widest at apical third, lateral carinae concave between eyes, median carina forked above lower margin of eyes. Postclypeus wider at base than frons at apex. Ocelli absent. Antennae cylindrical, reaching over middle of postclypeus, with basal segment longer than wide, shorter than second about 1:1.8. Pronotum with median carina feeble, lateral carinae not really reaching hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 15 teeth.

Anal segment of male very large, lateroapical angles not produced in process, with rounded emargination at ventrobasal margin to receive phallus. Pygofer in ventral margin with single medioventral process, lateral margins well defined. Phallus extremely long, twice as wide of pygofer, at apex armed with processes. Suspensorium irre recognizable. Diaphragm wide, dorsal margin concave medially. Genital styles moderately long, parallel.

Type species: *Prodelphax formosana* n.sp.  
(here designated)

This genus resembles some *Tropidocephalini* Muir in the shape of the large and unarmed anal segment of the male, but differs from the latter by the ventrobasal margin is emarginated for conducting the phallus; without suspensorium. Aedeagus without phallobase, diaphragm prominent.



(12) *PRODELPHAX FORMOSANA* n.sp.

## Fig. 13

General color black. Carinae of frons and postclypeus, rostrum, antennae, legs after trochanters, central line of vertex, pro- and mesonotum, margins of tegmina except ends of clavus and base pale yellow. Abdomen with dorsal aspect somewhat brownish. Tegmina opaque, black with margins white.

Vertex as long submedially as wide at base, apical margin between submedian carinae produced roundly, at apex slightly narrower than at base, basal compartment wider at base than greatest length about 1.8:1. Frons longer in middle line than wide at widest part about 2.2:1, median carina forked above lower level of eyes, narrowly separated. Rostrum reaching to meta-trochanters. Antennae with basal segment longer than wide about 1.7:1, shorter than second about 1:1.85. Post-tibial spur with 15-16 teeth, brachypterous tegmina short, ventroapical angle roundly produced, longer than wide, about 1.4:1, Sc, R,M, Cu single respectively, claval vein feeble. Wings absent.

Anal segment of male large, in profile ventroapical angle strongly produced, bluntly pointed at apex, in dorsal view longer than wide, widest subapically, anal style reaching far before anterior margin, anterior margin broadly rounded, in ventral view with basal margin deeply incised. Pygofer in profile slightly wider dorsally than ventrally, laterodorsal portion forming a right angle, medioventral process distinct, in posterior view with opening triangular, lateral margins well defined, medioventral process small, single. Phallus extremely long, about twice as long as the width of the pygofer, longer than wide, about 16:1, subapically with three processes at dorsal aspect, the shortest one directed dorsad, the median one caudad, the longest one directed dorsad then curved cephalad, this process membranous in most parts, only sclerotized at the cephalic side, the sclerotized part branched at apical third, the one branch along membranous part does not reach the apex. Diaphragm broad, dorsal margin incised medially. Genital styles parallel, gradually narrowing apically, apex slightly bent medially, in lateral view slightly scoop-like at apex.

## Male (brachypterous)

Length of body: 2.16 mm.

Length of tegmen: 0.83 mm.

## Female (brachypterous)

Length of body: 2.50 mm.

Length of tegmen: 0.83 mm.

Holotype: Male (dissected) Kukuan, Taichung Hsien, 10-X-1987, C.T. Yang.  
In NCHU.

Paratype: 1 ♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

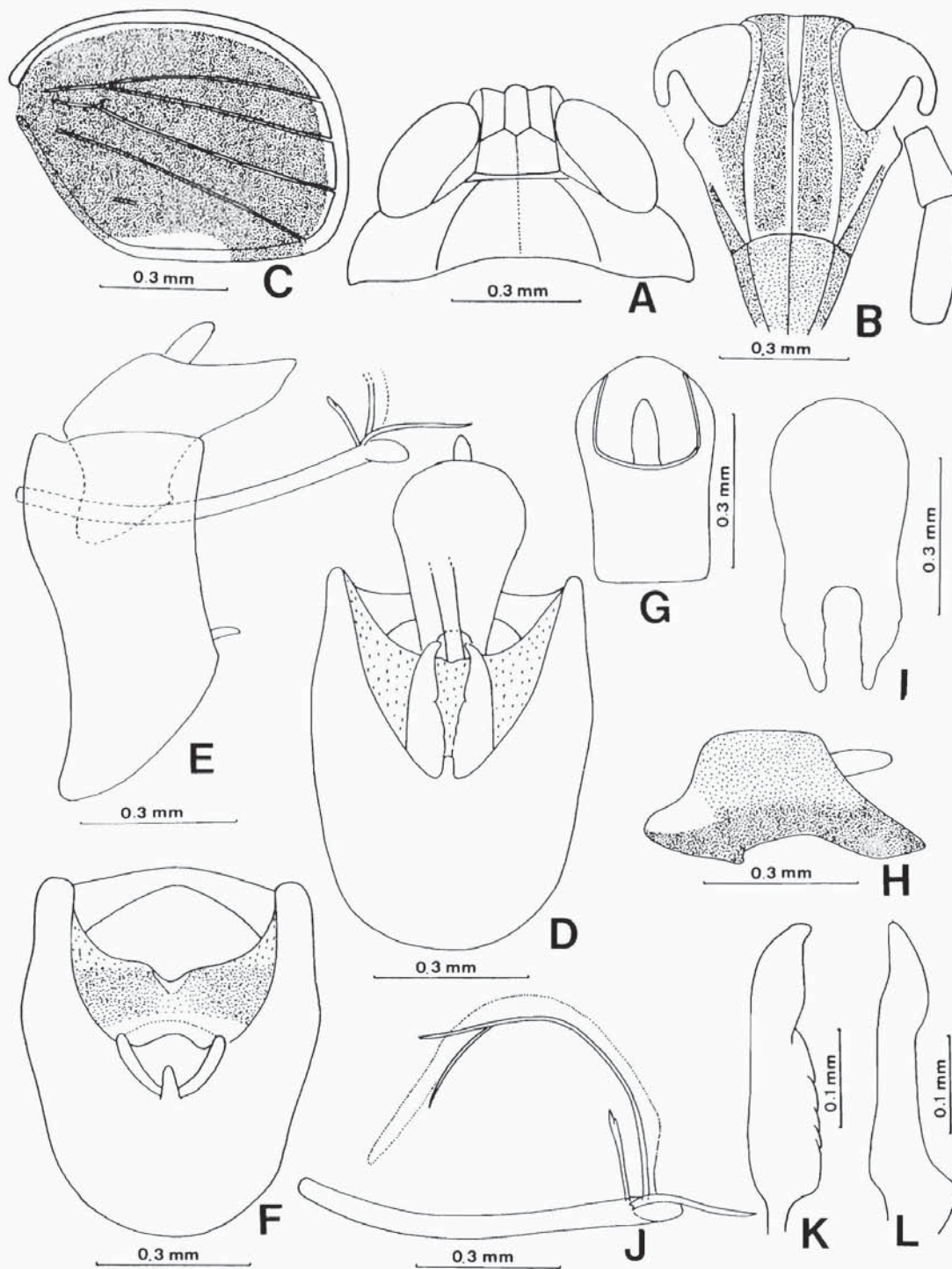


Fig. 13. *Prodelphax formosana* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, anal segment of male, dorsal view; H, the same, left side; I, the same, ventral view; J, phallus, left side; K, genital style, posterior view; L, the same, left side.



## 7. Genus *Yanunka* Ishihara

*Yanunka* Ishihara, 1952, *Sci. Rep. Matsuyama Agric. Coll.*, 8:39.

The generic characters outlined by Ishihara [1952] are modified as follows.

Head including eyes narrower than pronotum. Vertex distinctly longer submedially than wide at base, apical margin slightly produced between submedian carinae, submedian carinae not uniting at apex, Y-shaped carina feeble. Frons longer in middle line than wide at widest part about 2.6:1, widest at apical third, lateral carinae concave at base, nearly straight below ocelli, with 2 median carinae which contact each other near base and apex or parallel throughout, interfrons distinctly narrower than laterofrons. Postclypeus slightly wider at base than frons at apex, tricarinated. Rostrum reaching to meso-trochanters. Ocelli present. Antennae cylindrical, reaching to frontoclypeal suture. Pronotum with lateral carinae attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male ring-like, lateroapical angles not produced, apical margin roundly acute. Pygofer in profile wide, caudal margin produced caudad medially, without medioventral process. Phallus tubular, reflected cephalad in a lobe ventrally, armed with small teeth. Suspensorium ring-like ventrally. Diaphragm wide. Genital styles moderately long, divergent, simple.

Type species: *Yanunka miscanthi* Ishihara  
(original designation)

### (13) *YANUNKA INCERTA* n.sp.

Fig. 14.

General color dirty yellowish brown. Areas between lateral carinae of pronotum, mesonotum and mesoscutellum yellow, areas between median and lateral carinae, genae, lateral fields of pro- and mesonotum, round spot of each meta-pleuron and abdomen dark brown to black. Tegmina opaque, black, bordered with white margin except apex black, veins concolorous.

Vertex longer submedially than wide at base about 1.2:1, narrower at apex than at base, lateral margins slightly concave, basal compartment wider at base than greatest length about 1.5:1. Frons with 2 median carinae distinctly separated at base and at apex, nearly parallel, distance between interfrons narrower than laterofrons, in middle line longer than wide at widest part about 2.7:1, lateral carinae very shallowly convex. Frontoclypeal suture slightly arched. Postclypeus at base slightly wider than frons at apex, longer than wide at base. Antennae surpassing frontoclypeal suture, basal segment slightly longer than wide, shorter than second about 1:2.3. Post-tibial spur with about 17-19 teeth. Coelopterous tegmina roundly acuted at apex, considerably longer than widest part, about 3.2:1, widest near base. Wings small, sinuate at dorsal margin, without any veins.

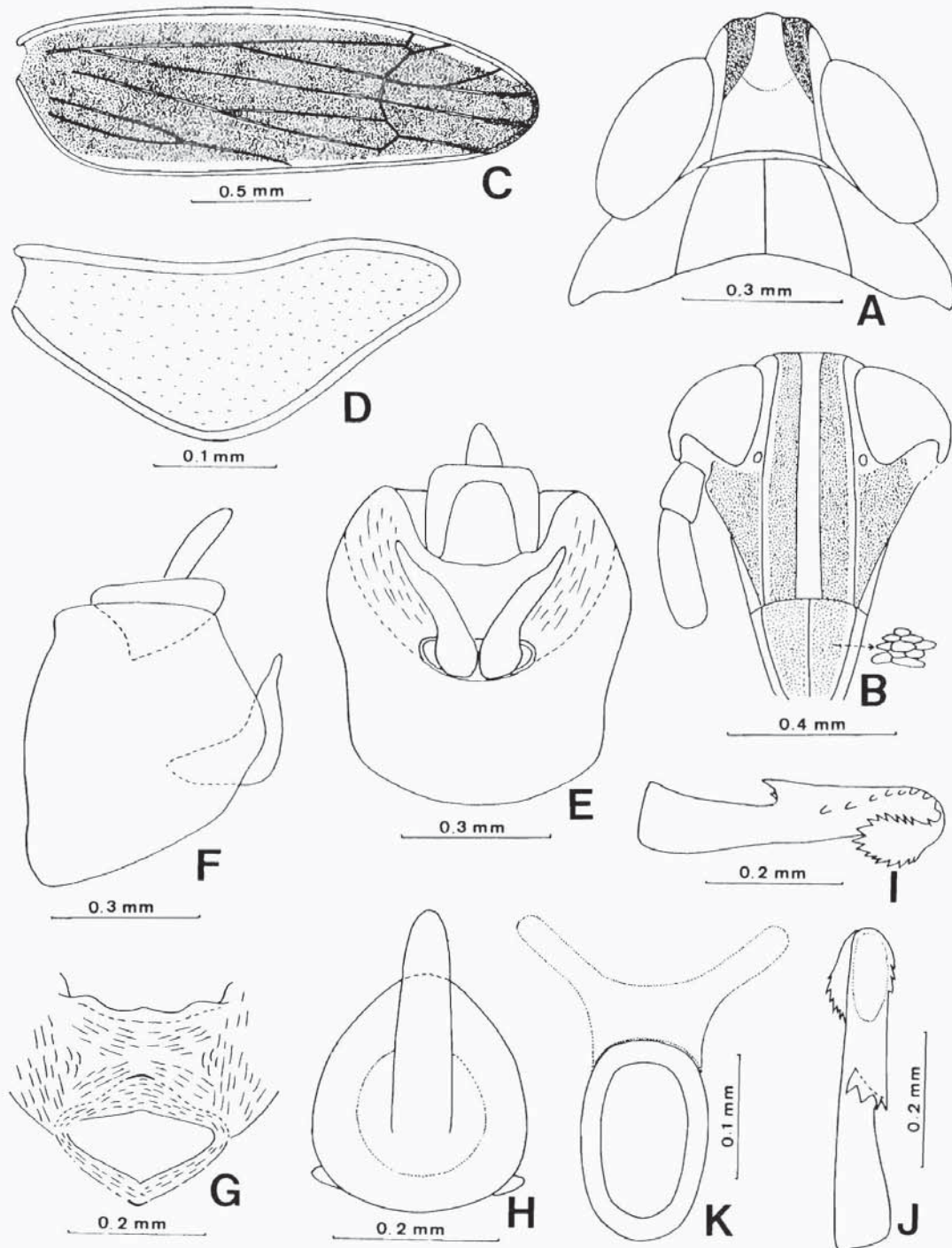


Fig. 14. *Yanunka incerta* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, dorsal view; I, phallus, left side slightly ventrad; J, the same, dorsal view; K, suspensorium.



Anal segment of male rather long, deeply sunk in dorsal emargination of pygofer. Pygofer in profile longer ventrally than dorsally, strongly produced caudad medially, laterodorsal angle not produced, in posterior view with opening distinctly wider than long, lateral margins weakly defined. Phallus rather stout, tubular, apex lobed, circular, turned down then directed cephalad, on left side with stout spinose processes at apical half and around apical lobe, near mediodorsal portion strongly concave with 4 stout spinose processes, directed cephalad. Orifice dorsad. Suspensorium with sclerotized ring ventrally and membranous arms dorsally. Diaphragm very broad, not sclerotized, dorsal margin sinuate. Opening for genital styles angulated at ventral margin, slightly arched at dorsal margin with rather broad margins. Genital styles moderately long, divergent from base, attenuating to apex.

The name *incerta* is Latin adjective, means uncertain.

Male (coelopterous)

Length of body (includ.teg.): 2.70-3.23 mm.

Length of tegmen: 2.13-2.36 mm.

Female (coelopterous)

Length of body (includ.teg.): 3.06-3.52 mm.

Length of tegmen: 2.40-2.90 mm.

#### **Fifth instar nymph (Fig. 15)**

General color pale yellowish brown. Dorsal aspect with large pale black markings. Frons, postclypeus and genae at lower portion pale black.

Head between eyes slightly wider at narrowest portion than long in middle line, moderately protruding beyond level of eyes, length of eye longer than length between level of eyes and lateral point of frons, about 4.6:1, width of head including eyes wider than width of basal compartment at hind margin, about 3.2:1, submedian carinae attaining hind margin of vertex laterally, basal compartment wider at hind margin than greatest length, about 1.2:1, hind margin curved upward laterally. Frons longer in middle line than wide at widest part, about 1.7:1, widest at level of lower margin of eyes, lateral carinae distinct convex medially, with 2 median carinae, separated, parallel. Interfrons narrower than laterofrons. Number and arrangement of sensory pits typical, each side with 3 extra pits, lowest pit lies far away from frontoclypeal suture, distance about 2.5 diameters of pit, distance between dorsal level of lower pits and ventral level of median pits much shorter than former to frontoclypeal suture about 1:4.2, lower of upper pits higher than higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies at middle of eye. Frontoclypeal suture straight. Rostrum reaching to meta-coxae, relative length of each segment about 1.4:1.7:1. Antennae with basal segment wider than long, shorter than second about 1:3.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 4:1, anterior wing pad protruding distinctly over level of hind one, not attaining hind margin of tergite III. Spinal formula of hind leg 5-7-4, metatibia longer than three tarsi combined about 1.4:1, post-tibial spur shorter than first tarsal segment, with about 15 teeth.

Abdominal tergite V: bears 1 pit on each side; VI and VII: 1+2 respectively;

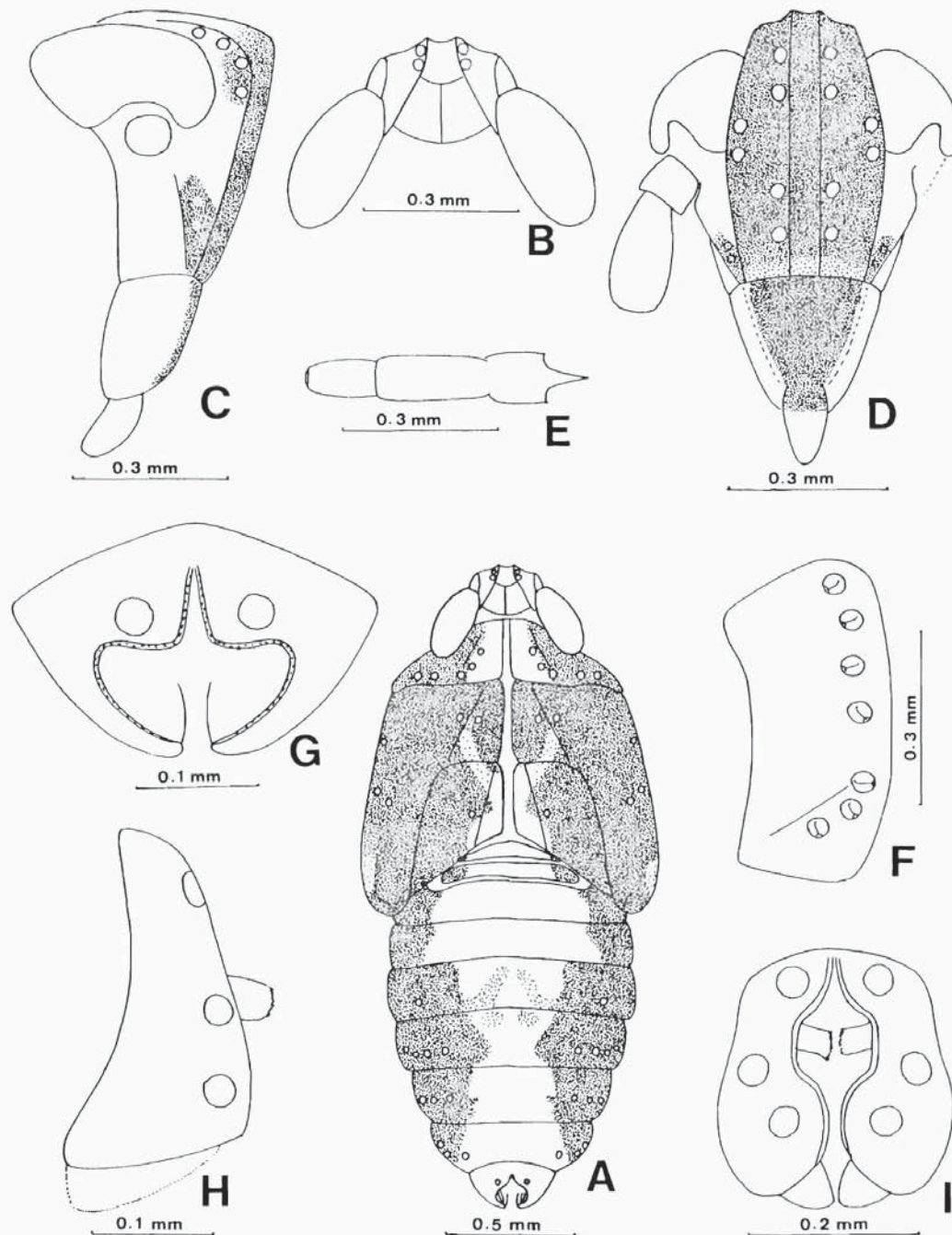


Fig. 15. Nymph of *Yanunka incerta* n.sp. A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.



VIII: 1+3; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobes present, not cylindrical, pits lie near base, in lateral view with hind margin nearly straight, anal comb moderately small, in caudal view with opening small, quadrate.

Length of body: 2.50 mm.

Width of head including eyes: 0.60 mm.

Length of anterior wing pad: 0.88 mm.

Length of antenna: 0.29 mm.

Holotype: Male, Yakou, Kaohsiung Hsien, 27-XII-1981, C.T. Yang. In NCHU.

Paratypes: 8 ♂♂, 10 ♀♀, same data as for holotype.

Nymphal specimen examined: Fifth instar nymph: 1, Chuhkow, Chiayi Hsien, 31-VII-1986, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan.

This new species is very close to the type species, *Yanunka miscanthi* Ishihara, differs from the latter in having 2 median carinae of frons parallel throughout (contact each other near the base and the apex in *miscanthi*).

## 8. Genus *Garaga* Anufriev

*Garaga* Anufriev, 1977, *Zool. Zhurnal*, **56**(6):867, nom.n. for *Nagara* Vilbaste, 1968 [nec. Walker, 1865 et Budde-Lund, 1908].

*Nagara* Vilbaste, 1968, *Tallin*:35, (nom. preocc.)

Head including eyes narrower than pronotum. Vertex wider at base than long submedially, about 1.3:1, submedian carinae not uniting at apex. Frons in middle line longer than wide at widest part, about 2:1, widest at level of ocelli, median carina forked at level of ocelli. Rostrum with apical segment shorter than subapical. Antennae reaching over frontoclypeal suture, basal segment longer than wide, shorter than second, about 1:1.7. Ocelli distinct, small. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 28 teeth.

Anal segment of male very short, ring-like, lateroapical angles not produced. Dorsolateral angle of pygofer not produced, in profile caudoventral angle strongly produced caudad. Medioventral margin comprises three processes: the lateral 2 widely separated, lobe-like, their inner apical angles slightly pointed; the median process broad, moderately or deeply incised at apical margin. Phallus long, reflected dorsocephalad at apex in a flagellum. Diaphragm incised at dorsal margin, sclerotized, strongly raised in middle line. Suspensorium broadly Y-shaped, ventral stem very small, about one-fifth as long as an arm. Genital styles divergent, slender, pointed distally, with sharp projection subapically.

Type species: *Liburnia nagaragawana* Matsumura  
(original designation)

This genus differs from *Thriambus* Fennah in the proportions of the rostrum, apical segment distinctly shorter than subapical (in *Thriambus* apical segment longer than subapical). More differences found in following characters: dorsal margin of diaphragm without membranous part; lateroapical angles of the male anal segment not produced; with 3 medioventral processes. *Garaga* differs from *Parathriambus* Kuoh in the shape of the male anal segment; of the medioventral processes of the pygofer and of the genital styles.

#### Key to the species of *Garaga*

1. Tegmina entirely black; frons uniformly yellowish brown, without yellowish spots; flagellum of phallus terminating in 2 processes . . . . . *orchidensis* n.sp.
  - Tegmina not entirely black, at least basal claval area yellowish; frons pale brown with yellowish spots; flagellum of phallus terminating with 4 processes . . . . . 2
2. Genae each with a triangular black marking; median one of the medioventral processes of the pygofer moderately incised at apex, forming 2 pointed apical processes . . . . . *pallida* n.sp.
  - Genae unicolor; median one of the medioventral processes of the pygofer deeply incised at apex, forming 2 truncate apical processes . . . . . *nagaragawana* (Matsumura)

#### (14) *GARAGA NAGARAGAWANA* (Matsumura)

Fig. 16.

*Garaga nagaragawana* Anufriev, 1977, *Zool. Zhurnal*, **56**(6):867.

*Delphacodes? nagaragawana* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, **34**.

*Dicranotropis nagaragawana* Matsumura et Ishihara, 1945, *Mushi*, **16**:67.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, **2**:71.

–: Kuoh, 1983, *Econ. Ins. Fauna China*, **27**:84.

*Liburnia nagaragawana* Matsumura, 1900, *Ent. Nachr.*, **26**:265.

*Nagara nagaragawana* Vilbaste, 1968, Tallin:36.

*Stenocranus japonicus* Kato (nec Matsumura), 1933, *Three Col. Illustr. Ins. Jap.*, **4**: pl. 17.

Pro- and mesonotum yellowish white. Antennae, vertex, frons, genae and postclypeus pale brown with yellowish spots on frons and genae, apex of first antennal segment somewhat dark. Legs with coxae black, remainder yellowish brown, femora with stripes, tibiae with ring black markings. Abdomen black. Tegmina opaque, with apex, tip of clavus and area between bifurcation of R and Cu black.

Vertex wider at base than long submedially, about 1.2:1, basal compartment wider at base than greatest length, about 1.9:1. Frons longer in middle line than wide at widest part, about 1.9:1, widest at level of ocelli, lateral carinae nearly straight below ocelli, median carina forked at level of ocelli. Postclypeus wider at base than frons at apex, slightly wider at base than long in middle line. Rostrum reaching to meta-coxae, relative length of each segment about 1.1:1.2:1. Antennae reaching to level of middle of postclypeus, basal segment longer than wide, about 2:1, shorter than



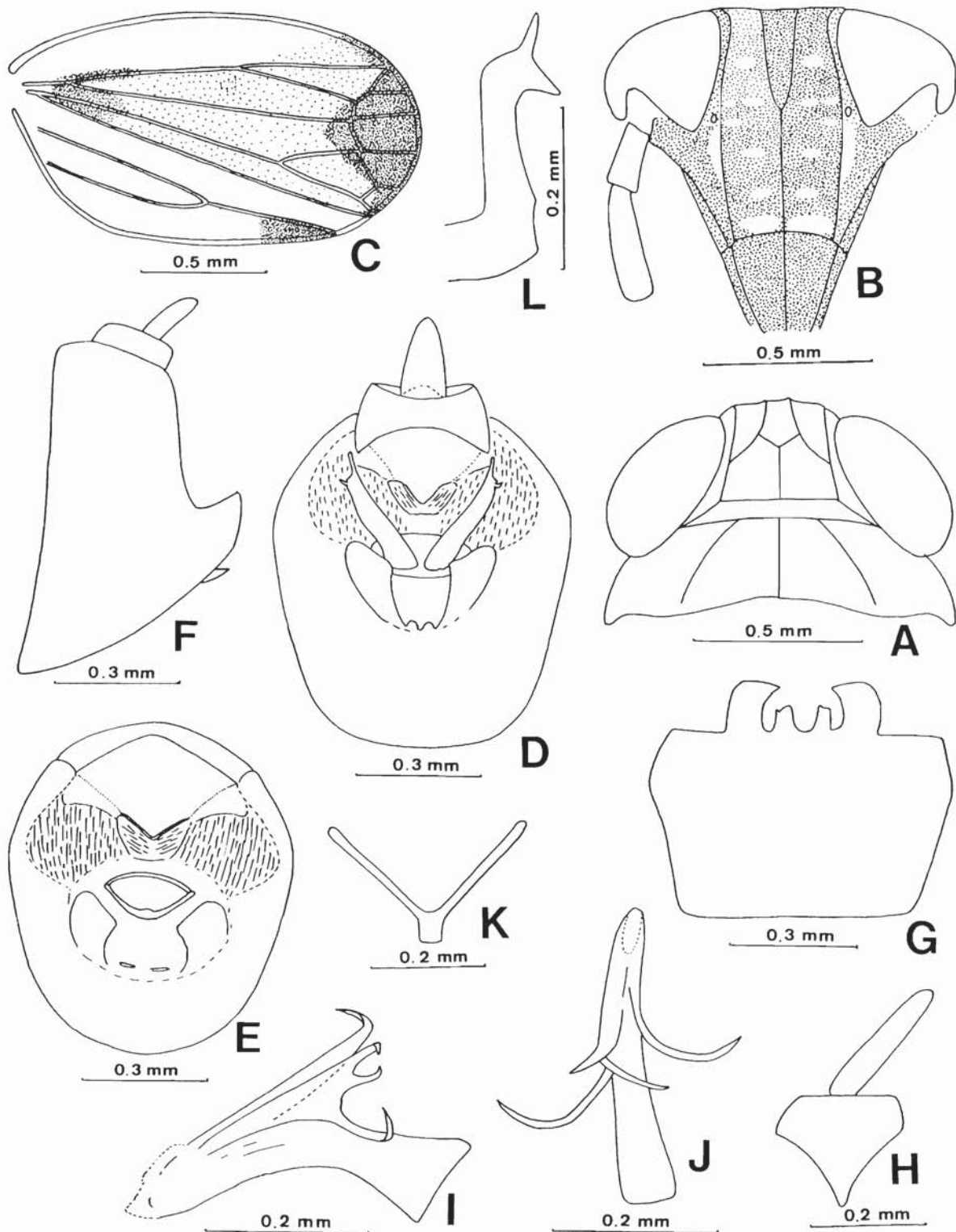


Fig. 16. *Garaga nagaragawana* (Matsumura) A, head and pronotum, dorsal view; B, frons and post-clypeus; C, tegmen; D, male genitalia, posterior view; E, diaphragm of pygofer; F, male genitalia, left side; G, pygofer, ventral view; H, anal segment of male, left side; I, phallus, right side; J, the same, dorsal view; K, suspensorium; L, genital style, left side.

second, about 1:2. Post-tibial spur with 29-30 teeth.

Pygofer in posterior view with opening wider than long, lateral margins well defined, strongly convex. Medioventral processes with median one deeply incised at dorsal margin, forming 2 processes truncate apically. Phallus arched upward medially, reflected cephalad in two large lobes, right one terminating in 3 processes, upper one turned right then down, median one turned left, lower one turned right then upward, left lobe terminating in a single process, turned left. Produced portion of diaphragm with ventral margin straight, lateral margins obliquely straight. Opening for genital styles oval. Genital styles slender, divergent, apical seventh very narrow, with curved tooth subapically, directed caudad.

Male (brachypterous)

Length of body: 2.56 mm.

Length of tegmen: 1.66 mm.

Specimen examined: 1 ♂, Nanhua, Tainan Hsien, 24-I-1985. C.T. Yang

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China, Japan, Philippines, USSR, Kuril Is.

(15) *GARAGA ORCHIDENSIS* n.sp.

Fig. 17.

General color yellowish brown. Abdomen and pygofer somewhat dark. Tegmina uniformly black.

Vertex wider at base than long submedially about 1.5:1, basal compartment wider at base than greatest length about 2.4:1. Frons longer in middle line than wide at widest part about 2:1, widest at level of ocelli, lateral carinae concave between eyes, nearly straight below level of ocelli. Postclypeus wider at base than frons at apex, distinctly wider at base than long in middle line. Rostrum reaching to meta-coxae, relative length of each segment about 1.1:1.2:1. Antennae reaching to middle of post-clypeus, basal segment longer than wide about 2.3:1, shorter than second about 1:1.5. Post-tibial spur with 25-29 teeth.

Pygofer in posterior view with opening wider than long, lateral margins well defined, convex. Medioventral processes with median one moderately incised at apex, forming 2 processes pointed apically. Phallus arched upward medially, reflected cephalad in single lobe, terminating in 2 processes at right side, upper one curved downward, lower one curved upward. Produced portion of diaphragm with ventral and lateral margins straight. Opening for genital styles oval, ventral margin slightly produced upward medially. Genital styles slender, divergent, narrowed at apical sixth, with a stout tooth subapically, directed caudad.

The name *orchidensis* is genitive of Orchid Island.

Male (brachypterous)

Length of body: 2.66 mm.

Length of tegmen: 1.53 mm.



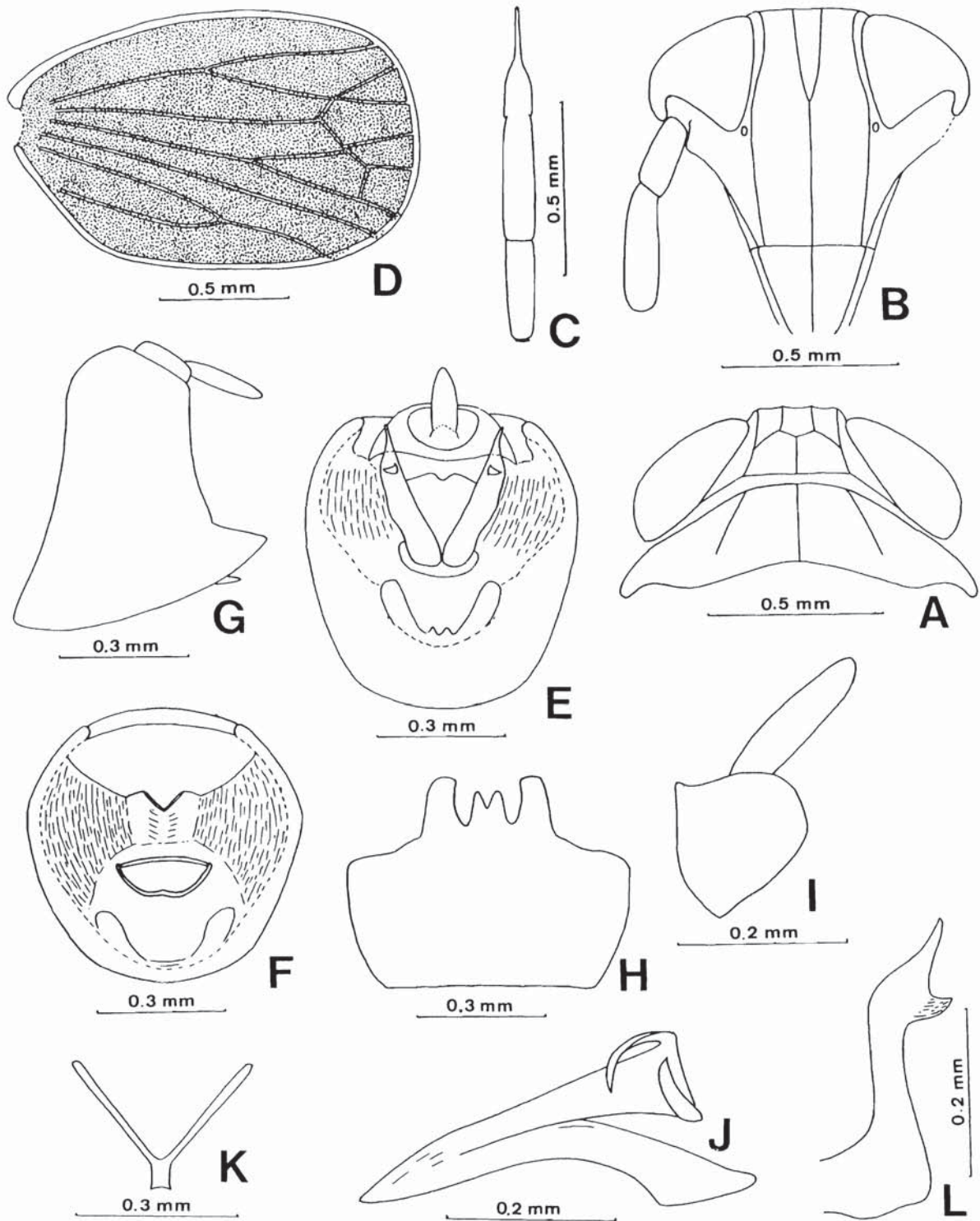


Fig. 17. *Garaga orchidensis* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, rostrum, ventral view; D, tegmen; E, male genitalia, posterior view; F, diaphragm of pygofer; G, male genitalia, left side; H, pygofer, ventral view; I, anal segment of male, left side; J, phallus, right side; K, suspensorium; L, genital style, left side.

Holotype: Male (dissected) Orchid Is., Taitung Hsien, 5-VII-1985, S.C. Hsaur.  
In NCHU.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from the type species and *G. pallida* Yang in the number of terminating process of the phallus; as well as in the uniformly black color of the tegmina.

(16) *GARAGA PALLIDA* n.sp.

Fig. 18.

General color brown. Antennae with apices of first and base of second black, genae each with a triangular area black. Pro- and mesonotum somewhat yellowish, femora with stripe and tibiae with ring-like pale black markings, pleura with black marking. Abdomen and pygofer black. Tegmina opaque, black except claval area and margins yellowish.

Vertex wider at base than long submedially, about 1.2:1, basal compartment wider at base than greatest length, about 1.9:1. Frons longer in middle line than wide at widest part, about 1.9:1, widest below level of ocelli, median carina forked above level of ocelli. Postclypeus wider at base than frons at apex, about as long in middle line as broad at base. Rostrum reaching to meta-trochanters, relative length of each segment about 1:1.2:1. Antennae surpassing frontoclypeal suture, basal segment longer than wide, about 2:1, shorter than second about 1:1.5. Post-tibial spur with about 28 teeth.

Pygofer in posterior view with opening wider than long, lateral margins well defined, strongly convex. Medioventral processes with median one moderately incised at apex, forming 2 processes pointed apically. Phallus reflected cephalad in two long lobes, right one terminating in 3 processes, upper and lower ones nearly same length, turned right then cephalad, median one short, turned left, left lobe terminating in a single process, turned left. Produced portion of diaphragm with ventral margin rounded. Opening for genital styles oval. Genital styles slender, divergent, apical fourth with process, directed laterad.

The name *pallida* is Latin adjective, means pale.

Male (brachypterous)

Length of body: 2.83 mm.

Length of tegmen: 1.73 mm.

Holotype: Male (dissected), Mukwa, Hualien Hsien, 8-VIII-1985, S.C. Tsaur. In NCHU.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from the type species in having genae each with a black triangular marking (unicolor in *nagaragawana*); direction of process of the genital styles and color of the tegmina.



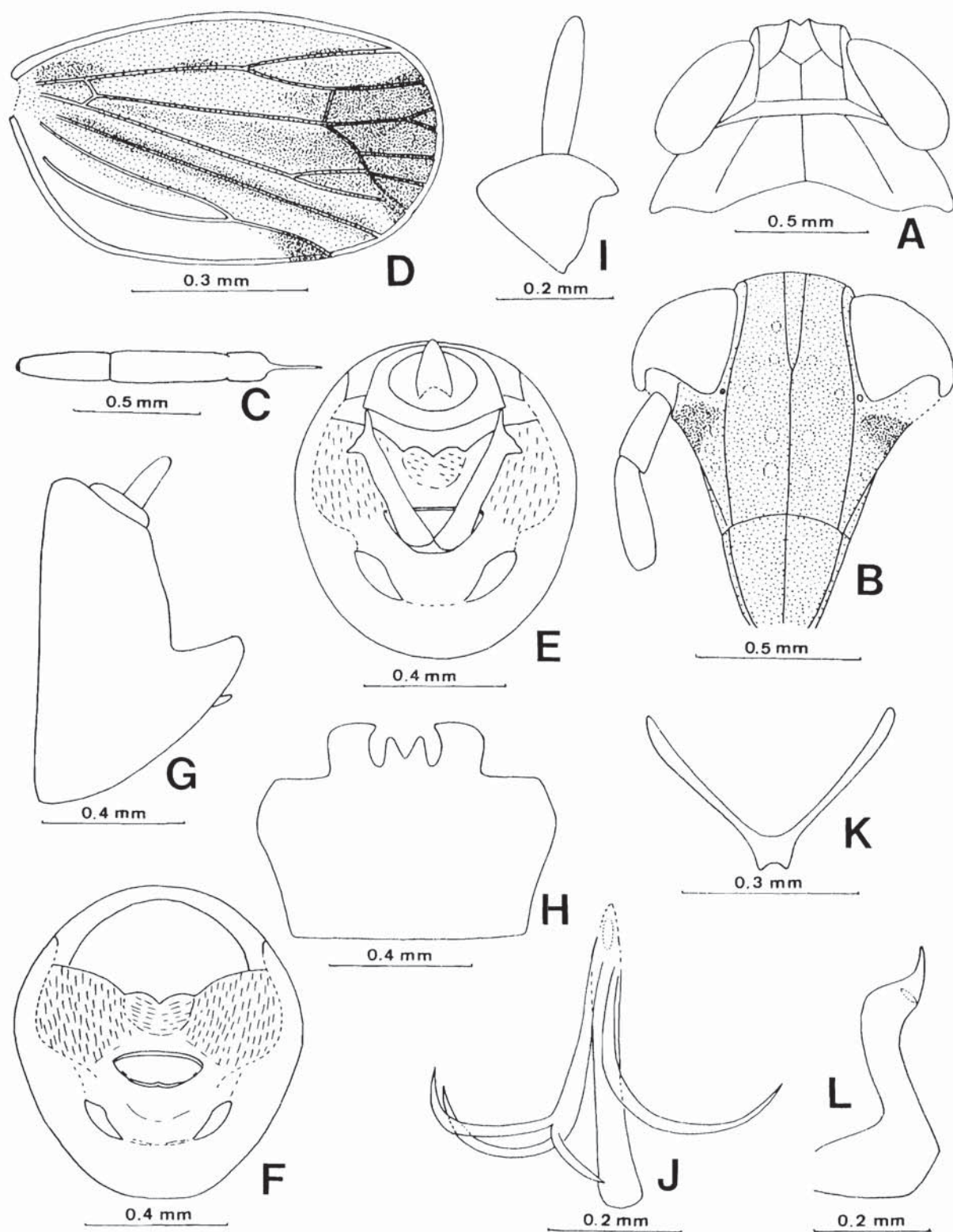


Fig. 18. *Garaga pallida* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, rostrum, ventral view; D, tegmen; E, male genitalia, posterior view; F, diaphragm of pygofer; G, male genitalia, left side; H, pygofer, ventral view; I, anal segment of male, left side; J, phallus, dorsal view; K, suspensorium; L, genital style, left side.

## 9. Genus *Peregrinus* Kirkaldy

*Peregrinus* Kirkaldy, 1904, *Entomologist*, 37:175.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:79.

–: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:72.

The generic characters outlined by Kirkaldy [1904] are modified and supplemented as follows.

Head including eyes narrower than pronotum. Vertex about as long submedially as wide at base, apical margin transverse, lateral carinae slightly concave, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment wider at base than greatest length about 2:1. Frons longer in middle line than wide at widest part about 2:1, widest at middle, lateral carinae slightly convex, median carina forked above level of ocelli. Postclypeus wider at base than frons at apex. Rostrum reaching to meta-coxae. Ocelli present. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:1.7. Pronotum with lateral carinae attaining to hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 28 teeth.

Anal segment of male ring-like, lateroapical angles not produced into process. Pygofer in profile longer ventrally than dorsally, in posterior view with opening as wide as long, without medioventral process. Phallus slender, rod-like, simple. Suspensorium rod-like. Diaphragm narrow. Genital styles moderately long, parallel.

Genital scale present.

Type species: *Delphax maidis* Ashmead  
(original designation)

### (17) *PEREGRINUS MAIDIS* (Ashmead)

Fig. 19.

*Peregrinus maidis* Kirkaldy, 1904, *Entomologist*, 37:176.

–: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 39.

–: Matsumura et Ishihara, 1945, *Mushi*, 16:71.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:80.

–: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:73.

*Delphax maidis* Ashmead, 1890, *Psyche*, 5:323.

General color light brown. Apices of first antennal segment, rounded spots of mesopleura black. Abdomen and pygofer dark brown. Tegmina subhyaline, with a broad black marking along apical hind margin except four semicircular areas, whole line of  $R_5$ , ends of other veins, hind margin near end of claval suture black.

Vertex wider at base than long medially about 1.1:1, obtusely rounding into frons, at apex as wide as at base, lateral margin straight, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 2.2:1. Frons in middle line longer than wide at widest part about 1.7:1, lateral carinae very shallowly convex,



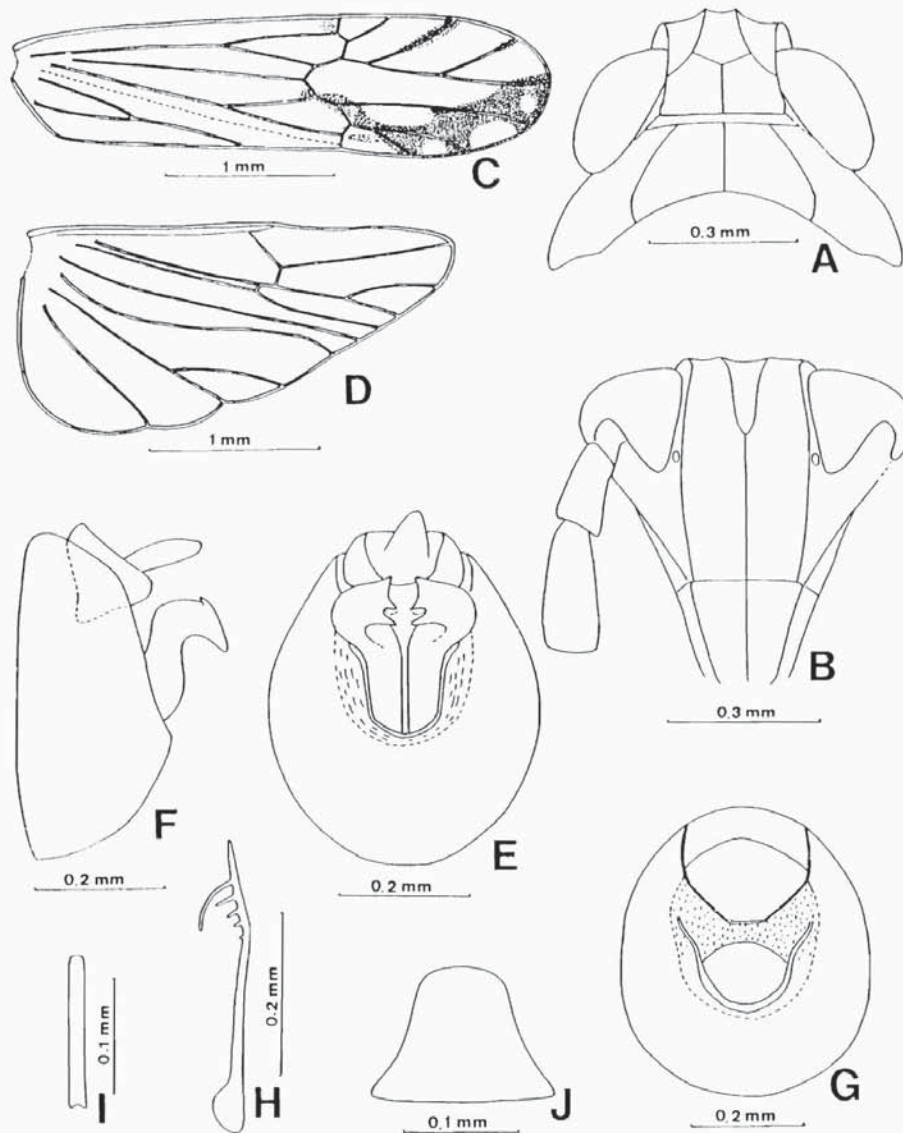


Fig. 19. *Peregrinus maidis* (Ashmead) A, head and pronotum; dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, lateral view; G, diaphragm of pygofer; H, phallus, dorsal view; I, suspensorium; J, genital scale.

median carina forked at basal third. Postclypeus at base slightly wider than frons at apex, wider at base than length. Rostrum reaching to meta-coxae. Antennae surpassing frontoclypeal suture, first segment longer than wide, shorter than second about 1:1.7. Post-tibial spur with about 28 teeth.

Anal segment of male short. Pygofer in profile longer ventrally than dorsally, laterodorsal angles not produced, in posterior view with opening about as wide as long. Phallus narrow and slender, apical third with 5 various length of processes on left side, apical spine the longest. Diaphragm very narrow, not strongly sclerotized. Opening for genital styles very large, nearly circular. Genital styles large and broad, nearly contiguous, apical third strongly curved, directed caudad, in caudal view apex shallowly concave dorsally, deeply concave at ventral third.

Male (macropterous)

Length of body (includ.teg.): 3.66-3.83 mm.

Length of tegmen: 3.23-3.30 mm.

Female (macropterous)

Length of body (includ.teg.): 3.93 mm.

Length of tegmen: 3.33 mm.

### Fifth instar nymph (Fig. 20)

General color uniformly pale yellowish brown.

Head between eyes wider at narrowest part than long in middle line, moderately protruding beyond level of eyes, length of eye longer than length between level of eyes and lateral point of frons about 3.2:1, width of head including eyes wider than width of basal compartment at base about 2.3:1, submedian carinae attaining hind margin of vertex laterally, basal compartment wider at hind margin than greatest length about 1.75:1, hind margin slightly curved upward laterally. Frons slightly wider at widest part than long in middle line, widest above level of lower margin of eyes, lateral carinae slightly convex, with 2 median carinae, separated, parallel. Interfrons narrower than laterofrons. Number and arrangement of sensory pits typical, each side with 3 extra pits, lowest pit lies far away from frontoclypeal suture, about 2 diameters of pit, distance between dorsal level of lower pits and ventral level of median pits much shorter than former to frontoclypeal suture about 1:4.4, lower of upper pits higher than higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies at middle of eye. Frontoclypeal suture slightly arched medially. Rostrum reaching to meso-trochanters, relative length of each segment about 1:1.2:1, third segment longer than wide about 2.2:1. Antennae with basal segment as long as wide, shorter than second about 1:2.5.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, relative distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 1.7:1, anterior wing pad protruding distinctly not to level of hind one, latter reaching to middle of tergite III. Spinal formula of hind leg 5-7-4, metatibia as long as three tarsi combined, spur shorter than first tarsal segment, with 18-25 teeth.

Abdominal tergite V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobes not cylindrical, pits lie at middle, in lateral view strongly produced basally, hind margin emarginate medially, anal comb small, in caudal view with opening wider at middle.

Length of body: 2.64 mm.

Width of head including eyes: 0.58 mm.

Length of anterior wing pad: 0.72 mm.

Length of antenna: 0.34 mm.

Specimen examined: 7 ♂♂, 4 ♀♀, Pingtung, Pingtung Hsien, 10-IX-1984, C.T. Yang.

Nymphal specimen examined: Fifth instar nymph: 5, Fengkong, Pingtung Hsien, 22-VII-1986, C.T. Yang.

Host plant: *Zea mays* L.

Distribution: Cosmotropical species.



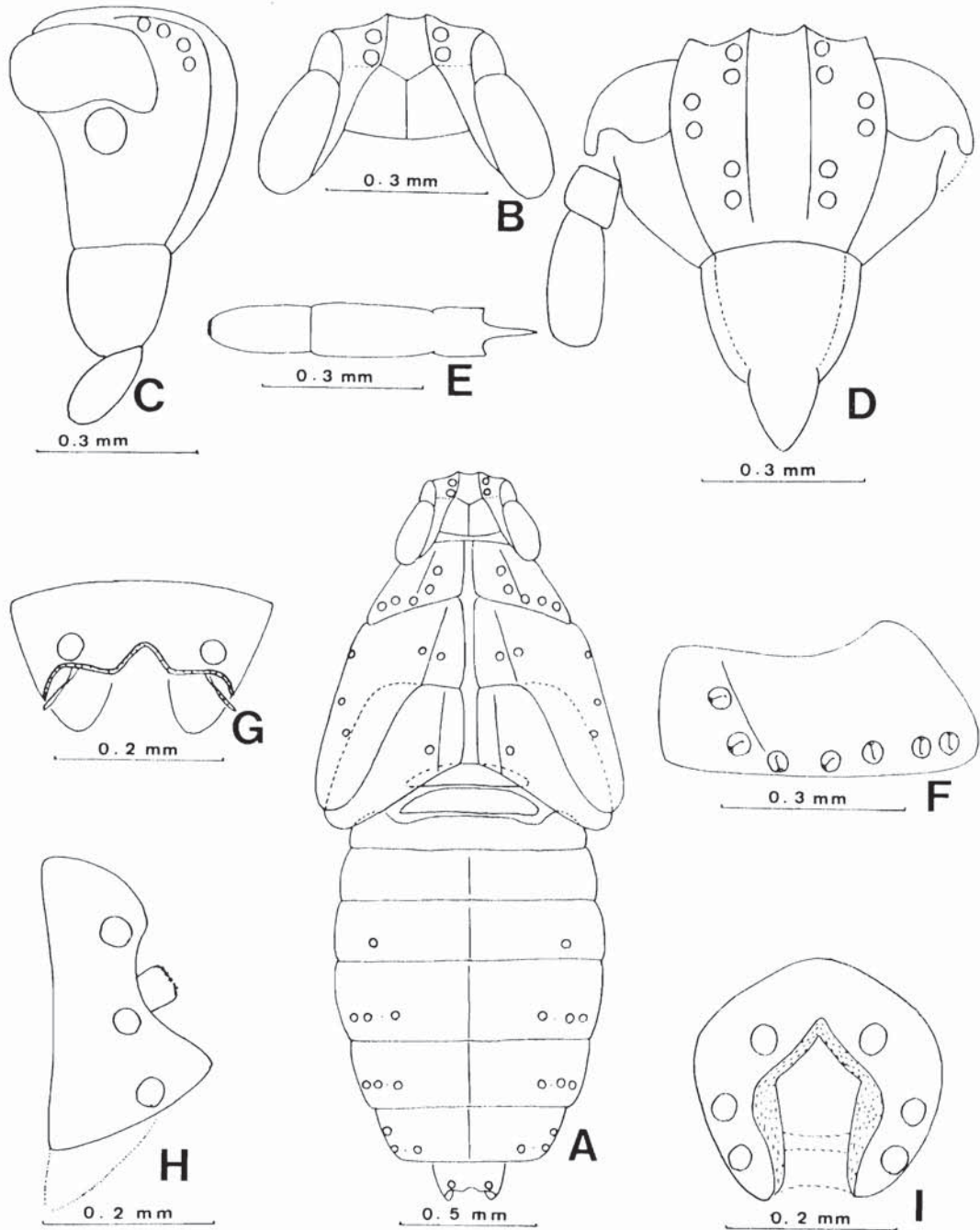


Fig. 20. Nymph of *Peregrinus maidis* (Ashmead) A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.

## 10. Genus *Numata* Matsumura

*Numata* Matsumura, 1935, *Ins. Matsum.*, 9:139.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:35.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:77.

*Unkana* Matsumura, 1935, *Ins. Matsum.*, 10:73.

The generic characters outlined by Matsumura [1935] and Ishihara [1949] are modified and supplemented as follows.

Head including eyes slightly narrower than pronotum. Vertex about as long submedially as wide at base, anterior margin transverse, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 1.7:1. Frons longer in middle line than wide at widest part about 2.3:1, median carina forked above level of ocelli. Postclypeus wider at base than frons at apex. Rostrum attaining meso-trochanters. Ocelli present. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Teeth of post-tibial spur in various number, from 17 to 35.

Anal segment of male ring-like, lateroapical angles each produced into a rather stout process or not. Pygofer in profile longer ventrally than dorsally, in posterior view with opening wider than long, in ventral view with margin deeply incised medially, without medioventral process. Phallus very large, laterally compressed, in profile acute apically, ventral margin distinctly incised subapically, reflected at apex in a flagellum, overlying phallus, surpass its base. Suspensorium Y-shaped, stem very short. Diaphragm very short. Genital styles long, divergent, in basal part directed caudad then abruptly dorsad.

Type species: *Stenocranus sacchari* (Matsumura)  
(original designation)

### Key to the species of *Numata*

1. Tegmina  $R_1$  and  $R_5 + M_1$  with common stem; length of tegmina ♂ 3.66-3.73 mm.; phallus with flagellum terminating into 2 processes protruding cephalad ..... *muiri* (Kirkaldy)
- Tegmina  $R_1$  and  $R_5 + M_1$  without common stem; length of tegmina ♂ 3.06 mm.; phallus with flagellum terminating into 2 processes turned right and left ..... *corporaali* (Muir)



(18) *NUMATA CORPORALI* (Muir)

Fig. 21.

*Numata corporali* Fennah, 1973, *Ann. Zool. Warszawa*, 34(9):222.*Dicranotropis corporali* Muir, 1923, *Philip. Jour. Sci.*, 22:173.

General color yellowish brown. Metapleura each with a dark rounded marking. Tegmina hyaline, ends of clavus, apical veins and along both sides of vein  $M_2$  somewhat dark.

Vertex longer submedially than wide at base about 1.2:1, lateral carinae sinuate, apical margin transverse, slightly produced medially, submedian carinae not uniting at apex, basal compartment longer at base than greatest length about 1.5:1. Frons longer in middle line than wide at widest part about 2.3:1, widest at level of ocelli, median carina forked at basal third, lateral carinae slightly convex. Postclypeus as wide at base as frons at apex, distinctly longer than wide at base about 1.5:1. Rostrum surpassing slightly over meso-trochanters, relative length of each segment about 1.2:1:1. Antennae relatively long, surpassing frontoclypeal suture, basal segment longer than wide about 2:1, shorter than second about 1:1.6. Post-tibial spur with 17-20 teeth. Tegmina longer than widest part about 3.5:1.

Anal segment of male short, in profile dorsal margin distinctly emarginate medially, lateroapical angles widely separated, each produced into a short process. Pygofer with lateral margins weakly defined, in ventral view with median portion emarginate, sinuate. Phallus very large, strongly compressed laterally, reflected cephalad distally, terminating with 2 long processes, left one turned right, right one turned left. Suspensorium Y-shaped, stem short. Diaphragm very narrow, dorsal margin almost not sclerotized, deeply emarginate. Opening for genital styles small, dorsal margin evenly arched, ventral margin almost straight, lateral margins membraneous. Genital styles moderately long, divergent, apical third narrowed, in profile caudoventral angle concave.

## Male (macropterous)

Length of body (includ.teg.): 3.73 mm.

Length of tegmen: 3.06 mm.

Specimens examined: 1♂, Pingtung, Pingtung Hsien, 26-VI-1985, C.T. Yang; 1♂,

Kantzuling, Tainan Hsien, 18-VI-1985, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record), Viet-nam, Sumatra.

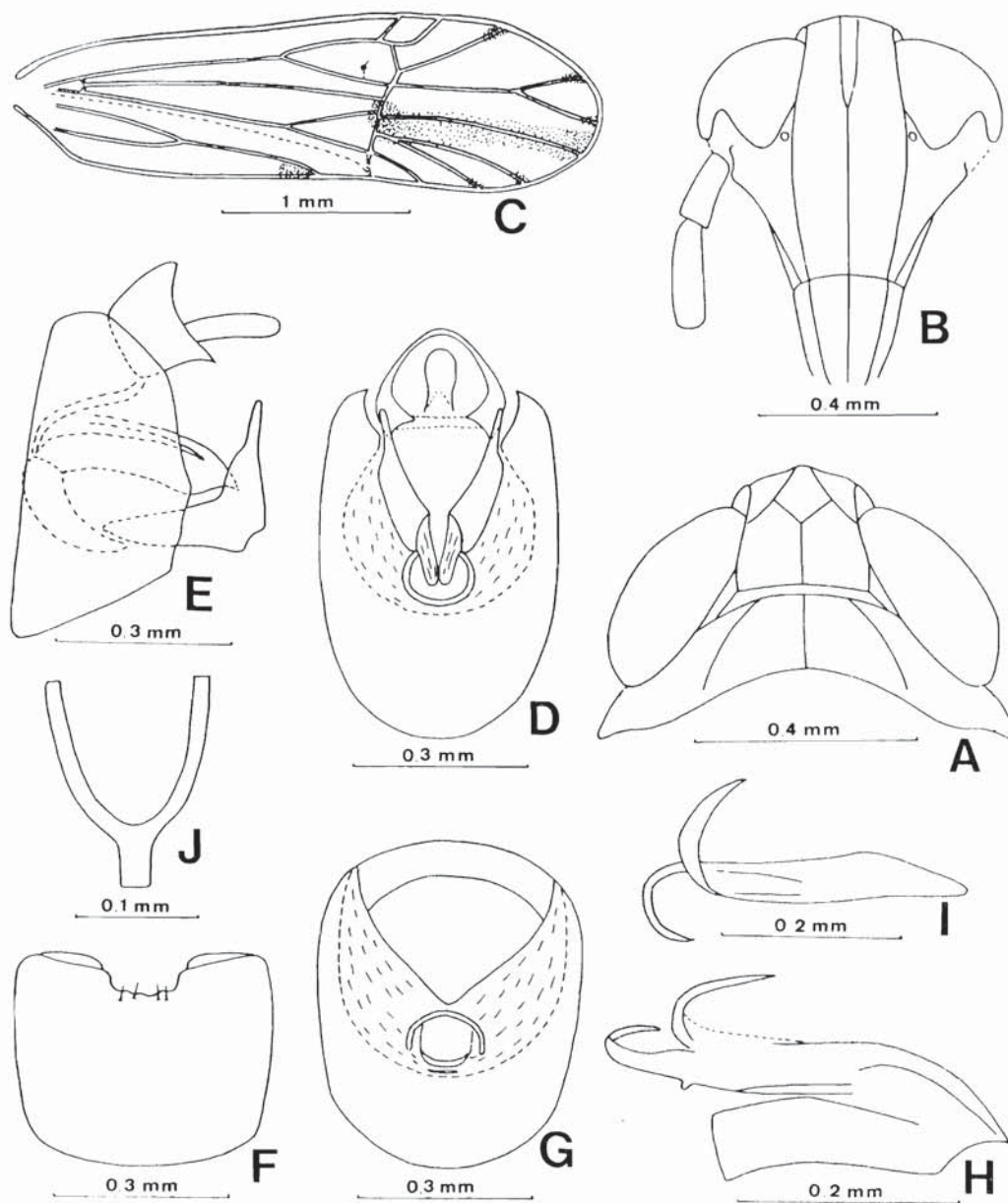


Fig. 21. *Numata corporaali* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, the same, ventral view; G, diaphragm of pygofer; H, phallus, left side; I, the same, dorsal view; J, suspensorium.

(19) *NUMATA MUIRI* (Kirkaldy)

Fig. 22.

*Numata muiri* Fennah, 1978, *Ann. Zool. Warszawa*, 34(9):222.

*Dicranotropis muiri* Kirkaldy, 1907, *Bull. Hawaiian Sugar Pl. Assoc.*, 3:134.



- : Muir, 1916, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 13:53.  
 –: Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:317.  
*Numata sacchari* Matsumura, 1935, *Ins. Matsum.*, 9:139.  
 –: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 18.  
 –: Matsumura et Ishihara, 1945 *Mushi*, 16:70.  
 –: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:36.  
*Stenocranus sacchari* Matsumura, 1910, *Schad. u. nütz. Ins. Zuckerrohr Formosas*, 16.  
*Unkana sacchari* Matsumura, 1935, *Ins. Matsum.*, 10:73.

General color light yellowish brown. Metapleura each with a rounded black spot. Abdomen dark brown to black. Tegmina subhyaline, hind margin near end of claval suture, apices of apical veins dark brown, membrane between  $M_{3+4}$  and  $Cu_{1a}$  light brown.

Vertex as long submedially as wide at base, distinctly narrower at apex than at base, submedian carinae not uniting at apex, Y-shaped carina with stem feeble, basal compartment of vertex wider at base than greatest length about 2:1. Frons in middle line longer than wide at widest part about 2.3:1, subparallel sided except narrowed at base, median carina forked at basal third. Postclypeus very long, distinctly longer than wide at base. Antennae surpassing level of frontoclypeal suture, basal segment longer than wide, second segment about 2 times as long as first. Post-tibial spur with about 30 teeth. Tegmina longer than widest part about 4:1.

Anal segment of male short, ring-like, lateroapical angles rather separated, each produced ventrad in a rather stout spinose process. Pygofer in profile distinctly longer ventrally than dorsally, in posterior view with opening distinctly wider than long, lateral margins not well defined. Phallus very large, strongly compressed laterally, reflected cephalad distally with two processes, upper one surpassing base and lower one not reaching it. Suspensorium with arms dilate at apices. Diaphragm very narrow, dorsal margin angulated, forming a V-shaped weakly sclerotized area. Genital styles long, rather narrow, directed dorsad, contiguous at base and divergent apically.

Male (macropterous)

Length of body (includ.teg.): 4.10-4.12 mm.

Length of tegmen: 3.66-3.73 mm.

Female (macropterous)

Length of body (includ.teg.): 5.00-5.17 mm.

Length of tegmen: 4.20-4.33 mm.

Specimens examined: 6♂♂, 7♀♀, Tungkong, Pingtung Hsien, 10-XI-1983, C.T. Yang.

Host plant: *Saccharum officinarum* L.

Distribution: Taiwan, Mainland China, Ryukyu, Japan, Viet-nam. Philippines, Java, Borneo, Sudan.

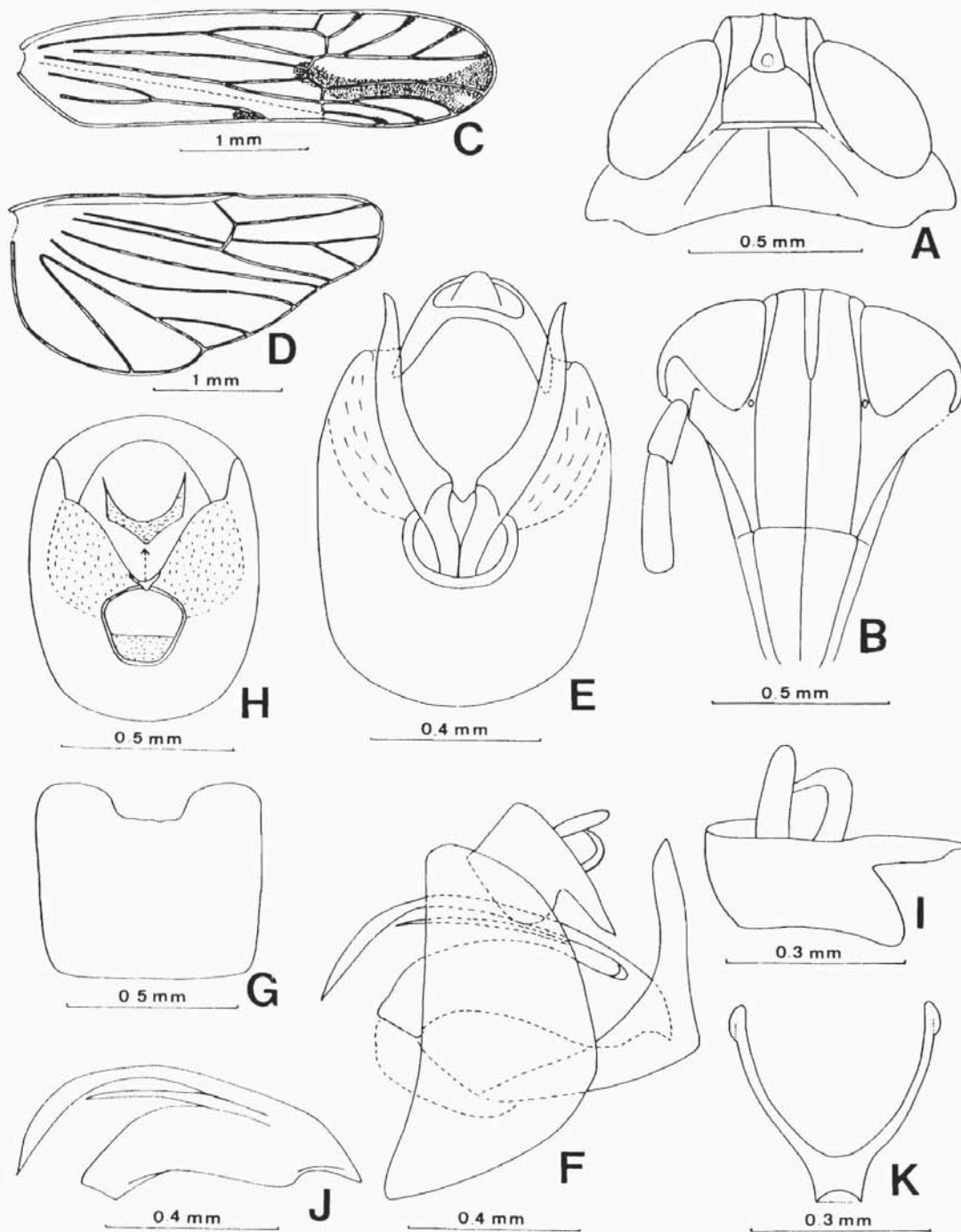


Fig. 22. *Numata muiri* (Kirkaldy) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, pygofer, ventral view; H, diaphragm of pygofer; I, anal segment of male, left side; J, phallus, left side; K, suspensorium.



## 11. Genus *Kakuna* Matsumura

*Kakuna* Matsumura, 1935, *Ins. Matsum.*, 10:76.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:36.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:141.

The generic characters outlined by Ishihara [1949] are modified and supplemented as follows.

Large size. Head narrower than pronotum. Vertex about as long submedially as wide at base, submedian carinae uniting or not uniting at apex of vertex. Frons longer in middle line than wide at widest part about 2:1. Antennae very long, almost reaching apex of postclypeus. Ocelli rudimental. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 30 teeth, first tarsal segment of hind leg very long, almost twice as long as other 2 combined.

Anal segment of male ring-like, lateroapical angles each produced in a spinose process. Pygofer in profile with dorsolateral angle not produced, with or without medioventral process. Phallus tubular, armed with many teeth. Suspensorium ring-like. Diaphragm moderate. Genital styles moderate.

Type species: *Kakuna kuwayamai* Matsumura  
(original designation)

### Key to the species of *Kakuna*

1. General color light green; frons with median carina forked below level of lower margin of eyes; length of tegmen of male 4.17-4.33 mm . . . . . *albipennis* (Matsumura)
  - General color yellowish white; frons with median carina forked above level of lower margin of eyes; length of tegmen of male 4.83-5.00 mm. . . . . *mira* n.sp.

### (20) *KAKUNA ALBIPENNIS* (Matsumura) n.comb.

Fig. 23.

*Euidella albipennis* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:34.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:79.

*Toyoides albipennis* Matsumura, 1935, *Ins. Matsum.*, 10:78.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 48.

General color light green. Vertex, frons, clypeus, antennae and legs pale brown, mesonotum somewhat darker, mesopleuron with a large, round, black spot. Tegmina subhyaline, anterior and posterior margins infuscated.

Vertex longer submedially than wide at base, about 1.1:1, obtusely rounding into frons, as wide at apex as at base, lateral margins straight, apical margin transverse.

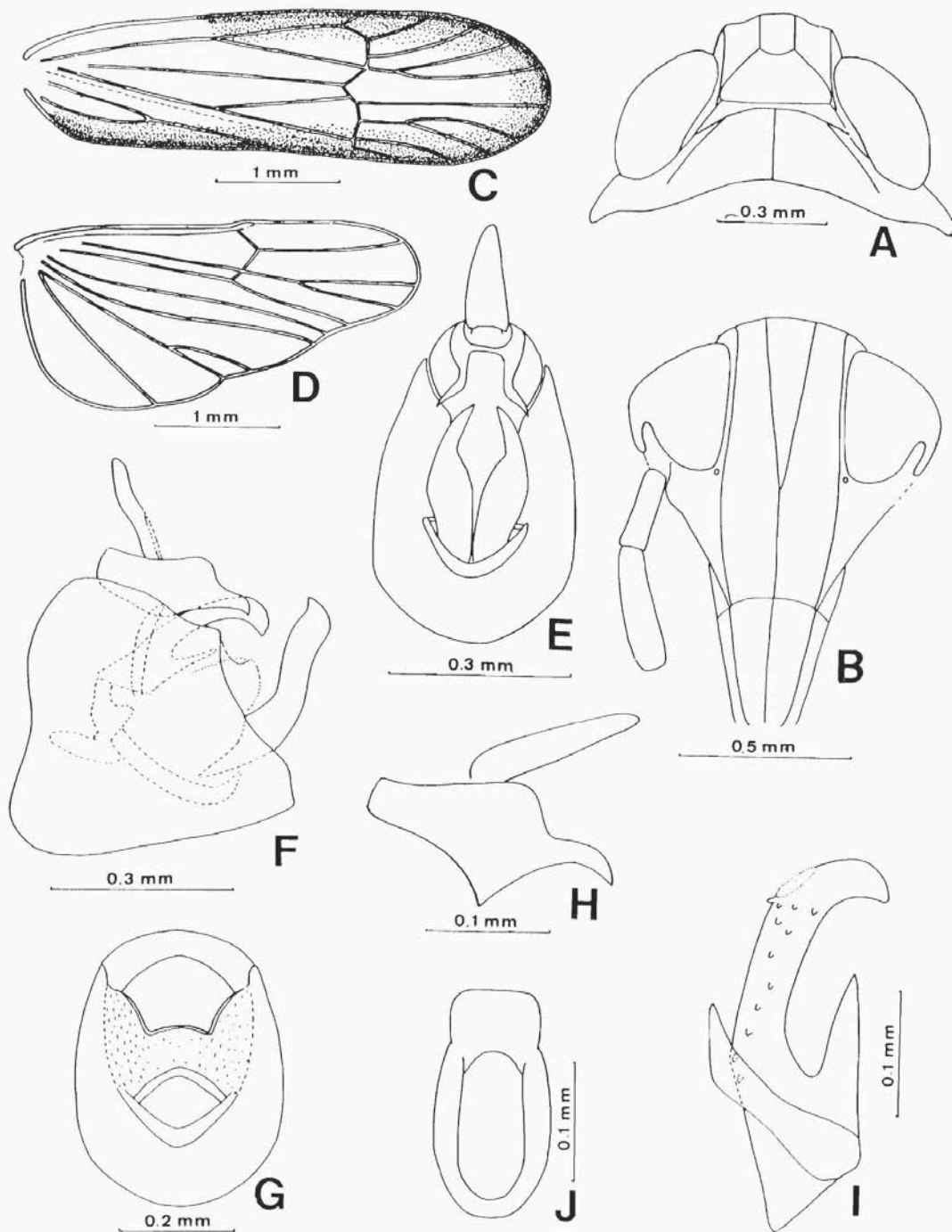


Fig. 23. *Kakina albipennis* (Matsumura) A, head and pronotum, dorsal view; B, frons and postclypeus; C, Tegmen; D, wing; E, male genitalia, posterior view; F, the sma, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium.



submedian carinae not uniting at apex, basal compartment of vertex wider at base than greatest length, about 2:1. Frons longer in middle line than wide at widest part, about 2.3:1, lateral margins slightly convex, median carina forked below eyes. Postclypeus at base slightly wider than frons at apex, longer than broad. Rostrum surpassing meso-trochanters. Antennae with basal segment long, 3 times as long as broad at apex, shorter than second, about 1:1.5. Post-tibial spur with 30-36 teeth. Tegmina longer than widest part about 3.4:1.

Anal segment of male moderately long, apical margin broad, a stout spinose process arising lateroapically on each side, directed ventrolaterad. Pygofer in profile distinctly longer ventrally than dorsally, diaphragm produced caudad, with laterodorsal angles moderately produced caudad, in posterior view with opening longer than wide, lateral margins weakly defined, opening for genital styles as figured. Phallus long, tubular, decurved distad, with a large pointed process ventrally, with several short, stout spinose processes on both sides at apical two-thirds. Orifice dorsad, far away from apex. Diaphragm broad, dorsal margin evenly convex. Genital styles long, weakly divergent, each with both sides convex at basal two-thirds and attenuate at apical third.

Male (macropterous)

Length of body (includ. teg.): 4.93-5.10 mm.

Length of tegmen: 4.17-4.33 mm.

Female (macropterous)

Length of body (includ.teg.): 5.33-5.53 mm.

Length of tegmen: 4.73-5.00 mm.

Specimens examined: 20♂♂, 12♀♀. Kuantzuling, Tainan Hsien, 31-VII-1984, C.T. Yang.

Host plant: *Pennisetum alopecuroides* (L.) Spreng

Distribution: Taiwan, Mainland China.

This species was described basing upon one female specimen from Kuantzuling (13-VII-1907) by Matsumura as new genus and species. The author collected 32 specimens from type-locality and redescribed it as above.

(21) *KAKUNA MIRA* n.sp.

Fig. 24.

General color yellowish white. Vertex, base of frons, pronotum behind eyes and mesonotum somewhat brown. Abdomen with dorsum black. Tegmina with anterior and posterior margins black, female with saw-sac and anal segment black.

Vertex nearly as long submedially as wide at base, apical margin rounded, lateral carinae straight, submedian carinae not uniting at apex, Y-shaped carina distant, basal compartment wider at base than greatest length about 2:1. Frons longer in middle line than wider at widest part about 2.5:1, widest at level of ocelli, lateral carinae nearly straight, median carina forked at middle of eyes. Postclypeus as wide at base as frons at apex, longer in middle line than wide at base about 1.6:1. Rostrum reaching to meta-coxae. Antennae reaching middle of postclypeus, basal segment longer than wide about 2:1, shorter than second about 1:2. Post-tibial spur with 34-38 teeth. Tegmina longer than widest part about 3.7:1.

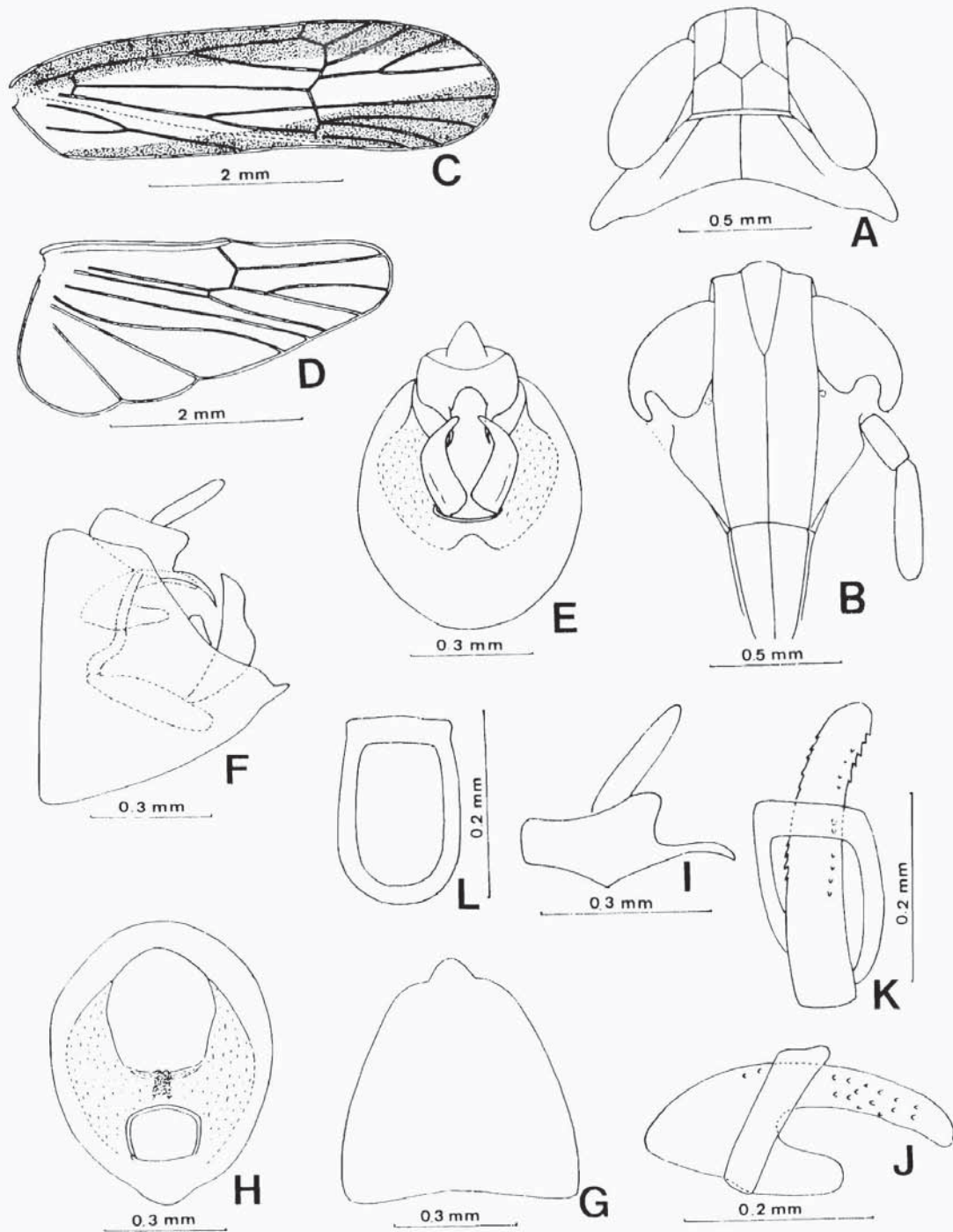


Fig. 24. *Kakuna mira* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, pygofer, ventral view; H, diaphragm of pygofer, caudodorsal view; I, anal segment of male, left side; J, phallus, left side; K, the same, dorsal view slightly left; L, suspensorium.



Anal segment of male ring-like, each apicobasal angle produced into a spinose process, directed caudad. Pygofer in profile extremely wider ventrally than dorsally, in posterior view with opening wider than long, lateral margins not well defined, in ventral view medioventral process distinct, rounded. Phallus stout, tubular, dorsal margin arched medially, at base produced a short, stout process, armed with many small teeth. Orifice terminal, ventrad. Suspensorium ring-like, dorsal margin truncate. Diaphragm moderately wide, somewhat produced cephalad at dorsal margin, pigmented centrally. Genital styles in caudal view attenuate at apical third, inner margin strongly concave.

The name *mira* is Latin adjective, means wonderful.

Male (macropterous)

Length of body (includ.teg.): 5.73-6.00 mm.

Length of tegmen: 4.83-5.00 mm.

Female (macropterous)

Length of body (includ.teg.): 6.43-6.83 mm.

Length of tegmen: 5.50-5.83 mm.

**Fifth instar nymph (Fig. 25)**

General color uniformly brown dorsally, white ventrally. Mesopleura each with a large, rounded black marking.

Head between eyes nearly as wide at narrowest part as long in middle line, strongly protruding beyond level of eyes, length of eye longer than length between level of eyes and lateral point of frons about 2.3:1, lateral carinae reaching hind margin of vertex, submedian carinae attaining hind margin of vertex at same point of lateral carinae, basal compartment wider at hind margin than greatest length about 1.8:1, hind margin not well defined. Frons longer in middle line than wide at widest part about 2.2:1, lateral carinae slightly convex, with 2 median carinae, separated, parallel. Interpits typical, each side with 3 extra pits, lowest pit lies far away from frontoclypeal suture, distance more than 4 diameters of pit, distance between dorsal level of lower pits and ventral level of median pits much shorter than former to frontoclypeal suture about 1:5, lower of upper pits much higher than higher of median pits. Between eye and lateral carina with 7 pits, lowest one lies at middle of eye. Frontoclypeal suture straight. Antennae with basal segment longer than wide, shorter than second about 1:2.4. Rostrum reaching to meta-coxae, relative length of each segment about 1.1:1:1, third segment longer than wide about 3:1.

Pronotum each side with 8 pits, 2 medial, 6 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, relative distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 2.6:1. Anterior wing pad not protruding to level of hind one, latter reaching anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, metatibia longer than 3 tarsi combined about 1.3:1, spur shorter than first tarsal segment, with about 27-31 teeth.

Abdominal tergite V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobes cylindrical, pits lie near middle, in lateral view strongly produced caudad near base, anal comb moderate, in caudal view opening widest near middle.

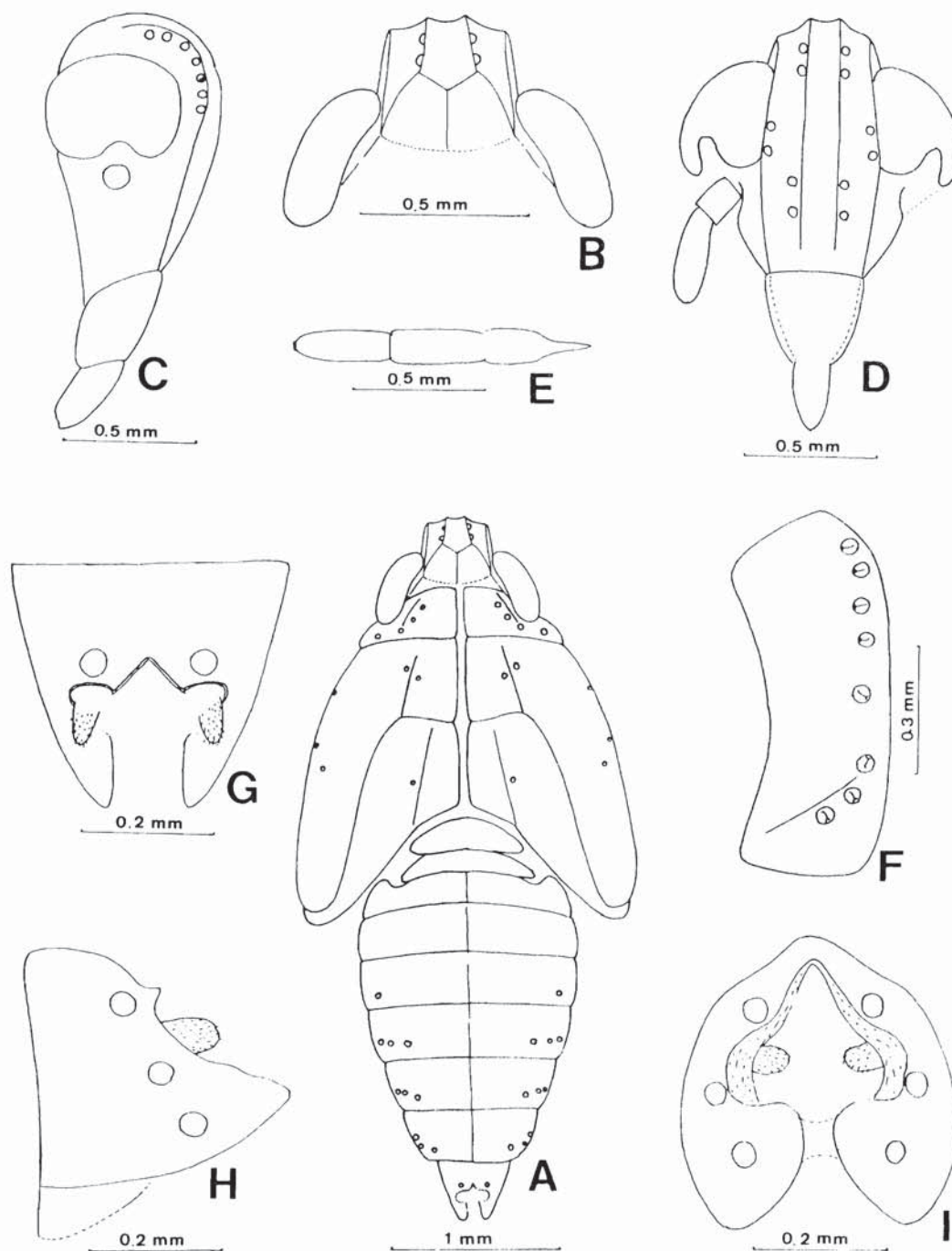


Fig. 25. Nymph of *Kakuna mira* n.sp. A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, left side; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.



Length of body: 4.13 mm.  
 Width of head including eyes: 0.96 mm.  
 Length of anterior wing pad: 1.57 mm.  
 Length of antenna: 0.50 mm.

Holotype: Male, Chiasien, Kaohsiung Hsien, 15-IX-1987, C.T. Yang. In NCHU.  
 Paratypes: 1♂ (dissected), 3 ♀♀, same data as for holotype; 1♂, 1♀, same locality as for holotype, 23-IX-1987, C.T. Yang.  
 Host plant: Unknown.  
 Distribution: Taiwan.

This new species differs from *Kakuna kuwayamai* Matsumura of Japan and Mainland China in having tegmina with anterior and posterior margins black (posterior half brownish black in *kuwayamai*). From other members of this genus it differs in having the median carina of frons forked above the level of ocelli.

## 12. Genus *Euidopsis* Ribaut

*Euidopsis* Ribaut, 1948, *Soc. Sci. Fen. Commentat. Biologicae*, 10:8, p.18.

The generic characters outlined by Ribaut [1948] are modified and supplemented as follows.

Head including eyes as wide as pronotum. Vertex as long submedially as wide at base, submedian carinae not uniting at apex. Frons longer in middle line than wide at widest part about 2:1, lateral carinae concave between eyes, median carina forked above level of ocelli. Postclypeus wider at base than frons at apex. Rostrum reaching to meso-trochanters. Ocelli distinct. Antennae cylindrical, almost reaching to apex of postclypeus. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 30 teeth.

Anal segment of male large, lateroapical angles each produced in a narrow flattened process. Phallus tubular, reflected cephalad at apex in flagellum. Suspensorium Y-shaped. Diaphragm wide, knob-like, produced caudad. Genital styles moderately long.

Type species: *Euidopsis truncata* Ribaut  
 (original designation)

### (22) *EUIDOPSIS TRUNCATA* Ribaut

Fig. 26.

*Euidopsis truncata* Ribaut, 1948, *Soc. Sci. Fen. Commentat. Biologicae*, X:8, p. 18.  
 --: Ashe, 1982, *Marburger Ent. Publ.*, 1(6):211-230.

General color pale brown. Vertex, frons, genae and postclypeus brown, frons

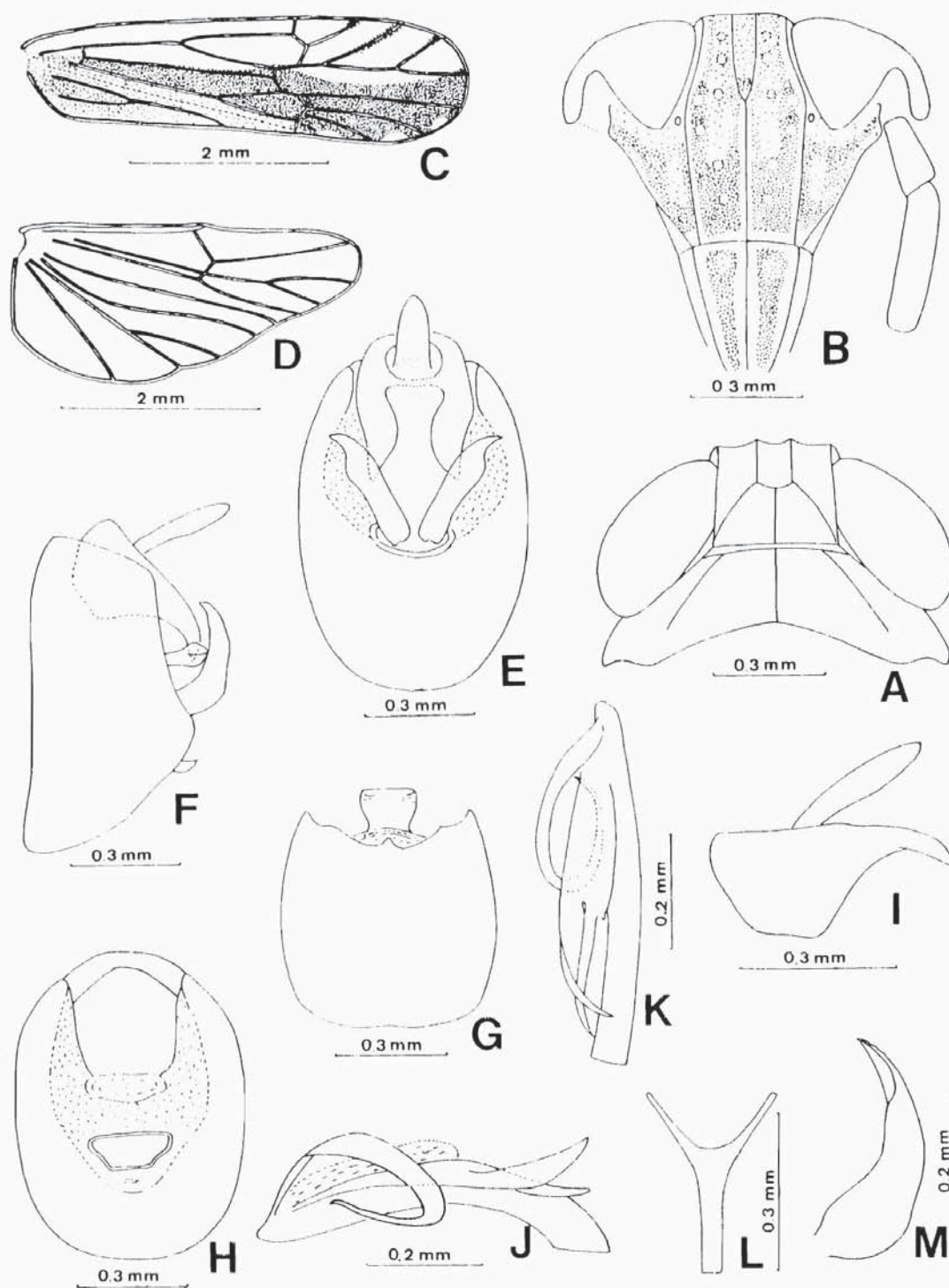


Fig. 26. *Euidopsis truncata* Ribaut A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, pygofer, ventral view; H, diaphragm of pygofer; I, anal segment of male, left side; J, phallus, right side; K, the same, dorsal view; L, suspensorium; M, genital style, left side.



scattered with yellowish spots. Pronotum with outer sides of lateral carinae dark brown except each median area and 4 spots near hind margin pale yellow, mesonotum with outer sides of lateral carinae dark brown. Antennae with first segment and base of second black except anteromedial area of first pale brown. Coxae and pleura dark brown. Abdomen black. Tegmina hyaline, posterior half black, along hind margin somewhat paler and between apical cells hyaline.

Vertex wider at base than long submedially about 1.2:1, at apex as wide as at base, lateral carinae straight, apical margin truncate, submedian carinae not uniting at apex, Y-shaped carina feeble or distinct, basal compartment wider at base than greatest length about 2.1:1. Frons longer in middle line than wide at widest part about 1.9:1, widest at level of ocelli. Postclypeus wider at base than frons at apex. Antennae with basal segment longer than wide about 1.9:1, shorter than second about 1:1.9. Post-tibial spur with 24,29 teeth. Tegmina longer than wide at widest part about 3.5:1.

Anal segment of male with lateroapical angles widely separated, each produced in a widely flattened process which curves laterad apically. Pygofer in profile wider ventrally than dorsally, medioventral process distinct, laterodorsal angle angulated, in posterior view with opening longer than wide, lateral margins well defined, in ventral view medioventral process triangulate, each side concave then angulated. Phallus large, tubular, reflected cephalad at apex in a large flagellum, right side one, slender process, circular, median lobe terminating in 2 processes, outer process curved mesad above inner one. Suspensorium with arms shorter than stem. Diaphragm wide, transversely ridged at middle, knob-like, produced caudad. Genital styles moderately long, apical fourth abruptly narrowing to apex.

Male (macropterous)

Length of body (includ.teg.): 5.06 mm.

Length of tegmen: 4.40 mm.

Specimen examined: 1♂, (dissected) Litao, Taitung Hsien, 10-II-1987, S.J. Fang.

Host plant: Unknown.

Distribution: Taiwan (new record), Italy, Cyprus, Greece, Turkey, Iraq, Egypt, South Africa.

### 13. Genus *Sinolacme* Fennah

*Sinolacme* Fennah, 1978, *Ann. Zool. Warszawa*, 34(9):229.

*Cripina* Kuoh, 1982, *Acta Zootaxonomica Sinica*, 7(1):78. N.SYN.

The generic characters outlined by Fennah [1978] are modified as follows.

Head including eyes slightly narrower than pronotum. Vertex a little shorter submedially than wide at base, apical margin transverse, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment wider at base than greatest length part, about 2:1, widest at level of ocelli, median carina forking at level of ocelli. Rostrum reaching slightly beyond meso-trochanters, apical segment shorter than subapical. Ocelli present. Antennae cylindrical, distinctly surpassing frontoclypeal

suture, basal segment longer than wide, shorter than second, about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male short, collar-shaped, lateroapical angles each produced in a broad spinose process. Pygofer with opening wider than long, medioventral process comprising 2 separated small processes. Phallus long, reflected cephalad at apex in a flagellum, terminating into 2 or 3 spinose processes, with a few spinose processes or teeth on distal half. Suspensorium Y-shaped. Diaphragm narrow, with dorsal margin weakly concave. Genital styles sinuate.

Type species: *Dicranotropis huensis* Fennah  
(original designation)

### Key to the species of *Sinolacme*

1. Tegmina black except area above Sc+R and R<sub>1</sub> white; phallus with flagellum terminating in 3 processes . . . . . *sinuosa* n.sp.
- Tegmina uniformly pale brown; phallus with flagellum terminating in 2 processes . . . . . *terrea* n.sp.

### (23) *SINOLACME SINUOSA* n.sp.

Fig. 27.

General color black. Antennae, legs yellowish brown. Tegmina subhyaline, black except area above veins Sc+R and R<sub>1</sub> hyaline, white.

Vertex shorter submedially than wide at base, about 1:1.1, obtusely rounding into frons, at apex as wide as at base, lateral margins weakly concave, apical margin truncate with submedian carinae markedly prominent, not uniting at apex. Y-shaped carina weak, basal compartment of vertex wider at base than greatest length about 2:1. Frons in middle line longer than wide at widest part, about 1.8:1, widest at level of ocelli, lateral margins slightly convex. Postclypeus at base as wide as frons at apex, as long as wide at base. Rostrum reaching to metacoxae. Antennae long, reaching beyond middle of postclypeus, basal segment longer than wide about 2.8:1, shorter than second about 1:1.6. Post-tibial spur with about 20 teeth. Tegmina longer than widest part about 3:1.

Anal segment of male with apical margin very wide, membraneous, lateroapical angles widely separated, each produced caudoventrad in a stout process, blunt at apex. Pygofer in profile distinctly narrower dorsally than ventrally, anterior margin convex, posterior margin produced caudad at position of genital styles, in posterior view with opening very small, distinctly wider than long, lateral margins strongly convex medially, weakly defined, ventral margin shallowly concave with a pair of small processes, each concave at apex. Phallus large, tubular, reflected cephalad at apex in a flagellum, terminating in 3 filamentous processes, 2 of them at right, one left, at apical third with a stout process in right and a slender one on dorsal. Orifice dorsad near apex. Suspensorium Y-shaped. Diaphragm moderately short, dorsal margin nearly membraneous, wide V-shaped. Opening for the genital styles with distinct conical processes at ventral



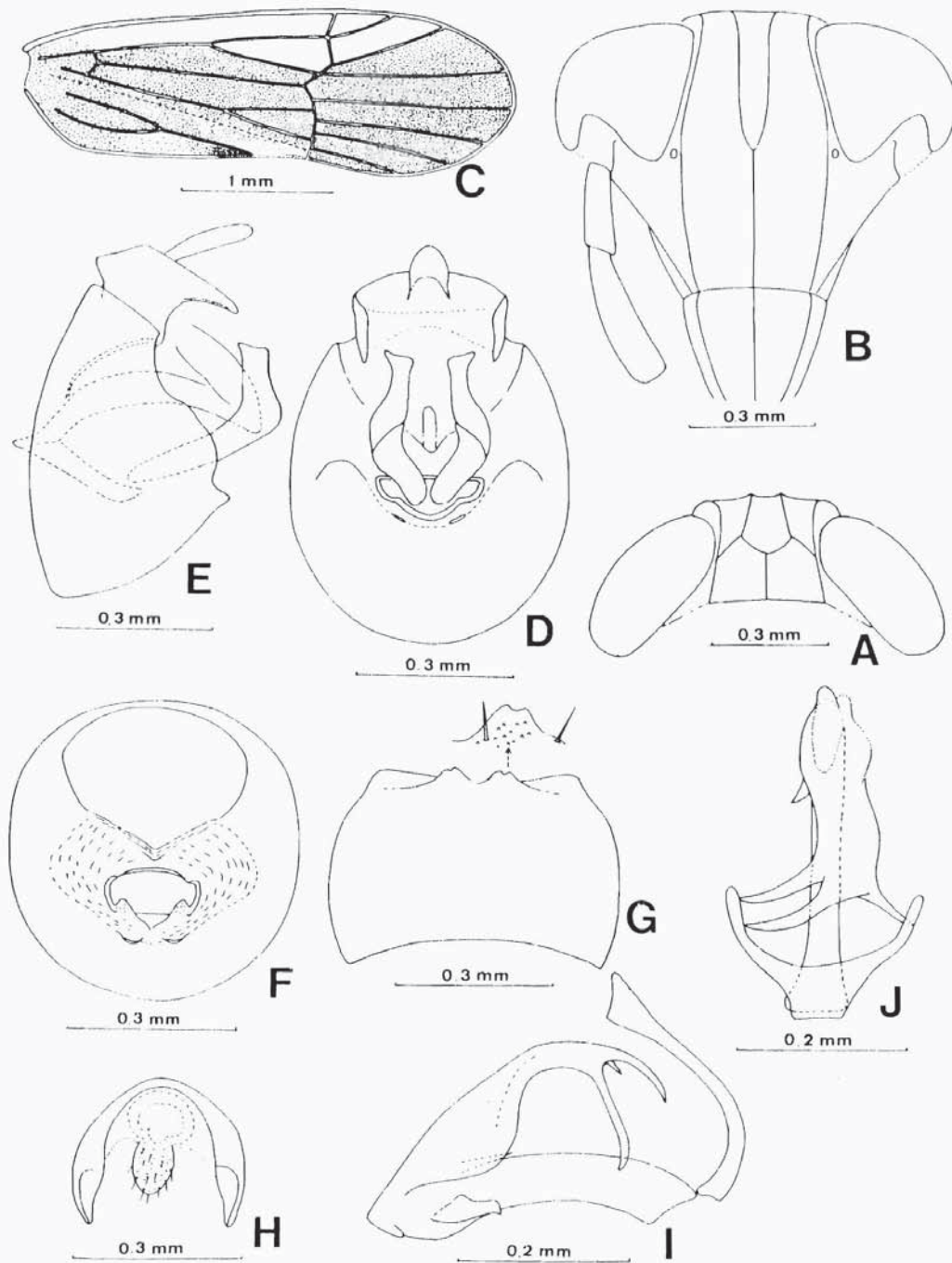


Fig. 27. *Sinolacme sinuosa* n.sp. A, head, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, pygofer, ventral view; H, anal segment of male, dorsal view; I, phallus, right side; J, the same, dorsal view.

margin, directed dorsad at each lateroventral angle. Margin between processes at lower side straight. Genital styles slender, divergent at base then parallel at apical half, in posterior view with outer margin strongly curved laterad medially, outer angle produced, slightly concave at apex, caudoventral view in whole feature deeply concave at basal two-thirds of caudocentral area.

The name *sinuosa* is Latin adjective, means sinuous.

Male (macropterous)

Length of body (includ.teg.): 3.90 mm.

Length of tegmen: 3.33 mm.

Holotype: Male, Pingtung, Pingtung Hsien, 15-X-1984, C.T Yang. In NCHU.

Paratype: 1♂ (dissected), same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from *Crispina tortilla* Kuoh and *C. tortuosa* Kuoh in having a longer first antennal segment; in the shape of the genital styles and of the terminal processes of the phallus. It differs from *Sinolacme tyranna* Fennah in color; the spinose processes of the aedeagus and the shape of the flagellum.

#### (24) *SINOLACME TERREA* n.sp.

Fig. 28.

General color brown. Legs somewhat yellowish. Abdomen dark brown to black. Tegmina hyaline, pale brown.

Vertex slightly wider at base than long submedially about 1.3:1, apical margin transverse, distinctly concave between ends of submedian carinae, lateral carinae straight, basal compartment wider at base than greatest length about 1.7:1. Frons longer in middle line than wide at widest part about 1.9:1, widest at level of ocelli, median carina forked above level of ocelli. Postclypeus wider at base than frons at apex. Rostrum reaching to meso-trochanters. Antennae reaching beyond frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with 26 teeth. Tegmina longer than widest part about 3.1:1.

Anal segment of male large, apicobasal angles each produced into a small, acute process. Pygofer in profile wider ventrally than dorsally, laterodorsal angle not produced, caudoventral angle distinctly produced, in posterior view with opening wider than long, lateral margins not well defined, in ventral view with anterior margin triangularly incised medially. Phallus tubular, reflected cephalad at apex in 2 flagellums, terminating in characteristic feature, large one on right, small one left. Suspensorium Y-shaped, arms widely separated. Diaphragm membranous. Genital styles moderately long, parallel, inner margin distinctly concave at middle, straight at apical fourth, pointed at apex, in lateral view apical fourth bent cephalad.

The name *terrea* is Latin adjective, means terrene.



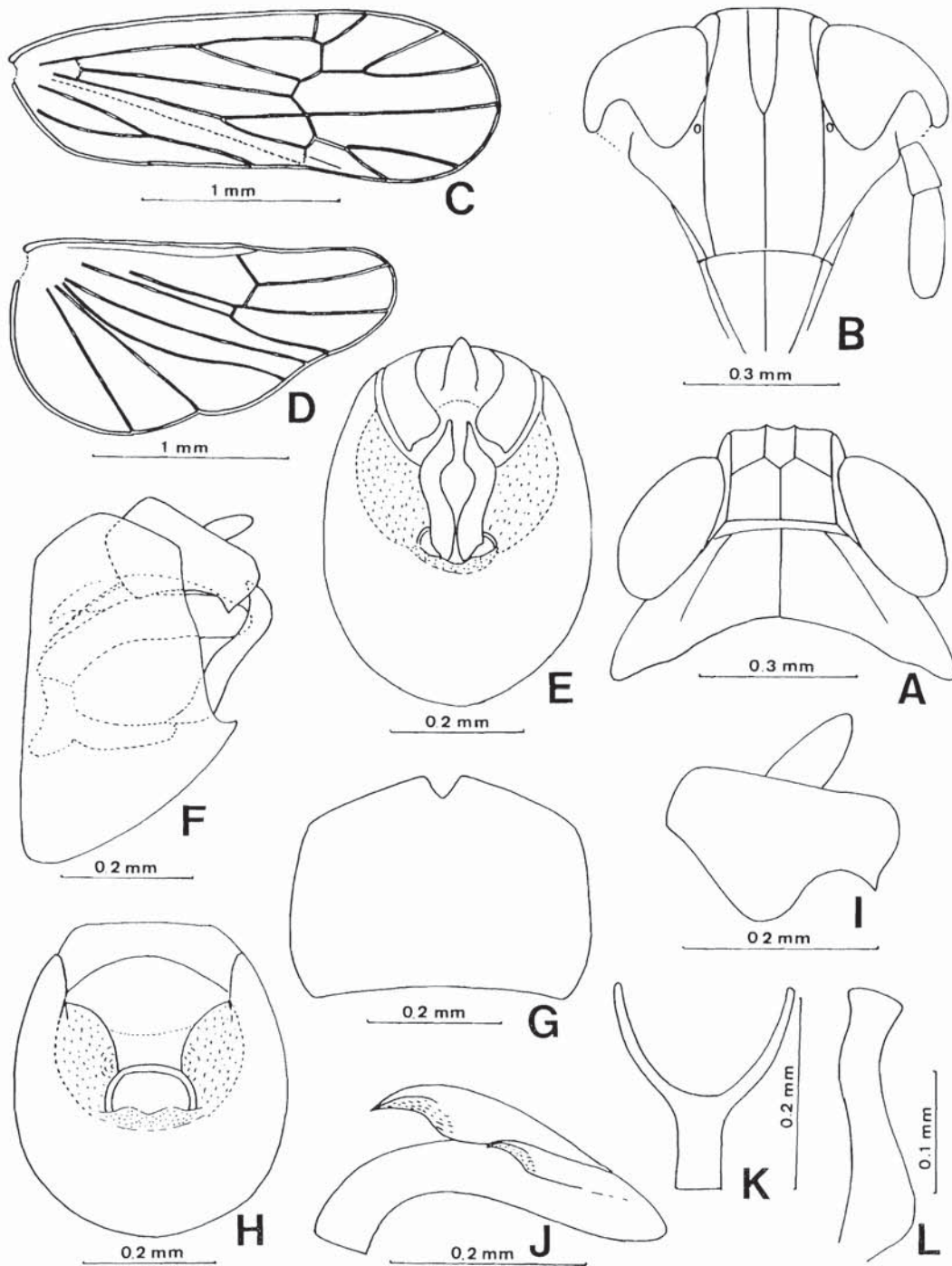


Fig. 28. *Sinolacme terrea* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, pygofer, ventral view; H, diaphragm of pygofer; I, anal segment of male, left side; J, phallus, left side; K, suspensorium; L, genital style, left side.

Male (macropterous)

Length of body (includ.teg.): 2.96 mm.

Length of tegmen: 2.46 mm.

Holotype: Male (dissected) Chiasien, Kaohsiung Hsien, 15-IX-1987, C.T. Yang.  
In NCHU.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from *Sinolacme sinuosa* in the color of the tegmina; the terminal processes of phallus and the shape of genital styles.

#### 14. Genus *Perkinsiella* Kirkaldy

*Perkinsiella* Kirkaldy, 1903, *Entomologist*, 36:179.

—: Kirkaldy, 1906, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 1:404.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:18.

The generic characters outlined by Kirkaldy [1903, 1906], Ishihara [1949] are modified as follows.

Body large sized. Head including eyes narrower or as wide as pronotum. Vertex wider at base than long submedially, rounding into frons, lateral carinae nearly parallel, submedian carinae not uniting at apex, Y-shaped carina distinct. Frons in middle line longer than wide at widest part about 2:1, median carina forked at level of ocelli. Postclypeus at base about as wide as frons at apex. Rostrum surpassing meso-trochanters. Ocelli present. Antennae large, almost reaching apex of postclypeus, with basal segment triangular, second segment flattened which narrower at apex than at base, longer than first about 1.5:1. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with more than 30 teeth.

Anal segment of male collar-shaped, with lateroapical angles produced into processes. Pygofer in profile wider ventrally than dorsally, medioventral processes paired, moderately or very long.

Type species: *Perkinsiella saccharicida* Kirkaldy  
(original designation)

#### Key to the species of *Perkinsiella*

1. Smaller species, tegmen of macropterous 2.83 mm.; genital styles long and slender, strongly produced at inner basal portion, near outer angle with a distinct process . . . . . *taiwana* n.sp.
- Larger species, tegmen of macropterous 3.33 mm. or more; not as above . . . . . 2



2. Frons unicolor throughout or most part of apical half dark; tegmina with most areas before  $R_S+M_1$  and after cross veins black . . . . . 3
  - Frons with apical half colorless or only small part dark; tegmina with most areas before  $R_S+M_1$  and after cross veins not marked or only marked along  $R_1$  . . . . . 4
3. Tegmina with area between  $Sc_2$  and  $R_S+M_1$  black except 3 transparent areas; frons unicolor except small areas near frontoclypeal suture; anal segment with processes very short, bifurcated at apex . . . . . *vastatrix* (Breddin)
  - Tegmina with only black areas between  $R_1$ , stems of  $R_S+M_1$  and  $R_S$ ; frons with apical half pale black in middle; anal segment with extreme long processes . . . . . *bakeri* Muir
4. Pygofer with medioventral processes very long, distinctly longer than half the height of opening . . . . . 5
  - Pygofer with medioventral processes very short, distinctly shorter than half the height of opening; post-tibial spur with 36-38 teeth . . . . . *saccharicida* Kirkaldy
5. Tegmina with black markings only between  $R_S+M_1$ ,  $M_1$  and  $M_2$ ; phallus not reflected at apex, with 2 spinose processes at basal half; post-tibial with about 33 teeth . . . . . *sinensis* Kirkaldy
  - Tegmina with black markings more than only between  $R_S+M_1$ ,  $M_1$  and  $M_2$ ; phallus strongly reflected, with 3 spinose processes at apical half; post-tibial spur with about 26 teeth . . . . . *thompsoni* Muir

(25) *PERKINSIELLA SACCHARICIDA* Kirkaldy

Fig. 29.

*Perkinsiella saccharicida* Kirkaldy, 1903, *Entomologist*, 36:179.

–: Matsumura, 1917, *Applied Ent.*, form ser., 378.

–: Takano et Yanagihara, 1938, *Spec. Rep. Tokyo Exp. Stat. Formosa*, 2:122.

–: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 45.

–: Matsumura et Ishihara, 1945, *Mushi*, 16:73.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:19.

–: Ding, 1983, *Econ. Ins. Fauna China*, 27:59.

General color light yellowish brown. Basal half of frons and postclypeus blackish brown. Antennae brown with apical margins of first segment black. Thorax with each outer side of lateral carinae of mesonotum brown. Legs with base of coxae, a large spot on each pleuron, longitudinal stripes on femora, basal and subapical annulations on tibiae, all tarsi except basal segment of hind tarsi black. Abdomen black, apical margins and laterally more or less widely light. Pygofer black, genital styles dark brown. Tegmina hyaline, apical membrane below M light brown, median portion of apical part, ends of other veins, hind margin near end of clavus black, wings white, veins brown to black.

Vertex shorter than wide at base about 1:1.3, basal compartment wider at base than greatest length about 2:1. Frons in middle line longer than wide at widest part about 2:1, length of frons and postclypeus together slightly longer than wide of head including eyes, frons longer than postclypeus about 1.7:1. Antennae with second segment longer than first about 1.5:1. Post-tibial spur with 36-38 teeth. Tegmina longer than widest part about 3.5:1.

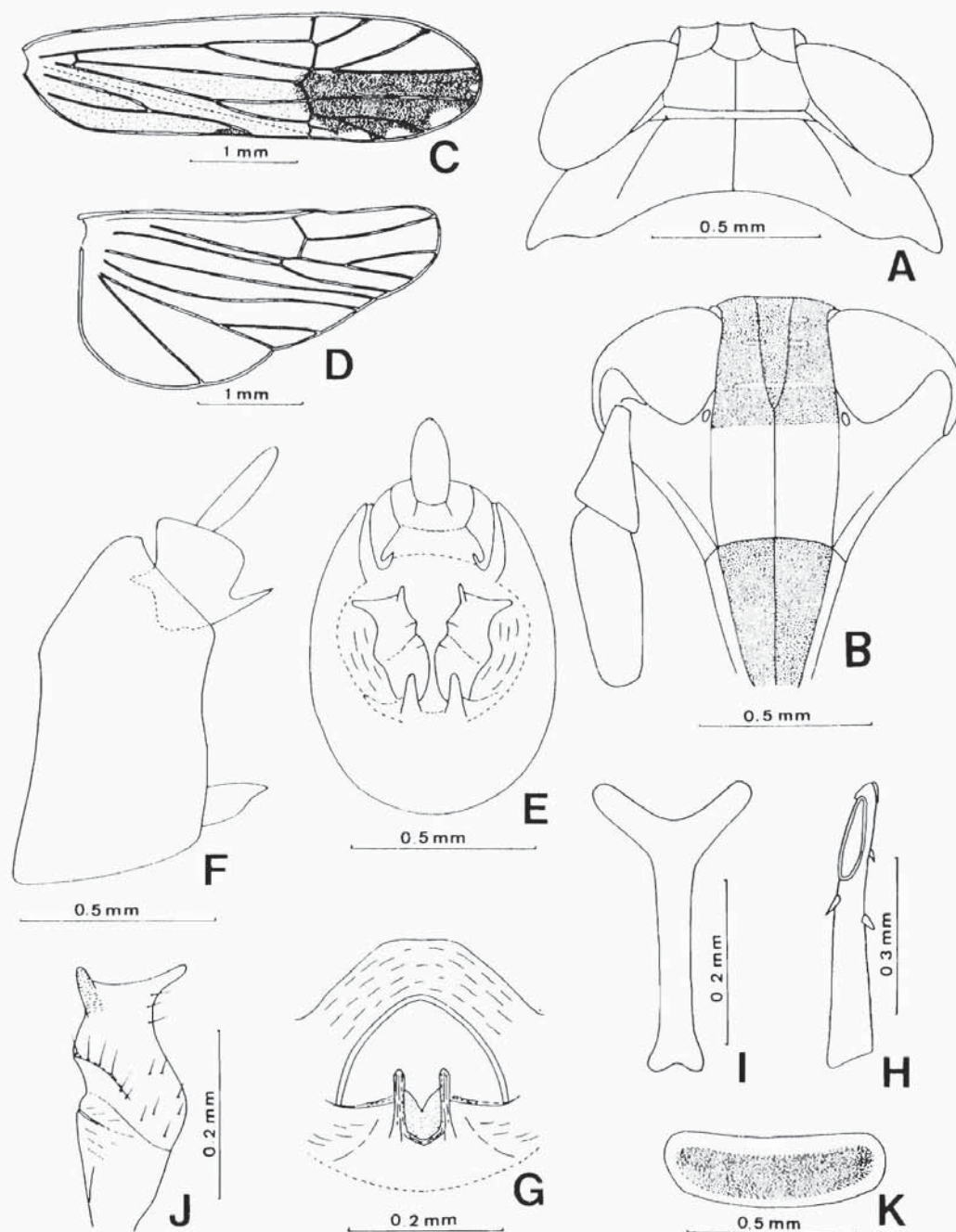


Fig. 29. *Perkinsiella saccharicida* Kirkaldy A, head and pronotum, dorsal view; B, frons and post-clypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, dorsal view; I, suspensorium; J, genital style, posterior view; K, genital scale.



Anal segment relatively short, a stout spinose process directed dorsad, arising laterobasally on each side. Pygofer in profile almost as wide dorsally as ventrally, medioventral process stout, very broad at base, attenuate at apical third, pointed at apex, in posterior view with opening longer than wide, lateral margins well defined, evenly concave, with two short medioventral processes. Phallus long, tubular, each lateral side with 2 stout spinose processes, 2 near middle, left one at apical three-fourths, the smallest right one near apex. Orifice large, dorsad. Diaphragm very narrow, not sclerotized, narrower than opening for genital styles, latter rounded dorsally. Genital styles broad, slightly divergent from base, inner margin sinuate, outer margin produced medially, inner apical angle with short process, outer apical angle with rather long process.

Male (macropterous)

Length of body (includ.teg.): 5.06-5.50 mm.

Length of tegmen: 4.16-4.66 mm.

Female (macropterous) (brachypterous)

Length of body (includ.teg.): 5.66-6.06 mm. 3.83 mm.

Length of tegmen: 5.00-5.40 mm. 3.00 mm.

Specimens examined: 2♂♂, 3♀♀, Tadushan, Taichung Hsien, 4-XII-1981, C.T. Yang.

Host plants: *Saccharum officinarum* L.

*Zea mays* L.

Distribution: Taiwan, Mainland China, Malaysia, Java, Hawaii, Amboina, Bonin Is., Mauritius, Reunion, Fiji, New Geinea, Australia, Madagascas, S. Africa.

(26) *PERKINSIELLA SINENSIS* Kirkaldy

Fig. 30.

*Perkinsiella sinensis* Kirkaldy, 1907, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 3: 138.

—: Matsumura, 1917, *Applied Ent., form ser.*, 379.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 45.

—: Matsumura et Ishihara, 1945, *Mushi*, 16:73.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:20.

—: Ding, 1983, *Econ. Ins. Fauna China*, 27:62.

General color and markings nearly same as in *P. saccharicida*.

Head including eyes nearly as wide as pronotum. Vertex shorter than wide at base about 1:1.3, basal compartment wider at base than greatest length about 2.4:1. Frons in middle line longer than wide about 2:1, length of frons and postclypeus together longer than wide of head including eyes, frons longer than postclypeus about 1.6:1. Antennae with second segment longer than first about 1.4:1. Post-tibial spur with about 33 teeth. Tegmina longer than widest part about 3.6:1.

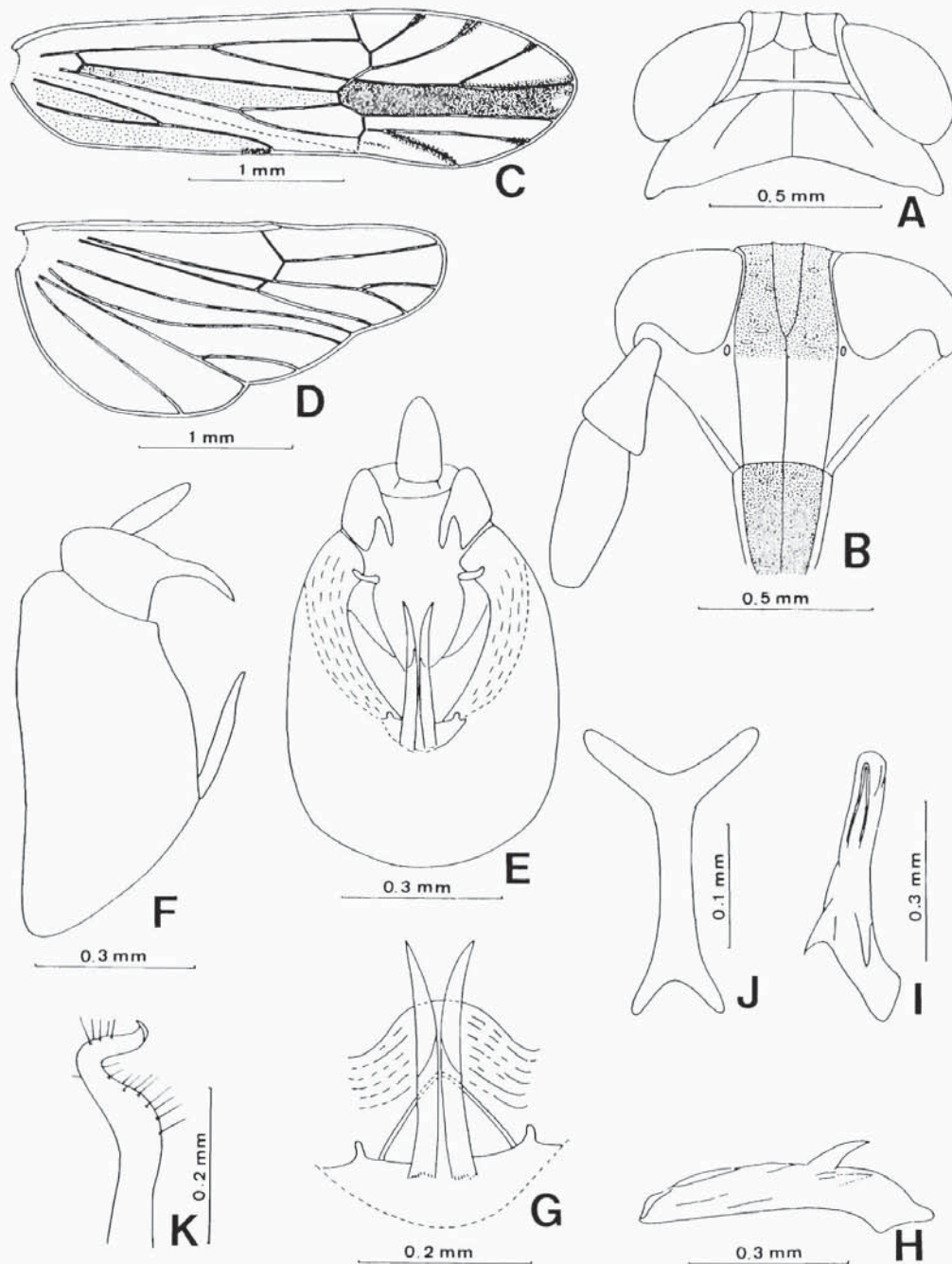


Fig. 30. *Perkinsiella sinensis* Kirkaldy A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, right side; I, the same, dorsal view; J, suspensorium; K, genital style, left side.



Anal segment relatively short, with strong spinose process directed caudad, arising laterodorsally on each side. Pygofer distinctly wider ventrally than dorsally, in profile with very long, slender medioventral processes, in posterior view with opening wider than long, lateral margins well defined, evenly concave, medioventral processes concave at outer apical half, very long. Phallus relatively short, 2 stout spinose processes one each on lateral sides at basal half. Orifice large, dorsad. Diaphragm narrow, not strongly sclerotized. Opening for genital styles angulated dorsally, near basal angle with a distinct, short process laterally, directed dorsad. Genital styles slender, distinctly divergent from base, inner margin concave, outer margin curved, inner apical angle with long, twisted process, directed caudad then laterad.

Male (macropterous)

Length of body (includ.teg.): 4.33-4.80 mm.

Length of tegmen: 3.63-3.83 mm.

Female (macropterous) (brachypterous)

Length of body (includ.teg.): 4.73-5.06 mm. 3.06 mm.

Length of tegmen: 4.00-4.26 mm. 2.80 mm.

Specimens examined: 2♂♂, Chiasien, Kaohsiung Hsien, 25-XII-1981, C.T. Yang; 9♂♂, 2♀♀, Lanshu, Taitung Hsien, 21-I-1987, S.J. Fang; 3♂♂, 3♀♀, Chiasien, Kaohsiung Hsien, 23-IX-1987, C.T. Yang.

Host plants: *Saccharum officinarum* L.

*Oryza sativa* L.

*Andropogon sorghum* (L.)

*Phragmites communis* Trinius

Distribution: Taiwan, Mainland China, Japan, Micronesia, W. Borneo, N. India, New Guinea, Belau (= Palau).

(27) *PERKINSIELLA VASTATRIX* (Breddin)

Fig. 31.

*Perkinsiella vastatrix* Kirkaldy, 1906, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 1:407.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 45.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:21.

*Perkinsiella (Dicranotropis) vastatrix* Matsumura, 1910, *Schad. u. nutz. Zuckerrohr Formosa*, 15.

*Dicranotropis vastatrix* Breddin, 1896, *Deutsch. ent. Zeits.*, 107.

General color nearly same as in *P. saccharicida* except for the frons which wholly pale brown.

Vertex shorter than wide at base about 1:1.4, basal compartment wider at base than greatest length about 2:1. Frons in middle line longer than wide at widest part about 1.8:1, length of frons and postclypeus together slightly longer than wide of head including eyes, frons longer than postclypeus about 1.9:1. Antennae relatively short, reaching to level of middle of postclypeus, second segment longer than first about 1.6:1. Post-tibial spur with 36 teeth. Tegmina longer than widest part about 1.9:1.

Anal segment relatively short, with a stout spinose process, arising lateromedially on each side, deeply bifurcate at apex, one pointed, directed dorsad. another small one

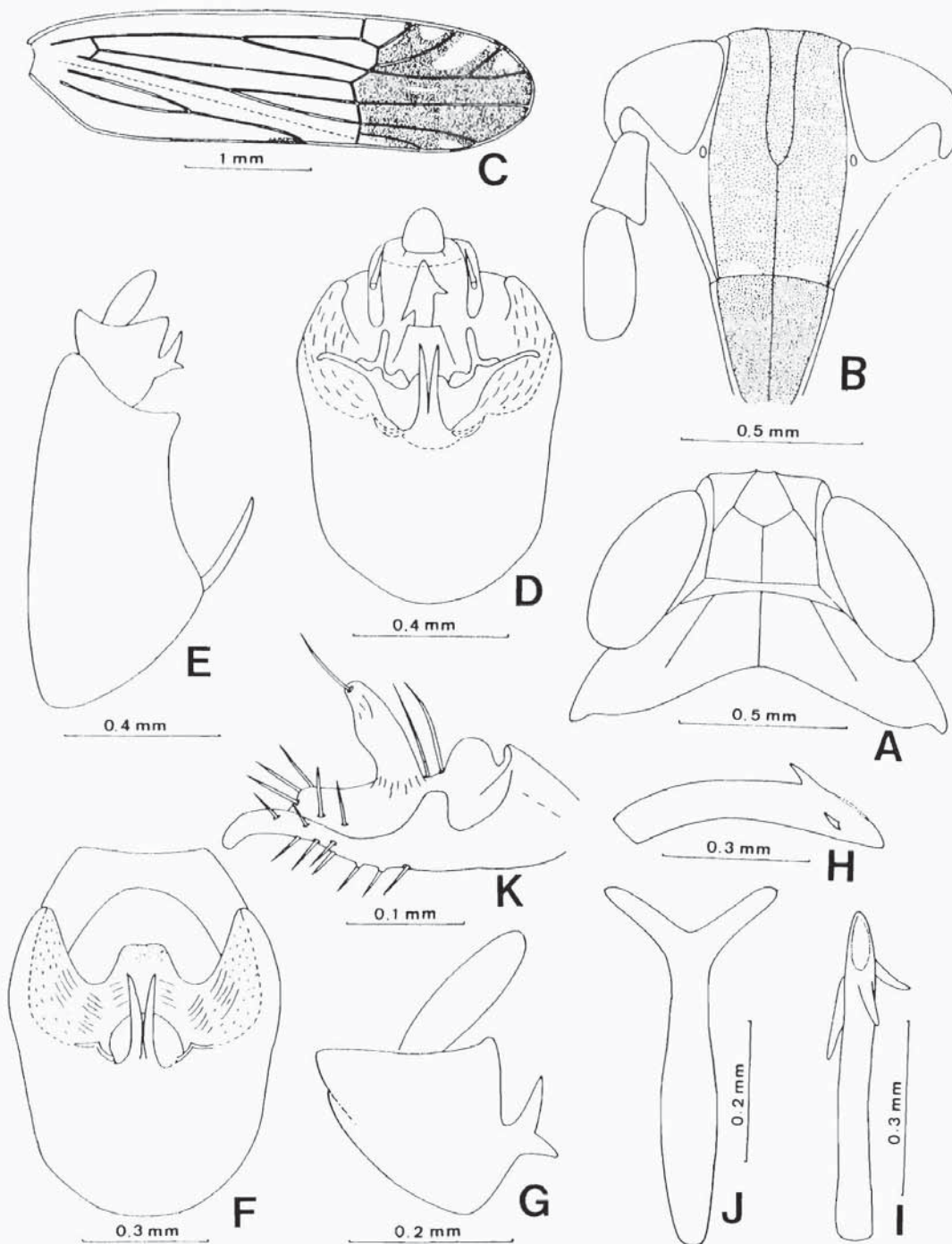


Fig. 31. *Perkinsiella vastatrix* (Breddin) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, anal segment of male, left side; H, phallus, left side; I, the same, dorsal view; J, suspensorium; K, genital style, posterior view.



caudad. Pygofer in profile wider ventrally than dorsally, with long, slender medioventral process, in posterior view with opening wider than long, lateral margins well defined, evenly concave, medioventral processes slightly divergent. Phallus long, tubular, with 2 stout spinose at right and one at left, all spinose in apical half. Orifice small, dorsad. Diaphragm distinctly longer than opening for genital styles, dorsal two-fifths somewhat sclerotized, ventral part not. Opening for genital styles rounded dorsally. Genital styles more complex as figured, strongly divergent from base.

Male (macropterous)

Length of body (includ.teg.): 6.00 mm.

Length of tegmen: 4.20 mm.

Specimen examined: 1♂, Chiasien, Kaohsiung Hsien, 23-X-1981, C.T. Yang.  
Host plant: *Saccharum officinarum* L.

Distribution: Taiwan, Amboina, W. Borneo, Java, Ceram, New Guinea, Philipines, Sulawesi.

(28) *PERKINSIELLA BAKERI* Muir

Fig. 32.

*Perkinsiella bakeri* Muir, 1916, *Philip. Jour. Sci.*, 11:379.

General color black. Vertex, pro- and mesonotum between lateral carinae yellow, frons and genae below level of lower margin of eyes yellowish brown except a broad line yellow above frontoclypeal suture. Tibiae and tarsi yellow, post-tibial spur pale black. Tegmina subhyaline, with large black marking as figured.

Head including eyes as wide as pronotum. Vertex slightly shorter than wide at base, apical margin transverse, lateral margin straight, basal compartment wider at base than greatest length about 1.9:1. Frons longer in middle line than wide at widest part about 2:1, length of frons and postclypeus together shorter than wide of head including eyes, frons longer than postclypeus about 2:1. Postclypeus slightly wider at base than frons at apex. Rostrum surpassing meso-trochanters. Antennae long, reaching to apex of postclypeus, basal segment longer than wide about 1.4:1, shorter than second about 1:1.5. Post-tibial spur with about 35 teeth, tooth rounded at apex. Tegmina longer than widest part about 3.25:1.

Anal segment of male with lateroapical angles each produced into a extremely long process. Pygofer in profile wider ventrally than dorsally, laterodorsal angle rounded, in posterior view with opening wider than long, lateral margins defined, medioventral processes short. Phallus tubular, moderately long, reflected cephalad subapically into 2 processes, left one small, another large one arising from the same base then curving to right side. Suspensorium Y-shaped. Diaphragm very broad, weakly sclerotized. Opening for genital styles slightly angulated at dorsal margin. Genital styles stout, broad at base, narrowed and twisted apically, apical portion directed cephalolaterad.

Male (macropterous)

Length of body (includ.teg.): 3.90 mm.

Length of tegmen: 3.33 mm.

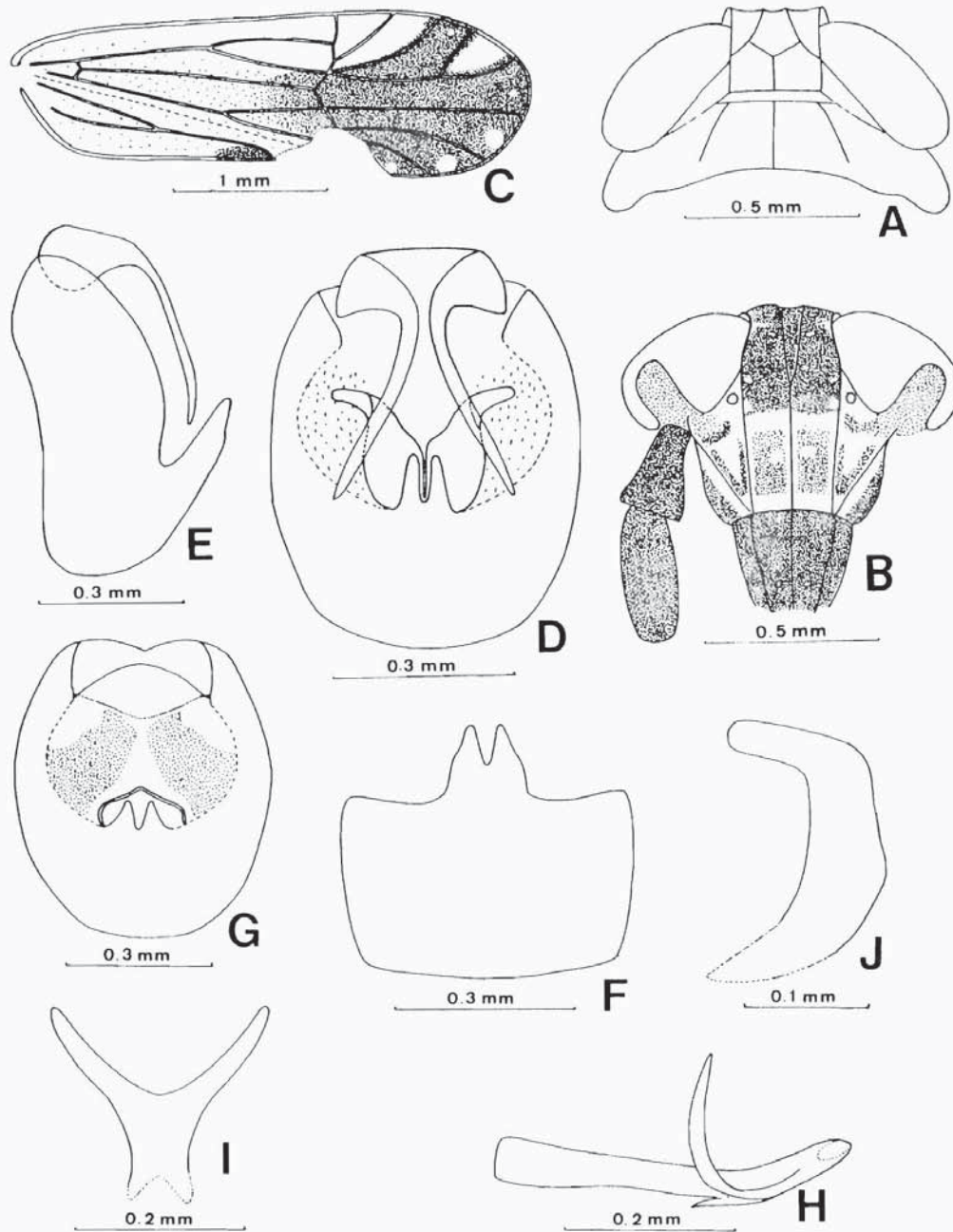


Fig. 32. *Perkinsiella bakeri* Muir A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, pygofer, ventral view; G, diaphragm of pygofer; H, phallus, dorsal view; I, suspensorium; J, genital style, left side.



Specimens examined: 1♂ (dissected), Paisha, Penghu Hsien, 7-VIII-1985, C.L. Hsieh.

Host plant: Sweeping from *Andropogon sorghum* (L.)

Distribution: Taiwan (new record), Philippines, Belau (Palau), Vietnam.

(29) *PERKINSIELLA THOMPSONI* Muir

Fig. 33.

*Perkinsiella thompsoni* Muir, 1913, *Proc. Hawaiian Ent. Soc.*, 2:240.

—: Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:325.

General color and markings same as in *P. saccharicida* except dorsal aspect of pronotum and mesonotum nearly concolor. Tegmina hyaline throughout, apical marking more narrow or not present at all.

Vertex shorter than wide at base about 1:1.2, basal compartment wider at base than greatest length about 2.2:1, length of frons and postclypeus together distinctly shorter than width of head including eyes, frons longer than postclypeus about 2.5:1. Antennae with second segment longer than first about 1.6:1. Post-tibial spur with about 26 teeth. Tegmina longer than widest part about 3.5:1.

Anal segment relatively short, with a stout spinose process directed caudad, arising laterobasally on each side. Pygofer nearly as wide dorsally as ventrally in profile, with medioventral process produced caudad then directed dorsad, very long and stout, in posterior view with opening wider than long, lateral margins well defined, evenly concave, 2 medioventral processes nearly parallel. Phallus long, tubular, strongly reflected at apex, with 3 spinose processes, left one near middle, right 2 in apical half. Orifice small, dorsad. Diaphragm longer than opening for genital styles, opening rounded dorsally. Genital styles broad, divergent, outer side nearly straight, inner side produced medially, outer apical angle with twisted process, produced from anterior side, protruding to inner then bending to outer side and caudad,

Male (macropterous)

Length of body (includ.teg.): 4.16-4.73 mm.

Length of tegmen: 3.33-3.90 mm.

Female (brachypterous)

Length of body: 2.80-3.27 mm.

Length of tegmen: 2.40-2.70 mm.

**Fifth instar nymph (Fig. 34)**

General color pale yellowish with various size pale brown markings scattered on dorsal aspect especially on abdomen. Frons pale brown above level of lower margins of eyes. Postclypeus black, antennal segment somewhat pale brown, femora with stripe brown markings, fore and mid-tibiae each with 2 ring-like brown markings, tarsi with bases and apices brown.

Head between eyes wider at narrowest portion than long in middle line about 1.3:1, slightly protruding beyond level of eyes, anterior margin between submedian carinae

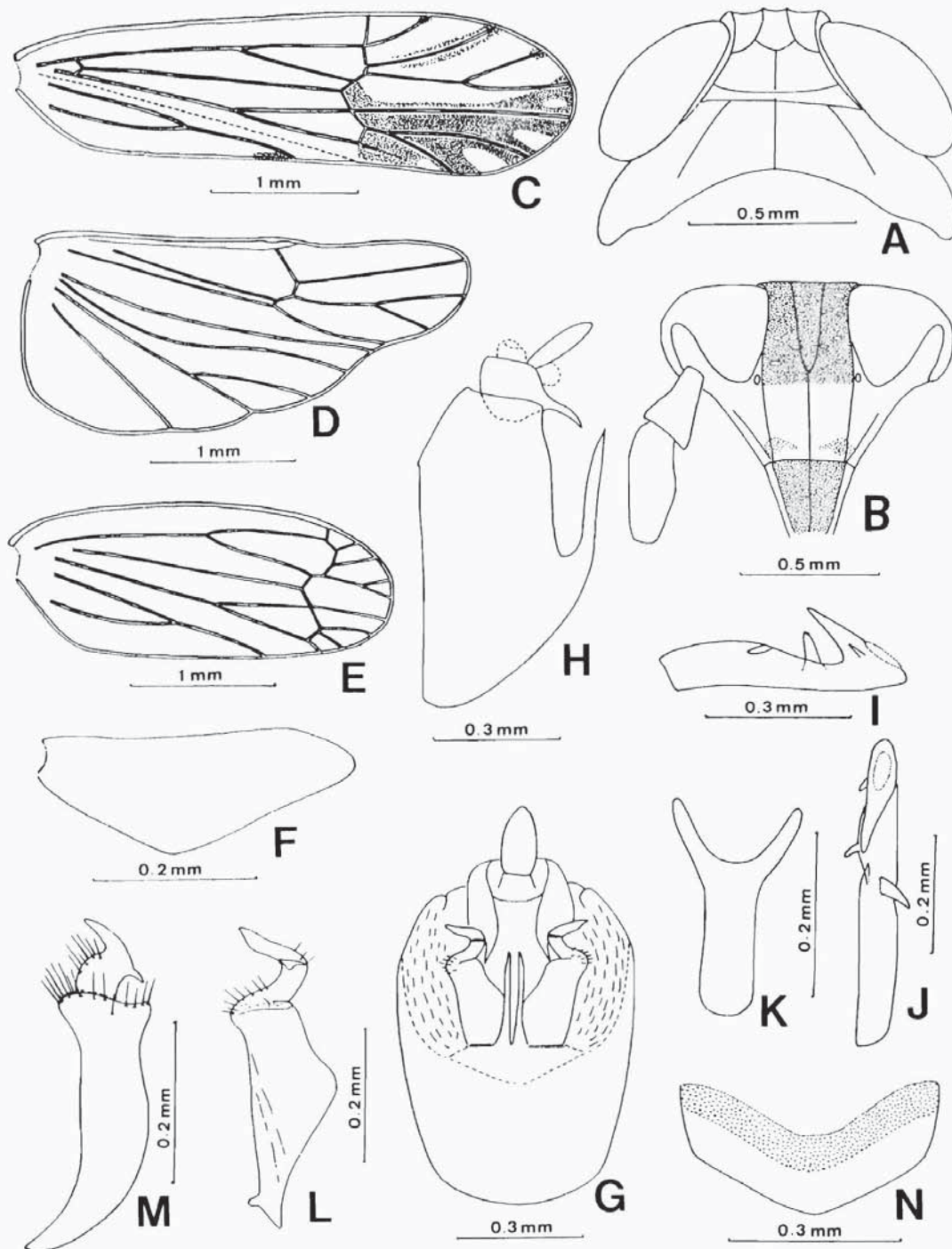


Fig. 33. *Perkinsiella thompsoni* Muir A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, tegmen (brachypterous); F, wing (brachypterous); G, male genitalia, posterior view; H, the same, left side; I, phallus, left side; J, the same, dorsal view; K, suspensorium; L, genital style, posterior view; M, the same, left side; N, genital scale of female.



concave, eyes divergent posteriorly, length of eyes longer than length between level of eyes and lateral point of frons about 5:1, width of head including eyes wider than width of basal compartment at hind margin about 4:1, submedian carinae attaining lateral carinae near anterior margins of eyes, basal compartment at hind margin wider than greatest length about 1.6:1, hind margin straight. Frons longer in middle line than wide at widest part about 1.4:1, widest above lower margin of eyes, lateral carinae strongly convex above lower margin of eyes, with 2 median carinae, separated, parallel, at widest part interfrons narrower than laterofrons about 1:2.3. Number and arrangement of pits typical, each side with 3 extra pits, lower pit lies near frontoclypeal suture, distance about a diameter of pit, distance of dorsal level of lower pits and ventral level of median pits slightly shorter than former to frontoclypeal suture, lower of upper pits slightly overlap with higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies below median point of eye. Frontoclypeal suture straight. Antennae moderately long, surpassing frontoclypeal suture, basal segment wider than long, shorter than second about 1:3. Rostrum reaching beyond meso-trochanters, relative length of each segment about 0.9:1.2:1, third segment longer than wide about 2.5:1.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, distance between  $W_1$  to  $W_2$  longer than  $W_2$  to  $W_3$  about 2.3:1, anterior wing pad protruding not over hind one, latter reaching to anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, metatibia longer than 3 tarsi combined about 1.4:1, spur shorter than first tarsal segment, with 25-27 teeth.

Abdominal tergite V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobes moderately long, pits distinctly lie near apex, in lateral view strongly produced caudad below middle, anal comb small, in caudal view with opening wider in middle.

Length of body: 2.82 mm.

Width of head including eyes: 0.80 mm.

Length of anterior wing pad: 1.18 mm.

Length of antenna: 0.42 mm.

Specimens examined: 5♂♂, 5♀♀, Paolai, Kaohsiung Hsien, 25-XII-1981, C.T. Yang.

Nymphal specimens examined: Fifth instar nymph: 3, Kuantzuling, Tainan Hsien, 26-X-1984, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record)., Guam, Marinace Is., Saipan, Belau (=Palau), Yap, Is., Truk Is., New Guinea.

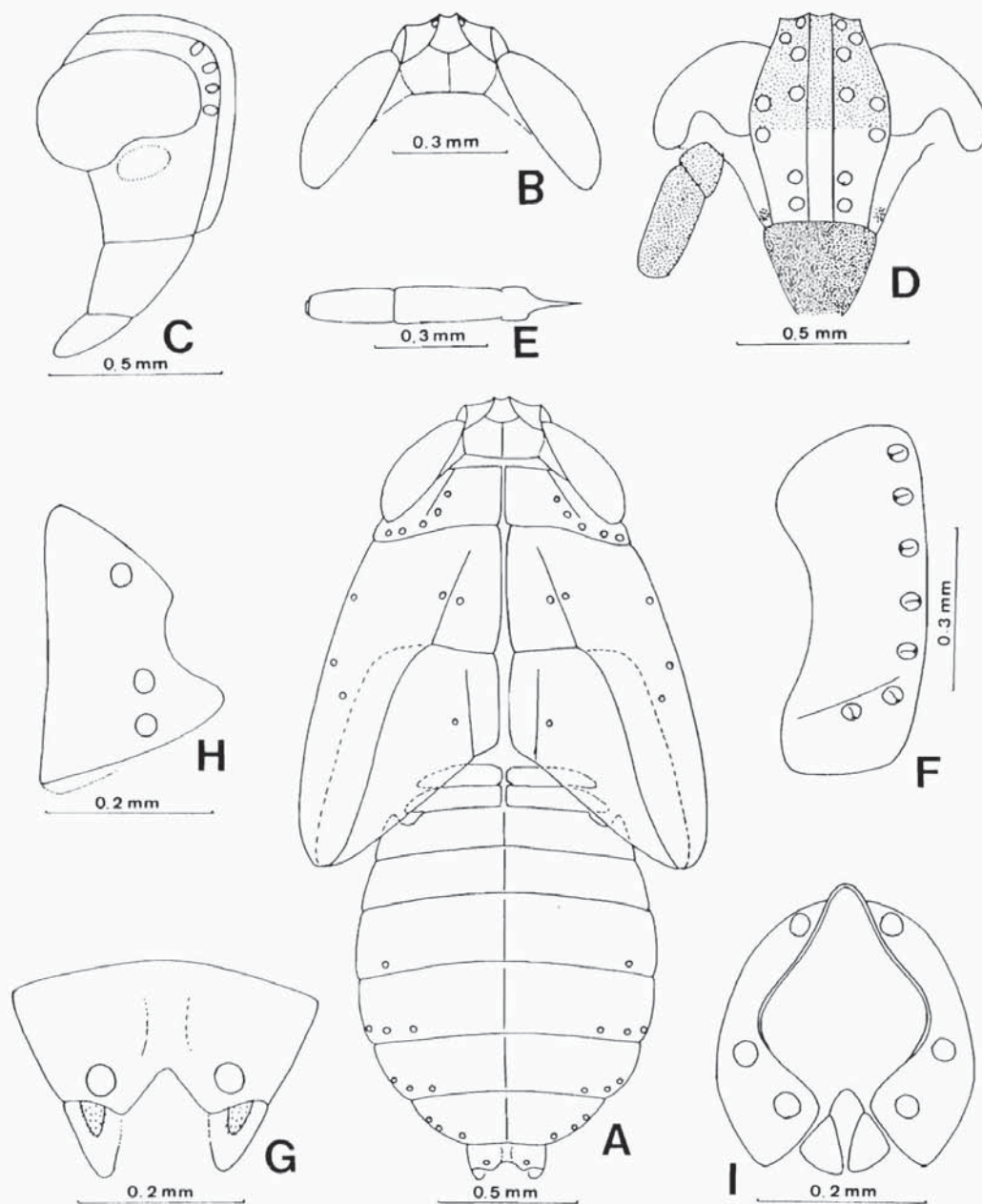


Fig. 34. Nymph of *Perkiensiella thompsoni* Muir A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.



(30) *PERKINSIELLA TAIWANA* n.sp.

Fig. 35.

General color pale yellowish brown. Lateral areas of pro- and mesonotum, frons at base and apex, and postclypeus pale brown to brown. Legs with black markings. Tegmina hyaline, black markings as figured.

Vertex wider at base than long submedially about 1.6:1, at apex narrower than at base, submedian carinae not uniting at apex, Y-shaped carinae feeble. Frons longer in middle line than wide at widest part about 1.5:1, widest at level of ocelli, lateral carinae strongly convergent below level of ocelli, median carina forked slightly below level of lower margin of eyes. Postclypeus distinctly shorter than wide at base, in profile inclined apically. Antennae with basal segment shorter than second about 1:1.4. Post-tibial spur with about 25 teeth. Tegmina longer than widest part about 2.9:1.

Anal segment of male collar-shaped, lateroventral angles each produced in a spinose process, directed ventrad. Pygofer in profile with laterodorsal angle not produced, in posterior view opening wider than long, lateral margins not well defined, with 2 medioventral processes, short. Phallus tubular, reflected cephalad at apex in lobe which truncated at apex, lower side near apex protruding a slender process, directed cephalad, slightly right, in dorsal view near middle with a rather large process at right. Suspensorium Y-shaped, arms slightly shorter than stem. Diaphragm rather narrow. Genital styles long and slender, strongly produced at inner basal portion, outer margin slightly sinuate, near outer angle with a distinct process.

## Male (macropterous)

Length of body (includ.teg.): 3.33 mm.

Length of tegmen: 2.83 mm.

## Female (macropterous)

Length of body (includ.teg.): 3.93 mm.

Length of tegmen: 3.33 mm.

Holotype: Male (dissected), Taipei, 18-VI-1960, K.S. Lin. In TARI.

Paratype: 1♀, same place and collector as for holotype, 20-VI-1960.

Host plant: Unknown.

Distribution: Taiwan.

This new species resembles *Perkinsiella graminicida* Kirkaldy but differs from latter in having anal segment with processes shorter; flagellum at apex in lobe which truncated at apex, lower side near apex protruding a slender process.

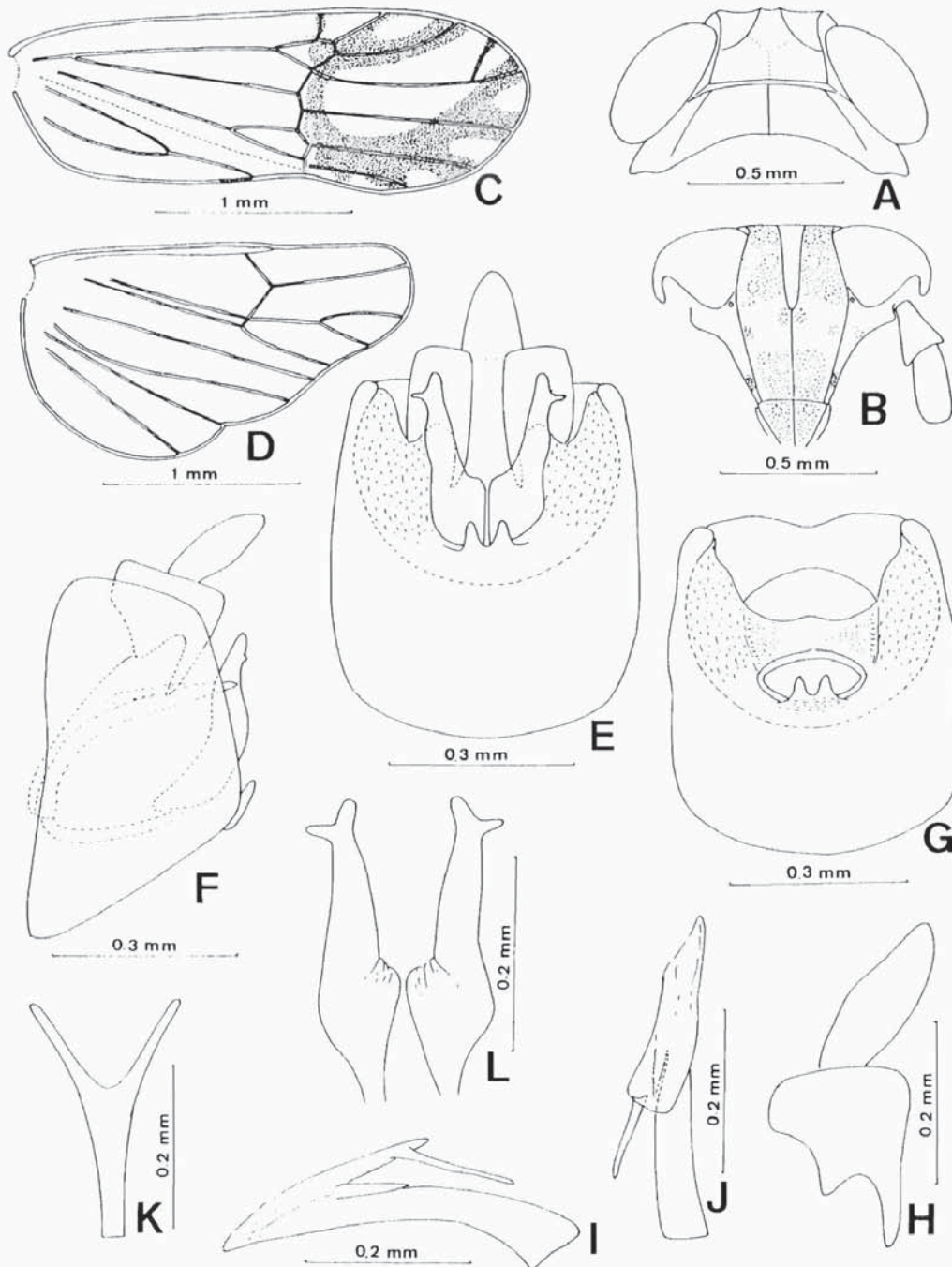


Fig. 35. *Perkinsiella taiwana* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, right side; J, the same, dorsal view; K, suspensorium; L, genital styles, caudal view.



## 15. Genus *Thymalops* Fennah

*Thymalops* Fennah, 1965, *Bull Br. Mus nat. Hist. (Ent.)*, 17:20.

The generic characters outlined by Fennah [1965] are modified as follows.

Head including eyes as wide as pronotum. Vertex as long submedially as wide at base, at apex as wide as at base, lateral margins slightly concave, apical margin transverse, submedian carinae not uniting at apex, nearly parallel, Y-shaped carinae moderately distinct, basal compartment wider at base than greatest length about 1.8:1. Frons in middle line longer than wide at widest part about 2:1, median carina forked at level of ocelli. Rostrum surpassing meso-trochanters. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:1.8. Ocelli present. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with less than 20 teeth.

Anal segment of male collar-shaped, lateroapical angles each produced in a small spinose process. Pygofer with opening longer than wide, lateral margins weakly defined, medioventral process present, in ventral view rounded apically, strongly incised evenly on both sides. Phallus tubular, compressed laterally, reflected cephalad at apex in a flagellum, with one or two teeth left. Suspensorium Y-shaped, arms about as long as stem. Diaphragm broad, membranous. Genital styles simple, divergent.

Type species: *Dicranotropis anderida* Kirkaldy  
(original designation)

### Key to the species of *Thymalops*

1. Phallus with 2 teeth at left side; anal segment of male in lateral view with prominent process . . . . . *anderida* (Kirkaldy)
- Phallus with only one tooth at left side; anal segment of male in lateral view without process . . . . . *taiwana* n.sp.

### (31) *THYMALOPS ANDERIDA* (Kirkaldy)

Fig. 36.

*Thymalops anderida* Fennah, 1965, *Bull. Br. Nat. Hist. (Ent.)* 17:20.

*Dicranotropis anderida* Kirkaldy, 1907, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 3: 133.

General color pale yellowish brown. Median line of pro- and mesonotum somewhat paler, metapleura with large black marking. Abdomen and pygofer dark brown to black. Tegmina hyaline, veins concolorous at base, black apically, in brachypterous form apical margin rounded with large black marking.

Vertex as long submedially as wide at base, lateral carinae slightly concave, submedian carinae not uniting at apex, basal compartment wider than greatest length about 1.8:1. Frons in middle line longer than wide at widest part about 2:1, widest just

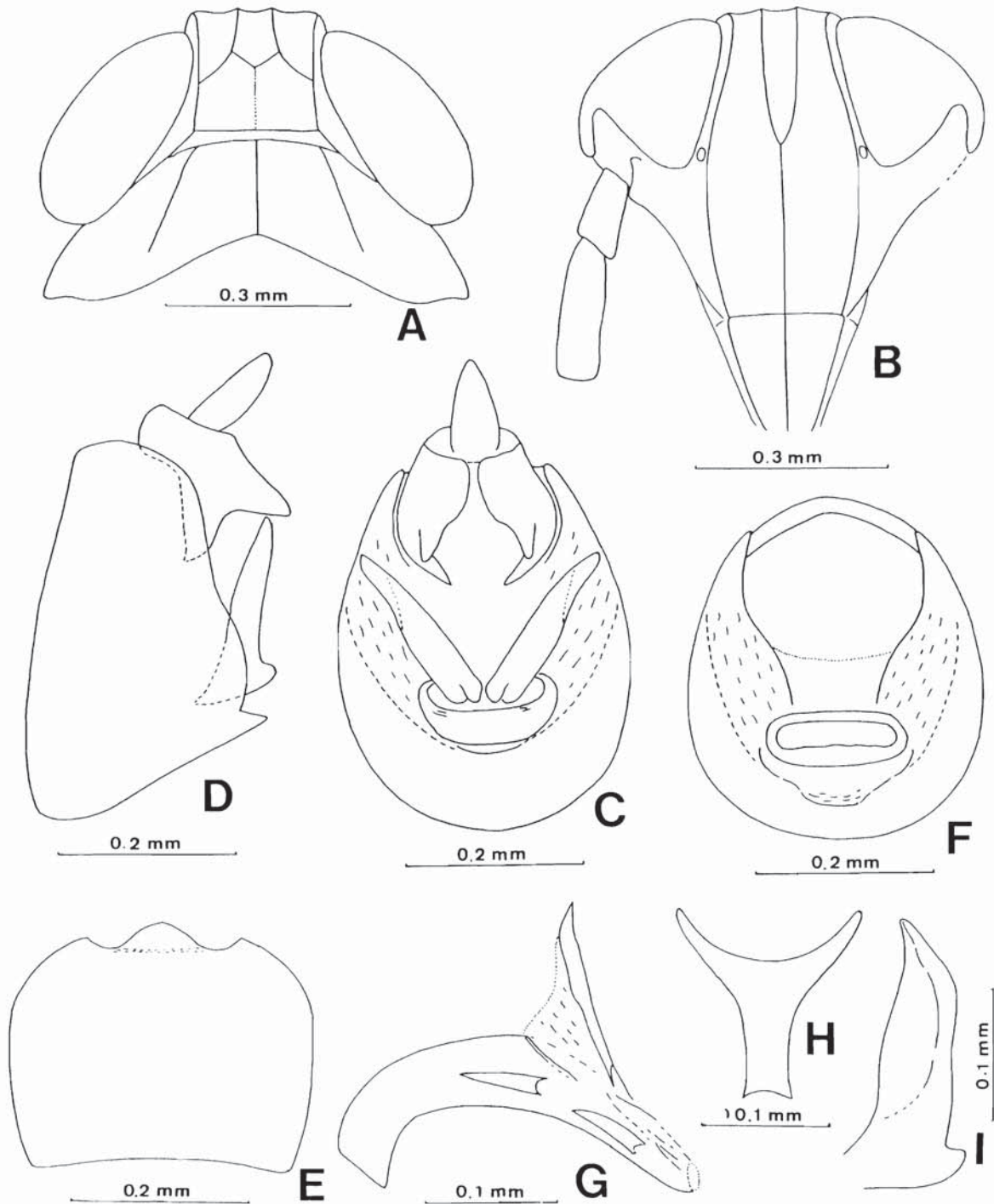


Fig. 36. *Thymalops anderida* (Kirkaldy) A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, the same, left side; E, pygofer, ventral view; F, diaphragm of pygofer; G, phallus, left side; H, suspensorium; I, genital style, left side.



below level of ocelli, lateral carinae distinctly convex, median carina forked at level of ocelli. Postclypeus at base slightly wider than frons at apex, nearly as long as wide at base. Ocelli present in macropterous, absent in brachypterous specimens. Antennae long, reaching to level of middle of postclypeus, basal segment longer than wide about 1.5:1, shorter than second about 1:2. Post-tibial spur with 15-17 teeth, with one-third setal area.

Anal segment of male short, lateroapical angles produced into stout processes, directed caudad. Pygofer in profile distinctly wider ventrally than dorsally, posterior margin produced caudad near ventral, laterodorsal angle not produced, in posterior view with opening as wide as long. Phallus large, tubular, arched upward medially, with 2 large teeth at left, one medially, another subapically, on right side with a very long irregular flagellum, connected with main body by membranous. Orifice terminal dorsad. Suspensorium with stem wider than arms. Diaphragm of pygofer membranous, not defined. Opening for the genital styles very broad and short. Genital styles divergent, moderately long, inner margin nearly straight, outer margin slightly concave in apical third, basal angles each with a prominent process.

| Male                              | (macropterous) | (brachypterous) |
|-----------------------------------|----------------|-----------------|
| Length of body<br>(includ. teg.): | 2.97-3.00 mm.  | 1.76-1.83 mm.   |
| Length of tegmen:                 | 2.50-2.53 mm.  | 1.06-1.16 mm.   |
| Female                            |                |                 |
| Length of body:                   |                | 2.33-2.50 mm.   |
| Length of tegmen:                 |                | 1.40-1.50 mm.   |

Specimens examined: 3♂♂ (macropterous), 2♀♀ (brachypterous) 17-IX-1984, C.T. Yang; 18♂♂ (macropterous), 3♀♀ (brachypterous) 15-XI-1985, Taichung, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan, S. China, Philippines, Java, Ceram.

(32) *THYMALOPS TAIWANA* n.sp.

Fig. 37.

General color yellowish brown to brown. Metapleura each with a rounded dark brown marking. Abdomen and pygofer dark brown to black. Tegmina hyaline, yellowish brown with apical veins somewhat dark, tegmina of brachypterous with apical margin rounded, black at apex.

Vertex as long submedially as wide at base, lateral carinae slightly convex, apical margin transverse, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 1.7:1. Frons longer in middle line than wide about 2:1, widest at level of ocelli, lateral carinae slightly convex, concave between eyes, median carina forked at level of ocelli. Postclypeus slightly wider at base than frons at apex. Rostrum reaching to meta-coxae. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.2:1, shorter than second about 1:2. Post-tibial spur with about 14 teeth, each tooth with 1-2 setae.

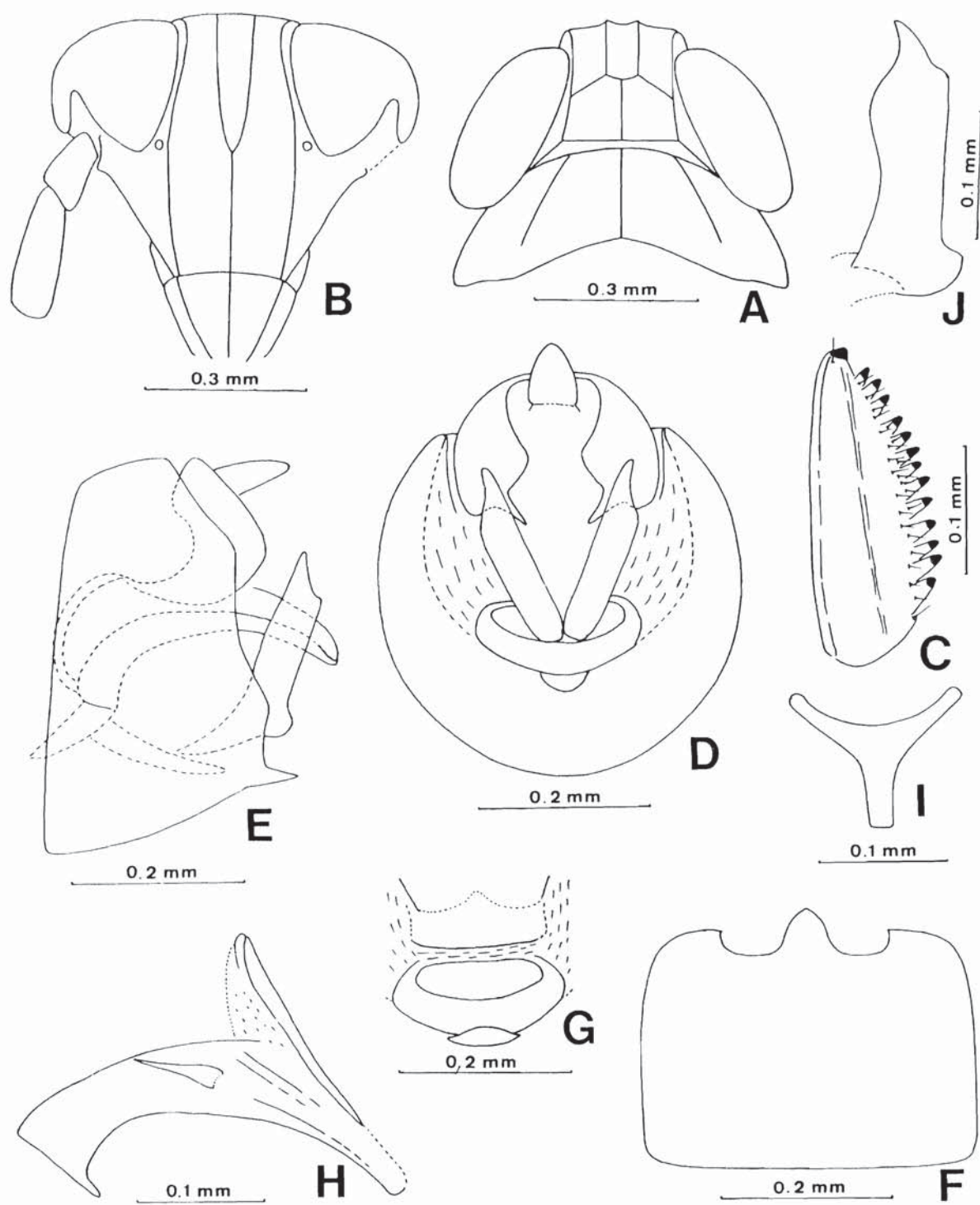


Fig. 37. *Thymalops taiwana* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, post-tibial spur; D, male genitalia, posterior view; E, the same, left side; F, pygofer, ventral view; G, diaphragm of pygofer; H, phallus, left side; I, suspensorium; J, genital style, left side.



Anal segment of male relatively long, lateroapical angles widely separated, short and stout, spinose process produced from middle, directed mesad, invisible in lateral view. Pygofer in profile distinctly longer ventrally than dorsally, dorsal margin produced medially, in posterior view with opening wider than long, lateral margins gently convex, not well defined. Phallus tubular, large, strongly arched dorsad medially, left side with a large tooth at middle, strongly reflected subapically, forming a winged lobe, margin sclerotized, lower portion membranous, at right side with another filament branch. Suspensorium with stem as wide as arms. Diaphragm narrow, dorsal two-thirds membranous, dorsal margin not defined, basal third sclerotized. Opening for the genital styles with ventral ridge very broad, slightly concave. Genital styles slender, divergent, outer angle concave, obtusely pointed apically, in profile strongly produced at basal angle, inner margin straight, outer margin strongly sinuate, apex pointed medially, directed cephalolaterad.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.): | 2.93-3.00 mm.  | 1.80-1.93 mm.   |
| Length of tegmen:                | 2.43-3.66 mm.  | 1.03-1.33 mm.   |
| Female                           |                |                 |
| Length of body<br>(includ.teg.): | 3.40-3.66 mm.  | 2.33-2.60 mm.   |
| Length of tegmen:                | 2.83-3.03 mm.  | 1.33-1.46 mm.   |

Holotype: Male, Jihyuetan, Nantou Hsien, 24-III-1985, C.T. Yang. In NCHU.

Paratypes: 16♂♂, 17♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from *T. anderida* in having phallus with only one tooth at left side; moreover by the shaped of the processes of the male anal segment; suspensorium with stem nearly as wide as arms; and the post-tibial spur with fewer setae and teeth.

## 16. Genus *Nycheuma* Fennah

*Nycheuma* Fennah, 1964, *Trans. R. Ent. Soc. Lond.*, **116**(7):145.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, **27**:81.

The generic characters outlined by Fennah [1964] are modified and supplemented as follows.

Head as wide as pronotum or slightly wider. Vertex shorter submedially than wide at base about 1:1.2, moderately rounding into frons, about as wide at apex as at base, apical margin transverse with submedian carinae moderately prominent, Y-shaped carina feeble, submedian carinae not uniting at apex. Frons in middle line longer than wide at widest part about 2:1, widest at level of ocelli, lateral margins straight and converging distad beyond this level, median carina forked at base, Rostrum with apical segment about as long as subapical. Antennae cylindrical, reaching slightly beyond frontoclypeal suture, basal segment longer than wide about 2:1, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male short, lateroapical angles widely separated, each produced ventrad in a spinose process. Pygofer short dorsally, long and strongly convex ventrally, posterior opening about as long as wide, laterodorsal angle not produced, lateral margins rather feeble, medioventral process present, small, sometimes complex. Phallus rather long, laterally compressed, reflected cephalad at apex in a flagellum. Suspensorium Y-shaped. Diaphragm deeply impressed with dorsal margin membranous. Genital styles simple, rather narrow, tapering distally, rectangulately or subacutely bent dorsad, if produced caudad at point of flexure, then lobe narrow and very small.

Type species: *Dicranotropis capensis* Muir  
(original designation)

### Key to the species of *Nycheuma*

1. Tegmina of macropterous male without marking apically; frons longer in middle line than wide at widest part about 1.7:1; phallus with process on right side near apex . . . . . *cognatum* (Muir)
- Tegmina of macropterous male with black marking apically; frons longer in middle line than wide at widest part about 2.3:1; phallus with process on right side near middle . . . . . *coctum* n.sp.



(33) *NYCHEUMA COGNATUM* (Muir)

Fig. 38.

*Nycheuma cognatum* Fennah, 1964, *Trans. R. Ent. Soc. Lond.*, 117(4):145.—: Fennah, 1969, *Pacif. Ins. Monogr.*, 21:37.—: Fennah, 1971, *Ins. of Micronesia*, 6(9):571.—: Fennah, 1973-75, *Ent. scand. Suppl.*, 4:89.—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:81.*Dicranotropis cognata* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:317.—: Muir, 1921, *Proc. Hawaiian Ent. Soc.*, 4:575.—: Fennah, 1956, *Ins. of Micronesia*, 6(3):111.

General color uniformly brown. Tegmina subhyaline, brown, in brachypterous male with a large black marking at apex.

Vertex shorter submedially than wide at base about 1:1.1, Y-shaped carina moderately distinct, basal compartment of vertex wider at base than greatest length about 1.8:1. Frons in middle line longer than wide at widest part about 1.7:1, widest at level of ocelli. Postclypeus wider at base than frons at apex, slightly wider at base than length in middle line. Rostrum reaching to meta-trochanters, apical segment distinctly shorter than subapical. Antennae surpassing level of middle of postclypeus, basal segment longer than wide about 1.7:1, shorter than second about 1:1.8. Post-tibial spur with about 27 teeth.

Anal segment of male moderately long, collar-shaped, lateroapical angles very widely separated, each produced caudad and slightly mesad in a stout spinose process. Pygofer in profile wider ventrally than dorsally, posterior margin strongly produced caudad medially, in posterior view with opening small, distinctly wider than long, lateral margin weakly defined, ventral margin shallowly concave, with 3 distinct medioventral processes, middle the longest. Phallus long, tubular, slightly arched upward medially, reflected cephalad at apex in a flagellum on right side, top of flagellum slightly turned mesad then laterad, pointed at apex, with a large, stout process at middle left and a smaller one near apex right. Orifice terminal dorsad. Suspensorium Y-shaped, arms longer than stem. Diaphragm rather broad, membranous, triangularly incised dorsally. Opening for genital styles elongate oval. Genital styles slender, widely divergent, narrowing to apex, inner margin nearly straight, outer margin moderately produced laterad medially.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.): | 3.26 mm.       | 2.56 mm.        |
| Length of tegmen:                | 2.76 mm.       | 1.30 mm.        |

Specimens examined: 2♂♂, Bat cave, Taichung Hsien, 9-XI-1983, C.T. Yang.  
Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China, Philippines, West Caroline Is., Bonin Is., Sri Lanka, New Caledonia, Fiji, Australia.

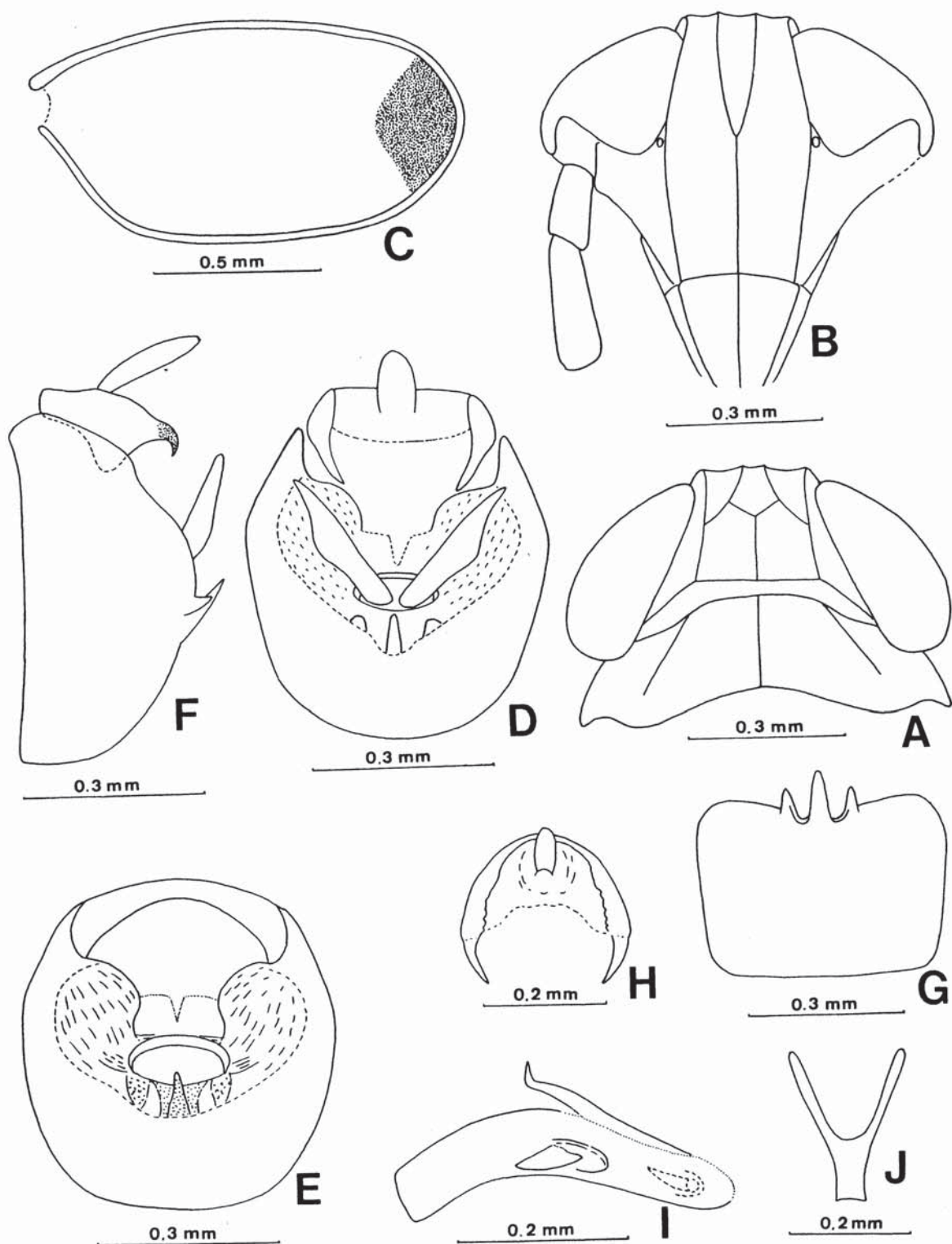


Fig. 38. *Nycheuma cognatum* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, diaphragm of pygofer; F, male genitalia, left side; G, pygofer, ventral view; H, anal segment of male, dorsal view; I, phallus, left side; J, suspensorium.



(34) *NYCHEUMA COCTUM* n.sp.

## Fig. 39.

General color pale yellowish brown. Apex of first antennal segment and base of second, abdomen and pygofer brown, metapleura with large rounded brown spot. Tegmina hyaline, with brown marking on hind margin near end of clavus, anterior area of Cu, on ends of Sc<sub>1</sub>, Sc<sub>2</sub>, wider on R<sub>1</sub>, narrower on R<sub>5</sub>, oblique area along postero-apical area, reaching to end of M<sub>1</sub> except for 3 hyaline areas.

Vertex wider at base than long submedially about 1.1:1, at apex as wide as at base, basal compartment at base wider than greatest length about 1.8:1. Frons in middle line longer than wide at widest part about 2.3:1, widest about level of ocelli, lateral carinae nearly straight below ocelli, median carina forked at level of ocelli. Postclypeus as wide at base as frons at apex, slightly longer than wide at base. Rostrum reaching meta-coxae, apical segment shorter than subapical. Post-tibial spur with about 26 teeth.

Anal segment of male short, collar-shaped, lateroapical angles each produced into a long spinose process, widely separated each other, directed ventrad. Pygofer in profile distinctly longer ventrally than dorsally, in posterior view with opening about as wide as long, lateral margins defined, ventral margin shallowly concave with 3 medioventral processes, in ventral view pointed at same level. Phallus large, tubular, apex reflected cephalad at right, turned dorsad near apex, with 2 long, stout processes directed basad, one on apical fourth left, another near apical third right. Suspensorium Y-shaped, arms shorter than stem. Diaphragm not distinctly membranous, dorsal margin slightly concave. Opening for genital styles small, dorsal and ventral margins evenly convex. Genital styles moderately long, divergent, apical half slightly twisted, turned caudad apically, inner margin slightly sinuate, outer margin shallowly concave at apical half, outer angle pointed.

The name *coctum* is Latin adjective, means mature.

Male (macropterous)

Length of body (includ.teg.): 3.40 mm.

Length of tegmen: 2.90 mm.

Holotype: Male, Pingtung, Pingtung Hsien, 10-IX-1984, C.T. Yang. In NCHU.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from *N. cognatum* in having the different position of process of phallus; the narrower frons; the shape of processes on anal segment of male.

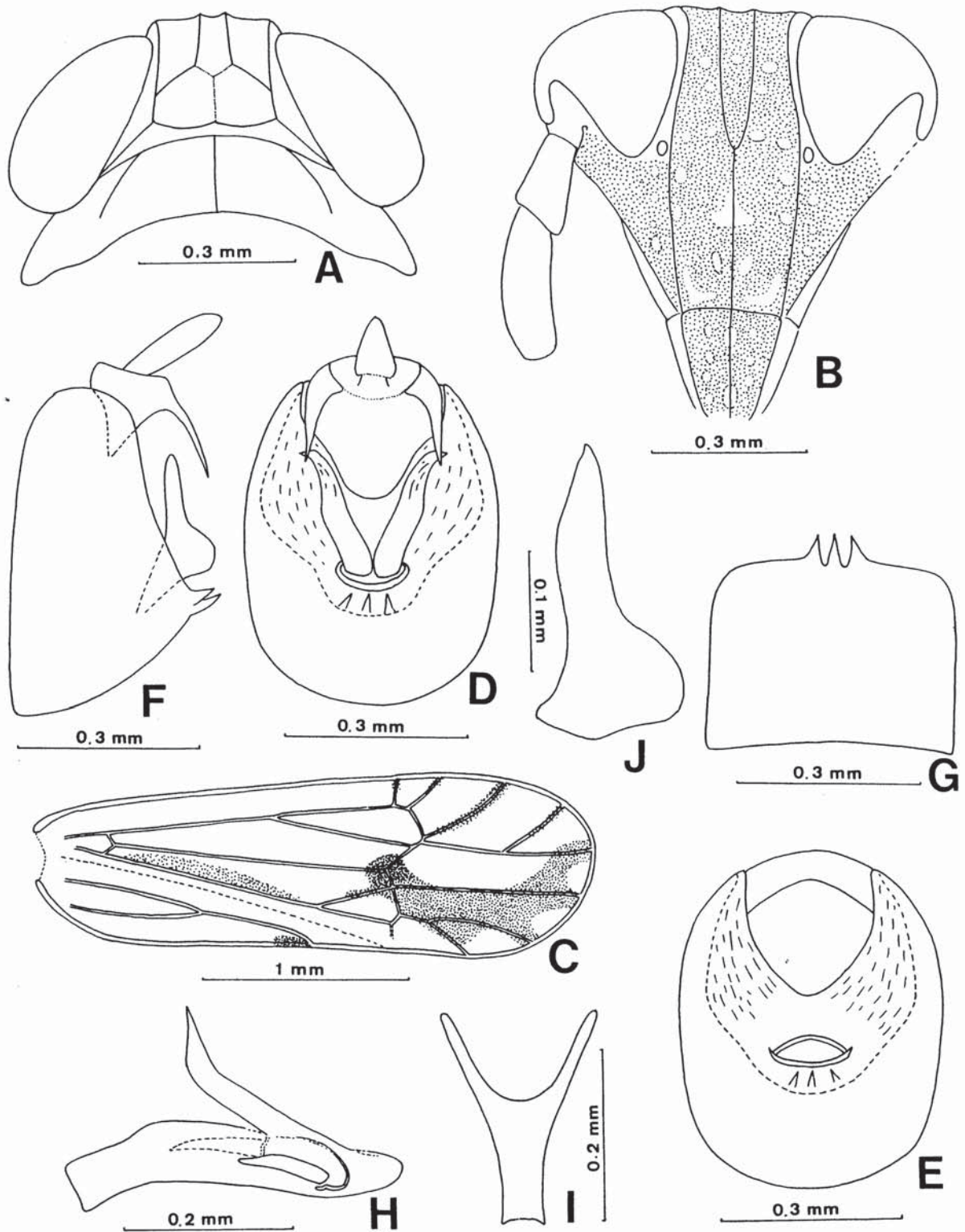


Fig. 39. *Nycheuma coctum* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, diaphragm of pygofer; F, male genitalia, left side; G, pygofer, ventral view; H, phallus, left side; I, suspensorium; J, genital style, left side.



## 17. Genus *Eunycheuma* n. gen.

Head including eyes narrower than pronotum. Vertex wider at hind margin than long submedially, apical margin transverse, lateral carinae straight, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment wider at hind margin than greatest length. Frons longer in middle line than wide at widest part about 2.3:1, median carina forked above level of ocelli. Postclypeus wider at base than frons at apex. Rostrum reaching to meta-coxae. Antennae cylindrical, nearly reaching apex of postclypeus, basal segment longer than wide, shorter than second about 1:1.5. Ocelli present. Pronotum with lateral carinae strongly incurved posteriorly, attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 30 teeth.

Anal segment of male stout, ring-like, lateroapical angles each produced in a small process. Pygofer in profile longer ventrally than dorsally, laterodorsal angle slightly produced, hind margin sinuate, medioventral process in profile forming a relatively long, continuous ridge from end of genital styles, in posterior view pointed portion crescent-shaped, pygofer in posterior view with opening very shallow, about as wide as long. Phallus tubular, armed with strong teeth. Suspensorium Y-shaped. Diaphragm narrow. Genital styles small, situated far away from ventral margin of opening.

Type species: *Eunycheuma curtum* n.sp.  
(here designated)

This genus is distinguishable by the pronotum with lateral carinae strongly incurved posteriorly, attaining hind margin; male anal segment with processes rather small; the medioventral process in profile forming a relatively long, continuous ridge from end of the genital styles.

### (35) *EUNYCHEUMA CURTUM* n.sp.

Fig. 40.

General color pale yellowish brown. Abdomen brown, abdominal tergites IV-V each side with a black marking, widened at tergite V, tergites VI-VIII each side with a narrow longitudinal yellowish white stripe. Pygofer yellowish ventrally. Tegmina hyaline, before end of claval stem somewhat black, truncate at apex.

Vertex wider at base than long submedially about 1.3:1, basal compartment wider at base than greatest length about 1.75:1. Eyes relatively large. Frons longer in middle line than wide at widest part about 2.3:1, widest at level of ocelli, lateral carinae concave between eyes, nearly straight below ocelli, median carina forked at basal third. Antennae stout and long, basal segment longer than wide about 1.5:1, shorter than second about 1:1.65. Post-tibial spur with 27,33 teeth.

Anal segment of male in posterior view area between processes distinctly arched upward medially, processes separated from each other, arising from lower margin, very small. Opening for pygofer with lateral margins weakly defined. Phallus moderately large, tubular, slightly arched upward medially, acutely rounded at apex, 3 teeth nearly situated at same line. Suspensorium long, stem broad at base tapering to apex,

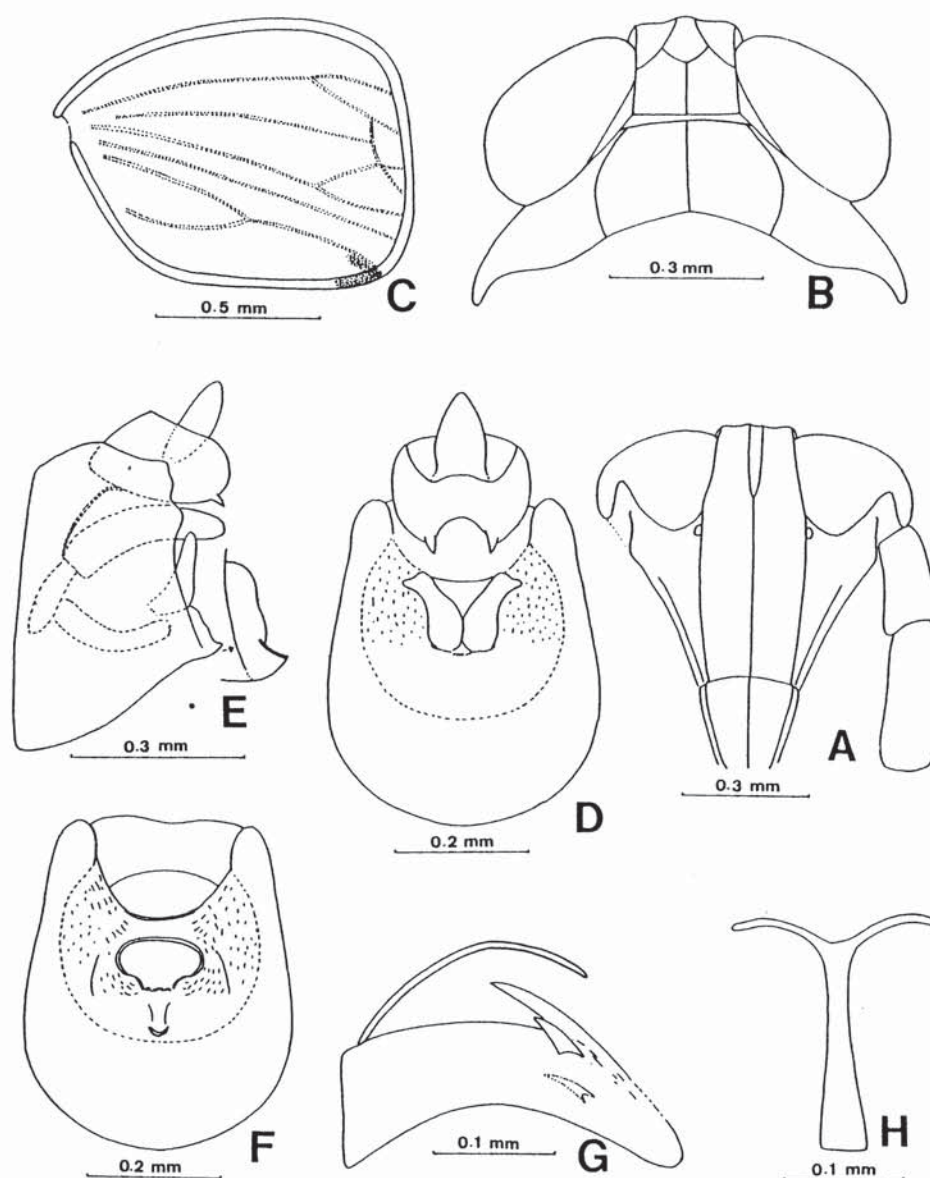


Fig. 40. *Eunycheuma curtum* n.sp. A, head and pronotum; dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, phallus, left side; H, suspensorium.

arms slender. Diaphragm with dorsal margin evenly concave. Opening for genital styles with ventral margin weakly defined medially, laterally with small lobe-like structure. Genital styles divergent at apex, outer angle with a small process.

The name *curtum* is Latin adjective, means short.

Male (brachypterous)

Length of body: 2.40 mm.

Length of tegmen: 1.03 mm.

Holotype: Male, Orchid Is., Taitung Hsien, 8-VII-1985, S.C. Tsaur. In NCHU.

Host plant: Unknown.

Distribution: Taiwan.



## 18. Genus *Hagamiodes* Fennah

*Hagamiodes* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:90.

The generic characters outlined by Fennah [1973-75] are modified as follows.

Head including eyes narrower than pronotum. Vertex longer submedially than wide at base about 1.2:1, lateral carinae slightly convergent distally, apical margin transverse, submedian carinae not uniting at apex. Frons longer in middle line than wide at widest part about 2.3:1, widest a little below level of ocelli, median carina forked at level of lower margin of eyes. Postclypeus at base as wide as frons at apex, in profile continuing line of frons. Rostrum reaching to meta-coxae. Antennae cylindrical, basal segment longer than wide about 2:1, shorter than second about 1:2. Ocelli present. Pronotum with lateral carinae not attaining hind margin.

Anal segment of male short. Pygofer relatively long dorsally and ventrally, posterior opening wider than long, medioventral process absent. Phallus tubular, cylindrical, decurved distad, without a flagellum. Orifice terminal. Diaphragm moderately deep, with dorsal margin concave. Genital styles relatively large.

Typ species: *Dicranotropis fuscicaudata* Muir  
(original designation)

### (36) *HAGAMIODES LIMOSUS* n.sp.

Fig. 41.

General color uniformly yellowish brown. Abdomen and pygofer dark brown. Tegmina hyaline, pale yellowish brown.

Vertex as long submedially as wide at base, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 1.5:1. Frons longer in middle line than wide at widest part about 1.8:1, widest at level of lower margin of eyes, median carina forked at level of lower margin of eyes. Postclypeus wider at base than frons at apex, wider at base than long in middle line. Antennae surpassing fronto-clypeal suture, basal segment slightly longer than wide, shorter than second about 1:2.2. Spinal formula of hind leg 5-6-4 or 5-7-4. Post-tibial spur with about 15 teeth. Tegmina longer than widest part about 3.5:1.

Anal segment of male collar-shaped, each laterobasal angle produced into a strong spinose process. Pygofer in profile relatively long, longer ventrally than dorsally, in posterior view with opening wider than long. Phallus tubular, slightly arched upward medially, with 2 large teeth on dorsal aspect subapically. Suspensorium with long arms, U-shaped, sclerotized, pigmented, stem short and broad, membraneous and transparent. Diaphragm relatively wide, dorsal margin produced rod-like medially. Genital styles stout, in profile caudal margin strongly concave at apical third, apex quadrate, in caudal view dilated subapically, then narrowed at apex, apical margin inclined, inner angle more higher, median line ridged.

The name *limosus* is Latin adjective, means muddy.

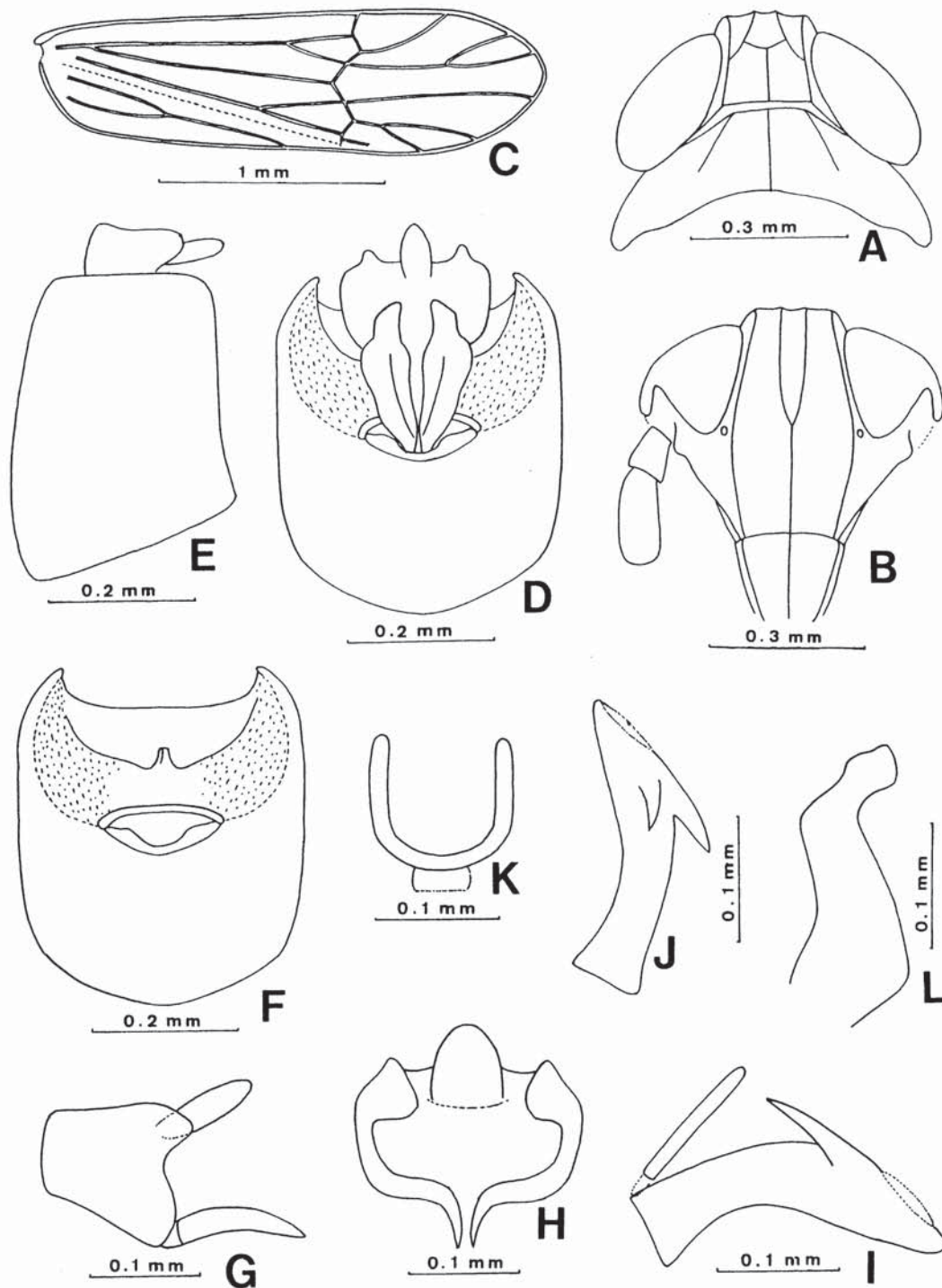


Fig. 41. *Hagamiodes limosus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, lateral view; F, diaphragm of pygofer; G, anal segment of male, left side; H, the same, caudal view; I, phallus, left side; J, the same, dorsal view; K, suspensorium; L, genital style, lateral view.



| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.): | 2.70 mm.       | 1.83-1.93 mm.   |
| Length of tegmen:                | 2.30 mm.       | 1.03-1.10 mm.   |
| Female (macropterous)            |                |                 |
| Length of body (includ.teg.):    | 3.03-3.13 mm.  |                 |
| Length of tegmen:                | 2.56-2.66 mm.  |                 |

Holotype: Male, Kending, Pingtung Hsien, 28-VI-1986, S.C. Tsaur. In NCHU.

Paratypes: 6♂♂, 3♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from the type species, *H. fuscicaudata* (Muir) of philippines and *H. meator* Fennah of Sri Lanka by the genital styles in lateral view with apical portion quadrate (In *fuscicaudata* and *meator*, pointed); the aedeagus with 2 large teeth on dorsal aspect subapically (with rather small teeth in *fuscicaudata* and *meator*).

### 19. Genus *Neoconon* n. gen.

Head including eyes narrower than pronotum. Vertex longer submedially than wide at base about 1.2:1, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment wider at base than greatest length. Frons longer in middle line than widest part about 2.4:1, widest at level of lower margin of eyes, median carina forked above level of lower margin of eyes. Postclypeus wider at base than frons at apex, longer in middle line than wide at base. Rostrum reaching to meta-coxae. Ocelli absent. Antennae cylindrical, surpassing middle of postclypeus, basal segment longer than wide about 2.5:1, shorter than second about 1:1.8. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 14 teeth, each tooth with 1-2 setae.

Anal segment of male collar-shaped, lateroapical angles separated, each produced into a broad, lobe-like process. Pygofer in profile wider ventrally than dorsally, latero-dorsal angle not produced, in posterior view with opening wider than long, medio-ventral process lobe-like, broad at base, emarginate at apex. Phallus tubular, exceptionally long and slender, without flagellum, with several teeth subapically. Suspensorium long, Y-shaped. Genital styles moderately long, somewhat sinuate.

Type species: *Neoconon incersa* n.sp.  
(here designated)

This new genus resembles *Euconon* Fennah in the shape of the vertex, the length of rostrum, the phallus, and the medioventral process. It can be distinguished from this and other genera by lobe-like processes of anal segment of the male; ocelli absent; first antennal segment longer than wide. From *Thriambus* Fennah it differs by the form of the phallus.

(37) *NEOCONON INCENSA* n.sp.

## Fig. 42.

Vertex, frons, antennae and pygofer brown. Pro- and mesothorax yellow. Genae, postclypeus, fore and mid-coxae, metapleura and abdomen dark brown, remainder of legs yellowish white. Tegmina hyaline, with base and apex black.

Vertex longer submedially than wide at base about 1.2:1, apical margin transverse, lateral carinae slightly concave, basal compartment wider at base than greatest length about 1.4:1. Frons longer in middle line than wide at widest part about 2.4:1, widest at level of lower margin of eyes, lateral carinae slightly convex medially, median carina forked above level of lower margin of eyes. Frontoclypeal suture nearly straight. Postclypeus longer in middle line than wide at base about 1.2:1. Antennae long and slender, basal segment longer than wide about 2.5:1, shorter than second about 1:1.85. Post-tibial spur with about 14 teeth. Wings present.

Anal segment of male with lateroapical angles each produced into a broad, lobe-like process. Pygofer in profile wider ventrally than dorsally, laterodorsal angle not produced, in posterior view with opening wider than long, lateral margins not well defined, medioventral process single, broad at base, attenuating to apex, distinctly emarginate at apex. Phallus very long, tubular, apex small, rounded, left side with a long tooth subapically, right side with 2. Suspensorium slightly narrowed below arms. Diaphragm weakly sclerotized, moderately long, dorsal margin slightly incised medially. Genital styles slightly sinuate, outer angle slightly pointed, another long process directed caudomesad.

The name *incensa* is Latin adjective, means unrecorded.

## Male (coelopterous)

Length of body: 2.00-2.26 mm.

Length of tegmen: 1.33 mm.

## Female (coelopterous)

Length of body: 2.50-2.56 mm.

Length of tegmen: 1.66-1.73 mm.

**Fifth instar nymph (Fig. 43)**

General color pale yellowish scattered with pale brown markings.

Head between eyes longer in middle line than wide at narrowest part about 1.3:1, strongly protruding beyond level of eyes, anterior margin between submedian carinae concave, eyes oblique, length of eye longer than length between level of eyes and lateral point of frons about 4:1, than mid-point of anterior margin about 2.8:1, width of head including eyes wider than width of basal compartment at hind margin about 3.4:1, submedian carinae attaining hind margin of vertex laterally, basal compartment at hind margin wider than greatest length about 1.5:1, hind margin distinctly curved downward. Frons longer in middle line than widest part about 1.3:1, widest at level of lower margin of eyes, lateral carinae convex, with 2 median carinae, separated, parallel.



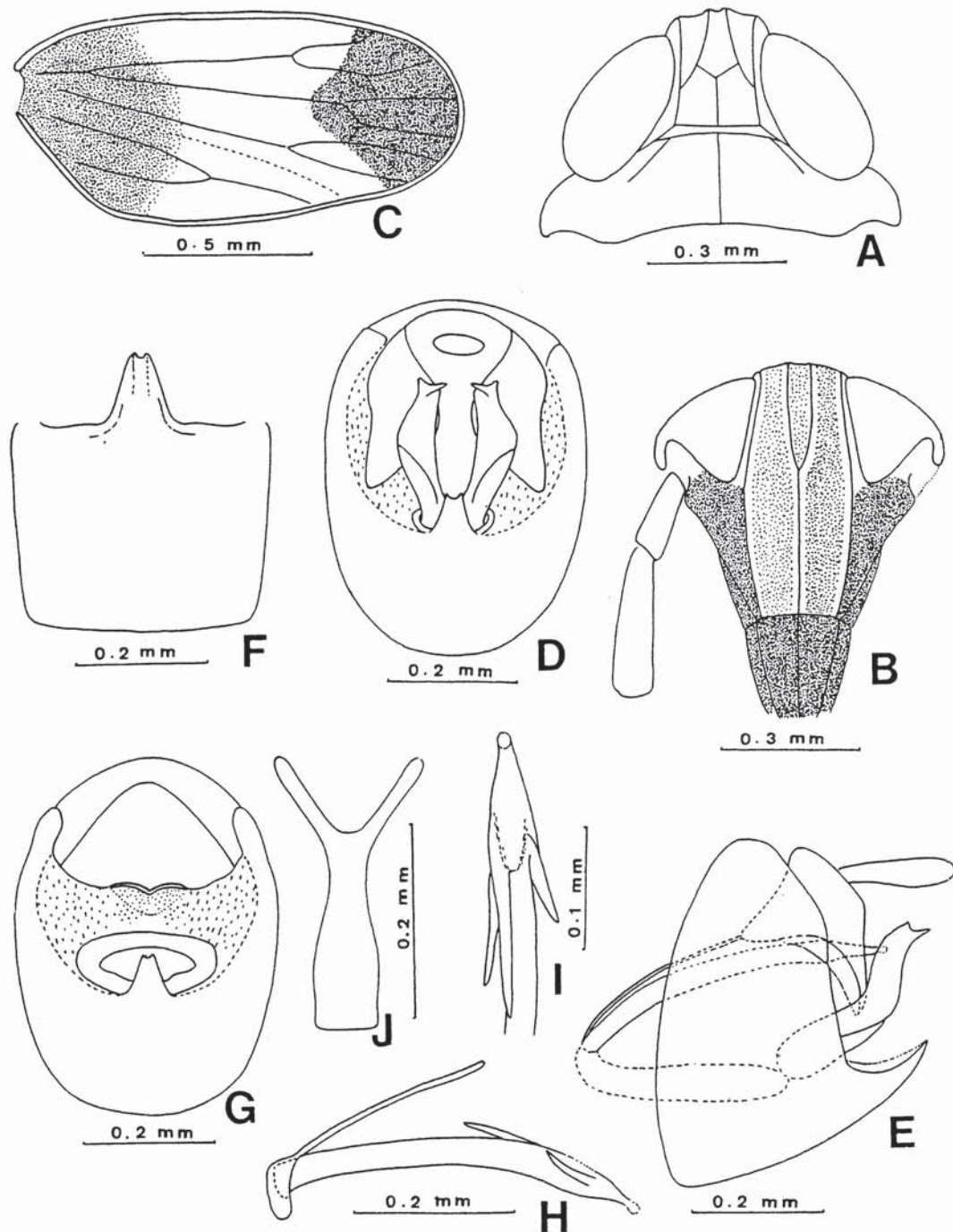


Fig. 42. *Neoconon incensa* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus, C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, pygofer, left side; G, diaphragm of pygofer; H, phallus, left side; I, apex of phallus, dorsal view; J, suspensorium.

Interfrons narrower than laterofrons. Number and arrangement of pits typical, each side with 3 extra pits, lower pit lies near frontoclypeal suture, distance about 2 diameters of pit, distance between dorsal level of lower pits and ventral level of median pits shorter than former to frontoclypeal suture about 1:3.6, lower of upper pits slightly higher than higher of median pits. Between eye and lateral carina with 4 pits, lower one lies below median point of eye. Frontoclypeal suture slightly arched. Antennae moderately long, basal segment as wide as long, shorter than second about 1:2.6. Rostrum short, reaching to meso-trochanters, relative length of each segment about 0.9:1.2:1, third segment longer than wide about 2.7:1.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, distance between  $W_1$  to  $W_2$  longer than  $W_2$  to  $W_3$  about 2.1:1, anterior wing pad protruding not over hind one, latter reaching to anterior margin of tergite III, Spinal formula of hind leg 5-7-4, meta-tibia longer than 3 tarsi combined about 1.3:1, first tarsal segment longer than 2 latter combined about 1.2:1, spur shorter than first tarsal segment, with about 12 teeth.

Abdominal tergite V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobes not cylindrical, pits lie near apex, in lateral view with caudal margin obliquely truncate, anal combs normal, in caudal view with opening wider near middle.

Length of body: 2.23 mm.

Width of head including eyes: 0.63 mm.

Length of anterior wing pad: 0.62 mm.

Length of antenna: 0.30 mm.

Holotype: Male, Paolai, Kaohsiung Hsien, 30-III-1987, C.T. Yang. In NCHU.

Paratypes: 4♂♂, 6♀♀, same data as for holotype: 1♂, Chuhkou, Chiayi Hsien, 31-VII-1986, C.T. Yang; 1♂, 2♀♀, Bat cave, Taichung Hsien, 8-VII-1987, C.T. Yang

Nymphal specimen examined: Fifth instar nymph: 1, same data as for holotype

Host plant: Unknown.

Distribution: Taiwan.



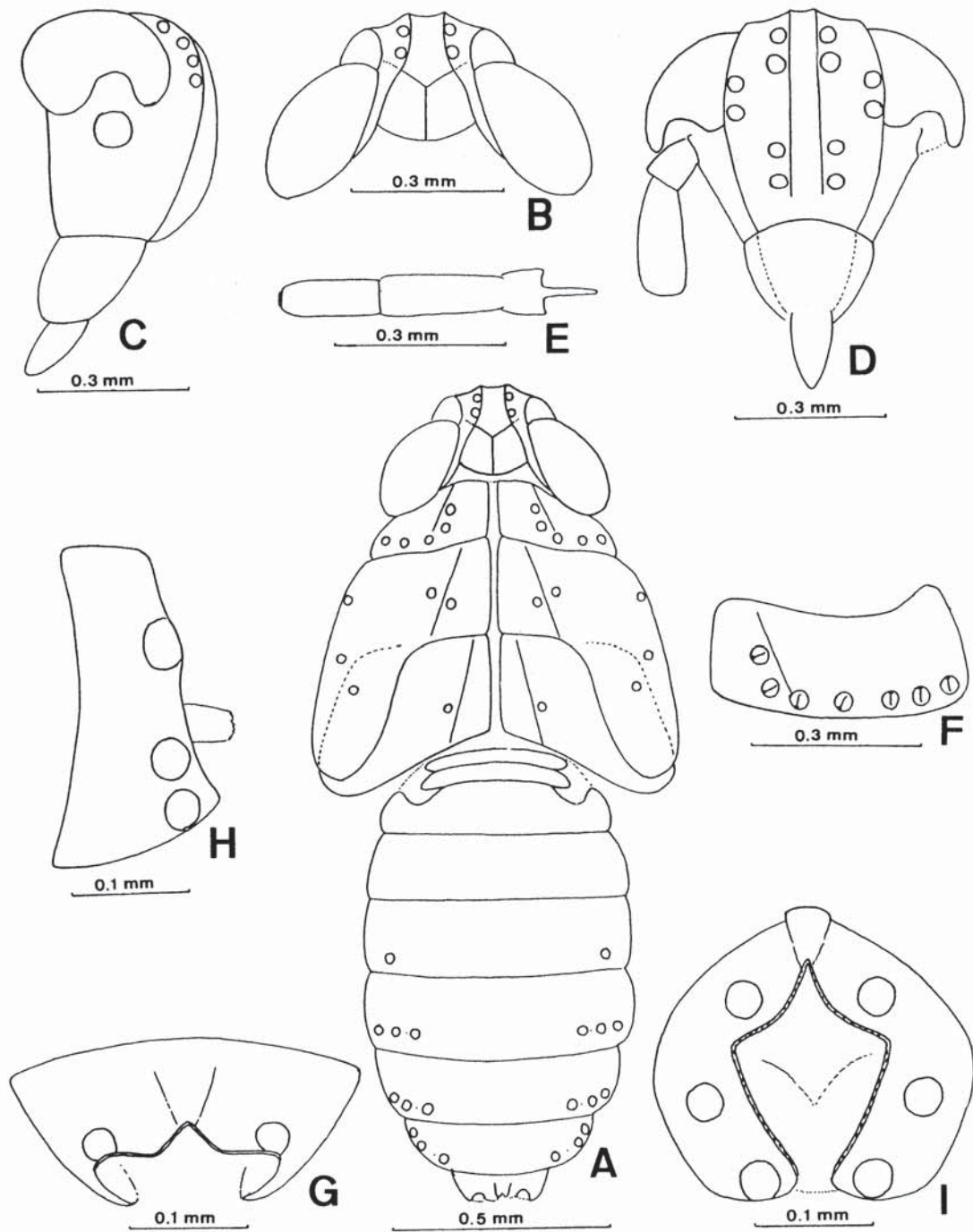


Fig. 43. Nymph of *Neoconon incensa* n.sp. A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.

## 20. Genus *Paraconon* n. gen.

Head including eyes as wide as pronotum. Vertex wider at base than long submedially, submedian carinae not uniting at apex, Y-shaped carina present, basal compartment wider at base than greatest length about 2:1. Frons longer in middle line than wide at widest part about 2.2:1, widest at level of ocelli, lateral carinae concave between eyes, median carina forked at level of ocelli. Postclypeus wider at base than frons at apex. Rostrum reaching beyond meso-trochanters. Ocelli present. Antennae cylindrical, reaching over middle of postclypeus, basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 25 teeth.

Anal segment of male ring-like, lateroapical angles each produced into spinose process. Pygofer in profile with dorsal margin as long as ventral, in posterior view opening wider than long, medioventral process present, stout. Phallus tubular, stout, armed with tooth. Suspensorium Y-shaped. Diaphragm narrow. Genital styles rather short.

Type species: *Paraconon membranacea* n.sp.  
(here designated)

This genus is characterized by the head including the eyes as wide as the pronotum, the shape of the medioventral process of male pygofer and the shape of the aedeagus.

### (38) *PARACONON MEMBRANACEA* n.sp.

Fig. 44.

General color pale yellowish brown. Vertex, pro-, mesonotum and base of frons pale brown, apical two-thirds of frons dark brown scattered with yellowish spots. Postclypeus brown, darker apically. Legs pale yellowish brown to brown, fore and mid-tibiae with black rings. Antennae with apices of first segment and base of second black. Tegmina hyaline, grayish white, granulose black, ends of apical veins black. Abdomen black with each posterior margin yellowish brown.

Vertex wider at base than long submedially about 1.3:1, at apex narrower than at base, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 1.9:1. Frons longer in middle line than wide at widest part about 2.2:1, widest at level of ocelli, lateral carinae strongly concave at base, straight below ocelli. Postclypeus wider at base than frons at apex. Antennae reaching beyond middle of postclypeus, basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with 24,27 teeth. Tegmina longer than widest part about 3:1.

Anal segment of male small, lateroapical angles each produced in small spinose process. Pygofer in profile with dorsal margin as long as ventral, laterodorsal angle roundly produced and reflected, medioventral process long and pointed, in posterior view with opening wider than long, lateral margins strongly convex, in ventral view with medioventral process triangular, base as wide as lateral margin, apex distinctly bifurcated, both sides of medioventral process strongly emarginated. Phallus stout, tubular,



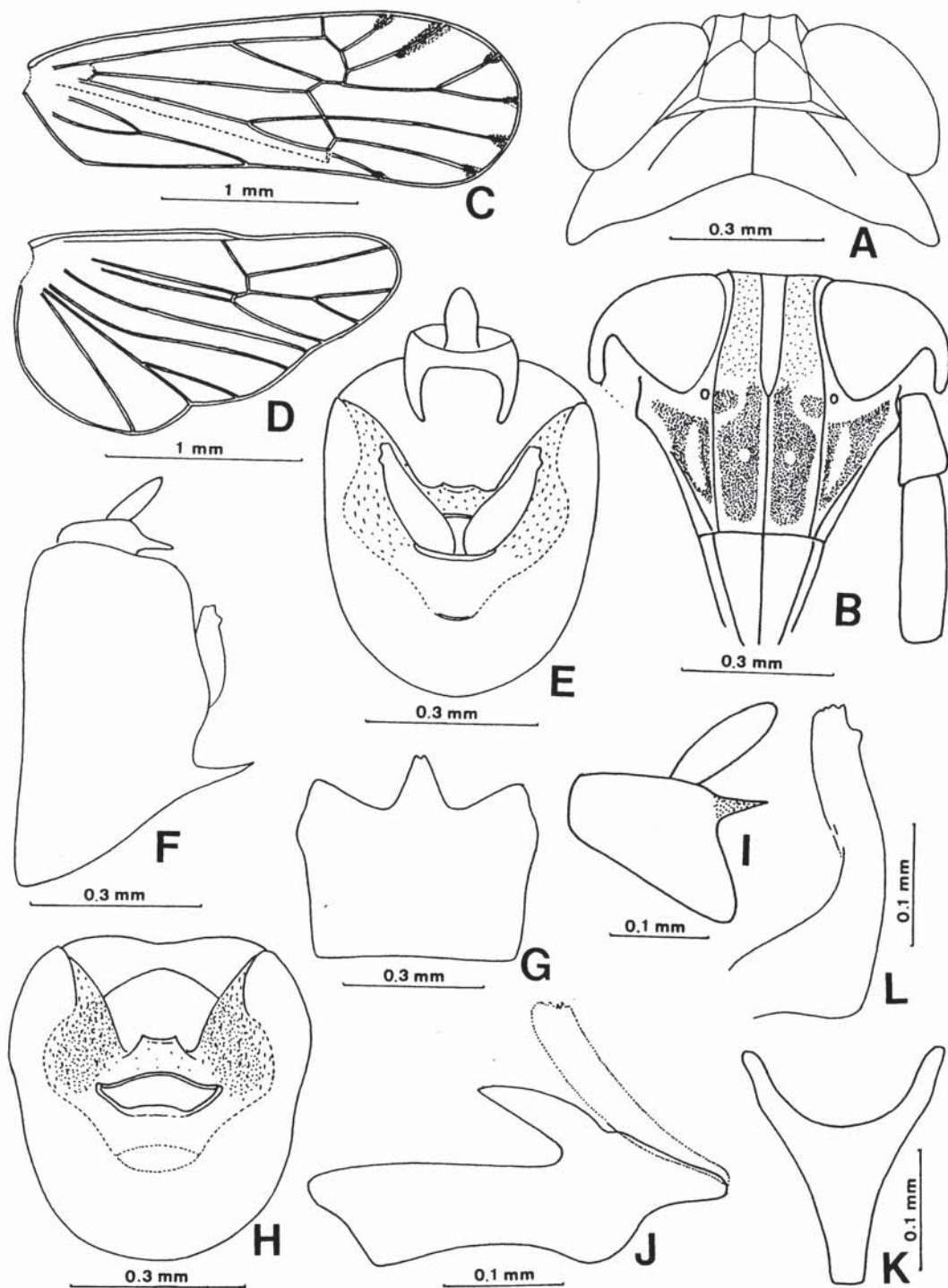


Fig. 44. *Paraconon membranacea* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, pygofer, ventral view; H, diaphragm of pygofer; I, anal segment of male, left side; J, phallus, left side; K, suspensorium; L, genital style, left side.

ventral margin at apical half roundly produced ventrally, dorsal margin armed with a stout process, at its dorsal aspect with another membranous tube which reflected from apex of phallus. Suspensorium Y-shaped, arms as long as stem. Diaphragm moderate, produced medially, dorsal margin slightly incised. Genital styles moderately long, divergent apically, slightly narrowed at apex, outer margin with small production subapically, apex truncate.

The name *membranacea* is Latin adjective, means membranous.

Male (macropterous)

Length of body (incl. teg.): 3.17-3.50 mm.

Length of tegmen: 2.60-3.00 mm.

Holotype: Male, Henchun, Pingtung Hsien, 11-X-1987, C.T. Yang. In NCHU.

Paratype: 1♂, (dissected) same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

## 21. Genus *Falcotoya* Fennah

*Falcotypa* Fennah, 1969, *Pacif. Ins. Monogr.*, 21:39.

The distinctive characters outlined by Fennah [1969] are expanded as follows.

Head including eyes as wide as or narrower than pronotum. Vertex as wide or wider at base than long submedially, at apex as wide as at base, apical margin truncate, submedian carinae slightly prominent, uniting at apex or not, Y-shaped carina distinct, basal compartment wider at base than greatest length about 1.3-2.9:1. Frons in middle line longer than wide at widest part about 1.5-2.0:1, widest near middle, median carina forked at level of ocelli or simple. Postclypeus at base wider than frons at apex, wider at base than long. Rostrum reaching to meso-trochanters. Antennae cylindrical, reaching to frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Ocelli present. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with 14-19 teeth.

Anal segment of male short, ring-like or collar-shaped, lateroapical angles approximately or widely separated, each produced into a sinuate spinose or straight process, directed ventrad. Pygofer with laterodorsal angle produced caudad, medioventral process absent. Phallus tubular, approximately sickle-shaped, with many teeth on apical third. Suspensorium ring-like, nearly straight at dorsal margin, rounded and slightly narrowed ventrally. Diaphragm narrow in median third, produced caudad in a verticle ridge or rounded lobe at middle. Genital styles moderately long, divergent, each produced mesad at base in a lobe, slightly widening distad, truncate apically, usually with inner angle acute or more deeply rounded than outer angle.

Type species: *Falcotoya aurinia* Fennah  
(original designation)



Key to the species of *Falcotoya*

1. Frons with median carina forked at level of ocelli; tegmina with membrane between  $M_2$  and  $M_3$ , and lower half between  $M_1$  and  $M_2$  pale black; post-tibial spur with about 19 teeth . . . . . *formosana* n.sp.  
 – Frons with median carina simple; tegmina with membrane only basal portion below  $M_2$  black; post-tibial spur with about 14 teeth . . . . . *shaluensis* n.sp.

(39) *FALCOTOYA FORMOSANA* n.sp.

## Fig. 45.

General color pale yellowish brown. Areas on vertex and frons between carinae and genae brown to dark brown. Tegmina hyaline, membrane between  $M_2$  and  $M_3$  and lower half between  $M_1$  and  $M_2$  pale black, granulose black.

Vertex wider at base than long submedially about 1.4:1, lateral carinae nearly straight, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 2.9:1. Frons longer in middle line than wide at widest part about 1.5:1, widest between eyes, lateral carinae slightly convex, median carina widely forked at level of ocelli. Antennae with basal segment slightly longer than wide, shorter than second about 1:2.3. Post-tibial spur with about 19 teeth. Tegmina longer than widest part about 3.2:1.

Anal segment of male collar-shaped, lateroapical angles approximate. Pygofer in posterior view with opening wider than long, lateral margins weakly defined. Phallus horizontal in basal half then abruptly curved dorsad, and finely recurved caudoventrad, dorsal aspect with several small teeth apically. Diaphragm narrow, dorsal margin roundly produced medially, lateral sides margined. Opening for genital styles evenly convex dorsally, ventral margin deeply concave. Genital styles moderately broad, divergent, inner angles slightly pointed.

The name *formosana* is a adjective, means of Formosa.

Male (macropterous)

Length of body (includ.teg.): 2.60-2.66 mm.

Length of tegmen: 2.16 mm.

Holotype: Male, Chishan, Kaohsiung Hsien, 2-I-1985, C.T. Yang. In NCHU.

Paratypes: 4♂♂, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from any known species of this genus in having the median carina of frons widely forked at level of ocelli, one-third width between eyes. It differs from type species of New Caledonia in the markings of tegmina and the shape of anal segment of male.

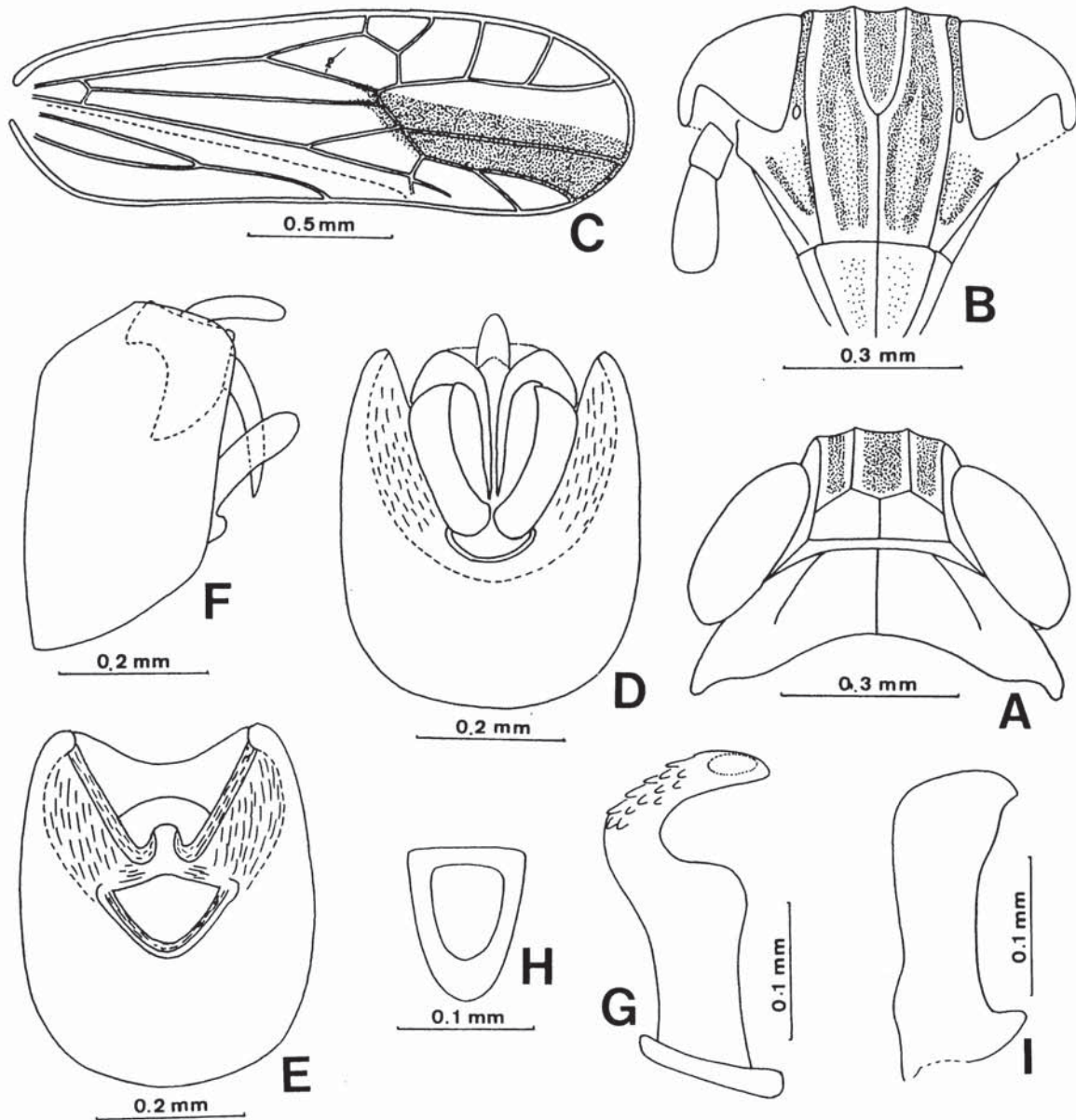


Fig. 45. *Falcotoya formosana* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, diaphragm of pygofer; F, male genitalia, left side; G, phallus, left side; H, suspensorium; I, genital style, left side.



(40) *FALCOTOYA SHALUENSIS* n.sp.

Fig. 46.

General color grayish white. First antennal segment, both sides of carinae of frons somewhat dark, intercarinal areas of postclypeus black. Femora and tibiae with light black stripes. Abdomen and meso-coxae light black. Tegmina hyaline, near ends of apical veins except Sc and area below  $M_2$  except area between veins near margin black, hind margin at claval end with black marking.

Head including eyes slightly narrower than pronotum. Vertex as long submedially as wide at base, broadly rounding into frons, apical margin truncate, lateral carinae nearly straight, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 1.3:1. Frons in middle line longer than wide at widest part about 2:1, widest at level of ocelli, median carina simple. Postclypeus slightly wider at base than frons at apex. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.3:1, shorter than second about 1:2. Post-tibial spur with about 14 teeth. Tegmina longer than widest part about 3.1:1.

Anal segment of male collar-shaped, in profile apical three-fifths produced downward as broad lobe, truncate at apex, lateroapical angles moderately separated, each produced into a strongly curved spinose process. Pygofer in profile with laterodorsal angle produced caudad triangulately, in posterior view with opening as wide as long, lateral margins concave. Phallus typical, but dorsal margin of apical half bend rectangulately and denitculate. Suspensorium as figured. Diaphragm produced dorsad as equilateral triangle. Opening for genital styles with both dorsal and ventral margins concave. Genital styles broad, nearly parallel, inner margin strongly sinuate, obliquely truncate at apex.

The name *shaluensis* is genitive of Shalu, name of a town in Taiwan

Male (macropterous)

Length of body (includ.teg.): 2.50-2.66 mm.

Length of tegmen: 2.00-2.13 mm.

Female (macropterous) (brachypterous)

Length of body

(includ.teg.): 3.10-3.16 mm. 2.06-2.16 mm.

Length of tegmen: 2.43-2.60 mm. 0.73-0.80 mm.

Holotype: Male, Shalu, Taichung Hsien, 5-XII-1984, C.T. Yang. In NCHU.

Paratypes: 4♂♂, 8♀♀, same data as for holotype; 15♂♂, 5♀♀, same locality, 12-V-1985, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from *F. lyraiformis* (Matsumura) by the mesonotum, frons and postclypeus uniformly grayish white (mesonotum with a large brownish marking on each outside of lateral carina, the frons and the postclypeus equally brownish black in *lyraiformis*).

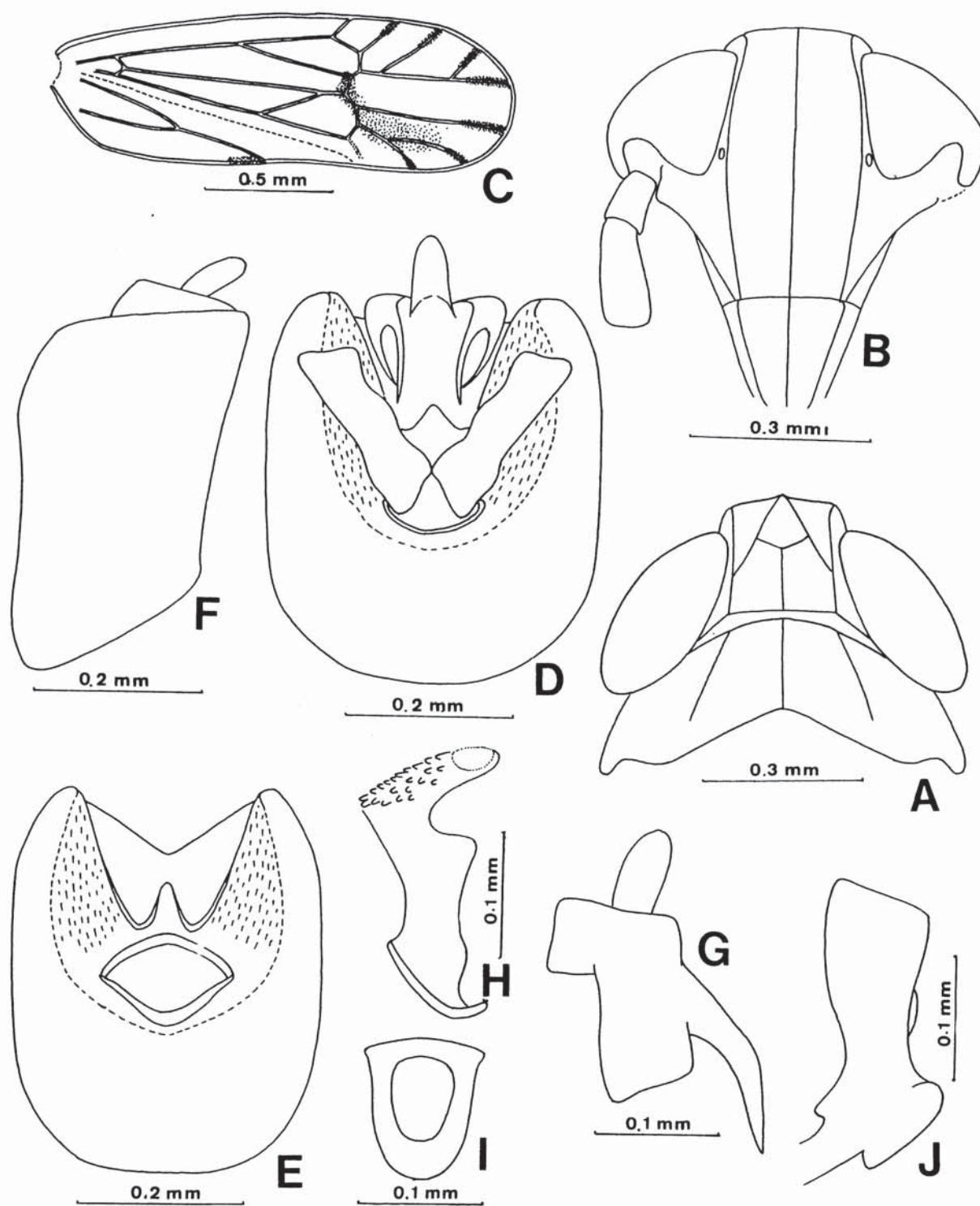


Fig. 46. *Falcotoya shahuensis* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, diaphragm of pygofer; F, male genitalia, left side; G, anal segment of male, left side; H, phallus, left side; I, suspensorium; J, genital style, left side.



## 22. Genus *Muellerianella* Wagner

*Nuellerianella* Wagner, 1963, *Mitt. Hamberg. Zool. Mus.*, 60:168.

The generic characters are based on *M. extrusa* from Taiwan only.

Head including eyes narrower than pronotum. Vertex wider at base than long submedially, submedian carinae not uniting at apex. Frons longer in middle line than wide at widest part about 1.9:1, median carina forked above level of ocelli. Rostrum reaching to meta-coxae. Ocelli present. Antennae cylindrical, surpassing frontoclypeal suture. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male sunk in emargination of pygofer, ring-like, lateroapical angle not produced into process. Pygofer in profile with laterodorsal angle strongly produced, directed dorsocaudad, in posterior view with opening longer than wide, without medioventral process, ventral angles slightly produced. Phallus stout, reflected cephalad at apex, not forming into a flagellum, armed with processes. Suspensorium ring-like. Diaphragm narrow, slightly concave at dorsal margin. Genital styles broad, slightly divergent.

Type species: *Delphax fairmairei* Perris  
(original designation)

This genus comprises 4 Europe species originally found in Greece. Lindberg and Zachvatkin [1936, *Arkiv. Zool.*, 29:3,28] listed the type species from China. This is the first record from Taiwan.

### (41) *MUELLERIANELLA EXTRUSA* (Scott)

Fig. 47.

*Muellerianella extrusa* Booij, 1981, *Neth. J. Zool.*, 31(3):572.

—: Drosopoulos, 1983, *Ent. Berichten Deel*, 43:72.

*Liburnia extrusa* Scott, 1871, *Ent. Monthly Mag.*, 7:194.

General color pale yellowish. Vertex, frons, antennae and clypeus somewhat dark. Thorax with lateral areas dark brown, metapleura each with a large rounded black marking. Abdomen brown ventrally, black dorsally. Pygofer yellowish with genital styles and anal style black. Tegmina hyaline, anterior margin near end of Sc and area below claval veins pale black.

Vertex wider at base than long submedially about 1.3:1, apical margin transverse, slightly produced medially, rounding into frons, lateral carinae nearly straight, submedian carinae not uniting at apex, Y-shaped carina with stem feeble, basal compartment wider at base than greatest length about 2:1. Frons longer in middle line than wide at widest part about 1.9:1, widest at middle of eyes, as wide at base as at apex, lateral carinae concave at base, nearly straight below ocelli, curved laterad near apex, median carina forked above level of ocelli. Postclypeus as wide at base as frons at apex, longer in middle line than wide at base. Antennae with basal segment longer than wide

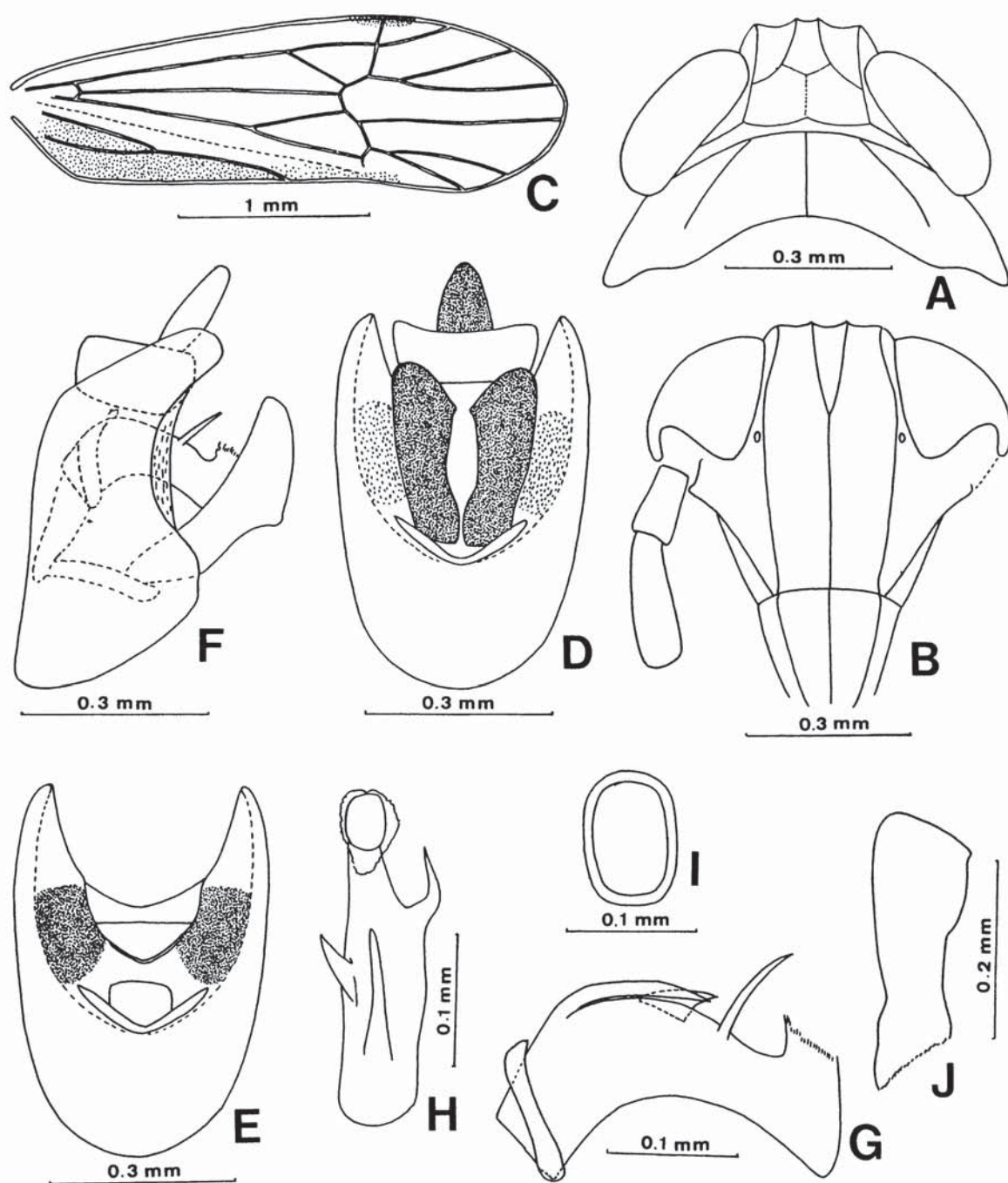


Fig. 47. *Muellerianella extrusa* (Scott) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, diaphragm of pygofer; F, male genitalia, left side; G, phallus, left side; H, the same, dorsal view; I, suspensorium; J, genital style, left side.



about 1.6:1, shorter than second about 1:2. Post-tibial spur with 19-22 teeth. Tegmina longer than widest part about 3.2:1.

Anal segment of male moderately long. Phallus in left view stout, arched upward medially, left process the farthest slender, directed dorsocaudad, right one at middle, triangular, median one the nearest, slender, parallel with dorsal margin. Genital styles widening to apex, apical margin obliquely protruding, inner margin slightly pointed apically.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.): | 3.60-3.63 mm.  | 2.33-2.40 mm.   |
| Length of tegmen:                | 2.93-3.00 mm.  | 1.16-1.33 mm.   |
| Female                           |                |                 |
| Length of body<br>(includ.teg.): | 3.66-3.70 mm.  | 2.56-2.66 mm.   |
| Length of tegmen:                | 3.00 mm.       | 1.30-1.50 mm.   |

Specimens examined: 2♂♂, 4♀♀, (macropterous), 25♂♂, 21♀♀, (brachypterous), Mukwa, Hualien Hsien, 7-VIII-1985, C.T. Yang; 1♂, 2♀♀, Tienchih, Kaohsiung Hsien, 26-X-1981, C.T. Yang.

Host plant: Unknown in Taiwan.

Distribution: Taiwan (new record), Europe.

### 23. Genus *Neodicranotropis* n. gen.

Head including eyes distinctly narrower than pronotum. Vertex slightly wider at base than long submedially, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 1.8:1. Frons longer in middle line than wide at widest part about 1.7:1, widest at level of ocelli, lateral carinae convex medially, median carina forked at level of ocelli. Postclypeus wider at base than frons at apex, slightly longer than wide at base. Rostrum reaching to meso-trochanters, apical segment shorter than subapical. Antennae cylindrical, surpassing frontoclypeal suture. Ocelli present. Pronotum with lateral carinae reaching near to hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 22 teeth.

Anal segment of male collar-shaped, sunk in dorsal emargination of pygofer, lateroapical angles each produced into a stout process. Pygofer in profile distinctly wider ventrally than dorsally, in posterior view with opening wider than long, lateral margins well defined, lateral quadrate areas strongly sclerotized and pigmented, ventral margin with single, large medioventral process, widening to apex. Phallus tubular, armed with teeth. Suspensorium elongate, bifurcate dorsally. Diaphragm broad, transparent, dorsal margin weakly defined. Genital styles moderate, slightly divergent, simple.

Type species: *Neodicranotropis tungyaanensis* n.sp.

(here designated)

This genus characterized by the medioventral process of male pygofer widening to apex, slightly protruded at apex medially, the opening of male pygofer with lateral quadrate areas strongly sclerotized and pigmented.

(42) *NEODICRANOTROPIS TUNGYAANENSIS* n.sp.

Fig. 48.

General color dark brown. Antennae, rostrum and legs yellowish brown. Abdomen black. Tegmina hyaline, with veins black.

Vertex slightly wider at base than long submedially, apical margin transverse, lateral carinae slightly concave, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment wider at base than greatest length about 1.8:1. Frons longer in middle line than wide at widest part about 1.7:1, widest at level of ocelli, lateral carinae convex medially, median carina forked at basal half. Postclypeus wider at base than frons at apex, slightly longer than wide at base. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.5:1, shorter than second about 1:2. Post-tibial spur with about 22 teeth. Tegmina longer than widest part about 2.9:1.

Pygofer in profile distinctly wider ventrally than dorsally, laterodorsal angle not produced, in posterior view with opening wider than long, medioventral process widening to apex, slightly produced at apex medially. Phallus slightly arched upward medially, reflected subapically, left side with wing-like produced, right side with 2 large teeth, one upper, another lower. Suspensorium large, plate-shaped, widening dorsally, dorsal margin shallowly emarginate, forming distinct arms, ventral arms indistinct. Diaphragm broad, transparent, dorsal margin incised with a small triangular production, directed caudodorsad. Opening for genital styles transverse oval. Genital styles moderately large, pointed at apex, inner margin concave, in profile sinuate, distinctly bifurcate at apex, basal angle distinctly produced.

The name *tungyaanensis* is genitive of Tungyaanshan, a mountain in Taiwan.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.): | 3.76-3.96 mm.  | 2.53 mm.        |
| Length of tegmen:                | 3.20-3.40 mm   | 1.33 mm.        |
| Female (brachypterous)           |                |                 |
| Length of body:                  | 3.00 mm.       |                 |
| Length of tegmen:                | 1.40 mm.       |                 |

Holotype: Male, Chushan, Nantou Hsien, 26-X-1985, C.T. Yang. In NCHU.

Paratypes: 1♂, (dissected) Tungyaanshan, Nantou Hsien, 22-VII-1985, C.T. Yang;

1♂, 1♀, Tungshih, Taichung Hsien, 20-I-1987, J.T. Yang.

Host plant: Unknown.

Distribution: Taiwan.



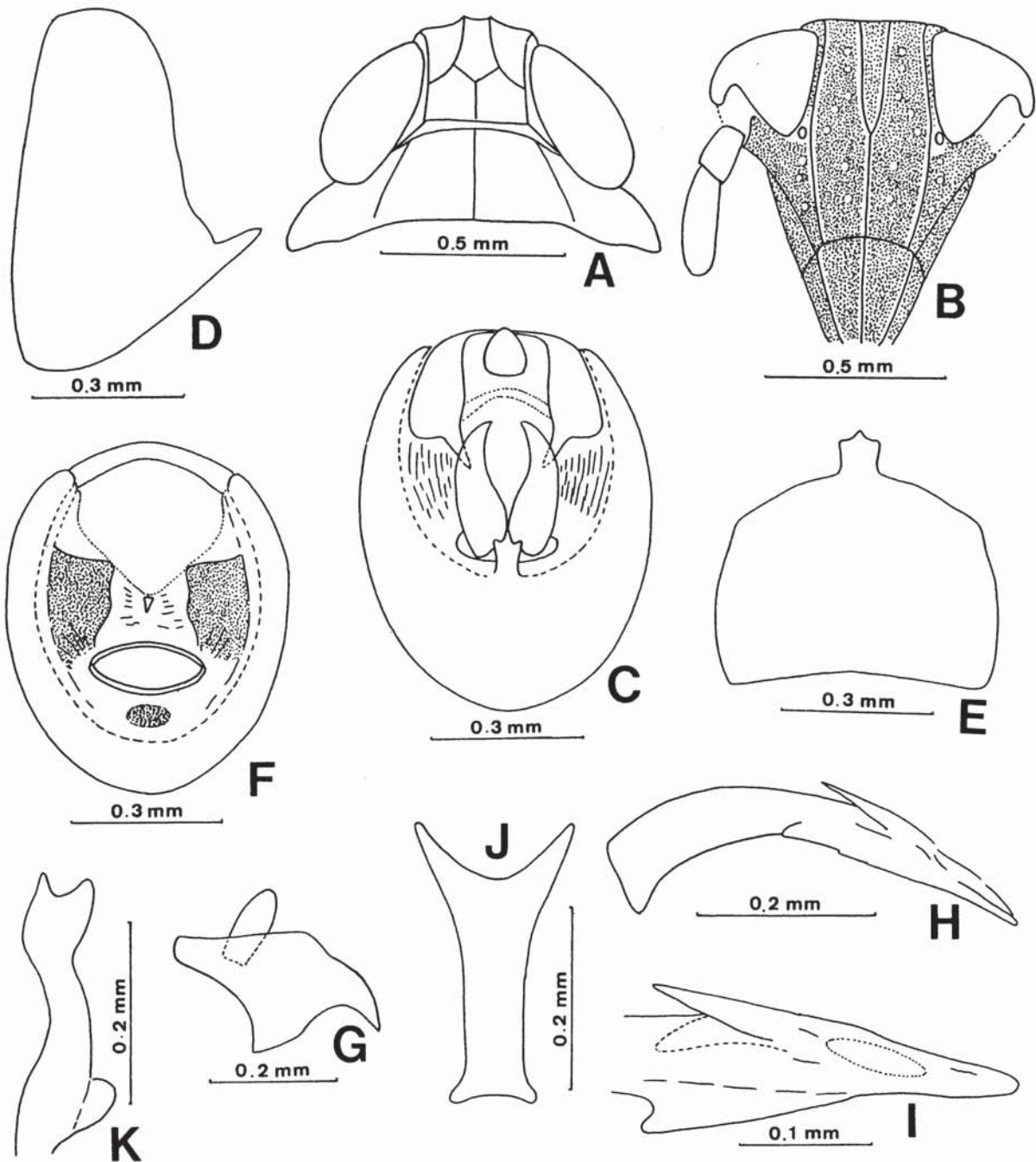


Fig. 48. *Neodicranotropis tungyaanensis* n.sp. A, head and pronotum, dorsal view; B, frons and post-clypeus; C, male genitalia, posterior view; D, the smaie, left side; E, pygofer, ventral view; F, diaphragm of pygofer; G, anal segment of male, left side; H, phallus, left side; I, the same, dorsal view; J, suspensorium; K, genital style, left side.

## 24. Genus *Peliades* Jacobi

*Peliades* Jacobi, 1928, *Arkiv. Zool.*, 19(28):43.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:69.

*Platybrachys* Bierman, 1910, *Notes Leyden Mus.*, 33:41.

The generic characters outlined by Jacobi [1910] and Kuoh [1983] are modified as follows.

Head including eyes slightly narrower than pronotum. Vertex wider at base than long submedially, apical margin transverse, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment wider at base than greatest length. Frons longer in middle line than wide at widest part about 2:1, widest just below level of eyes, lateral carinae concave between eyes, median carina forked near middle. Rostrum reaching to meso-trochanters. Ocelli absent. Antennae long, cylindrical, almost reaching to apex of postclypeus. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with more than 20 teeth. Pro-tibiae foliately expanded.

Anal segment of male ring-like, lateroapical angles produced or not. Pygofer in profile short, posterior view with opening wider than long, medioventral process present. Phallus long, tubular, reflected cephalad apically. Suspensorium Y-shaped. Diaphragm broad, dorsal margin strongly incised medially. Genital styles moderately long, simple.

Type species: *Platybrachys platypoda* Bierman  
(original designation)

### (43) *PELIADES CHUHKOUENSIS* n.sp.

Fig. 49.

Vertex, frons, clypeus and antennae yellowish brown. Genae black. Pronotum yellowish brown with dark brown behind eyes and whitish below, mesonotum yellowish brown with lateral areas black. Legs yellowish brown except tarsi, femora and tibiae of fore and mid-legs dark brown to black, pleura dark brown, abdomen dark brown to black, with pygofer dorsal half yellowish white. Tegmina black.

Vertex wider at base than long submedially about 1.6:1, transverse apically, lateral carinae nearly straight, basal compartment wider at base than greatest length about 3.1:1. Frons longer in middle line than wide at widest part about 1.8:1, widest at level of lower margin of eyes, lateral carinae angulate at level of lower margin of eyes, median carina forked at basal three-fourths. Postclypeus distinctly wider at base than frons at apex, longer than wide at base. Rostrum with relative length of each segment about 1.3:1.4:1. Tegmina (brachypterous) rounded at apex, veins with more branches than typical. Wing present, small, scale-like. Pro-tibiae foliately expanded, widest at middle, about twice as wide as femora, wider than base of first tarsal segment about 6:1. Post-tibial spur with about 28 teeth.



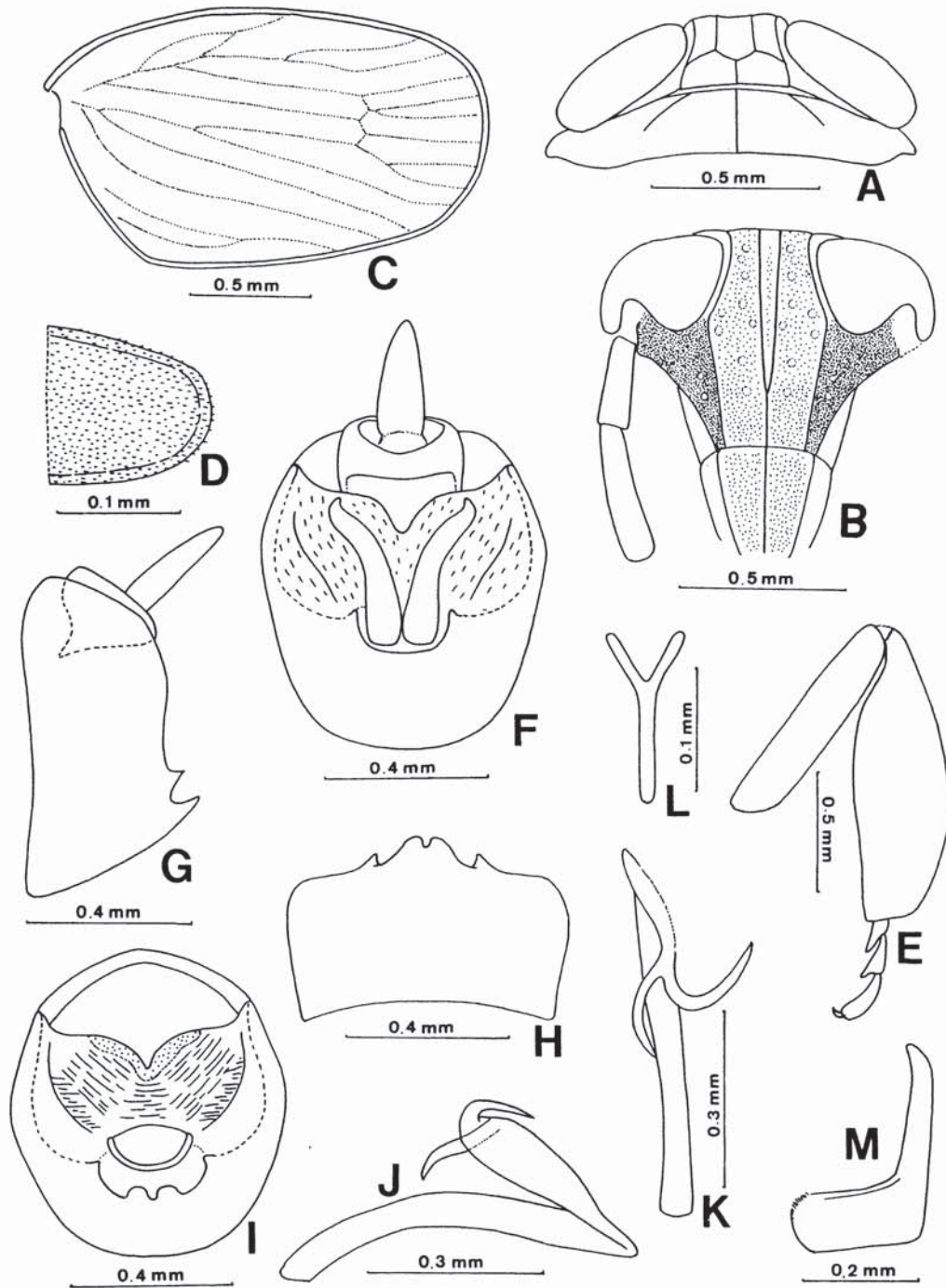


Fig. 49. *Peliades chuhkouensis* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, fore leg; F, male genitalia, posterior view; G, the same, left side; H, pygofer, ventral view; I, diaphragm of pygofer; J, phallus, left side; K, the same, dorsal view; L, suspensorium; M, genital style, left side.

Anal segment of male moderately long, lateroapical angles not produced into process. Pygofer in profile wider ventrally than dorsally, in posterior view with opening wider than long, lateral margins not well defined, medioventral process present, incised medially, at each lateral side with another small process. Phallus long and slender, slightly arched upward medially, reflected apically, reaching to middle of main body, terminating into 2 processes, left one curved left, right one turned downward. Suspensorium very weakly sclerotized, shallowly V-shaped. Opening for genital styles evenly concave at both margins. Genital styles long and slender, apical half turned laterad, then mesad near apex, in profile golf-club-shaped.

The name *chuhkouensis* is genitive of chuhkou, a small village in Chiayi, Taiwan

Male (brachypterous)

Length of body: 2.46-2.70 mm.

Length of tegmen: 1.83-1.90 mm.

Holotype: Male (dissected), Chuhkou, Chiayi Hsien, 29-I-1985, C.T. Yang. In NCHU.

Paratypes: 3♂♂, Chiasien, Kaohsiung Hsien, 5-IV-1986, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from all known members of the genus in having the median carina forked at the basal three-fourths; the shapes of the genital styles and the phallus.

## 25. Genus *Cemus* Fennah

*Cemus* Fennah, 1964, *Trans. R. Ent. Soc. Lond.*, 116(7):147.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:63.

The generic characters outlined by Fennah [1964] are modified as follows.

Head including eyes narrower than pronotum. Vertex shorter submedially than wide at base, broadly and obtusely rounding into frons, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment wider at base than greatest length about 2.5:1. Frons in middle line longer than wide at widest part about 1.8:1, widest at level of ocelli, median carina forked at level of ocelli. Postclypeus at base slightly wider than frons at apex, about as long in middle line as wide at base. Rostrum reaching to meta-trochanters, with apical segment about as long as subapical. Antennae reaching almost to level of apex of postclypeus, basal segment longer than wide more than 2:1, second segment longer than first. Ocelli distinct, very close to anterior margin of genae. Pronotum with lateral carinae not attaining hind margin. Fore and middle femora and tibiae a little compressed but not, or only feebly expanded foliately. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 30 teeth.



Anal segment of male short, ring-like, lateroapical angles each produced ventrad in a slender spinose process. Pygofer short dorsally, long and strongly convex ventrally, posterior opening relatively small, much longer than wide, laterodorsal angle feebly produced, strongly inflected, medioventral process short, wider than long, quadrate. Phallus long, slightly decurved distad, with a long flagellum arising at apex, directed cephalad. Suspensorium Y-shaped, arms very short. Diaphragm wide, with dorsal margin weakly concave, deeply incised medially. Genital styles simple, narrow, usually tapering distally to acute apex, directed dorsad, in posterior view only weakly divergent.

Type species: *Cemus leviculus* Fennah  
(original designation)

#### Key to the species of *Cemus*

1. Genital styles widely divergent apically, apical half narrowed and strongly curved laterad . . . . . *nigropunctatus* (Matsumura)
  - Genital styles nearly parallel . . . . . 2
2. Phallus with flagellum terminating in 3 processes; genital styles simple, parallel . . . . . 3
  - Phallus with flagellum terminating in 2 processes; genital styles with process or twisted subapically . . . . . 4
3. Median process of flagellum of phallus rather long nearly as long as others . . . . . *nigromaculosus* (Muir)
  - Median process of flagellum of phallus rather short, rod-like . . . . . *zhitus* Kuoh
4. Tegmina below Sc<sub>1</sub> with black line; post-tibial spur with about 30 teeth . . . . . *changchias* Kuoh
  - Tegmina below Sc<sub>1</sub> without black line . . . . . 5
5. Genital styles with apical third of outer margin with a large, obtuse process; post-tibial spur with 21-24 teeth; medioventral process with apex rounded . . . . . *sauteri* (Muir)
  - Genital styles with apical third narrowed and turned cephalad then laterad; post-tibial spur with 13-19 teeth; medioventral process with apex bifurcated . . . . . *punctatus* (Muir)

(44) *CEMUS ZHITUS* Kuoh

Fig. 50.

*Cemus zhitus* Kuoh, 1981, *Acta Entomologica Sinica*, 24(4):423.—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:68.

General color dark brown to black. Pronotum below eyes, tegular, lower sides of genae yellowish white. Antennae with first segment black with a longitudinal yellowish brown stripe, second brown. Tegmina hyaline, colorless, granulose black, near apex of clavus at hind margin with a black marking, black bands along  $R_1$ ,  $R_5$ , across nodal line and along posterior margin except 2 oval areas.

Vertex shorter submedially than wide at base about 1:1.1, basal compartment at base wider than greatest length about 2.2:1. Frons in middle line longer than wide at widest part about 1.6:1, widest above level of ocelli. Postclypeus at base wider than frons at apex, about as long as wide at base. Rostrum reaching to meta-trochanters, apical segment shorter than subapical. Antennae very long, surpassing apex of postclypeus, basal segment longer than wide about 2.3:1, shorter than second about 1:1.5. Post-tibial spur with about 30 teeth. Tegmina of brachypterous with apical margin truncate.

Anal segment of male moderately long, lateroapical angles each produced into a moderately long spinose process, widely separated, directed ventrad. Pygofer in profile distinctly wider ventrally than dorsally, laterodorsal angles not produced, posterior opening very narrow, lateral margins well defined, medioventral process present, broad, evenly produced caudad. Phallus relatively long, tubular, reflected cephalad near apex, terminal with 3 processes, right one the longest, lobe-like, acute and slight turned right at apex, median one the smallest, rod-like, left one directed left then downward. Suspensorium as figured. Diaphragm broad, produced caudad with dorsal margin deeply incised medially. Opening for genital styles with dorsal and ventral margins slightly convex medially, lateral margin strongly concave. Genital styles relatively small, parallel, broad near base, gradually tapering to apex, inner margin nearly straight, outer margin shallowly emarginate at basal third.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.): | 3.40-3.83 mm.  | 2.33-2.50 mm.   |
| Length of tegmen:                | 3.07-3.33 mm.  | 1.43-1.50 mm.   |
| Female                           |                |                 |
| Length of body<br>(includ.teg.): | 3.60-4.03 mm.  | 2.57-2.83 mm.   |
| Length of tegmen:                | 3.33-3.46 mm.  | 1.50-1.67 mm.   |

Specimens examined: 3♂♂, 3♀♀, Pingtung, Pingtung Hsien, 10-IX-1984, C.T.

Yang; 4♂♂, 4♀♀, Chiasien, Kaohsiung Hsien, 2-I-1985, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China.



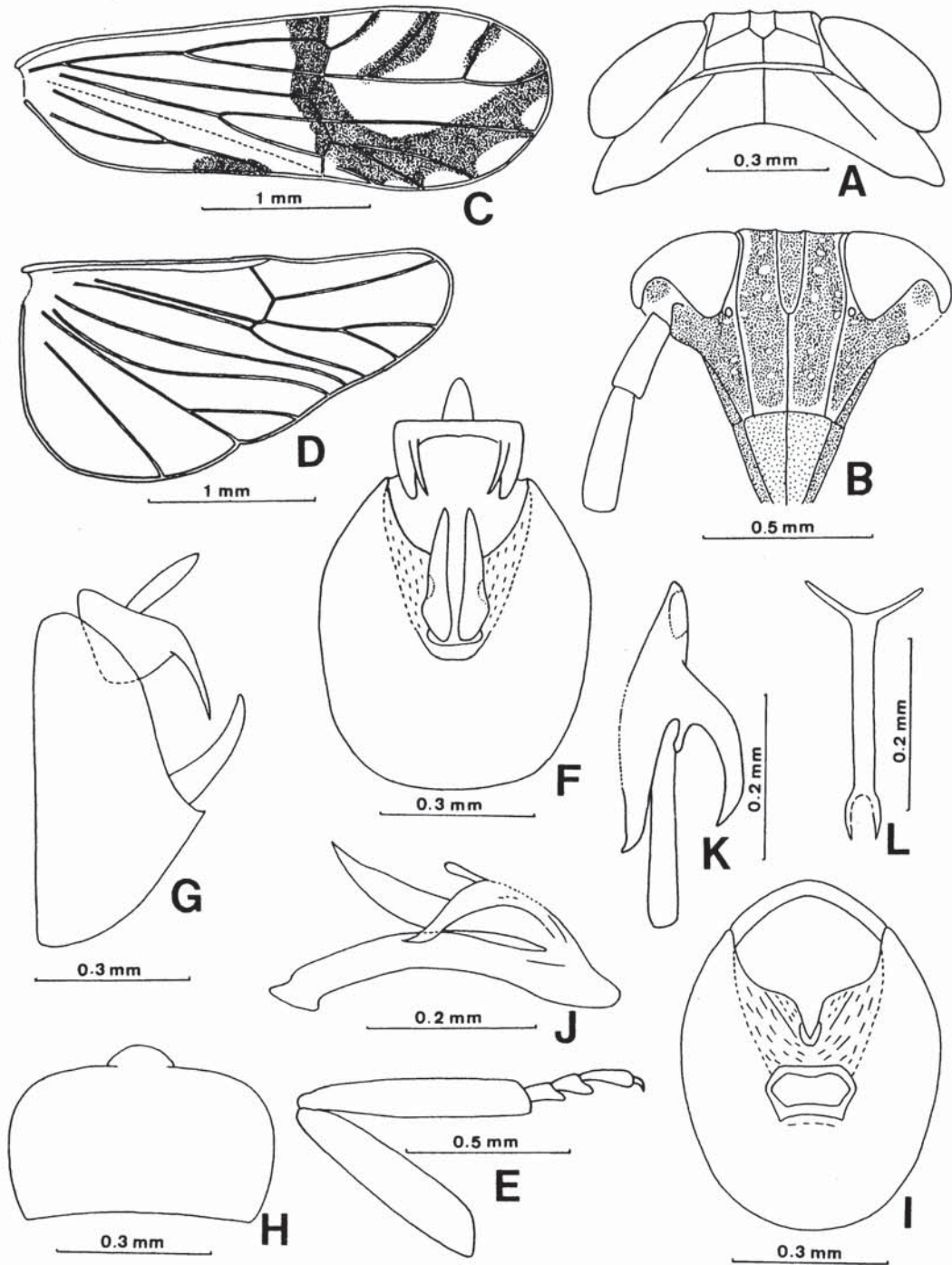


Fig. 50. *Cemus zhitus* Kuoh A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, fore leg; F, male genitalia, posterior view; G, the same, left side; H, pygofer, ventral view; I, diaphragm of pygofer; J, phallus, left side; K, the same, dorsal view; L, sponsorium.

(45) *CEMUS SAUTERI* (Muir)

## Fig. 51.

*Cemus sauteri* Fennah, 1964, *Trans. R. Ent. Soc. Lond.* 116(7):147.

—: Fennah, 1973-75, *Ent. scand. Suppl.*, 4:87.

—: Fennah, 1978, *Ann. Zool. Warszawa*, 34(9):21.

*Phyllodinus sauteri* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:319.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 44.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:76.

General color black. Carinae of head and thorax, spots on frons, base and apex of tibiae, post-tibial spur, second segment of metatarsi yellowish brown. Antennae with first segment black, dorsal aspect with elongate oval yellowish marking, second segment dark brown, lateral lobes of pronotum and tegulae creamy white. Tegmina hyaline, granulose black, black marking from node to anal angle thence submarginally to apex of tegmen and at end of Sc, along both sides of  $R_1$ ,  $R_5$  and end of clavus. Pygofer black with crescentic white band at each lateral side of genital opening.

Vertex shorter than wide at base about 1:1.1, broadly and obtusely rounding into frons, basal compartment wider than greatest length about 3:1, submedian carinae uniting on frons. Frons in middle line longer than wide at widest part about 1.8:1, widest just above ocelli level, lateral margins straight below level of ocelli. Antennae with first segment longer than wide about 2:1, shorter than second about 1:1.7. Post-tibial spur with 21-24 teeth. Tegmina longer than widest part about 3:1, brachypterous with apex rounded.

Anal segment of male long, lateroapical angles each produced into a strong, short spinose process, directed ventrad. Pygofer in profile distinctly longer ventrally than dorsally, laterodorsal angle narrowly produced caudad, in posterior view with opening relatively small, longer than wide. Phallus long, curved dorsally, a broad flagellum arising at subapex, directed dorsad and cephalad, at middle with a hooked process arising at left side, directed mesad, a long process producing at right side, parallel with phallus. Orifice dorsad. Diaphragm with dorsal margin obliquely straight, triangularly incised medially. Genital styles slender, slightly divergent, apical third of outer margin with a large, obtus process, in lateral view strongly sinuate.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.)  | 3.16-3.26 mm.  | 1.66-2.06 mm.   |
| Length of tegmen:                | 2.73-2.83 mm.  | 1.00-1.40 mm.   |
| Female                           |                |                 |
| Length of body<br>(includ.teg.): | 3.73-3.86 mm.  | 2.33-2.50 mm.   |
| Length of tegmen:                | 3.00-3.30 mm.  | 1.33-1.40 mm.   |



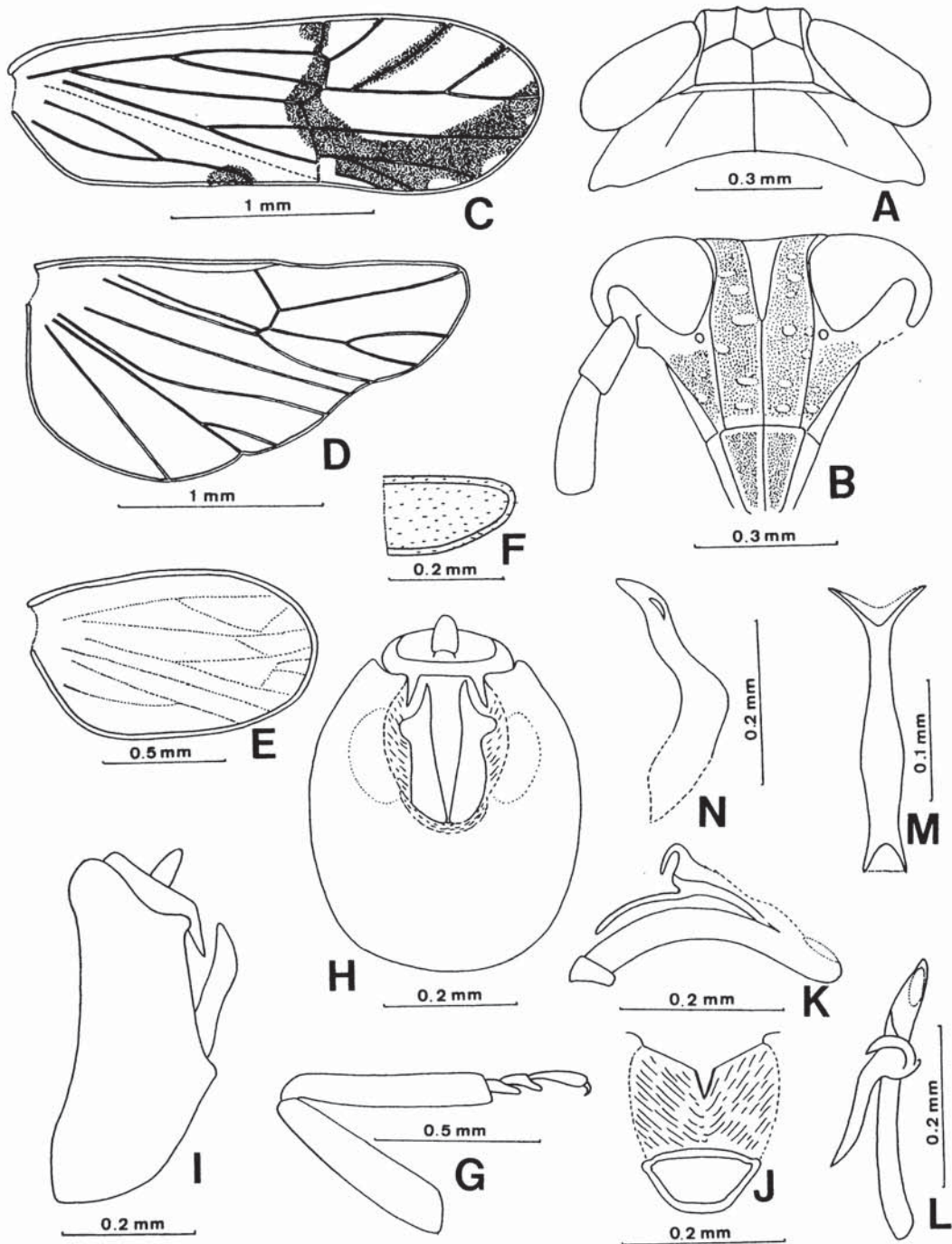


Fig. 51. *Cemus sauteri* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, tegmen (brachypterous); F, wing (brachypterous); G, fore leg; H, male genitalia, posterior view; I, the same, left side; J, diaphragm of pygofer; K, phallus, left side; L, the same, dorsal view; M, suspensorium. N, genital style, left side.

### Fifth instar nymph (Fig. 52)

General color pale yellowish brown. Tibiae with brown, ring makings.

Head between eyes wider at narrowest portion than long in middle line about 1.35:1, moderately protruding beyond level of eyes, length of eye longer than length between level of eyes and lateral point of frons about 4.8:1, width of head including eyes wider than width of basal compartment at base about 2.8:1, submedian carinae attaining hind margin of vertex submedially, basal compartment wider at hind margin than greatest length about 2.2:1, hind margin nearly straight. Frons longer in middle line than wide at widest part about 1.3:1, widest above level of lower margin of eyes, lateral carinae distinctly convex, with 2 median carinae, separated, parallel. Interfrons narrower than laterofrons. Number and arrangement of sensory pits typical, each side with 3 extra pits, lowest pit lies near frontoclypeal suture, distance less than a diameter of pit, distance between dorsal level of lower pits and ventral level of median pits shorter than former to frontoclypeal suture about 1:1.5, dorsal margin of lower of upper pits same high of median pits. Between eye and lateral carina with 4 pits, lowest one lies at middle of eye. Frontoclypeal suture straight. Rostrum reaching beyond meso-trochanters, relative length of each segment about 0.9:1.1:1, third segment longer than wide about 2.25:1. Antennae reaching beyond frontoclypeal suture, with basal segment wider than long, shorter than second about 3.8:1.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, relative length between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 2.3:1, anterior wing pad protruding to level of hind one, latter reaching to middle of tergite III. Spinal formula of hind leg 5-7-4, metatibia longer than 3 tarsi combined, spur slightly shorter than first tarsal segment, with 14-16 teeth.

Abdominal terige V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobe not cylindrical, pits lie near apex, in lateral view hind margin nearly straight, only slightly produced caudad at base, anal comb narrow, in caudal view with opening wider at middle.

Length of body: 1.91 mm.

Width of head including eyes: 0.58 mm.

Length of anterior wing pad: 0.60 mm.

Length of antenna: 0.27 mm.

Specimens examined: 15♂♂, 10♀♀, Tungkong, Pintung Hsien, 10-XI-1983, C.T. Yang.

Nymphal specimen examined: Fifth instar nymph: 1, Keelung, 12-VIII-1986, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan, Viet-nam, Sri Lanka, Fiji.



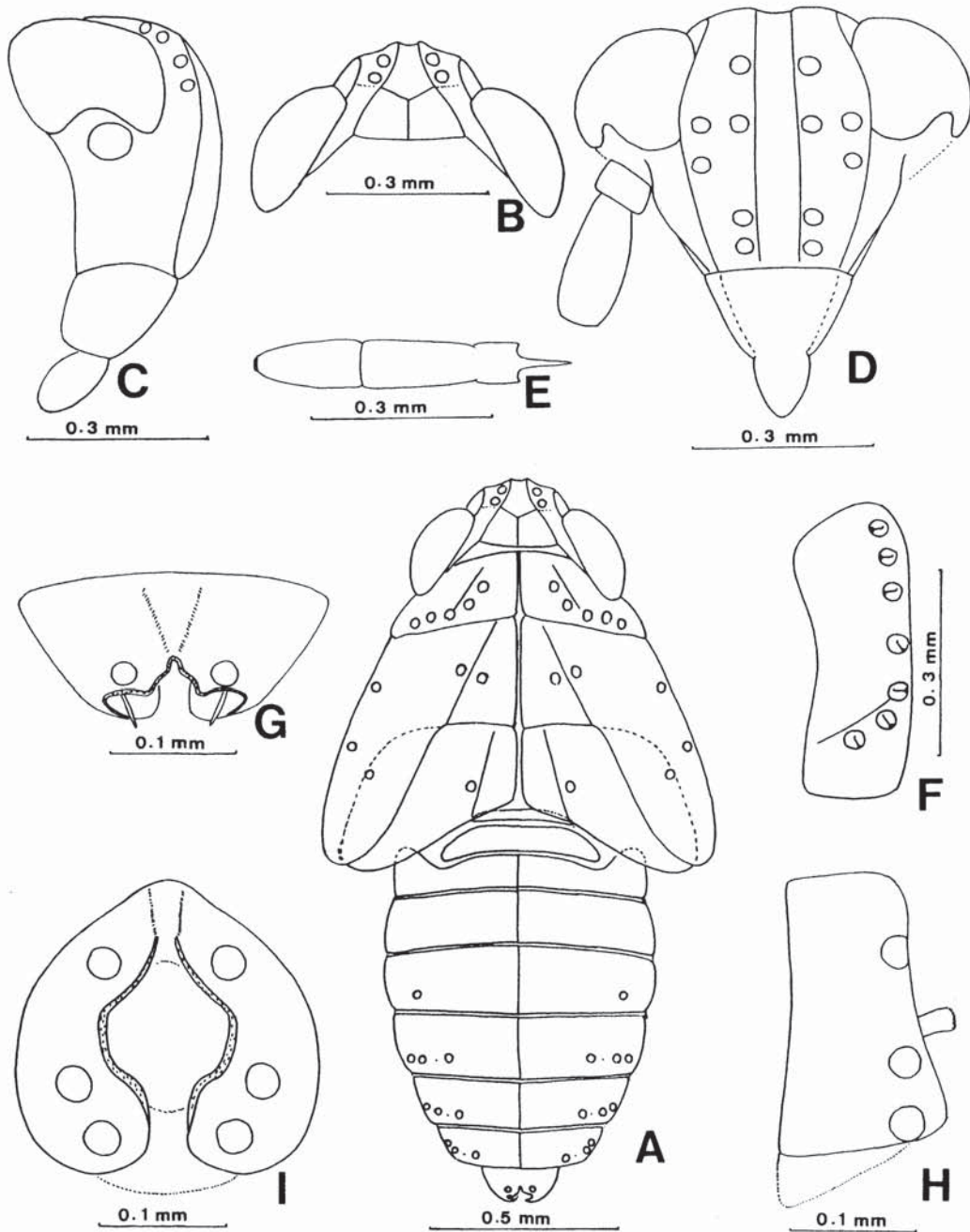


Fig. 52. Nymph of *Cemus sauteri* (Muir) A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.

(46) *CEMUS PUNCTATUS* (Muir) n. comb.

Fig. 53.

*Phyllostinus punctata* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:320.—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 44.—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:77.

General color dark brown to black. Apices of tibiae, tarsi of meso- and meta-legs white. Brachypterous tegmina subhyaline, obtusely rounded at apex.

Vertex shorter submedially than wide at base about 1:1.1, about as wide at apex as at base, obtusely rounding into frons, lateral carinae straight, submedian carinae not uniting at apex, Y-shaped carina feeble, basal compartment at base longer than greatest length about 1.9:1. Frons in middle line longer than wide at widest part about 1.8:1, widest at basal third, median carina forked slightly above level of ocelli. Postclypeus at base wider than frons at apex. Ocelli in brachypterous specimens absent. Antennae long, nearly reaching to level of apex of postclypeus, basal segment longer than wide about 2:1, shorter than second about 1:2. Post-tibial spur with 13-19 teeth.

Anal segment short, with lateroapical angles each produced into a slender spinose process, directed ventrad, widely separated. Pygofer in profile distinctly longer ventrally than dorsally, laterodorsal angle not produced, posterior margin obliquely running at dorsal half, in posterior view with opening slightly wider than long, lateral margins well defined, ventral margin shallowly concave, with distinct medioventral process which bifurcate at apex, on lateral angles each with smaller conical process. Phallus long, tubular, reflected dorsally at apex, terminating into 2 processes, one left, one right. Suspensorium long, Y-shaped. Diaphragm wide, strongly produced caudad along longitudinal median portion, dorsal margin deeply incised medially, about half depth of diaphragm. Opening for genital styles with dorsal margin straight at most part, curved laterad, ventral margin irregularly curved. Genital styles divergent, slender, slightly wide at base, abruptly narrowed and turned cephalad then laterad at apical third.

## Male (brachypterous)

Length of body: 1.96-2.10 mm.

Length of tegmen: 1.13-1.23 mm.

## Female (brachypterous)

Length of body: 2.56-2.83 mm.

Length of tegmen: 1.33-1.40 mm.

Specimens examined: 12♂♂, 11♀♀, Chuhkou, Chiayi Hsien, 29-I-1985, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan.



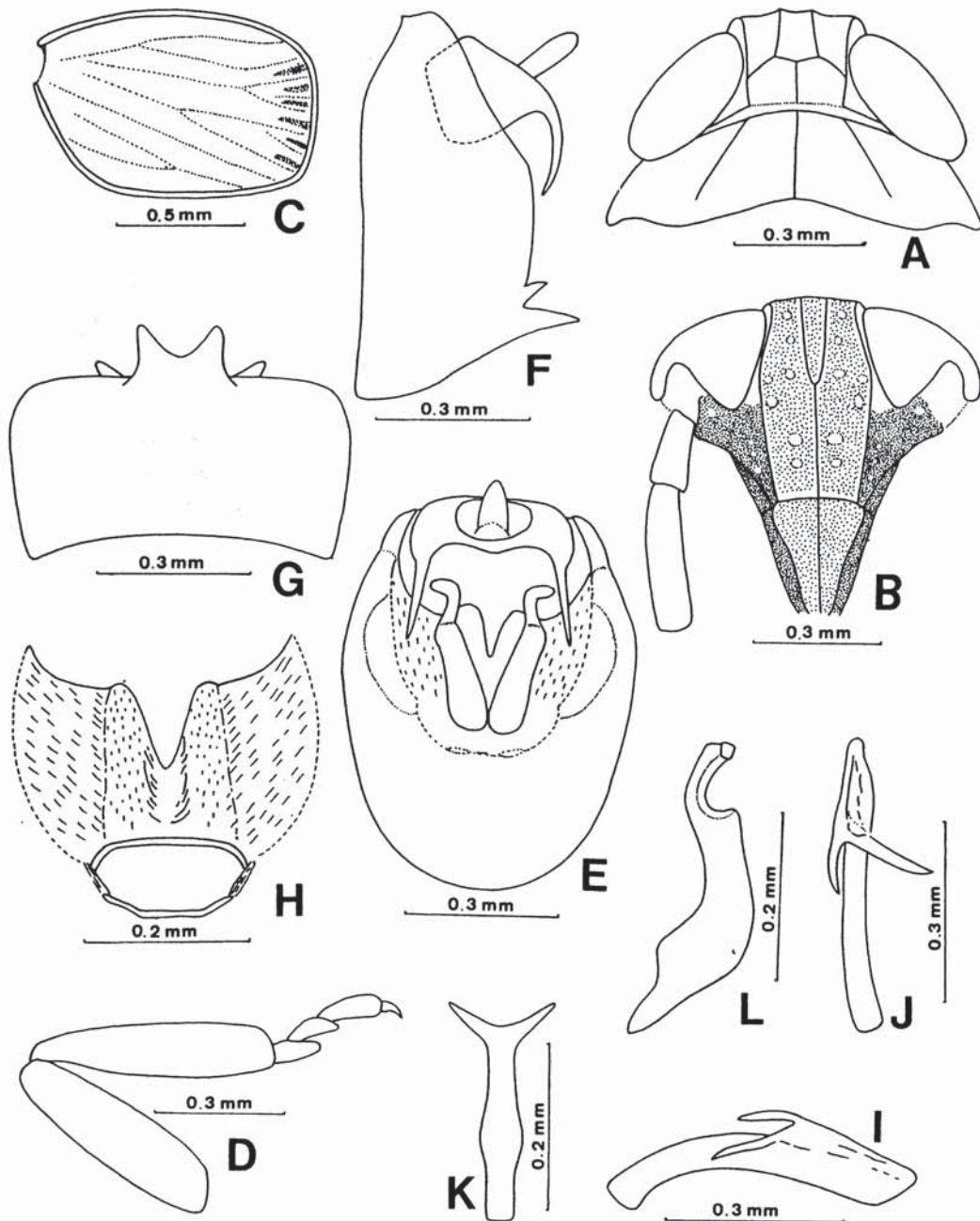


Fig. 53. *Cemus punctatus* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, fore leg; E, male genitalia, posterior view; F, the same, left side; G, pygofer, ventral view; H, diaphragm of pygofer; I, phallus, left side; J, the same, dorsal view; K, suspensorium; L, genital style, left side.

(47) *CEMUS CHANGCHIAS* Kuoh  
Fig. 54.

*Cemus changchias* Kuoh, 1981, *Acta Entomologica Sinica*, 24(4):422.  
—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:66.

General color uniformly pale brown. Intercarinal areas of frons scattered with yellowish spots. Genae darker. Tegmina hyaline, black marking from anterior margin along nodal line then posterior margin of apical half, along  $R_1$  and  $R_5$ , below  $Cu_1$  and short oblique line at base.

Vertex wider at base than long submedially about 1.4:1, apical margin transverse, lateral carinae concave, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 2.5:1. Frons longer in middle line than wide at widest part about 1.8:1, widest at level of ocelli, median carina forked at level of ocelli. Postclypeus at base as wide as frons at apex. Antennae with basal segment longer than wide about 2:1, shorter than second about 1:1.7. Post-tibial spur with about 27,32 teeth. Tegmina longer than widest part about 3:1.

Anal segment of male sunk in emargination of pygofer, lateroapical angles each produced in rather long, spinose process which reaching nearly to base of genital styles. Pygofer in profile about as wide ventrally as dorsally, in posterior view with opening as wide as long, in ventral view with medioventral process rather broad, slightly incised medially at apex. Phallus tubular, reflected cephalad at apex in 2 process, left one lobe-like, apex curved left, right one directed right then cephalad, outer margin with blunt small production medially. Suspensorium Y-shaped, arms short. Diaphragm broad, dorsal margin incised medially. Genital styles rather short, outer margin strongly concave medially.

Male (macropterous)

Length of body (includ.teg.): 4.06 mm.

Length of tegmen: 3.33 mm.

Female (macropterous)

Length of body (includ.teg.): 4.40 mm.

Length of tegmen: 3.73 mm.

Specimens examined: 1♂, 1♀, Taipei, 13-IV-1960, 25-IV-1960, K.S. Lin.

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China.



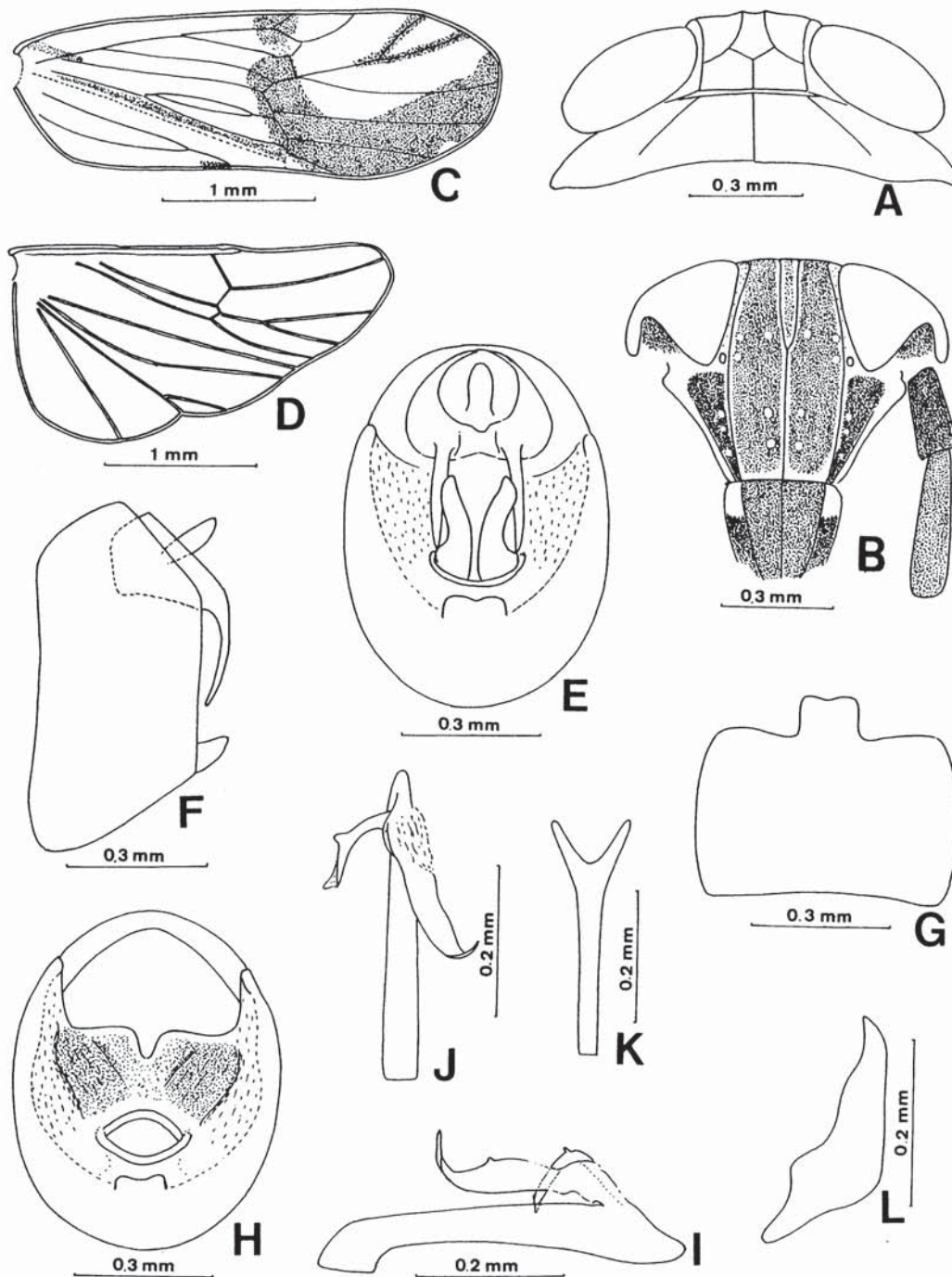


Fig. 54. *Cemus changchias* Kuoh A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, pygofer, ventral view; H, diaphragm of pygofer; I, phallus, left side; J, the same, dorsal view; K, suspensorium; L, genital style, left side.

(48) *CEMUS NIGROPUNCTATUS* (Matsumura, 1940) n. comb.

Fig. 55.

*Jamiphax nigropunctata* Matsumura, 1940, *Ins. Matsum.*, 15:36.*Phyllodinus nigropunctatus* (misidentification) Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:75.

Ishihara 1949, identified and figured his species as *Phyllodinus nigropunctatus* [Motschulsky, 1863], but according to Fennah 1973-75 (*Ent. scand. Suppl.*, 4:88, Figs. 27-31), Ishihara's species is another species which belongs to the genus *Cemus*.

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan, Japan.

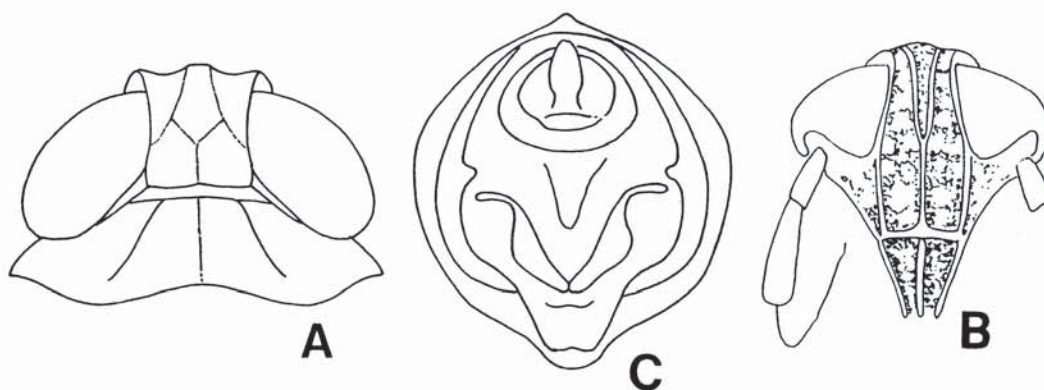


Fig. 55. *Cemus nigropunctatus* (Matsumura) A, head and pronotum dorsal view; B, frons and post-clypeus; C, male genitalia, posterior view. (after Ishihara)

(49) *CEMUS NIGROMACULOSUS* (Muir)

Fig. 56.

*Cemus nigromaculosus* Fennah, 1964, *Trans. R. Ent. Soc. Lond.*, 116(7):148.—: Fennah, 1969, *Pacific. Ins. Monogr.*, 21:35.—: Fennah, 1971, *Ins. Micronesia*, 6(8):572.*Phyllodinus nigromaculosus* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:319.—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:76.—: Fennah, 1956, *Ins. Micronesia*, 6(3):111.



The description and illustration are reproduced from Muir [1917].

Dark brown; lateral areas of pronotum, carinae of head and thorax, second joint of antennae, spots on frons, base and apex of femora and tibiae, hind tarsi and along hind tibiae, base of abdomen and anal tube lighter brown or yellowish. Tegmina hyaline, very light brown, fuscous over apical area, veins white with distinct black granules each bearing a white hair.

♂ Head as wide as thorax; vertex wider than long; mediofrontal carina forking near middle; antennae reaching to middle of clypeus or beyond, second segment slightly clavate; first and second femora and tibiae distinctly flattened but not so wide as in *P. nervatus* V. D.; tegmina reaching pygophor.

Pygophor short dorsally, long ventrally, aperture longer than broad, medio-ventral edge forming a small quadrate lip; anal segment large, with a long, curved spine at each apical corner; styles long, thin, diminishing to apex slightly sinuate; aedeagus complex, thin at the base, the apex forming a large barb with the corners projecting basad, that on the left forming a curved spine, that on the right a longer and thinner spine with a shorter one near base.

Length 2 mm.; tegmen 1.4 mm.

♀ similar to male in coloration.

Length 2.7 mm.; tegmen 1.7 mm.

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan, Japan, Philippines, West Micronesia, New Guinea, New Caledonia, Tonga, Fiji.



Fig. 56. *Cemus nigromaculosus* (Muir) A, male genitalia, posterolateral view (after Muir).

## 26. Genus *Ecdelphax* n. gen.

Head including eyes narrower than pronotum. Vertex as long as or slightly longer than wide at base, apical margin transverse, submedian carinae not uniting at apex, Y-shaped carina distinct. Frons longer in middle line than wide at widest part about 2:1, widest at middle, lateral carinae slightly convex medially, median carina forked above level of ocelli. Rostrum reaching to meso-trochanters. Ocelli present. Antennae cylindrical, reaching over middle of postclypeus, basal segment longer than wide about 2:1, shorter than second. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with 20-30 teeth.

Anal segment of male short and stout, ring-like, processes arising from apicolateral portion medially. Pygofer in profile narrow, caudoventral angle evenly curved, medioventral process rather small, in posterior view opening wider than long, lateral margins weakly defined. Phallus tubular, reflected at apex in flagellum. Suspensorium Y-shaped. Diaphragm broad, dorsal margin widely produced dorsad. Genital styles in caudal view forked at middle.

Type species: *Dicranotropis cervina* Muir  
(here designated)

The forked genital styles and the processes of male anal segment are characteristics of the genus.

### Key to the species of *Ecdelphax*

1. Frons and genae scattered with yellowish spots; anal segment of male with processes arising from apicobasal angles; pygofer in profile with hind margin distinctly produced caudad triangularly at dorsal third . . . . . *cervina* (Muir)
- Frons and genae concolorous, without spots; anal segment of male with processes arising from apicolateral portion medially; pygofer in profile with hind margin slightly produced truncately at dorsal half . . . . . *dentata* n.sp.



(50) *ECDELPHAX CERVINA* (Muir)

Fig. 57.

*Dicranotropis cervina* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:318.—: Kuoh, 1982, *Acta Entomologica Sinica*, 25(1):71.—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:85.*Dicranotropis nagaragawana* (misidentification) Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:71.

General color brown. Frons scattered with yellowish spots. Antennae yellowish brown, apex of basal segment and base of second somewhat black. Mesonotum with lateral areas more dark. Abdomen and pygofer dark brown. Tegmina semihyaline, grayish brown, veins dark brown.

Vertex slightly longer submedially than wide at base about 1.2:1, at apex as wide as at base, apical margin transverse, lateral carinae slightly concave, submedian carinae not uniting at apex, basal compartment longer at base than greatest length about 1.7:1. Frons longer in middle line than wide at widest part about 1.9:1, widest just below level of ocelli, median carina forked above level of ocelli. Postclypeus wider at base than frons at apex. Antennae with basal segment longer than wide about 2:1, shorter than second about 1:1.7. Post-tibial spur with 27, 32 teeth. Tegmina longer than widest part about 3.1:1.

Anal segment of male not sunk into emargination of pygofer, processes arising from apicobasal angle, small, ventral margin sinuate, directed caudad. Pygofer in profile with hind margin slightly produced truncately at dorsal half, in this aspect medio-ventral process visible, in caudal view with opening wider than long, lateral margins not well defined. Phallus tubular, reflected at apex in single, large process, not reaching to base, at terminal cleft into 2 small processes, apex truncate, left side subapically with single process. Suspensorium with arms about half as long as stem. Diaphragm wide, dorsal margin truncately produced dorsad. Genital styles relatively large, forked near middle, curve between 2 branches evenly, inner side strongly concave medially, in lateral view inner branch angulate at apical half.

## Male (macropterous)

Length of body (includ.teg.): 4.00 mm.

Length of tegmen: 3.60 mm.

Specimen examined: 1♂ (dissected) Kuantaochi, Nantou Hsien, 5-IX-1987, M.M. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China, Philippines.

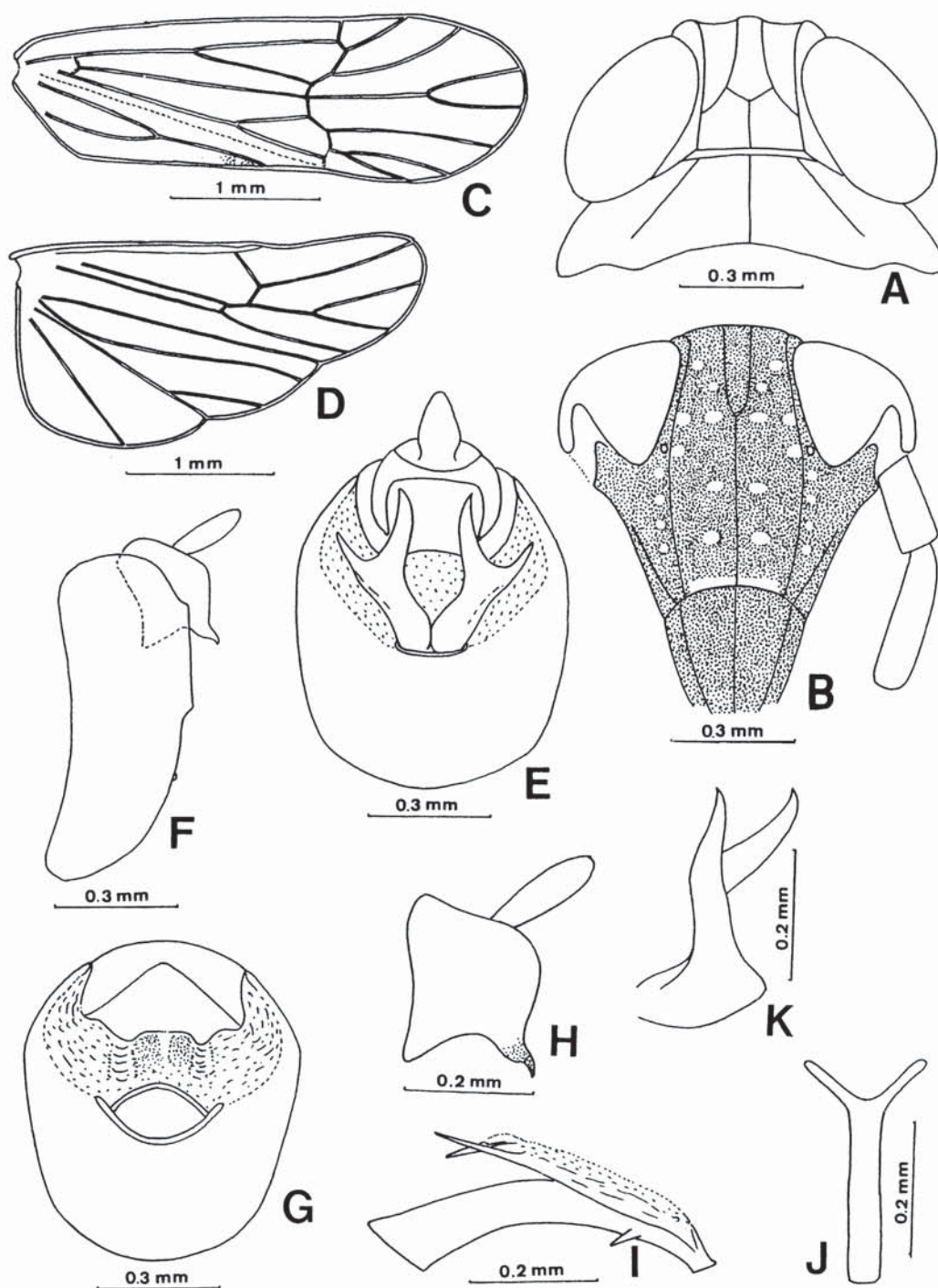


Fig. 57. *Ecdelphax cervina* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, left side.



(51) *ECDELPHAX DENTATA* n.sp.

Fig. 58.

General color pale brown. Basal and base of second antennal segments dark brown. Metapleura with black spot. Abdomen with lateral sides and ventrum of pygofer black. Tegmina semiopaque, pale brown, near end of clavus and apical veins black.

Vertex as long in middle line as wide at base, at apex slightly narrower than at base, apical margin transverse, lateral carinae straight, basal compartment wider at base than greatest length about 2:1. Frons longer in middle line than wide at widest part about 2:1, widest at level of ocelli, narrowed near base, median carina forked above level of ocelli. Postclypeus wider at base than frons at apex. Antennae with basal segment longer than wide about 2.2:1, shorter than second about 1:2. Post-tibial spur with 21-22 teeth. Tegmina longer than widest part about 3.2:1.

Anal segment of male small, sunk into emargination of pygofer, processes arising from apicolateral portion medially, stout, directed dorsocaudad. Pygofer in profile with hind margin distinctly produced caudad triangularly at dorsal third, in this aspect small medioventral process distinct, in caudal view opening wider than long, lateral margins not well defined. Phallus large, tubular, reflected at apex in single, long, twisted process, nearly reaching to base, in profile apex truncate, left side subapically with 2 small processes. Suspensorium with arms as long as stem. Diaphragm wide, dorsal margin roundly produced dorsally. Genital styles in caudal view forked at middle, abruptly curve between 2 branches, inner margin slightly concave medially, in lateral view apical half sinuated, cephaloapical portion distinctly concave, 2 branches nearly at same plane.

The name *dentata* is Latin adjective, toothed.

Male (macropterous)

Length of body (includ.teg.): 3.86 mm.

Length of tegmen: 3.33 mm.

Holotype: Male, Chaipaotai, Taichung Hsien, 11-VII-1987, C.T. Yang. In NCHU.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from *Ecdelphax cervina* (Muir) in having frons and genae concolorous; the processes of male anal segment; projection of hind margin of pygofer in profile; the reflected flagellum of phallus terminating in single process (double in *cervina*).

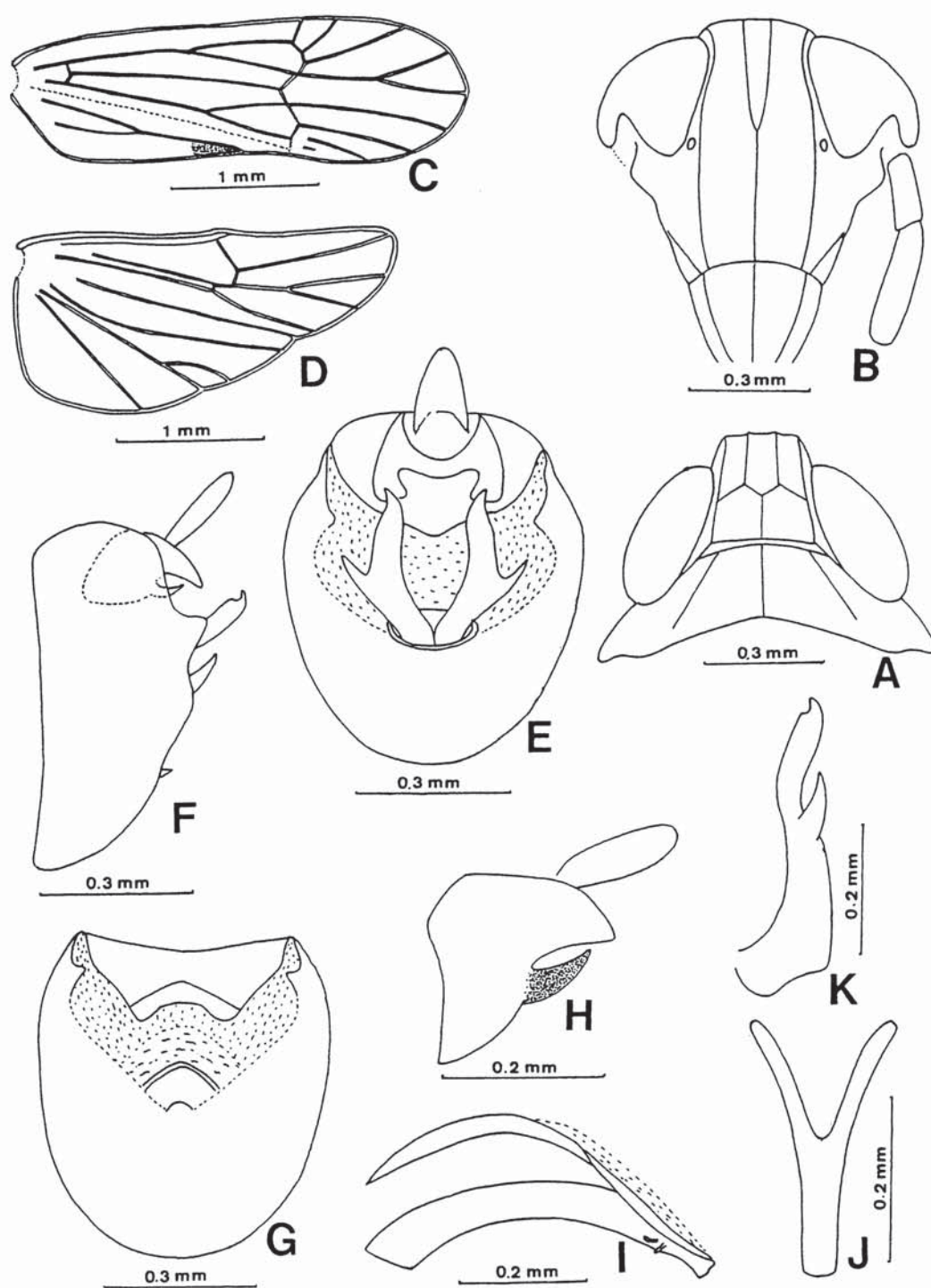


Fig. 58. *Ecdelphax dentata* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, left side.



## 27. Genus *Cemopsis* Fennah

*Cemopsis* Fennah, 1978, *Ann. Zool. Warsz.*, 34(9):19.

The generic characters outlined by Fennah [1978] are modified as follows.

Head including eyes slightly narrower than pronotum. Vertex wider at base than long submedially about 1.2:1, apical margin truncate, submedian carinae not uniting at apex, Y-shaped carina present. Frons longer in middle line than wide at widest part about 2:1, widest at level of ocelli, median carina forked at level of ocelli. Postclypeus wider at base than frons at apex. Rostrum reaching over meso-trochanters. Ocelli present. Antennae cylindrical, basal segment longer than wide, shorter than second about 1:2.3. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 30 teeth.

Anal segment of male collar-shaped, lateroapical angles produced. Pygofer in profile short, very high, with ventral surface strongly convex, medioventral process distinct in this aspect. Phallus tubular, straight. Suspensorium Y-shaped. Diaphragm broad, in profile produced caudad over hind margin of pygofer. Genital styles simple.

Type species: *Cemopsis griphus* Fennah  
(original designation)

### (52) *CEMOPSIS GRIPHUS* Fennah

Fig. 59.

*Cemopsis griphus* Fennah, 1978, *Ann. Zool. Warsz.*, 34(9):20.

General color pale yellowish brown. Metapleura with round brown spot. Abdomen with dorsum yellowish brown, ventrum dark brown. Tegmina with apex and end of clavus black.

Vertex wider at base than long submedially about 1.1:1, wider at base than at apex, apical margin truncate, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 1.9:1. Frons longer in middle line than wide at widest part about 1.8:1, widest at level of ocelli, lateral carinae nearly straight below ocelli, concave between eyes, median carina forked at level of ocelli. Postclypeus wider at base than frons at apex. Rostrum long, reaching to meta-coxae. Antennae reaching to middle of postclypeus, basal segment longer than wide, shorter than second about 1:2.6. Brachyperous tegmina long, not really reaching to apex of abdomen, rounded at apex. Post-tibial spur with 25-27 teeth.

Anal segment of male with lateroapical angles each produced in a spinose process, directed mesoventrad. Pygofer in profile extremely high, laterodorsal angle rounded, medioventral process distinct, diaphragm distinctly produced caudad over hind margin triangular, phallus nearly longitudinal, connective strongly curved, running along ventral margin, in posterior view opening longer than wide, lateral margins not well defined. Phallus tubular, laterally compressed, apex truncate, in dorsal view with

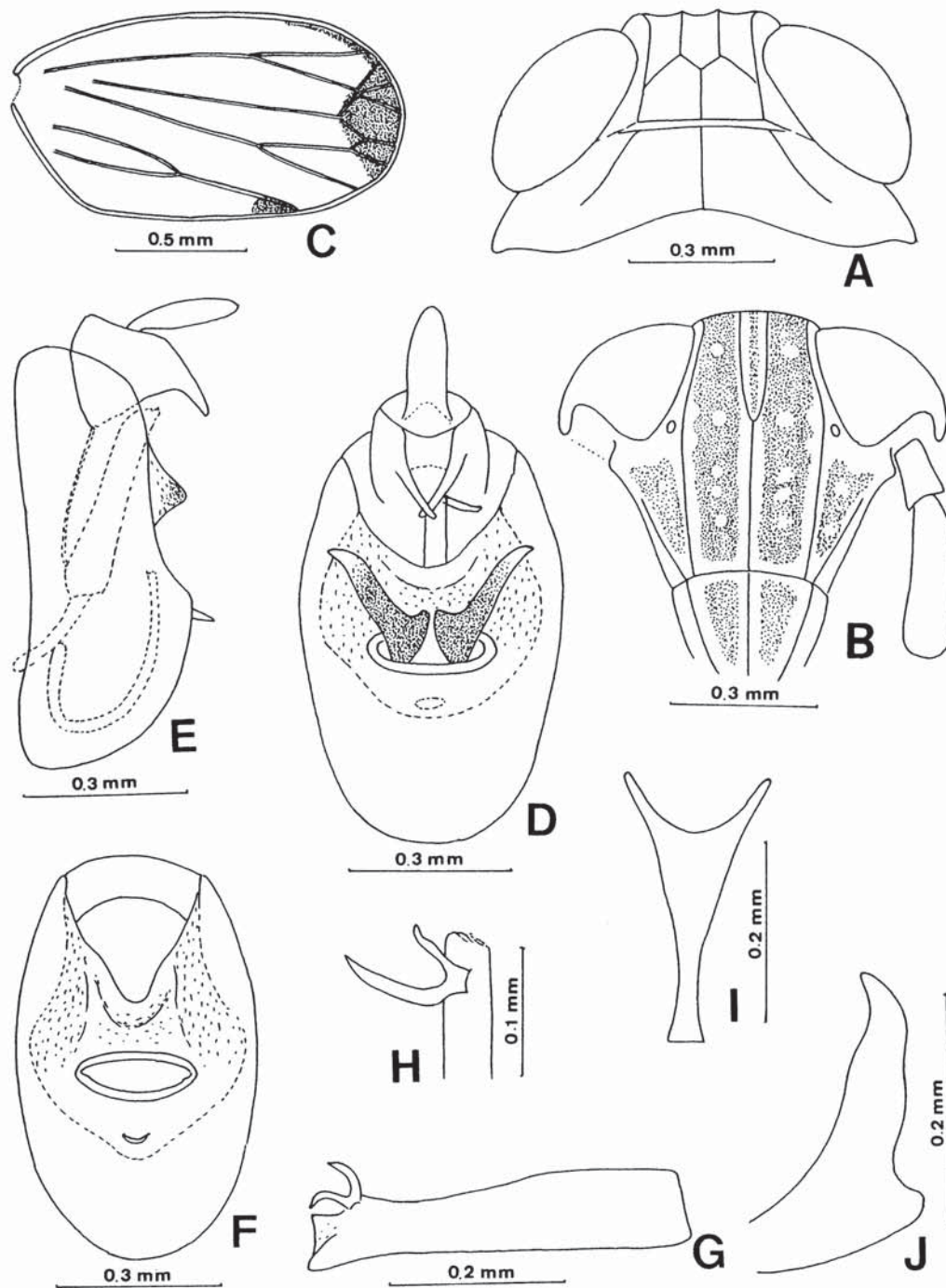


Fig. 59. *Cemposis griphus* Fennah A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, phallus, right side; H, apex of phallus, dorsal view; I, suspensorium; J, genital styles, left side.



2-branched process subapically, anterior one directed apical then downward, posterior one directed right. Suspensorium Y-shaped, arms very short. Diaphragm wide, strongly incised at dorsal margin. Genital styles short, divergent apically, apical portion slightly curved laterad, basal angle produced in a blunt process.

Male (brachypterous)

Length of body: 2.26 mm.

Length of tegmen: 1.56 mm.

Specimen examined: 1♂, Shantimen, Pingtung Hsien, 1-5, III-1982, K.C. Chou & C.C. Pan.

Host plant: Unknown.

Distribution: Taiwan (new record), Viet-nam.

## 28. Genus *Horcoma* Fennah

*Horcoma* Fennah, 1969, *Pacif. Ins. Monogr.*, 21:36.

—: Kuoh et Ding, 1983, *Econ. Ins. Fauna China*, 27:80.

The generic characters outlined by Fennah [1969] are modified as follows.

Head including eyes narrower than pronotum. Vertex as long submedially as wide at base, apical margin truncate, submedian carinae not uniting at apex, Y-shaped carina distinct. Frons longer in middle line than wide at widest part about 2:1, widest at level of ocelli, lateral carinae convex, median carina forked basally. Postclypeus strongly convex, as wide as long. Rostrum just reaching over meso-trochanters. Ocelli distinct. Antennae cylindrical, reaching over frontoclypeal suture, basal segment as long as wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 15-20 teeth.

Anal segment of male ring-like, lateroapical angles each produced in a spinose process. Pygofer strongly rounded, with posterior opening relatively small, without medioventral process. Phallus rather short, tubular, armed with many teeth. Suspensorium circular ventrally. Genital styles relatively short and stout.

Type species: *Delphacodes lacteipennis* Muir  
(original designation)

### Key to the species of *Horcoma*

1. Pronotum with basal half greenish white each side with a transverse elongate oval black marking; post-tibial spur with 19-21 teeth ..... *dividua* n.sp.
- Pronotum with basal half white; post-tibial spur with 11-13 teeth .....  
..... *colorata lacteipennis* (Muir)

(53) *HORCOMA COLORATA LACTEIPENNIS* (Muir)

Fig. 60.

*Horcoma colorata lacteipennis* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:113.*Horcoma lacteipennis* Fennah, 1971, *Ins. Micronesia*, 6(8):582.*Delphacodes celaeno* Fennah, 1956, *Ins. Micronesia*, 6(3):126.*Delphacodes lacteipennis* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:337.—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:58.

General color dark brown. Pronotum with basal half white. Apices of tibiae and tarsi somewhat paler. Tegmina hyaline.

Vertex wider at base than long submedially about 1.1:1, apical margin truncate, submedian carinae not really uniting at apex, Y-shaped carina distinct, basal compartment wider at base than greatest length about 1.9:1. Frons longer in middle line than wide at widest part about 1.7:1, widest at level of ocelli, lateral carinae convex medially, median carina forked at basal fourth. Postclypeus wider at base than frons at apex. Post-tibial spur with 11-13 teeth. Tegmina longer than widest part about 2.6:1.

Anal segment of male large, lateroapical angles widely separated, each produced in spinose process, directed ventrad. Pygofer in profile wider ventrally than dorsally, laterodorsal angle acutely produced, diaphragm far protruding over hind margin, in posterior view opening with lateral margins not well defined, ventral margin well defined and strongly incised. Phallus tubular, slightly compressed, armed with many teeth mainly on ventral median area. Orifice terminal. Suspensorium circular ventrally. Diaphragm narrow, dorsal margin produced triangularly and pigmented. Genital styles small, outer margin strongly emarginate at apical half, inner angle pointedly produced, apical margin truncate.

## Male (macropterous)

Length of body (includ.teg.): 2.26 mm.

Length of tegmen: 1.93 mm.

## Female (macropterous)

Length of body (includ.teg.): 2.53 mm.

Length of tegmen: 2.13 mm.

Specimens examined: 1♂, Chung yeon, WS Taiwan, 20-5-1961, K.S. Lin; 1♀,

Pingtung, Pingtung Hsien, 17-VII-1960, K.S. Lin.

Host Plant: Unknown.

Distribution: Taiwan, Java, Fiji, Palau, Caroline Atolls.



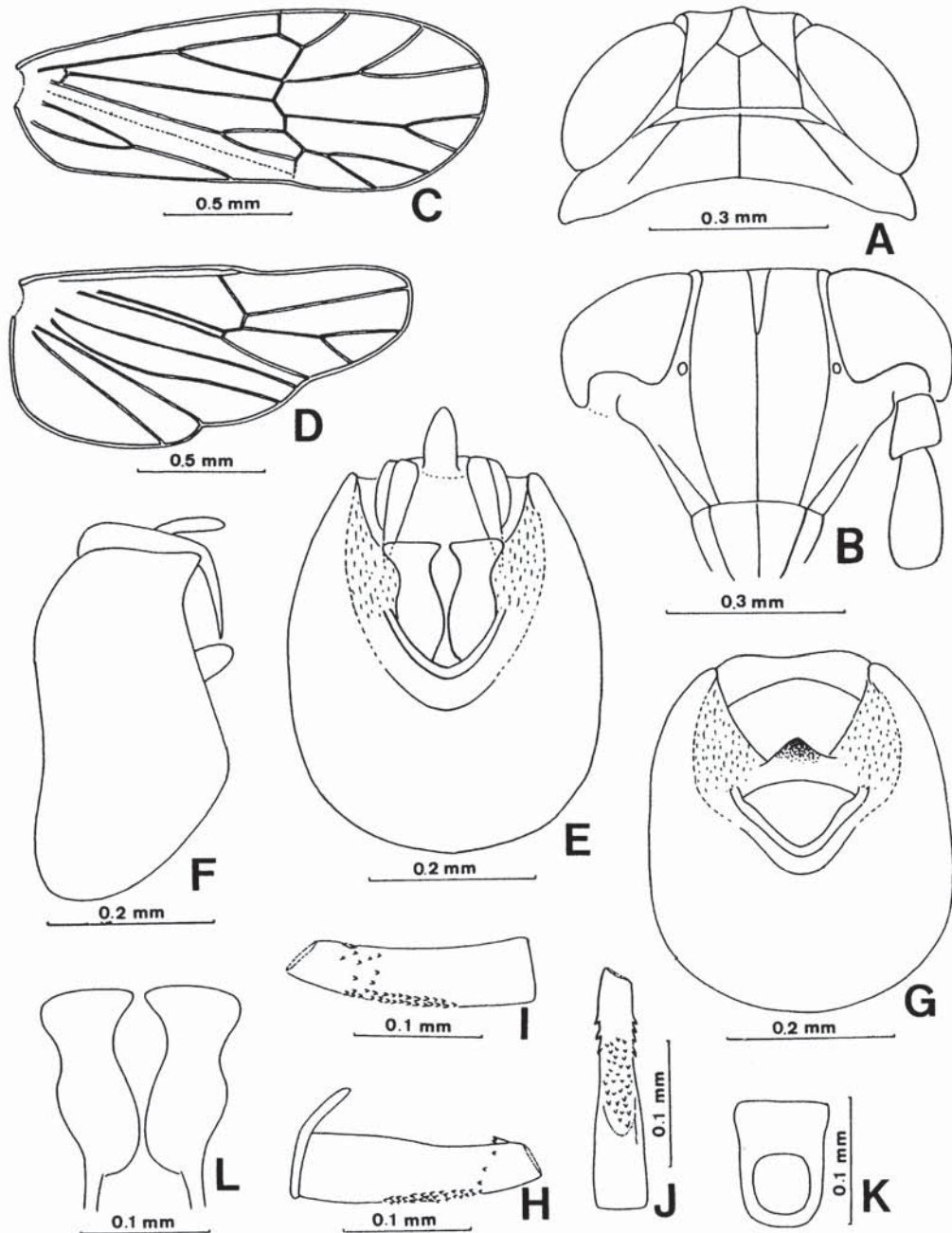


Fig. 60. *Horcoma colorata lacteipennis* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, left side; I, the same, right side; J, the same, ventral view; K, suspensorium; L, genital style, posterior view.

(54) *HORCOMA DIVIDUA* n.sp.

Fig. 61.

General color dark brown to black. Pronotum with basal half greenish white, each side with a transverse elongate oval black marking. Legs with apices of femora, apices of tibiae, post-tibial spur, first tarsal segment of fore and mid-legs, second of hind legs yellowish. Tegmina hyaline, brown.

Vertex wider at base than long submedially about 1.1:1, rounding into frons, apex wider than base, lateral carinae nearly straight, basal compartment wider at base than greatest length about 2.1:1. Frons longer in middle line than wide at widest part about 1.7:1, widest at level of ocelli, lateral carinae only slightly convex. Postclypeus distinctly wider at base than frons at apex, wider at base than long. Rostrum reaching to meso-trochanters. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.3:1, shorter than second about 1:2. Post-tibial spur with 19-21 teeth.

Anal segment of male with lateroapical angles narrowly separated, each produced into a long spinose process, directed ventrad. Pygofer in profile wider ventrally than dorsally, laterodorsal angle strongly produced triangularly, not reflected, in posterior view with opening longer than wide, lateral margins not well defined. Phallus tubular, moderate large, apical half with many teeth obliquely. Orifice terminal, dorsad. Suspensorium small, slightly longer than wide, ring-like at ventral half. Diaphragm moderate wide, dorsal margin roundly produced. Opening for genital styles evenly curved at dorsal margin, deeply concave ventrally, ventral margin wide. Genital styles moderate large, divergent, very wide and subtruncate at apex, narrowed subapically, in caudo-lateral view with production of basal angle truncate at apex.

The name *dividua* is Latin adjective, dividable.

Male (macropterous)

Length of body (includ.teg.): 2.06 mm.

Length of tegmen: 1.76 mm.

Holotype: Male, Nanjenshan, Pingtung Hsien, 14-II-1985, C.T. Yang. In NCHU.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from *Horcoma colorata lacteipennis* in having pronotum with basal half greenish white, each side with a transverse elongate oval black marking (pronotum with basal half white in *colorata lacteipennis*); post-tibial spur with 19-21 teeth (11-13 teeth in *colorata lacteipennis*).



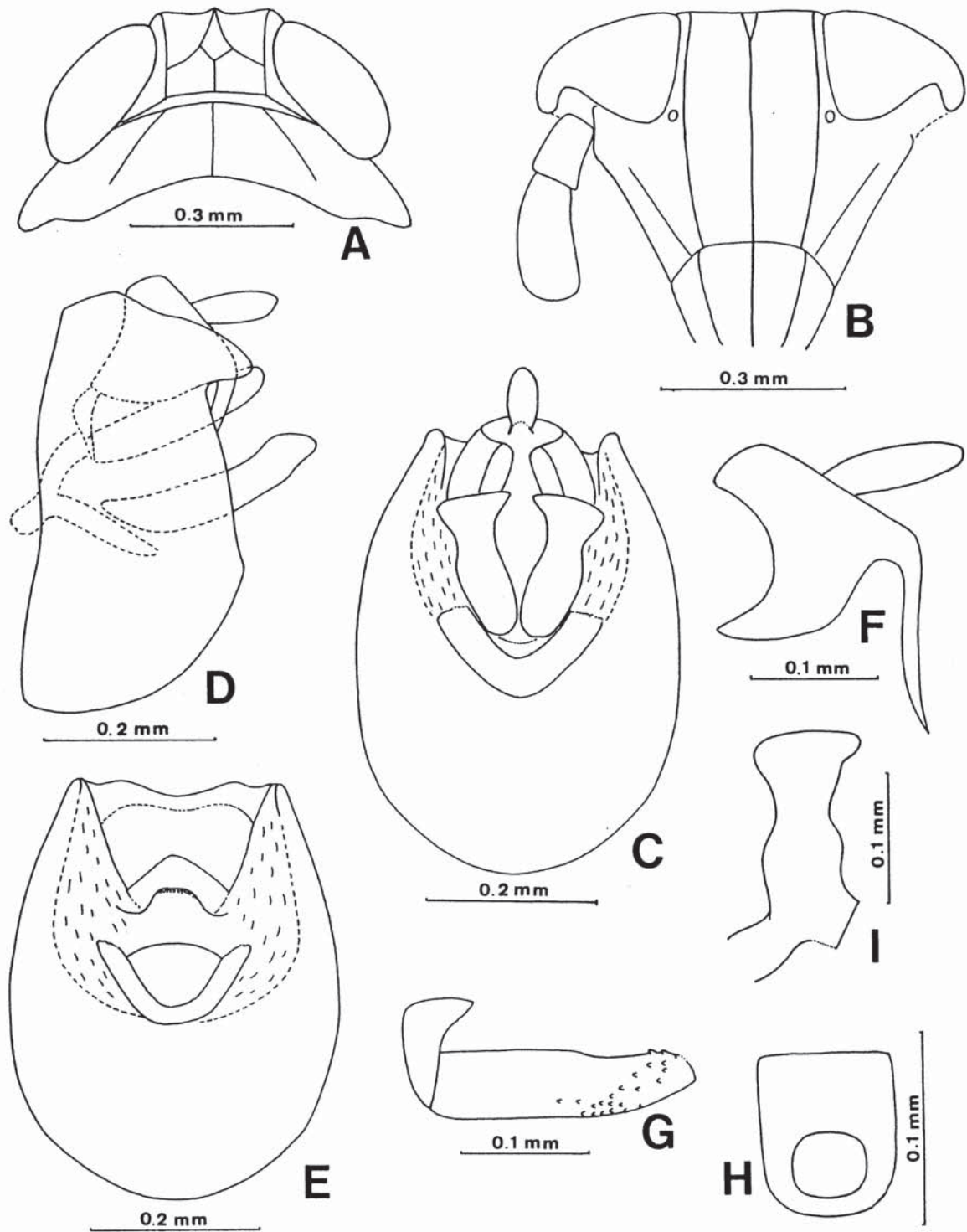


Fig. 61. *Horcoma dividua* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, the same, left side; E, diaphragm of pygofer; F, anal segment of male, left side; G, phallus, left side; H, suspensorium; I, genital style, left side.

## 29. Genus *Indozuriel* Fennah

*Indozuriel* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:133.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:74.

The generic characters outlined by Fennah [1973-75] are modified as follows.

Small size. Head including eyes narrower than pronotum. Vertex about as long submedially as wide at base, obtusely rounding into frons, apical margin slightly convex, submedian carinae not uniting at apex, Y-shaped carina present or stem feeble. Frons longer in middle line than wide at widest part about 1.5-2.1:1, widest at level of ocelli, lateral margins convex, median carina forked. Postclypeus at base wider than frons at apex. Rostrum reaching to meta-trochanters. Pronotum with lateral carinae reaching hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 11 teeth.

Anal segment of male short, ring-like, apical margin transverse, lateroapical angle not produced or median portion produced in a slender process. Pygofer in profile longer ventrally than dorsally, in posterior view opening longer than wide, medioventral process present. Phallus long, simple. Suspensorium fine, Y-shaped. Diaphragm broad. Genital styles slender.

Type species: *Indozuriel samiator* Fennah  
(original designation)

### (55) *INDOZURIEL DANTUR* Kuoh

Fig. 62.

*Indozuriel dantur* Kuoh, 1980. *Acta Ent. Sinica*, 23(2):195.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:74.

General color pale brown. Carinae and pronotum below eyes yellowish white. Antennae pale yellowish brown with apex of basal segment and base of second dark brown. Rostrum and legs yellowish except meta-femora pale brown. Abdomen dark brown. Tegmina hyaline, with black markings as figured.

Vertex slightly wider at base than long submedially about 1.1:1, apical margin transverse, at apex narrower than at base, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment wider at base than greatest length about 1.8:1. Frons longer in middle line than wide at widest part about 2.1:1, widest at level of ocelli, lateral carinae strongly concave near base, straight below ocelli, median carina forked above level of ocelli. Rostrum reaching to meta-coxae. Antennae with basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not really attaining hind margin. Post-tibial spur with 11-12 teeth. Tegmina longer than widest part about 3.4:1.



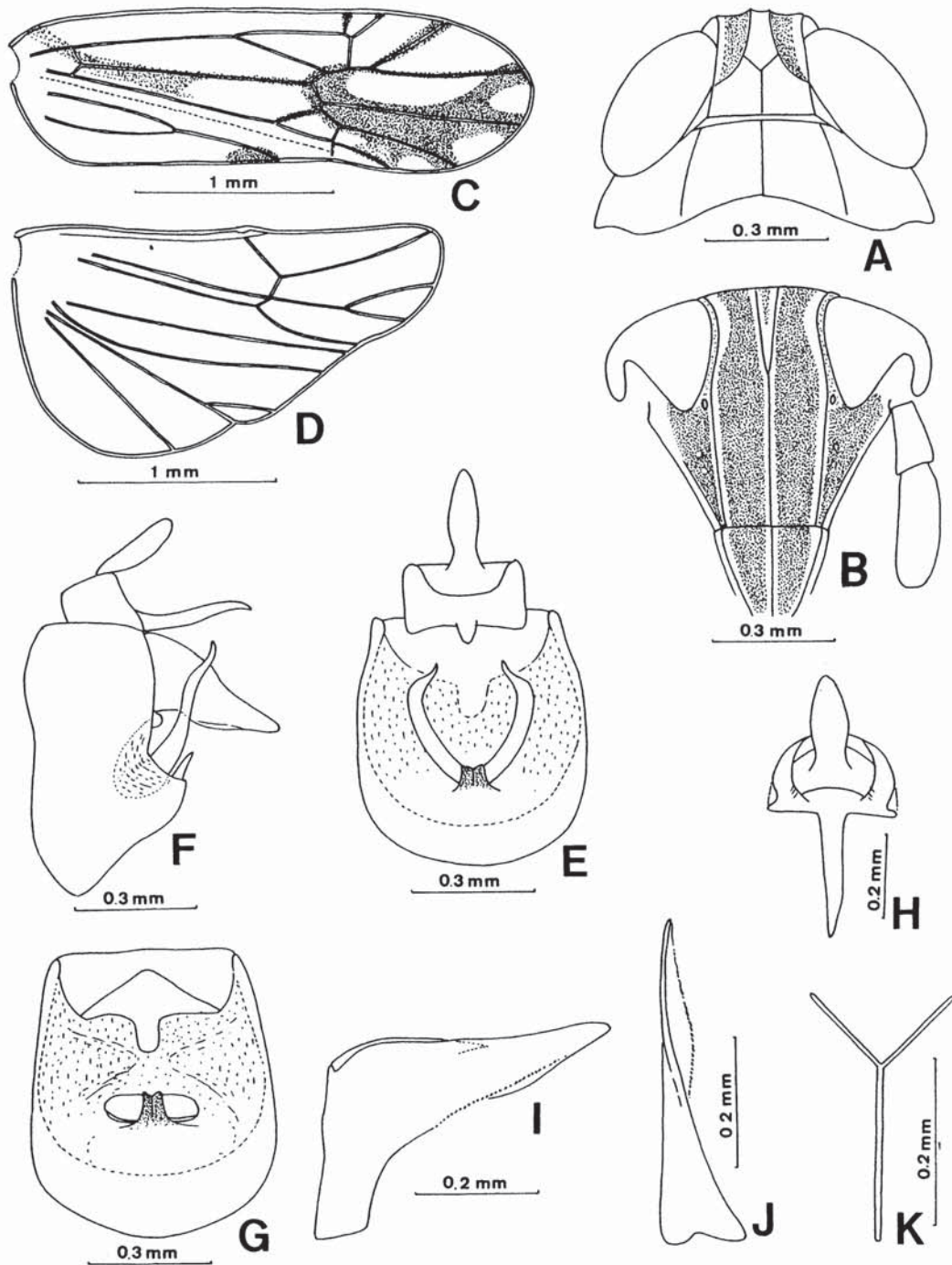


Fig. 62. *Indozeuriel dantur* Kuoh A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, dorsal view; I, phallus, left side; J, the same, dorsal view; K, suspensorium.

Anal segment of male short, apical margin lower, median portion produced in a long, slender process, directed caudad. Pygofer in profile with caudoventral angle strongly produced caudad, medioventral process triangular, caudal area near base of genital style strongly emarginate, diaphragm slightly produced over hind margin, in posterior view with opening very large, wider than long, lateral margins not well defined, medioventral process seemly combined from 2 lobes, apical margin slightly incised medially, opening with lateral areas somewhat raised. Phallus very large, strongly compressed, blade-shaped, in left side view with prominent petiole, at dorsobasal margin somewhat rolling left, ventral margin after middle rolling too and armed with many small teeth. Suspensorium Y-shaped, very weakly sclerotized, very fine and unpigmented. Diaphragm broad, dorsal margin deeply incised roundly. Genital styles slender, apical third curved mesad then dorsad.

Male (macropterous)

Length of body (includ.teg.): 3.40 mm.

Length of tegmen: 2.66 mm.

Female (macropterous)

Length of body (includ.teg.): 3.73 mm.

Length of tegmen: 3.16 mm.

Specimens examined: 1♂, Taipei, 22-VI-1960, K.S. Lin; 1♀, Taipei, 14-V-1960, K.S. Lin.

Host plant: Unknown in Taiwan.

Distribution: Taiwan (new record), Mainland China.

### 30. Genus *Tarophagus* Zimmerman

*Tarophagus* Zimmerman, 1948, *Ins. Hawaiian*, 4:245.

The generic characters outlined by Zimmerman [1948] are modified as follows.

Head including eyes narrower than pronotum. Vertex longer submedially than wide at base about 1.3:1, subacutely running into frons, apical margin transverse, submedian carinae not uniting at apex, Y-shaped carina not distinct, basal compartment wider at base than greatest length about 1.2:1. Frons longer in middle line than wide at widest part about 2:1, widest at apical third. Rostrum reaching to meta-coxae. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:1.7. Ocelli present. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male ring-like, lateroapical angles each produced into a stout process. Pygofer in profile longer ventrally than dorsally, dorsal margin acutely angulated medially, laterodorsal angle inflected mesad, in posterior view with opening distinctly wider than long, with 3 medioventral processes. Phallus tubular, flagellum reflected cephalad above phallus, forking into 2 processes. Suspensorium slender, with small arms at dorsal margin. Diaphragm moderately narrow. Genital styles short, simple.

Type species: *Megamelus proserpina* Kirkaldy  
(original designation)



(56) *TAROPHAGUS COLOCASIAE* (Matsumura)

Fig. 63.

*Tarophagus colocasiae* Wilson et Ashe, *Bull. Ent. Res.* (in press).*Delphacodes? colocasiae* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 36.*Liburnia (Delphax) colocasiae* Matsumura, 1920, *Dainippon Gaichu Zensho, form. ser.* (rev. and added.), 564.*Megamelus proserpina* (misinterpretation) Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 19.-: (misidentification) Matsumura et Ishihara, 1945, *Mushi*, 16:71.-: (misidentification) Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:78.

General color brown to dark brown. Along median carina of pronotum, mesonotum and mesoscutellum yellowish white, legs light brown to yellowish brown except fore and mid-coxae dark brown. Tegmina gray to black except along anterior margin colorless.

Vertex longer submedially than wide at base about 1.3:1, slightly narrower at apex than at base, lateral carinae straight, Y-shaped carina feeble, submedian carinae not uniting at apex, basal compartment of vertex wider at base than greatest length about 1.2:1. Frons in middle line longer than wide at widest part about 2:1, widest in middle of ocellus and frontoclypeal suture, lateral carinae convex, median carina forked about at middle of eyes. Postclypeus at base as wide as frons at apex, distinctly longer than wide at base. Antennae surpassing middle of postclypeus, basal segment longer than wide about 2:1, shorter than second about 1:1.7. Post-tibial spur with about 23 teeth. Tegmina longer than widest part about 3.3:1, brachypterous with apex truncate, apicoventral in right angle.

Anal segment of male with lateroapical angles narrowly separated, each produced ventrad in a stout spinose process. Pygofer in profile much longer ventrally than dorsally, laterodorsal angles strongly inflected mesad, caudal margin extremely short. Phallus long, tubular, arched upward medially, narrowed at apex, flagellum reflected cephalad into 2 processes, one reaching to middle on left, another short one on right. Orifice dorsad near apex. Diaphragm with dorsal margin moderately convex, produced caudad medially. Opening for genital styles nearly straight on dorsal margin and shallowly concave on ventral margin. Genital styles in caudal aspect short and quadrate, outer angle produced laterad broadly, somewhat arched upward medially, rounded at apex.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.); | 3.69-3.83 mm.  | 2.40-2.73 mm.   |
| Length of tegmen:                | 3.13-3.27 mm.  | 0.83-0.90 mm.   |
| Female (macropterous)            |                |                 |
| Length of body (includ.geg.):    | 3.96-4.03 mm.  |                 |
| Length of tegmen:                | 3.40-3.47 mm.  |                 |

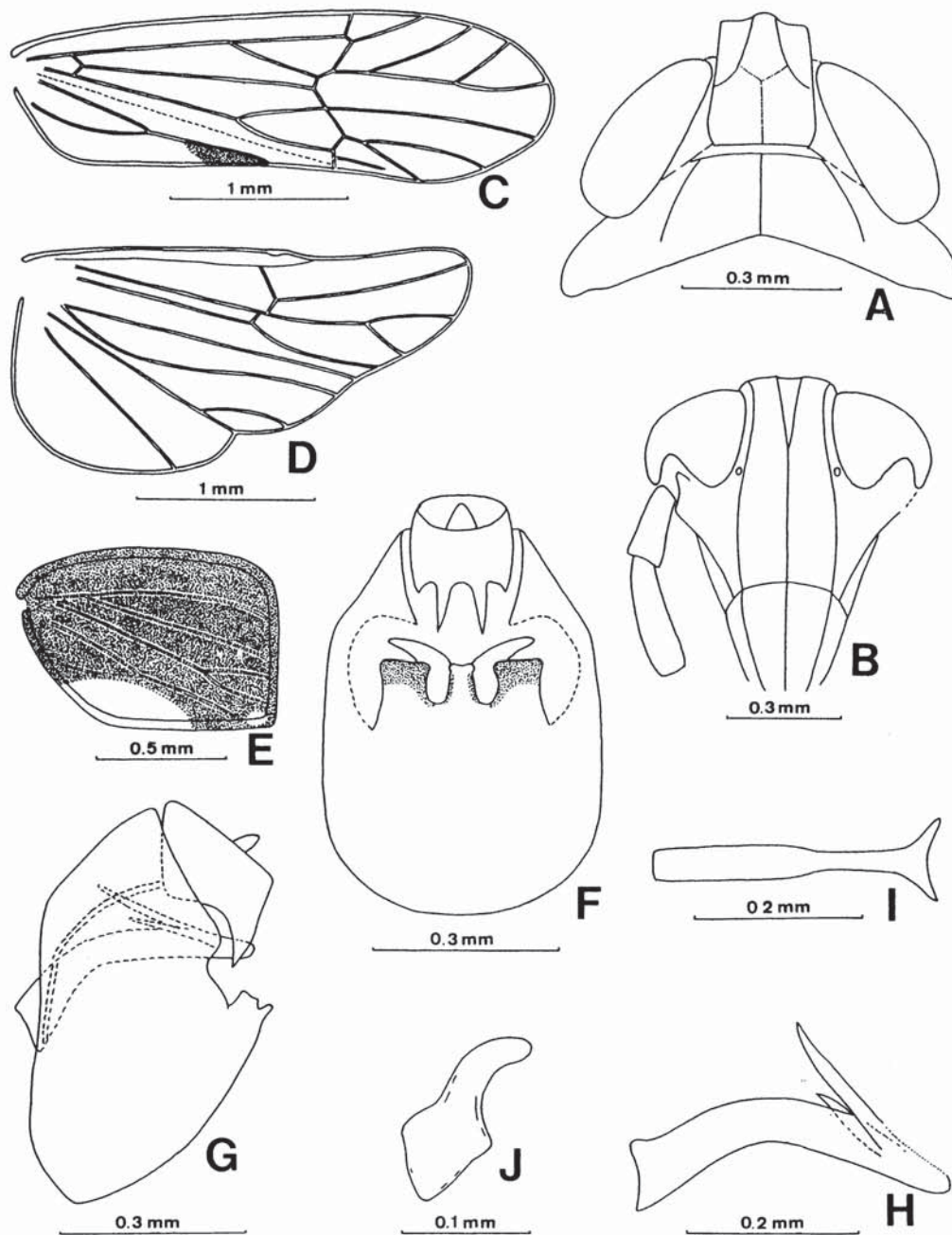


Fig. 63. *Tarophagus colocasiae* (Matsumura) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, tegmen (brachypterous); F, male genitalia, posterior view; G, the same, left side; H, phallus, left side; I, suspensorium; J, genital style, left side.



Specimens examined: 14♂♂, 9♀♀, Chiasien, Kaohsiung Hsien 23-X-1981, C.T. Yang.

Host plant: *Colocasia antiquorum*

Distribution: Taiwan, Micronesia, Philippines, Amboina, Java.

Dr. Asche of University of Philipps, West Germany, corrected the author's manuscript said that "Dr. Wilson and me have just finished a revision of *Tarophagus*: our results clearly show that *T. prosperpina* (loc.typ. = Fiji) does not occur in Taiwan. The Taiwanese species (also what you have figured) is different and has to be named *Tarophagus colocasiae* (Matsumura) Our paper is going to be published in Bull. Ent. Res."

### 31. Genus *Onidodelphax* n. gen.

Head including eyes narrower than pronotum. Vertex as long submedially as wide at base, slightly wider at apex than at base, apical margin transverse, Y-shaped carina distinct, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 1.3:1. Frons in middle line longer than wide at widest part about 1.8:1, lateral carinae evenly convex medially. Postclypeus slightly wider at base than frons at apex, distinctly wider at base than long in middle line. Rostrum reaching to meso-trochanters. Ocelli present. Antennae cylindrical, basal segment longer than wide, shorter than second. Pronotum with lateral carinae not attaining hind margin. Wings with M and Sc<sub>1</sub> fused apically. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 13 teeth, each with one seta.

Anal segment very small, ring-like, lateroapical angles obtusely produced. Pygofer in lateral view as wide dorsally as ventrally, laterodorsal angle rectangular, in posterior view opening distinctly wider than long, without medioventral process. Phallus tubular, apical two-thirds decurved downward which armed with complex teeth. Suspensorium circular. Diaphragm broad. Genital styles moderately long, parallel, simple.

Type species: *Onidodelphax serratus* n.sp.  
(here designated)

This genus may possibly be proved to be most readily recognizable by the characters of phallus; size and shape of anal segment of male; moderate number of teeth on the post-tibial spur; the wings with M and Cu<sub>1</sub> fused apically and by the brachypetrous individuals with relative long tegmina.

(57) *ONIDODELPHAX SERRATUS* n.sp.

## Fig. 64.

General color yellowish brown. Abdomen pale black. Tegmina hyaline, grayish white, granulose concolorous with veins.

Vertex nearly as wide at base as long submedially, roundly running to frons, apex transverse, lateral carinae slightly concave, basal compartment wider at base than greatest length about 1.3:1. Frons longer in middle line than wide at widest part about 1.8:1, widest at level of ocelli, lateral margin convex medially. Postclypeus wider at base than frons at apex. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.7:1, shorter than second about 1:2. Post-tibial spur with about 13 teeth.

Anal segment of male with lateroapical angles obtusely produced, not spinose-shaped, widely separated. Pygofer in profile with laterodorsal angle produced but not reflected, in posterior view with opening wider than long, lateral margins defined. Phallus tubular, apical two-thirds decurved downward, left side with small tooth, right with large process which armed 3 teeth at basal margin, in caudal view trifid. Diaphragm with dorsal margin nearly membraneous medially. Opening for genital styles evenly curved dorsally, ventral margin concave. Genital styles slender, parallel, apical third attenuate, inner angle obliquely truncate, outer angle rounded.

The name *serratus* is Latin adjective, serrate.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.): | 3.03 mm        | 1.80-1.93 mm.   |
| Length of tegmen:                | 2.53 mm.       | 1.36-1.43 mm.   |
| Female (brachypterous)           |                |                 |
| Length of body:                  | 2.13-2.26 mm.  |                 |
| Length of tegmen:                | 1.36-1.53 mm.  |                 |

Holotype: Male (macropterous) (dissected), Tsaoliing, Yunlin Hsien, 6-VIII-1985, C.T. Yang. In NCHU.

Paratypes: 3♂♂, 2♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.



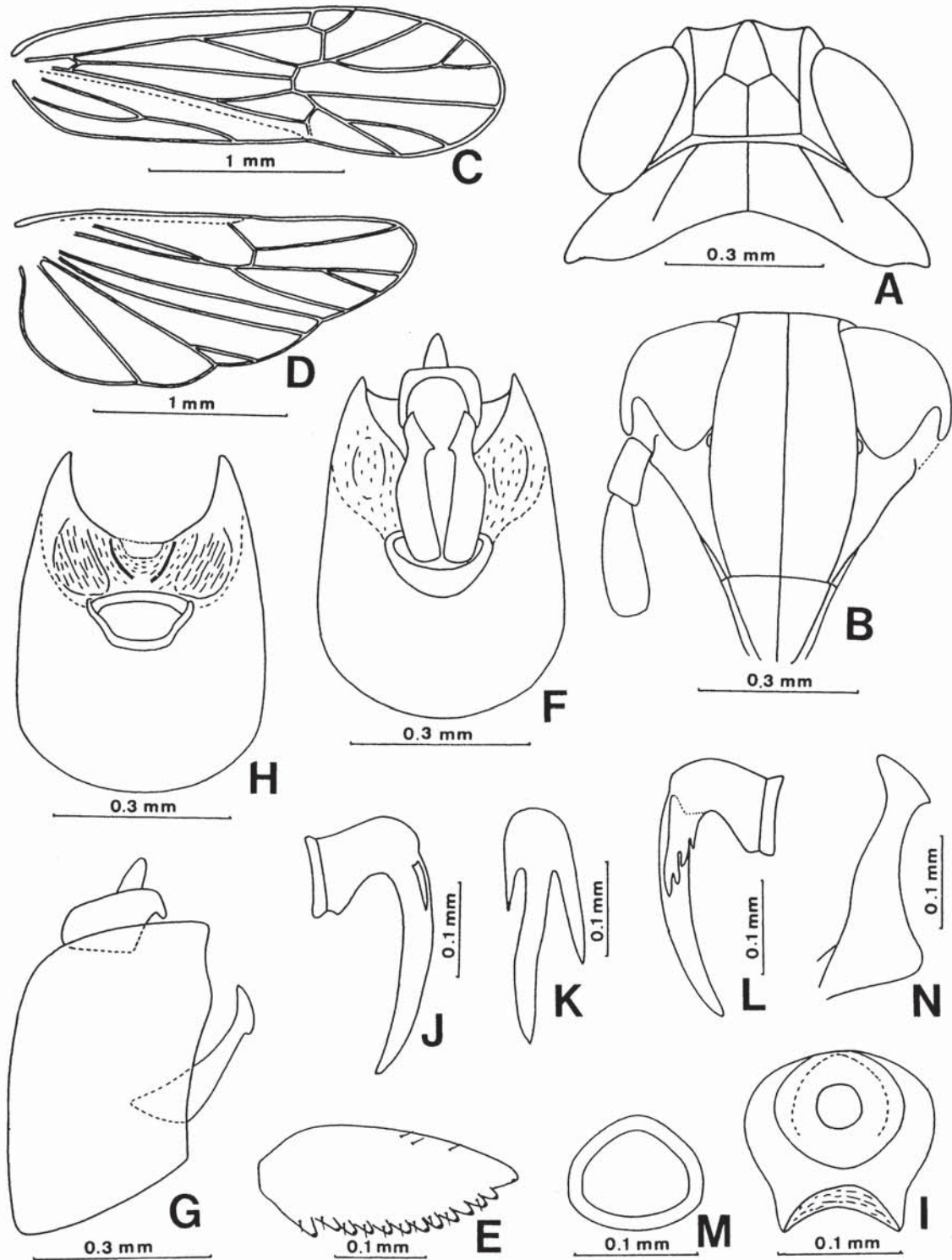


Fig. 64. *Onidodelphax serratus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, post-tibial spur; F, male genitalia, posterior view; G, the same, left side; H, diaphragm of pygofer; I, anal segment of male, dorsal view; J, phallus, left side; K, the same, caudal view; L, the same, right side; M, suspensorium; N, genital style, left side.

### 32. Genus *Unkanodes* Fennah

*Unkanodes* Fennah, 1956, *Proc. Calif. Acad. Sci.*, 4(28):474.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:144.

The generic characters outlined by Fennah [1956] are modified as follows.

Head including eyes little narrower than pronotum. Vertex slightly longer submedially than wide at base, shallowly rounded at apical margin, submedially carinae not really uniting at apex, Y-shaped carina feeble, basal compartment slightly longer than greatest length. Frons in middle line longer than wide at widest part about 2:1, widest at level of ocelli, median carina forked only at extreme base. Postclypeus wider at base than frons at apex. Ocelli present. Antennae cylindrical, surpassing frontoclypeal suture, basal segment more than 2 times as long as wide, at least half as long as second. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 22 teeth.

Anal segment of male ring-like, lateroapical angles each produced into strong spinose process, directed ventrad. Pygofer in profile with laterodorsal angle produced and reflected mesad, lateral margin with lobe-like production medially, in posterior view with opening wider than long, without medioventral process. Phallus tubular, armed with many strong spines. Suspensorium H-shaped, ventral arms very long. Diaphragm moderately wide, distinctly turned caudad at dorsal margin. Genital styles slender, divergent.

Type species: *Unkana sapporona* Matsumura  
(original designation)

(58) *UNKANODES SAPPORONA* (Matsumura)

Fig. 65.

*Unkanodes sapporona* Fennah, 1956, *Proc. Calif. Acad. Sci.*, 4(28):474.

—; Ishihara, 1965, *Spec. Bull. Lep. Soc. Jap.*, :213.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:144.

*Delphacodes sapporona* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:57.

*Unkana sapporona* Matsumura, 1935, *Ins. Matsum.*, 10:74.

*Unkanella sapporona* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, :22.

—: Matsumura et Ishihara, 1945, *Mushi*, 16:69.

General color pale black with white line running from vertex, pronotum to mesonotum. Antennae and legs yellowish brown, lateral areas of mesonotum reddish brown, pleura of thorax, abdomen, pygofer and genital styles black, lateral processes of pygofer white. Tegmina hyaline, clavus and area behind  $M_3$  pale black.

Vertex longer submedially than wide at base about 1.1:1, wider at base than at apex, lateral carinae nearly straight, submedian carinae not uniting at apex, Y-shaped carina with only fragment arms near submedian carinae, basal compartment wider



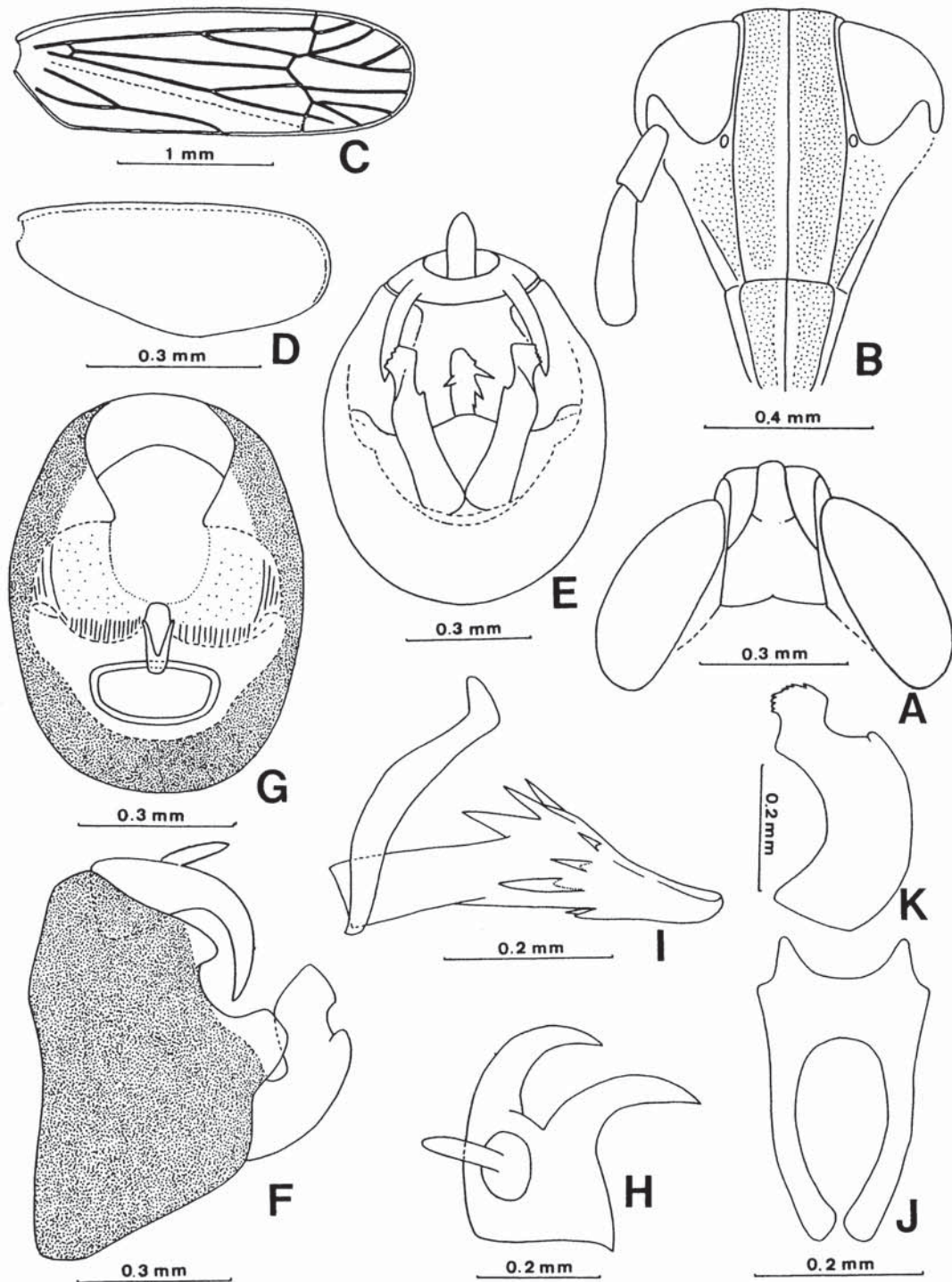


Fig. 65. *Unkanodes sapporona* (Matsumura) A, head, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, dorsolateral view; I, phallus, left side; J, suspensorium; K, genital style, left side.

at base than greatest length about 1.5:1. Frons in middle line longer than widest part about 2.4:1, widest at level of ocelli. Postclypeus at base wider than frons at apex, distinctly shorter than length in middle line. Rostrum reaching to meso-trochanters, apical segment shorter than subapical. Antennae slender, basal segment longer than wide about 2.3:1, shorter than second about 1:2. Post-tibial spur with about 22 teeth. Wings of coelopterous very small, about 0.2 times as long as tegmina.

Anal segment of male in profile wedge-shaped, lateroapical angles each produced in a strong process, curved ventrad, widely separated. Pygofer in profile wider ventrally than dorsally, laterodorsal angle distinctly produced caudad and reflected mesad, hind margin with a large process medially, in posterior view with opening wider than long, lateral margins defined, strongly convex, ventral margin shallowly concave. Phallus tubular, slightly tapered at apical third, with 9 teeth slightly after middle, most of them on left. Suspensorium with long arms ventrally, very short ones dorsally, connect phallus at ventral side. Diaphragm produced medially, rounded at apex then directed caudad, turned dorsad as V-shaped. Opening for genital styles quadrate, wider than long. Genital styles moderately large, divergent, narrowed and twisted at apical fourth, outer angle serrated, inner margin apical fourth with small process.

| Male                             | (macropterous) | (coelopterous) |
|----------------------------------|----------------|----------------|
| Length of body<br>(includ.teg.): | 4.33-4.60 mm.  | 3.00-3.20 mm.  |
| Length of tegmen:                | 3.60-3.93 mm.  | 2.40-2.50 mm.  |
| Female                           |                |                |
| Length of body<br>(includ.teg.): | 3.13 mm.       | 2.93-3.33 mm.  |
| Length of tegmen:                | 2.83 mm.       | 2.36-2.50 mm.  |

#### Fifth instar nymph (Fig. 66.)

General color pale yellowish brown, wing pads pale brown, lateral margins of abdomen dark brown.

Head between eyes wider at narrowest portion than long in middle line about 1.2:1, moderately protruding beyond level of eyes, length of eye longer than length between level of eyes and lateral point of frons about 3.6:1, submedian carinae attaining hind margin of vertex laterally, basal compartment wider at hind margin than greatest length about 1.9:1. Frons longer in middle line than wide at widest part about 1.6:1, lateral carinae slightly convex medially, with 2 median carinae, separated, parallel. Interfrons narrower than laterofrons. Number and arrangement of sensory pits typical, each side with 3 extra pits, lowest pit lies near frontoclypeal suture, distance about 1.5 diameters of pit, distance between dorsal level of lower pits and ventral level of median pits much shorter than former to frontoclypeal suture about 1:2.4, lower of upper pits higher than higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies at middle of eye. Frontoclypeal suture straight. Antennae short, basal segment nearly as long as wide, shorter than second about 1:2.7. Rostrum reaching beyond meso-trochanters, relative length of each segment about 1.4:1.1:1, third segment longer than wide about 1.8:1.



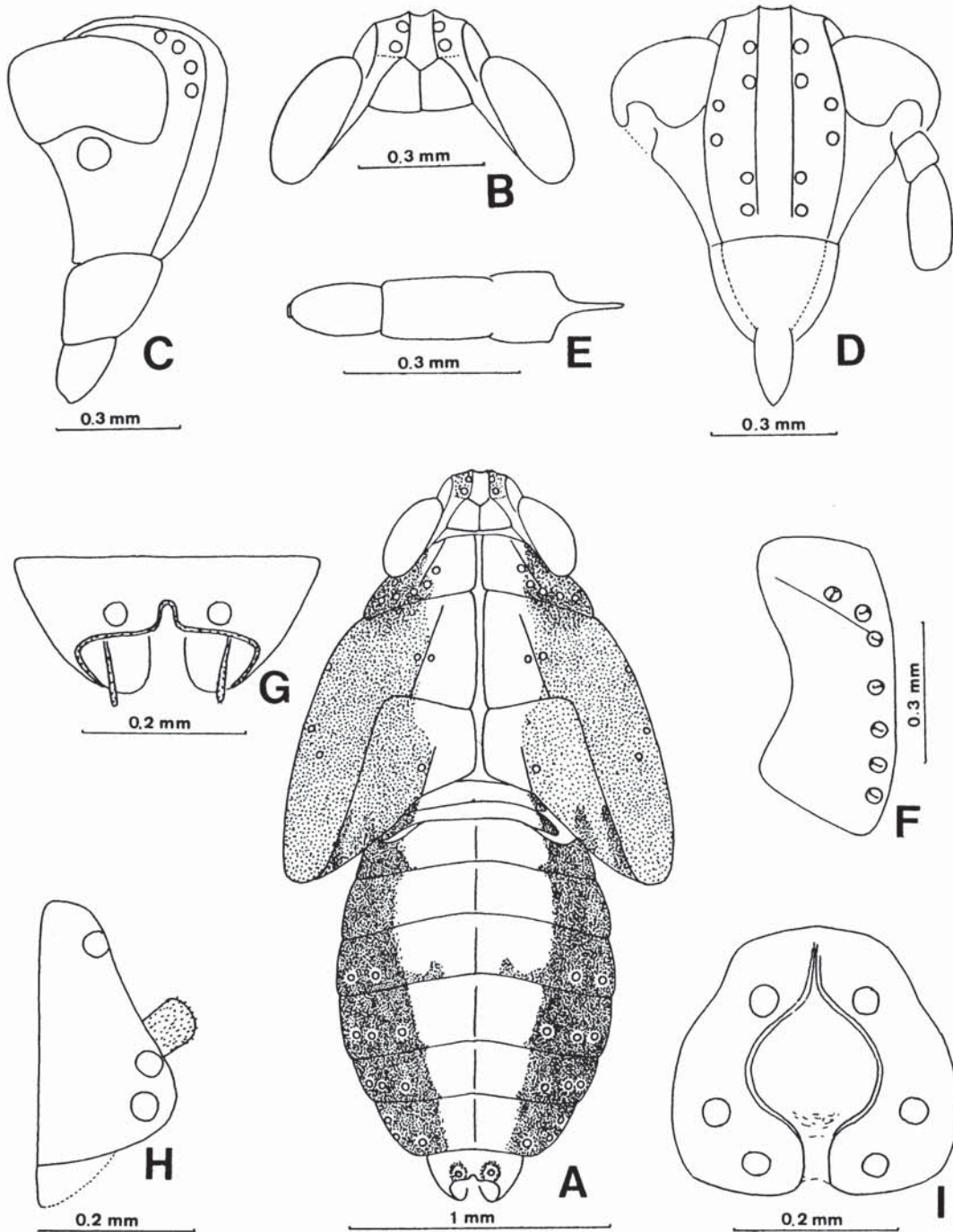


Fig. 66. Nymph of *Unkanodes sapporona* (Matsumura) A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, relative distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 3:1, anterior wing pad protruding to level of hind one, reaching to anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, metatibia longer than 3 tarsi combined about 1.1:1, spur shorter than first tarsal segment, with about 15 teeth.

Abdominal tergite V: bears 2 pits on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge roundly incised medially, lateral lobes blunt, pits lie near middle, in lateral view strongly produced near base, with anal comb large, in caudal view with opening widest near middle.

Length of body: 2.83 mm.

Width of head including eyes: 0.73 mm.

Length of anterior wing pad: 1.02 mm.

Length of antenna: 0.31 mm.

Specimens examined: 1♂, 3♀♀, Yushih, Nantou Hsien, 14-X-1984, J.T. Yang; 30♂♂, 25♀♀, Lishan, Taichung Hsien, 22-X-1987, C.T. Yang.

Nymphal specimen examined: Fifth instar nymph: 1, Lishan, Taichung Hsien, 22-X-1987, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China, Japan. USSR.

### 33. Genus *Mestus* Motschulsky

*Mestus* Motschulsky, 1863, *Bull. Soc. Nat. Moscou*, 36:111.

The generic characters outlined by Distant [1960] modified as follows.

Head including eyes narrower than pronotum. Vertex wider at base than long submedially about 1.3:1, apical margin rounded, apices of submedian carinae feeble, Y-shaped carina distinct. Frons longer in middle line than wide at widest part about 1.6:1, lateral carinae convex, median carina feeble at base. Postclypeus wider at base than frons at apex. Rostrum reaching to meso-trochanters. Ocelli small. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur without any recognizable tooth.

Anal segment of male collar-shaped, lateroapical angles produced in spinose processes. Pygofer in profile wider ventrally than dorsally, caudal margin near base strongly produced caudad, in posterior view with opening wider than long, medioventral process present, single or absent. Phallus tubular, with many large teeth at each side of apex. Orifice terminal, dorsad. Suspensorium circular ventrally. Diaphragm broad, in profile produced caudad over hind margin of pygofer. Genital styles widely divergent apically.

Typ species: *Mestus morio* Motschulsky  
(original designation)



**(59) *MESTUS TUNGPUENSIS* n.sp.****Fig. 67.**

General color dark brown to black. Antennae and rostrum pale yellowish. Legs pale yellowish except fore and mid-femora dark brown. Tegmina opaque, uniformly black. Female uniformly pale yellowish brown except metapleura with brown spot.

Vertex wider at base than long submedially about 1.3:1, apical margin rounded, submedian carinae with apical portion feeble, basal compartment wider at base than greatest length about 1.85:1. Frons longer in middle line than wide at widest part about 1.6:1, widest at level of ocelli, lateral carinae slightly convex medially, median carina feeble basally. Postclypeus wider at base than frons at apex. Post-tibial spur without any recognizable tooth. Tegmina (coelopterous) of male nearly reaching to apex of abdomen, longer than widest part about 2.5:1.

Anal segment of male with lateroapical angles each produced in a spinose process. Pygofer in profile with caudoventral angle produced caudad, dorsolateral angle rounded, in posterior view opening wider than long, lateral margins not well defined, in ventral view medioventral process long, simple. Phallus tubular, arched medially, in dorsocaudal view each side armed with 4 teeth, another single one beset left. Orifice dorsad. Suspensorium ring-like ventrally, dorsal portion broad. Diaphragm broad, dorsal margin broadly produced, slightly incised medially. Genital styles widely divergent apically, sinuate, apices pointed, directed laterad, in caudolateral view caudal margin with distinct process medially.

The name of *tungpuensis* is genitive of Tungpu, the type locality.

**Male (coelopterous)**

Length of body: 2.30-2.36 mm.

Length of tegmen: 1.70-1.73 mm.

**Female (coelopterous)**

Length of body: 3.00 mm.

Length of tegmen: 1.83 mm.

**Holotype:** Male, Tungpu, Nantou Hsien, 28-IV-1981, T. Lin & C.J. Lee. In TARI.

**Paratypes:** 1♂ (dissected), 1♀, same data as for holotype.

**Host plant:** Unknown.

**Distribution:** Taiwan.

Dr. Ashe corrected the author's error said, "I am rather convinced that your species belongs to *Mestus* Motschulsky."

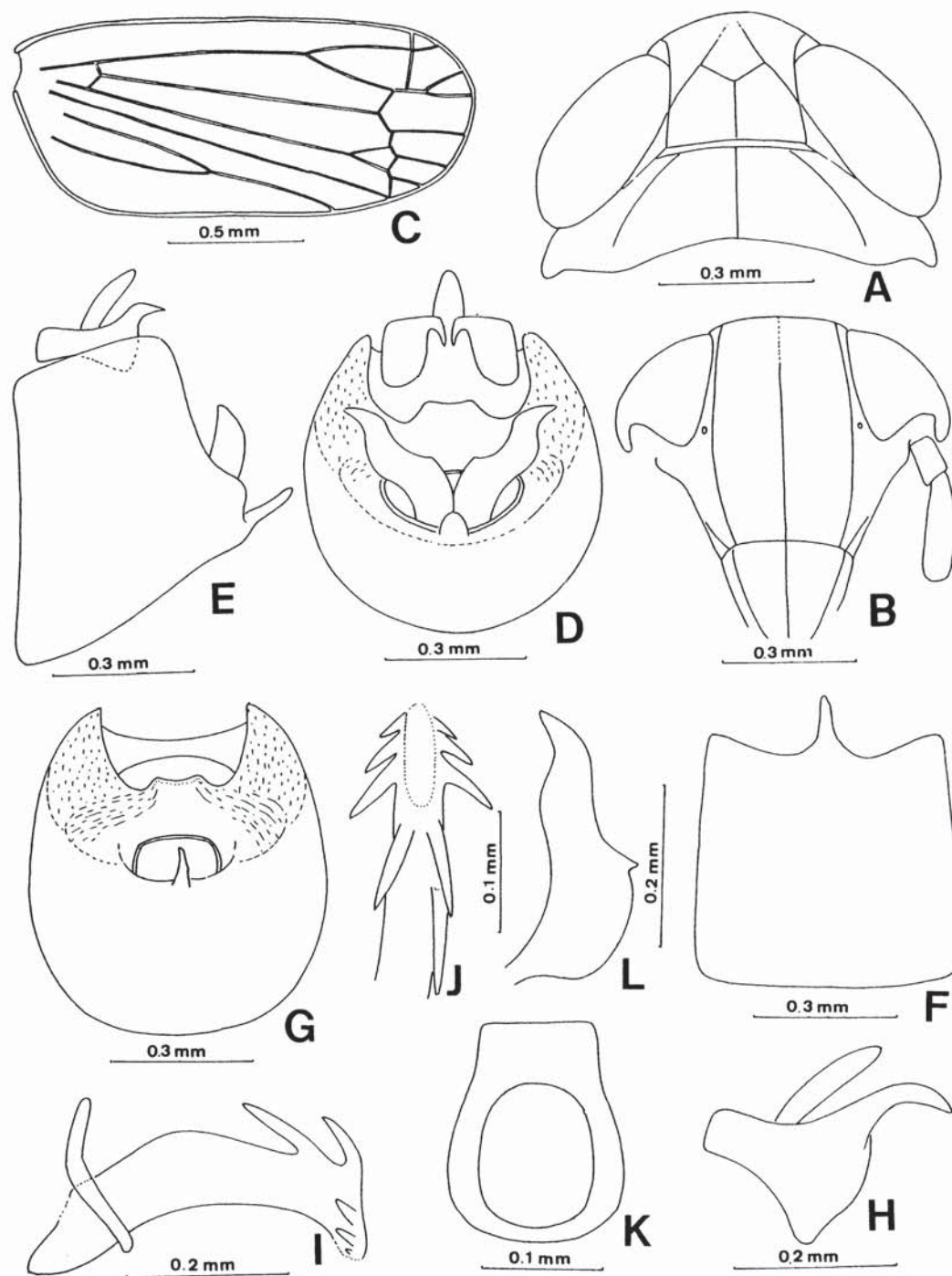


Fig. 67. *Mestus tungpuensis* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, pygofer, ventral view; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, apex of phallus, dorsal view; K, suspensorium; L, genital style, left side.



### 34. Genus *Neunkanodes* n. gen.

Head including eyes narrower than pronotum. Vertex longer submedially than wide at base about 1.2: 1, apical margin transverse, submedian carinae uniting at apex, Y-shaped carina present. Frons longer in middle line than wide at widest part about 2.7:1, widest at apex. Rostrum reaching to meta-coxae. Ocelli present. Antennae cylindrical, basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 23 teeth.

Anal segment of male ring-like, lateroapical angles widely separated, each produced in a spinose process. Pygofer in profile wider ventrally than dorsally, caudal margin strongly produced caudad medially, in posterior view opening wider than long, medioventral process present, wide, apical margin evenly incised. Phallus short, furcate at apex. Suspensorium ring-like ventrally. Diaphragm rather broad, dorsal margin roundly produced medially. Genital styles widely divergent apically, long and fine.

Type species: *Neunkanodes formosana* n.sp.  
(here designated)

This new genus differs from *Unkanodes* Fennah in having frons longer in middle line than wide at widest part about 2.7:1, widest at apex (2:1 and widest at level of ocelli in *Unkanodes*); pygofer with medioventral process.

#### (60) *NEUNKANODES FORMOSANA* n.sp.

Fig. 68.

General color yellowish brown. Median line of frons, vertex, pro- and mesonotum, commissural stuture white. Areas between carinae of frons somewhat black. Abdomen somewhat reddish. Pygofer yellowish. Tegmina hyaline.

Vertex longer submedially than wide at base about 1.2:1, apical margin transverse, lateral carinae nearly straight, submedian carinae not really uniting at apex, basal compartment wider at base than greatest length about 1.3:1. Frons longer in middle line than wide at widest part about 2.7:1, widest at apex, median carina simple. Post-clypeus wider at base than frons at apex, very long, longer than half of frons. Antennae reaching over frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2.3. Post-tibial spur with 23-24 teeth. Tegmina longer than widest part about 3.4:1.

Anal segment of male with lateroapical angles widely separated, each produced in a stout spinose process. Pygofer in profile distinctly wider ventrally than dorsally, at caudal margin strongly produced caudodorsad in a large lobe, in caudodorsal view opening wider than long, medioventral process present, very wide, apical margin evenly concave medially. Phallus somewhat compressed, apical margin produced in 3 processes, upper one directed caudad, lower 2 with common petiole, median one longer, at apex directed caudoventrad, lower one shorter, at apex directed caudo-dorsad. Suspensorium ring-like ventrally, dorsal portion transversely lobed. Dia-

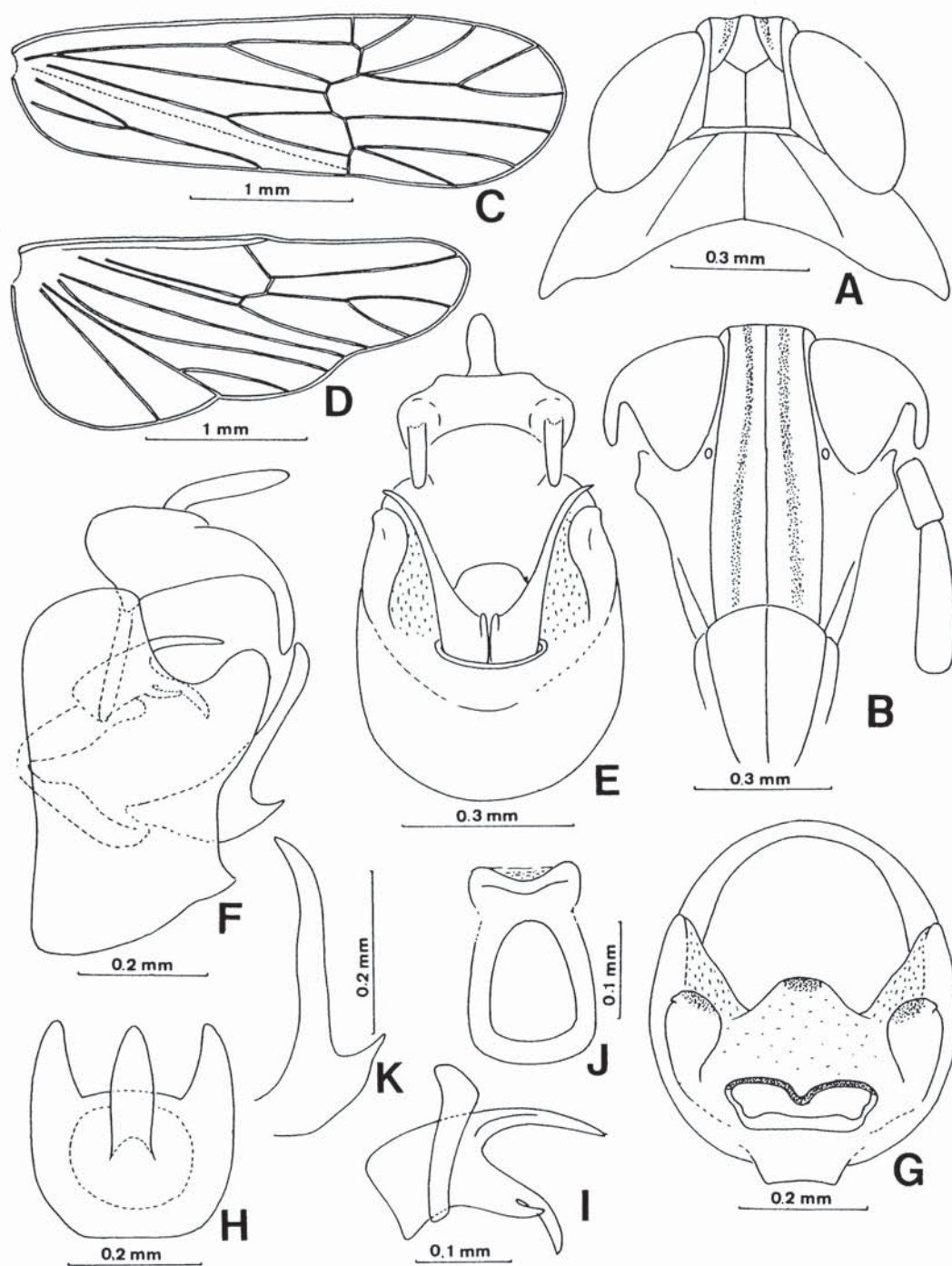


Fig. 68. *Neunkanodes formosana* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, pygofer, dorso-caudal view; H, anal segment of male, dorsal view; I, phallus, left side; J, suspensorium; K, genital style, left side.



phragm broad, dorsal margin rounded, protruding cephalad to supporting phallus as in *Sogata* Distant. Opening for genital styles transverse, dorsal margin protruding medially. Genital styles very long, slender, divergent apically, quadrate at base, basal angle with process, distinct at lateral view.

The name *formosana* is genitive of Formosa.

Male (macropterous)

Length of body (includ.teg.): 4.40 mm.

Length of tegmen: 3.76 mm.

Holotype: Male (dissected) Tungpu, Nantou Hsien, 25-IX-1980, L.Y. Chou & T. Lin. In TARI.

Host plant: Unknown.

Distribution: Taiwan.

### 35. Genus *Chloriona* Fieber

*Chloriona* Fieber, 1866, *Verh. Zool. Bot. Ges. Wien.*, 16:519.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:30.

—: Tian, 1983, *Econ. Ins. Fauna China*, 27:134.

Head including eyes narrower than pronotum. Vertex as long submedially as wide at base, at apex distinctly narrower than at base, submedian carinae uniting at apex, Y-shaped carina distinct. Frons longer in middle line than wide at widest part about 2:1, widest at middle. Rostrum reaching to meso-trochanters. Ocelli present. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male ring-like, lateroapical angles not produced. Pygofer very short, opening wider than long, without medioventral process. Phallus short, tubular, armed with teeth. Diaphragm broad, evenly produced dorsad medially. Genital styles divergent, long and slender.

Type species: *Delphax unicolor* Herrich-Schaffer.

(subsequent designation by Kirkaldy, 1907)

(61) *CHLORIONA TATEYAMANA* Matsumura  
Fig. 69.

*Chloriona tateyamana* Matsumura, 1935, *Ins. Matsum.*, 9:138.

- : Esaki et Ishihara, 1943, *Cat. Araeopid Imp. Jap.*, 25.
- : Matsumura et Ishihara, 1945, *Mushi*, 16:71.
- : Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:33.
- : Tien, 1983, *Econ. Ins. Fauna China*, 27:135.

General color pale green. First antennal segment, middle and hind legs somewhat yellowish brown. Pygofer and genital styles black. Tegmina hyaline, yellowish brown.

Vertex shorter submedially than wide at base about 1:1.1, distinctly narrower at apex than at base, acutely running into frons, lateral carinae nearly straight, submedian carinae uniting at apex and protruding beyond apical margin, basal compartment wider at base than greatest length about 2:1. Frons in middle line longer than wide at widest part about 2.3:1, widest below level of ocelli, lateral carinae strongly convex, median carina simple. Postclypeus at base as wide as frons at apex, nearly as long as wide at base. Rostrum reaching to meso-trochanters, apical segment shorter than subapical. Antennae reaching to level of middle of postclypeus, basal segment longer than wide about 1.6:1, shorter than second about 1:2. Post-tibial spur with about 27 teeth. Tegmina longer than widest part about 3.8:1.

Anal segment of male short. Pygofer in posterior view with opening broad oval, lateral margins well defined. Phallus short and stout, tubular, irregularly armed with teeth, at basal half dorsad strongly expanded laterad, forming a pair, large wings. Orifice terminal. Suspensorium ring-like, dorsal part triangular. Diaphragm broad, median portion produced caudad, dorsal margin strongly sclerotized, evenly convex medially. Opening for genital styles evenly curved on both dorsal and ventral margins, in ventral view deeply concave medially. Genital styles widely divergent, long and slender, inner and outer margins nearly parallel, inner and outer angles slightly produced.

Male (macropterous)

Length of body (includ.teg.): 3.60-4.00 mm.

Length of tegmen: 2.83-3.33 mm.

Female (macropterous) (brachypterous)

Length of body

(includ.teg.): 4.60-4.90 mm. 3.83-4.10 mm.

Length of tegmen: 3.73-3.83 mm. 1.26-1.33 mm.

Specimens examined: 1♂, 1♀, Shalu, Taichung Hsien, 11-IX-1984, C.T. Yang;  
13♂♂, 15♀♀, same locality, 5-XII-1984, C.T. Yang.

Host plant: *Phragmites communites* Trinius

Distribution: Taiwan (new record), Mainland China, Japan, USSR, Mongolia.



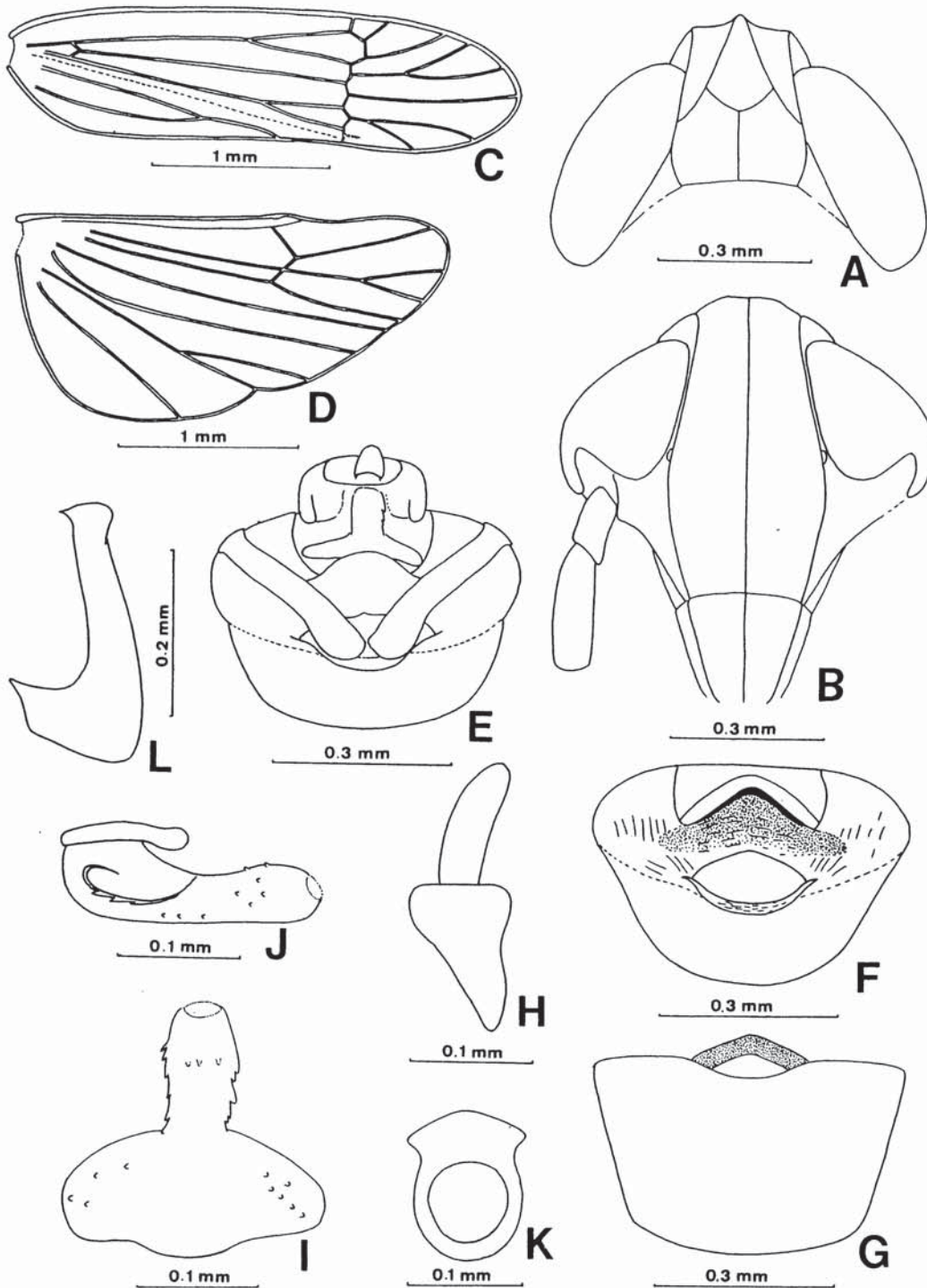


Fig. 69. *Chloriona tateyamana* Matsumura A, head, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, diaphragm of pygofer; G, pygofer, ventral view; H, anal segment of male, left side; I, phallus, dorsal view; J, the same, left side; K, suspensorium.

### 36. Genus *Sogatodes* Fennah

*Sogatodes* Fennah, 1964, *Bull. Ent. Res.*, 54:71.

The generic characters outlined by Fennah [1964] are modified as follows.

Size small, about 4 mm including tegmina, form slender. Vertex longer than wide at base about 1.2:1, apical margin truncate, submedian carina slightly prominent, uniting at apex of vertex or at extreme base of frons, Y-shaped carina distinct or stem feeble. Frons longer in middle line than wide at widest part about 2.2-2.5:1. Post-clypeus wider at base than frons at apex. Rostrum reaching to meso-trochanters. Ocelli present. Antennae cylindrical, not or scarcely reaching to frontoclypeal suture, basal segment slightly longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male collar-shaped, lateroapical angles each produced into a spinose process. Pygofer in profile moderately long, in posterior view with opening longer than wide. Phallus tubular, simple. Suspensorium slender, with ventral half ring-like. Diaphragm narrow. Genital styles relatively short.

Type species: *Sogatodes molinus* Fennah  
(subsequent designation by Fennah, 1964)

#### Key to the species of *Sogatodes*

1. Tegmina with basal half wholly black . . . . . 2
  - Tegmina with basal half not wholly black . . . . . 3
2. Frons longer in middle line than wide at widest part about 3.2:1; vertex as long submedially as wide at base . . . . . *pusanus* (Distant)
  - Frons longer in middle line than wide at widest part about 2.2:1; vertex 1.3 times longer submedially than wide at base . . . . . *assimilis* n. sp.
3. Post-tibial spur with about 20 teeth; diaphragm with dorsal margin wide, shallowly concave . . . . . *eumpope* (Kirkaldy)
  - Post-tibial spur with about 10-14 teeth; diaphragm with dorsal margin roundly produced dorsad medially . . . . . 4
4. Tegmina 3.5 times longer than widest part; vertex with apical margin transverse . . . . . *incanus* n.sp.
  - Tegmina 3.1 times longer than widest part; vertex with apical margin distinctly produced forward medially . . . . . *infestus* n.sp.



(62) *SOGATODES EUPOMPE* (Kirkaldy)

Fig. 70.

*Sogatodes eupompe* Fennah, 1965, *Bull. Br. Mus. Nat. Hist. (Ent.)*, 17:46.*Delphax eupompe* Kirkaldy, 1907, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 3: 162.

General color black. Median carina of frons, vertex, median part of pro- and mesonotal disc, more than half of hind margin of clavus white. Antennae, tibiae and tarsi of fore and mid-legs yellowish white, hind legs white. Tegmina subhyaline, black exarct area before  $M_2$  sordid white and end of clavus more darker.

Vertex longer submedially than wide at base about 1.6:1, in profile obtusely rounding into frons, a little narrower at apex than at base, lateral margins slightly concave, Y-shaped carina feeble, submedian carinae uniting at apex of vertex, basal compartment of vertex wider at base than greatest length about 1.2:1. Frons in middle line longer than wide at widest part about 2.1:1, widest in middle between ocelli and frontoclypeal suture, lateral carinae convex, median carina simple. Postclypeus at base slightly wider than frons at apex. Antennae reaching to middle of postclypeus, basal segment longer than wide about 1.3:1. shorter than second about 1:2.6. Post-tibial spur with about 20 teeth. Tegmina longer than widest part about 3.4:1.

Anal segment of male short, deeply sunk in dorsal emargination of pygofer, lateroapical angles widely separated, each produced into a stout spinose process. Pygofer long, in profile longer dorsally than ventrally, laterodorsal angle inflected mesad, in posterior view with opening wider than long, lateral margins weakly defined, evenly concave. Phallus long, with about 16 teeth in left side, 5 in middle of right and 6 in ventral distally. Orifice terminal. Suspensorium narrowed dorsally, ring-like ventrally. Diaphragm with dorsal margin shallowly concave, a pair of peg-like process indistinct. Opening for genital styles compressed. Genital styles long, divergent, rather wide at basal half, truncate at apex, inner and outer angles slightly produced, lateral view as figured.

## Male (macropterous)

Length of body (includ.teg.): 2.50 mm.

Length of tegmen: 2.33 mm.

Specimens examined: 3♂♂, 3♀♀, Taichung, 15-XII-1981, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record), Philippines, Fiji, Samoa, Tahiti, Australia, New Caledonia, Micronesia, Society Is.

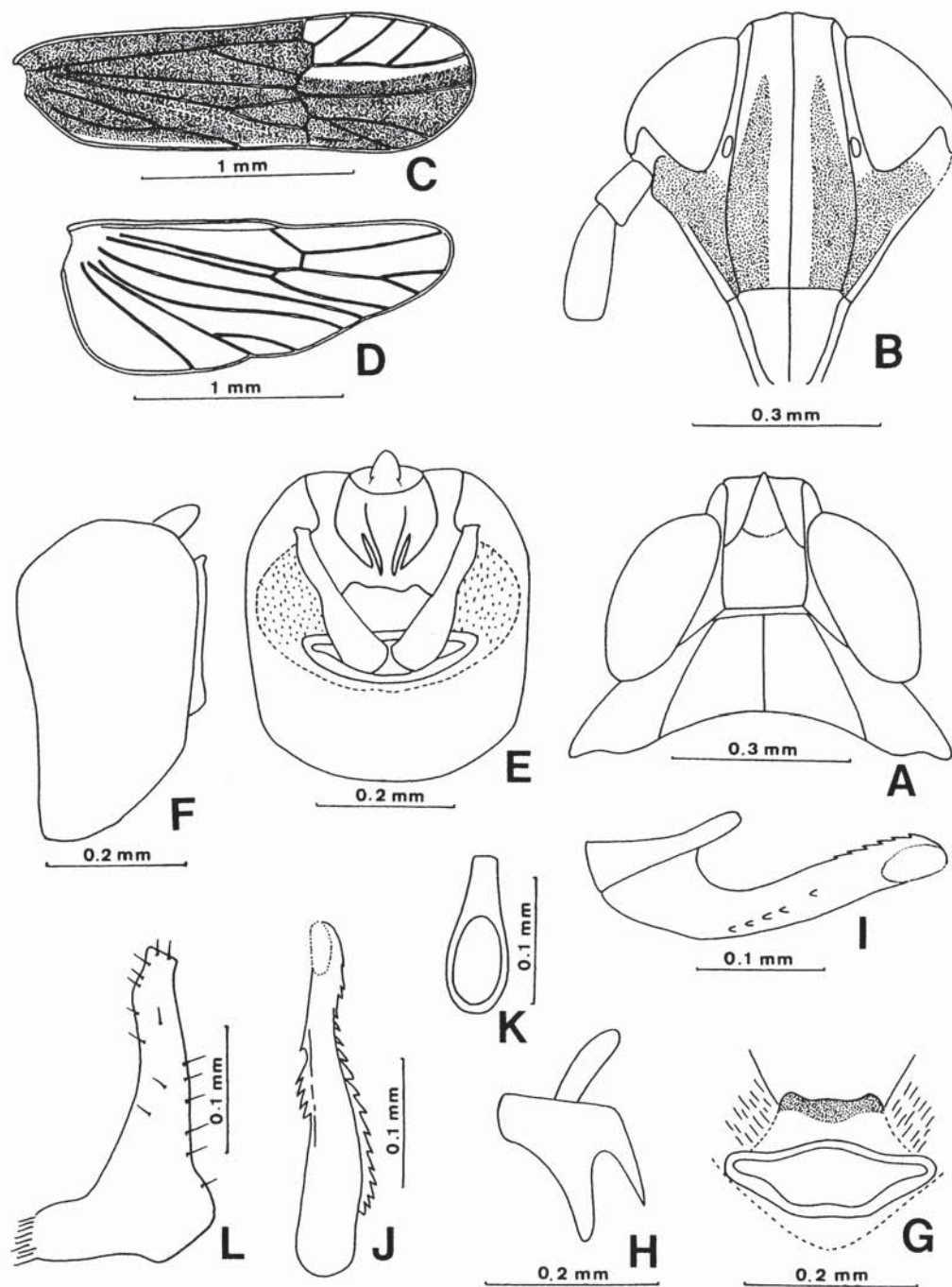


Fig. 70. *Sogatodes eupompe* (Kirkaldy) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, the same, ventral view; K, suspensorium; L, genital style, left side.



(63) *SOGATODES INFESTUS* n.sp.

Fig. 71.

General color black. Vertex, pro- and mesonotum between lateral carinae and commissural suture whitish. Frons along median carina yellowish white. Postclypeus, rostrum, antennae and legs after trochanter yellowish white. Tegmina black except after cross-vein before  $R_1$  and small area between  $R_1$  and  $R_5$  somewhat paler.

Vertex longer medially than wide at base about 1.7:1, apical margin distinctly produced forward medially, lateral carinae straight, submedian carinae nearly uniting at apex, stem of Y-shaped carina irre recognizable, arms feeble, basal compartment slightly wider at base than greatest length. Frons longer in middle line than wide at widest part about 2.1:1, widest at apical third, lateral carinae distinctly convex at apical third. Postclypeus slightly wider at base than frons at apex, slightly wider at base than long in middle line. Rostrum short, not really attaining mesotrochanters. Antennae with basal segment slightly longer than wide, shorter than second about 1:2.4. Pronotum with lateral carinae attaining hind margin. Post-tibial spur with about 13 teeth. Tegmina longer than widest part about 3.1:1.

Anal segment of male collar-shaped, lateroapical angles separated, each produced into a stout process. Pygofer in profile as long ventrally as dorsally, laterodorsal angle not produced but distinctly reflected mesad, in posterior view with opening wider than long, without medioventral process. Phallus long. Suspensorium with upper part nearly parallel, ventral part ring-like. Diaphragm with dorsal margin slightly produced medially. Genital styles short, very broad at base, tapering to apex, acute at apex.

The name *infestus* is Latin adjective, its inhabitation.

Male (macropterous)

Length of body (includ. teg.): 2.83-2.93 mm.

Length of tegmen: 2.33 mm.

Holotype: Male, Shalu, Taichung Hsien, 12-V-1985, C.T. Yang. In NCHU.

Paratype: 1♂, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from *S. eupompe* (Kirkaldy) in the shape and the length of genital styles; the number of teeth of post-tibial spur; the shape of vertex and the dorsal margin of diaphragm.

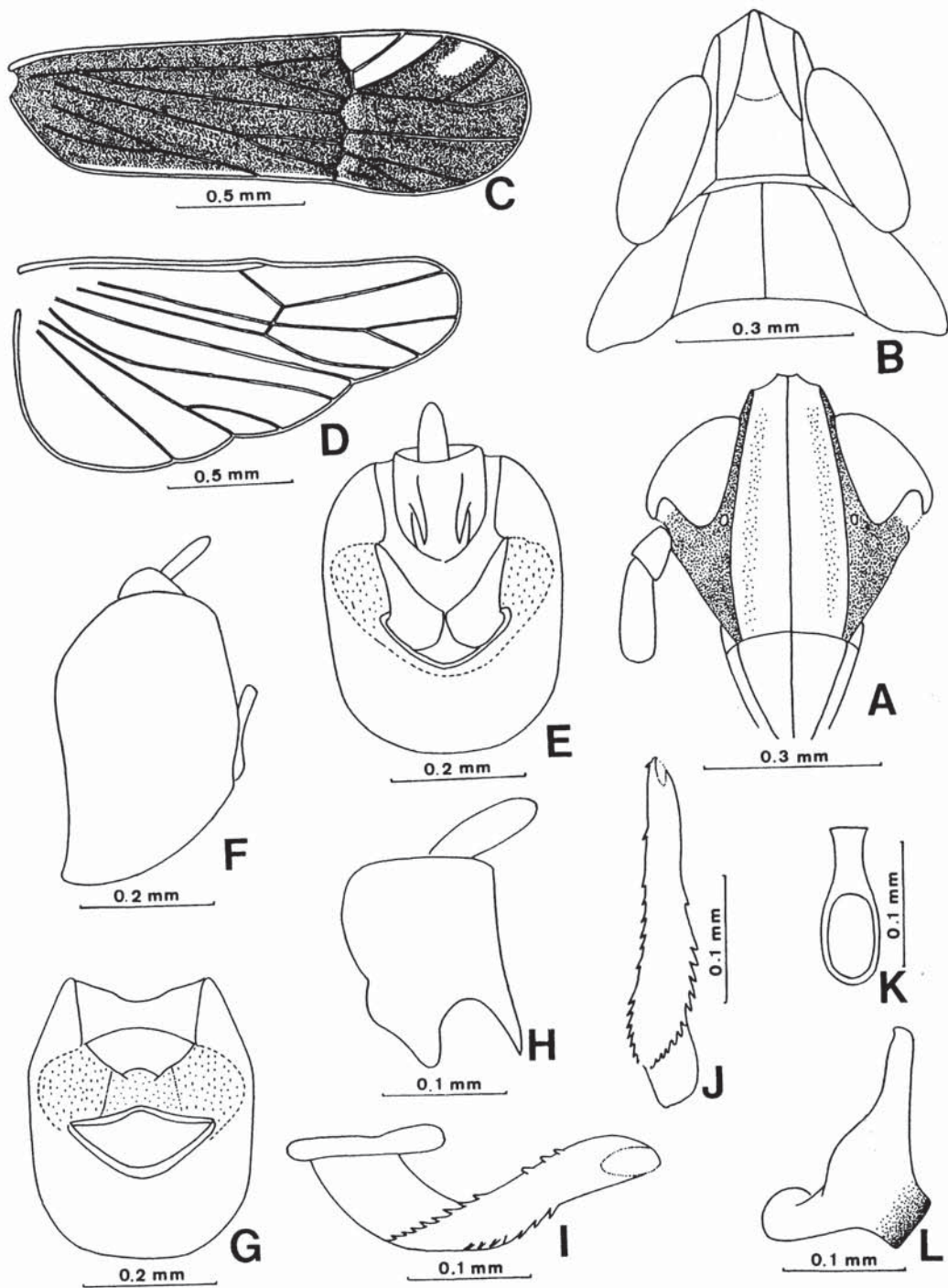


Fig. 71. *Sogatodes infestus* n.sp. A, frons and potclypeus; B, head and pronotum, dorsal view; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, the same, ventral view; K, suspensorium; L, genital style, left side.



(64) *SOGATODES PUSANUS* (Distant)

## Fig. 72.

*Sogatodes pusanus* Fennah, 1973-75, *Ent. scand, Suppl.*, 4:95.

*Kelisia fieberi*, Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:331.

*Sogata formosella* Matsumura et Ishihara, 1945, *Mushi*, 16:64.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:65.

*Unkana formosella* Matsumura, 1935, *Ins. Matsum.*, 10:72.

*Unkanella formosella* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 21.

General color yellowish white. Dorsal aspect with white stripe recurring from vertex to meso-scutellum, frons with areas between carinae, genae, pronotum with areas behind eyes, mesonotum with areas outer lateral carinae, legs with coxae, pleura and abdomen black. Tegmina hyaline, with black markings as figured, granulose concolorous with veins.

Vertex as long submedially as wide at base, apical margin transverse with median portion slightly produced, lateral carinae straight, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 1.5:1. Frons longer in middle line than wide at widest part about 3.2:1, widest just below level of ocelli, lateral carinae slightly convex below ocelli, median carina forked at base. Postclypeus distinctly wider at base than frons at apex, without median carina, abruptly narrowed, longer in middle line than wide at base. Antennae with basal segment longer than wide about 1.3:1, shorter than second about 1:2.5. Post-tibial spur with 27-29 teeth. Tegmina longer than widest part about 3.3:1.

Anal segment of male with lateroapical angles contiguous, each produced into single stout spinose process. Pygofer in profile with laterodorsal angle produced in right angle, in posterior view with opening wider than long, lateral margins evenly convex. Phallus tubular, attenuating to apex, with several teeth near apex dorsally. Orifice terminal, dorsad. Suspensorium circular at ventral, stem very small, slightly winged at each side. Diaphragm broad, with dorsal margin roundly produced dorsad, slightly directed caudad, pigmented ring elongate. Opening for genital styles evenly concave on both margins. Genital styles broad, moderately long, divergent, apical margin shallowly incised, outer angle larger.

## Male (macropterous)

Length of body (includ.teg.): 2.93 mm.

Length of tegmen: 2.40 mm.

Specimens examined: 2♂♂, Liukuei, Kaohsiung Hsien, 31-XII-1985, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan, Philippines, Micronesia, Sri Lanka, India.

Dr. M.R. Wilson compared our specimen with *Sogatodes pusanus* (Distant) in British Museum, and said "I have not doubt they are identical."

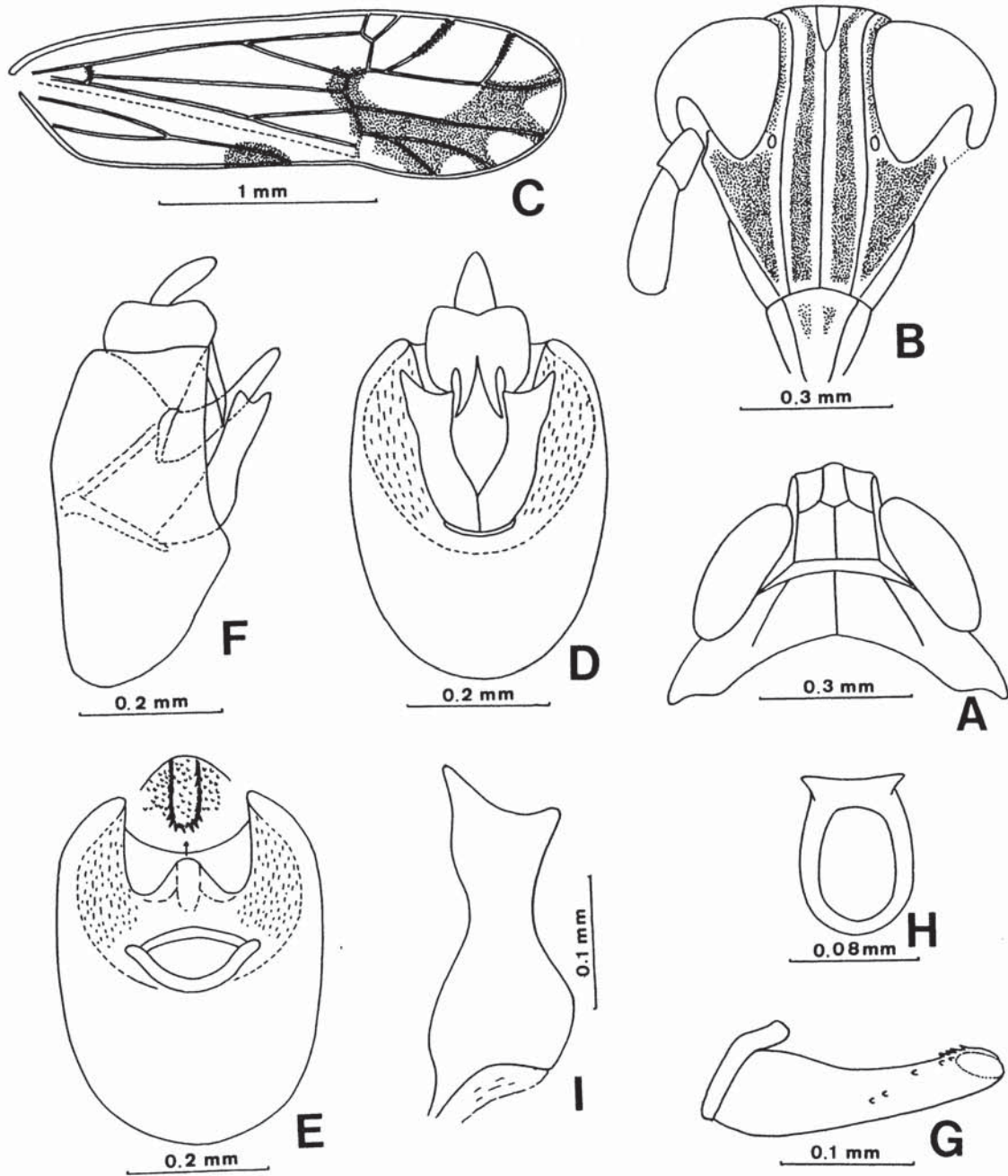


Fig. 72. *Sogatodes pusanus* (Distant) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, diaphragm of pygofer; F, male genitalia, left side; G, phallus, left side; H, suspensorium; I, genital style, left side.



(65) *SOGATODES INCANUS* n.sp.

Fig. 73.

General color black. Vertex, pro-, mesonotum and commissural suture with wide white stripe percurrent. Frons along median carina white, intercarinal areas and genae black. Postclypeus, rostrum, antennae and legs pale yellowish brown. Tegmina semi-opaque, black except apicodorsal area transparent, colorless.

Vertex longer submedially than wide at base about 1.15:1, lateral carinae straight, apical margin transverse, slightly produced forward medially, submedian carinae fine, not uniting at apex, Y-shaped carina irre recognizable. Frons longer in middle line than wide at widest part about 2.25:1, widest below level of ocelli, lateral carinae concave between eyes, nearly straight below ocelli, median carina forked at base. Postclypeus distinctly wider at base than frons at apex. Antennae reaching to middle of postclypeus, basal segment longer than wide about 1.7:1, shorter than second about 1:2. Post-tibial spur with about 10-14 teeth. Tegmina longer than widest part about 3.5:1.

Anal segment of male relatively small, lateroapical angles each produced into a stout, short process. Pygofer in profile distinctly wider ventrally than dorsally, dorsal margin produced dorsad medially, laterodorsal angle not produced. Phallus compressed, armed with several teeth. Orifice at left apically. Suspensorium ring-like ventrally, stem winged at each side. Diaphragm broad, dorsal margin evenly rounded, pigmented ring narrowed ventrally. Genital styles small, outer angle rounded, inner angle acutely produced, inner margin distinctly concave.

The name *incanus* is Latin adjective, whitish.

## Male (macropterous)

Length of body (includ.teg.): 2.76-2.90 mm.

Length of tegmen: 2.20-2.33 mm.

## Female (macropterous)

Length of body (includ.teg.): 3.16-3.33 mm.

Length of tegmen: 2.73-2.83 mm.

Holotype: Male, Lanshu, Taitung Hsien, 19-I-1987, S.J. Fang. In NCHU.

Paratypes: 13♂♂, 2♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from *S. pusanus* (Distant) in having post-tibial spur with 10-14 teeth (27-29 teeth in *pusanus*); black area of the tegmina and shape of the phallus.

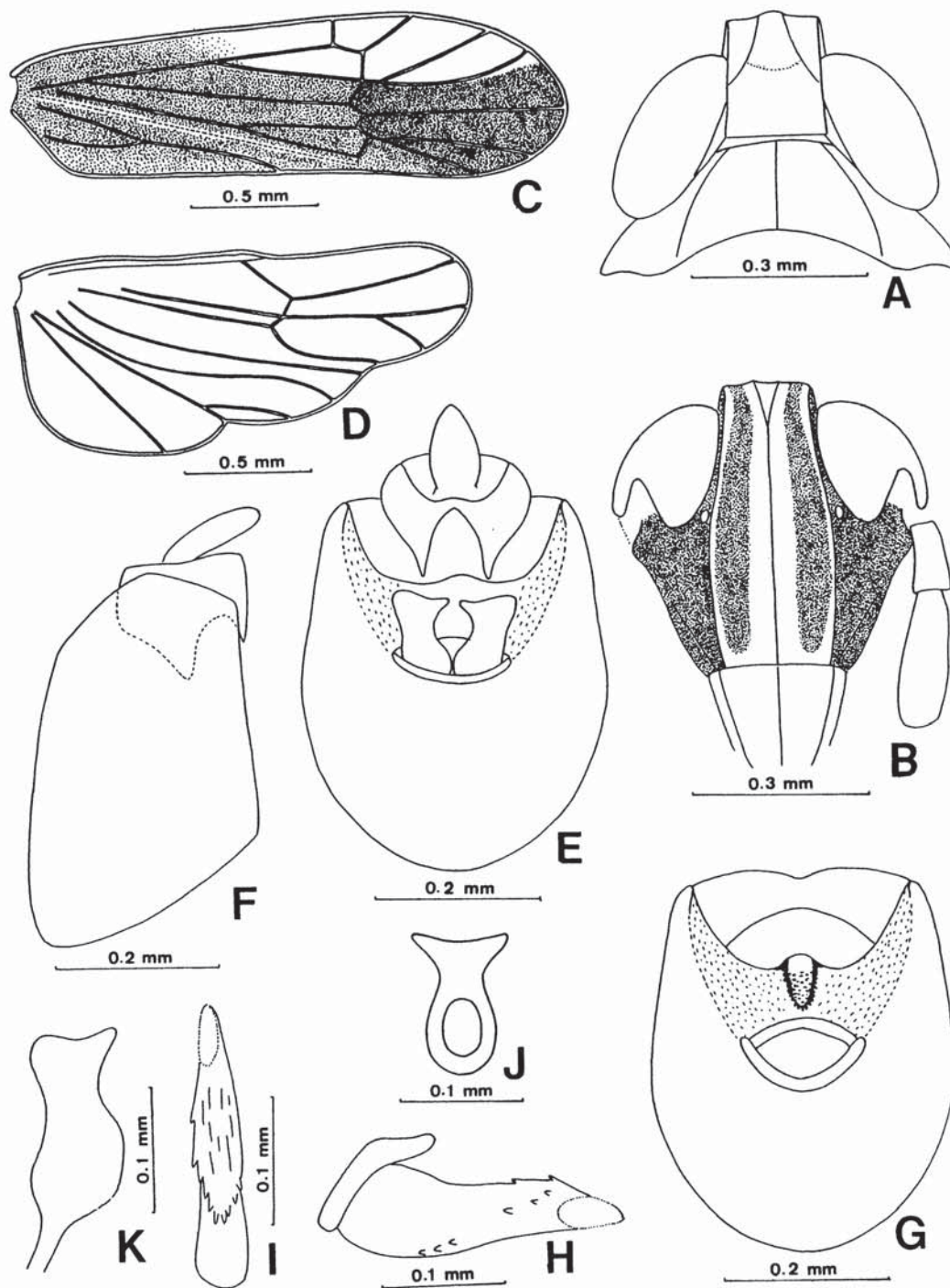


Fig. 73. *Sogatodes incanus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, left side; I, the same, dorsal view; J, suspensorium; K, genital style, laterocaudal view.



(66) *SOGATODES ASSIMILIS* n.sp.

Fig. 74.

General color dark brown. Vertex, pronotum between lateral carinae and lateral areas below eyes, mesonotum between lateral carinae and commissural suture dirty white. Frons and postclypeus somewhat paler and carinae whitish. Antennae and legs pale yellowish brown except fore and mid-coxae brown. Abdomen brown. Tegmina hyaline, black markings as figured.

Vertex longer submedially than wide at base about 1:3:1, at apex narrower than at base, lateral carinae straight, submedian carinae not really uniting at apex, Y-shaped carina feeble. Frons longer in middle line than wide at widest part about 2.2:1, widest at apical third. Postclypeus as wide as frons at apex. Antennae reaching to middle of postclypeus, basal segment longer than wide about 1.7:1, shorter than second about 1:2. Post-tibial spur with 23,25 teeth. Tegmina longer than widest part about 3.1:1.

Anal segment of male with lateroapical angles approximately, each produced in a spinose process, directed ventrad. Pygofer in profile wider ventrally than dorsally, laterodorsal angle roundly produced, diaphragm distinctly produced caudad, in posterior view with opening wider than long, lateral margins not well defined. Phallus tubular, gradually narrowing to apex, armed with several teeth at apical half. Orifice teminal, dorsad. Suspensorium small, oval-ring at ventral, winged at dorsum. Diaphragm broad, dorsal margin broadly produced, distinctly emarginated at middle, granulating area heart-shaped. Genital styles stout, outer angle with process, rather slender, inner angle blunt, outer margin sinuate, inner margin concave medially.

The name *assimilis* is Latin adjective, similar.

## Male (macropterous)

Length of body (includ.teg.): 2.93 mm.

Length of tegmen: 2.33 mm.

Holotype: Male (dissected), Pingtung Hsien, VI-1960, K.S. Lin. In TARI.

Host plant: Unknown.

Distribution: Taiwan.

This new species very resembles *Sogatodes pusanus* (Distant) but differs from latter in frons longer in middle line than widest part about 2.2:1 (3.2:1 in *pusanus*); tegmina with brown marking at base between veins R and Cu<sub>1</sub>.

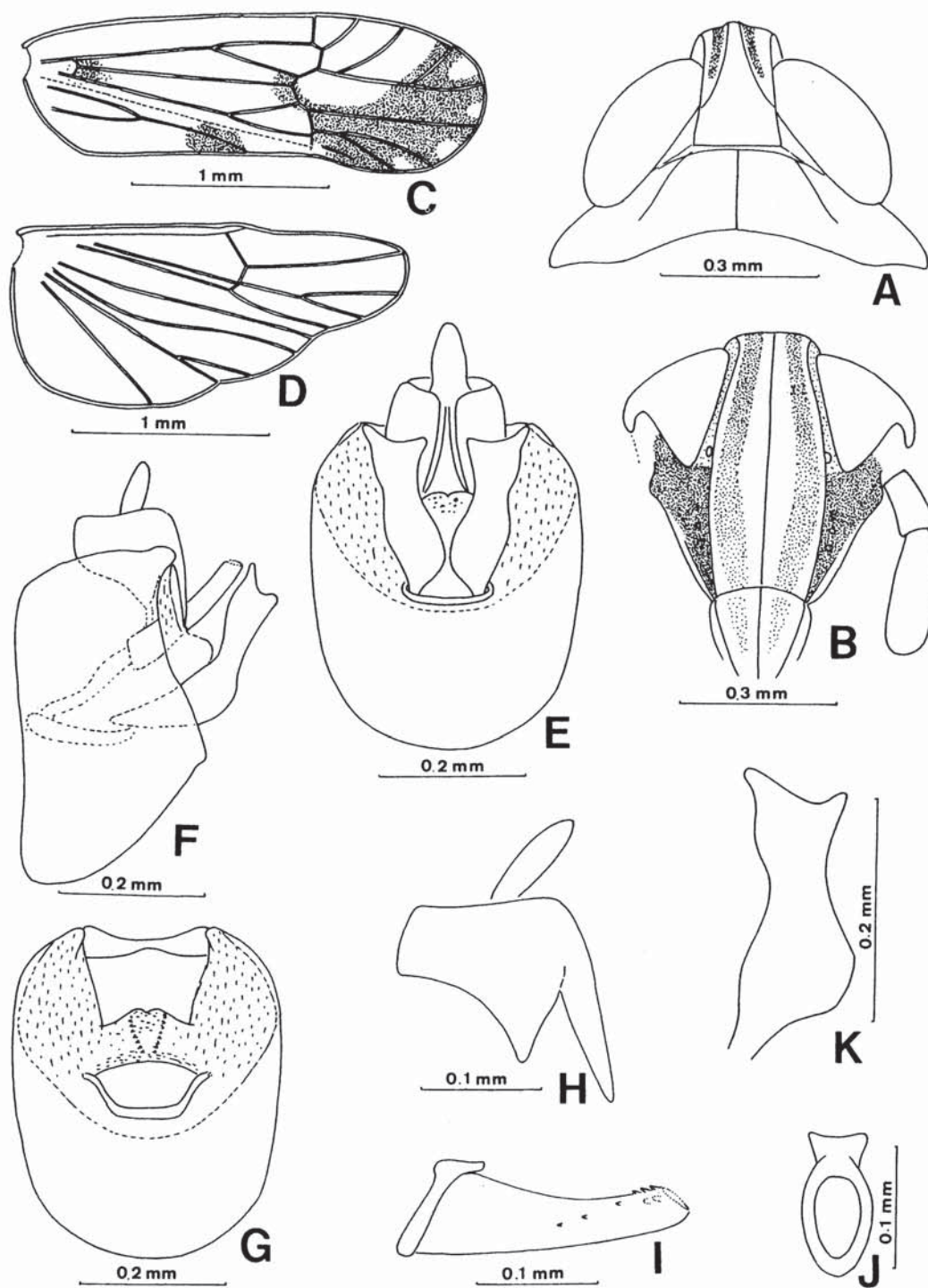


Fig. 74. *Sogatodes assimilis* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, left side.



### 37. Genus *Matutinus* Distant

*Matutinus* Distant, 1917, *Trans. Linn. Soc. Zool.*, 17:278.

—: Fennah, 1972, *Bull. Ent. Res.*, 61:421.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:120.

The generic characters are simplified from Fennah c1972'as follows.

Size small, about 3.5mm. including tegmina. Vertex much longer than wide at base 1.2-2.0:1, in one species 3:1, apical margin truncate with submedian carinae prominent, uniting at apex, Y-shaped carina present, but common stem frequently absent, vertex in profile very feebly convex, almost straight, rectangulately or subacutely rounding into frons. Frons longer than wide about 2.5-3.3:1, in one species 5:1, median carina simple. Rostrum moderately long, surpassing meso-trochanters. Ocelli well developed. Antennae not attaining frontoclypeal suture. Pronotum with lateral carinae strongly diverging basad, almost straight, not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 25 teeth. Tegmina relative long, about 3.5 times as long as widest part.

Anal segment of male collar-like, with a pair of moderately long, rather slender spinose processes arising some distance apart on distal margin or laterally on ventral surface, directed ventrad in a simple curve or sinuate. Pygofer moderately long, posterior opening ovate or lozenge-shaped, usually slightly longer dorsoventrally than wide. Phallus tubular, armed with small teeth. Suspensorium ring-like. Diaphragm with median portion produced dorsad in a lobe that is ovate or trapezoidal. Genital styles rather stout.

Type species: *Matutinus opulentus* Distant  
(original designation)

#### Key to the species of *Matutinus*

1. Vertex with submedian carinae uniting at apex; phallus armed with stout teeth on both sides . . . . . *yanchinus* Kuoh
- Vertex with submedian carinae uniting far before apex; phallus armed with several teeth at dorsal aspect near apex only . . . . . *aculeatus* n.sp.

**(67) MATUTINUS YANCHINUS Kuoh****Fig. 75.**

*Matutinus yanchinus* Kuoh, 1980, *Acta Entomologica Sinica*, 23(2):197.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:121.

General color black. Vertex, submedian carinae of vertex, antennae, lateral lobes of pronotum, mesoscutellum and legs except femora yellowish white. Tegmina black, anterior area of apical half white, margins yellowish white except before ends of clavus and hind median margin of claval area black.

Vertex longer in middle line than wide at base about 1.3:1, at apex slightly narrower than at base, anterior margin produced at middle. Frons longer in middle line than wide at widest part about 2.7:1, widest at apical third, median carina simple. Postclypeus as wide at base as frons at apex. Antennae with basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with 19-24 teeth. Tegmina longer than widest part about 2.9:1.

Anal segment of male small, apical margin roundly produced, in profile stout process produced from middle, in caudal view process angulated, directed latero-ventrad, ventral portion slender. Pygofer in profile as wide dorsally as ventrally, laterodorsal angle roundly produced, in caudal view with opening wider than long, lateral margins not well defined, without medioventral process. Phallus tubular, slightly narrowing to apex, in ventral view armed with stout teeth at each side. Orifice ventrad. Suspensorium small, circular, transverse dorsally. Diaphragm narrow, dorsal margin produced arrow-shaped. Genital styles wide, slightly divergent apically, inner margin at middle produced a small, curved spine.

**Male (macropterous)**

Length of body (includ.teg.): 3.33 mm.

Length of tegmen: 2.80 mm.

Specimen examined: 1♂, Tali, Ilan Hsien, 10-VIII-1986, C.C. Chaing.

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China (Hainan).



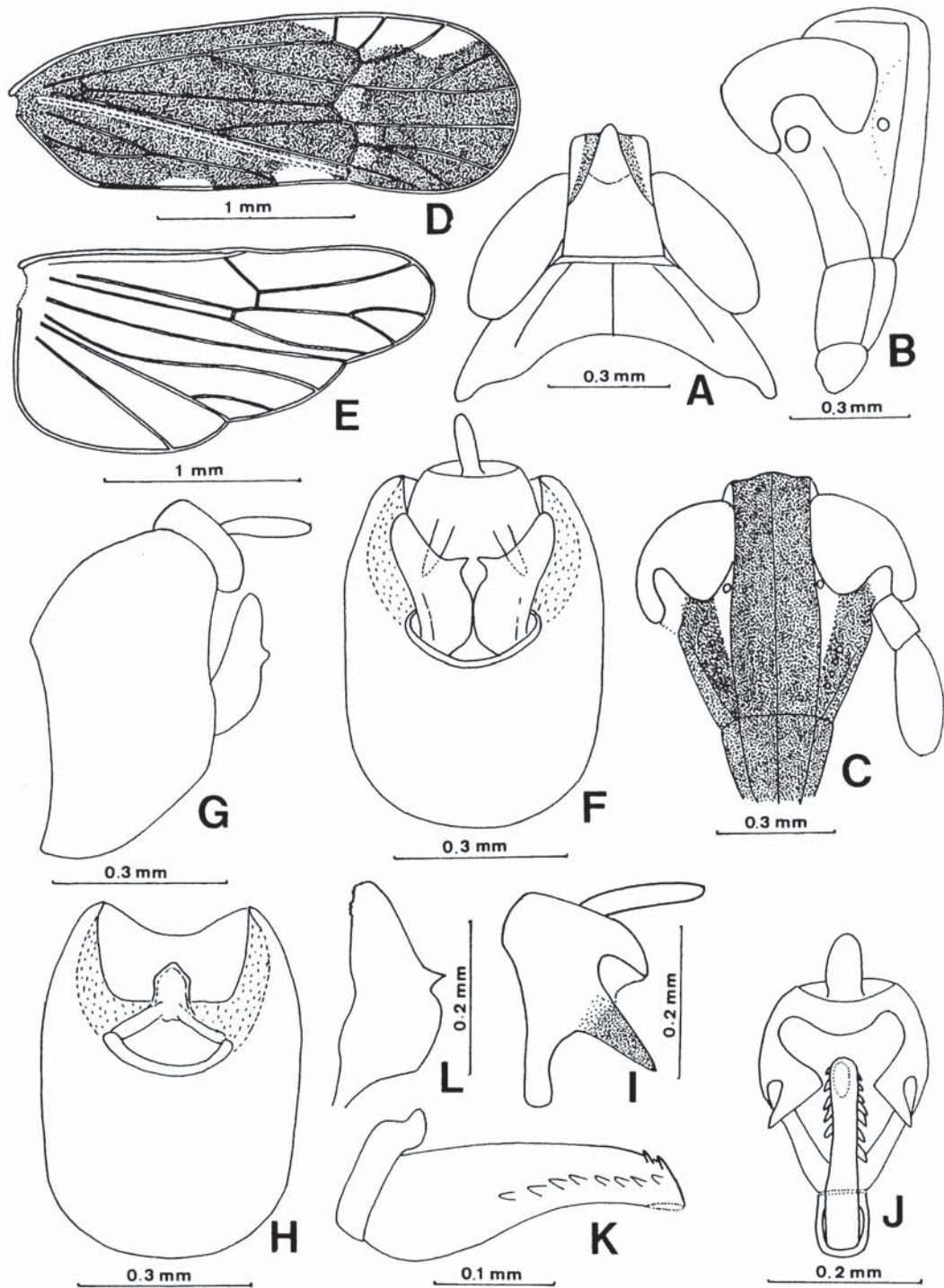


Fig. 75. *Matutinus yanchinus* Kuoh A, head and pronotum, dorsal view; B, head, left side; C, frons and postclypeus; D, tegmen; E, wing; F, male genitalia, posterior view; G, the same, left side; H, diaphragm of pygofer; I, anal segment of male, left side; J, anal segment of male and phallus, ventral view; K, phallus, left side; L, genital style, left side.

(68) *MATUTINUS ACULEATUS* n.sp.

Fig. 76.

General color dark brown. Antennae, rostrum and legs yellowish white except fore and mid-coxae dark brown. Tegmina semihyaline, brown with dorsoapical area somewhat paler.

Vertex longer submedially than wide at base about 1.4:1, lateral carinae concave, apical margin slightly wider than at base, submedian carinae uniting far before apex, Y-shaped carina present, basal compartment wider than greatest length about 1.3:1. Frons longer in middle line than wide at widest part about 2.7:1, widest near apex. Postclypeus as wide as frons at apex. Rostrum reaching to meta-coxae. Post-tibial spur with 23-24 teeth, very long, as long as basal tarsus. Tegmina longer than widest part about 3.2:1.

Anal segment of male rather small, collar-shaped, lateroapical angles approximately, each produced into a spinose process, process arising from dorsad. Pygofer in profile as wide ventrally as dorsally, laterodorsal angle slightly produced below which somewhat emarginate, diaphragm produced caudad quadrate, in posterior view with opening very short, lateral margins not well defined. Phallus tubular, nearly parallel, only slightly widened at base, armed with several teeth at dorsal aspect near apex only. Suspensorium small, somewhat quadrilateral ventrally, dorsal margin triangular. Diaphragm rather broad, dorsal margin strongly produced in quadrate lobe, surface distinctly sculptured and produced caudad in elongate circular. Genital styles stout, strongly divergent apically, outer margin sinuate, acute at apex, inner margin with blunt process near middle, in laterocaudal view basal process distinct.

The name *aculeatus* is Latin adjective, means pointed.

## Male (macropterous)

Length of body (includ.teg.): 3.50-3.66 mm.

Length of tegmen: 2.83-3.00 mm.

## Female (macropterous)

Length of body (includ.teg.): 3.83 mm.

Length of tegmen: 3.16 mm.

Holotype: Male, Taipei, 5-V-1960, K.S. Lin. In TARI.

Paratypes: 3♂♂, same data as for holotype; 1♀, same locality, 13-IV-1960, K.S. Lin.

Host plant: Unknown.

Distribution: Taiwan.

This new species resembles *M. yanchinus* Kuoh, *M. melichari* (Kirkaldy) and *M. amyclas* Fennah in the shape of the genital styles, but differs from latter in submedian carinae uniting far before apex of vertex and the shape of phallus.



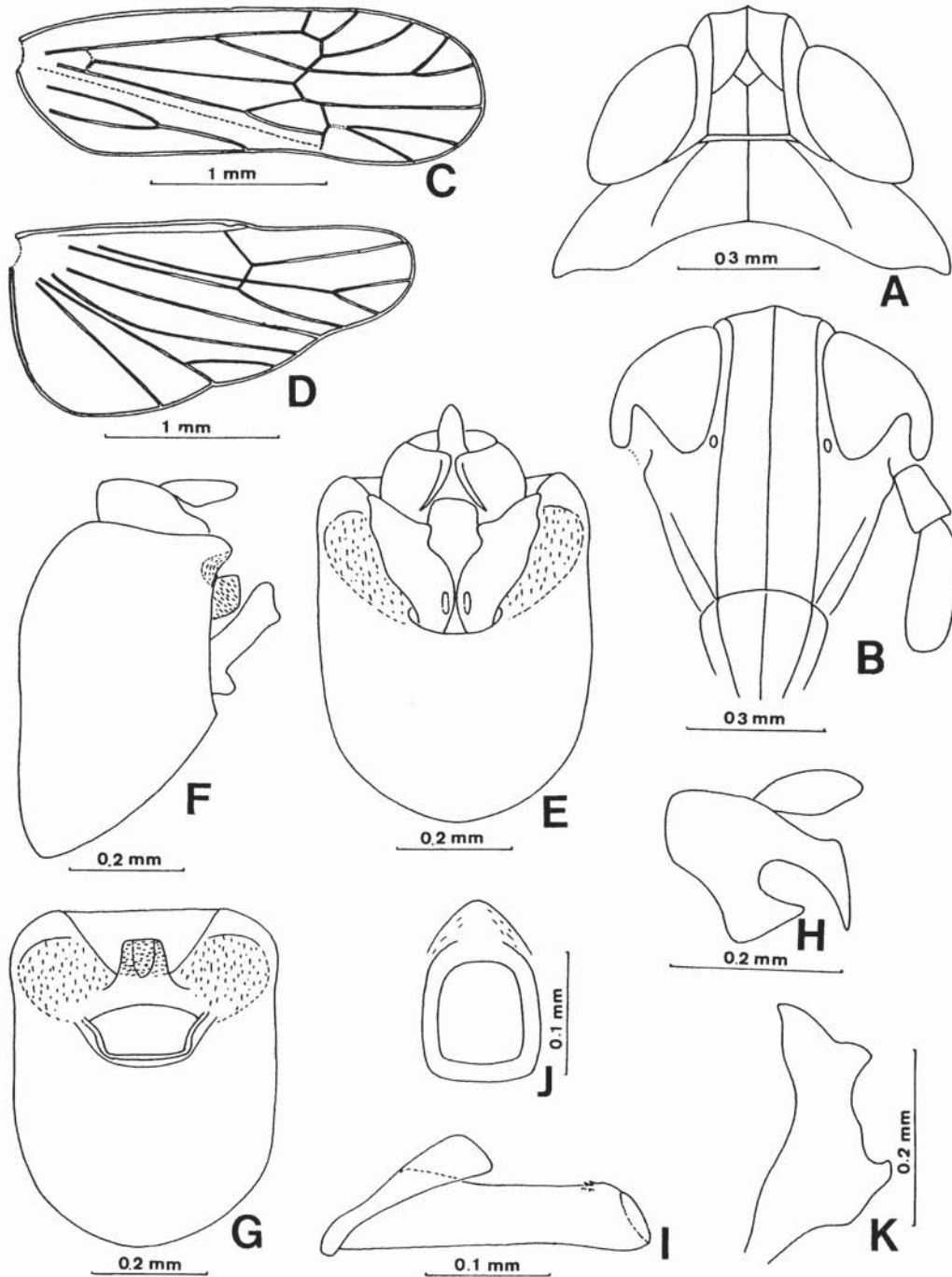


Fig. 76. *Matutinus aculeatus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, left side.

### 38. Genus *Sogatella* Fennah

*Sogatella* Fennah, 1964, *Bull. Ent. Res.*, 54: 58.

*Chloriona* (*Sogatella*) Fennah, 1956, *Proc. Calif. Acad. Sci.*, 4(28):471.

The generic characters outlined by Fennah [1964] are simplified as follows.

Head including eyes narrower than pronotum. Vertex longer submedially than wide at base from subequality to 1.4:1, lateral carinae parallel or weakly convergent distad, submedian carinae uniting at base of frons, Y-shaped carina distinct but not prominent. Frons longer in middle line than wide at widest part about 2.4-2.8:1, lateral carinae straight or weakly convex. Rostrum reaching to meso-trochanters. Ocelli present. Antennae cylindrical, little surpassing frontoclypeal suture. Pronotum with lateral carinae almost attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with 17-22 teeth.

Anal segment of male collar-shaped, spinose processes arising close to middle on distal margin. Pygofer moderately long. Phallus simple, tubular, usually sinuate, with two more or less complete rows of teeth, one obliquely on left side. Suspensorium ring-like medially or ventrally. Diaphragm rather narrow at its middle, sometimes a very small medioventral process present. Genital styles relatively short, broad, flattened and distally furcate or moderately long, straight and tapering.

Typic species: *Delphax furcifera* Horváth  
(original designation)

#### Key to the species of *Sogatella*

1. Genital styles each with inner margin produced into a process . . . . . 2
  - Genital styles inner margin without process . . . . . 4
2. Frons with intercarinal areas dark brown to black; tegmina with end of clavus brown . . . . . *furcifera* (Horváth)
  - Frons with intercarinal areas not dark brown to black . . . . . 3
3. Genae black; diaphragm with dorsal margin evenly concave, semicircular, peg-like processes indistinct . . . . . *vibix* (Haupt)
  - Genae not black; diaphragm with dorsal margin slightly produced medially, each side with a distinct peg-like process . . . . . *kolophon* (Kirkaldy)
4. Postclypeus and frons concolor; genae entirely brown . . . . . *fulva* n.sp.
  - Postclypeus and frons bicolor, postclypeus much paler; genae only lower half brown . . . . . *lima* n.sp.



(69) *SOGATELLA FURCIFERA* (Horváth)

Fig. 77.

*Sogatella furcifera* Fennah, 1964, *Bull. Ent. Res.*, 54:50.—: Fennah, 1971, *Ins. Micronesia*, 6(8):573.—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:113.*Chloriona (Sogatella) furcifera* Fennah, 1956, *Proc. Calif. Acad. Sci.*, 4(28):471.—: Fennah, 1956, *Ins. Micronesia*, 6(3):115.*Delphax furcifera* Horváth, 1899, *Terms Fuzetek*, 22:372.*Sogata furcifera* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 26.—: Matsumura et Ishihara, 1945, *Mushi*, 16:64.—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:63.

General color yellowish to yellowish brown. Pronotum white except areas behind eyes black. Frons, clypeus, genae, lateral fields of mesonotum, fore and mid-coxae and pleura black or blackish. Abdomen and pygofer dark brown. Tegmina hyaline with brown spot at end of clavus.

Vertex nearly as long submedially as wide at base, obtusely rounding into frons, lateral carinae straight, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 1.6:1. Frons in middle line longer than wide at widest part about 2.4:1, lateral carinae shallowly convex, median carina simple. Post-clypeus at base slightly wider than frons at apex. Antennae surpassing frontoclypeal suture, basal segment longer than wide at apex, shorter than second about 1:1.8. Post-tibial spur with about 25 teeth. Tegmina longer than widest part about 3.3:1.

Anal segment of male short, lateroapical angles distinctly separated, each produced ventrad in a moderately stout spinose process. Pygofer in profile slightly narrower dorsally than ventrally, in posterior view with opening nearly as long as wide, laterodorsal angle obtusely rounded, only weakly produced. Phallus compressed laterally, with about 18 teeth on left side and 14 on right, 2 rows separated at base. Suspensorium elongate, with hole at middle. Diaphragm with dorsal margin evenly concave with a pair of peg-like process. Opening for genital styles with dorsal margin evenly arched upward, ventral margin with a broad lobe medially. Genital styles divergent, each with outer angle broadly produced, obtuse at apex, inner angle produced as long as outer one, acute apically.

## Male (macropterous)

Length of body (includ.teg.): 3.50-3.66 mm.

Length of tegmen: 2.93-3.06 mm.

Specimens examined: 12♂♂, Pingtung, Pingtung Hsien, 20-IV-1984, C.T. Yang.

Host plant: *Oryza sativa* L.

Distribution: Taiwan, Mainland China, Japan, Korea, Siberia, Micronesia, Philippines, Indo-China, India, Sri Lanka, Sumatra, Amboina, Fiji, Seychelles, N. Africa.

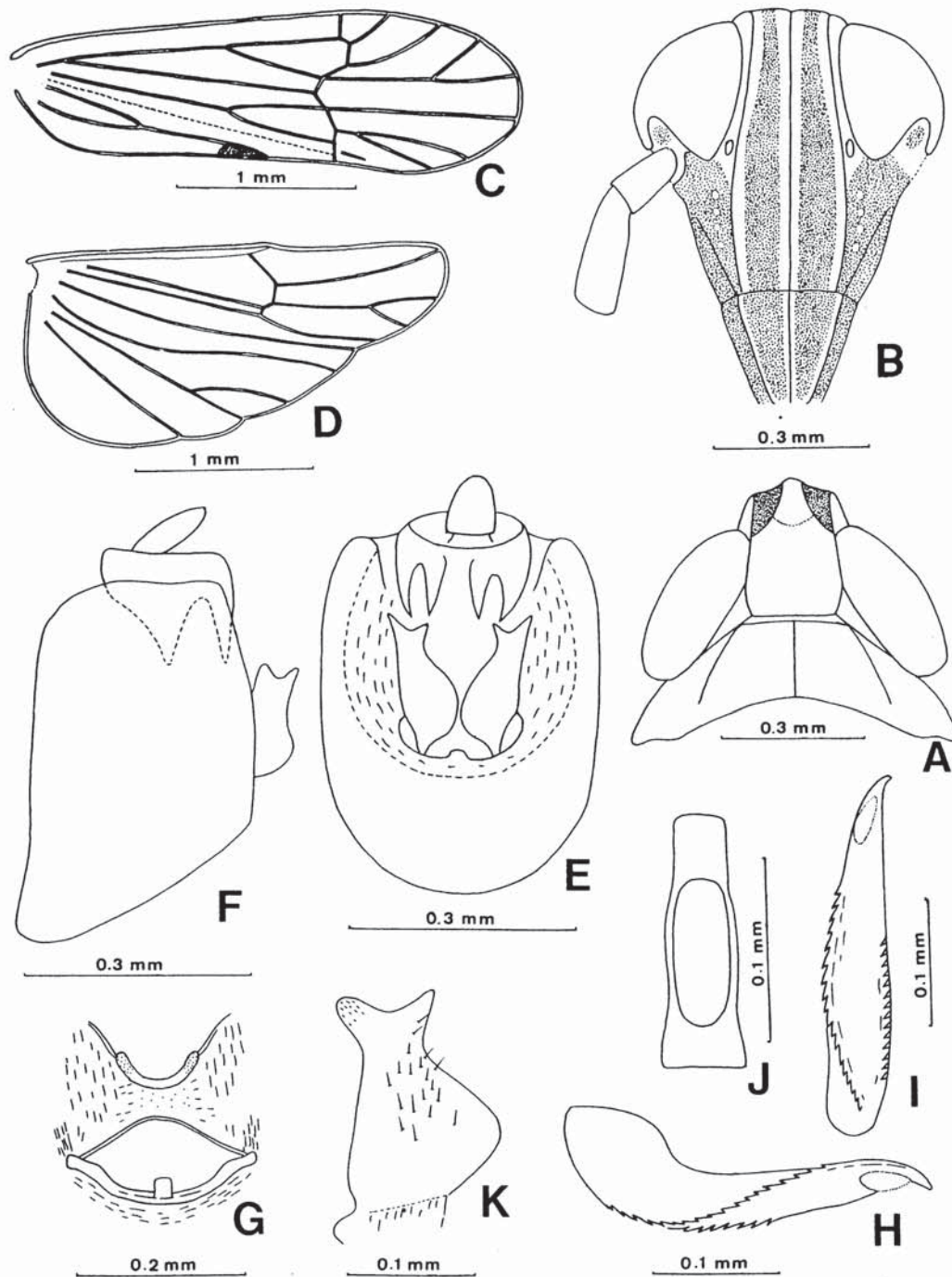


Fig. 77. *Sogatella furcifera* (Horváth) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, left side; I, the same, ventral view; J, suspensorium; K, genital style, left side.



(70) *SOGATELLA VIBIX* (Haupt)

Fig. 78.

*Sogatella vibix* Wilson et Ashe. (unpublished)*Sogatella longifurcifera* Fennah, 1956, *Bull. Ent. Res.*, 54:53.—: Fennah, 1971, *Ins. Micronesia*, 6(8):574.—: Mochida et Okada, 1971, *Bull. Kyushu Agr. Expt. Sta.*, 15(4):788.—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:115.*Delphacodes longifurcifera* Esaki et Ishihara, 1947, *Mushi*, 17:41.—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:50.

General color whitish yellow. Genae, large triangular area of mesopleura, round spot of metapleura black, mesonotum with lateral fields pale brown to brown, apex of last tarsi black. Abdomen and pygofer dark brown. Tegmina hyaline.

Vertex longer submedially than wide at base about 1.3:1, rounding into frons, wider at base than at apex, lateral carinae straight, arms of Y-shaped carinae distinct, stem weak, submedian carinae not really uniting at apex, basal compartment of vertex wider at base than greatest length about 1.3:1. Frons in middle line longer than wide at widest part about 2.4:1, median carina simple, forked at extreme base. Postclypeus at base wider than frons at apex, in middle line distinctly longer than wide at base. Antennae surpassing frontoclypeal suture, first segment longer than wide at apex, shorter than second about 1:2.2. Post-tibial spur with about 20 teeth. Tegmina longer than widest part about 3.5:1.

Anal segment of male moderately short, lateroapical angles approximated but not contiguous, each produced ventrad in a moderately long spinose process. Pygofer in profile with dorsal margin nearly as long as ventral, laterodorsal angle scarcely produced mesad, in posterior view opening nearly as wide as long. Phallus generally similar to that of *S. furcifera* with about 18 teeth in an oblique row on left and about 8 on right, 2 rows distinctly separated at base, not approximated. Suspensorium with hole at middle. Diaphragm with dorsal margin deeply concave, median portion narrow, with a pair of peg-like process, directed slightly caudad, apical portion strongly sclerotized. Opening for genital styles evenly concave ventrally with a small process medially. Genital styles similar to that of type species.

## Male (macropterous)

Length of body (includ.teg.): 3.33-3.60 mm.

Length of tegmen: 2.90-3.06 mm.

## Female (macropterous)

Length of body (includ.teg.): 4.10-4.16 mm.

Length of tegmen: 3.40-3.46 mm.

Specimens examined: 10♂♂, 10♀♀, Pintung, Pintung Hsien, 10-IX-1984, C.T. Yang.

Host plant: *Oryza sativa* L.

Distribution: Taiwan, Mainland China, Japan, Korea, Mongolia, New Caledonia, Tonga, N. Australia, Europe, Africa.

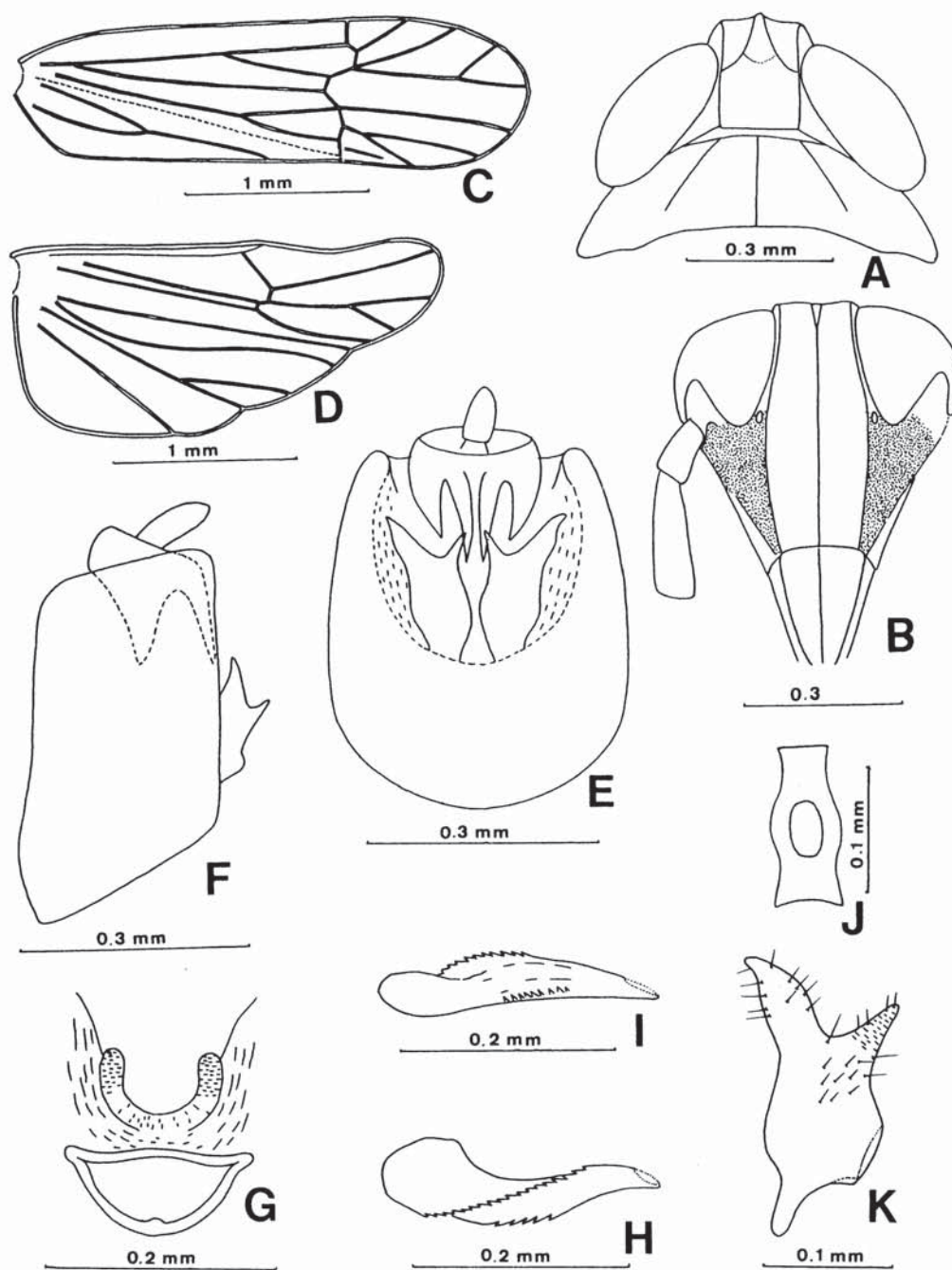


Fig. 78. *Sogatella vibix* (Haupt) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, left side, I, the same, ventral view; J, suspensorium; K, genital style, left side.



(71) *SOGATELLA KOLOPHON* (Kirkaldy)

Fig. 79.

*Sogatella kolophon* Fennah, 1964, *Bull. Ent. Res.*, 54:58.*Delphax kolophon* Kirkaldy, 1907, *Hawaiian Sugar Pl. Assoc. Div. Ent.*, 3:157.

General color yellowish brown. Mesonotum with lateral fields somewhat darker, fore and mid-coxae, pleura, abdomen except laterally and pygofer brown to dark brown. Tegmina hyaline.

Vertex longer submedially than wide at base about 1.3:1, evenly rounding into frons, slightly narrower at apex than at base, basal compartment of vertex wider at base than greatest length about 1.4:1. Frons in middle line longer than widest part about 2.2:1, lateral carinae slightly concave, median carina forked at basal fifth. Postclypeus at base slightly wider than frons at apex. Antennae reaching to frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with 15-22 teeth. Tegmina longer than widest part about 3.4:1.

Anal segment of male short, lateroapical angles each produced ventrad in a short, stout spinose process. Pygofer in profile wider dorsally than ventrally, in posterior view with opening slightly longer than wide, laterodorsal angle typically inflected. Phallus with about 16 teeth in oblique row on left and 6 on right margin, on caudal aspect left row obliquely reaching right side, 2 rows separated at base. Susepnsorium with hole at middle. Diaphragm with peg-like process on each side, dorsal margin slightly arched, peg-like processes and dorsal half of median portion strongly sclerotized. Opening for genital styles with dorsal margin arched upward and ventral margin with median production obtusely. Genital styles with outer angle evenly tapering to apex, basal angle with distinct ridge.

## Male (macropterous)

Length of body (includ.teg.): 3.19-3.46 mm.

Length of tegmen: 2.73-3.00 mm.

## Female (macropterous)

Length of body (includ.teg.): 3.76-3.89 mm.

Length of tegmen: 3.30-3.43 mm.

Specimens examined: 18♂♂, 6♀♀, Tienchih, Kaohsiung Hsien, 26-X-1981, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record), Japan, Micronesia, Sri Lanka, New Caledonia, Tonga, Australia.

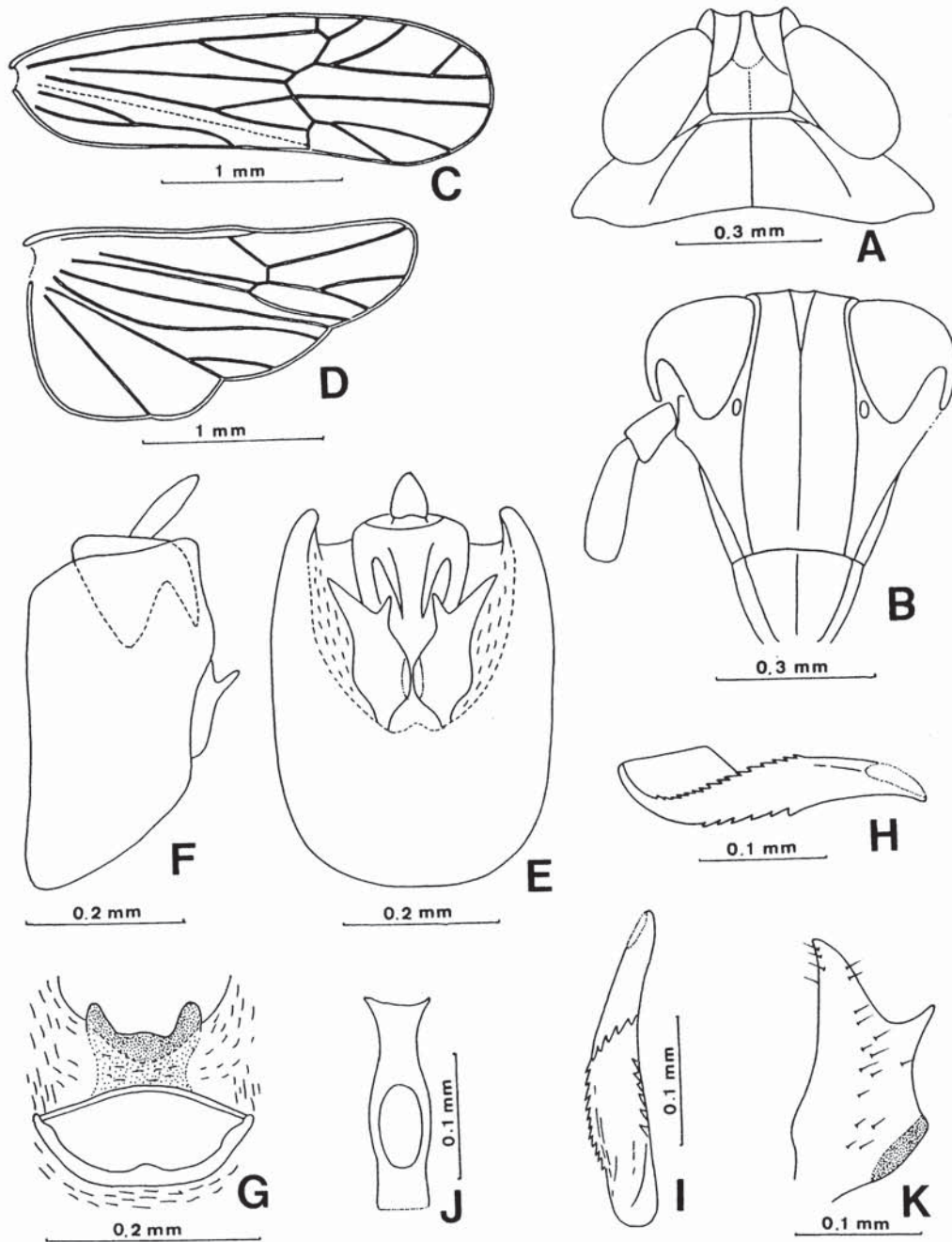


Fig. 79. *Sogatella kolophon* (Kirkaldy) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, left side; I, the same, ventral view; J, suspensorium; K, genital style, left side.



(72) *SOGATELLA FULVA* n.sp.

## Fig. 80.

General color yellowish brown. Face except carinae, pleura, coxae dark brown. Abdomen, pygofer and genital styles dark brown to black. Tegmina hyaline, veins concolor at base and brown at apex.

Vertex longer submedially than wide at base about 1.3:1, Y-shaped carina feeble, submedian carinae uniting at apex, basal compartment of vertex wider at base than greatest length about 1.5:1. Frons in middle line longer than wide at widest part about 2.4:1, lateral carinae weakly convex, median carina simple. Postclypeus at base distinctly wider than frons at apex. Antennae distinctly surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with about 20 teeth. Tegmina longer than widest part about 3.4:1.

Anal segment of male moderately short, a pair of moderately long spinose process arising submedially at apical margin, directed ventrad. Pygofer in profile distinctly longer dorsally than ventrally, with laterodorsal angle shortly produced, distinctly inflected mesad, in posterior view with opening wider than long. Phallus moderately short, with 3 teeth ventrally near apex, a row of 8 coarse teeth on left side and a row of 11 coarse teeth dorsally, sloping across right side. Suspensorium ring-like ventrally. Diaphragm with median portion sclerotized, dorsal margin rather broadly concave, with a short verticle peg-like process on each side. Opening for genital styles with dorsal margin arched upward, ventral margin nearly straight. Genital styles slender, strongly divergent, inner margin sinuate, inner angle with small point, obtusely rounded at apex.

The name *fulva* is Latin adjective, brownish.

## Male (macropterous)

Length of body (includ.teg.): 2.99-3.39 mm.

Length of tegmen: 2.47-2.87 mm

Holotype: Male, Sungho, Taichung Hsien, 28-XII-1983, C.T. Yang. In NCHU.

Paratypes: 7♂♂, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan

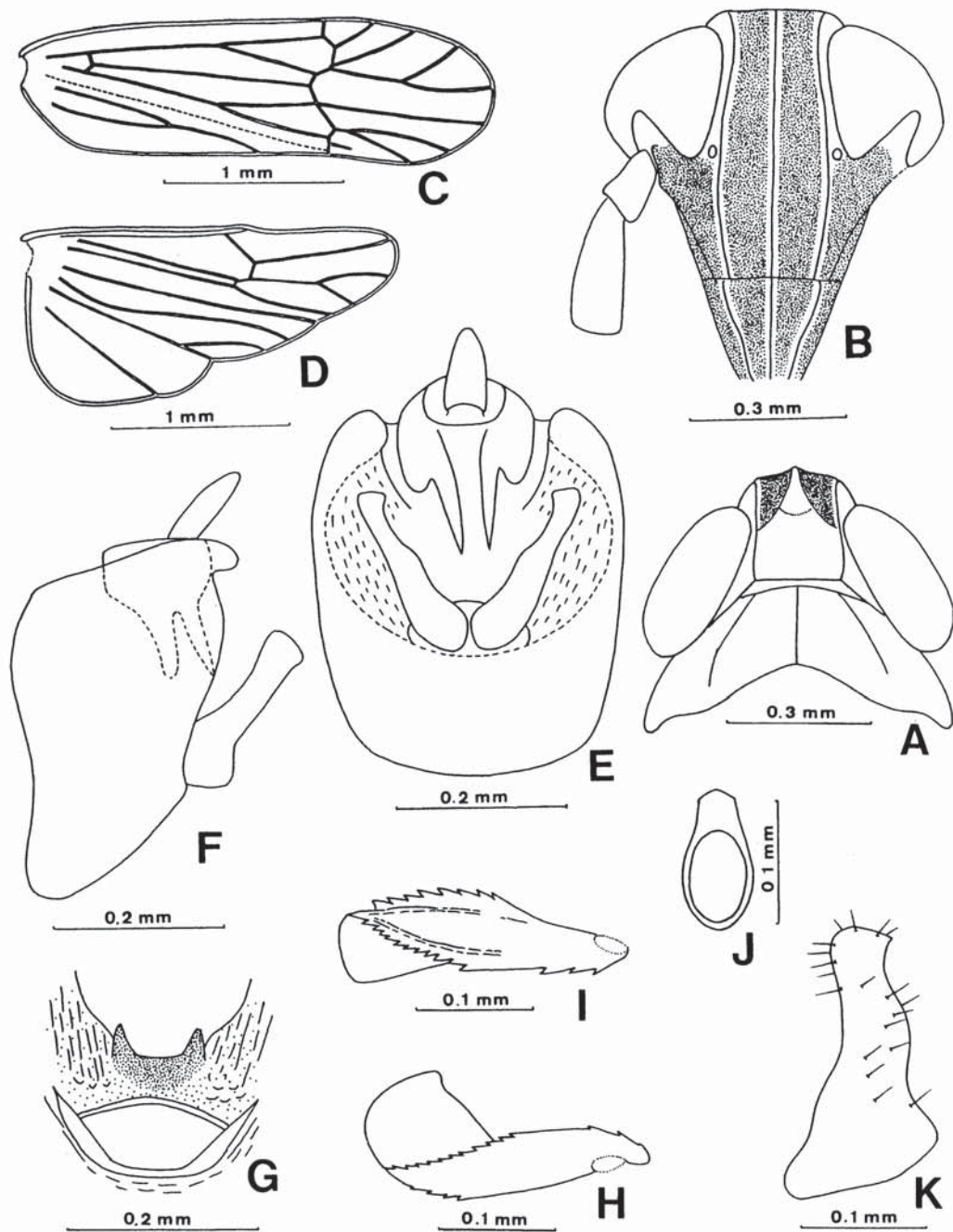


Fig. 80. *Sogatella fulva* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, left side; I, the same, ventral view; J, suspensorium; K, genital style, left side.



(73) *SOGATELLA LIMA* n.sp.

## Fig. 81.

General color pale yellowish brown. Intercarinal areas of frons black, intercarinal areas of postclypeus, lower half of genae, near apices of first antennal segment, metapleura brown. Abdomen dark brown to black. Tegmina hyaline.

Vertex wider at base than long submedially about 1.1:1, obtusely rounding into frons, nearly as wide at apex as at base, lateral carinae slightly concave, apical margin transverse, submedian carinae uniting at apex of vertex or at extreme base of frons, basal compartment of vertex wider at base than greatest length about 2:1. Frons in middle line longer than wide at widest part about 2.1:1, widest in middle, lateral carinae slightly convex, median carina simple. Postclypeus at base as wide as frons at apex, distinctly longer than wide at base. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.5:1, shorter than second about 1:1.6. Post-tibial spur with about 24 teeth. Tegmina longer than widest part about 3.4:1.

Anal segment of male moderately short, lateroapical angles each produced into a stout spinose process, directed ventrad. Pygofer in profile distinctly wider dorsally than ventrally, laterodorsal angle shortly produced ventrad, posterior margin strongly produced at dorsal half, in posterior view with opening wider than long. Phallus typical form, with several teeth scattered near apex. Suspensorium narrower dorsally, truncate ventrally. Diaphragm narrow, dorsal margin rather broadly concave, pigmented, semicircular. Opening for genital styles curved at ventral and dorsal margins. Genital styles moderately long and broad, obliquely rounded at apex, inner angle very weakly produced, basal angle produced, apical third attenuate.

The name *lima* is Latin adjective, oblique.

## Male (macropterous)

Length of body (includ.teg.): 3.39-3.46 mm.

Length of tegmen: 2.90-2.97 mm.

Holotype: Male, Taichung, 30-XI-1981, C.T. Yang, In NCHU.

Paratypes: 5♂♂, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

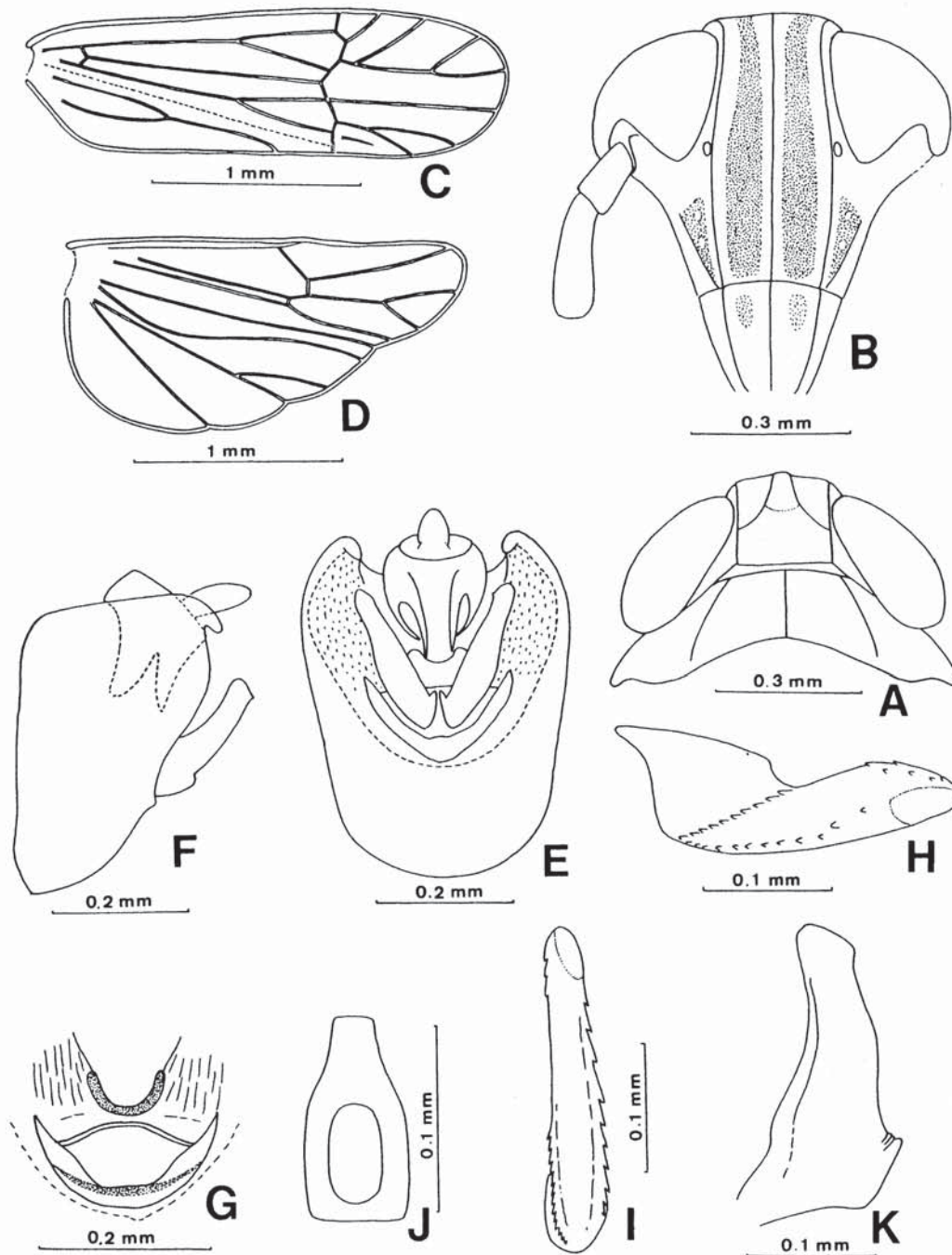


Fig. 81. *Sogatella lima* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, left side; I, the same, ventral view; J, suspensorium; K, genital style, left side.



### 39. Genus *Sogatellana* Kuoh

*Sogatellana* Kuoh, 1980, *Acta Zootaxonomica Sinica*, 5(2):169.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:118.

The distinctive characters outlined by Kuoh (1980) are modified as follows.

Head including eyes distinctly narrower than pronotum. Vertex longer submedially than wide at base about 1.3:1, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 1.3:1. Frons longer in middle line than wide at widest part about 2.1-2.4:1, widest at apical third, lateral carinae convex below ocelli, median carina forked at base or not. Postclypeus as wide as or wider than frons at apex. Rostrum reaching to meso-trochanters. Ocelli present. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2.3. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with 16-23 teeth.

Anal segment of male short, ring-like, lateroapical angles moderately separated, each produced into 2 processes. Phallus tubular, slightly narrowed apically, armed with several teeth. Suspensorium ring-like, with indistinct arms dorsally. Diaphragm broad, with dorsal margin produced medially, median area near dorsal margin convex, margin with distinct pigmented ring, along it armed with many small spines, rugged on surface. Genital styles broad, moderately long, only slightly divergent, inner angle always produced.

Type species: *Sogatellana marginata* Kuoh  
(original designation)

#### (74) *SOGATELLANA SEMICIRCULARA* n.sp.

Fig. 82.

General color pale yellowish brown. Dorsal aspect with white stripe recurring from vertex to meso-scutellum. Legs yellowish white. Tegmina hyaline, apical membrane with posterior half pale black.

Vertex longer submedially than wide at base about 1.4:1, apical margin transverse, slightly produced medially, lateral carinae sinuate, submedian carinae uniting at apex, Y-shaped carina feeble, basal compartment wider at base than greatest length about 1.3:1. Frons longer in middle line than wide at widest part about 2.3:1, widest at apical third. Postclypeus at base as wide as frons at apex, slightly longer than wide at base. Antennae with basal segment longer than wide about 1.5:1, shorter than second about 1:1.8. Post-tibial spur with about 16 teeth. Tegmina longer than widest part about 3.3:1.

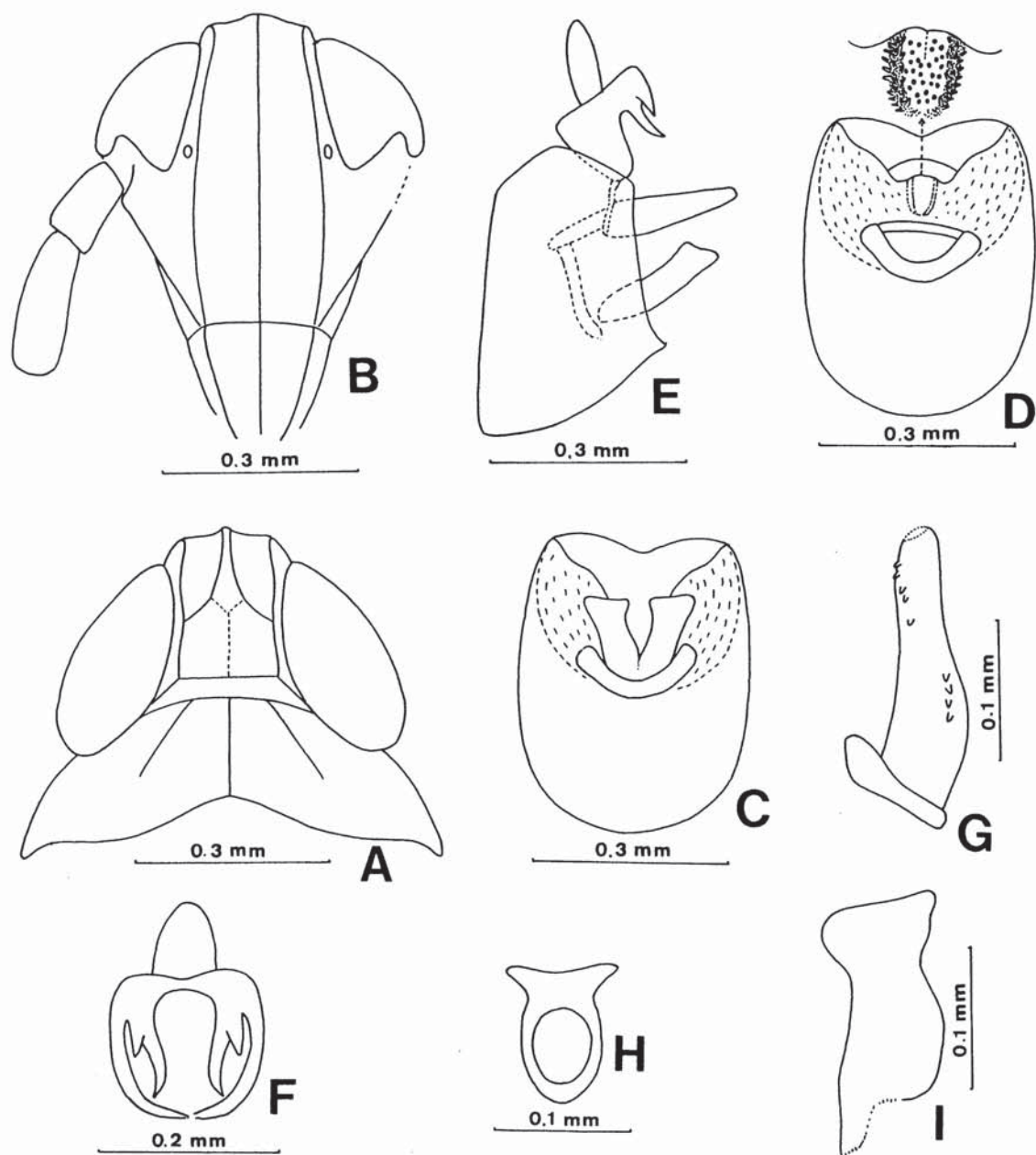


Fig. 82. *Sogatellana semicirculara* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, diaphragm of pygofer; E, male genitalia, left side; F, anal segment of male, posterior view; G, phallus, left side; H, suspensorium; I, genital style, left side.



Anal segment of male with lateroapical angles moderately separated, each produced into 2 processes, upper one short and stout, directed slightly laterad, lower one long, spinose, arched medially. Pygofer in profile distinctly wider ventrally than dorsally, dorsal margin angulate medially, laterodorsal angle not produced, in posterior view with opening wider than long, lateral margins not well defined. Phallus tubular, slightly narrowed at apical half, with several teeth at middle and near apex. Orifice terminal, dorsad. Suspensorium circular at ventral two-thirds, stem winged at each side. Diaphragm slightly directed caudad, with dorsal margin roundly produced, pigmented ring semicircular. Opening for genital styles nearly straight at dorsal margin, evenly concave at ventral. Genital styles short and broad, divergent, truncate at apex, outer margin straight, inner margin concave at apical half.

The name *semicirculara* is Latin adjective, semicircular.

| Male                             | (macropterous) | (coelopterous) |
|----------------------------------|----------------|----------------|
| Length of body<br>(includ.teg.): | 2.66-2.80 mm.  | 2.20-2.53 mm.  |
| Length of tegmen:                | 2.16-2.26 mm.  | 1.66-2.03 mm.  |
| Female (coelopterous)            |                |                |
| Length of body:                  | 2.20-2.26 mm.  |                |
| Length of tegmen:                | 1.66-1.73 mm.  |                |

Holotype: Male, Nanjenshan, Pingtung Hsien, 12-II-1985, C.T. Yang. In NCHU.

Paratypes: 11♂♂, 5♀♀, same locality, 12-14, II-1985. C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan:

This new species differs from other 2 species of the Mainland China in shape of the genital styles; the processes of anal segment and by the smallest body.

#### 40. Genus *Harmalia* Fennah

*Harmalia* Fennah, 1969, *Pacif. Ins. Monogr.*, 21:37.

—: Tian, 1983, *Econ. Ins. Fauna China*, 27:133.

*Paracorbulo* Tian et Ding, 1980, *Entomotaxonomica*, 2(4):315. NEW SYNONYMY.

The generic characters outlined by Fennah (1969) are modified as follows.

Head including eyes narrower than pronotum. Vertex quadrate, longer medially than wide at base, apical margin transverse, submedian carinae uniting on vertex more or less basad of anterior margin, Y-shaped carina with stem feeble, basal compartment wider at base than greatest length. Frons longer in middle line than wide at widest part more than 2:1, widest at apical third, median carina simple. Postclypeus at base only a little wider than frons at apex. Rostrum scarcely reaching to meta-trochanters. Ocelli present. Antennae cylindrical, with basal segment longer than wide, shorter than second about 1:1.5. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male short, collar-shaped, lateroapical angles each produced into spinose process. Pygofer in profile wider dorsally than ventrally, laterodorsal angle strongly produced, in posterior view with opening longer than wide, without medioventral process. Phallus tubular, with or without teeth. Suspensorium ring-like ventrally, dorsal portion triangular. Diaphragm narrow, dorsal margin roundly produced and granulated. Genital styles moderately long, simple.

Type species: *Sogata thoracica* Distant  
(original designation)

Tian et Ding [1980] erected genus *Paracorbulo* for three species of Mainland China and designated *Sogata sirokata* Matsumura et Ishihara as type species. Tian [1983, *Econ. Ins. Fauna China*, 27:127] noted "This genus resembles *Harmalia* Fennah, but the latter with frons longer than wide at widest part about 2.3:1 (2.6-3.2:1 in *Paracorbulo*); phallus with teeth. Listing characters of Taiwanese species, it is difficult for the author to arrange the species according to Tian's definition. All our species here have the diaphragm narrow with dorsal margin roundly produced and granulated; suspensorium with dorsal portion triangular, ring-like ventrally. The author does not desire to follow Tian to split them into different genera.

#### Key to the species of *Harmalia*

1. Phallus armed with teeth ..... 2
  - Phallus without tooth ..... 3
2. Tegmina opaque, black; phallus distinctly broad at basal half, narrow at apical half ..... *commelinae* n.sp.
  - Tegmina hyaline, pale yellowish brown; phallus nearly same diameter throughout ..... *separata* n.sp.
3. Frons longer in middle line than widest part about 2.8:1; postclypeus as wide at base as frons at apex ..... *sirokata* (Matsumura et Ishihara)
  - Frons longer in middle line than widest part about 2.6:1 ..... 4
4. Submedian carinae uniting at apex of vertex; tegmina semihyaline, pale brown ..... *sameshimai* (Matsumura)
  - Submedian carinae uniting before apex of vertex ..... 5
5. Pygofer in profile with caudal and ventral margins evenly curved; genital styles with production of inner angle distinct higher than outer ..... *cordata* n.sp.
  - Pygofer in profile caudal and ventral margins distinct, not evenly curved; genital styles with production of inner angle indistinct, lower than outer ..... *heitensis* (Matsumura et Ishihara)



(75) *HARMALIA HEITENSIS* (Matsumura et Ishihara)

Fig. 83.

*Harmalia heitensis* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:105.—: Fennah, 1978, *Ann. Zool. Warszawa*, 34(9):15.*Sogata heitensis* Matsumura et Ishihara, 1945, *Mushi*, 16:66.—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:66.

General color dark brown to black. Pronotum with posterior half white, carinae of frons and postclypeus, rostrum, antennae, legs brown except coxae dark brown and tibiae somewhat light. Tegmina brown, granulose concolorous with veins.

Vertex as long submedially as wide at base, lateral carinae straight, submedian carinae uniting on vertex far before apical margin, basal compartment wider at base than greatest length about 1.7:1. Frons longer in middle line than wide at widest part about 2.5:1, widest at apical third, lateral carinae distinctly convex below ocelli. Postclypeus wider at base than frons at apex, as long as wide at base. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.6:1, shorter than second about 1:1.9. Post-tibial spur with 19-21 teeth, spur thin and wide about each tooth with a seta. Tegmina longer than widest part about 2.9:1.

Anal segment of male short, collar-shaped, lateroapical angles approximate, each produced into a strong spinose process, directed ventrad. Pygofer in profile wider dorsally than ventrally, laterodorsal angle strongly produced and reflected, in posterior view with opening wider than long, lateral margins convex. Phallus long, tubular, without tooth. Orifice terminal on dorsal aspect. Diaphragm narrow, dorsal margin roundly produced, small. Opening for genital styles evenly curved at dorsal margin, straight at ventral then angulate to laterad. Genital styles wide, slightly divergent, outer margin produced medially, inner margin convex, outer angle produced into a broad, triangulate lobe, inner angle short and acute.

## Male (macropterous)

Length of body (includ.teg.): 3.26-3.33 mm.

Length of tegmen: 2.70-2.86 mm.

## Female (brachypterous)

Length of body: 2.13-2.26 mm.

Length of tegmen: 0.93-1.06 mm.

Specimens examined: 5♂♂, 6♀♀, Nanjenshan, Pintung Hsien, 14-II-1985, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan, Viet-Nam.

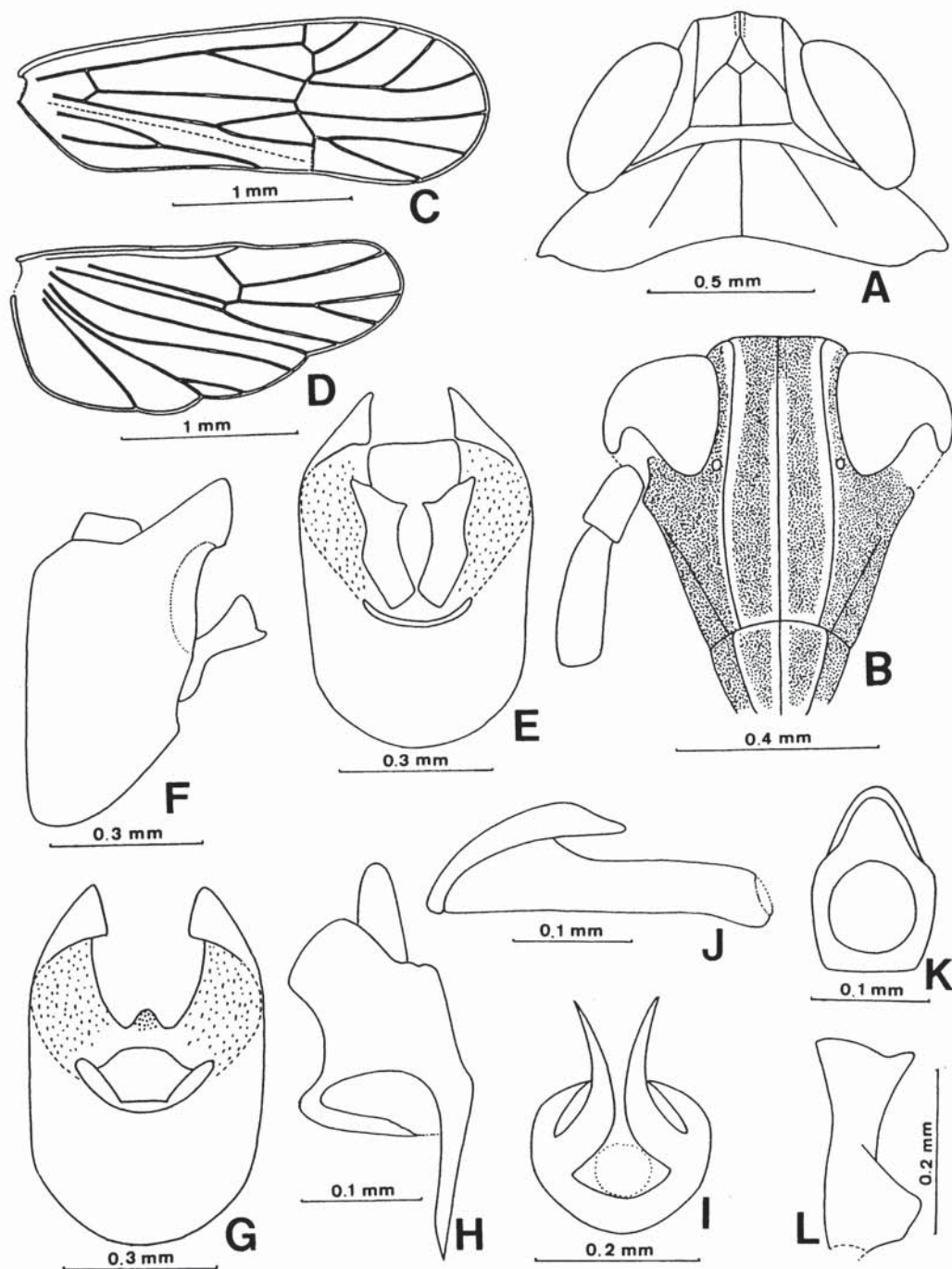


Fig. 83. *Harmalia heitensis* (Matsumura et Ishihara) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the smae, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, the same, dorsal view; J, phallus, left side; K, suspensorium.



(76) *HARMALIA SAMESHIMAI* (Matsumura et Ishihara)

Fig. 84.

*Harmalia sameshimae* (sic) Fennah, 1971, *Ins. Micronesia*, 6(8):582.*Delphacodes sameshimai* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:54.*Unkuna sameshimai* Matsumura et Ishihara, 1945, *Mushi*, 16(10):68.

General color pale brown. Pronotum between lateral carinae and posterior margin yellowish white, face except carinae, coxae of legs and abdomen dark brown to black. Tegmina semihyaline, pale brown.

Vertex nearly as long submedially as wide at base, at apex slightly narrower than at base, apical margin acutely produced medially, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 1.5:1, widest at apical third. Rostrum reaching beyond meso-trochanters. Antennae surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with about 19 teeth, very broad, half as wide as long. Tegmina longer than widest part about 2.8:1.

Anal segment of male collar-shaped, lateroapical angles approximately, each produced into a strong spinose process which right angulated at base. Pygofer in profile very wide, laterodorsal angle broadly produced, in posterior view with opening wider than long, lateral margins not well defined. Phallus tubular, without tooth. Suspensorium acutely rounded at dorsal margin, ventral two-third ring-like. Diaphragm with dorsal margin roundly produced medially, rather large. Genital styles moderately long, slightly sinuate, outer angle with lobe-like production, inner angle with rod-like process, basal angle with distinct small process.

## Male (macropterous)

Length of body (includ.teg.): 3.33 mm.

Length of tegmen: 2.73 mm.

Specimen examined: 1♂ (dissected) Kuohsing, Nantou Hsien, 30-VI-1986, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record), Japan, South Mariana Is.

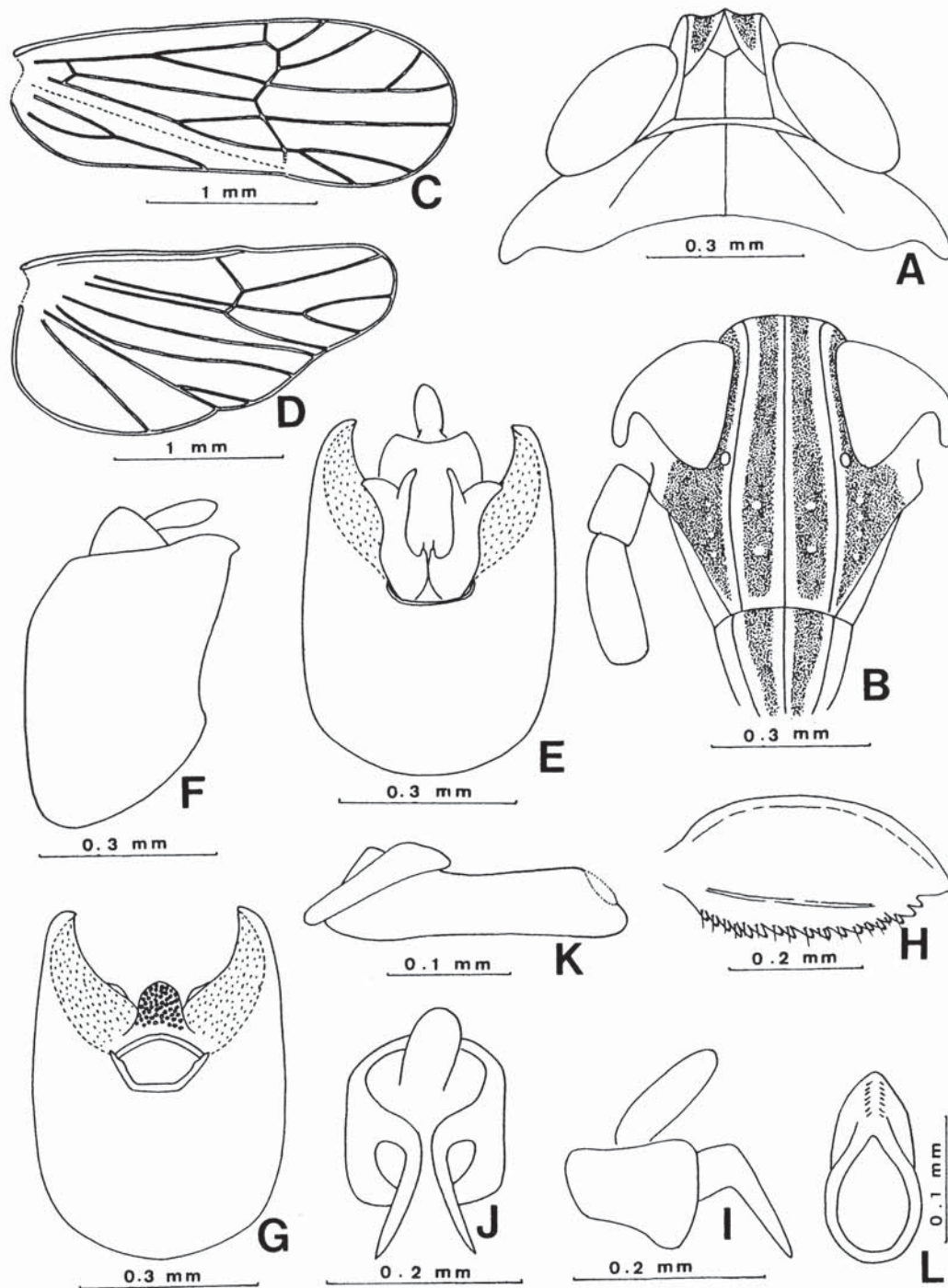


Fig. 84. *Harmalia sameshimai* (Matsumura et Ishihara) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, post-tibial spur; I, anal segment of male, left side; J, the same, caudal view; K, phallus, left side; L, suspensorium.



(77) *HARMALIA SIROKATA* (Matsumura et Ishihara) n.comb.  
Fig. 85.

*Chloriona (Sogatella) sirokata* Fennah, 1956, *Calif. Acad. Sci.*, 28:472.

*Delphacodes albicollis* Hirano, 1942, (nec Motschulsky vel Sahlberg) *Byochugai-zasshi*, 29:38.

*Sogata sirokata* Matsumura et Ishihara, 1945, *Mushi*, 16:64.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:65.

*Paracorbulo sirokata* Tian, Ding et Kuoh, 1980, *Entomotaxonomia*, 2(4):316.

General color pale yellowish brown. Pronotum white except areas behind eyes somewhat brown. Mesonotum dark brown. Abdomen brown. Tegmina hyaline, uniformly pale yellowish brown.

Vertex as long submedially as wide at base, narrower at apex than at base, submedian carinae uniting before apex, Y-shaped carina indistinct. Frons longer in middle line than wide at widest part about 2.8:1, widest at middle. Postclypeus as wide at base as frons at apex. Rostum reaching meta-coxae. Antennae reaching over frontoclypeal suture, basal segment longer than wide about 2.7:1, shorter than second about 1:2. Post-tibial spur with about 18-19 teeth. Tegmina longer than widest part about 2.8:1.

Anal segment of male collar-shaped, lateroapical angles each produced into a spinose process. Pygofer in profile with laterodorsal angle strongly produced, in posterior view opening wider than long, lateral margins not well defined. Phallus tubular. Suspensorium ring-like ventrally, dorsal portion lobe-like, ventral margin truncate. Diaphragm narrow, dorsal margin cornically produced medially, rather small, granulated. Genitl styles moderately long, outer margin sinuate, inner margin concave medially, apical margin incised near inner.

Male (macropterous)

Length of body (includ.teg.): 3.66-3.76 mm.

Length of tegmen: 3.10-3.16 mm.

Female (macropterous)

Length of body (includ.teg.): 3.94 mm.

Length of tegmen: 3.23 mm.

Specimens examined: 4♂♂, 1♀, Taipei, 6,14-V-1960; 9,28-VI-1960, K.S. Lin.

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China, Japan.

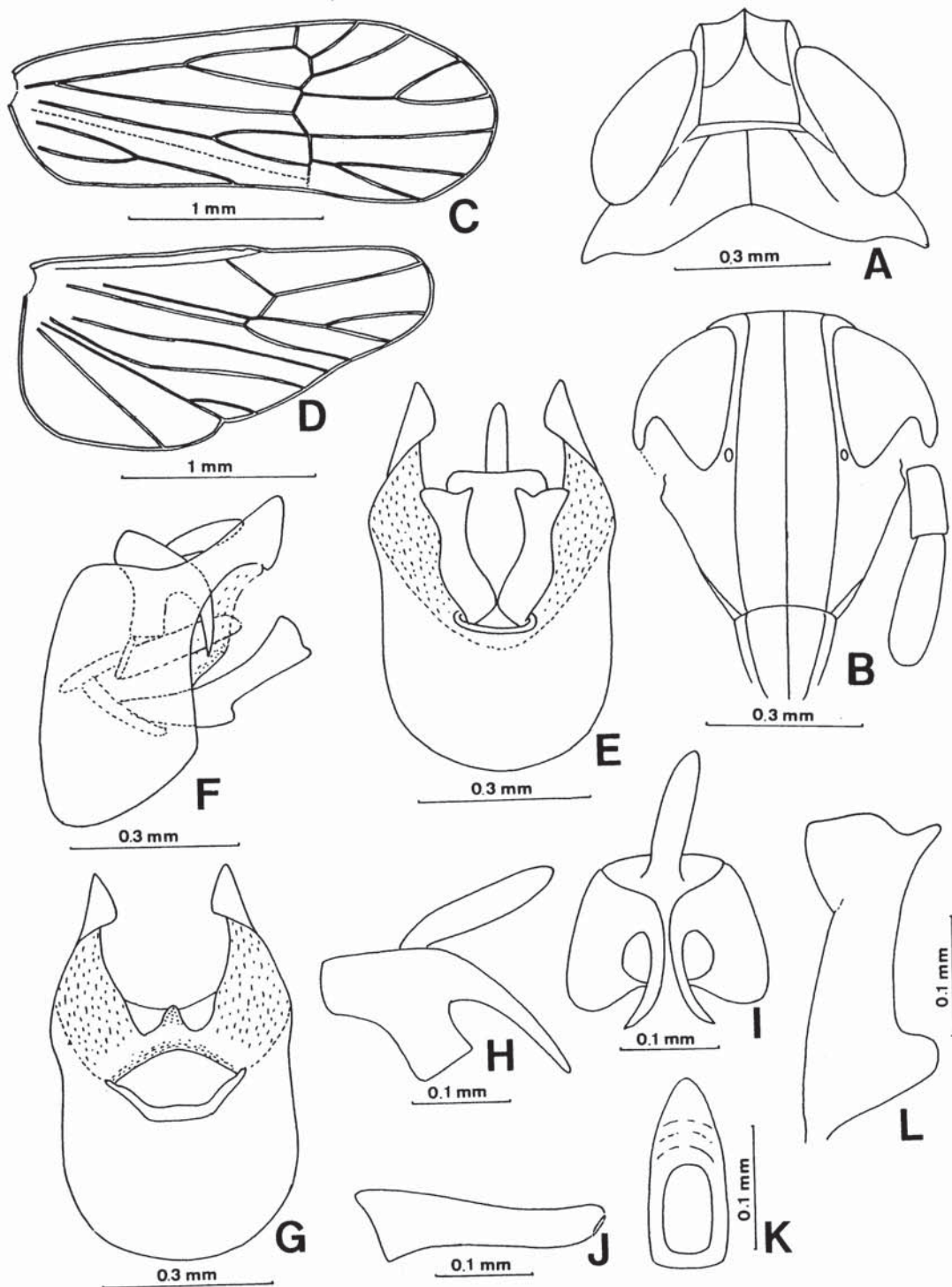


Fig. 85. *Harmalia sirokata* (Matsumura et Ishihara) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, the same, caudal view; J, phallus, left side; K, suspensorium; L, genital style, left side.



(78) *HARMALIA COMMELINAE* n.sp.

## Fig. 86.

General color black. Carinae of frons, genae, clypeus, rostrum, legs after trochanters yellowish to yellowish white. Tegmina opaque, black, membrane after cross-vein slightly paler.

Vertex longer submedially than wide at base about 1.1:1, apical margin distinctly produced forward medially, Y-shaped carina distinct, basal compartment wider at base than greatest length about 1.7:1. Frons longer in middle line than wide at widest part about 2.3:1, lateral carinae slightly convex. Rostrum slightly over meso-trochanters. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 2:1, shorter than second about 1:1.8. Post-tibial spur with 22-23 teeth. Tegmina longer than widest part about 3.2:1.

Anal segment of male collar-shaped, processes moderately long. Pygofer in profile with laterodorsal angle strongly produced, in posterior view with opening wider than long, lateral margins convex. Phallus tubular, distinctly broad at base, with four distinct teeth at dorsal aspect near apex. Suspensorium elongate quadrate, ventral two-thirds ring-like. Diaphragm with dorsal margin acutely rounded produced, surface armed with many granulations. Genital styles nearly same as in *H. heitensis* but production of inner angle somewhat longer.

The name *commelinae* is genitive of *Commelina*, the generic name of host plant.

## Male (macropterous)

Length of body (includ.teg.): 3.10-3.26 mm.

Length of tegmen: 2.56-2.70 mm.

| Female            | (macropterous) | (brachypterous) |
|-------------------|----------------|-----------------|
| Length of body    |                |                 |
| (includ.teg.):    | 3.66-3.93 mm.  | 2.73-2.83 mm.   |
| Length of tegmen: | 3.26 mm.       | 1.06-1.14 mm.   |

**Fifth instar nymph (Fig. 87)**

General color white. Antennae, vertex with laterocaudal angles black. Dorsal aspect of meso- and metathorax and abdominal segment V and VI with irregular black markings.

Head between eyes as long in middle line as wide at narrowest portion, strongly protruding beyond level of eyes, length of eye longer than between level of eyes and lateral point of frons about 3.2:1, than mid-point of anterior margin about 2.3:1, width of head including eyes wider than width of basal compartment at hind margin about 2:1, submedian carinae attaining hind margin of vertex laterally, basal compartment at hind margin longer than greatest length about 2.8:1, hind margin straight. Frons longer in middle line than widest part about 1.7:1, widest at level of lower margin of eyes, lateral carinae slightly convex medially, with 2 median carinae, separated,

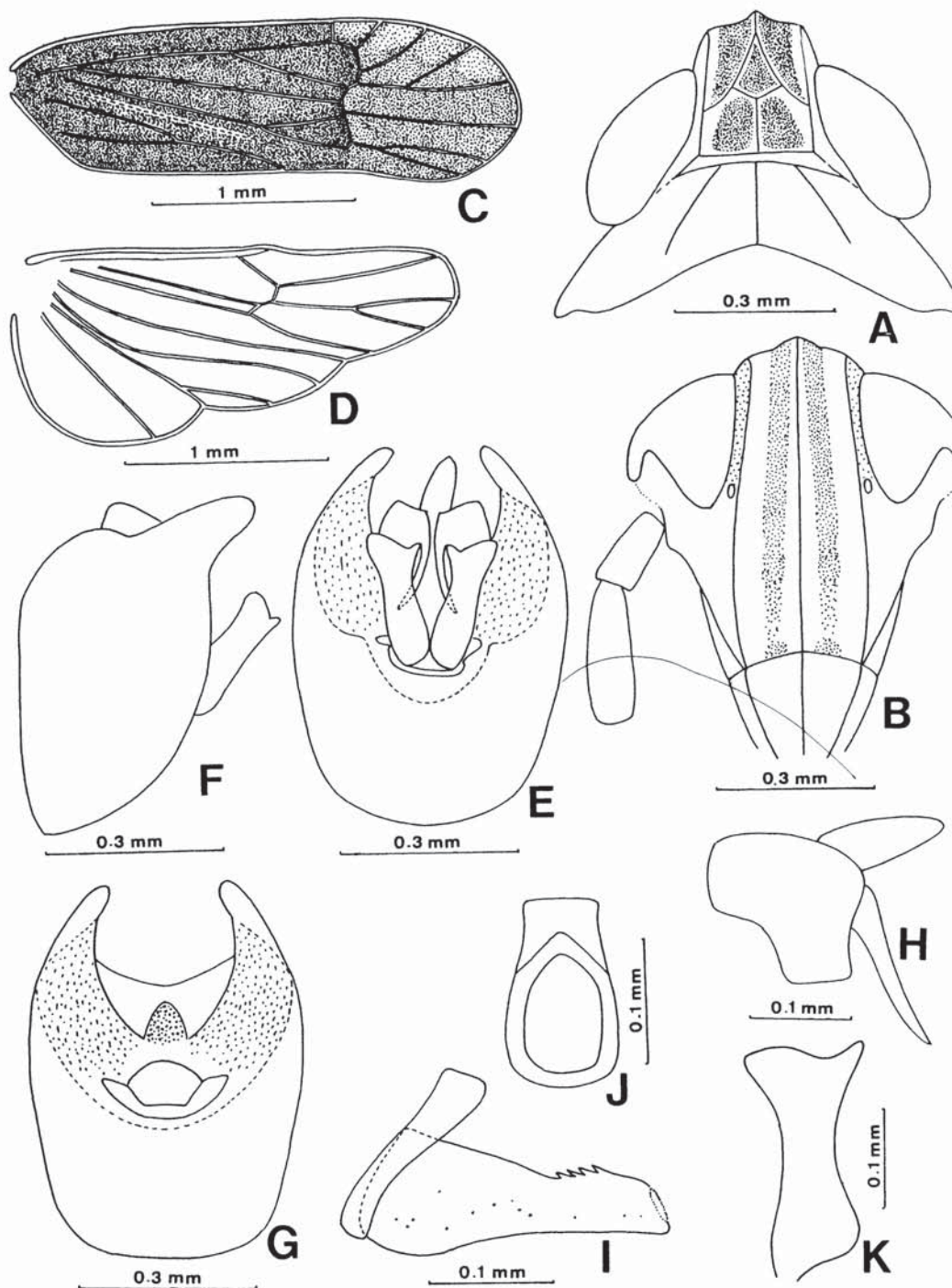


Fig. 86. *Harmalia commelinae* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, lateral view; G, diaphragm of pygofer; H, anal segment of male, lateral view; I, phallus, left side; J, suspensorium; K, genital style, laterocaudal view.



nearly parallel. Interfrons narrower than laterofrons. Number and arrangement of pits typical, each side with 3 extra pits, lower pit lies far away from frontoclypeal suture, distance about three diameters of pit, distance between dorsal level of lower pits and ventral level of median pits, shorter than former to frontoclypeal suture about 1:5, lower of upper pits higher than higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies above median point of eye. Frontoclypeal suture slightly arched, postclypeus in middle line shorter than wide at base. Antennae stout, basal segment as long as wide, shorter than second about 1:2.5. Rostrum short, reaching to meso-trochanters, relative length of each segment about 0.9:1.3:1.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, distance between  $W_1$  to  $W_2$  longer than  $W_2$  to  $W_3$  about 2:1, anterior wing pad protruding not over hind one, latter not reaching to anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, metatibia longer than 3 tarsi combined about 1.1:1, first tarsal segment longer than 2 latter combined about 1.2:1, spur shorter than first tarsal segment with about 14 teeth.

Abdomen distinctly wider at middle, tergite V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX:1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge incised medially, lateral lobes broadly protruding, pits distinctly lie near base, in lateral view strongly produced near base, dorsal portion very narrow, in caudal view with opening widest dorsad.

Length of body: 2.23 mm.

Width of head including eyes: 0.60 mm.

Length of anterior wing pad: 0.80 mm.

Length of antenna: 0.30 mm.

Holotype: Male, Chiasien, Kaohsiung Hsien, 24-VIII-1986, C.T. Yang. In NCHU.

Paratypes: 42♂♂, 17♀♀, same data as for holotype.

Nymphal specimens examined: Fifth instar nymph: 5, data same as for holotype.

Host plant: *Commelina diffusa* Burm.

Distribution: Taiwan.

This new species differs from *H. heitensis* by the teeth of phallus; color of the face, the tegmina and the pronotum.

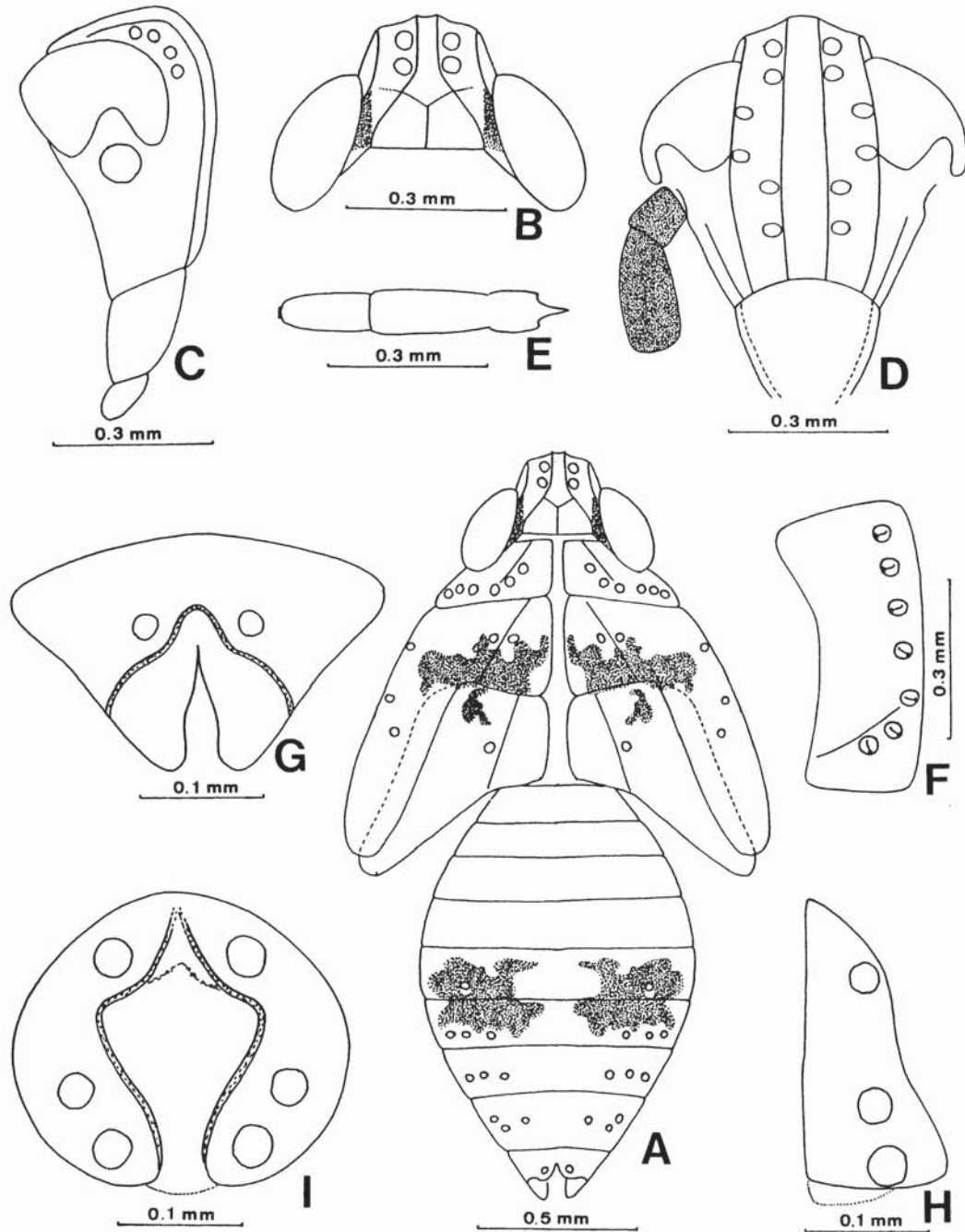


Fig. 87. Nymph of *Harmalia commelinae* n.sp. A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.



(79) *HARMALIA CORDATA* n.sp.

Fig. 88.

General color dark brown. Pronotum with posterior half white, vertex, mesonotum, antennae and legs pale brown. Intercarinal areas of frons and genae dark brown. Abdomen black. Tegmina semiopaque, yellowish brown.

Vertex longer submedially than wide at base about 1.2: 1, lateral carinae convex, apical margin transverse, distinctly incised submedially, submedian carinae distinctly uniting before apex, basal compartment wider at base than greatest length about 1.4:1. Frons longer than wide at widest part about 2.5:1. Postclypeus distinctly wider at base than frons at apex. Antennae with basal segment longer than wide about 1.6: 1, shorter than second about 1:1.9. Post-tibial spur as long as basitarsal segment, with about 22 teeth. Tegmina longer than widest part about 3.2:1.

Anal segment of male small. Pygofer in profile with hind and ventral margins evenly curved, laterodorsal angle strongly produced caudad, acutely rounded at apex, lateral areas of production of diaphragm rectangularly produced mesad. Phallus tubular. Suspensorium with stem small, ring-like portion large. Diaphragm with dorsal margin produced medially, acutely rounded, at both lateral margins near base with indistinct, irregular production. Genital styles each with process of inner angle more higher than outer, at basal angles each with a small process beset a strong seta at apex.

The name *cordata* is Latin adjective, cordated.

## Male (macropterous)

Length of body (includ.teg.): 3.03-3.23 mm.

Length of tegmen: 2.60-2.73 mm.

Holotype: Male, Puli, Nantou Hsien, 22-XII-1986, C.T. Yang, In NCHU.

Paratypes: 12♂♂, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from other numbers of this genus in shaped of diaphragm; hind margin of pygofer and basal angles of genital styles. From *Opiconsiva dilpa* (Kirkaldy) in anal segment of male deeply sunk in emargination of pygofer; hind tibia longer than femura.

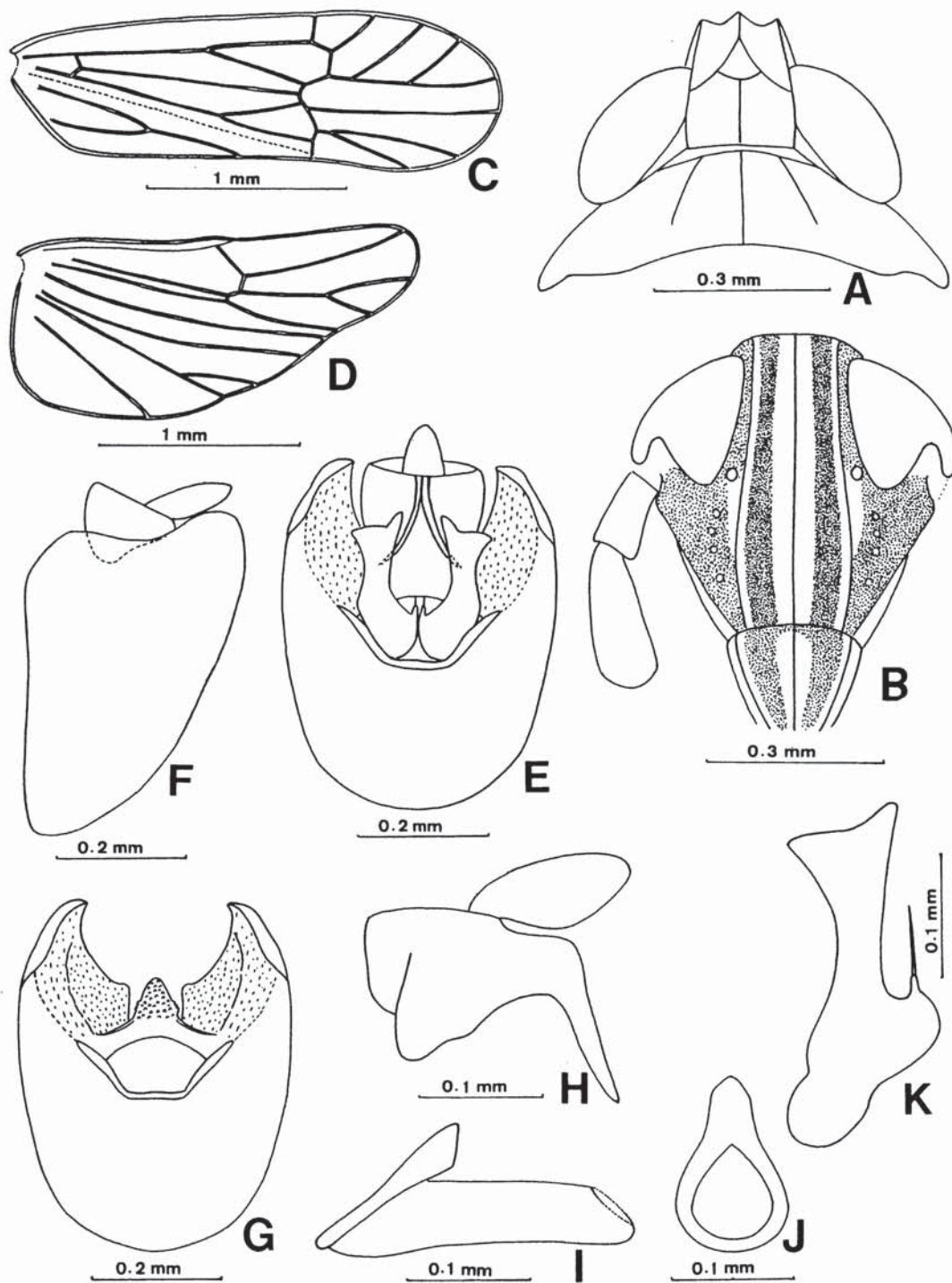


Fig. 88. *Harmalia cordata* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, left side.



(80) *HARMALIA SEPARATA* n.sp.

Fig. 89.

General color uniformly pale yellowish brown.

Vertex longer submedially than wide at base about 1.1:1, at apex narrower than at base, apical margin strongly emarginate at each side of midpoint, submedian carinae uniting slightly before apex, Y-shaped carina feeble. Frons longer in middle line than wide at widest part about 2.4:1, widest at level of ocelli, carinae not really attaining frontoclypeal suture, lateral carinae nearly straight below ocelli, slightly concave between eyes. Postclypeus wider at base than frons at apex. Antennae rather long, reaching over middle of postclypeus, basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with 17-20 teeth. Tegmina longer than widest part about 3.3:1.

Anal segment of male sunk in emargination of pygofer, lateroapical angles approximately, each produced in spinose process. Pygofer in profile wider dorsally than ventrally, laterodorsal angle roundly produced caudad and reflected, in posterior view with opening very wide, lateral margins not well defined. Phallus tubular, armed with several teeth on dorsal portion near apex. Orifice terminal. Suspensorium ring-like ventrally, triangular lobed dorsally. Diaphragm broad, somewhat circular, dorsal margin slightly incised medially, granulated laterad. Genital styles moderate, inner angle strongly produced in process, in laterocaudal view with basal process very stout, apical margin obliquely truncate.

The name *separata* is Latin adjective, distinct.

Male (macropterous)

Length of body (includ.teg.): 3.46-3.50 mm.

Length of tegmen: 2.80-2.83 mm.

Female (macropterous)

Length of body (includ.teg.): 3.83 mm.

Length of tegmen: 3.16 mm.

Holotype: Male, Taipei, 1-VI-1960, K.S. Lin. In TARI.

Paratypes: 1♂ (dissected), Taipei, 3-V-1960, K.S. Lin; 1♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from all known Taiwanese *Harmalia*-species in the shape of diaphragm and genital styles.

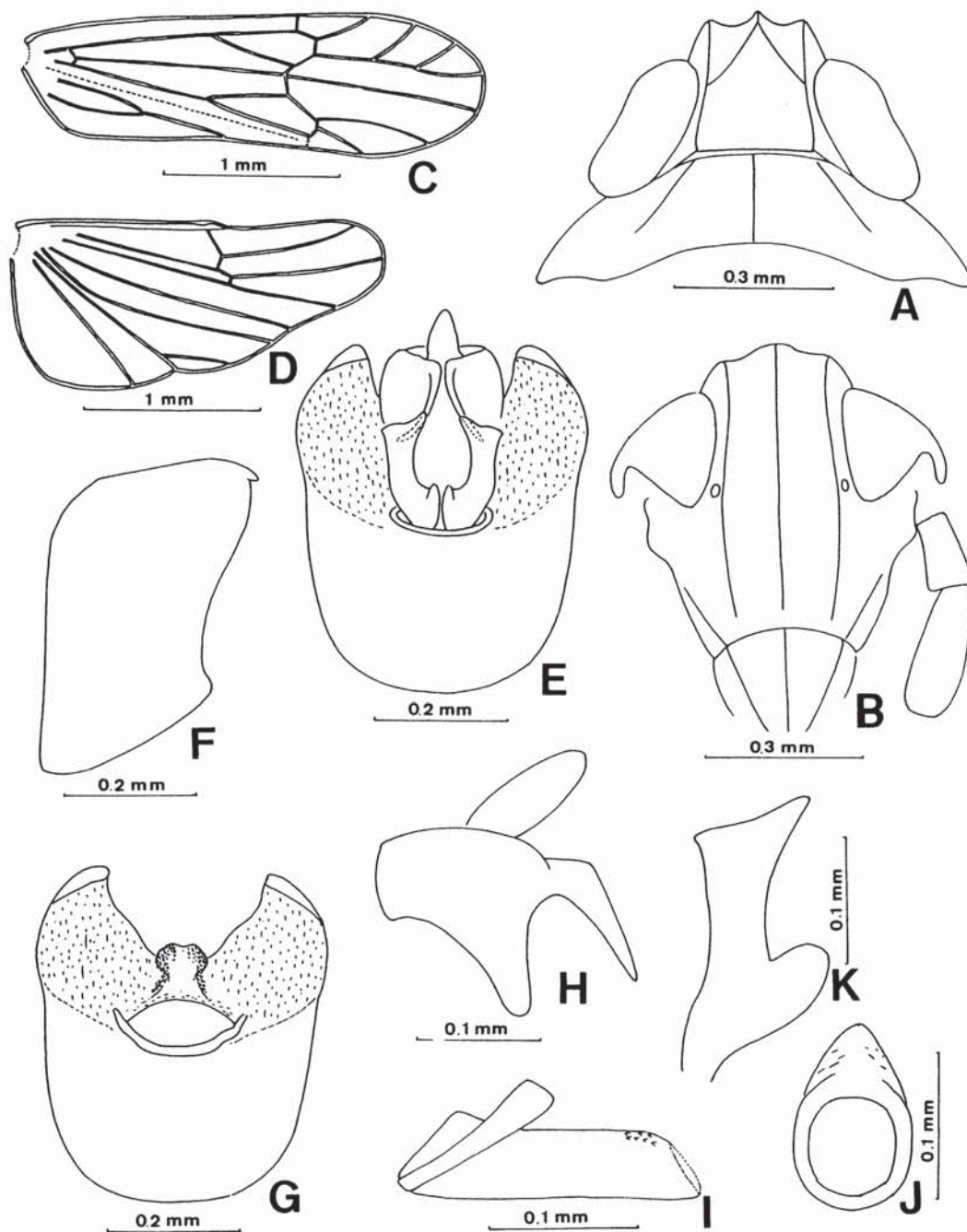


Fig. 89. *Harmalia separata* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, left side.



#### 41. Genus *Opiconsiva* Distant

*Opiconsiva* Distant, 1917, *Trans. Linn. Soc. Lond. Zool.*, 17:301.

—: Fennah, 1964, *Trans. R. Ent. Soc. Lond.*, 116(7):143.

—: Ding, 1980, *Econ. Ins. Fauna China*, 27:130.

*Corbulo* Fennah, 1965, *Bull. Br. Mus. Nat. Hist. (Ent.)* 17:48. (Asche, in press)

The generic characters outlined by Distant [1917] are modified as follows.

Head including eyes wider than pronotum. Vertex slightly longer submedially than wide at base, about as wide at apex as at base, apical margin truncate, Y-shaped carina distinct or stem feeble, submedian carinae uniting at apex or at extreme base of frons. Frons longer in middle line than wide at widest part about 2:1, widest near middle. Rostrum surpassing meso-trochanters. Ocelli present. Rostrum surpassing meso-trochanters. Ocelli present. Antennae cylindrical, basal segment slightly longer than wide. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male small, ring-like or collar-shaped, lateroapical angles approximately, each produced in a spinose process. Pygofer in profile moderately short, in posterior view opening longer than wide. Phallus tubular, dorsobasal half stratified. Suspensorium ring-like. Diaphragm with dorsal margin produced dorsad medially. Genital styles rather short.

Type species: *Opiconsiva fuscovaria* Distant  
(original designation)

#### (81) *OPICONSIVA ALBICOLLIS* (Motschulsky) Fig. 90.

*Opiconsiva albicollis* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:112.

*Delphax albicollis* Motschulsky, 1863, *Bull. Soc. Nat. Moscou*, 36:110.

General color pale yellowish brown. Intercarinal areas of frons, postclypeus and genae pale brown. Pronotum white, mesonotum black, pleura and coxae black. Abdomen black, each segment with laterocaudal angles yellowish. Pygofer with dorso-caudal angles yellowish white. Tegmina of macropterous hyaline, pale yellowish brown, of brachypterous opaque, black with apical margin and posterior margin white.

Brachypterous. Vertex longer submedially than wide at base about 1.2:1, lateral carinae straight, apical margin transverse, submedian carinae uniting at apex, Y-shaped carina with arms distinct, stem feeble, basal compartment wider at base than greatest length about 1.4:1. Frons longer in middle line than wide at widest part about 2:1, widest below level of ocelli. Postclypeus distinctly wider at base than frons at apex. Post-tibial spur with 17 teeth in macropterous, 13-15 in brachypterous.

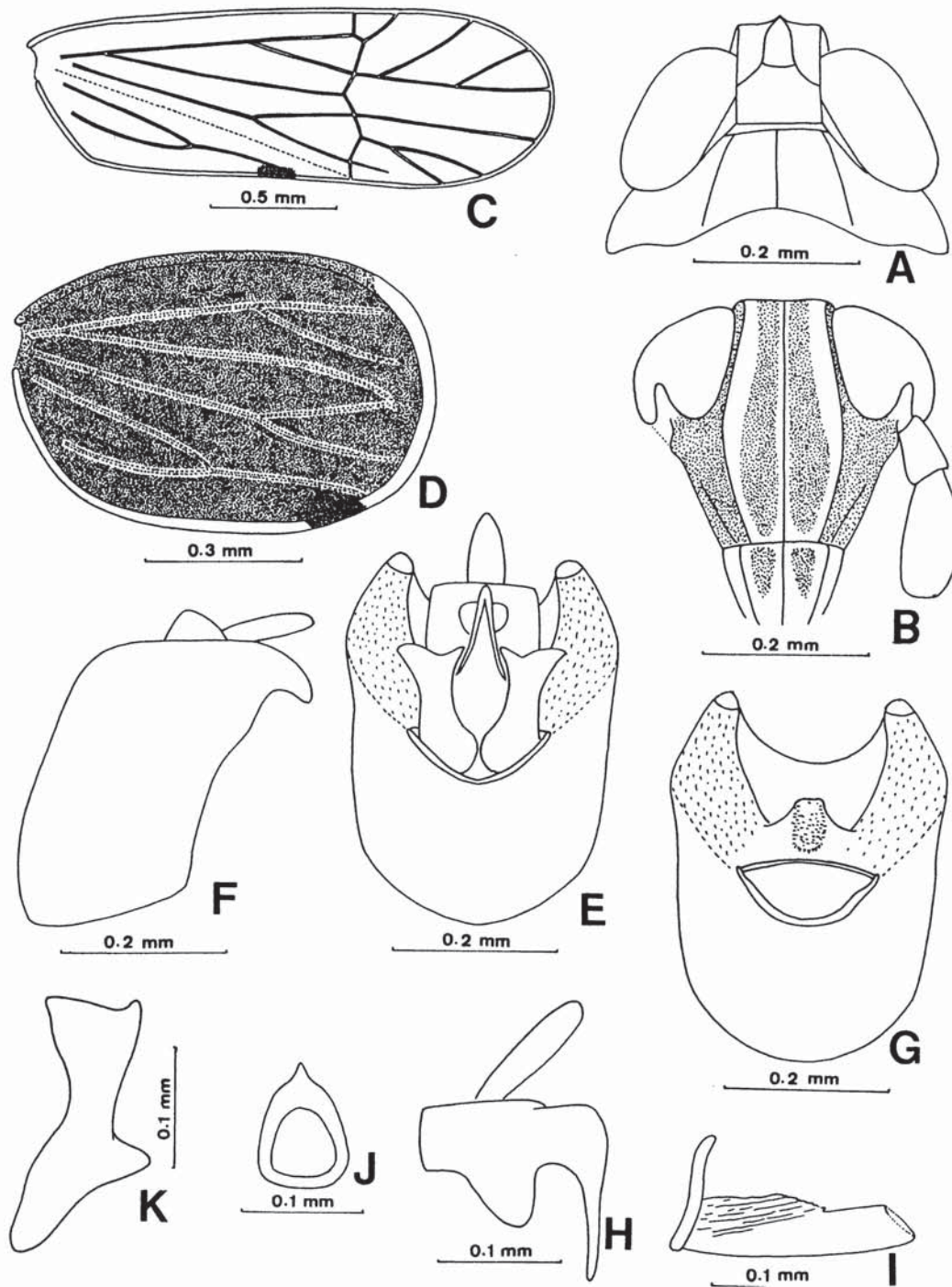


Fig. 90. *Opicònsiva albicollis* (Mostschulsky) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen (macropterous); D, tegmen (brachypterous); E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, laterocaudal view.



Anal segment of male small, 2 processes nearly uniting at base. Pygofer in profile dorsoapical angle strongly produced, turned ventrad at apex, ventral margin broad, in posterior view with opening wider than long. Phallus tubular, dorsobasal half stratified, orifice dorsoapical. Suspensorium small, ring-like, ventral margin straight, dorsal margin acutely produced medially. Diaphragm with dorsal margin produced dorsad, apex transverse, scaled. Genital styles as figured.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.): | 2.60 mm.       | 1.56-1.83 mm.   |
| Length of tegmen:                | 2.16 mm.       | 0.86-0.96 mm.   |

Specimens examined: 3♂♂, Lanshu, Taitung Hsien, 21-I-1987, S.J. Fang.

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China, Japan, Philippines, Java, Sri Lanka, Turkey, Europe.

## 42. Genus *Laodelphax* Fennah

*Laodelphax* Fennah, 1963, *Proc. R. Ent. Soc. Lond.*, (B) 32:15.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:147.

The generic characters outlined by Fennah [1963] are modified as follows.

Head including eyes narrower than pronotum. Vertex quadrate, as long submedially as wide at base, apical margin transverse, lateral carinae straight, submedian carinae not really uniting at apex, Y-shaped carina distinct, basal compartment longer at base than greatest length about 1.4:1. Frons longer in middle line than wide at widest part about 2:1, widest below level of ocelli. Postclypeus as wide at base as frons at apex. Rostrum just surpassing meso-trochanters. Ocelli present. Antennae cylindrical, basal segment longer than wide, shorter than second about 1:1.9. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 17 teeth.

Anal segment of male ring-like, lateroapical angles each produced into a spinose process. Pygofer in profile very short dorsally, longer and convex ventrally, in posterior view lateral margins strongly produced caudad basally, without medioventral process. Phallus tubular, lateral compressed, broad at basal half, pointed at apex. Suspensorium ring-like with 2 relatively long arms at dorsal margin, directed dorsocephalad. Diaphragm very broad. Genital styles simple, short.

Type species: *Delphax striatella* Fallén  
(original designation)

(82) *LAODELPHAX STRIATELLUS* (Fallén)

## Fig. 91.

*Laodelphax striatella* Fennah, 1963, *Proc. R. Ent. Soc. Lond.*, (B):32:15.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:148.

*Delphacodes striatella* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 31.

—: Matsumura et Ishihara, 1945, *Mushi*, 16:60.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:49.

General color black. Vertex, carinae of frons, antennae, tip of meso-scutellum and legs yellowish white. Pronotum white with areas behind eyes black. Tegmina hyaline, yellowish brown, near end of clavus with black marking.

Vertex as long submedially as wide at base, obtusely rounding into frons, as wide at apex as at base, lateral carinae straight, submedian carinae not really uniting at apex of vertex, basal compartment wider at base than greatest length about 1.4:1. Frons in middle line longer than wide at widest part about 2.1:1, widest just below ocelli, lateral carinae shallowly convex. Postclypeus as wide at base as apex of frons, little longer than wide at base. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.6:1, shorter than second about 1:1.9. Post-tibial spur with 17-20 teeth. Tegmina longer than widest part about 3.3:1.

Anal segment of male short, lateroapical angles each produced ventrad in a stout spinose process. Pygofer in profile distinctly longer ventrally than dorsally, in posterior view with opening wider than long, laterodorsal angle slightly produced mesad. Phallus very broad at basal two-fifths, abruptly attenuate apically, apical fifth slender, pointed at apex. Orifice at apical fifth on lower side. Suspensorium elongate oval, narrowed ventrally, with rather long arms at dorsal aspect. Diaphragm very broad, median area strongly produced caudad, each mid-lateral area strongly sclerotized and produced caudad, dorsal margin produced dorsad and truncated at apex. Opening for genital styles as figured. Genital styles very short, transverse, outer angles each broadly produced laterad, like a bird.

## Male (macropterous)

Length of body (includ.teg.): 3.33-3.43 mm.

Length of tegmen: 2.83-2.93 mm.

## Female (macropterous)

Length of body (includ.teg.): 3.70-4.00 mm.

Length of tegmen: 3.03-3.16 mm.

Specimens examined: 15♂♂, 13♀♀, Anmashan, Taichung Hsien, 28-VII-1983, C.T. Yang.

Host plant: *Oryza sativa* L. and

*Saccharum officinarum* L.

Distribution: Taiwan, Mainland China, Mongolia, Ryukyu Is., Japan, Micronesia, Philippines, Korea, Siberia, Europe, USSR.



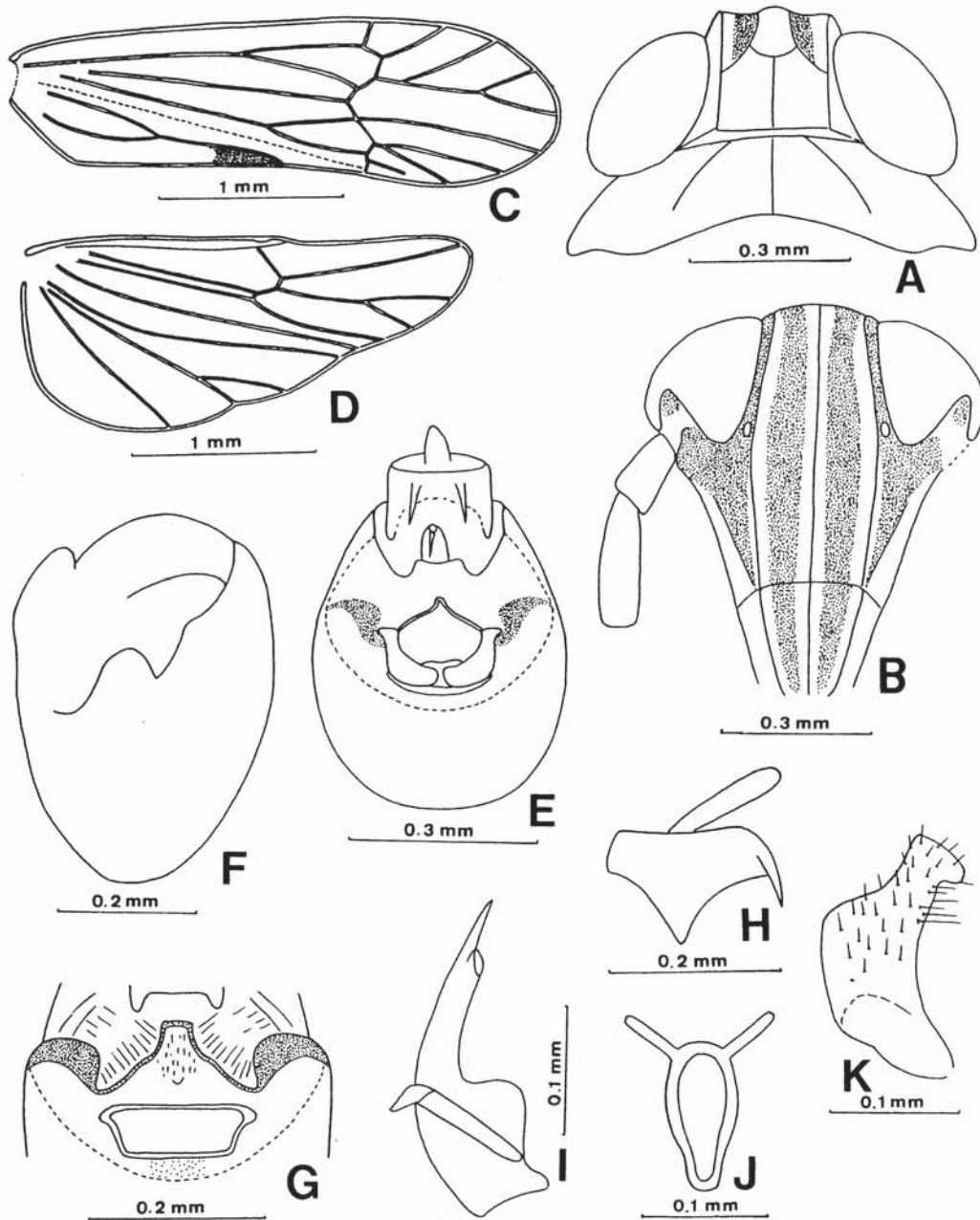


Fig. 91. *Laodelphax striatellus* (Fallén) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, laterocaudal view; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, lateral view.

### 43. Genus *Toya* Distant

*Toya* Distant, 1906, *Fauna of India*, 3:472.

—: Ding, 1983, *Econ. Ins. Fauna China*, 27:153.

Head including eyes narrower than pronotum. Vertex as wide or slightly wider at base than long submedially, apical margin transverse, submedian carinae uniting at apex, Y-shaped carina distinct or feeble. Frons longer in middle line than wide at widest part about 2:1, lateral carinae weakly convex. Postclypeus at base wider than frons at apex. Rostrum reaching to meta-coxae. Antennae cylindrical, with basal segment longer than wide and shorter than second. Ocelli present. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male short, deeply immersed in dorsal emargination of pygofer, lateroapical angles narrowly separated, each produced ventrad in a relatively long, slender spinose process. Pygofer with laterodorsal angle strongly produced, reflected mesad, lateral margins concave and ventral margin shallowly excavate, without medioventral process. Phallus short and stout, with or without teeth. Suspensorium ring-like ventrally, with distinct stem dorsally. Diaphragm relative narrow, dorsal margin variant. Genital styles moderately long, flattened, divergent.

Type species: *Toya attenuata* Distant  
(original designation)

*Toya attenuata* Distant occurred in Taiwan is doubtful. Therefore this species will not be listed here.

#### Key to the species of *Toya*

1. Diaphragm with dorsal margin sinuate . . . . . *tuberculosa* (Distant)  
— Diaphragm with dorsal margin straight or bifurcate, not sinuate . . . . . 2
2. Diaphragm of pygofer with dorsal margin strongly bifurcate; phallus tubular, nearly parallel, with teeth at dorsoapical portion . . . . . *propinqua* (Fieber)  
— Diaphragm of pygofer with dorsal margin only slightly concave; phallus elongate oval, with teeth at oblique row . . . . . *bridwelli* (Muir)

#### (83) *TOYA PROPINQUA* (Fieber)

Fig. 92.

*Toya propinqua* Fennah, 1964, *Trans. R. Ent. Soc. Lond.*, 116(7):142.

—: Fennah, 1971, *Ins. Micronesia*, 6(8):581.

—: Fennah, 1973-75, *Ent. scand. Suppl.*, 4:115.

*Delphax* (*Delphacodes*) *propinqua* Fieber, 1866, *Verh. Zool. Bot. Ges. Wien.*, 16: 525.



*Delphax propinqua* Matsumura, 1910, *Schad. u. nutz. Ins. Zuckerrohr Formosas*:17.

*Delphacodes neopropinqua* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 7:335.

—: Ding, 1983, *Econ. Ins. Fauna China*, 27:155.

*Delphacodes propinqua* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*:33.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:52.

*Delphacodes shirozui* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:53.

General color pale yellowish brown. Frons brown with more darker stripes along both sides of carinae. Abdomen dark brown, pygofer dark brown with laterodorsal production white. Tegmina hyaline.

Vertex nearly as long submedially as wide at base, obtusely rounding into frons, at apex as wide as at base, basal compartment wider at base than greatest length about 2:1. Frons longer in middle line than wide at widest part about 2:1, widest at middle, wider at apex than at base, lateral carinae convex. Postclypeus at base slightly wider than frons at apex, shorter than wide at base. Antennae reaching to level of middle of postclypeus, basal segment longer than wide about 1.6:1, shorter than second about 1:1.8. Post-tibial spur with 14-18 short, weak teeth.

Anal segment of male with lateroapical angles narrowly separated, each produced ventrad in a long spinose process, directed ventrocaudad and slightly laterad. Pygofer in profile with laterodorsal angle strongly produced, as long dorsally as ventrally, in posterior view with opening wider than long. Phallus relative short, armed with 6 distinct teeth dorsally (Fennah, 1973-75, notes "in population from Taiwan and the Philippines, the aedeagus is relatively shorter and is armed with 2-6 distinct teeth dorsally and 0-5 teeth ventrally"). Orifice dorsally at apex. Suspensorium elongate, with ventral two-thirds circular, oval, stem slightly narrower. Diaphragm wide and pigmented, dorsal margin strongly bifurcated. Genital styles moderately long and wide, strongly divergent, inner margin shallowly concave, inner angle slightly produced mesad, outer angle slightly produced laterad obtusely, truncate at apex, in caudolateral view with basal production rounded at apex.

|                   |                |                 |
|-------------------|----------------|-----------------|
| Male              | (macropterous) | (brachypterous) |
| Length of body    |                |                 |
| (includ.teg.):    | 2.87-3.23 mm.  | 1.13-1.27 mm.   |
| Length of tegmen: | 2.37-2.73 mm.  |                 |
| Female            | (macropterous) | (brachypterous) |
| Length of body    |                |                 |
| (includ.teg.):    | 3.23-3.40 mm.  | 1.23-1.34 mm.   |
| Length of tegmen: | 2.73 mm.       |                 |

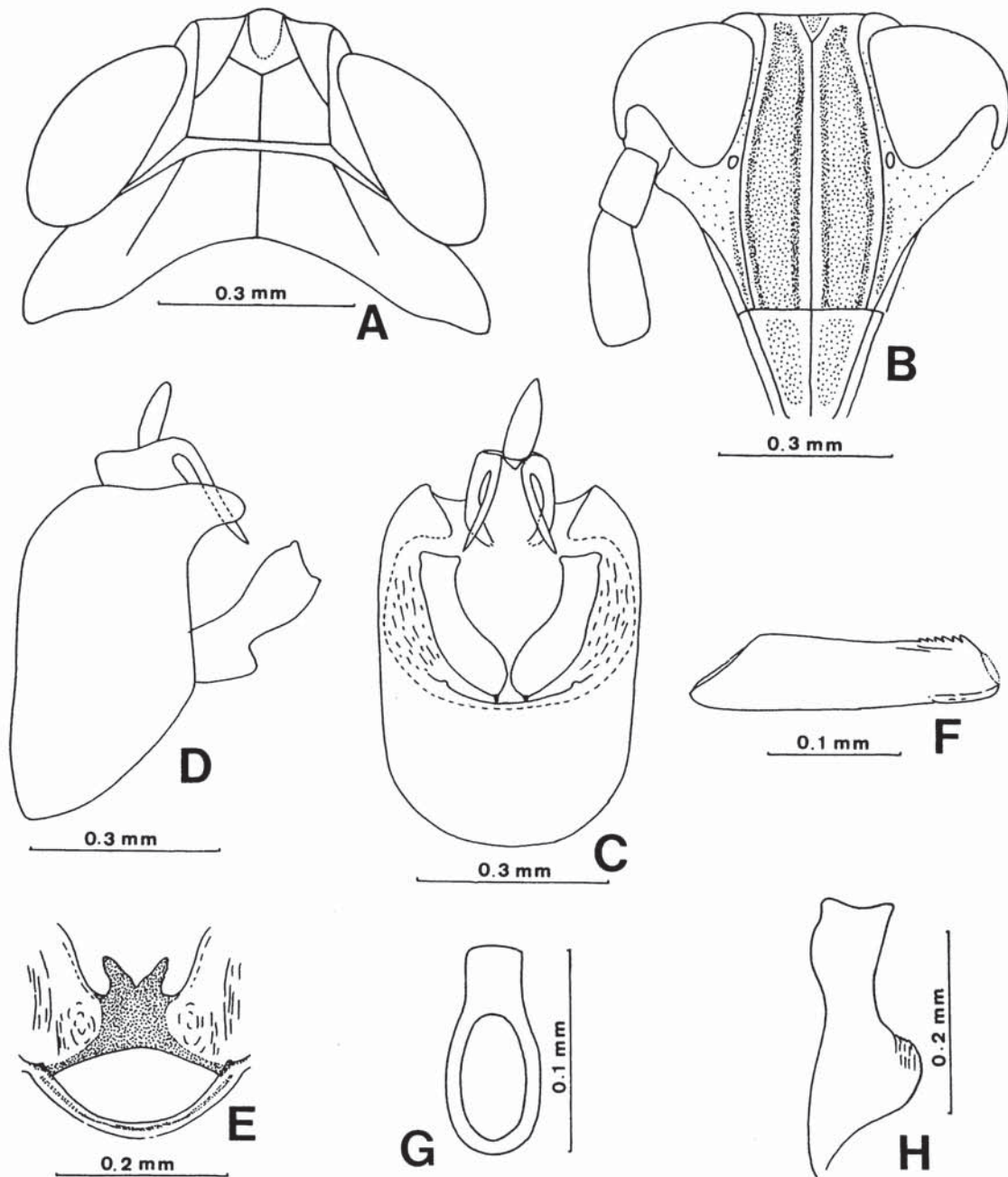


Fig. 92. *Toya propinqua* (Fieber) A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, the same, left side; E, diaphragm of pygofer; F, phallus, left side; G, suspensorium; H, genital style, left side.



**Fifth instar nymph (Fig. 93)**

General color uniformly pale yellowish brown.

Head between eyes nearly as wide at narrowest part as long in middle line, moderately protruding beyond level of eyes, length of eye longer than length between level of eyes and lateral point of frons about 4.7:1, width of head including eyes wider than width of basal compartment at hind margin about 3.5:1, submedian carinae attaining hind margin of vertex laterally, basal compartment wider at hind margin than greatest length about 2:1, hind margin only slightly curved upward laterally. Frons longer in middle line than wide at widest part about 1.4:1, widest above level of lower margin of eyes, lateral carinae convex, with 2 median carinae, separated, parallel. Interfrons narrower than laterofrons. Number and arrangement of sensory pits typical, each side with 3 extra pits, lowest pit lies near frontoclypeal suture, distance about one and half diameters of pit, distance between dorsal level of lower pits and ventral level of median pits nearly as long as former to frontoclypeal suture, lower of upper pits slightly overlapping level of higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies at middle of eye. Frontoclypeal suture straight. Rostrum reaching meso-trochanters, relative length of each segment about 1.4:1.5:1, third segment longer than wide about 1.7:1. Antennae with basal segment about as long as wide, shorter than second about 1:2.5.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, relative distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 3:1, anterior wing pad protruding not over of hind one, latter reaching anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, metatibia longer than three tarsi combined about 1.1:1, spur shorter than first tarsal segment, with 13-15 teeth.

Abdominal tergite V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobes not cylindrical, pits lie near base, in lateral view strongly produced caudad medially, with ventral margin oblique, anal comb moderately large, in caudal view with opening wider dorsally.

Length of body: 1.92 mm.

Width of head including eyes: 0.61 mm.

Length of anterior wing pad: 0.72 mm.

Length of antenna: 0.27 mm.

Specimens examined: 10♂♂, 8♀♀, Paolai, Kaohsiung Hsien, 25-XII-1981, C.T. Yang.

Nymphal specimens examined: Fifth instar nymph: 5, Makung, Penghu Hsien, 10-VII-1986, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan, Mainland China, Japan, Philippines, Vietnam, Western Micronesia, Malaysia, Sri Lanka, India, Pakistan, Europe, Australia, Africa, America.

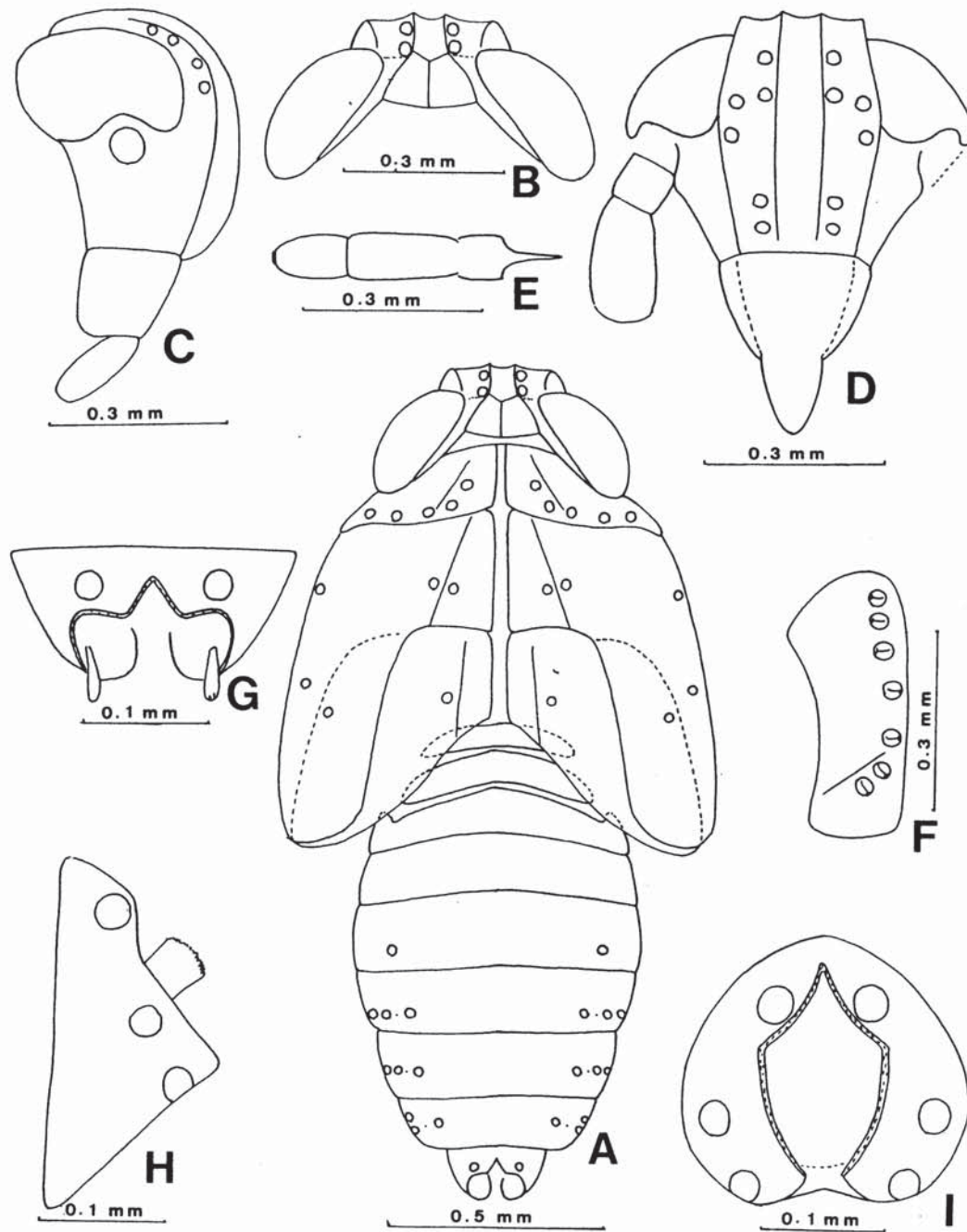


Fig. 93. Nymph of *Toya propinqua* (Fieber) A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.



(84) *TOYA BRIDWELLI* (Muir)

## Fig. 94.

*Toya bridwelli* Linnavuori, 1973, *Notulae ent.*, 53(3):107.

*Delphacodes bridwelli* Muir, 1920, *Bull Ent. Res.*, 10:140.

—: Fennah, 1958, *Bull. de l'I.F.A.N.*, 20:484.

General color pale yellowish brown. Intercarinal areas of frons, abdomen and pygofer dark brown. Tegmina hyaline.

Vertex as long submedially as wide at base, obtusely rounding into frons, as wide at apex as at base, lateral carinae straight, apical margin transverse, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 1.7:1. Frons in middle line longer than wide at widest part about 2.2:1, widest at middle, lateral carinae very shallowly convex. Postclypeus slightly wider at base than frons at apex, as long as wide at base. Antennae reaching to level of middle of postclypeus, basal segment longer than wide about 1.5:1, shorter than second about 1:2. Post-tibial spur with about 22 teeth.

Anal segment of male with lateroapical angles moderately separated, each strongly produced ventrad in a long spinose process. Pygofer in profile as long dorsally as ventrally, posterior margin nearly straight, laterodorsal angle narrowly produced, reflected mesad, in posterior view with opening wider than long. Phallus short and stout, elongate oval, slightly narrowed at both ends, left side with about 9 teeth in apical half at oblique row, right side with about 7 teeth in middle near lower margin. Orifice on left at apex. Suspensorium circular at middle, dorsal stem straight at dorsal margin, ventral end produced ventrad medially. Diaphragm rather narrow, produced caudad, dorsal margin wide and pigmented, slightly concave medially. Opening for genital styles with both dorsal and ventral margins concave. Genital styles moderately long and wide, narrowed at middle, inner angle slightly produced mesad, basal angle produced dorsad.

Male (macropterous)

Length of body (includ.teg.): 3.33-3.50 mm.

Length of tegmen: 2.73-2.90 mm.

**Fifth instar nymph (Fig. 95)**

General color yellowish brown. Abdominal tergites somewhat brown.

Head between eyes wider at narrowest part than long in middle line about 1.5:1, protruding beyond level of eyes, anterior margin between submedian carinae concave. Eye oblique, length of eye longer than length between level of eyes and lateral point of frons about 5.3:1, width of head including eyes wider than width of basal compartment at hind margin about 3.1:1, submedian carinae attaining hind margin of vertex laterally, basal compartment at hind margin wider than greatest length about 2:1, hind margin slightly curved. Frons longer in middle line than widest part about 1.5:1, widest at level of lower margin of eyes, with 2 median carinae, separated, parallel.

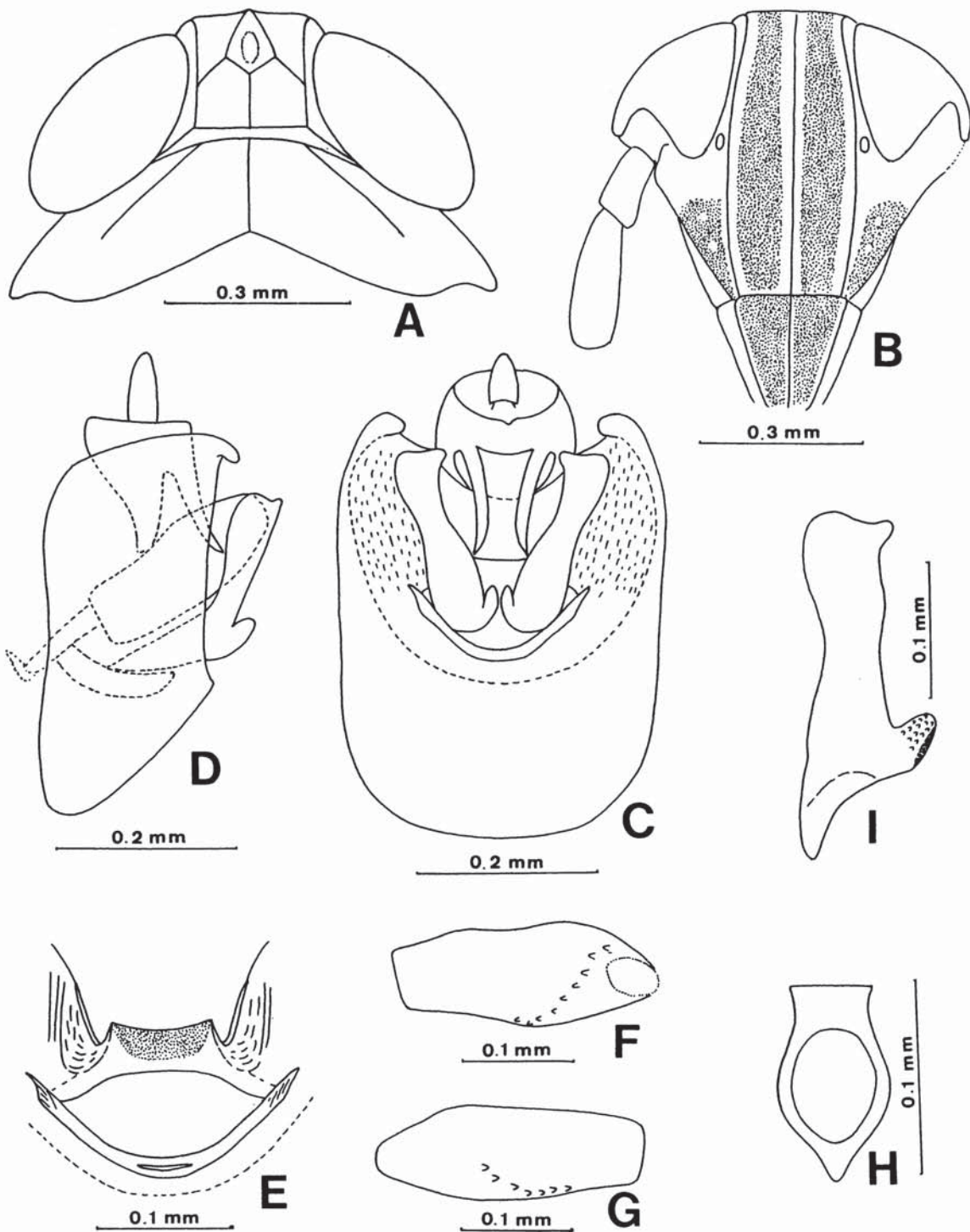


Fig. 94. *Toya bridwelli* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, the same, left side; E, diaphragm of pygofer; F, phallus, left side; G, the same, right side; H, suspensorium; I, genital style, left side.



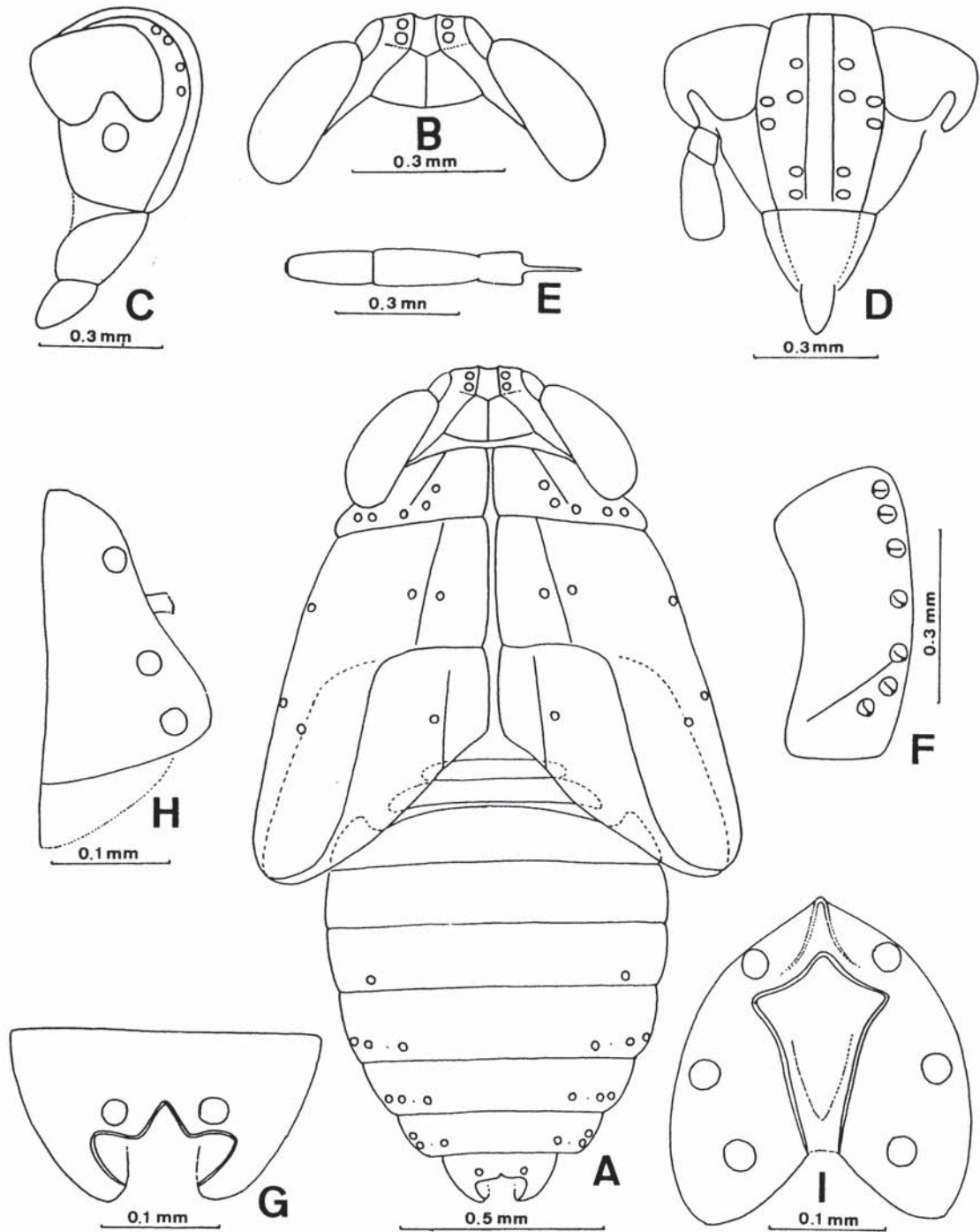


Fig. 95. Nymph of *Toya bridwelli* (Muir) A, fifth instar nymph; dorsal view; E, head, dorsal view; C, the same, lateral view; D, the same, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.

Interfrons narrower than laterofrons. Number and arrangement of pits typical, each side with 3 extra pits, lower pit lies near frontoclypeal suture, distance about a diameter of pit, distance between dorsal level of lower pits and ventral level of median pits nearly as long as former to frontoclypeal suture, lower of upper pits overlapping higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies below median point of eye. Frontoclypeal suture straight. Antennae short, basal segment as long as wide, shorter than second about 1:2.5. Rostrum long, reaching to meta-coxae, relative length of each segment about 1.1:1.2:1, third segment longer than wide about 2.6:1.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, distance between  $W_1$  to  $W_2$  longer than  $W_2$  to  $W_3$  about 4.1:1, anterior wing pad protruding not over hind one, latter reaching to anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, metatibia longer than three tarsi combined about 1.5:1, first tarsal segment as long as 2 latter. Spur shorter than first tarsal segment, with 15-16 teeth.

Abdominal tergite V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobes distinct but not cylindrical, pits lie at middle, in lateral view strongly produced medially, anal combs small, in caudal view opening widest dorsally.

Length of body: 2.01 mm.

Width of head including eyes: 0.69 mm.

Length of anterior wing pad: 0.84 mm.

Length of antenna: 0.26 mm.

Specimens examined: 4♂♂, Chiasien, Kaohsiung Hsien, 23-X-1981, C.T. Yang; 1♂, Santimen, Pingtung Hsien, 1-II-1987, C.T. Yang.

Nymphal specimen examined: Fifth instar nymph: 1, Chishan, Kaohsiung Hsien, 28-III-1987, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan (new record), Africa.

(85) *TOYA TUBERCULOSA* (Distant)

Fig. 96.

*Toya tuberculosa* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:117.

*Delphacodes terryi* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:334.

—: Matsumura et Ishihara, 1945, *Mushi*, 16:62.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:54.

*Liburnia tuberculosa* Distant, 1916, *Fauna of British India*, 6:145.

The description is reproduced from Muir [1917], figures after Fennah [1973-75].



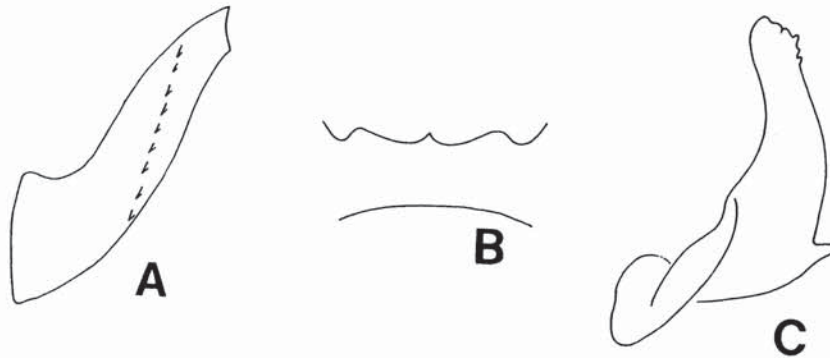


Fig. 96. *Toya tuberculosa* (Distant) A, phallus, left side; B, diaphragm of pygofer; C, genital style, left side. (after Fennah)

Face, genae and clypeus between carinae black, carinae of clypeus and face, antennae, vertex, pro- and mesonotum ochraceous, pro- and mesopleura and coxae black or fuscous, metapleura with a round fuscous spot, abdomen fuscous with the basal segments and posterior edges of 3-8 segments ochraceous. Tegmina ochraceous-buff, fuscous around apex, veins concolorous with membrane, with very minute concolorous granules.

Brachypterous. ♂ Vertex as long as broad; antennae reaching to near the middle of clypeus, second joint double as long as first; frons narrowest at base between eyes, medio-frontal carina simple or furcate only at the extreme base; tegmina reaching to end of abdomen; first joint of hind tarsal as long as the other two together, spur laminate, as long as the first tarsal joint, with many (14-20) fine teeth on posterior edge; lateral pronotal carinae divergingly curved, not reaching hind margin.

Length 1.8 mm.; tegmen 1.3 mm.

♀ Lighter in color, especially between carinae of head.

Length 2.5 mm.; tegmen 1.5 mm.

Macropterous. ♂ Similar in coloration to the brachypterous form. Tegmina hyaline, slightly opaquely white, veins before cross veins light yellow, beyond cross veins brown, apical margin brown, veins with very small granules; wings hyaline, slightly opaque, veins brown. Length of tegmen 3 mm.

♀ similar in coloration to the brachypterous form, or slightly darker; tegmina similar in coloration and size to that of the macropterous male.

Specimen examined: No specimen has been collected by author.

Host plant: *Panicum repens* L. (in Japan)

Distribution: Taiwan, Japan, Java, Vietnam, Sri Lanka, S-Africa, St. Helena, Sudan.

#### 44. Genus *Smicrotatodelphax* Kirkaldy

*Smicrotatodelphax* Kirkaldy, 1906, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 1(9): 411.

The generic characters outlined by Kirkaldy [1906] are modified as follows.

Head including eyes as wide as pronotum. Vertex as long submedially as wide at base or slightly wider, apical margin transverse, submedian carinae uniting at apex or not. Y-shaped carina with stem feeble, basal compartment longer at base than greatest length 1.4-2.1:1. Frons longer in middle line than wide at widest part 1.6-2.0:1, widest at middle, lateral carinae convex, median carina simple or forked slightly below level of middle of eyes. Postclypeus wider at base than frons at apex. Rostrum reaching to meso-trochanters. Ocelli present or absent. Antennae surpassing frontoclypeal suture, cylindrical, basal segment longer than wide, shorter than second. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with 13-22 teeth.

Anal segment of male ring-like, deeply sunk in dorsal emargination of pygofer, lateroapical angles rather closely approximated, each produced in a moderately long spinose process. Pygofer in profile as long dorsally as ventrally, laterodorsal angle strongly produced, caudal margin nearly straight, in posterior view with opening as wide as long, without medioventral process. Phallus moderately long, tubular, armed with several teeth. Suspensorium ring-like ventrally, stem small. Diaphragm moderately broad. Genital styles moderately long, divergent.

Type species: *Smicrotatodelphax perkinsi* Kirkaldy  
(by monotypy)

#### Key to the species of *Smicrotatodelphax*

1. Tegmina (macropterous) ♂ 2.33-2.50 mm; post-tibial spur with about 22 teeth  
..... *ferinus* n. sp.  
– Tegmina (macropterous) ♂ 1.60-1.83 mm.; post-tibial spur with about 10 teeth . 2
2. Intercarinal areas of frons and genae pale yellowish brown; pygofer in lateral view angulate at caudoventral angle ..... *paucus* n.sp.  
– Intercarinal areas of frons dark brown; pygofer in lateral view evenly curved at caudoventral angle ..... *maritimus* n.sp.



(86) *SMICROTATODELPHAX PAUCUS* n.sp.

Fig. 97.

General color pale yellowish brown. Metapleura each with a pale black marking, dorsum of abdomen and genital styles dark brown to black. Tegmina hyaline, somewhat grayish, margin of apical two-thirds nearly black. Coelopterous male without wings.

Vertex as long submedially as wide at base, lateral carinae nearly straight, as wide at apex as at base, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 1.5:1. Frons in middle line longer than wide at widest part about 1.8:1, widest at level of ocelli, lateral carinae convex, median carina simple. Postclypeus distinctly wider than frons at apex, distinctly wider at base than long. Ocelli present. Antennae reaching beyond level of middle of postclypeus, with basal segment longer than wider about 1.6:1, shorter than second about 1:2. Post-tibial spur with 8-12 teeth. Tegmina longer than widest part about 2.9:1.

Anal segment of male short, lateroapical angles moderately separated, each produced in a slender spinose process, directed ventrad. Pygofer in profile with latero-dorsal angle broadly produced dorsocaudad, slightly reflected mesad, in posterior view with opening as wide as long, lateral margins slightly concave, ventral margin deeply excavate at middle. Phallus short, tubular, almost straight, on left with 6-7 teeth scattered near apex, on right with 5, in ventral view with two lines symmetry, each contain 10 teeth. Orifice on left at apex. Diaphragm with dorsal margin strongly and narrowly produced dorsad at middle. Opening for genital styles dorsal margin slightly convex, ventral margin V-shaped. Genital styles moderately long and divergent, broadest at base, apical fourth narrowed and pointed at apex, in laterocaudal view in inner margin apical third roundly produced mesad.

The name *paucus* is Latin adjective, few.

|                   |                |                 |
|-------------------|----------------|-----------------|
| Male              | (macropterous) | (coelopterous)  |
| Length of body    |                |                 |
| (includ.teg.):    | 1.96-2.06 mm.  | 1.33 mm.        |
| Length of temen:  | 1.60-1.66 mm.  | 1.00 mm.        |
| Female            | (macropterous) | (brachypterous) |
| Length of body    |                |                 |
| (includ.teg.):    | 2.33 mm.       | 1.60-1.66 mm.   |
| Length of tegmen: | 1.70 mm.       | 0.60-0.66 mm.   |

Holotype: Male, Taichung, 15-X-1984, C.T. Yang, In NCHU.

Paratypes: 15♂♂, 7♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan

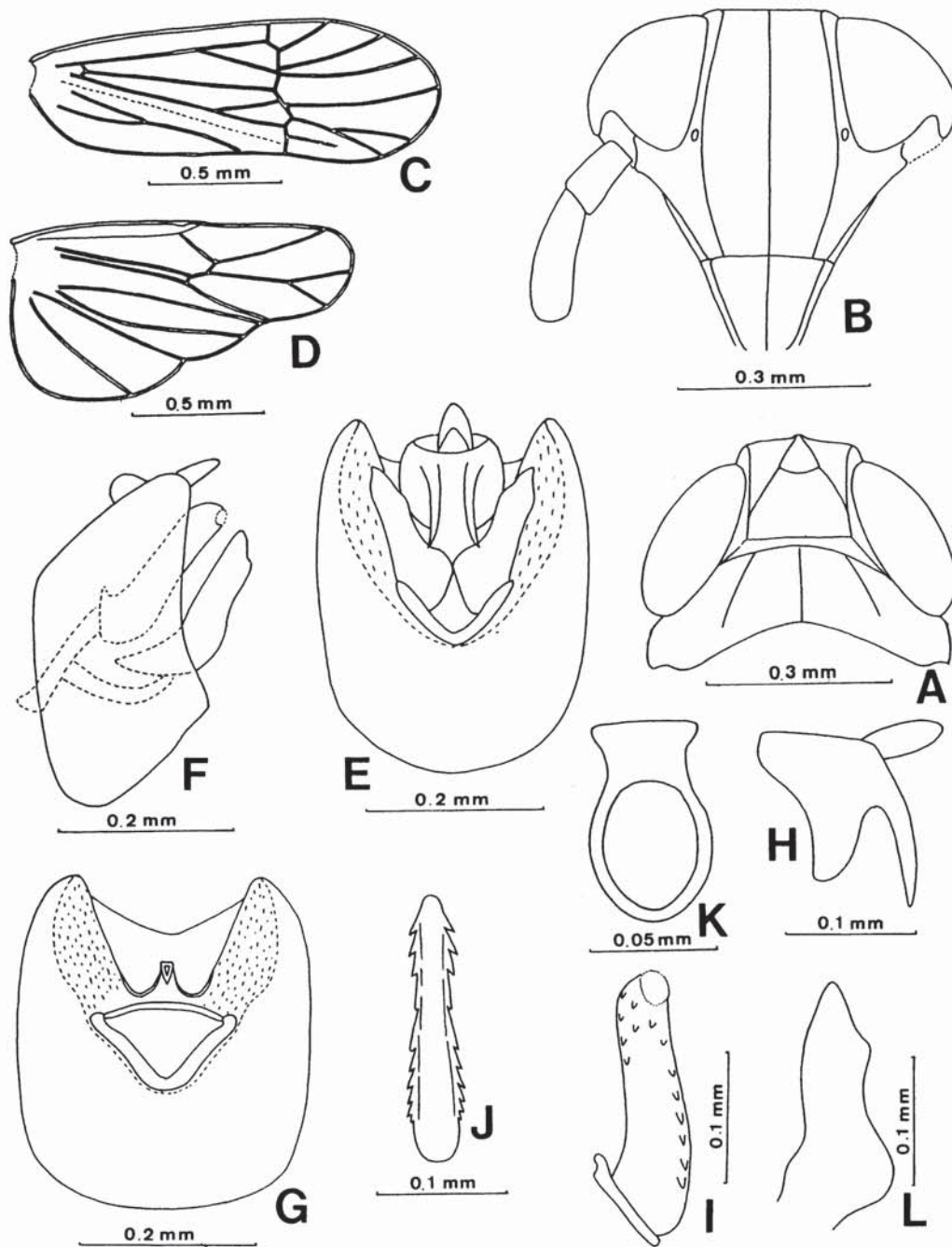


Fig. 97. *Smicrotatodelphax paucus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, the same, ventral view; K, suspensorium; L, genital style, left side.



(87) *SMICROTATODELPHAX MARITIMUS* n.sp.

## Fig. 98.

General color yellowish brown. Frons, genae and postclypeus dark brown except carinae and areas around ocelli yellowish. Abdomen dark brown to black. Tegmina hyaline, somewhat grayish, margins somewhat dark.

Vertex slightly shorter submedially than wide at base, lateral carinae straight, as wide at apex as at base, submedian carinae uniting at apex, Y-shaped carina visible, basal compartment wider at base than greatest length about 1.6:1. Frons in middle line longer than wide at widest part about 1.8:1, widest at level of ocelli, lateral carinae convex. Postclypeus wider at base than frons at apex. Ocelli present. Antennae reaching beyond frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2.5. Post-tibial spur with about 8 teeth. Tegmina longer than widest part about 2.8:1.

Anal segment of male short, lateroapical angles each produced in a spinose process. Pygofer in profile distinctly wider dorsally than ventrally, caudoventral angle evenly curved, laterodorsal angle roundly produced, in posterior view with opening wider than long, lateral margins weakly defined, ventral margin deeply concave at middle. Phallus tubular, armed with teeth, in ventral view with 2 lines, 10 at left, 7 at right side. Orifice at left terminal. Suspensorium ring-like ventrally. Diaphragm narrow, dorsal margin strongly and narrowly produced dorsad at middle. Genital styles divergent, broad at base, narrowing to apex, lateral view caudal margin strongly sinuate, apex distinctly pointed, directed cephalad.

The name *maritimus* is Latin adjective, maritime.

## Male (macropterous)

Length of body (includ.teg.): 2.00-2.30 mm.

Length of tegmen: 1.67-1.83 mm.

## Female (macropterous)

Length of body (includ.teg.): 1.60-1.76 mm.

Length of tegmen: 0.60-0.66 mm.

**Fifth instar nymph (Fig. 99)**

General color yellowish white. Anterior area of vertex and base of frons brown. Lateral margins of thorax and abdomen pale brown to brown. Abdomen each side near middle line with somewhat pale brown stripe, tergite IX with dorsal median portion pale brown.

Head between eyes slightly longer in middle line than wide at narrowest portion, slightly protruding beyond level of eyes, eyes divergent posteriorly, length of eye longer than length between level of eyes and lateral point of frons about 5:1, width of head including eyes wider than width of basal compartment at hind margin about 3.5:1, submedian carinae attaining hind margin of vertex laterally, basal compartment at

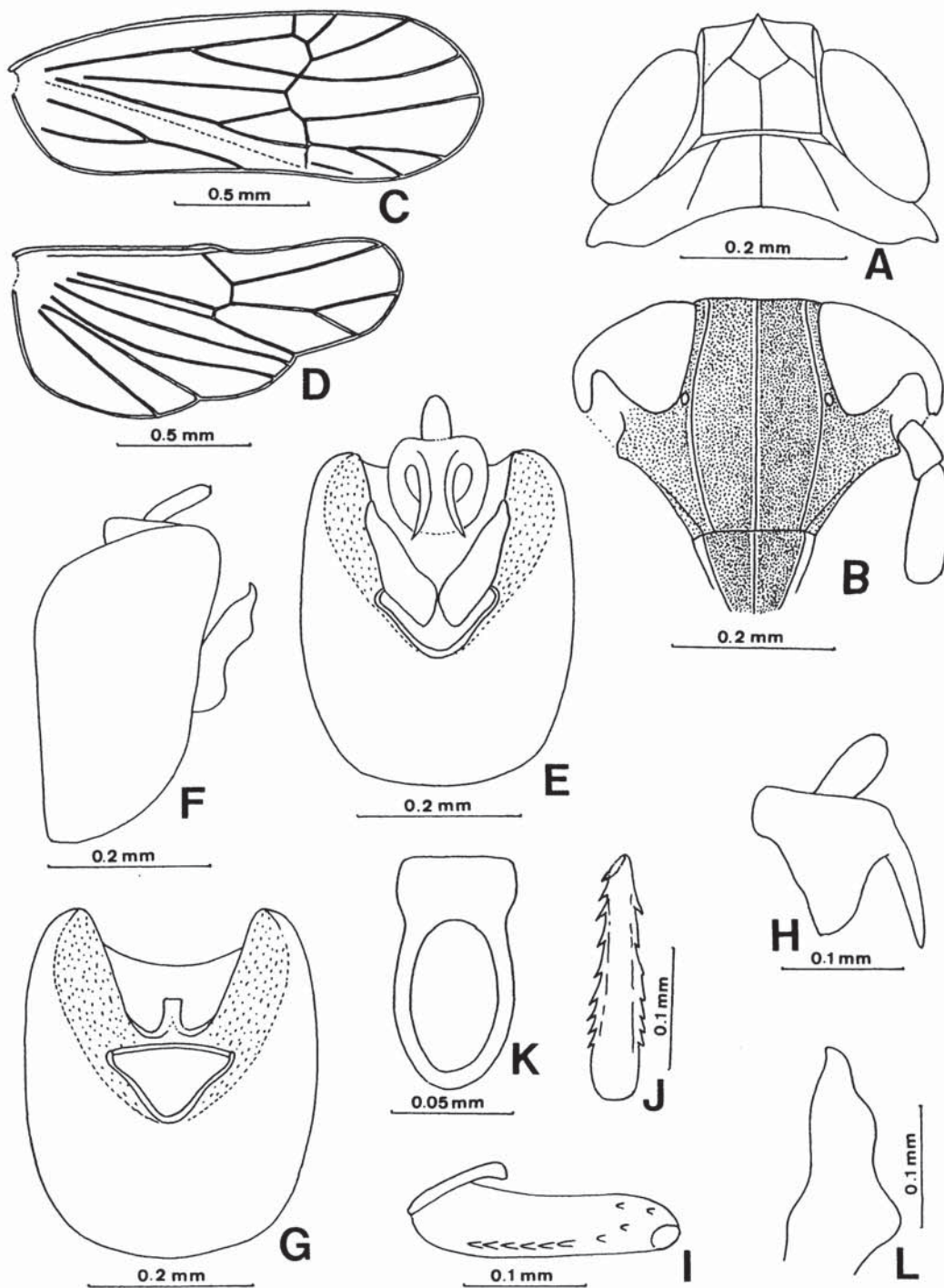


Fig. 98. *Smicrotatodelphax maritimus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, the same, dorsal view; K, suspensorium; L, genital style, left side.



hind margin longer than greatest length about 1.6:1, hind margin slightly curved downward medially. Frons nearly as long in middle line as wide at widest part, widest at level above lower margins of eyes, lateral carinae strongly convergent apically, with 2 median carinae, separated, parallel. Interfrons narrower than laterofrons. Number and arrangement of pits typical, each side with 3 extra pits, lower pit lies near frontoclypeal suture, distance about 1.5 diameters of pit, distance between dorsal level of lower pits and ventral level of median pits shorter than former to frontoclypeal suture about 1:1.7, lower of upper pits higher than higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies below median point of eye. Frontoclypeal suture straight. Antennae short, basal segment shorter than wide, shorter than second about 1:4. Rostrum short, reaching to meso-trochanters, relative length of each segment about 1.5:1.5:1, third segment longer than wide about 1.2:1.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, distance between  $W_1$  to  $W_2$  longer than  $W_2$  to  $W_3$  about 4:1, anterior wing pad protruding not over hind one, latter reaching to anterior margin of tergite III. Spinal formula of hind leg 5-7-4, metatibia longer than three tarsi combined about 1.2:1, first tarsal segment longer than 2 latter combined, spur shorter than first tarsal segment, with 5 teeth.

Abdominal tergite V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobes not cylindrical, pits lie at middle, in lateral view moderately produced caudad near base, anal combs large, in caudal view with opening widest dorsally.

Length of body: 1.73 mm.

Width of head including eyes: 0.63 mm.

Length of anterior wing pad: 0.48 mm.

Length of antenna: 0.19 mm.

Holotype: Male, Lanshu, Taitung Hsien, 2-VII-1987, C.T. Yang. In NCHU.

Paratypes: 81♂♂, 24♀♀, same data as for holotype.

Nymphal specimen examined: fifth instar nymph: 1, same data as for holotype.

Host plant: Unknown. Live on grasses on the rock of sea-shore.

Distribution: Taiwan.

This new species resembles *S. paucus* Yang, but differs from the latter in the darker coloration; the pygofer in lateral view is evenly curved at caudoventral angle (angulate in *paucus*); the genital styles in lateral view distinctly curved cephalad apically; coelopterous specimen has not been found.

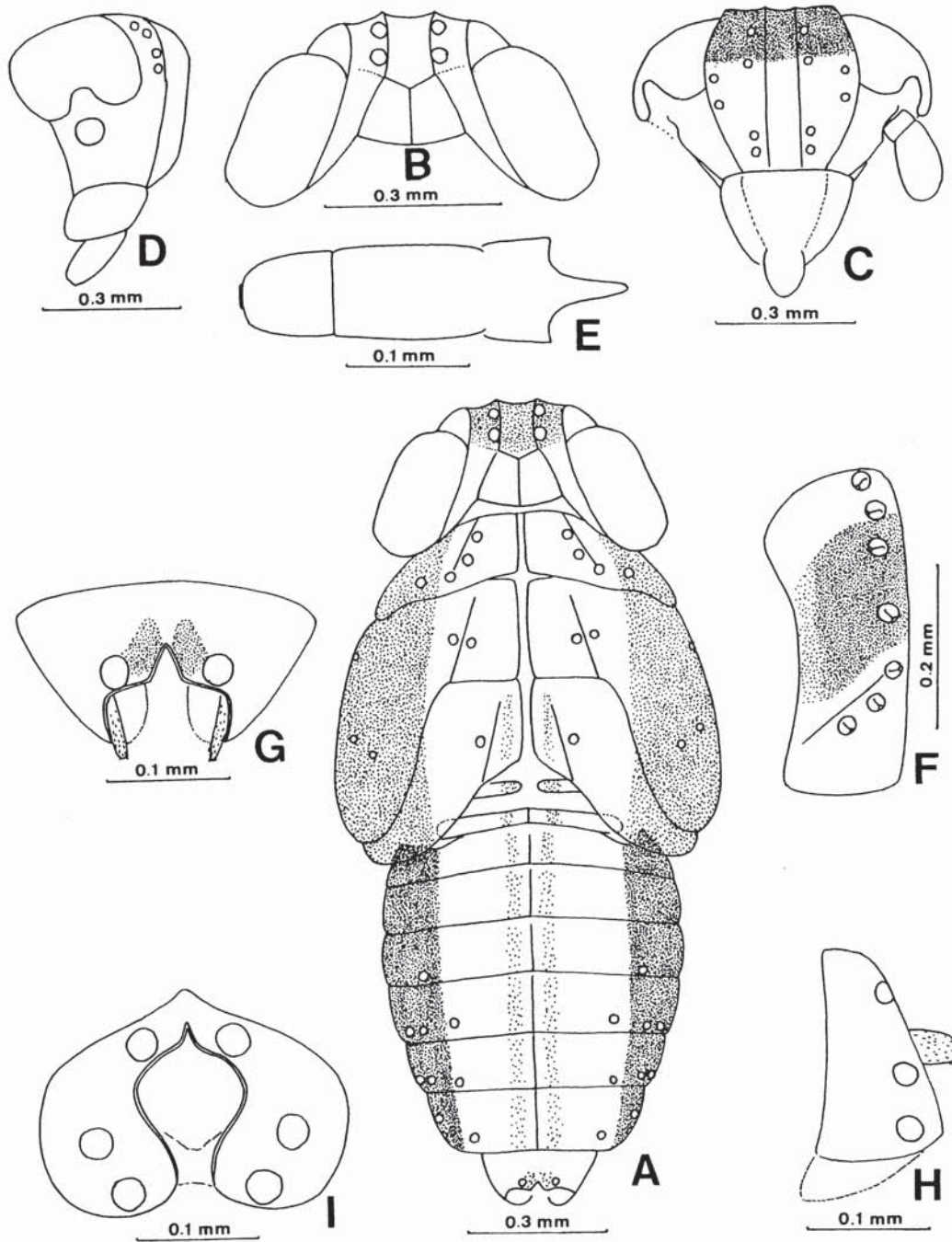


Fig. 99. Nymph of *Smicrotatodelphax maritimus* A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, ventral view; D, the same, lateral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.



(88) *SMICROTATODELPHAX FERINUS* n.sp.

## Fig. 100

General color pale yellowish brown. Intercarinal areas of frons and postclypeus, genae, ventral aspect of thorax, coxae, abdomen and pygofer dark brown to black. Antennae with apex of basal segment and base of second somewhat darker. Tegmina hyaline.

Vertex longer submedially than wide at base about 1.1:1, obtusely rounding into frons, as wide at apex as at base, lateral carinae straight, apical margin transverse, submedian carinae uniting at apex, basal compartment wider at hind margin than greatest length about 1.6:1. Frons longer in middle line than wide at widest part about 2:1, widest at middle of ocelli and frontoclypeal suture, lateral carinae convex, median carina simple. Postclypeus at base as wide as frons at apex, as long as wide at base. Ocelli present. Antennae reaching to level of middle of postclypeus, basal segment longer than wide about 1.5:1, shorter than second about 1:2.1. Rostrum reaching to meta-coxae. Post-tibial spur with about 22 teeth. Tegmina longer than widest part about 3.4:1.

Anal segment of male short, lateroapical angles not widely separated, each produced ventrad in a stout spinose process. Pygofer in profile with laterodorsal angle angulate, posterior margin strongly convex at dorsal third, in posterior view opening wider than long, lateral margins distinct and concave. Phallus short and stout, dorsal margin shallowly concave, with many teeth on both sides and dorsal aspect apically, not in row. Orifice on left at apex. Diaphragm broad, lobe-like, dorsal margin slightly produced medially, median line produced caudad. Opening for genital styles shallowly concave at dorsal and ventral margins. Genital styles moderately long and broad, strongly divergent, each broadest at base, outer margin shallowly concave subapically, inner margin produced caudad above middle, basal angle slightly produced dorsad.

The name *ferinus* is Latin adjective, wild.

## Male (macropterous)

Length of body (includ.teg.): 2.74-2.91 mm.

Length of tegmen: 2.33-2.50 mm.

## Female (macropterous)

Length of body (includ.teg.): 2.92 mm.

Length of tegmen: 2.50 mm.

Holotype: Male, Tungkong, Pingtung Hsien, 10-X-1983, C.T. Yang, In NCHU.

Paratypes: 2♂♂, 5♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

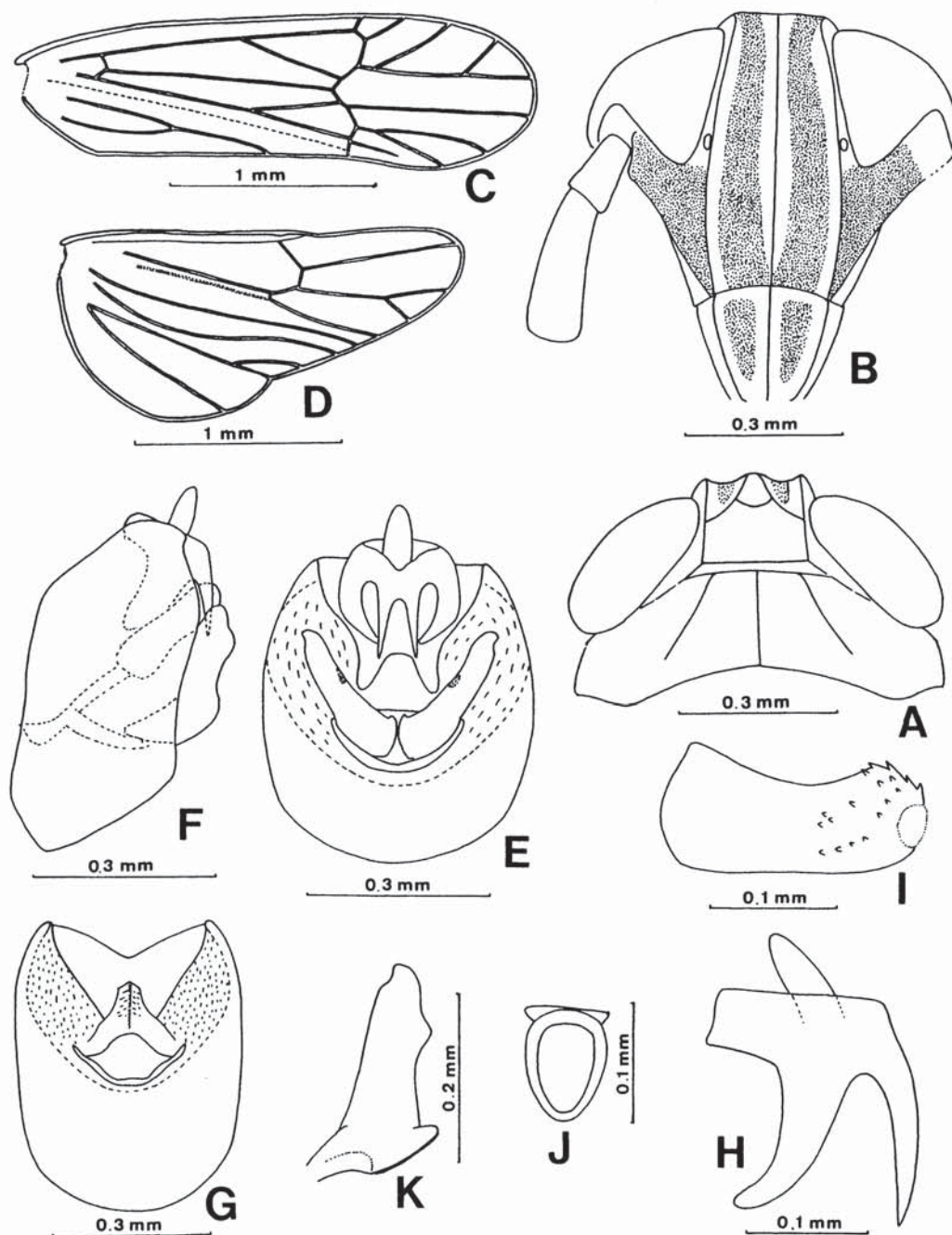


Fig. 100. *Smicrotatodelphax ferinus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, left side.



#### 45. Genus *Terthron* Fennah

*Terthron* Fennah, 1965, *Bull. Br. Mus. Nat. Hist. (Ent.)*, 17:55.

—: Ding, 1983, *Econ. Ins. Fauna China*, 27: 145.

The distinctive characters outlined by Fennah [1965] are expanding on the base of Taiwanese species as follows.

Head including eyes narrower than pronotum. Vertex as wide or wider at base than long submedially, as wide at base as at apex, lateral carinae straight or concave, apical margin transverse, submedian carinae uniting at apex, Y-shaped carina weakly present, basal compartment wider at base than greatest length about 1.6-2.2:1. Frons in middle line longer than wide at widest part about 2:1, widest at middle, lateral carinae shallowly convex, median carina simple. Postclypeus at base wider than frons at apex. Rostrum reaching beyond meso-trochanters, but not attaining meta-trochanters. Antennae cylindrical, surpassing frontoclypeal suture. Ocelli present. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male short, ring-like, lateroapical angles widely separated, each produced into a long spinose process, in profile arising far below dorsal margin. Pygofer with opening as long as wide, lateral margins weakly defined, with or without medioventral process. Phallus compressed, broad at base, protruding thumb-like dorsally, ventral margin produced rod-like or triangularly. Suspensorium triangular oval or elongate with ventral ring-like. Diaphragm produced lobe-like, widening towards apex, dorsal margin slightly incised, surface beset with many granulations. Genital styles widening towards apex, truncate apically, inner margin sinuate.

Type species: *Delphax anemonias* Kirkaldy  
(original designation)

#### Key to the species of *Terthron*

1. Pygofer with medioventral process; phallus with ventroapical process rod-like, slender . . . . . *albovittata* (Matsumura)
- Pygofer without medioventral process; phallus with ventroapical process triangular . . . . . 2
2. Phallus with dorsoapical process beset teeth; dorsal aspect with yellowish brown stripe recurring from vertex to mesoscutellum and commissural suture of tegmina . . . . . *denticulatum* n.sp.
- Phallus with dorsoapical process not beset tooth; dorsal aspect with narrower white stripe recurring from vertex to meso-scutellum . . . . . *triangulum* n.sp.

(89) *TERTHRON ALBOVITTATA* (Matsumura)

Fig. 101.

*Terthron albovittata* Fennah, 1965, *Bull. Br. Mus. Nat. Hist. (Ent.)*, 17:55.*Delphacodes albovittata* Matsumura et Ishihara, 1945, *Mushi*, 16:61.—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:56.*Dicranotropis albovittata* Matsumura, 1900, *Ent. Nachr.*, 26:269.*Sogata albovittata* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 28.

General color dark brown. Carinae of frons, median carina of postclypeus yellowish white, frons, genae, clypeus, antennae, coxae, femora and abdomen black. Tibiae and tarsi yellowish white. Dorsal aspect with a fairly wide median stripe from vertex to apex of meso-scutellum and commissural suture of tegmina. Tegmina hyaline, veins of apical third except Sc and apical half of union of claval vein black.

Vertex as long submedially as wide at base, lateral carinae straight, basal compartment wider at base than greatest length about 1.6:1. Frons in middle line longer than wide at widest part about 2.1:1. Antennae reaching to middle of postclypeus, basal segment longer than wide about 2:1, shorter than second about 1:1.7. Post-tibial spur with 19-22 teeth.

Pygofer in profile wider ventrally than dorsally, medioventral process present, far away from base of genital styles (Fennah, 1973-75, *Ent. scand. Suppl.*, 4:108 "pygofer without a medioventral process"), in posterior view with opening nearly as wide as long, laterodorsal angle obtusely produced mesad. Phallus with thumb-like process curved ventrad apically, with ventroapical process rod-like, slender. Suspensorium triangular. Diaphragm strongly sclerotized, triangulated, median portion somewhat emarginated. Opening for genital styles triangulated, border broad, especially dorsal margin. Genital styles very broad, rather closely approximated, inner angle produced obtusely mesad, below which with another smaller one.

## Male (macropterous)

Length of body (includ.teg.): 2.66-2.73 mm.

Length of tegmen: 2.23-2.40 mm.

## Female (macropterous)

Length of body (includ.teg.): 3.26 mm.

Length of tegmen: 2.76 mm.

Specimens examined: 4♂♂, 1♀, Tungkong, Pingtung Hsien, 20-X-1983, C.T. Yang;

1♂, Nanjenshan, Pingtung Hsien, 14-II-1985, C.T. Yang.

Host plant: *Oryza sativa* L.

Distribution: Taiwan, Mainland China, Japan, Korea, Malaysia, Vietnam, India.



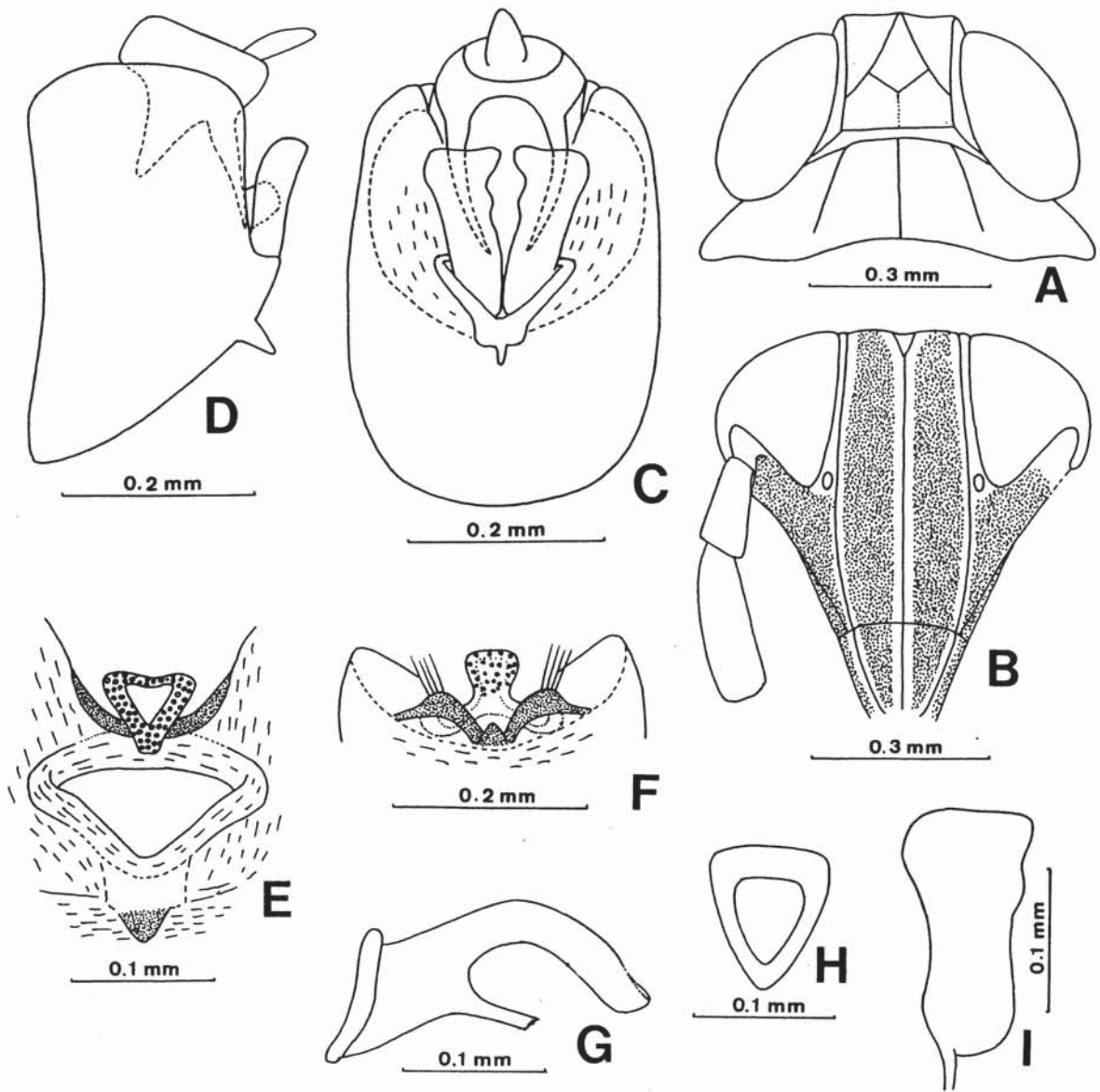


Fig. 101. *Terthron albovittata* (Matsumura) A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, the same, left side; E, diaphragm of pygofer, posterior view; F, the same, ventral view; G, phallus, left side; H, suspensorium; I, genital style, left side.

(90) *TERTHRON TRIANGULUM* n.sp.

## Fig. 102

General color dark brown to black. Narrow white median stripe from vertex to apex of meso-scutellum. Frons and postclypeus with both sides of median carina and inner side of lateral carinae yellowish brown to white. Pronotum with laterocaudal margin white. Rotrum, tibiae and tarsi yellowish brown. Tegmina hyaline, yellowish brown, apical veins more dark.

Vertex wider at base than long submedially about 1.4:1, lateral carinae slightly curved, apical margin transverse, slightly produced medially, basal compartment wider at base than greatest length about 2.2:1. Frons in middle line longer than wide at widest part about 2.2:1, widest at apical third, lateral carinae slightly convex below ocelli. Postclypeus wider at base than frons at apex, distinctly wider at base than long. Antennae with basal segment longer than wide about 1.8:1, shorter than second about 1:1.9. Post-tibial spur with about 20 teeth.

Pygofer in profile slightly wider ventrally than dorsally, laterodorsal angle reflected mesad, posterior margin produced caudad below base of genital styles, in posterior view with opening as wide as long, without medioventral process. Phallus with dorso-apical process not beset tooth, ventroapical process triangular. Suspensorium ring-like at lower portion, with distinct stem dorsally. Diaphragm in posterior view with ventral margin wide. Opening for genital styles evenly curved at dorsal margin, right angulate at ventral margin. Genital styles short and broad, divergent, outer margin straight, inner angle and subangle slightly produced.

The name *triangulum* is Latin adjective, triangular.

## Male (macropterous)

Length of body (includ.teg.): 2.56-2.90 mm.

Length of tegmen: 2.13-2.36 mm.

Holotype: Male, Nanjenshan, Pingtung Hsien, 14-II-1985, C.T. Yang. In NCHU.

Paratypes: 11♂♂, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan

This new species differs from *T. albovittata* in having pygofer without medioventral process; phallus with ventroapical process triangular.



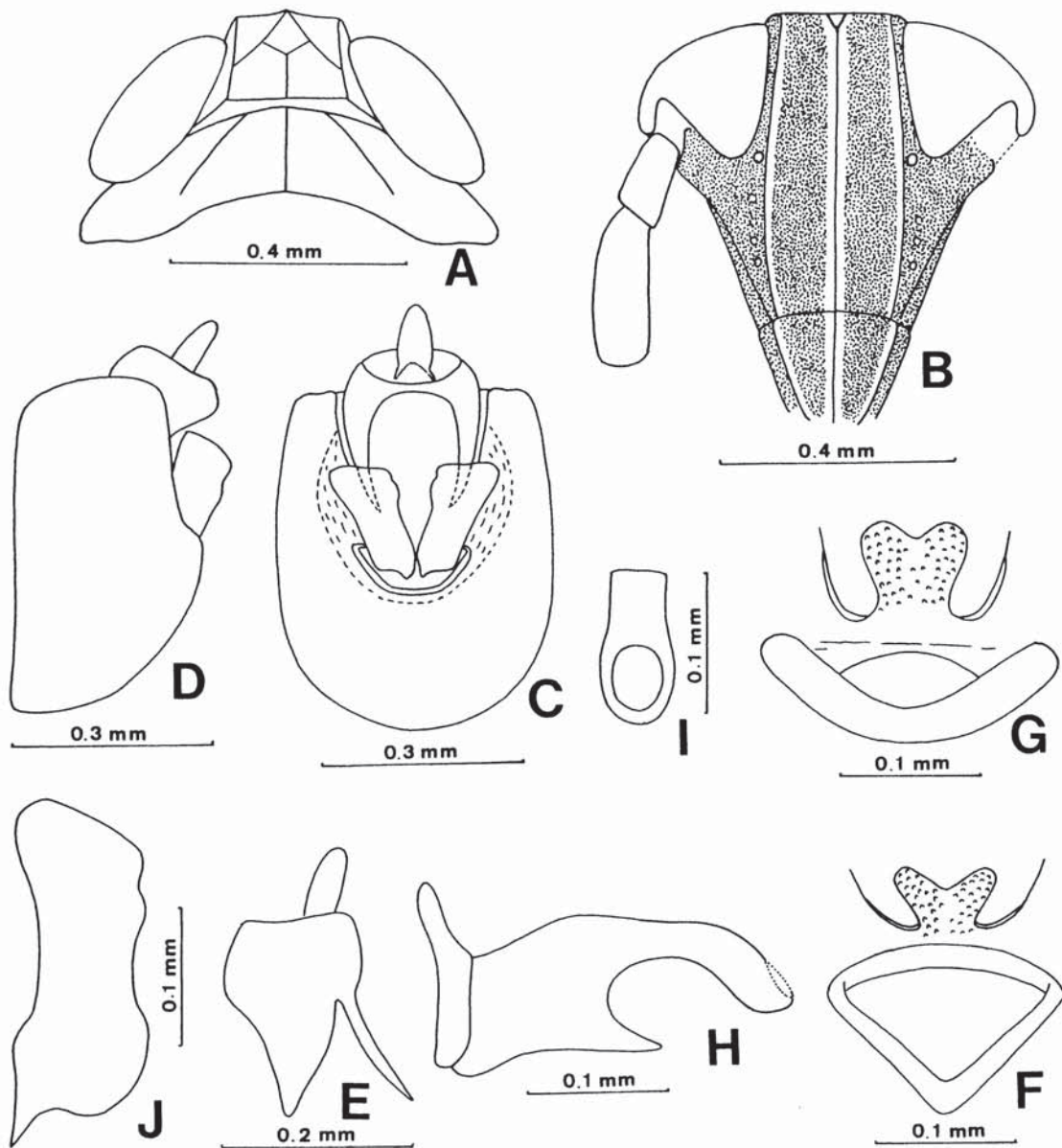


Fig. 102. *Terthron triangulum* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, the same, left side; E, anal segment of male, left side; F, diaphragm of pygofer, posterior view; G, the same, posteroventral view; H, phallus, left side; I, suspensorium; J, genital style, left side.

(91) *TERTHRON DENTICULATUM* n.sp.

Fig. 103.

General color dark brown to black. Frons and postclypeus with areas along carinae yellowish brown. Vertex, pro- and mesonotum and commissural suture of tegmina with yellowish brown stripe recurring. Legs brown to yellowish brown. Tegmina semihyaline, apical veins dark.

Vertex wider at base than long submedially about 1.3:1, apical margin transverse, slightly produced medially, lateral carinae nearly straight, basal compartment wider at base than greatest length about 1.7:1. Frons in middle line longer than wide at widest part about 2.1:1, widest below level of ocelli, lateral carinae slightly convex medially. Postclypeus wider at base than frons at apex, longer in middle line than wide at base. Rostrum reaching beyond meso-trochanters. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.7:1, shorter than second about 1:2.1. Post-tibial spur with 15-18 teeth.

Pygofer in profile nearly as long ventrally as dorsally, laterodorsal angle produced at right angle not reflected, in posterior view with opening wider than long, lateral margins weakly defined, without medioventral process. Phallus as in *T. triangulum*, but dorsoapical process with 5 teeth near apex, ventroapical portion triangular, short and stout, dorsal margin sinuate. Suspensorium circular. Diaphragm in posterior view triangular. Opening for genital styles and shape of genital styles nearly same as in *T. triangulum*.

The name *denticulatum* is Latin adjective, denticulated.

Male (macropterous)

Length of body (includ.teg.): 2.60 mm.

Length of tegmen: 2.13 mm.

Holotype: Male, Orchid Is., Taitung Hsien, 14-VII-1985, C.T. Yang, In NCHU.

Host plant: Unknown.

Distribution: Taiwan.

This new species is a very close relative of *T. triangulum*, differs from the latter in having phallus with teeth; the shape of suspensorium. Differs from *T. albovittata* in pygofer without medioventral process.



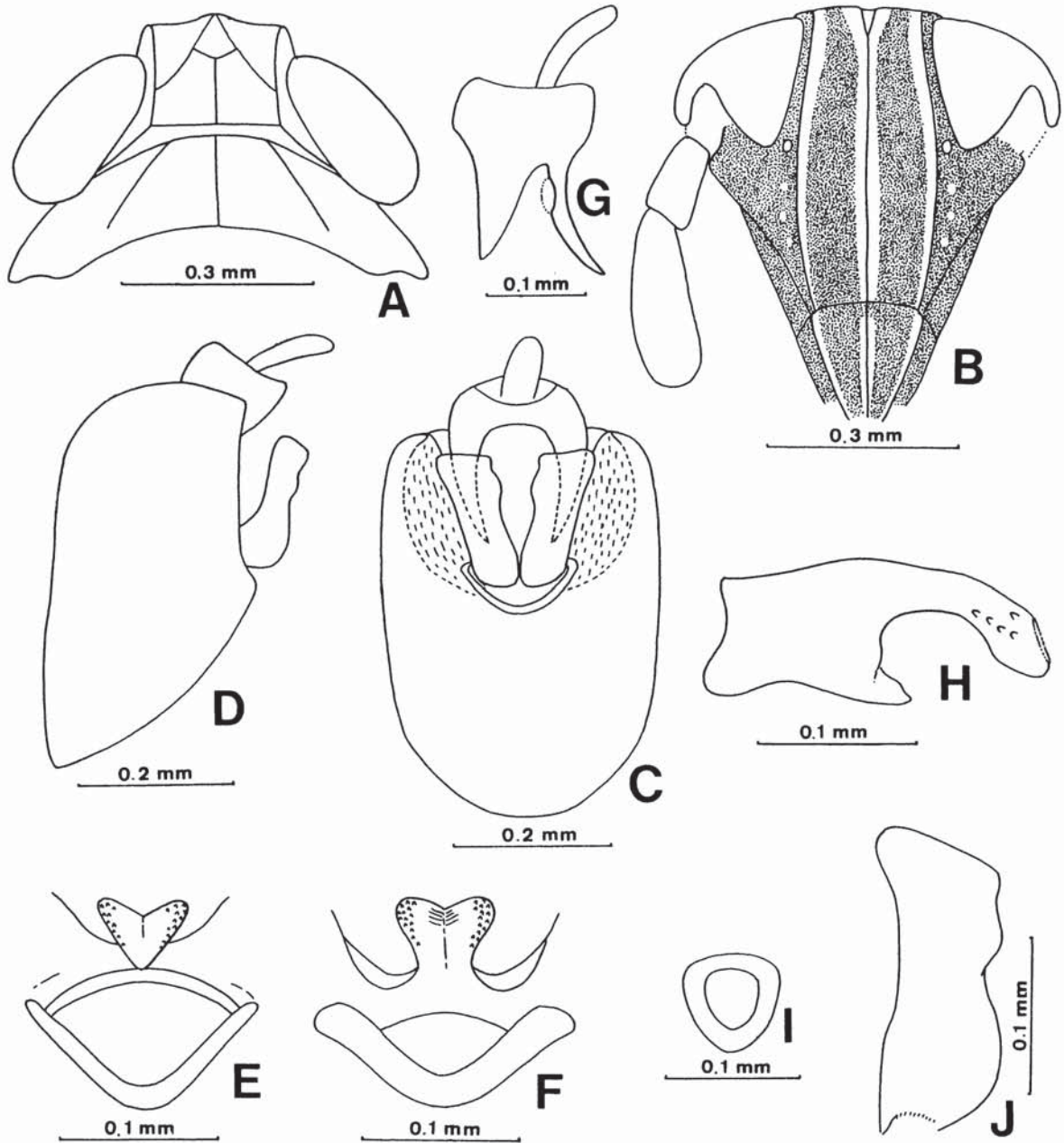


Fig. 103. *Terthron denticulatum* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, the same, left side; E, diaphragm of pygofer, posterior view; F, the same, posteroventral view; G, anal segment of male, left side; H, phallus, left side; I, suspensorium; J, genital style, left side.

## 46. Genus *Sogata* Distant

*Sogata* Distant, 1906, *Fauna British India*, 3:471.

—: Fennah, 1971, *Ins. Macronesia*, 6(8):580.

*Hosunka* Matsumura, 1935, *Ins. Matsum.*, 10:76.

*Unkana* Matsumura, 1935, *Ins. Matsum.*, 9:72.

*Unkanella* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 20.

The generic characters outlined by Distant (1906) are modified based only on species drawn by the author as follows.

Relatively large species. Head including eyes narrower than pronotum. Vertex fairly oblong, longer submedially than wide at base about 1.3:1, narrower at apex than at base, submedian carinae uniting at apex, basal compartment of vertex as wide at base as greatest length or slightly wider. Frons in middle line longer than wide at widest part about 2.5:1, widest at apex. Frontoclypeal suture arched upward. Post-clypeus longer than wide at base. Antennae fairly long, second segment longer than first about 2:1. Ocelli present. Pronotum with lateral carinae straight, almost attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with 18-23 teeth.

Anal segment of male collar-shaped, with lateroapical angles each produced into a spinose process, produced from upper angle, directed upward first, then ventrad. Phallus tubular, apical third sharply turned down. Suspensorium transverse, with ventral margin deeply emarginate, dorsal margin nearly straight, processes not connected with phallus. Diaphragm broadly lobed, protruding cephalad, connected end of phallus. Opening for genital styles elongate oval, dorsal margin with small process medially, directed ventrad. Genital styles rather long, sharply turned dorsad near basal third, outer angle incised.

Genital scale with apical margin bifurcate, surface beset with many micro-spines.

Type species: *Sogata dohertyi* Distant  
(original designation)

All members of this genus considered here are associated with *Miscanthus* spp. They show a uniform structure of the male genitalia except some variation on the processes of the male anal segment. The processes of the male anal segment are directed dorsad first, then ventrad. The phallus is simple, tubular, the apical half or apical third is sharply turned down. The suspensorium is transverse with its ventral margin deeply emarginate. The diaphragm is protruding cephalad, connected with the end of phallus. The genital scale of the females with apical margin bifurcate, surface beset with micro-spines. By this *Sogata* forms a unique taxon, well separated from others.

Old recorded *Sogata*-species are for the moment very difficult to judge, because of the type specimens could not be available to examine.



### Key to the species of *Sogata*

(modified from Ishihara's [1949] key to the species of *Hosunka*. *Sogata dohertyi* and *S. jamiiana* Matsumura are not included).

1. Body above without a conspicuous light-coloured longitudinal stripe along median line . . . . . 2
  - Body above with a conspicuous light-coloured longitudinal stripe along median line . . . . . 3
2. Face between carinae filled with black lines; body mostly testaceous, carinae whitish; tegmina with apical veins robust, strongly granulated and fuscated at apices; male genitalia with genital styles wavy, at bases broader, gradually tapering towards apices and excurved; Length ♂ 5.5 mm., ♀ 6 mm. (includ.teg.) . . . . . *arisana* (Matsumura)
  - Face between carinae not filled with black line; body mostly pale testaceous; tegmina with narrow veins and with very small granules; length ♀ 3.8 mm. (includ. teg.) . . . . . *heitonis* (Matsumura)
3. Face black except basal third carinae brownish and narrow . . . . . 4
  - Face not black, concolorous with body . . . . . 5
4. Tegmina along and between  $M_2$  and  $M_3$  black; genital scale distinctly widened subapically . . . . . *nigrifrons* (Muri)
  - Tegmina along and between  $M_2$  and  $M_3$  not black; genital scale with lateral margins parallel, not widened subapically . . . . . *hyalipennis* (Matsumura)
5. Body mostly dark brown except vertex and narrow central stripe running from pronotum to scutellum whitish testaceous; length ♂ 4.5 mm., ♀ 3.5 mm. (brachypt.) . . . . . *taiwanella* (Matsumura)
  - Body light-coloured, mostly light brown or dull yellow . . . . . 6
6. Body length including tegmina ♀ 3.2 mm . . . . . *pallidula* (Matsumura)
  - Body length including tegmina ♀ 5 mm. or more. . . . . 7
7. Anal segment of male each lateroapical angle produced into two processes; genital scale longer at longest part than widest part about 1.3:1 . . . . . *hakonensis* (Matsumura)
  - Anal segment of male each lateroapical angle produced into single process; genital scale only slightly longer at longest part than widest part . . . . . *mukwaensis* n.sp.

(92) *SOGATA NIGRIFRONS* (Muir) n.comb.

## Fig. 104.

*Hosunka nigrifacies* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:40.

*Sogata nigrifacies* Fennah, 1971, *Ins. Micronesia*, 6(8):580.

*Stenocranus nigrifrons* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:322.

*Unkana nigrifacies* Matsumura, 1935, *Ins. Matsum.*, 9(4):134. NEW SYNONYMY.

*Unkanella nigrifacies* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, :21.

General color yellowish brown. Vertex, pro- and mesonotum with a longitudinal whity fascia running percurrently. Frons, clypeus and genae black except most basal carinae and its sides. Metapleuron with a small pale black marking. Abdomen uniformly red, pygofer grayish white. Tegmina hyaline, apical veins with ends of  $SC_2$ ,  $R_1$  nearly whole  $M_1$ ,  $M_2$  and  $M_3$  black and membrane with a irregular black marking before  $M_2$ . Female general color grayish, abdomen black each with white margin.

Vertex longer submedially than wide at base about 1.3:1, basal compartment at base wider than greatest length about 1.3:1. Frons in middle line longer than wide at widest part about 2.5:1, widest at apex. Postclypeus at base slightly wider than frons at apex. Rostrum surpassing meso-trochanters. Antennae surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with 18-23 teeth. Tegmina longer than widest part about 3.7:1.

Anal segment of male long, basal half strongly raised, deeply sunk in dorsal emargination of pygofer, in profile apicoventral angle rounded, lateroapical angles narrowly separated, each produced into a long, spinose process. Pygofer in profile distinctly longer ventrally than dorsally, dorsal margin slightly curved downward medially, in posterior view with opening wider than long. Phallus simple, tubular, apical half turned ventrad. Suspensorium broad, with ventral margin deeply emarginate, dorsal margin slightly produced medially. Genital styles typical.

Genital scale of female as longest as widest, apical half widened.

## Male (macropterous)

Length of body (includ.teg.): 4.33-4.67 mm.

Length of tegmen: 3.63-3.77 mm.

## Female (macropterous)

Length of body (includ.teg.): 5.07-5.27 mm.

Length of tegmen: 4.17-4.43 mm.

Specimens examined: 10♂♂, 19♀♀, Shitou, Nantou Hsien, 9-XII-1984, C.T. Yang.

Host plant: *Miscanthus floridulus* (Labill.) Warb.

Distribution: Taiwan.

This species and *Sogata hyalipennis* (Matsumura) can be distinguished from other species of *Sogata* by the male with face black.



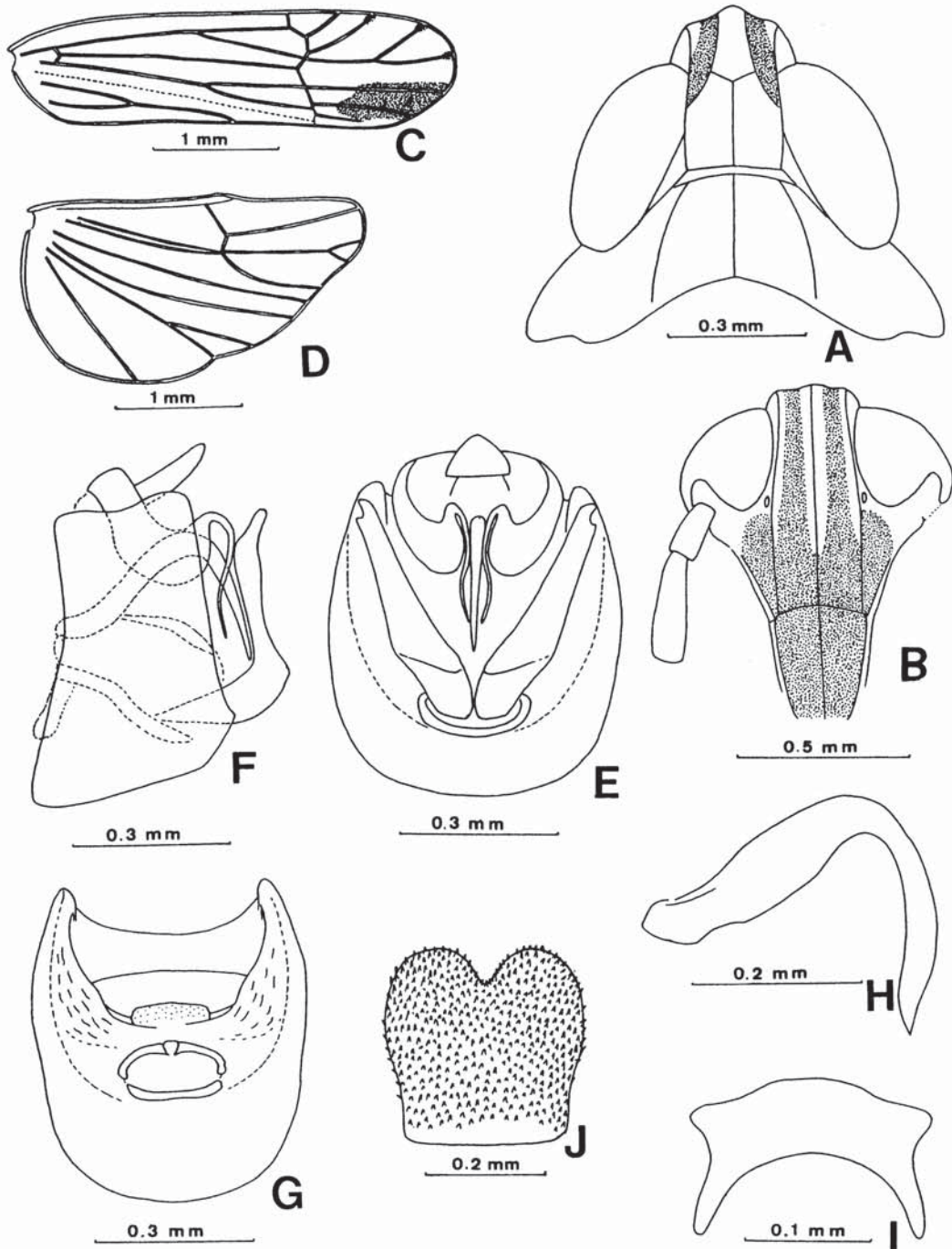


Fig. 104. *Sogata nigrifrons* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, left side; I, suspensorium; J, genital scale of female.

(93) *SOGATA HYALIPENNIS* (Matsumura) new status  
Fig. 105.

*Hosunka nigrifacies* form *hyalipennis* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:40.

*Sogata nigrifacies* form *hyalipennis* Fennah, 1971, *Ins. Micronesia*, 6(8):580.

*Unkana nigrifacies* form *hyalipennis* Matsumura, 1935, *Ins. Matsum.*, 9:134.

*Unkanella nigrifacies* form *hyalipennis* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*:21.

General color pale yellowish brown. Vertex, pronotum and mesonotum with a longitudinal whitish fascia running percurrently. Frons, clypeus and genae black except basal half of carinae, median carina of frons and its both sides white, lateral carinae brown. Metapleuron with a small rounded black marking. Abdomen yellowish red with dorsum pale black, pygofer grayish white. Tegmina hyaline, with apical veins black except Sc.

Vertex longer submedially than wide at base about 1.5:1, basal compartment at base as wide as greatest length. Frons in middle line longer than wide at widest part about 2.5:1, widest at apex. Postclypeus at base slightly wider than frons at apex. Antennae surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with 23-25 teeth. Tegmina longer than widest part about 3.9:1.

Anal segment of male moderately long, basal half strongly raised, deeply sunk in dorsal emargination of pygofer, in profile lateroapical angles moderately separated, each produced into a very long, spinose process. Pygofer in profile longer ventrally than dorsally, in posterior view with opening nearly as long as wide. Phallus simple, tubular, apical third turned ventrad. Suspensorium with ventral margin deeply emarginate, dorsal margin gently curved. Diaphragm produced cephalad as a wide lobe. Opening for genital styles with dorsal margin distinctly produced downward medially. Genital styles typical.

Genital scale of female longest part distinctly longer than widest part, nearly parallel.

Male (macropterous)

Length of body (includ.teg.): 4.33 mm.

Length of tegmen: 3.50 mm.

Female (macropterous)

Length of body (includ.teg.): 4.83-5.00 mm.

Length of tegmen: 4.00-4.20 mm.

Specimens examined: 4♂♂, 5♀♀, Peipu, Hsinchu Hsien, 30-XII-1984, C.T. Yang; 4♂♂, 3♀♀, Kukuan, Taichung Hsien, 30-XII-1981, C.T. Yang; 4♂♂, 3♀♀, Yangmingshan, Taipei, 21-VII-1984, J.T. Yang; 2♂♂, Shitou, Nantou Hsien, 21-XII-1981, C.T. Yang.



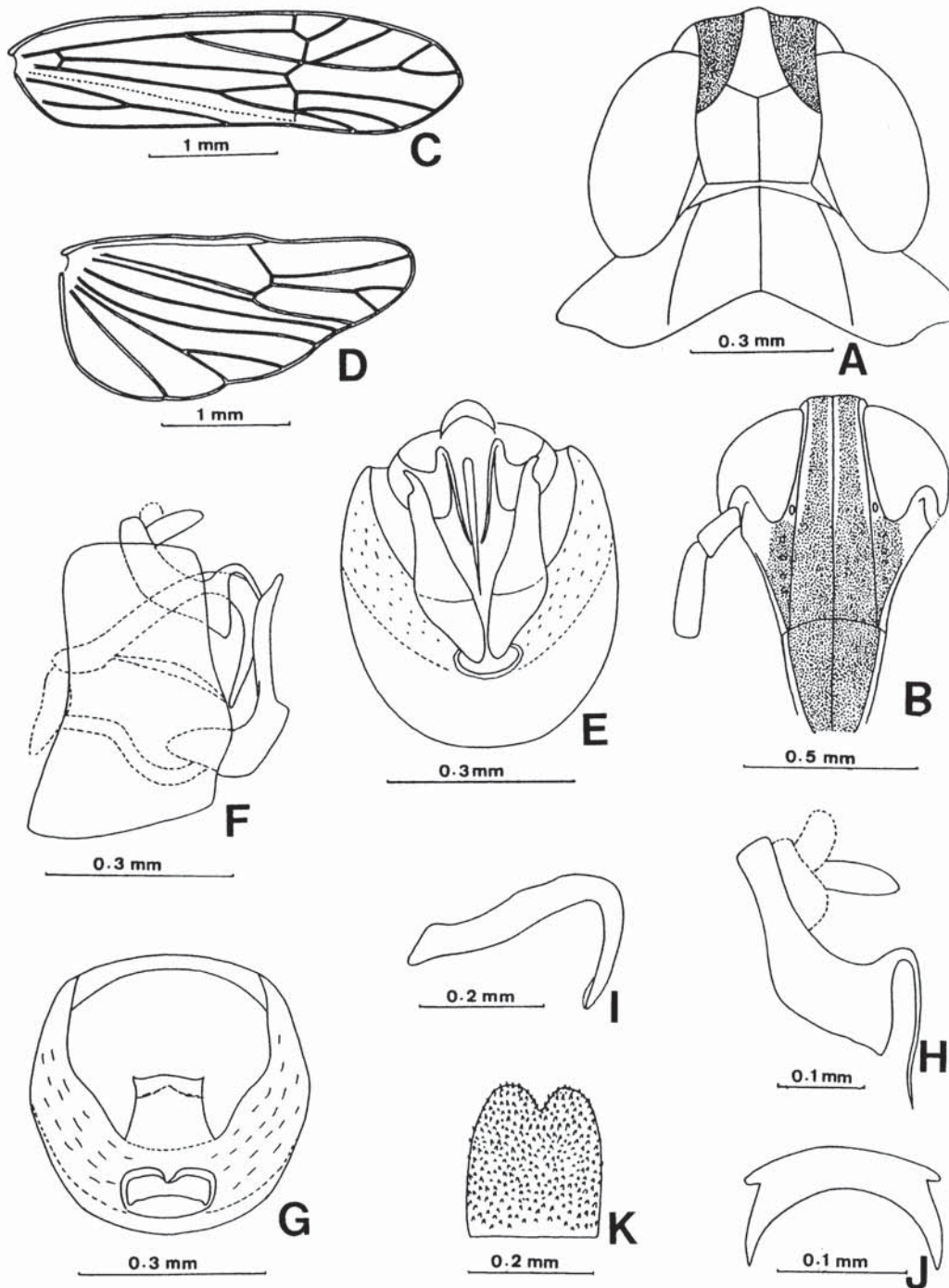


Fig. 105. *Sogata hyalipennis* (Matsumura) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital scale of female.

Host plant: *Miscanthus floridulus* (Labill.) Warb.

Distribution: Taiwan.

This species originally assigned as a form of *Unkana nigrifacies* Matsumura, 1935, but it differs from latter in the coloration of the female which is nearly concolorous with male; the genital scale is nearly parallel sided (widest at apical third in *nigrifrons*). Therefore it is considered as a distinct species.

(94) *SOGATA HAKONENSIS* (Matsumura)

Fig. 106.

*Sogata hakonensis* Fennah, 1971, *Ins. Micronesia*, 6(8):580.

*Hosunka hakonensis* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:40.

*Unkana hakonensis* Matsumura, 1935, *Ins. Matsum.*, 9:133.

*Unkanella hakonensis* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*:20.

—: Matsumura et Ishihara, 1945 *Mushi*, 16:69.

General color pale yellowish brown. Vertex, pro- and mesonotum with a wide white fascia running percurrently. Intercarinal areas of frons, small areas of genae and small spots of mesopleura black. Abdomen reddish yellow to red, pygofer yellow. Tegmina hyaline, apical veins black except Sc.

Vertex longer submedially than wide at base about 1.2:1, basal compartment at base longer than greatest length about 1.3:1. Frons longer in middle line than wide at widest part about 2.6:1, widest at apex. Poty Clypeus at base as wide as frons at apex, longer than wide at base. Antennae surpassing level of frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Post-tibial spur with 19-21 teeth. Tegmina longer than widest part about 4.1:1.

Anal segment of male very long, slightly sunk in dorsal emargination of pygofer, lateroapical angles separated, each produced into two processes, upper one rather long and slender, curved and directed ventrocaudad, lower one shorter and stout, directed dorsocaudad, the two forming an entire circle at base in lateral view. Pygofer in profile slightly longer ventrally than dorsally, anterior margin straight, laterodorsal angle nearly rectangular, in posterior view with opening distinctly longer than wide, lateral margins obscure. Opening for genital styles rectangular, about 3 times as wide as long. Phallus large, tubular, basal half wide, nearly parallel on both margins, apical half abruptly turned down, slender, slightly attenuating to apex, obtused at apex. Genital styles typical.

Genital scale of female longer at longest part than widest part about 1.3:1, nearly parallel, acutely bifurcate at apex.



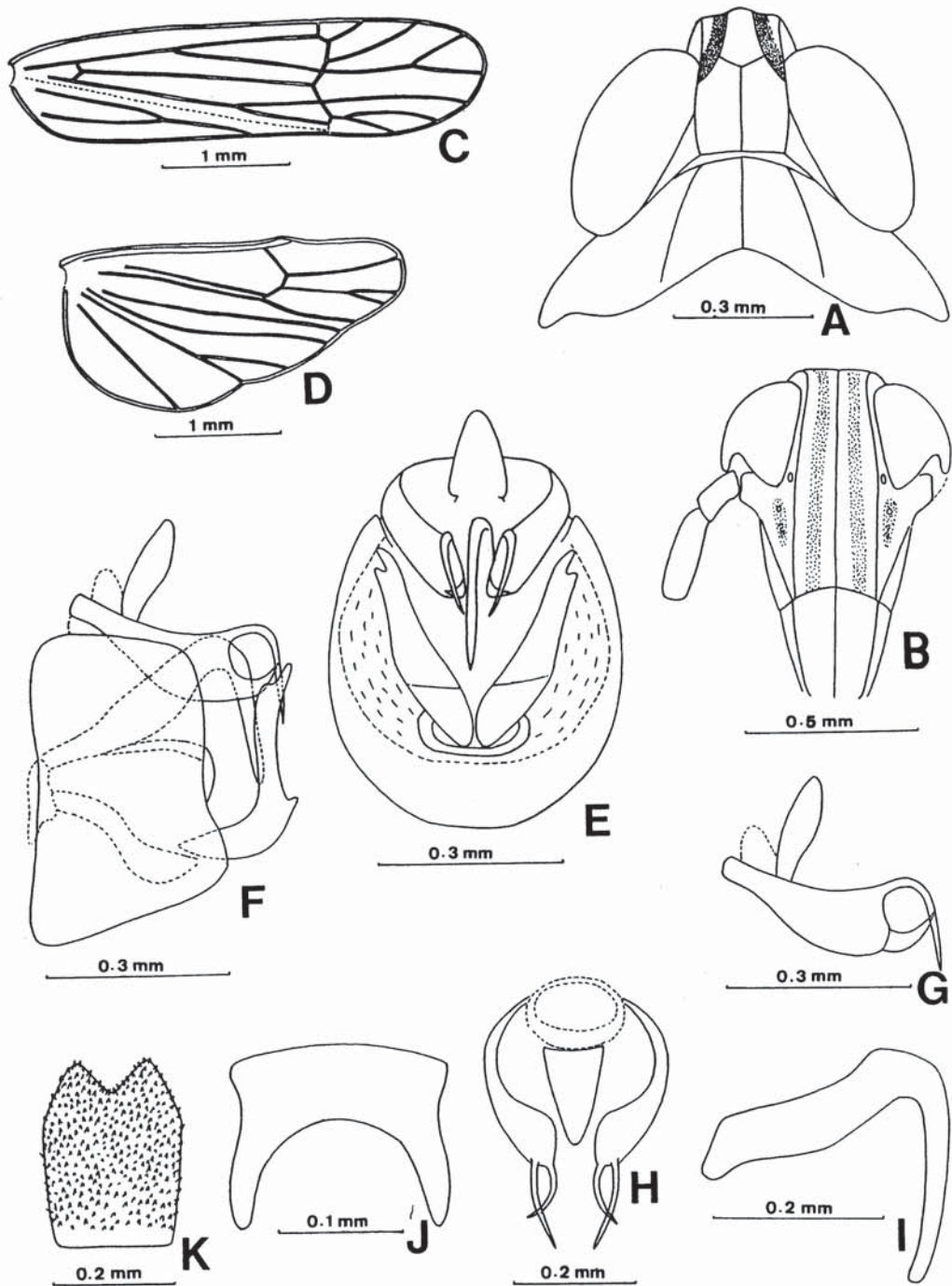


Fig. 106. *Sogata hakonensis* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, anal segment of male, left side; H, the same, dorsal view; I, phallus, left side; J, suspensorium; K, genital scale of female.

Male (macropterous)

Length of body (includ.teg.): 4.5-4.70 mm.

Length of tegmen: 3.33-3.66 mm.

Female (macropterous)

Length of body (includ.teg.): 5.00-5.20 mm.

Length of tegmen: 4.06-4.33 mm.

Specimens examined: 20♂♂, 10♀♀, Tienchih., Kaohsiung Hsien, 26-X-1981, C.T.

Yang; 2♂♂, 5♀♀, Shitou Nantou Hsien, 21-XII-1981, C.T. Yang; 2♂♂, 4♀♀,

Yangminshan, Taipei, 21-VIII-1984, J.T. Yang.

Host plant: *Miscanthus floridulus* (Labill.) Warb.

Distribution: Taiwan (new record), Japan, Bonin Is.

(95) *SOGATA MUKWAENSIS* n.sp.

Fig. 107.

General color yellowish brown. Vertex, pro- and mesonotum with a wide, white fascia running percurrently. Intercarinal areas of frons black, of postclypeus brown. Mesopleuron with a small black marking. Legs pale yellowish. Abdomen yellowish to reddish yellow. Tegmina hyaline, apical veins black except Sc. Female concolorous with male except abdomen yellowish with black markings laterally.

Vertex longer submedially than wide at base about 1.2:1, apical margin transverse, slightly produced medially, lateral carinae straight, submedian carinae not really uniting at apex, Y-shaped carina feeble, basal compartment wider at base than greatest length about 1.2:1. Frons longer in middle line than wide at widest part about 2.4:1, widest at apex, lateral carinae nearly straight, slightly convergent at base, median carina simple. Postclypeus distinctly wider at base than frons at apex, distinctly longer in middle line than wide at base. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.6:1, shorter than second about 1:2.4. Post-tibial spur with about 17 teeth. Tegmina longer than widest part about 3.8:1.

Anal segment of male very long, strongly downward caudally, lateroapical angles narrowly separated, each produced in a long spinose process. Pygofer in profile slightly wider ventrally than dorsally, laterodorsal angle produced in a right angle, reflected mesad, in posterior view with opening wider than long, lateral margins weakly defined. Phallus tubular, typical turned part as long as main body, rounded at apex with several teeth on ventral side near apex. Diaphragm typical, dorsal margin slightly convex medially, protruding portion with lateral margins restricted near apex. Opening for genital styles oval, with several small teeth on median portion of dorsal margin. Genital styles typical.

Genital scale greatest length slightly longer than widest, widest at middle.

The name *mukwaensis* is genitive of Mukwa, the type-locality.



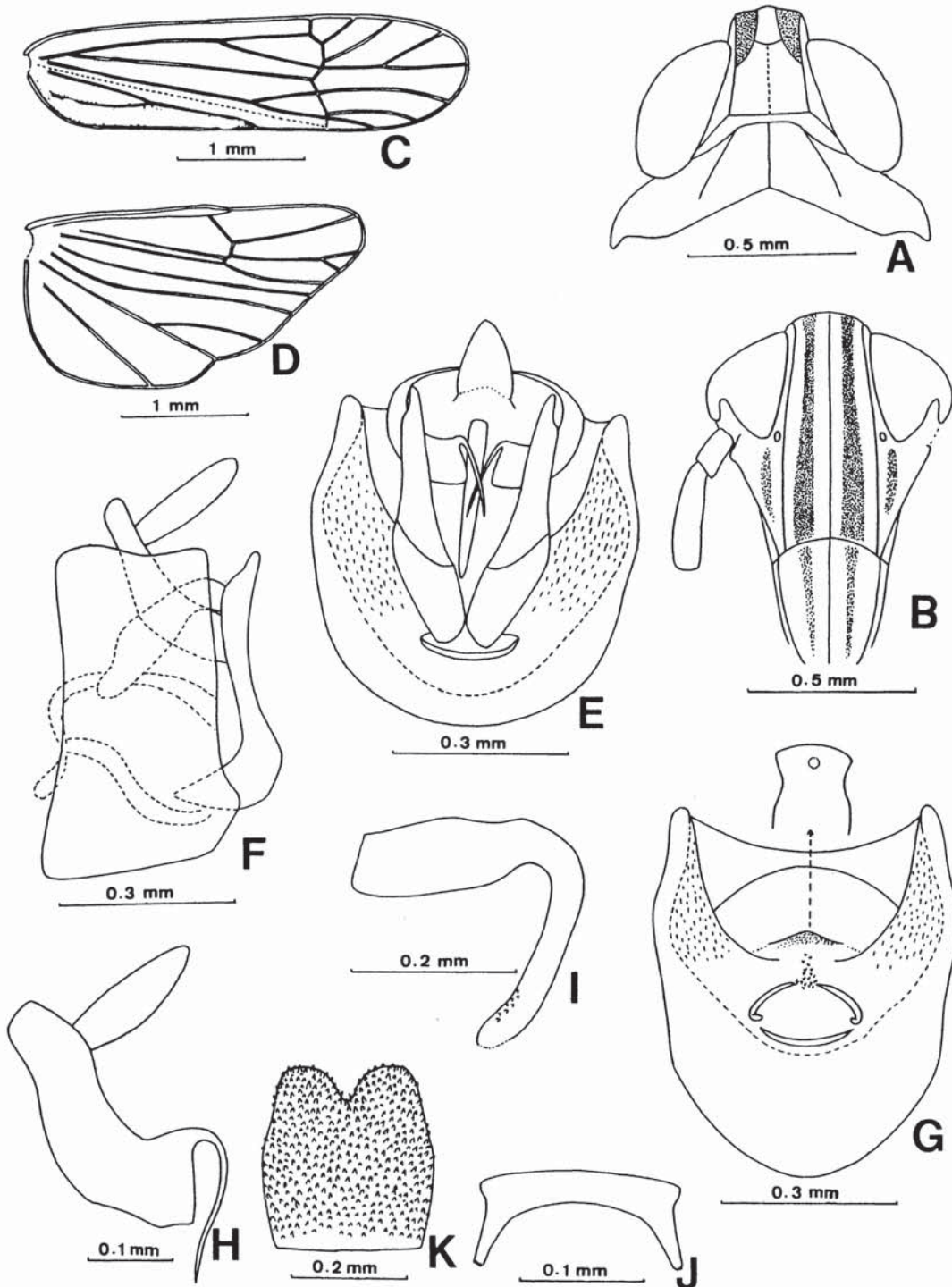


Fig. 107. *Sogata mukwaensis* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital scale of female.

## Male (macropterous)

Length of body (includ.teg.): 4.47-4.67 mm.

Length of tegmen: 3.73-3.93 mm.

## Female (macropterous)

Length of body (includ.teg.): 4.93 mm.

Length of tegmen: 4.10 mm.

**Fifth instar nymph (Fig. 108)**

General color nearly same as in *Sogata nigrifacies* except side of 7th abdominal segment with black marking.

Head between eyes distinctly longer in middle line than wide at narrowest part about 1.75:1, strongly protruding beyond level of eyes, anterior margin strongly protruding medially, eyes nearly straight, length of eye longer than length between eyes and lateral point of frons about 4.6:1, width of head including eyes wider than width of basal compartment at hind margin about 3.1:1, submedian carinae attaining hind margin of vertex laterally, basal compartment at hind margin slightly wider than greatest length, hind margin slightly curved downward. Frons longer in middle line than widest part about 1.8:1, widest above level of lower margin of eyes, lateral carinae evenly convex at level of middle of eyes, with 2 median carinae, parallel, separated, strongly narrow at base. Interfrons narrower than laterofrons. Number and arrangement of pits typical, each side with 3 extra pits, lower pit lies near frontoclypeal suture, distance about a diameter of pit, distance between dorsal level of lower pits and ventral level of median pits shorter than former to frontoclypeal suture about 1:2, lower of upper pits higher than higher of median pits. Between eye and lateral carina with 4 pits, lower one lies above middle of eye. Frontoclypeal suture nearly straight. Antennae with basal segment wider than long, shorter than second about 1:3.2. Rostrum reaching to meso-trochanters, relative length of each segment about 1.45:1.1:1, third segment longer than wide about 2:1.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, distance between  $W_1$  to  $W_2$  longer than  $W_2$  to  $W_3$  about 1.3:1. Anterior wing pad protruding not over hind one, latter reaching over anterior margin of abdominal tergite IV. Spinal formula of hind leg 5-7-4, metatibia longer than 3 tarsi combined about 1.25:1, first tarsal segment longer than 2 latters combined about 2.6:1, spur shorter than first tarsal segment, with 15-16 teeth.

Abdominal tergite V: bears 1 pit on each side; VI–VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal view with anal ridge incised medially, lateral lobes cylindrical, pits lie at middle, in lateral view strongly produced near base, with anal comb relatively small, in caudal view with opening widest near dorsal.



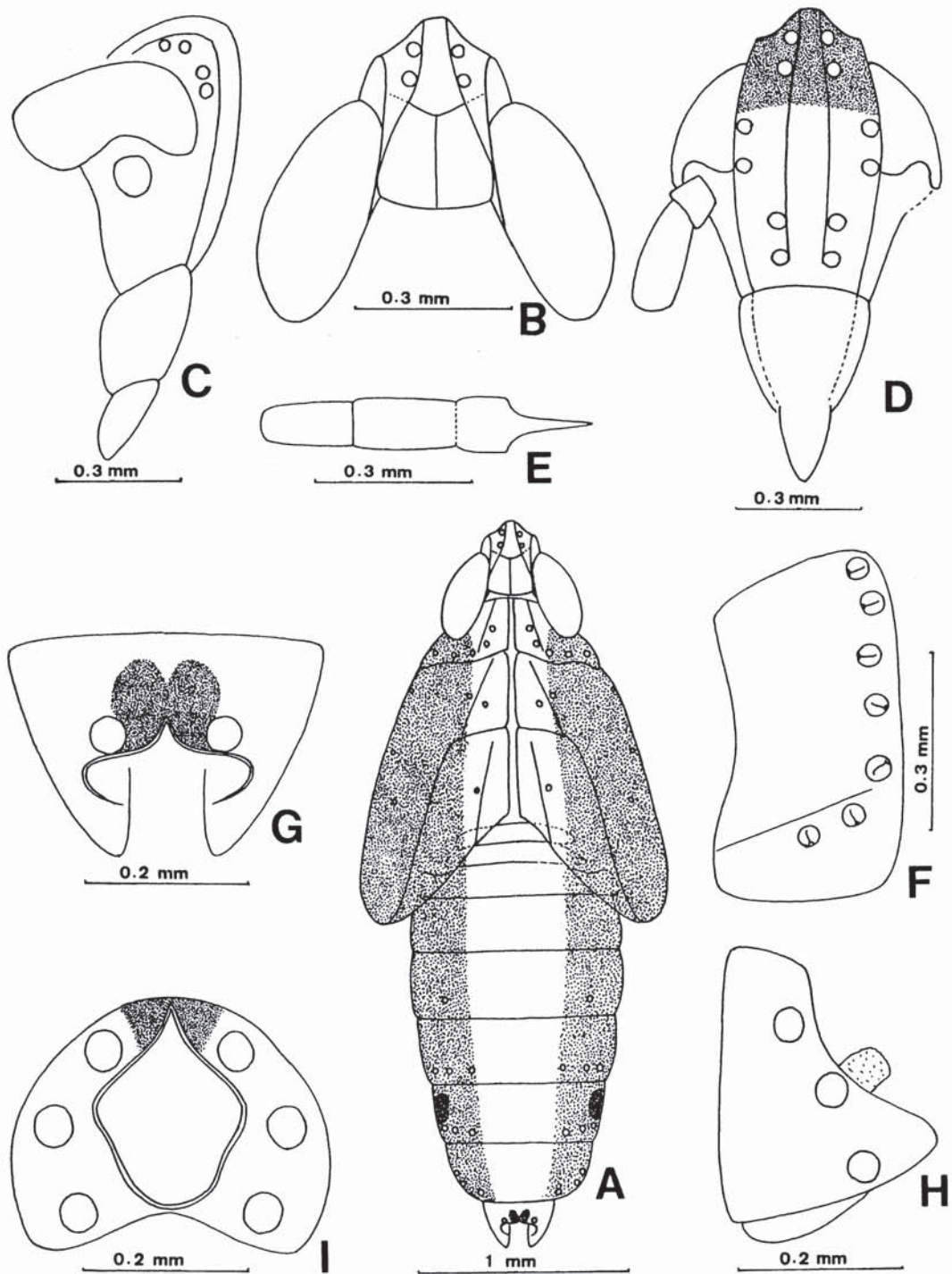


Fig. 108. Nymph of *Sogata mukwaensis* n.sp. A, fifth instar nymph; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.

Length of body: 3.43 mm.  
 Width of head including eyes: 0.67 mm.  
 Length of anterior wing pad: 1.22 mm.  
 Length of antenna: 0.33 mm.

Holotype: Male, Mukwa, Hualien Hsien, 7-VIII-1985, C.T. Yang. In NCHU.  
 Paratypes: 13♂♂, 1♀, same data as for holotype, C.T. Yang; S.C. Tsaur; C.L. Chen.  
 Host plant: *Miscanthus floridulus* (Labill.) Warb.  
 Distribution: Taiwan.

This new species runs to *Hosunka testacea* (Matsumura, 1900) in Ishihara's key (1949) but differs from the latter in having genital styles without yellowish brown small spine in each lateral side near base and a small spine outside near apex. To *Unkana arisana* Matsumura, 1935, in Matsumura's key (1935), but differs from the latter in having conspicuous light-colored longitudinal stripe along median line above; smaller; phallus toothed apically.

#### (96) *SOGATA ARISANA* (Matsumura)

*Sogata arisana* Fennah, 1971, *Ins. Micronesia*, 6(8):580.  
*Hosunka arisana* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:41.  
*Unkana arisana* Matsumura, 1935, *Ins. Matsum.*, 9:133.  
*Unkanella arisana* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*:20.

The description is reproduced from Matsumura [1935].

"Allied to *U. hakonensis* Mats., but differs from the latter as follows:

Testaceous; face with 2 dark brown stripes; keels whitish, vertex and mesonotum with no whitish stripe on the back; mesopleura with each a brown spot; tegmina at the membrane with robust veins strongly granulated and at the apices infuscated; abdomen in the male yellow, at the apex paler, genital segment grayish, much longer than the height, at the lower margin somewhat excavated, the claspers wavy, at the bases broader, gradually tapering towards the apices and excurved. ♀ abdomen testaceous, with some brownish markings, genital cushions with the anal tube and stylus concolorous with the body.

Length - ♂ 5.5 mm., ♀ 6 mm. (to the apices of tegmina)."

Specimens examined: No specimen has been collected by the author.  
 Host plant: Unknown.  
 Distribution: Taiwan.



(97) *SOGATA JAMIANA* Matsumura

*Sogata jamiana* Matsumura, 1940, *Ins. Matsum.*, 15(1&2):48.

—: Ishihara, 1949. *Sci. Rep. Matsuyama Agric. Coll.*, 2:65.

The description is reproduced from Matsumura [1940].

“♀. Fuscous; keels of the frons scarcely paler in colour, and the rostrum testaceous, the latter at the apex fuscous. Antennae with the granules white. Keels of the pronotum and mesonotum concolorous with the body. Tegmina subhyaline, with a pale brownish tinge, the veins brown, the granules concolorous, with each a very short white hair. Metasternum pale testaceous, at the sides near the base yellowish red. Legs whitish testaceous, the tips of spines mostly fuscous. Abdomen fuscous, at the lateral margins checked with testaceous; pygophor and ovipositor paler than the abdomen. Length, 3.5 mm. (incl. teg.).

Hab. — Kotocho. 2 (♀♀) specimens were collected.

In form and coloration this species much resembles *Dicranotropis fumosa* Mats. from Rinkiho (Formosa), which differs from the former in having a long forked central keel at the frons.”

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

(98) *SOGATA DOHERTYI* Distant

*Sogata dohertyi* Distant, 1906, *Fauna British Ind.*, 3:471.

—: Schumacher, 1915, *Suppl. Ent.*, 4:142.

—: Schumacher, 1915, *Mitt. Zool. Mus. Berlin*, 8:132.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*:26.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:63.

The description is reproduced from Distant [1906].

“Head, pronotum, and mesonotum testaceous, with a pale greyish central longitudinal fascia running percurrently through them; on anterior area of vertex there is on each side a submarginal black line, eyes greyish-brown; lateral carinations to pronotum and mesonotum indistinctly pale ochraceous; antennae ochraceous; body beneath and legs pale ochraceous; face with the central carination white, margined with black on each side, the lateral ridges ochraceous; tegmina pale brownish-grey, darker and semiopaque towards basal area, beyond the transverse veins the colour is more greyish, and a broad inner submarginal longitudinal pale fuscous fascia extends from the transverse veins to the apical margin.

Length incl. tegm. 4½ mm.

Specimen examined: No specimen has been collected by the author.  
 Host plant: Unknown.  
 Distribution: Taiwan, Tenasserim.

(99) *SOGATA HEITONIS* (Matsumura)

*Sogata heitonis* Fennah, 1971, *Ins. Micronesia*, 6(8):580.  
*Hosunka heitonis* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:40.  
*Unkana heitonis* Matsumura, 1935, *Ins. Matsum.*, 9:134.  
*Unkanella heitonis* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*:21.

The description is reproduced from Matsumura [1935].

“Allied also to *U. hakonensis* Mat., but differs from the latter as follows:

♀. Body pale testaceous, smaller, slenderer; pronotum and scutellum with no whity facia in the middle, but paler than the ground colour; abdomen of the dorsum concolorous with the body; tegmina with much narrower veins, the granules very small, being concolorous with the ground colour; mesonotum, abdomen at the venter, whity gray; anal stylus being concolorous with the body.

Length - 3.8 mm. (to the apices of tegmina)”

Specimen examined: No specimen has been collected by the author.  
 Host plant: Unknown.  
 Distribution: Taiwan.

(100) *SOGATA PALLIDULA* (Matsumura)

*Sogata pallidula* Fennah, 1971, *Ins. Micronesia*, 6(8):580.  
*Hosunka pallidula* Matsumura, 1935, *Ins. Matsum.*, 10:76.  
 —: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*:23.  
 —: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:41.

The description is reproduced from Matsumura [1935].

“♀ Pale testaceous; face somewhat darker in colour; scutellum in the middle from the base to the apex somewhat paler. Tegmina at the hind margin concolorous, the granules along the veins obsolete and the veins concolorous with tegmina; claval veins with short hair. Abdomen at the base of dorsum somewhat infuscated. Legs paler, the claws, the spines and the apices of the tibiae and tarsi black.

Length - 3.2 mm.”

Specimen examined: No specimen has been collected by the author.  
 Host plant: Unknown.  
 Distribution: Taiwan.



(101) *SOGATA TAIWANELLA* (Matsumura)

*Sogata taiwanella* Fennah, 1971, *Ins. Micronesia*, 6(8):580.

*Hosunka taiwanella* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:40.

*Unkana taiwanella* Matsumura, 1935, *Ins. Matsum.*, 10:74.

*Unkanella taiwanella* Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*:22.

The description is reproduced from Matsumura [1935].

"Differs from *U. hakonensis* Mats. as follows:

♂ Body dark brown; facial keels, vertex and the central stripe which runs from the pronotum to the apex of the scutellum more narrowly whitely testaceous. Genital segment black, at the lateral margin and at the engulfed region white. Claspers of the genital organ nearly as in *hakonensis*.

♀ Brachypterous; tegmina reached to the apex of abdomen.

Length - 4.5 mm. (♂), 3.5 mm. (♀)."

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

47. Genus *Ulanar* Fennah

*Ulanar* Fennah, 1975, *Ent. scand. Suppl.*, 4:127.

The generic characters as outlined by Fennah [1975].

"Head with eyes narrower than pronotum. Vertex longer than broad (about 1.4:1), acutely rounding into frons, posterior compartment broader than greatest length (about 1.3:1), lateral margins straight, anterior margin transverse, submedian carinae meeting at or slightly before apex of head, Y-shaped carina distinct; frons longer than broad (about 2.4:1), a little wider at apex than at base, lateral margins shallowly convex, median carina simple, distinct. Clypeus slightly longer than broad at base, where it is a little wider than frons at apex, medially carinate; rostrum surpassing mesotrochanters; ocelli present; antennae surpassing level of frontoclypeal suture, cylindrical, basal segment about twice as long as broad at apex, second segment longer than first (about 1.7:1). Pronotum longer in middle line than broad at anterior margin between lateral carinae (nearly 2:1), lateral carinae attaining posterior margin. Post-tibial spur with about 24 teeth.

Anal segment of male short, ring-like, lateroapical angles moderately widely separated, each slightly or distinctly produced ventrad. Pygofer with dorsolateral angles produced, and a small lobe developed on lateral margin below each, diaphragm deep an heavily-pigmented medially, with dorsal margin slightly produced caudad, medioventral process absent. Aedeagus tubular, slender, rather short, decurved distad, armed with a few delicate short spinose processes. Genital styles short, strongly diverging, outer margin minutely serrate distally."

Type species: *Megamelus mui* Metcalf.  
(original designation)

(102) *ULANAR CENTESIMA* n.sp.

Fig. 109.

General color brown. Head, pronotum and legs yellowish white, intercarinal areas of frons and postclypeus and genae brown. Tegmina opaque, brown except anterior margin and 2 small areas along posterior margin yellowish white.

Vertex longer submedially than wide at base about 1.1:1, distinctly wider at base than at apex, anterior margin transverse, slightly produced medially, submedian carinae not really uniting at apex, Y-shaped carina feeble, basal compartment longer at base than greatest length about 1.5:1. Frons longer in middle line than wide at widest part about 2.6:1, widest at level of ocelli, lateral carinae nearly straight, median carina feeble. Postclypeus with median carina feeble. Ocelli absent. Antennae with basal segment longer than wide about 2:1, shorter than second about 1:1.8. Pronotum with lateral carinae not really attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 27 teeth. Tegmina (brachypterous) widest near base, rounded at apex.

Anal segment of male deeply sunk in dorsal emargination of pygofer, lateroapical angles each produced in a rather short, stout spinose process, directed ventrad. Pygofer in profile as long dorsally as ventrally, in posterior view with opening wider than long. Phallus rather short, wide at basal three-fifths, abruptly attenuated apically, at apex with a long spinose process on right side, a small one on left side and another small one on ventral side. Orifice terminal. Diaphragm very long, strongly produced at dorsal margin, strongly ridged medially, triangulated from dorsal view. Opening for genital styles curved on both margins. Genital styles rather strongly divergent, each with inner margin shallowly concave at apical two-thirds, deeply concave at base, outer margin gently curved with many small teeth.

The name *centesima* is Latin adjective, hundredth.

Male (brachypterous)

Length of body: 2.60 mm.

Length of tegmen: 0.95 mm.

Holotype: Male, Taichung, 11-X-1981, C.T. Yang. In NCHU.

Host plant: Unknown.

Distribution: Taiwan.

This new species is a close relative of *Ulanar mui*, differs from the latter in having vertex slightly longer than wide about 1.1:1 (1.5:1 in *mui*); the shape of dorsal margin of diaphragm; the frons and the postclypeus with median carina indistinct; larger, the length of body 2.60 mm. (1.9 mm. in *mui*).



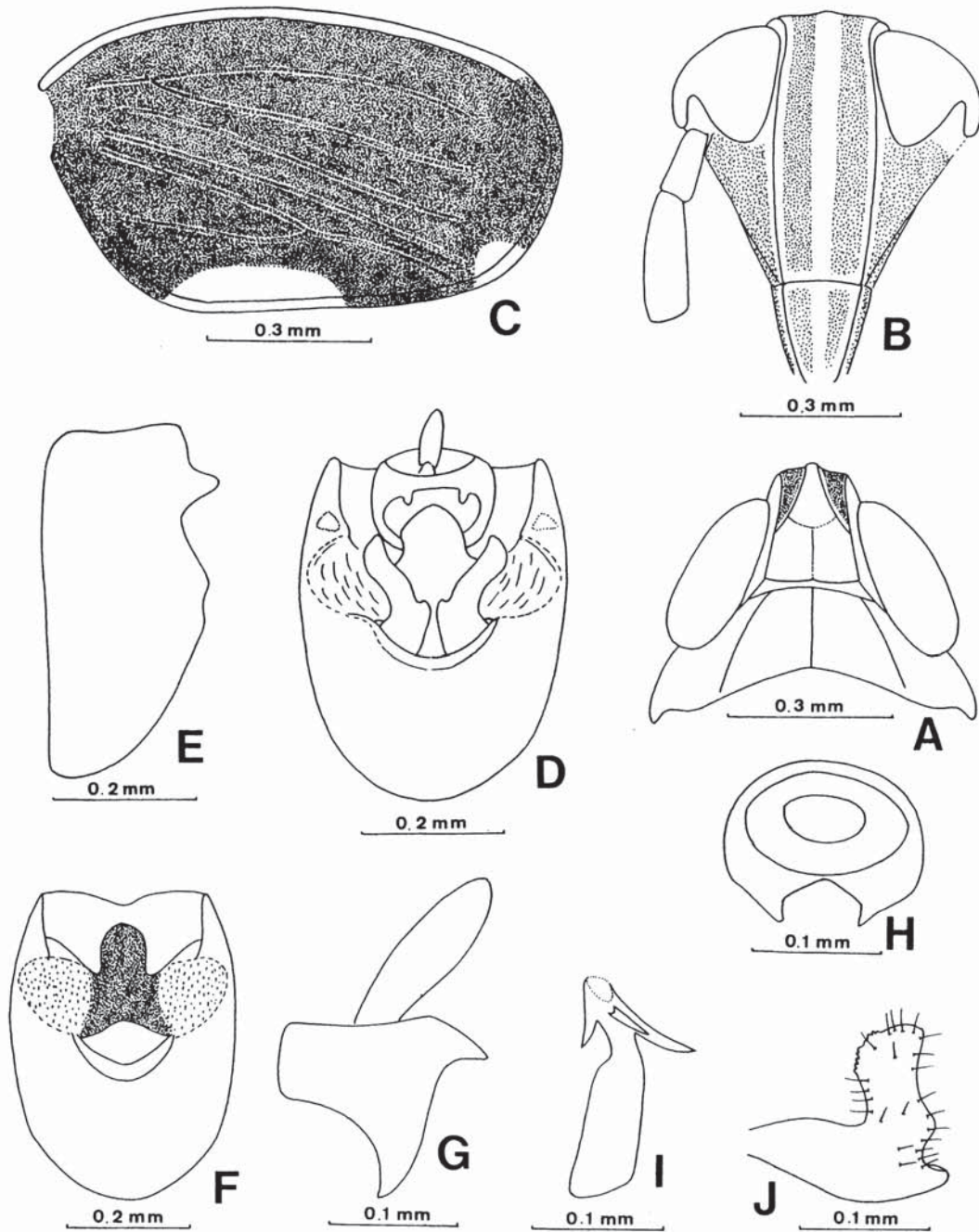


Fig. 109. *Ulanar centesima* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, anal segment of male, left side; H, the same, dorsal view; I, phallus, ventral view; J, genital style, left side.

## 48. Genus *Eoeurysa* Muir

*Eoeurysa* Muir, 1913, *Proc. Hawaiian Ent. Soc.*, 2:249.  
 —: Ding, 1983, *Econ. Ins. Fauna China*, 27:104.

The generic characters outlined by Muir [1913] are modified as follows.

Head including eyes narrower than pronotum. Vertex shorter submedially than wide at base, apical margin rounded, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment wider than greatest length, in profile between vertex and frons with distinct transverse carina, vertex acutely running into frons. Frons slightly longer in middle line than wide at widest part, widest at middle, flattened, lateral carinae slightly convex, median carina simple. Frontoclypeus suture obscure, postclypeus with median carina feeble. Rostrum reaching to meso-trochanters. Ocelli present. Antennae surpassing frontoclypeal suture, cylindrical, basal segment slightly longer than wide, shorter than second about 1:3. Pronotum with lateral carinae not really attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with 17-19 teeth.

Anal segment of male ring-like, apical margin with a distinct median process, lateroapical angles each produced into two short processes or not. Pygofer in profile as long ventrally as dorsally, laterodorsal angle not produced, in posterior view with opening wider than long, lateral margins not well defined, without medioventral process. Phallus tubular. Suspensorium elongate quadrate, circular at ventral half. Diaphragm moderately wide, dorsal margin protruding into a plate which connected base of suspensorium. Genital styles moderately long.

Type species: *Eoeurysa flavocapitata* Muir  
 (original designation)

### Key to the species of *Eoeurysa*

1. General color black; frons except narrow area at base of frons and postclypeus black ..... *flavocapitata* Muir
- General color pale yellowish brown; frons pale yellowish brown except apex and postclypeus dark brown to black ..... *arundina* Kuoh



(103) *EOEURYSA FLAVOCAPITATA* Muir

Fig. 110.

*Eoeurysa flavocapitata* Muir, 1913, *Proc. Hawaiian Ent. Soc.*, 2(5):249.-: Ding, 1983, *Econ. Ins. Fauna China*, 27:105.

General color black. Vertex, pronotum, ventral aspect of metathorax and hind legs yellowish white except hind femora and tibiae somewhat darker. Abdomen reddish brown. Tegmina opaque, black with paler stripe along nodal line.

Vertex submedially shorter than wide at base, narrower at apex than at base, lateral carinae oblique, apical margin roundly convex with transversal carina between vertex and frons, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment at hind margin longer than greatest length about 1.8:1. Frons in middle line slightly longer than wide at widest part, widest between eyes. Postclypeus at base narrower than frons at apex, nearly as long as wide at base, without median carina. Eyes relatively small. Ocelli present, but not visible from ventral. Antennae reaching to level of middle of postclypeus, basal segment slightly longer than wide about 1.2:1, shorter than second about 1:2.7. Rostrum short, reaching to level of meso-trochanters, apical segment shorter than subapical. Spinal formula of hind leg 5-8-4. Post-tibial spur with about 19 teeth. Tegmina longer than widest part about 3.8:1.

Anal segment of male moderately long, laterobasal angles each produced ventrad into 2 spinose processes, upper one the smaller, at median with another process, directed caudad. Pygofer in profile slightly longer ventrally than dorsally, laterodorsal angle rounded, slightly reflected mesad, in posterior view with opening wider than long, lateral margins not well defined, ventral margin slightly concave. Phallus moderately short, tubular with 2 small processes, directed dorsad near apex, forked at left from dorsal view. Suspensorium large. Diaphragm broad, median portion produced caudad, dorsal margin evenly convex. Opening for genital styles oval, dorsal margin with small process medially. Genital styles relatively long and slender, divergent, slightly bent laterad and narrowed at apical third, from lateral view turned cephalad apically.

## Male (macropterous)

Length of body (includ.teg.): 3.70-4.00 mm.

Length of tegmen: 2.93-3.00 mm.

## Female (macropterous)

Length of body (includ.teg.): 4.23-4.33 mm.

Length of tegmen: 3.16-3.40 mm.

Specimens examined: 5♂♂, 4♀♀, Pingtung, Pingtung Hsien, 20-IV-1984, C.T. Yang.

Host plant: *Saccharum officinarum* L.

Distribution: Taiwan (new record), Mainland China, Malaysia, India.

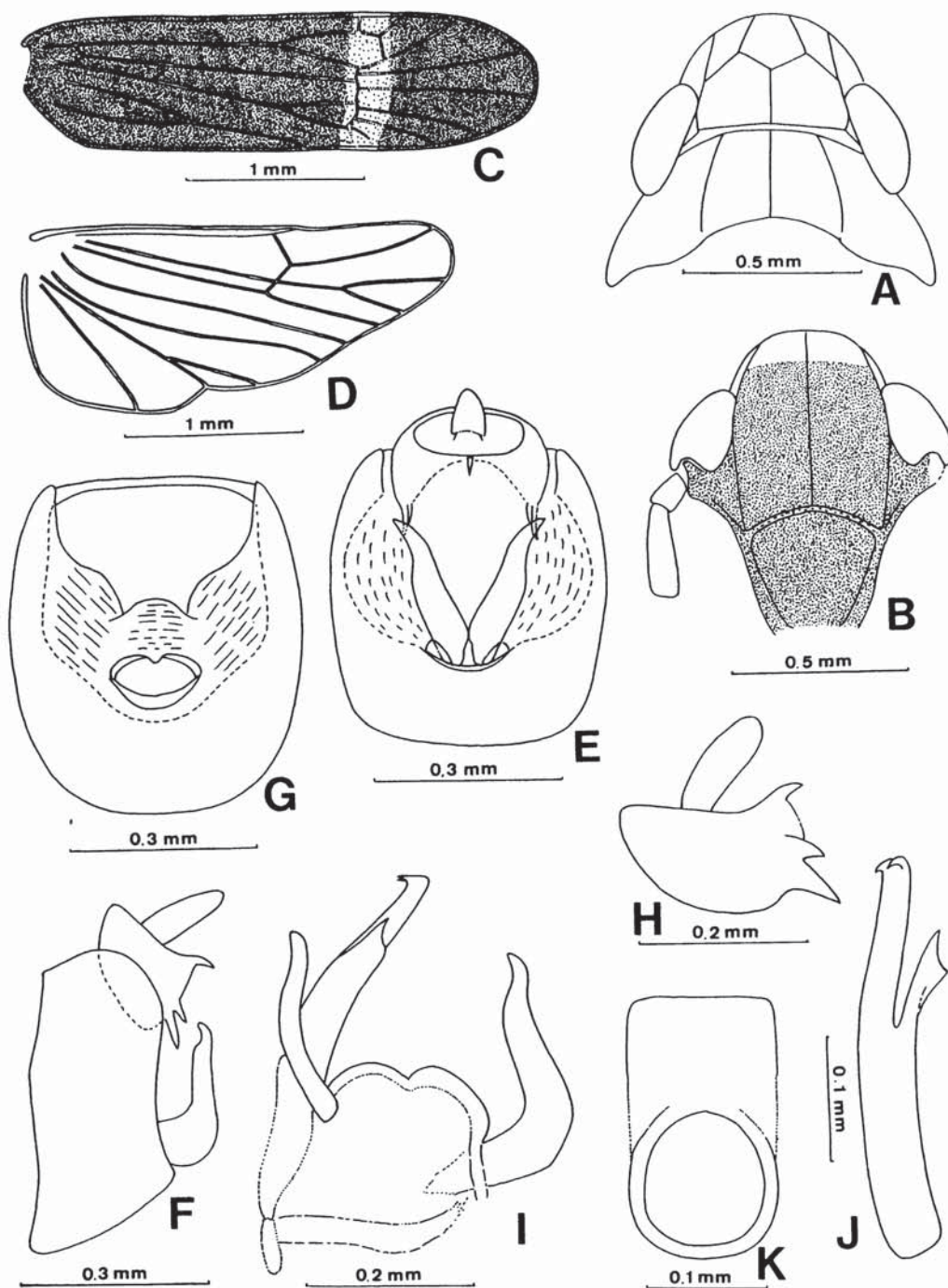


Fig. 110. *Eoerysa flavocapitata* Muir A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, diaphragm and genital style, left side; J, phallus, dorsal view; K, suspensorium.



(104) *EOEURYSA ARUNDINA* Kuoh et Ding  
Fig. 111.

*Eoeurysa arundina* Kuoh et Ding, 1980, *Acta Entomologica Sinica*, 23(4):422.  
—: Ding, 1983, *Econ. Ins. Fauna China*, 27:105.

General color pale yellowish brown. Postclypeus, apex of frons, fore and middle legs and pygofer dark brown to black. Abdomen somewhat dark dorsally, yellowish to reddish brown ventrally.

Body flattened. Vertex wider at base than long submedially about 1.3:1, at apex narrower than at base, apical margin slightly arched medially, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment longer at base than greatest length about 1.65:1. Frons longer in middle line than wide at widest part about 1.3:1, widest at level of lower margin of eyes, median carina simple. Postclypeus slightly wider at base than frons at apex. Ocelli absent. Antennae surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2.5. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth. Tegmina longer than widest part about 4:1.

Anal segment of male with apical margin produced medially into spinose process. Pygofer in profile longer ventrally than dorsally, laterodorsal angle not produced, in posterior view with opening longer than wide, lateral margins nearly straight. Phallus tubular, at basodorsal margin with a very large pointed process, apical fourth slightly turned downward, in dorsal view right side with 7-8 teeth, left 3. Suspensorium very large, ventral two-thirds ring-like. Diaphragm weakly sclerotized, dorsal margin slightly produced medially. Genital styles short, in caudal view strongly produced laterad basally, apex oblique, outer angle pointed, in lateral view basocaudal angle rod-like, in ventral view this rod-like structure with outer angle pointed.

Male (macropterous)

Length of body (includ.teg.): 3.80-4.26 mm.

Length of tegmen: 3.06-3.33 mm.

Female (macropterous)

Length of body (includ.teg.): 4.27-4.66 mm.

Length of tegmen: 3.40-3.66 mm.

**Fifth instar nymph (Fig. 112)**

General color yellowish brown. Frons except basal fifth, legs, apical half of 8th abdominal tergite and whole 9th dark brown to black.

Body depressed. Head between eyes slightly longer in middle line than wide at narrowest portion, protruding beyond level of eyes, anterior margin semicircular, length of eyes longer than length between level of eyes and mid-point of frons about 2.2:1, width of head including eyes wider than basal compartment at hind margin about 1.8:1, submedian carinae attaining lateral margin apically, basal compartment wider at

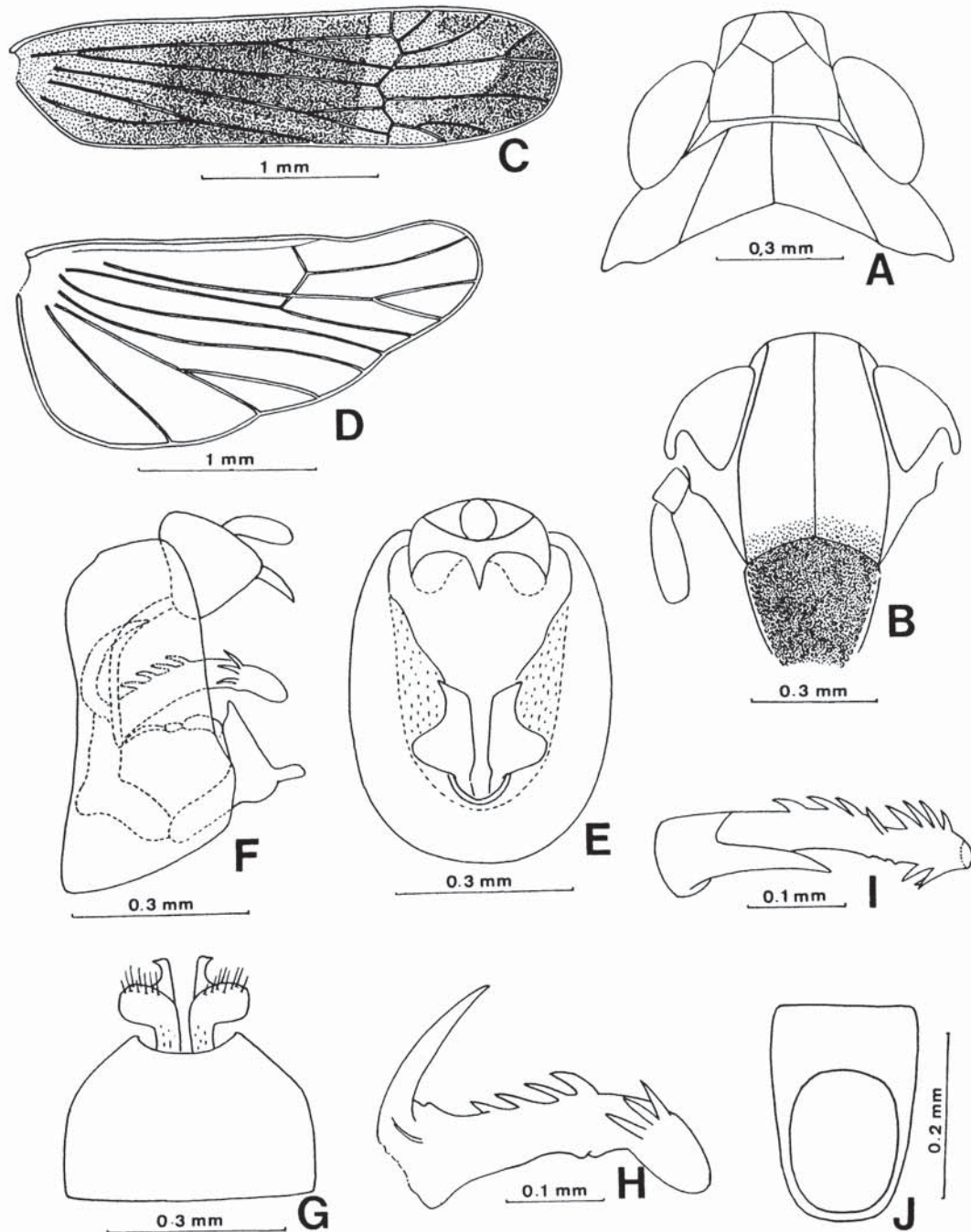


Fig. 111. *Eoerysa arundina* Kuoh et Ding A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, the same, ventral view; H, phallus, left side; I, the same, dorsal view; J, suspensorium.



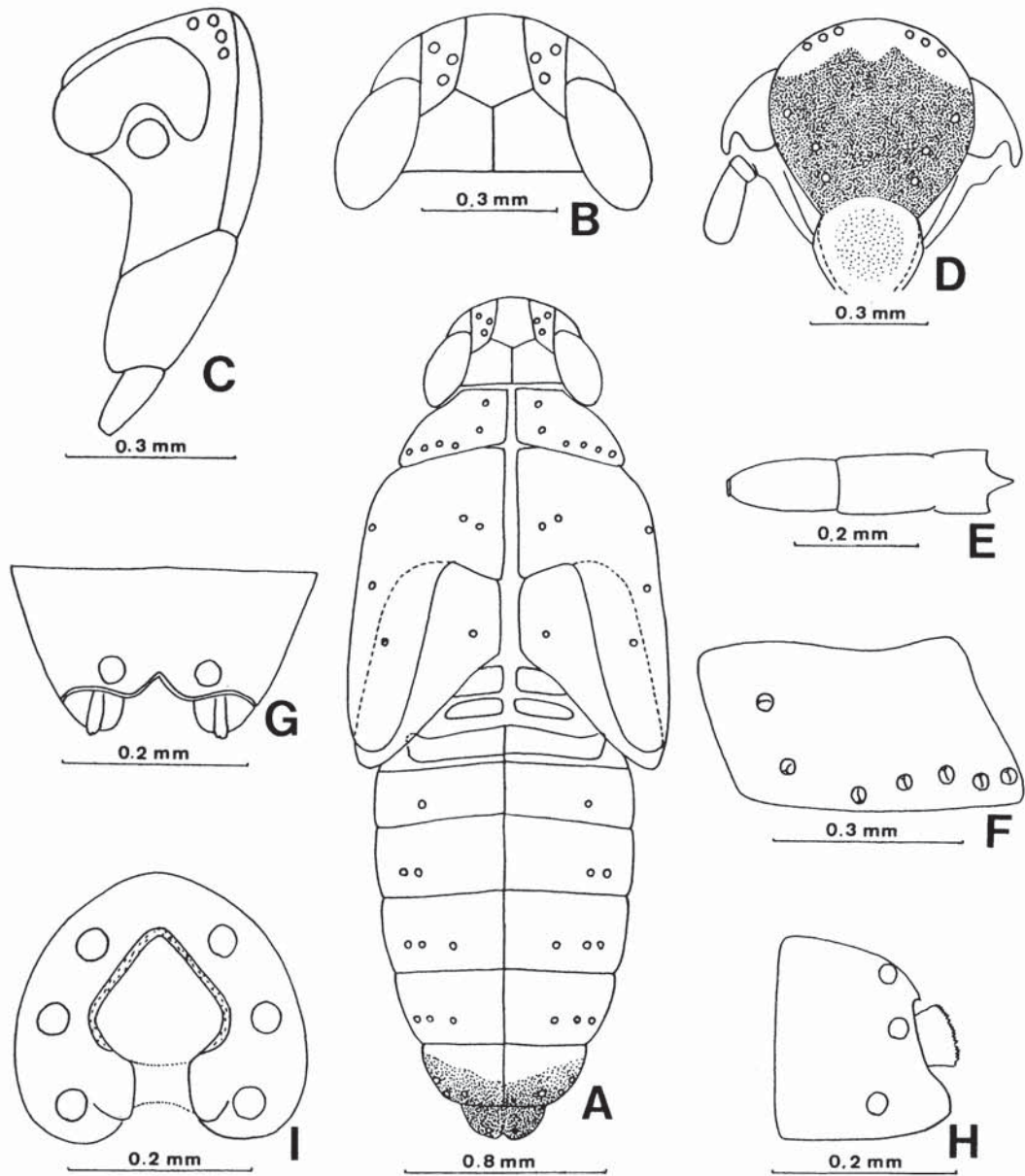


Fig. 112. Nymph of *Eoeurysa arundina* Kuoh et Ding A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, left side; I, the same, caudal view.

hind margin than greatest length about 2.1:1, hind margin straight. Frons wider at widest part than long in middle line about 1.2:1, widest at level of middle of eyes, lateral carinae strongly convex, without median carina. Number and arrangement of pits not typical, each side with 3 pits and 3 along basal margin, another extra 3 on dorsal aspect. Between eye and lateral carina of frons with 4 pits, lowest one above middle of eye ("Between eye and lateral carina with 2 pits above anterior margin of eye" Wu et Yang, 1985, Jour. Taiwan Mus., 38(2):101, was wrong, as in this species, the correct number is 4). Frontoclypeal suture strongly arched upward medially. Rostrum reaching to meso-trochanters, relative length of each segment about 0.74:0.85:1, third segment longer than wide about 2.2:1. Antennae short, basal segment wider than long, shorter than second about 1:5.

Pronotum without lateral carinae, each side with 7 pits, distance of median 3 about same. Number and arrangement of pits on meso-, metathorax and wing pads typical, relative distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 1:1, anterior wing pad protruding not over hind one, latter reaching to anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, metatibia shorter than 3 tarsi combined, spur shorter than first tarsal segment, with 16-19 teeth.

Abdominal tergite IV: bears 1 pit on each side; V:2; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge incised medially, lateral lobes slightly protruding, not cylindrical, pits lie near apex, in lateral view with posterior margin slightly emarginate in middle, anal comb broad, in caudal view with opening widest near base.

Length of body: 3.33 mm.

Width of head including eyes: 0.69 mm.

Length of anterior wing pad: 1.11 mm.

Length of antenna: 0.22 mm.

Adult specimens examined: 58♂♂, 59♀♀, Tunglian, Penghua Hsien, 9-VII-1986, C.T. Yang.

Nymphal specimens examined: Fifth instar nymph: 5, same data as for adult.

Host plant: *Arundo donax* Linn.

Distribution: Taiwan (new record), Mainland China.

#### 49. Genus *Syndelphax* Fennah

*Syndelphax* Fennah, 1963, *Proc. R. Ent. Soc. Lond.*, (B)32:15.

The generic characters outlined by Fennah [1963] are modified as follows.

Head including eyes narrower than pronotum. Vertex as long or slightly longer than wide at base, slightly narrower at apex than at base, submedian carinae uniting at apex. Frons in middle line longer than wide at widest part about 2:1. Postclypeus wider at base than frons at apex. Rostrum surpassing mesotrochanters. Antennae cylindrical, basal segment longer than wide, shorter than second. Ocelli present. Pronotum with lateral carinae incomplete. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 12-25 teeth.



Anal segment of male ring-like or collar-shaped, lateroapical angles approximated, each produced into a spinose process. Pygofer in profile with laterodorsal angle moderately produced, in posterior view with opening wider than long, with entire margins, without medioventral process. Phallus tubular, simple or with a few teeth subapically. Suspensorium elongate oval, ring-like. Diaphragm narrow, produced dorsomedially in a rather long process. Genital styles relative long, flattened and distally subtruncate.

Type species: *Delphax matanitu* Kirkaldy  
(original designation)

(105) *SYNDELPHAX DISONYMOS* (Kirkaldy)

Fig. 113.

*Syndelphax disonymos* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:109.

*Delphax disonymos* Kirkaldy, 1907, *Bull. Hawaiian Sugar Pl. Assoc. Ent.*, 3:156.

*Delphax matanitu* Kirkaldy, 1907, *Bull. Hawaiian Sugar Pl. Assoc. Ent.*, 3:156.

General color pale yellowish brown. Vertex, frons, genae and antennae somewhat brown, abdomen and pygofer dark brown to black. Tegmina hyaline, brachyterous with tegmina of male whole black, rounded at apex.

Vertex longer submedially than wide at base about 1.2:1, slightly narrower at apex than at base, apical margin transverse, lateral carinae nearly straight, submedian carinae uniting at apex, basal compartment at base wider than greatest length about 1.6:1. Frons in middle line longer than wide at widest part about 1.9:1, widest about level of ocelli, median carina simple. Postclypeus at base wider than frons at apex, nearly as long as wide at base. Rostrum with apical segment shorter than subapical. Antennae reaching to level of middle of postclypeus, basal segment longer than wide about 1.4:1, shorter than second about 1:1.8. Post-tibial spur with 16-18 teeth.

Anal segment of male short, collar-shaped, dorsoapical angles each produced into a long, slender process, directed ventrad, narrowly separated. Pygofer in profile nearly as wide ventrally as dorsally, dorsolateral angle strongly produced caudodorsad, obtusely rounded at apex, forming shallowly emargination at dorsal margin medially, in posterior view with opening slightly wider than long, lateral margins convex, ventral margin shallowly concave. Phallus tubular, without tooth, slightly narrowed at apical third, with tapering process at dorsoapical angle. Orifice terminal. Suspensorium elongate oval, without arms. Diaphragm with dorsal margin produced dorsad medially into a long process which with longitudinal median line produced caudad, apex blunt. Opening for genital styles shallowly arched dorsally and ventrally. Genital styles long and broad, moderately divergent, outer margin slightly sinuate, inner margin shallowly concave at basal two-thirds, widest near apex, very shallowly concave medially at apex, area between apical third and inner half somewhat thin.

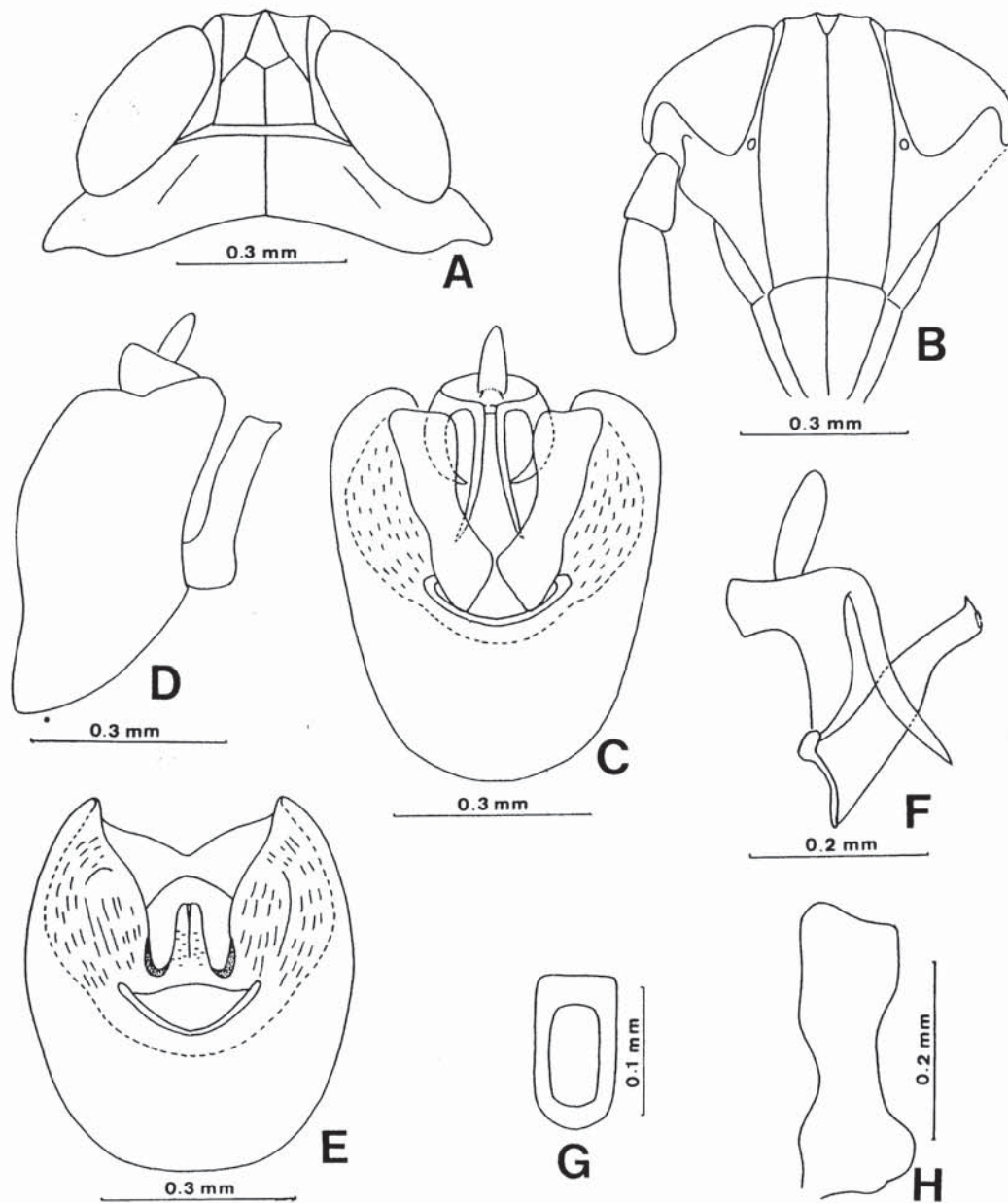


Fig. 113. *Syndelphax disonymos* (Kirkaldy). A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, the same, left side; E, diaphragm of pygofer; F, anal segment of male and phallus, left side; G, suspensorium; H, genital style, left side.



| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.); | 2.83-3.17 mm.  | 1.87-2.00 mm.   |
| Length of tegmen:                | 2.43-2.60 mm.  | 1.03-1.13 mm.   |
| Female                           |                |                 |
| Length of body<br>(includ.teg.): | 3.37-3.46 mm.  | 2.07-2.33 mm.   |
| Length of tegmen:                | 2.90-2.97 mm.  | 1.17-1.27 mm.   |

Specimens examined: 9♂♂, 8♀♀, Peitou, Yunlin Hsien, 4-IX-1984, C.T. Yang;  
29♂♂, Orchid. Isl, Taitung Hsien, 14-VII-1985, C.T. Yang.

Host palnt: Unknown.

Distribution: Taiwan (new record), Viet-nam, Fiji, New Caledonia, Cayman Is.,  
Sri Lanka, Australia, West Africa.

## 50. Genus *Rhombotoya* Fennah

*Rhombotoya* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:124.

The generic characters outlined by Fennah [1973-75] are modified as follows.

Head including eyes narrower than pronotum. Vertex a little longer submedially than wide at base, broadly curving into frons, submedian carinae uniting at apex. Frons longer in middle line than wide at widest part about 2:1, widest at apical third. Post-clypeus slightly wider at base than frons at apex. Rostrum reaching to meta-coxae. Ocelli present. Antennae cylindrical, basal segment longer than wide about 1.7:1, shorter than second about 1:1.7. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 17 teeth.

Anal segment of male collar-shaped, lateroapical angles produced. Pygofer in profile longer ventrally than dorsally, in posterior view opening with lateral margins strongly concave at middle (at level of apices of genital styles), lower margin defined, ventral margin excavate. Phallus tubular, slightly ascending to near apex, the moderately deflexed. Suspensorium small, armed ventrally. Diaphragm rather broad, median portion strongly pigmented and with dorsal margin broadly produced dorsad or dorsocaudad, convex. Genital styles rather long, strongly diverging, simple, shallowly curved, and broadest in distal third.

Type species: *Delphacodes pseudonigripennis* (Muir)  
(original designation)

(106) *RHOMBOTOYA PSEUDONIGRIPENNIS PSEUDONIGRIPENNIS* (Muir)  
Fig. 114.

*Rhombotoya pseudonigripennis* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:124.

*Delphacodes nigripennis* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:338.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:58.

*Delphacodes pseudonigripennis* Muir, 1918, *Proc. Hawaiian Ent. Soc.*, 3:427.

General color dark brown. Pronotum, postclypeus, rostrum, antennae and legs pale brown. Abdomen dark brown to black. Tegmina hyaline with black at end of claval vein.

Vertex longer submedially than wide at base about 1.1:1, apical margin transverse, lateral carinae concave, submedian carinae not really uniting at apex, ending at hind margin, Y-shaped carina distinct, basal compartment wider at base than greatest length about 1.5:1. Frons longer in middle line than wide at widest part about 2.3:1, widest at apical third, median carina forked at extreme base. Postclypeus wider at base than frons at apex. Post-tibial spur with 22-24 teeth. Tegmina longer than widest part about 3.4:1.

Anal segment of male with lateroapical angles widely separated, each produced in a long, spinose process. Pygofer in profile nearly as wide ventrally as dorsally, latero-dorsal angle produced and reflected, caudal margin strongly sinuate, in posterior view with opening wider than long, lateral margins not well defined, but ventral margin well defined, in ventral view anterior margin deeply emarginated medially. Phallus tubular, sinuate, ventral margin with a small process medially, apex turned ventrad, at dorsal aspect near apex with 2 lobes, right side one triangular, left side one truncate and serrate at apex. Suspensorium small, deeply incised ventrally. Disphragm rather broad, dorsal margin roundly produced and slightly incised medially. Genital styles rather large, divergent apically, outer angle produced triangularly, apical margin rounded, inner margin concave.

Male (macropterous)

Length of body (includ.teg.): 3.26 mm.

Length of tegmen: 2.66 mm.

Specimens examined: 1♂, Taipei, 5-V-1960, K.S. Lin; 1♂ Taipei, 13-IV-1960, K.S. Lin.

Host plant: Unknown.

Distribution: Taiwan.



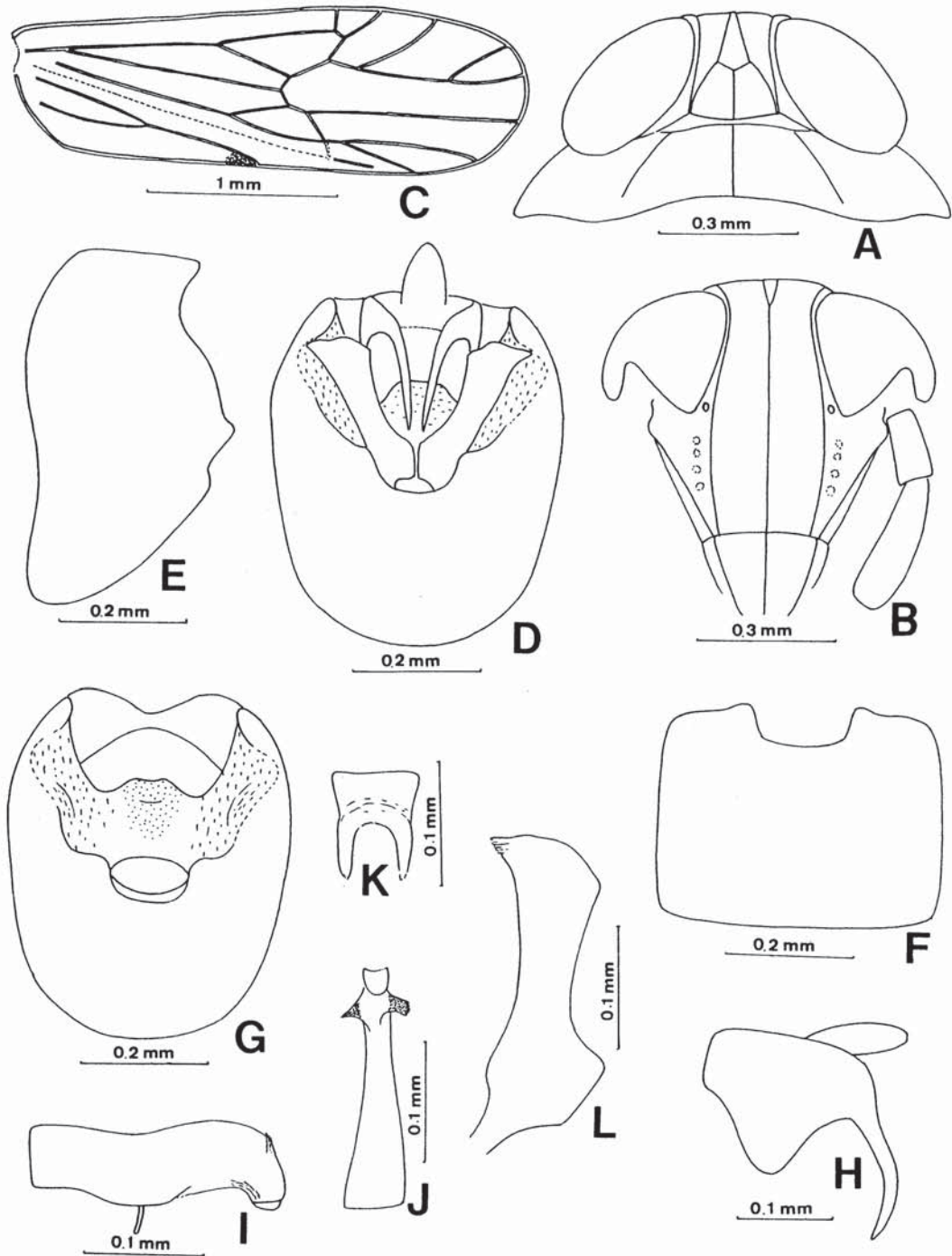


Fig. 114. *Rhombotoya pseudonigripennis pseudonigripennis* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, pygofer, ventral view; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus, left side; J, the same, dorsal view; K, suspensorium; L, genital style, left side.

## 51. Genus *Nilaparvata* Distant

*Nilaparvata* Distant, 1906, *Fauna British India*, 3:473.

—; Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:67.

*Hikona* Matsumura, 1935, *Ins. Matsum.*, 9:139.

*Kalpa* Distant, 1906, *Fauna British India*, 3:474.

The generic characters outlined by Distant [1906] are modified as follows.

Head including eyes narrower than pronotum. Vertex slightly longer submedially than wide at base or nearly same, submedian carinae not really uniting at apex, Y-shaped carina distinct. Frons longer in middle line than wide at widest part about 2.4:1, widest at middle, median carina forked at base or not. Postclypeus at base slightly wider than frons at apex. Rostrum reaching to meso-trochanters. Ocelli present. Antennae cylindrical, slightly surpassing frontoclypeal suture, with basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. First tarsal segment of hind leg with 1-5 lateral teeth. Post-tibial spur with 15-33 teeth.

Anal segment of male ring-like, lateroapical angles each produced into spinose process or not. Pygofer in profile longer ventrally than dorsally, laterodorsal angle slightly produced, in posterior view with opening wider than long, medioventral process present or absent. Shape of phallus varied. Suspensorium with stem broad, ventral half ring-like. Diaphragm broad. Genital styles long, complex.

Type species: *Nilaparvata green* Distant  
 = *Delphax lugens* Stål  
 (original designation)

### Key to the species of *Nilaparvata*

1. Pygofer of male without medioventral process; genital styles inner margin without process . . . . . *lugens* (Stål)
- Pygofer of male with distinct medioventral process; genital styles inner margin with distinct process . . . . . 2
2. General color dark brown to black; anal segment of male with short processes; length of tegmina ♂ about 3.6 mm . . . . . *bakeri* (Muir)
- General color pale yellowish brown; anal segment of male without process; length of tegmina ♂ about 3.1 mm . . . . . *muii* China



(107) *NILAPARVATA LUGENS* (Stål)

Fig. 115.

*Nilaparvata lugens* Muir and Giffard, 1924, *Bull. Hawaiian Sugar Pl. Asso. Div. Ent.*, 15:16.

—: Matsumura et Ishihara, 1945, *Mushi*, 16:64.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:67.

*Nilaparvata oryzae* Takano et Yanagihara, 1933, *Spec. Rep. Togyo Exp. Stat. Formosa*, no.2:120.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 42.

*Delphax lugens* Stål, 1854, *Ofv. Ak. Forh.*, 11.

*Hikona formosana* Matsumura, 1935, *Ins. Matsum.*, 9:139.

General color brown to dark brown. Tegmina hyaline, with apex of claval area black.

Vertex quadrate, nearly as long as wide, apical margin transverse, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 1.7:1. Frons longer in middle line than wide at widest part about 2.2:1, widest at level of ocelli, lateral carinae nearly straight, median carina forked at basal fourth. Antennae surpassing frontoclypeal suture, with basal segment longer than wide about 2:1, shorter than second about 1:2. Post-tibial spur with 24-29 teeth. Tegmina longer than widest part about 3.3:1.

Anal segment of male sunk in emargination of pygofer, lateroapical angles separated, each produced into a long, spinose process. Pygofer in posterior view with opening wider than long, lateral margins not well defined, without medioventral process. Phallus tubular, slender, narrowed and upturned at apical third. Orifice at apical third, right, below orifice with 5 small teeth. Suspensorium with stem slender, ventral ring turned 90 degree to stem, left side sclerotized, remainders membranous. Diaphragm very broad, dorsal margin evenly incised medially. Genital styles large, inner margin roundly emarginate at middle, inner angle strongly produced, apex pointed, caudo-lateral and lateral view as figured.

## Male (macropterous)

Length of body (includ.teg.): 4.20-4.33 mm.

Length of tegmen: 3.53-3.60 mm.

## Female (macropterous)

Length of body (includ.teg.): 4.50-4.37 mm.

Length of tegmen: 3.83-4.00 mm.

Specimens examined: 2♂♂, 3♀♀, Kuohsing, Nantou Hsien, 30-VI-1986, C.T. Yang.

Host plant: *Oryza sativa* L.

Distribution: Taiwan, Mainland China, Japan, Korea, Philippines, Fiji, Australia, Sri Lanka, India, Ceram, Sumatra, Sebesi, Guam, Malaysia, New Guinea, Vietnam, Palau, Yap.

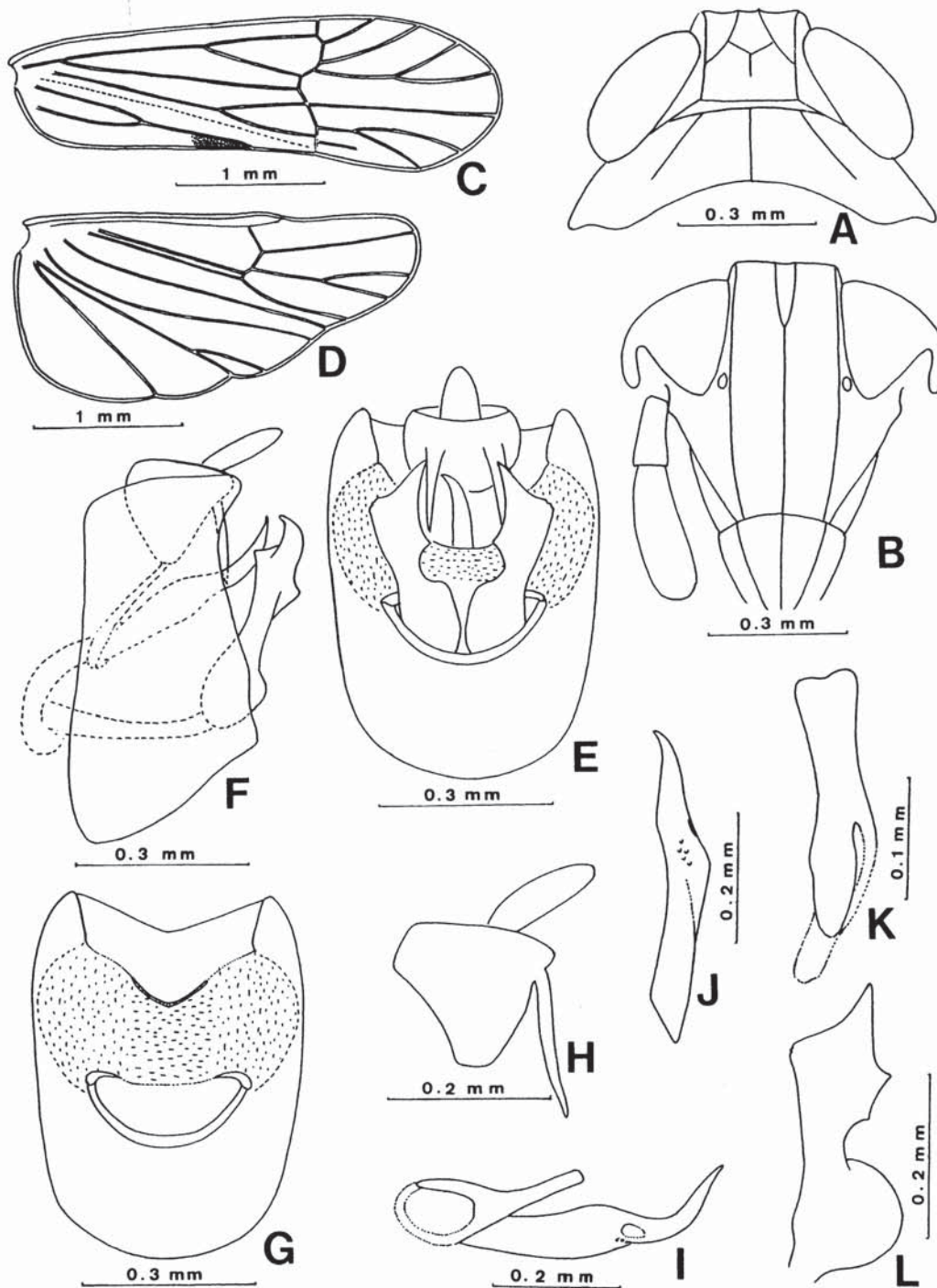


Fig. 115. *Nilaparvata lugens* Stål A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male, left side; I, phallus and suspensorium, left side; J, phallus, ventral view; K, the same, caudodorsal view; L, genital style, laterocaudal view.



(108) *NILAPARVATA BAKERI* (Muir)

Fig. 116.

*Nilaparvata bakeri* Muir, 1922, *Rec. Indian Mus.*, 24:351.—: Muir, 1923, *Philip. Jour. Sci.*, 22:158.—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:69.*Delphacodes bakeri* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:336.

General color dark brown to black. Vertex, face, antennae and legs somewhat pale. Tegmina hyaline, with apex of claval area black.

Vertex slightly wider at base than long submedially, apical margin transverse, submedian carinae not uniting at apex, basal compartment wider at base than greatest length about 2:1. Frons longer than wide at widest part about 2.4:1, widest at level of ocelli, lateral carinae slightly convex, median carina forked at basal fourth. Antennae surpassing frontoclypeal suture, with basal segment longer than wide about 1.7:1, shorter than second about 1:2. Post-tibial spur with about 33 teeth. Tegmina longer than widest part about 3.2:1.

Anal segment of male small, lateroapical angles separated, each produced into strong, short spinose process. Pygofer in profile with laterodorsal angle strongly produced, hind margin above medioventral process roundly produced caudad, medioventral process large, broad at base, narrowed at apical half, in posterior view with opening wider than long, lateral margins not well defined, medioventral process with both sides toothed, attenuating to apex. Phallus tubular, apical third turned downward, apical half with 5 teeth dorsally, 6 ventrally. Orifice terminal, right. Suspensorium with stem broad, ventral ring normal. Diaphragm broad, dorsal margin evenly incised medially. Genital styles large, inner margin with process medially which pointed ventrally, apical fourth attenuating to apex, caudolateral and dorsal view as figured.

## Male (macropterous)

Length of body (includ.teg.): 4.26 mm.

Length of tegmen: 3.66 mm.

Specimens examined: 2♂♂, Sungho, Taichung Hsien, 24-VI-1985, C.T. Yang.

Host plant: *Leersia japonica* Makino.

Distribution: Taiwan, Mainland China, Japan, Philippines, Sri Lanka.

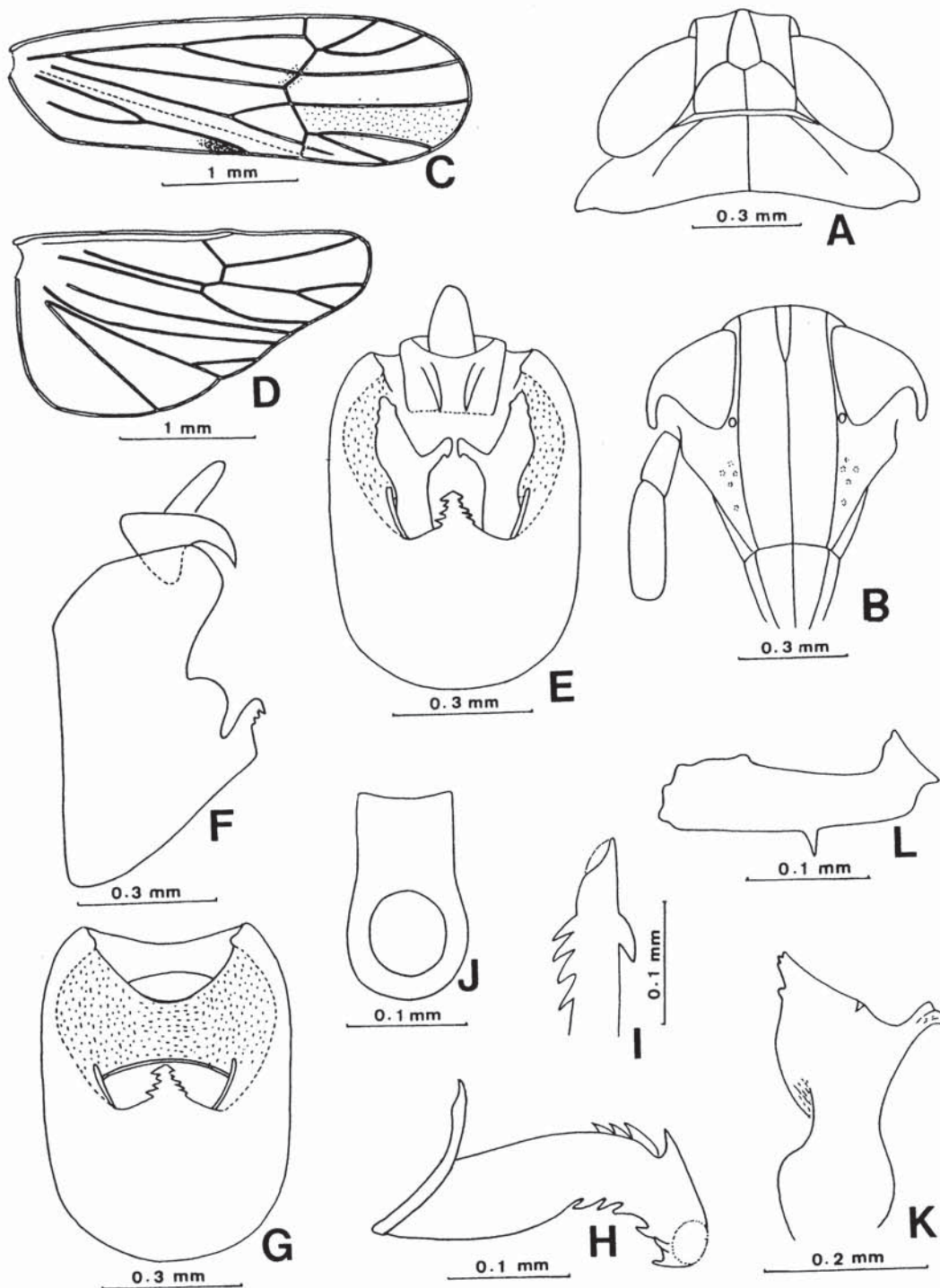


Fig. 116. *Nilaparvata bakeri* (Muir) A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, phallus, left side; I, apex of phallus, dorsal view; J, suspensorium; K, genital style, laterocaudal view; L, apex of genital style, dorsal view.



**(109) NILAPARVATA MUIRI** China**Fig. 117**

*Nilaparvata muiri* China, 1925, *Ann. Mat. Nat. Hist.*, (9)16:480.

—: Ding, 1983, *Econ. Ins. Fauna China*, 27:139.

General color pale yellowish brown. Abdomen brown. Tegmina hyaline, end of clavus black.

Vertex nearly as long submedially as wide at base, at apex slightly narrower than at base, submedian carinae not really uniting at apex, basal compartment wider at base than greatest length about 2:1. Frons longer in middle line than wide at widest part about 2.2:1, widest at level of ocelli, median carina forked at base. Postclypeus wider at base than frons at apex. Antennae reaching over frontoclypeal suture, basal segment longer than wide about 2:1, shorter than second about 1:1.5. Post-tibial spur with 26-30 teeth. Tegmina longer than widest part about 3.15:1.

Anal segment of male rather small, collar-shaped. Pygofer in profile slightly wider ventrally than dorsally, laterodorsal angle concave, medioventral process simple, distinct, a distinct process present at level of base of genital styles, in posterior view opening wider than long. Phallus in dorsal view slightly sinuate, dilate at apical half which right side armed with 11 teeth, left 6, basal left membraneous, right side at apex with beak-like process. Suspensorium asymmetrical, inverse Y-shaped, left arm directed left, membraneous apically. Diaphragm rather broad, dorsal margin sharply incised medially. Genital styles stout, bifurcate at apex, above middle with a short process.

Male (macropterous)

Length of body (includ.teg.): 3.50-3.83 mm.

Length of tegmen: 3.00-3.16 mm.

Specimens examined: 1♂, 4-X-1959, 2♂♂, 4-VI-1960, 1♂, 29-VII-1960, Taipei, K.S. Lin.

Host plant: Unknown.

Distribution: Taiwan (new record), Mainland China, Vietnam.

**52. Genus *Sardia* Melichar**

*Sardia* Melichar, 1903, *Hom. Fauna v. Ceylon*:96.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:82.

Head including eyes narrower than pronotum. Vertex longer in middle line than wide at narrowest portion between eyes about 2:1, strongly produced in front of eyes, sides nearly parallel, apical margin acutely produced medially, submedian carinae uniting on vertex, Y-shaped carina feeble, basal compartment narrower at base than greatest length. Frons in middle line longer than widest part about 3:1. Rostrum reaching metatrochanters. Antennae short, cylindrical. Ocelli present. Pronotum with lateral carinae attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

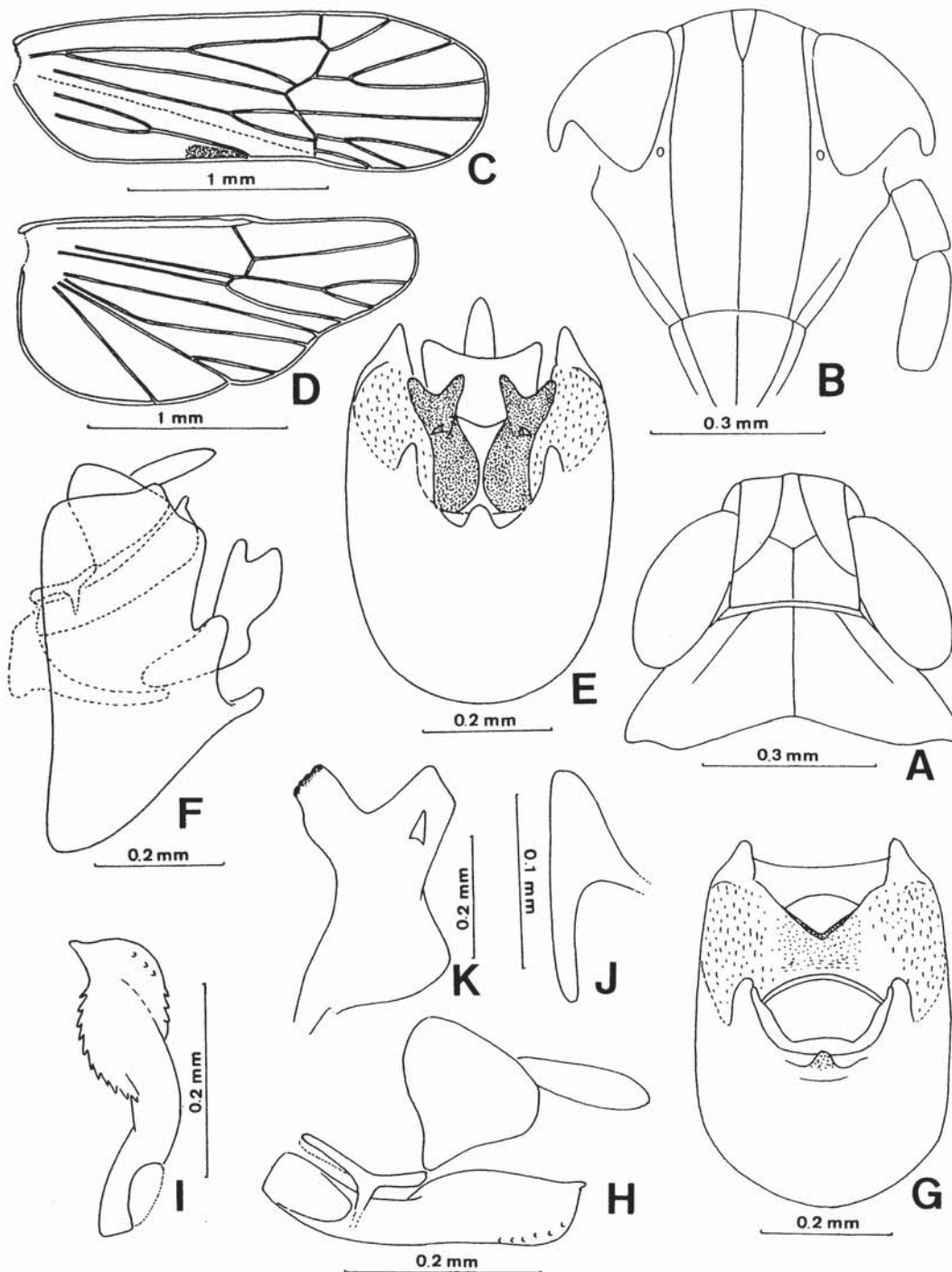


Fig. 117. *Nilaparvata muiri* China A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, male genitalia, posterior view; F, the same, left side; G, diaphragm of pygofer; H, anal segment of male and phallus, left side; I, phallus, dorsal view; J, suspensorium; K, genital style, left side.



Anal segment of male ring-like, in profile process arising from median portion. Pygofer in profile wider ventrally than dorsally. Phallus short and stout, simple, tubular. Suspensorium inverse Y-shaped, stem as long as arms. Diaphragm narrow, dorsal margin produced dorsad. Genital styles moderate, simple. Female without genital scale.

Type species: *Sardia rostrata* Melichar  
(by monotypy)

(110) *SARDIA ROSTRATA* Melichar  
Fig. 118.

*Sardia rostrata* Melichar, 1903, *Hom. Faun. v. Ceylon*:96.

- : Schumacher, 1915, *Suppl. Ent.*, 4:142.
- : Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 38.
- : Matsumura et Ishihara, 1945, *Mushi*, 16:75.
- : Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:83.
- : Kuoh, 1983, *Econ. Ins. Fauna China*, 27:123.

General color black. Antennae, rostrum, pro- and mesofemora, tibiae and tarsi yellowish white. Hind legs, tip of scutellum, basal two-thirds of hind claval margin of tegmen white. Tegmina opaque, pale black, whitish between Sc and another 3 areas along anterior margin between Sc<sub>2</sub> and R<sub>1</sub>, R<sub>1</sub> and R<sub>5</sub>, R<sub>5</sub> and M<sub>1</sub>, tip of clavus more dark.

Anal segment of male moderate, lateroapical angles each produced medially into a long spinose process, widely separated, directed ventrad. Pygofer in profile distinctly wider ventrally than dorsally, laterodorsal angle not produced, in posterior view with opening as wide as long, lateral margins weakly defined, slightly convex. Phallus short and stout, tubular, apical third slightly narrower, with 4-5 teeth on dorsal aspect near apex. Orifice terminal, on dorsal aspect. Suspensorium deeply incised ventrally, straight dorsally. Diaphragm very narrow, dorsal margin produced dorsad, apical margin incised medially. Opening for genital styles with dorsal margin slightly arched, ventral margin strongly convex. Genital styles moderate, nearly parallel, outer margin rounded, inner margin weakly concave, basal angle obtusely produced, especially in laterocaudal view.

Male (macropterous)

Length of body (includ.teg.); 4.33 mm.

Length of tegmen: 3.33 mm.

Female (macropterous)

Length of body (includ. teg.): 4.47 mm.

Length of tegmen: 3.43 mm.

Specimens examined: 1♂, 1♀, Pingtung, Pingtung Hsien. 10-IX-1984. C.T. Yang.

Hot plant: Unknown.

Distribution: Taiwan, Mainland China, Philippines, Malaysia, Borneo, Java, India, Sri Lanka, Saudan, Iran, Capeverde Is.

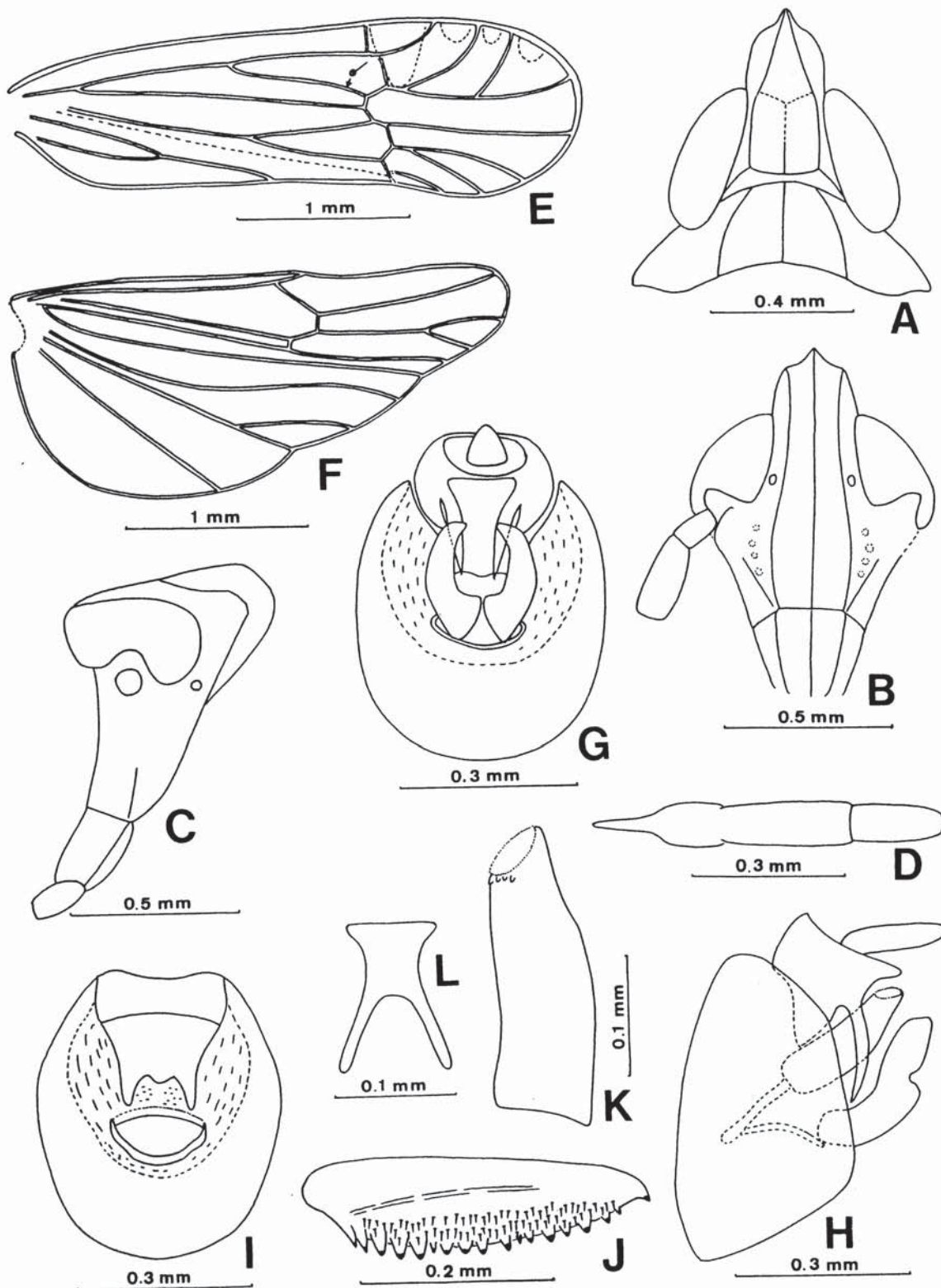


Fig. 118. *Sardia rostrata* Melichar A, head and pronotum, dorsal view; B, frons and postclypeus; C, head, left side; D, rostrum, ventral view; E, tegmen; F, wing; G, male genitalia, posterior view; H, the same, left side; I, diaphragm of pygofer; J, post-tibial spur; K, phallus, left side; L, suspensorium.



### 53. Genus *Hadeodelphax* Kirkaldy

*Hadeodelphax* Kirkaldy, 1906, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 1(9):410.  
*Sardia* Kirkaldy, 1908, *Ann. Soc. Ent. Belgique*, 52:14.

Head including eyes narrower than pronotum. Vertex longer in middle line than wide at narrowest part between eyes about 1.8:1, strongly produced in front of eyes, sides converging to apex, apical margin acutely produced medially, submedian carinae uniting on vertex, Y-shaped carina distinct, basal compartment wider at base than greatest length. Frons in middle line longer than widest part about 3.8:1, lateral carinae nearly straight. Rostrum reaching to meso-trochanters. Antennae short, cylindrical. Ocelli present. Pronotum with lateral carinae attaining hind margin. Spinal formula of hind leg 5-8-4. Post-tibial spur with over 30 teeth. Tegmina with anterior margin distinctly convex medially, acute at apex.

Anal segment of male collar-shaped, in profile processes arising from dorsad. Pygofer in profile distinctly wider ventrally than dorsally. Phallus rather long, stout, tubular. Suspensorium ring-like, stem very small. Diaphragm very narrow. Genital styles short, broad. Female with genital scale.

type species: *Hadeodelphax pluto* Kirkaldy  
 (by monotypy)

This genus was erected by Kirkaldy in 1906, for *pluto*, Kirkaldy 1908 suppressed it in synonymy under *Sardia*. The two are so alike superficially, but through the author's work: suspensorium ring-like; female with genital scale; spinal formula of hind leg 5-8-4; post-tibial spur with more than 30 teeth; the shape of tegmina give author deep impression that *Hadeodelphax* Kirkaldy is another genus.

#### (111) *HADEODELPHAX PLUTO* Kirkaldy

Fig. 119.

*Hadeodelphax pluto* Kirkaldy, 1906, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 1(9):  
 410.

—: Kirkaldy, 1907, *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 3:140.

*Sardia pluto* Kirkaldy, 1908, *Ann. Soc. Ent. Belgique*, 52:14.

—: Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:328.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:84.

General color of Taiwanese specimens brown to dark brown. Carinae, legs pale yellowish brown. Abdomen dark brown dorsally, yellowish brown ventrally. Tegmina opaque, brown, veins concolor, membrane between  $M_1$  and  $M_2$  black. Wings grayish white, veins black.

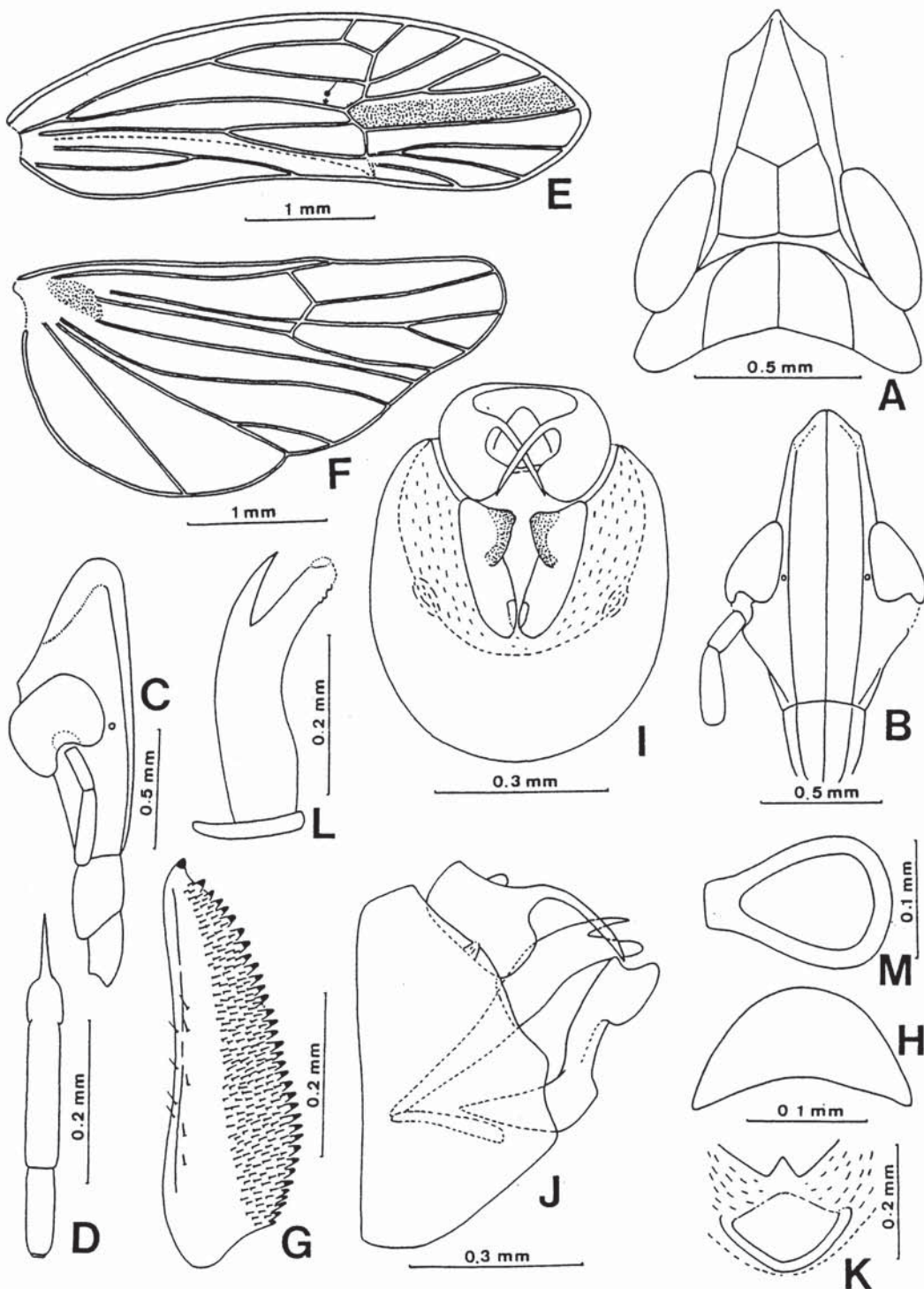


Fig. 119. *Hadeodelphax pluto* Kirkaldy A, head and pronotum, dorsal view; B, frons and post-clypeus; C, head, left side; D, rostrum, ventral view; E, tegmen; F, wing; G, post-tibial spur; H, genital scale of female; I, male genitalia, posterior view; J, the same, left side; K, diaphragm of pygofer; L, phallus, left side; M, suspensorium.



Vertex longer in middle line than wide at narrowest part between eyes about 1.8:1, basal compartment wider at base than greatest length about 1.3:1. Head in profile strongly extending in front of eyes, vertex meeting frons acutely rounded, frons and clypeus almost straight. Frons in middle line longer than wide at widest part about 3.8:1, widest at level of ocelli, median carina simple, lateral carinae nearly parallel. Postclypeus at base nearly as wide as frons at apex, distinctly longer than wide at base. Rostrum reaching over meso-trochanters, relative length of each segment about 1.3:1.7:1, third segment longer than wide about 3.3:1. Antennae short, surpassing frontoclypeal suture, basal segment longer than wide about 2.4:1, shorter than second about 1:1.7. Post-tibial spur with 32-36 teeth. one half area with setae. Tegmina longer than widest part about 3.4:1.

Anal segment of male moderate, spinose process long, produced from dorsal aspect, directed ventrad. Pygofer in profile distinctly wider ventrally than dorsally, laterodorsal angle not produced but with small process submarginally, posterior margin slightly produced caudad above base of genital styles. In posterior view with opening wider than long, lateral margins ill-defined, weakly convex. Phallus stout, tubular, apical third deeply incised, forming a spine-like process dorsally, lower portion narrow with several teeth at ventral aspect near apex. Orifice terminal, on dorsal aspect. Suspensorium circular. Diaphragm narrow, dorsal margin triangularly produced, directed dorsad. Opening for genital styles arched at both dorsal and ventral margins. Genital styles moderate, slightly divergent, outer margin nearly straight, apical margin broad, slightly emarginate, inner margin apical half with lobe-like production, oblique. Female with genital scale rounded apically, obtusely angulate basally.

Male (macropterous)

Length of body (includ.teg.): 5.56-5.73 mm.

Length of tegmen: 4.16-4.33 mm.

Female (macropterous)

Length of body (includ.teg.): 6.43-6.90 mm.

Length of tegmen: 5.00-5.33 mm.

Specimens examined: 2♂♂, 2♀♀, Jihyuetan, Nantou Hsien, 25-V-1985, S.C. Tsaur.

Host plant: Unknown.

Distribution: Taiwan, Philippines, Western Caroline Is., New Caledonia, Sri Lanka, Fiji, Samoa, Tahiti, Australia.

### 54. Genus *Taidelphax* n. gen.

Head including eyes narrower than pronotum. Vertex wider at base than long submedially about 1.5:1, roundly running into frons, submedian carinae uniting at apex of vertex or base of frons, basal compartment wider at base than greatest length about 2.4:1. Frons longer in middle line than wide at widest part about 2.7:1. Rostrum reaching over meso-trochanters. Ocelli present. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male short, ring-like, sunk in dorsal emargination of pygofer, lateroapical angles widely separated, each produced into a stout spinose process. Pygofer in profile wider ventrally than dorsally, dorsal margin rounded, dorsolateral angle slightly produced and reflected mesad, lateral margin with small production below base of genital styles, in posterior view with opening distinctly wider than long, without medioventral process, ventral angles distinctly produced, in ventral view with dorsal margin shallowly incised. Phallus tubular, acuminate at apex, with or without tooth. Suspensorium circular at ventral half, without distinct arms. Diaphragm broad, lobe-like produced, directed dorsad, pigmented on produced lobe, median portion and along dorsal margin of opening for genital styles. Genital styles strongly divergent, broad.

Type species: *Taidelphax chishanensis* n.sp.  
(here designated)

This genus is distinguishable by the combination of characters in having suspensorium elongate quadrate, circular at ventral half; pygofer in profile with dorsal margin rounded; vertex wider at base than long submedially; diaphragm pigmented and shape of phallus.

#### Key to the species of *Taidelphax*

1. Median carina of frons forked at base; phallus gradually narrowing to apex, apical third with a few very small teeth dorsally; basal compartment of vertex wider at base than greatest length about 2.1:1 . . . . . *chishanensis* n.sp.
- Median carina of frons simple; phallus with apical third abruptly narrowed, without tooth; basal compartment of vertex wider at base than greatest length about 2.7:1 . . . . . *orchidensis* n.sp.



(112) *TAIDELPHAX CHISHANENSIS* n.sp.

## Fig. 120.

General color black. Antennae with basal segment dark brown, second yellowish brown. Rostrum and legs yellowish brown except coxae dark brown to black. Tegmina hyaline, granulose concolorous with veins, brachypterous individuals with tegmina wholly black.

Macropterous. Vertex wider at base than long submedially about 1.4:1, lateral carinae convex, apical margin nearly transverse, basal compartment wider at base than greatest length about 2.1:1. Frons longer in middle line than wide at widest part about 1.7:1, widest below level of ocelli, median carina forked at basal fourth, lateral carinae slightly convex. Postclypeus wider at base than frons at apex, about as wide at base as long in middle line. Rostrum reaching over meso-trochanters, relative length of each segment about 1.1:1.2:1, third segment longer than wide about 2.4:1. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 2:1, shorter than second about 1:2. Post-tibial spur with about 16 teeth.

Pygofer in profile with laterodorsal angle produced caudad, in posterior view with opening wider than long. Phallus short, tubular, broad at base, gradually narrowing to apex, apical third with a few very small teeth dorsally. Diaphragm broad, dorsal margin produced, slightly incised medially. Opening for genital styles with dorsal margin obtusely angulate, ventral margin evenly concave. Genital styles broad and moderately long, strongly divergent, outer margin slightly emarginate medially, inner margin with basal half emarginate.

The name *chishanensis* is after the type locality.

| Male                             | (macropterous) | (brachypterous) |
|----------------------------------|----------------|-----------------|
| Length of body<br>(includ.teg.): | 2.50 mm.       | 1.67-1.76 mm.   |
| Length of tegmen:                | 1.93 mm.       | 0.93-1.03 mm.   |
| Female                           |                |                 |
| Length of body<br>(includ.teg.): | 2.73-2.80 mm.  | 1.93-2.10 mm.   |
| Length of tegmen:                | 2.33-2.40 mm.  | 1.13-1.20 mm.   |

**Fifth instar nymph (Fig. 121)**

General color dark brown on dorsal aspect. Ventral aspect, rostrum, antennae and legs yellowish, frons and genae pale brown.

Head between eyes wider at narrowest part than long in middle line about 1.5:1, moderately protruding beyond level of eyes, length of eye longer than length between level of eyes and lateral point of frons about 3.6:1, width of head including eyes wider than width of basal compartment in hind margin about 3.3:1, submedian carinae attaining lateral carinae, basal compartment wider at hind margin than greatest length about 1.9:1, hind margin slightly curved upward laterally. Frons longer in middle

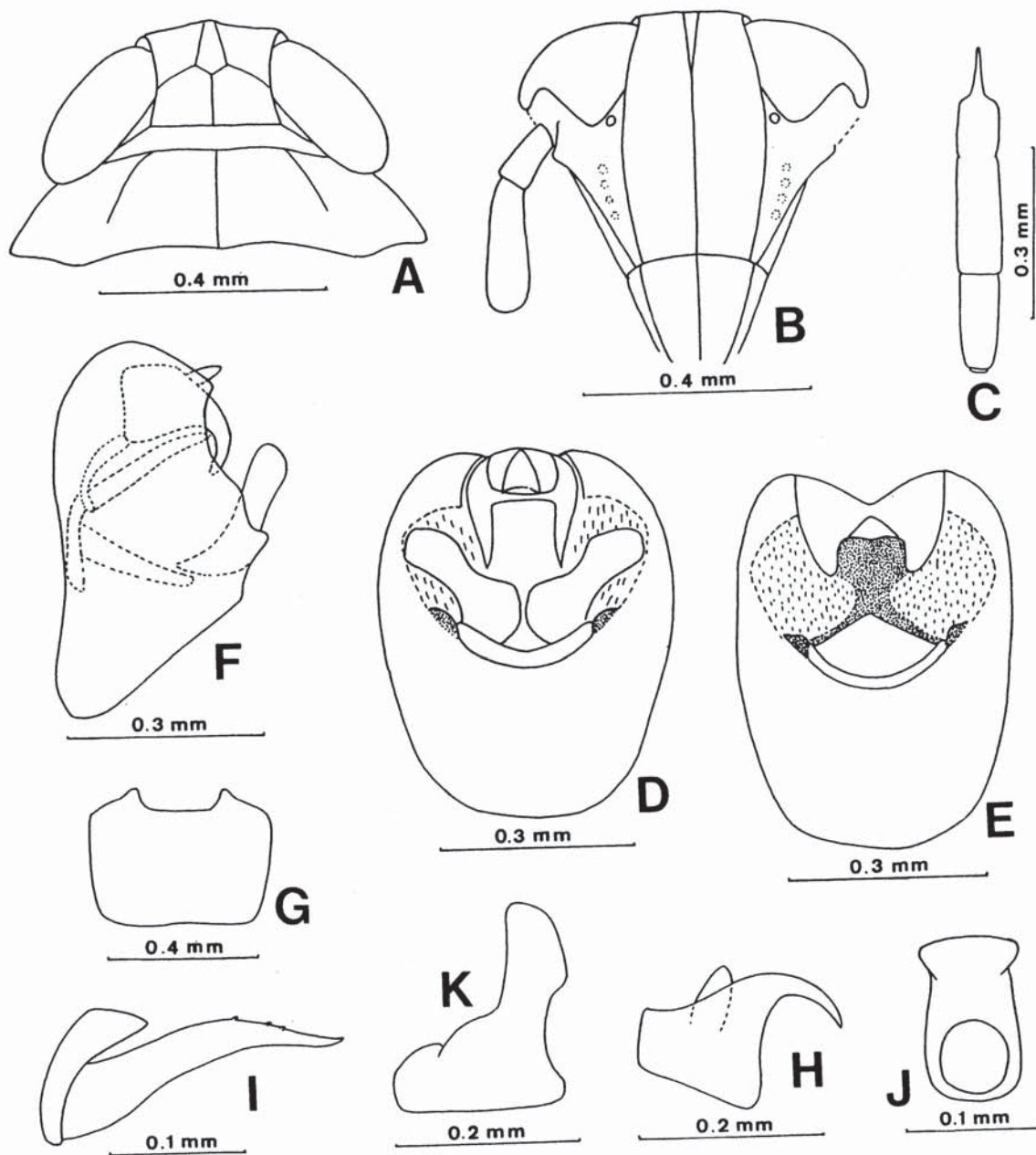


Fig. 120. *Taidelphax chishanensis* n.sp. A, head and pronotum, dorsal view; B, frons and post-clypeus; C, rostrum, ventral view; D, male genitalia, posterior view; E, diaphragm of pygofer; F, male genitalia, left side; G, pygofer, ventral view; H, anal segment of male, left side; I, phallus, left side; J, suspensorium; K, genital style, left side.



line than wide at widest part about 1.3:1, widest above lower level of eyes, lateral carinae slightly convex, with 2 median carinae, separated, parallel. Interfrons narrower than laterofrons. Number and arrangement of sensory pits typical, each side with 3 extra pits, lowest pit lies near frontoclypeal suture, distance about a diameter of pit, distance between dorsal level of lower pits and ventral level of median pits shorter than former to frontoclypeal suture about 1:1.9, lower of upper pits only slightly higher than higher of median pits. Between eye and lateral carina with 4 pits, lowest one lies at middle of eye. Frontoclypeal suture straight. Antennae short, basal segment as long as wide, shorter than second about 1:2.3. Rostrum long, reaching to meta-trochanters, relative length of each segment about 1:1:1, third segment longer than wide about 2.2:1.

Pronotum each side with 7 pits, 2 medial, 5 lateral. Number and arrangement of pits on meso-, metathorax and wing pads typical, distance between  $W_1$  to  $W_2$  and  $W_2$  to  $W_3$  about 4.5:1, anterior wing pad protruding not to level of hind one, latter reaching anterior margin of tergite IV. Spinal formula of hind leg 5-7-4, metatibia longer than 3 tarsi combined about 1.2:1, spur shorter than first tarsal segment, with about 15 teeth.

Abdominal tergite V: bears 1 pit on each side; VI-VIII: 1+2 respectively; IX: 1 dorsal, 2 ventral. Ninth abdominal segment in dorsal aspect with anal ridge deeply incised medially, lateral lobes not cylindrical, pits lie near apex, in lateral view with posterior margin obliquely protruding, anal comb small, in caudal view with opening widest dorsally.

Length of body: 2.00 mm.

Width of head including eyes: 0.60 mm.

Length of anterior wing pad: 0.76 mm.

Length of antenna: 0.27 mm.

Holotype: Male, Chishan, Kaohsiung Hsien, 2-I-1985, C.T. Yang. In NCHU.

Paratypes: 12♂♂, 12♀♀, same data as for holotype.

Nymphal specimens examined: Fifth instar nymph: 5, Chishan, Kaohsiung Hsien, 6-IV-1986, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan.

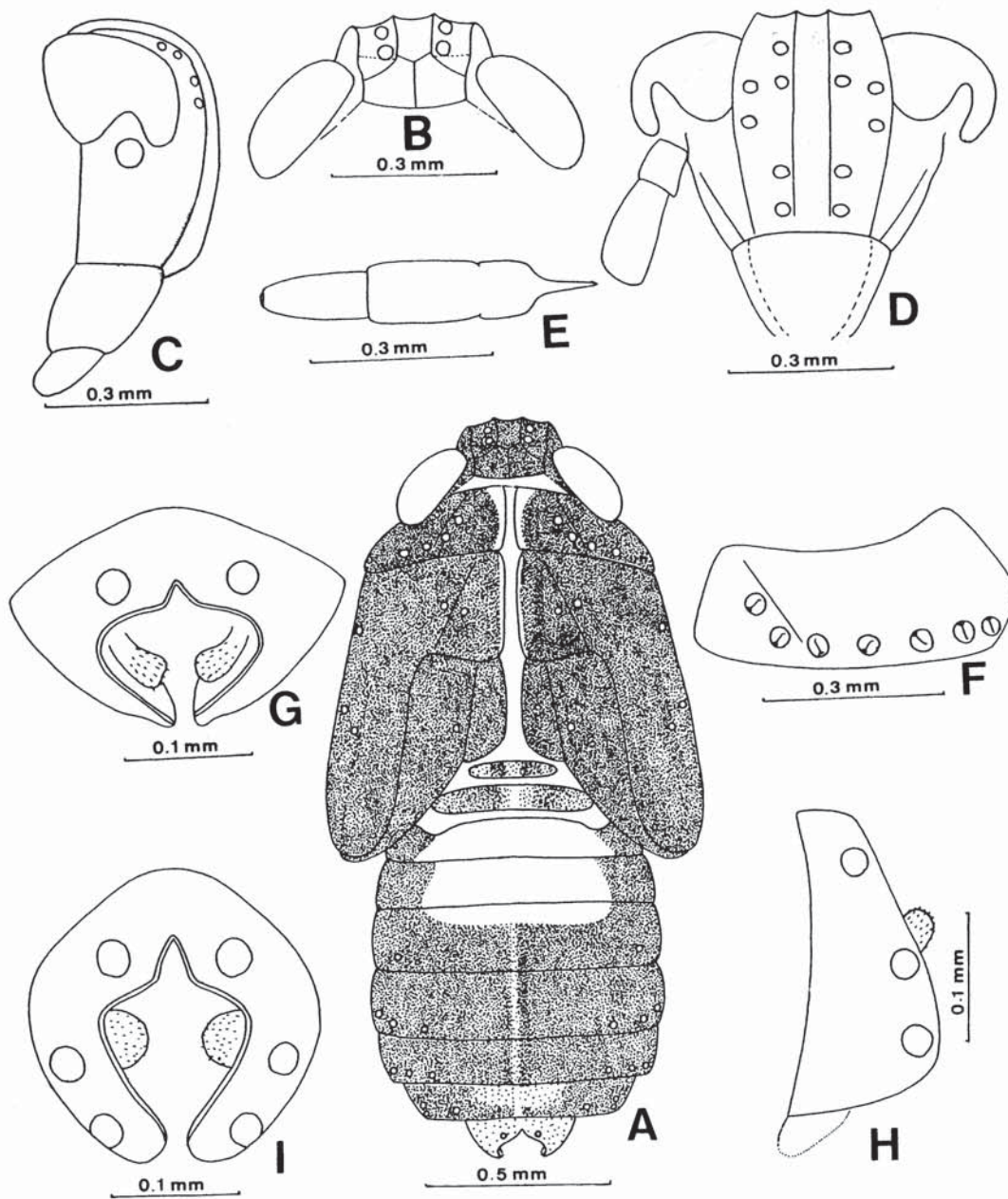


Fig. 121. Nymph of *Taidelphax chishanensis* n.sp. A, fifth instar nymph, dorsal view; B, head, dorsal view; C, the same, lateral view; D, the same, ventral view; E, rostrum, ventral view; F, pronotum, flat surface; G, ninth abdominal segment, dorsal view; H, the same, lateral view; I, the same, caudal view.



(113) *TAIDELPHAX ORCHIDENSIS* n.sp.

Fig. 122.

General color uniformly black except rostrum, legs yellowish brown and second antennal segment dark brown.

Brachypterous. Vertex wider at base than long submedially about 1.6:1, apical margin transverse, lateral carinae nearly straight, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 2.7:1. Frons longer in middle line than wide at widest part about 1.8:1, widest below level of ocelli, lateral carinae slightly convex medially, median carina simple. Postclypeus wider at base than frons at apex, distinctly wider at base than long in middle line. Antennae reaching to level of middle of postclypeus, basal segment longer than wide about 1.5:1, shorter than second about 1:1.9. Post-tibial spur with 16-21 teeth.

Pygofer in posterior view with opening wider than long, lateral margins well defined, ventral margin deeply concave. Phallus tubular, without tooth, apical third abruptly narrowed. Opening for genital styles with dorsal margin obtusely angulate, ventral margin evenly concave. Genital styles broad and moderately long, divergent, basal angle distinctly produced, outline nearly same as in type species.

The name *orchidensis* is after the type locality, Lanhsu (The Orchid Island).

## Male (brachypterous)

Length of body: 1.53-1.73 mm.

Length of tegmen: 0.83-0.90 mm.

| Female            | (macropterous) | (brachypterous) |
|-------------------|----------------|-----------------|
| Length of body    |                |                 |
| (includ.teg.):    | 2.66 mm.       | 1.90-2.00 mm.   |
| Length of tegmen: | 2.23 mm.       | 0.96-1.00 mm.   |

Holotype: Male, Orchid Is., Taitung Hsien, 14-VII-1985, C.T. Yang. In NCHU.

Paratypes: 5♂♂, 9♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

This new species is a very close relative of *Taidelphax chishanensis* Yang but differs from the latter in the shape of apical third of the phallus; the basal angle of genital styles; the median carina of frons is simple (forked in *chishanensis*).

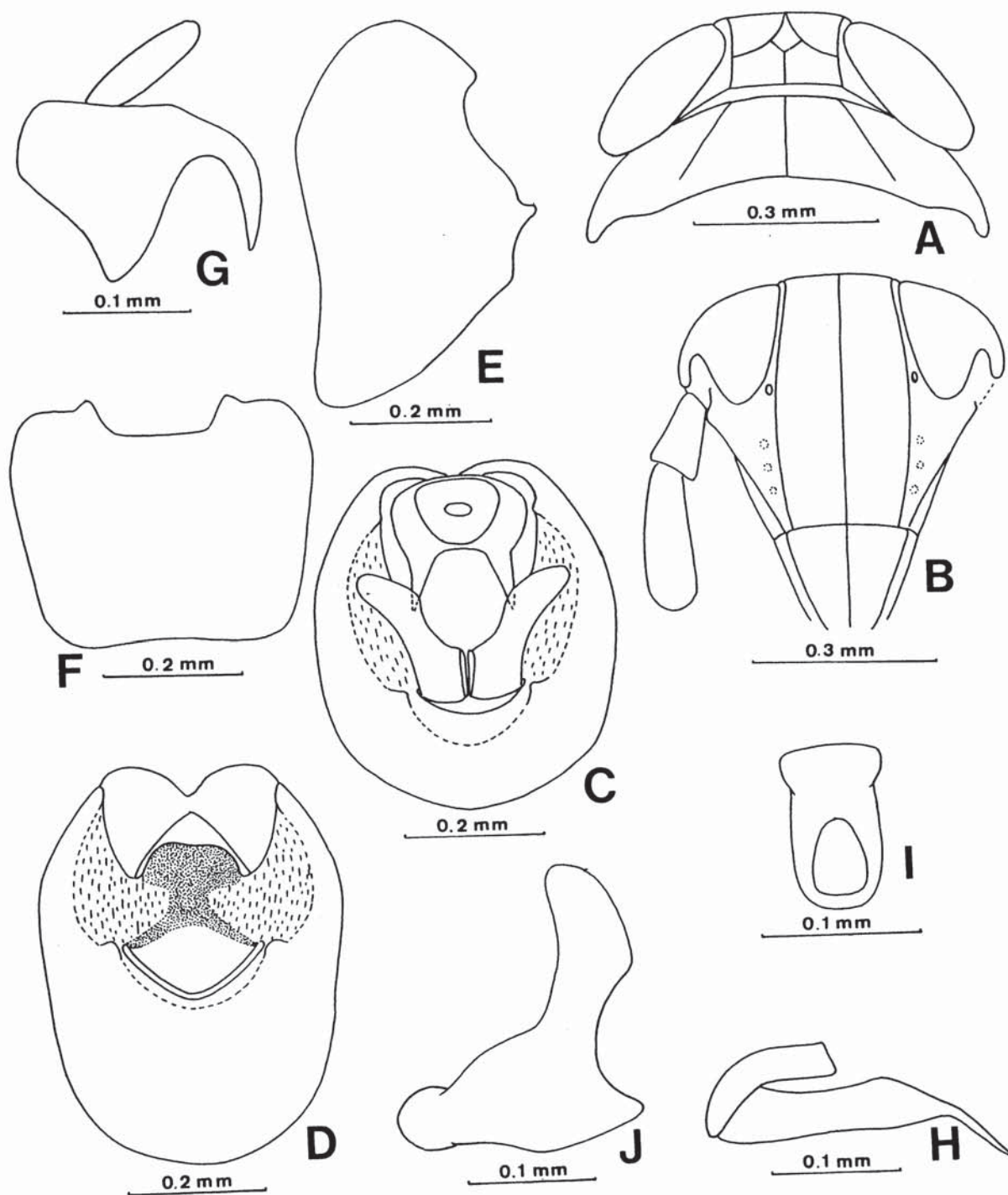


Fig. 122. *Taidelphax orchidensis* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, male genitalia, posterior view; D, diaphragm of pygofer; E, pygofer, left side; F, the same, ventral view; G, anal segment of male, left side; H, phallus, left side; I, suspensorium; J, genital style, left side.



### 55. Genus *Formodelphax* n. gen.

Head including eyes narrower than pronotum. Vertex moderately produced beyond level of eyes, longer submedially than wide at base about 1.3:1, submedian carinae not uniting at apex, basal compartment at base as wide as or slightly wider than greatest length. Frons longer in middle line than wide at widest part about 2.6:1, median carina forked at base. Rostrum reaching beyond meso-trochanters. Ocelli absent or present. Antennae surpassing frontoclypeal suture, cylindrical, basal segment longer than wide about 2:1, shorter than second about 1:1.6. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with 11-18 teeth, each tooth with 0-2 setae.

Anal segment of male collar-shaped, sunk in dorsal emargination of pygofer, lateral portion pigmented, sclerotized, basal and apical portions membranous, colorless, apical portion seems with two processes, directed ventrad. Pygofer in profile longer ventrally than dorsally, dorsolateral angle slightly produced and reflected mesad, in posterior view with opening wider than long, lateral margins strongly angulated, in ventral view with medioventral process broad, shallow. Suspensorium membranous, emarginate at ventral margin. Diaphragm narrow, dorsal margin protruding cephalad as in *Sogata*. Genital styles large, inner margin straight, outer margin strongly produced laterad medially, narrower apically.

Type species: *Formodelphax formodus* n.sp.  
(here designated)

This genus is distinguishable by the combination of characters in having the diaphragm with dorsal margin protruding cephalad; the structure of anal segment; the vertex longer submedially than wide at base; the tegmina more than 3 times as long as widest part; the setae of post-tibial spur and the shape of medioventral process.

#### Key to the species of *Formodelphax*

1. Tegmina 3.4 times as long as widest part, rounded at apex; tegmina without black marking at apical portion; post-tibial spur with about 16 teeth . . . . . 2
  - Tegmina 3.8 times as long as widest part, acuminate at apex; tegmina with black marking at apical portion; post-tibial spur with about 11 teeth . . . . . *molodus* n.sp.
2. Tegmina hyaline, unicolored; anal segment in dorsal view with lateral margin rounded . . . . . *formodus* n.sp.
  - Tegmina semiopaque, with area before cross veins brown; anal segment in dorsal view with lateral margin angulated . . . . . *confusus* n.sp.

(114) *FORMODELPHAX FORMODUS* n.sp.

Fig. 123.

General color pale yellowish brown. Frons and genae black except along carinal areas above lower level of eyes whitish to yellowish. Postclypeus dark brown. Meso- and metapleura with pale black marking. Abdomen black with hind margin reddish in male. Tegmina hyaline, granulose concolorous with veins.

Vertex longer submedially than wide at base about 1.5:1, anterior margin roundly produced, lateral carinae nearly straight, basal compartment as wide at base as greatest length. Frons longer in middle line than wide at widest part about 2.7:1, widest far below ocelli, narrowed between eyes, median carina forked at base, lateral carinae convex at apical half. Postclypeus distinctly wider at base than frons at apex, longer than wide at base. Ocelli absent. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 2:1, shorter than second about 1:1.5. Post-tibial spur with about 16 teeth, each with 0-2 setae. Tegmina 3.3 times longer than widest part, rounded at apex.

Pygofer in profile broad, posterior margin sinuate, in posterior view with opening wider than long, lateral margins well defined, strongly angulated, ventral margin deeply concave. Phallus small, colorless, tubular, slightly narrowed at apex. Suspensorium small, quadrate, colorless, bifurcate at lower margin. Diaphragm narrow, in caudal view with dorsal margin slightly convex, in caudodorsal view produced basad as a slightly pigmented lobe, connected with membraneous areas laterad, not as long as in *Sogata*. Opening for genital styles oval, weakly defined. Genital styles large, divergent, inner margin nearly straight, broad at basal two-thirds and strongly acuminate at apical third.

The name *formodus* is combination of letters, arbitrary.

## Male (macropterous)

Length of body (includ.teg.): 3.80-3.83 mm.

Length of tegmen: 3.00-3.06 mm.

## Female (macropterous)

Length of body (includ.teg.): 3.80-4.23 mm.

Length of tegmen: 3.36-3.73 mm.

Holotype: Male, N. Tungyaanshan, Nantou Hsien, 22-VII-1985, C.T. Yang. In NCHU.

Paratypes: 1♂, 10♀♀, same data as for holotype.

Host plant: Unknown. Sweeping from *Phragmites communis* Trinius.

Distribution: Taiwan.



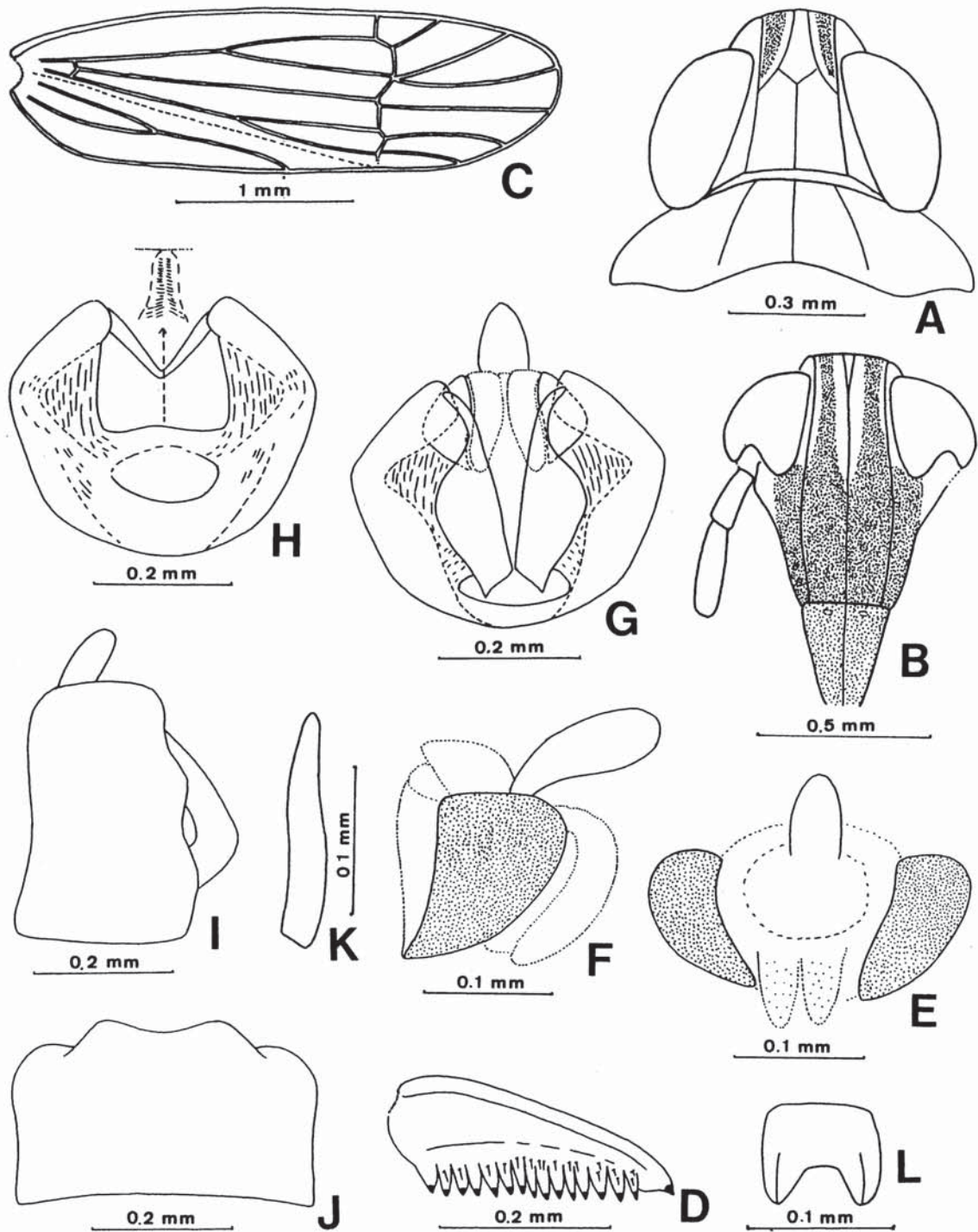


Fig. 123. *Formodelphax formodus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, post-tibial spur; E, anal segment of male, dorsal view; F, the same, left side; G, male genitalia, posterior view; H, diaphragm of pygofer; I, male genitalia, left side; J, pygofer, ventral view; K, phallus, left side; L, suspensorium.

(115) *FORMODELPHAX MOLODUS* n.sp.

Fig. 124.

General color yellowish brown. Frons between carinae, postclypeus and genae black. Pro- and mesonotum dark brown except along median carina of pronotum white. Meso- and metapleura black to pale black. Abdomen black with hind margin yellowish red. Tegmina hyaline, yellowish brown, membrane with area below  $M_1$  apically,  $M_2$  basally black, granulose concolorous with veins.

Vertex longer submedially than wide at base about 1.1:1, at apex narrower than at base, apical margin transverse, slightly produced medially, lateral carinae straight, basal compartment wider at base than greatest length about 1.2:1. Frons longer in middle line than wide at widest part about 2.5:1, widest at apical third, lateral carinae nearly straight, median carina forked at base. Postclypeus slightly wider at base than frons at apex, distinctly longer than wide at base. Ocelli present. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 2:1, shorter than second about 1:1.8. Post-tibial spur with 11 teeth, each with 0-1 stea at base. Tegmina 3.8 times as long as widest part, acute at apex.

Pygofer in posterior view with opening wider than long, lateral margins well defined, strongly angulated, ventral margin deeply concave. Phallus tubular, simple, colorless, slightly narrowed at apical half. Suspensorium small, semicircular, slightly sclerotized at upper margin. Diaphragm in caudal view with dorsal margin slightly convex, in caudodorsal view produced basad as a slightly pigmented lobe, connected with membraneous laterad. Opening for genital styles with dorsal margin strongly concave medially, ventral margin straight. Genital styles nearly same as in *F. formodus* except narrowed apical part more short.

The name *molodus* is combination of letters, arbitrary.

Male (macropterous)

Length of body (includ.teg.): 3.73 mm.

Length of tegmen: 3.00 mm.

Holotype: Male, (dissected) Mukwa, Hualien Hsien, 8-VIII-1985, S.C. Tsaur. In NCHU.

Host plant: Unknown. Sweeping from *Phragmites communis* Trinius.

Distribution: Taiwan.

This new species differs from *F. formodus* in having narrower tegmina which are acute at apex; post-tibial spur with 11 teeth (about 16 teeth in *formodus*); shape of suspensorium.



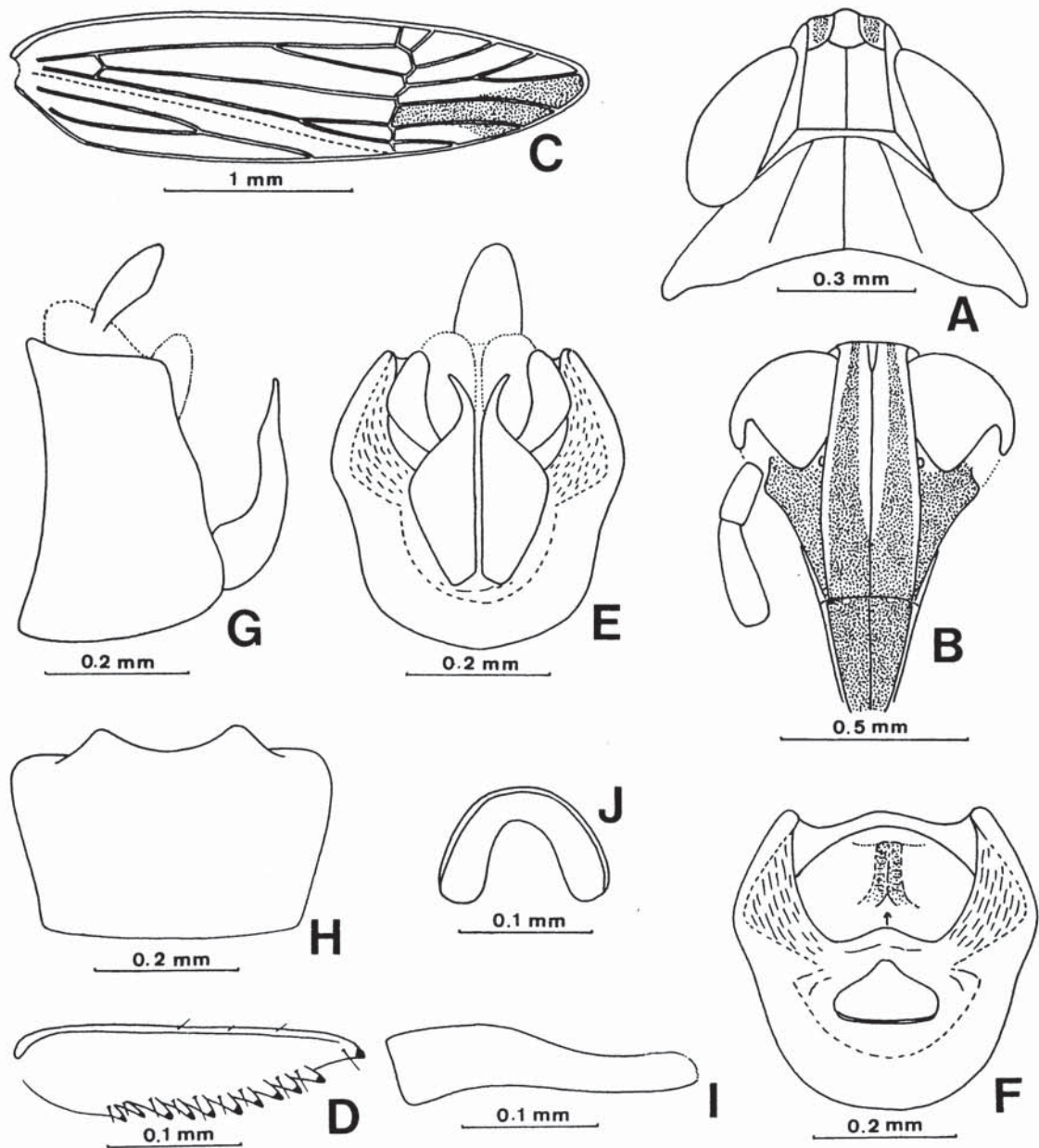


Fig. 124. *Formodelphax molodus* n.sp. A, head and pronotum, dorsal view; B, frons and post-clypeus; C, tegmen; D, post-tibial spur; E, male genitalia, posterior view; F, diaphragm of pygofer; G, male genitalia, left side; H, pygofer, ventral view; I, phallus, left side; J, suspensorium.

(116) *FORMODELPHAX CONFUSUS* n.sp.

Fig. 125.

General color pale yellowish brown. Frons, genae and postclypeus black except along basal half carinae of frons pale yellow. Abdomen with anterior two-thirds of each segment dark brown, posterior third reddish. Tegmina semiopaque, with area before cross veins brown.

Vertex longer in middle line than wide at base about 1.5:1, at apex as wide as at base, apical margin slightly produced medially, submedian carinae not uniting at apex, Y-shaped carina present, basal compartment nearly as wide at base as greatest length. Frons longer in middle line than wide at widest part about 2.7:1, widest at apical third, median carina forked at base. Postclypeus wider at base than frons at apex. Spinal formula of hind leg 5-6-4. Post-tibial spur with 16-18 teeth. Tegmina 3.4 times as long as widest part, acutely rounded at apex.

Anal segment of male in dorsal view with lateral margin angulated. Pygofer in profile wider ventrally than dorsally, posterior margin sinuate, in posterior view opening wider than long, ventral margin defined, in ventral view paired medioventral processes each roundly produced, inner margin nearly straight. Phallus tubular. Suspensorium irrecognizable. Diaphragm rather narrow, protruding cephalad. Opening for genital styles with dorsal margin with small production. Genital styles typical.

The name *confusus* is Latin adjective; confused.

Male (macropterous)

Length of body (includ. teg.): 3.93-4.00 mm.

Length of tegmen: 3.16 mm.

Holotype: Male, Meifen, Nantou Hsien, 7-XI-1981, S.C. Lin & W.S. Tang. In TARI.

Paratypes: 1♂, Tungpu, Nantou Hsien, 19-21, VII-1982, L.Y. Chou & T. Lin; 1♂, 5♀♀, N. Tungyaanshan, Nantou Hsien, 22-VII-1985, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan.

This new species differs from the 2 other members of this genus in the color of the tegmina and from *F. formodus* by the shape of the post-tibial spur.



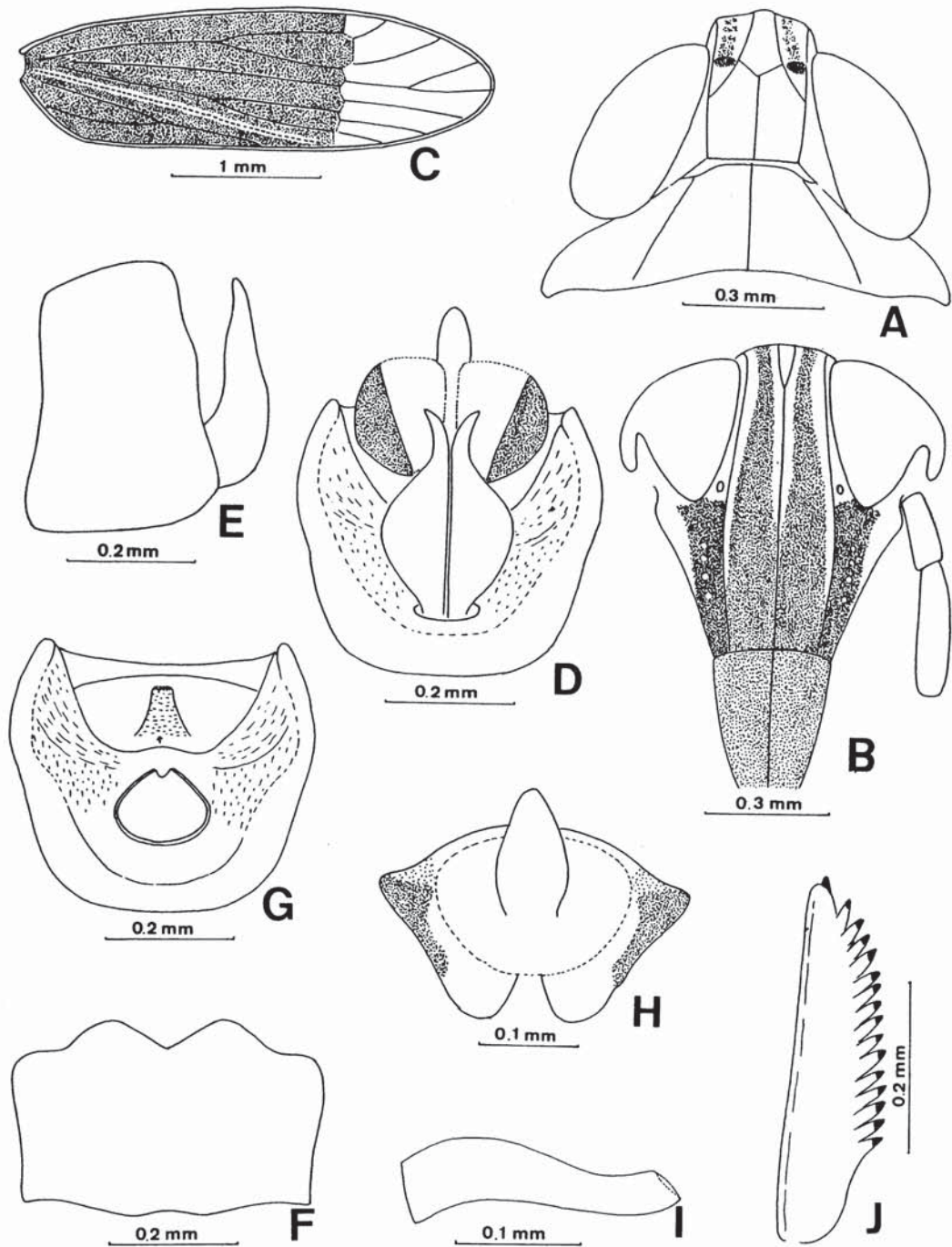


Fig. 125. *Formodelphax confusus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, pygofer, ventral side; G, diaphragm of pygofer; H, anal segment of male, dorsal view; I, phallus, left side; J, post-tibial spur.

## 56. Genus *Neometopina* n. gen.

Head including eyes narrower than pronotum. Vertex longer submedially than wide at base about 1.3:1, lateral carinae straight, submedian carinae not really uniting at apex, Y-shaped carina distinct, basal compartment as wide at base as greatest length. Frons longer in middle line than wide at widest part about 3:1, widest at apex. Rostrum reaching to meso-trochanters. Ocelli present. Antennae cylindrical, relatively long, basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male ring-like, apical margin produced medially into a large spinose process, in ventral margins each side produced ventrad into a small process. Pygofer without medioventral process, with rod-like process at each side of dorsal margin of diaphragm which slightly twisted. Phallus strongly compressed laterally, with large plate-like process at left side. Diaphragm broad. Genital styles long, simple.

Genital scale of female present.

Type species: *Neometopina penghuensis* n.sp.  
(here designated)

In anal segment with large median process, this genus resembles *Eumetopina* Breddin, but differs in having the following combination of characters: anal segment in ventral margins each side produced ventrad into a small process; pygofer without medioventral process but with a rod-like process at each side of dorsal margin of diaphragm; shape of phallus and frons.

### (117) *NEOMETOPINA PENGHUENSIS* n.sp.

Fig. 126.

General color uniformly pale yellowish brown except intercarinae of frons and postclypeus with narrow brown stripes.

Vertex longer submedially than wide at base about 1.3:1, as wide at apex as at base, apical margin transverse, acutely rounding into frons, submedian carinae not uniting at apex. Frons longer in middle line than wide at widest part about 3.1:1, lateral carinae straight, median carina forked at base. Postclypeus as wide at base as frons at apex, longer in middle line than wide at base about 1.4:1. Antennae relatively long, reaching to middle of postclypeus, basal segment longer than wide about 2.7:1, shorter than second about 1:1.7. Post-tibial spur with about 21 teeth. Tegmina longer than widest part about 3.9:1, acutely rounded at apex.

Anal segment of male large, median spinose process slightly turned right apically. Pygofer in profile distinctly wider ventrally than dorsally, laterodorsal angle not produced, in posterior view with opening longer than wide, lateral margins not well



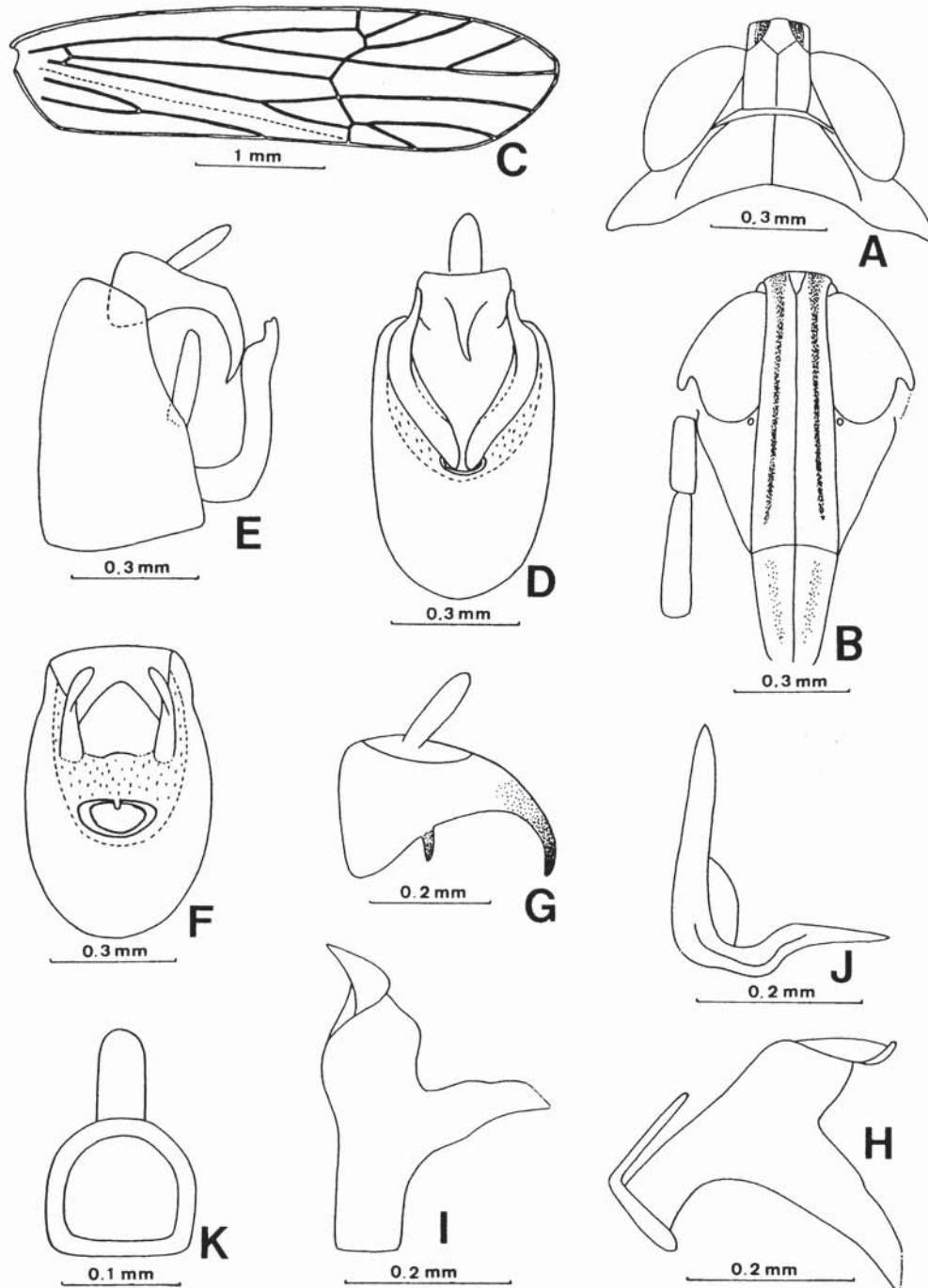


Fig. 126. *Neometopina penghuensis* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, anal segment of male, left side; H, phallus, left side; I, the same, laterocaudal view; J, the same, dorsal view; K, suspensorium.

defined. Phallus in dorsal view L-shaped, left lobe slightly sinuate. Suspensorium L-shaped, dorsal part narrow, ventral ring with ventral margin straight. Diaphragm broad, weakly sclerotized, dorsal margin evenly rounded medially, produced cephalad into a plate. Opening for genital styles straight at dorsal margin, produced into a small lobe medially, ventral margin evenly curved. Genital styles long and slender, narrowed near apex, evenly convex laterad medially.

The name *penghuensis* is the type locality, Penghu Is.

Male (macropterous)

Length of body (includ.teg.): 4.76 mm.

Length of tegmen: 4.24 mm.

Female (macropterous)

Length of body (includ.teg.): 5.56 mm.

Length of tegmen: 4.66 mm.

Holotype: Male, Makon, Penghu Hsien, 10-VIII-1985, C.L. Hsieh. In NCHU.

Paratypes: 1♂, (dissected), 5♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

### 57. Genus *Neoterthrona* n. gen

Head including eyes narrower than pronotum. Vertex as long submedially as wide at base, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 1.5:1. Frons longer in middle line than wide at widest part about 2:1. Postclypeus wider at base than frons at apex. Rostrum reaching to metacoxae. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide. Ocelli present. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male long, ring-like, lateroapical angles each produced into a long spinose process. Pygofer in profile distinctly longer ventrally than dorsally, ventrocaudal portion produced caudad, most opening area present from lateral view, laterodorsal angle not produced, in posterior view with opening slightly wider than long, medioventral process present, single, ventral angles each produced broadly. Phallus n-shaped. Suspensorium circular medially, armed at both ends, particularly connecting with phallus at its dorsal aspect. Diaphragm extremely narrow, dorsal margin deeply incised. Genital styles extremely long, slender, sinuate, strongly divergent.

Type species: *Neoterthrona spinosa* n.sp.  
(here designated)

This genus runs to *Laoterthrona* In Kuoh's key (1983, p. 26), it resembles the latter in having shape of diaphragm; shape of phallus and genital styles, but differs in pygofer with medioventral process; anal segment of male with lateroapical angles each produced into a long spinose process; genital styles simple without expanding armature.



(118) *NEOTERTHRONA SPINOSA* n.sp.

Fig. 127.

General color pale yellowish brown. Abdomen and genital segment dark brown to black.

Vertex as long submedially as wide at base, obtusely rounding into frons, lateral carinae slightly concave, apical margin convex with median carina not prominent, Y-shaped carina distinct, submedian carinae uniting before apex of vertex, basal compartment wider at base than greatest length about 1.5:1. Frons in middle line longer than wide at widest part about 2:1, widest below level of ocelli, lateral carinae shallowly convex. Postclypeus at base wider than frons at apex, as long in middle line as wide at base. Antennae surpassing level of frontoclypeal suture, basal segment longer than wide about 1.5:1, shorter than second about 1:2. Tegmina of brachypterous truncate at apex, common stem of claval vein terminating at apex. Post-tibial spur with about 22 teeth, with one-half setal area.

Anal segment of male with lateroapical angles moderately separated, each produced ventrad into a stout, long process, parallel. Pygofer in profile with median portion of opening distinctly produced caudad, in posterior view with lateral margins well defined, medioventral process present, very long, reaching to level of processes of anal segment, with base semicircular, in profile median portion with smaller process and produced laterally, production of ventral angles broad and stout, truncate at apex, strongly sclerotized and pigmented on dorsal half. Phallus n-shaped, laterally compressed, extremely broad at base, attenuate to dorsad, then reflected caudad, armed with a relative large tooth at dorsal left, sinuate near pointed distal end. Suspensorium with dorsal arms long and ventral arms very short. Diaphragm very narrow, with dorsal margin deeply concave. Opening for genital styles with dorsal and lateral margins nearly straight, ventral margin deeply concave at median one-third. Genital styles extremely long, surpassing level of lateral margin of pygofer, slightly widened at middle, narrowed near apex, strongly divergent from base.

The name *spinosa* is Latin adjective, spinose.

## Male (brachypterous)

Length of body: 2.50-2.60 mm.

Length of tegmen: 1.00 mm.

## Female (brachypterous)

Length of body: 2.80-3.17 mm.

Length of tegmen: 1.00-1.23 mm.

Holotype: Male, Paolai, Kaohsiung Hsien, 25-XII-1981, C.T. Yang. In NCHU.

Paratypes: 2♂♂, 3♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

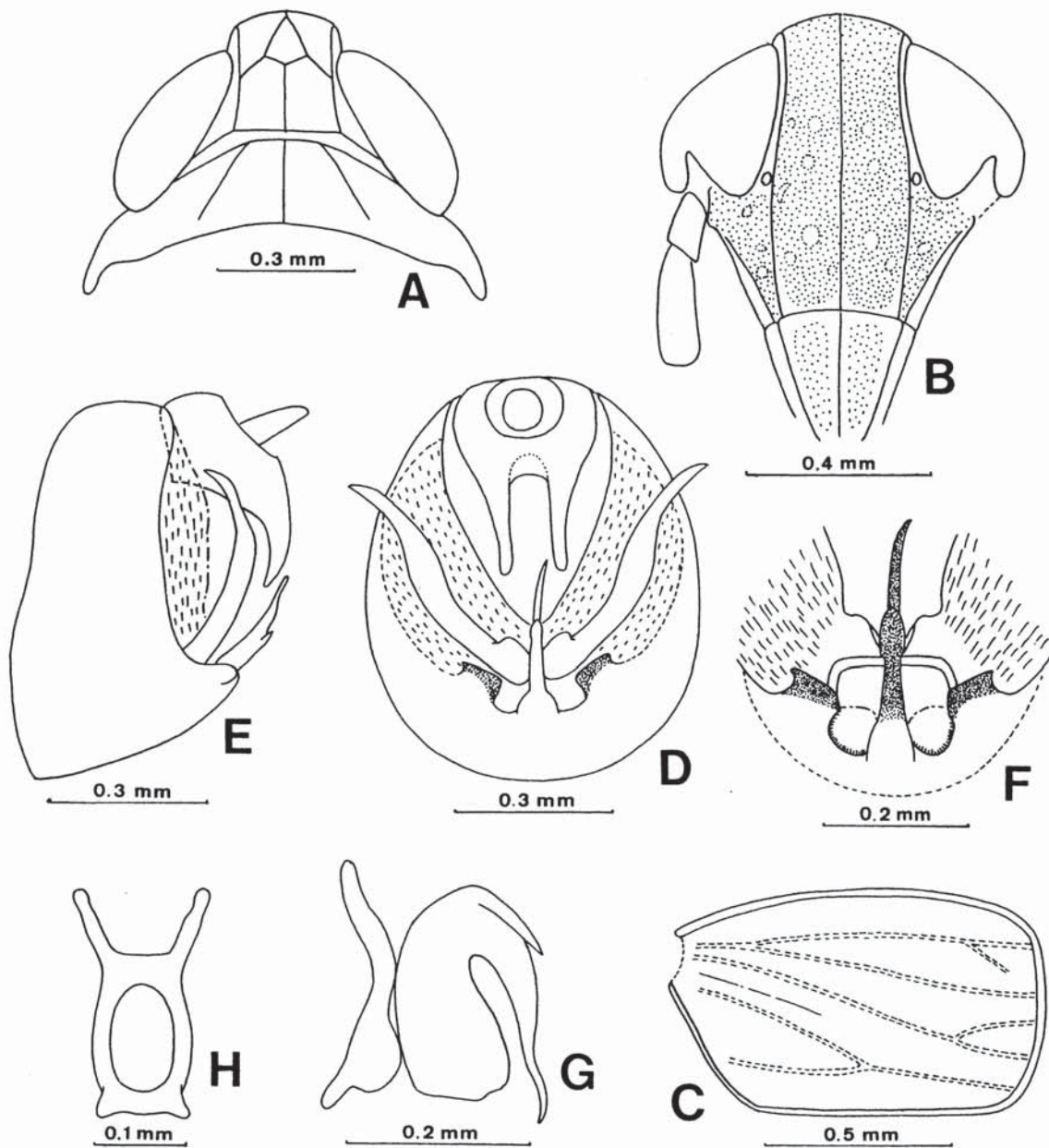


Fig. 127. *Neoterthrona spinosa* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, phallus, left side; H, suspensorium.



### 58. Genus *Tsaurus* n. gen.

Head including eyes narrower than pronotum. Vertex wider at base than long submedially about 1.2:1, narrower at apex than at base, rounding into frons, apical margin tranverse, sharply produced medially, submedian carinae uniting at apex, Y-shaped carina feeble, basal compartment wider at base than greatest length about 1.9:1. Frons longer in middle line than wide at widest part about 2.3:1, widest at level of ocelli, narrowed at base, median carina simple. Postclypeus wider at base than frons at apex, distinctly longer than wide at base. Rostrum reaching to meta-coxae, apical segment distinctly shorter than subapical. Ocelli present. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide about 1.6:1, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-8-4. Post-tibial spur with more than 30 teeth.

Anal segment of male moderately long, ring-like, lateroapical angles each produced into a very short, dentate process. Pygofer in profile slightly wider ventrally than dorsally, laterodorsal angle not produced, in posterior view with opening distinctly longer than wide, lateral margins well defined, in ventral view with median portion deeply incised, without medioventral process. Phallus far away from anal segment, tubular, strongly produced at basodorsal angle, apical two-thirds curved dorsocaudad, with several winged processes laterally. Suspensorium elongate. Diaphragm narrow, with 2 small pigmented processes, directed caudad and two weakly sclerotized plate, protruding cephalad. Genital styles long, divergent, with process near apex.

The name *Tsaurus* is the name of Tsaur, the collector of this species.

Typ species: *Tsaurus dentatus* n.sp.  
(here designated)

This genus is distinguishable by the shape of phallus; the diaphragm of pygofer and the shape of the male anal segment.

#### (119) *TSAURUS DENTATUS* n.sp.

Fig. 128.

General color brownish yellow. Dorsal aspect with white stripe recurring from vertex to meso-scutellum. Apices of first antennal segment, base of second and anteclypeus somewhat dark. Abdomen and pygofer dark brown to black. Tegmina brownish yellow, membrane with large area above Cu, basad apical veins and apical veins themselves black. Wings white.

Vertex wider at base than long submedially about 1.2:1, lateral carinae nearly straight, basal compartment wider at base than greatest length about 1.9:1. Frons longer in middle line than wide at widest part about 2.3:1. Rostrum with relative length of each segment about 1.1:1.2:1. Tegmina of coelopterous of male longer than wide about 2.3:1, Cu bifurcated basad than Sc+R, cross veins more apically, wings very small, longer than wide about 2.3:1, shorter than tegmina about 1:2.1. Post-tibial spur with 33-35 teeth.

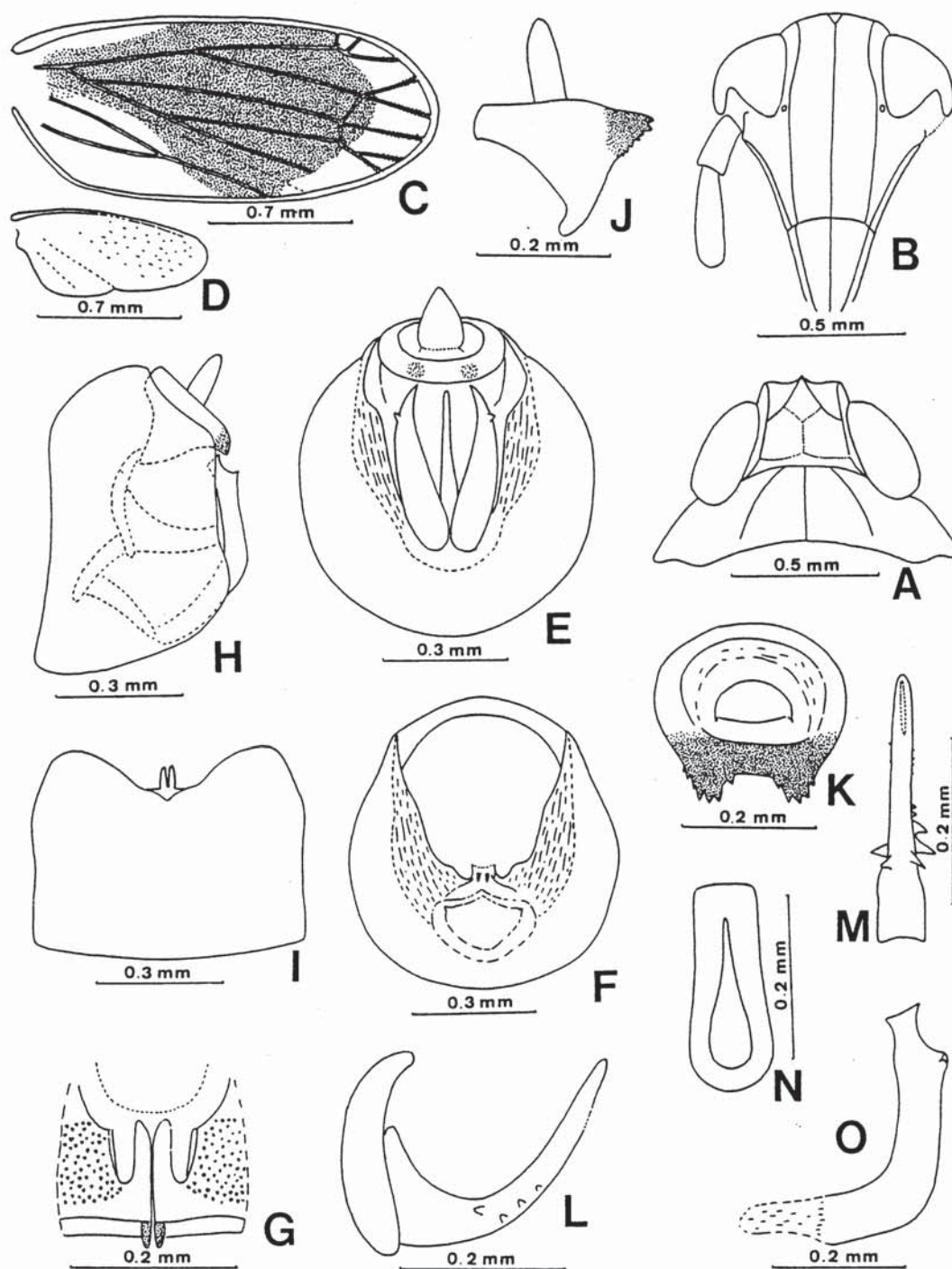


Fig. 128. *Tsaurus dentatus* n.sp. A, head and pronotum, dorsal view; B, frons and postclypeus, C, tegmen; D, wing; E, male genitalia, posterior view; F, diaphragm of pygofer; G, the same, dorsal view; H, male genitalia, left side; I, pygofer, ventral view; J, anal segment of male, left side; K, the same, dorsal view; L, phallus, left side; M, the same, dorsal view; N, suspensorium; O, genital style, left side.



Anal segment of male dentate around lateroapical stout process, in dorsal aspect rounded. Phallus slender, in dorsal view with 3 winged processes left, 2 right and several small ones or granulates on each side. Orifice terminal, ventrad. Suspensorium elongate, longer than wide at widest part about 2.6:1, rounded ventrally and straight dorsally, median hole elongate, narrowed dorsally. Processes of diaphragm (Fig. 128-I) in ventral view slender, parallel, 3 times as long as wide. Opening for genital styles weakly defined, deeply convex dorsomedially, evenly concave ventrally. Genital styles broad at base, attenuate to apex and acute at apex, slightly curved mesad at apex, lateral view strongly bent at base, nearly parallel, obliquely truncated at apex, narrowed subapically, inner margin below narrow portion with triangular process, curved laterad apically.

The name *dentatus* is Latin adjective, toothed.

Male (coelopterous)

Length of body: 2.76-3.00 mm.

Length of tegmen: 2.16-2.26 mm.

Female (coelopterous)

Length of body: 3.26-3.80 mm.

Length of tegmen: 2.53-2.60 mm.

Holotype: Male, Arisan, Chiayi Hsien, 26-X-1985, S.C. Tsaur. In NCHU.

Paratypes: 7♂♂, 11♀♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

### 59. Genus *Parametopina* n. gen.

Head including eyes narrower than pronotum. Vertex as long submedially as wide at base, lateral carinae slightly concave, submedian carinae uniting at apex. Frons in middle line longer than wide at widest part about 2:1. Rostrum reaching to metacoxae. Antennae cylindrical, surpassing frontoclypeal suture. Ocelli present. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with more than 40 teeth.

Anal segment of male ring-like, apical margin strongly produced at middle in an elongate triangular process. Pygofer in profile wider ventrally than dorsally, caudal margin produced caudad medially, in posterior view with opening longer than wide, without medioventral process. Phallus tubular, slender, with processes near apex. Suspensorium ring-like, dorsal aspect with short arms. Genital styles small.

Type species: *Parametopina yushaniae* n.sp.  
(here designated)

This genus resembles *Eumetopina* Breddin, but differs from latter in having the pygofer without medioventral process; relative length of frons; number of teeth of post-tibial spur and by the host plant.

(120) *PARAMETOPINA YUSHANIAE* n.sp.

Fig. 129.

General color of male brown. White stripe recurring in middle of pronotum, mesonotum and hind margins of tegmina, terminating at apex of clavus. Antennae with apices of basal segment and base of second black. Legs yellowish brown. Abdomen brown with basal area of each segment pale black. Pygofer and genital styles black. Tegmina brown with anterior margin white, area above  $M_1$  and apex below  $R_S$ , above  $M_3$  black, more darker anteriorly and paler posteriorly, hind margin near end of clavus black. Female nearly same as male except abdomen uniformly yellowish brown, tegmina with black area narrower or absent before cross veins.

Body robust. Vertex nearly as long submedially as wide at base, apical margin transverse, lateral carinae nearly straight, Y-shaped carina distinct, basal compartment wider at base than greatest length about 2:1. Frons longer in middle line than wide at widest part about 2.1:1, widest above level of ocelli, lateral carinae slightly convex. Postclypeus as wide at base as frons at apex, longer than wide at base. Antennae reaching to level of middle of postclypeus, basal segment longer than wide about 1.7:1, shorter than second about 1:1.6. Post-tibial spur with about 42 teeth.

Anal segment of male moderately long, deeply sunk in pygofer, apical margin strongly produced caudad, in dorsal view pear-shaped. Pygofer in profile wider ventrally than dorsally, dorsal margin straight, laterodorsal angle produced, in posterior view with opening small, distinctly longer than wide, lateral margins nearly straight, ventral margin deeply concave. Phallus tubular, moderately long, with 6 spinose processes at dorsoapical end, in dorsal aspect each side with 3. Suspensorium ring-like, with a pair small arm connects with anal segment. Diaphragm narrow, ventral half obliquely produced cephalad, dorsal margin with plate reflected cephalad, with small produced rod medially, directed caudodorsad, distinctly bilobed at apex. Opening for genital styles deeply concave at ventral margin, shallowly convex dorsomedially. Genital styles small, lateral margin curved, inner margin with apical half concave and basal half parallel, inner angle pointed, in lateral view caudal margin distinctly produced subapically.

The name *yushaniae* is after the host plant.

## Male (macropterous)

Length of body (includ.teg.): 4.00-4.10 mm.

Length of tegmen: 3.17-3.27 mm.

## Female (macropterous)

Length of body (includ.teg.): 4.30-4.66 mm.

Length of tegmen: 3.43-3.83 mm.

Holotype: Male, Kuanwu, Hsinchu Hsien, 11-XI-1984, J.T. Yang. In NCHU.

Paratypes: 3♂♂, 6♀♀, same data as for holotype; 2♂♂, 7♀♀, N. Tungyaanshan, Nantou Hsien, 22-23, VII-1985, C.T. Yang.

Host plant: *Yushania niitakayamensis* Keng

Distribution: Taiwan.



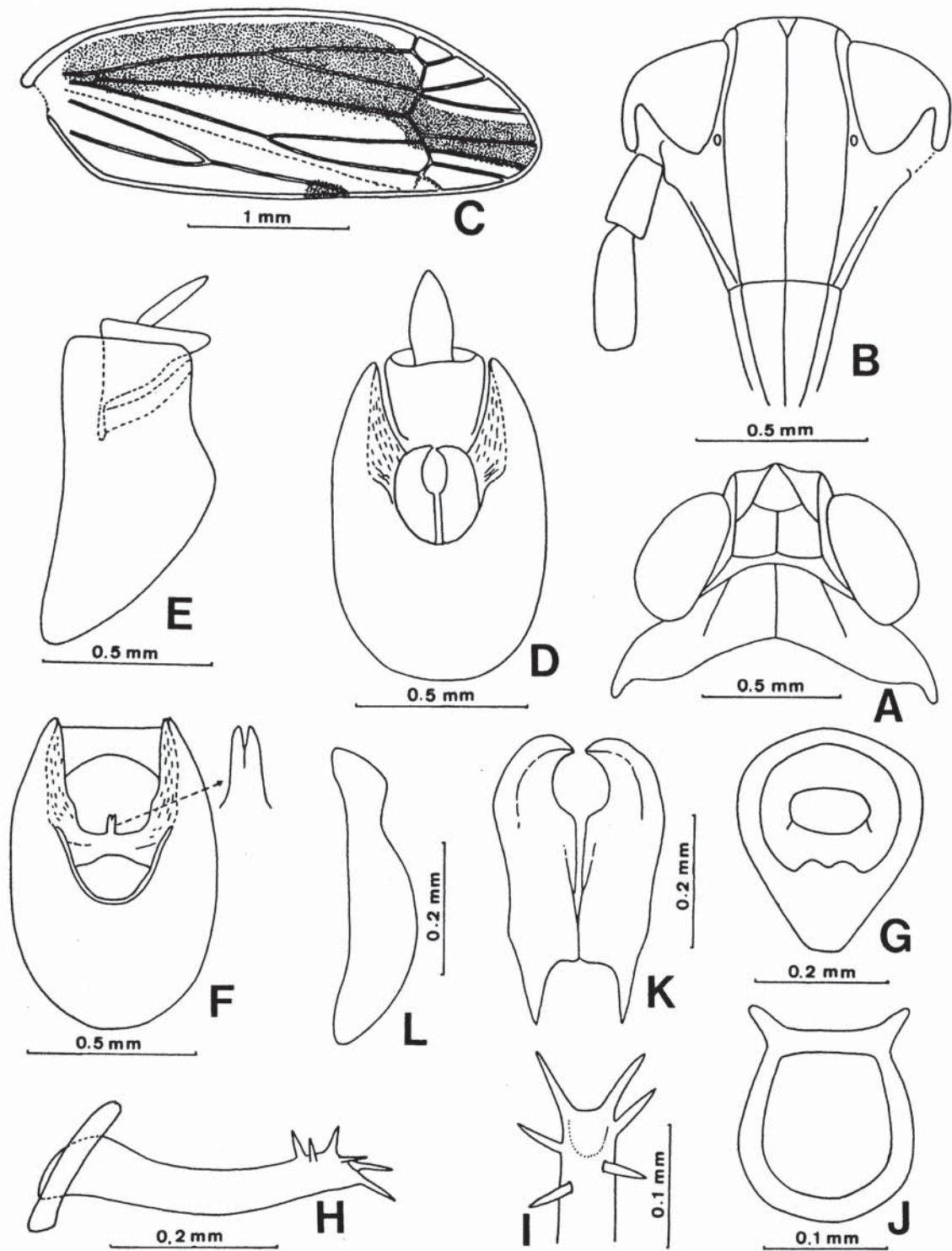


Fig. 129. *Parametopina yushaniae* n.sp. A, head and pronotum, dorsal view; B, frons and post-clypeus; C, tegmen; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, anal segment of male, dorsal view; H, phallus, left side; I, apex of phallus, dorsal view; J, suspensorium; K, genital styles, posterior view; L, the same, left side.

## 60. Genus *Diodelphax* n. gen.

Head including eyes narrower than pronotum. Vertex wider at base than long submedially about 1.5:1, submedian carinae uniting at apex, Y-shaped carina distinct, basal compartment wider at base than greatest length about 2.8:1. Frons longer in middle line than wide at widest part about 1.8:1. Rostrum reaching to meta-coxae. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:1.8. Ocelli present. Pronotum with lateral carinae not reaching hind margin. Spinal formula of hind leg 5-6-4. Post-tibial spur with less than 20 teeth, each tooth with single seta.

Anal segment of male ring-like, lateroapical angles not produced into spinose process. Pygofer in profile with whole posterior and ventral margins evenly curved, laterodorsal angle produced, anterior and dorsal margins straight, in posterior view with opening wider than long, without medioventral process. Phallus tubular, slender, nearly parallel. Suspensorium ring-like with stem small. Genital styles broad, simple, divergent.

Type species: *Diodelphax obstipus* n.sp.  
(here designated)

This genus occupies a rather isolated position. It is most easily recognizable by the shape of phallus; the spinal formula of hind leg; the lateral view of pygofer; each tooth of post-tibial spur with single seta.

### (121) *DIODELPHAX OBSTIPUS* n.sp.

Fig. 130.

General color uniformly pale yellowish brown.

Vertex wider at base than long submedially about 1.5:1, apical margin transverse, lateral carinae straight, submedian carinae uniting at apex, basal compartment wider at base than greatest length about 2.8:1. Frons longer in middle line than wide at widest part about 1.8:1, widest at level of ocelli, lateral carinae convex at middle. Postclypeus wider at base than frons at apex, wider at base than long in middle line. Antennae with basal segment longer than wide about 1.8:1, shorter than second about 1:1.8. Post-tibial spur with 12-17 teeth.

Anal segment of male rather deeply immersed in dorsal emargination of pygofer. Pygofer in profile as wide ventrally as dorsally, in posterior view with opening wider than long, lateral margins well defined and convex, ventral margin shallowly concave. Phallus moderately long, tubular, reflected into 2 processes on left side apically, apical longer one directed laterocaudad then laterad, basal one arrow-like, directed laterocaudad. Diaphragm very broad, dorsal margin strongly sclerotized and weakly convex medially. Opening for genital styles evenly curved on both dorsal and ventral margins. Genital styles moderately long, divergent, inner margin shallowly concave at apical half, outer margin shallowly concave, inner angle pointed, outer angle obtused.

The name *obstipus* is Latin adjective, oblique.



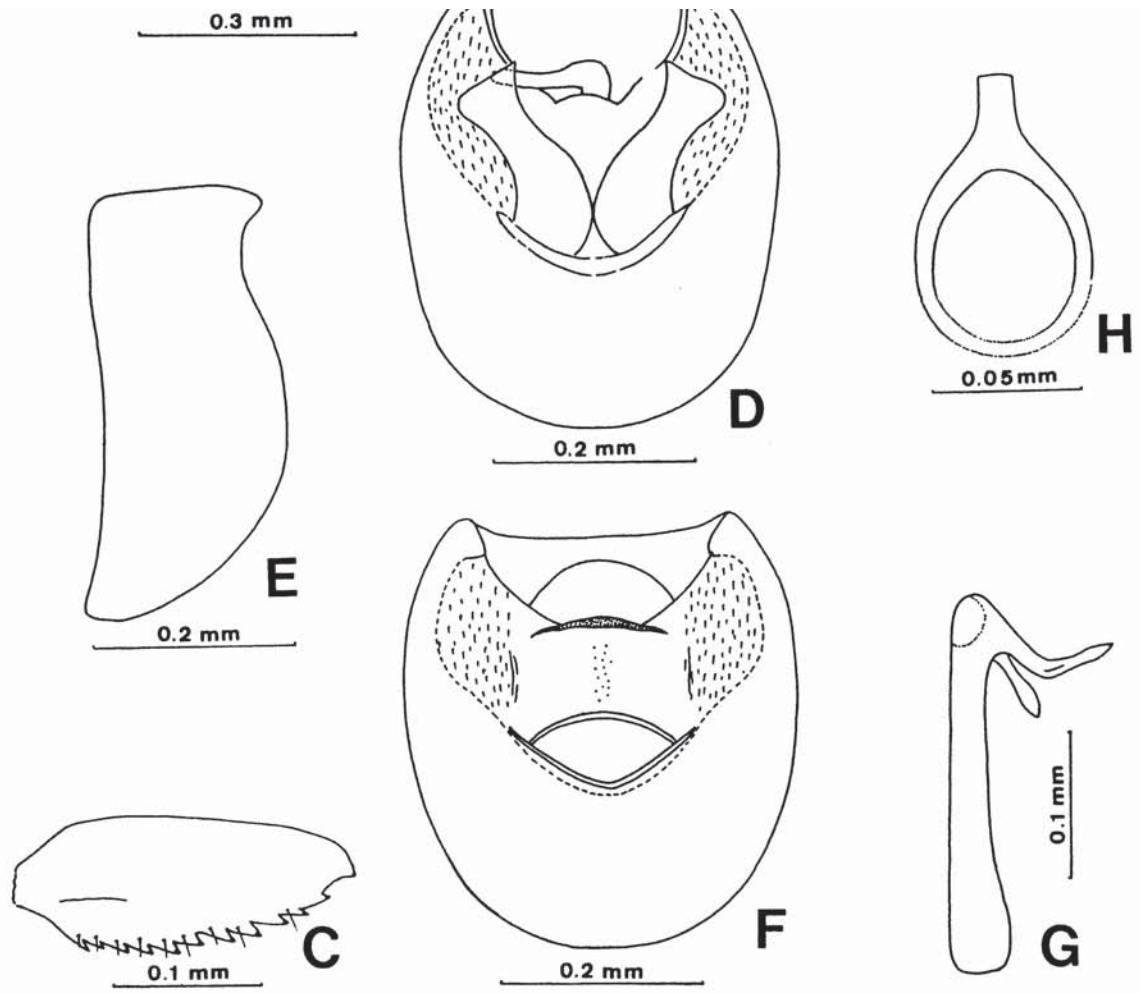


Fig. 130. *Diodelphax obstipus* n.sp. A, head and pronotum, dorsal view; B, forns and postclypeus; C, post-tibial spur; D, male genitalia, posterior view; E, the same, left side; F, diaphragm of pygofer; G, phallus, dorsal view; H, suspensorium.

## Male (macropterous)

Length of body (includ.teg.): 2.26-2.33 mm.

Length of tegmen: 1.80-2.00 mm.

## Female (macropterous)

Length of body (includ.teg.): 2.40 mm.

Length of tegmen: 2.06 mm.

Holotype: Male, Pingtung, Pingtung Hsien, 8-XI-1985, C.T. Yang. In NCHU.

Paratypes: 1♂, 1♀, same data as for holotype.

Host plant: Unknown.

Distribution: Taiwan.

**61. Genus *Coronacella* Metcalf***Coronacella* Metcalf, 1950, *B.P. Bishop Mus. Occ. papers*, 20(5):59.

Head including eyes slightly narrower than pronotum. Vertex longer submedially than wide at base about 1.3:1, in profile obtusely rounding into frons, submedian carinae uniting at apex. Frons in middle line longer than wide at widest part about 2.4:1, widest at middle, median carina simple. Rostrum reaching to meso-trochanters. Ocelli present. Antennae surpassing frontoclypeal suture, basal segment longer than wide, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4. Post-tibial spur with about 20 teeth.

Anal segment of male long, collar-shaped, lateroapical angles approximated, each produced into a spinose process. Pygofer in profile slightly wider ventrally than dorsally, laterodorsal angle not produced, in posterior view with opening wider than long, along lateral margins and areas of opening for aedeagus beset many small granulations, medioventral process absent. Phallus rather short, tubular, dorsobasal margin with prominent membranous process which conical at apex. Diaphragm very wide, dorsal margin evenly produced dorsad medially. Genital styles short and stout.

Type species: *Coronacella bella* Metcalf  
(original designation)

**(122) *CORONACELLA SINHALANA* (Kirkaldy)****Fig. 131.***Coronacella sinhalana* Fennah, 1973-75, *Ent. scand. Suppl.*, 4:108.*Coronacella bella* Metcalf, 1950, *B.P. Bishop Mus. Occ. papers*, 20(5):59.*Delphacodes sinhalanus* Kirkaldy, 1906, *Can. Ent.*, 38:156.*Delphax puella* Kirkaldy, 1907 [nec Van Duzee], *Bull. Hawaiian Sugar Pl. Assoc. Div. Ent.*, 3:1.*Kelisia kirkaldyi* Muir, 1917, *Proc. Hawaiian Ent. Soc.*, 3:329.*Liburnia frontalis* Melichar, 1903, *Hompotern-Fauna von Ceylon*:100.



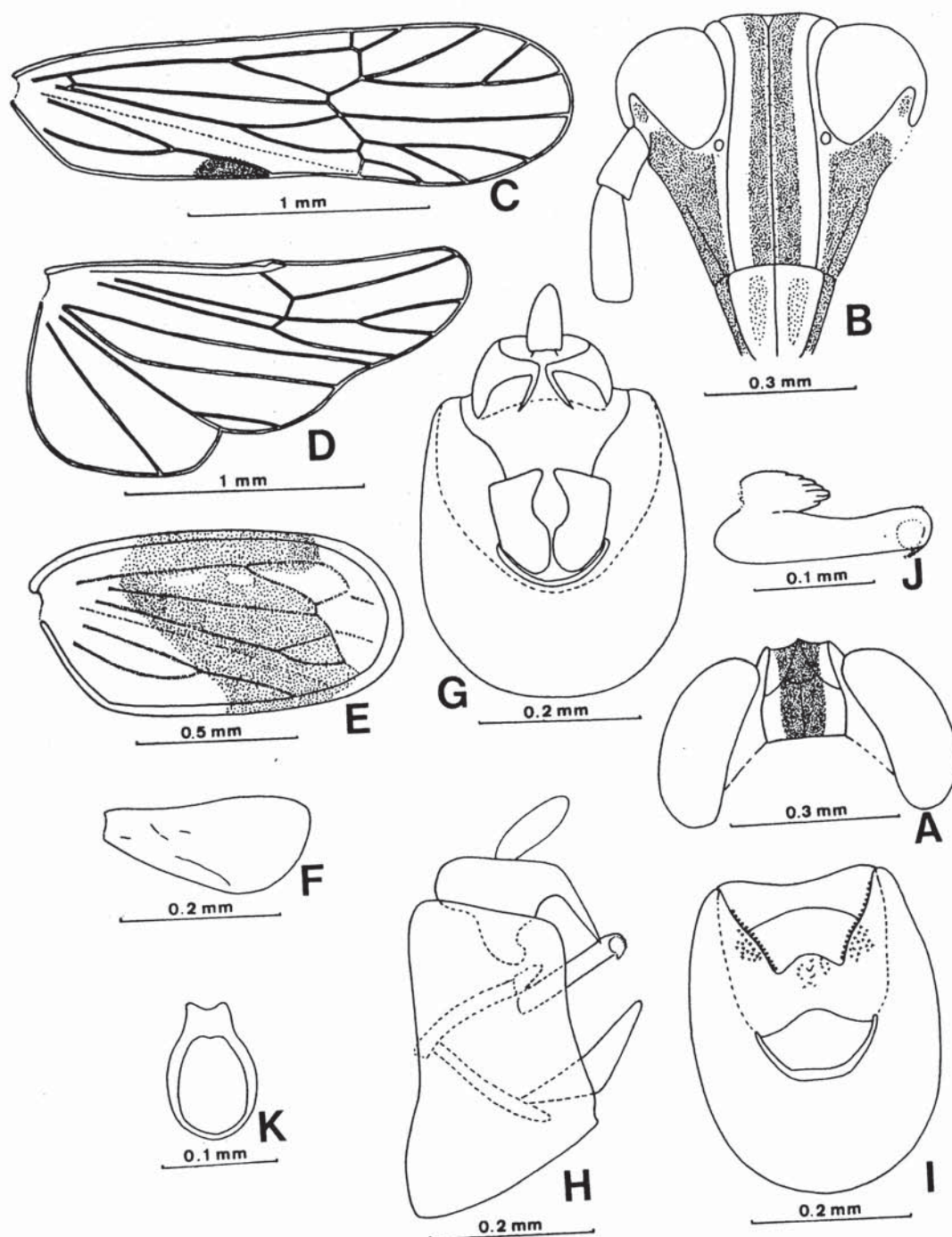


Fig. 131. *Coronacella sinhalana* (Kirkaldy) A, head, dorsal view; B, frons and postclypeus; C, tegmen; D, wing; E, tegmen (brachypterous); F, wing (brachypterous); G, male genitalia, posterior view; H, the same, left side; I, diaphragm of pygofer; J, phallus, left side; K, suspensorium.

General color pitchy black. Lateral carinae of vertex and frons, median line of pro- and mesonotum white, second antennal segment and legs yellowish brown except hind femora somewhat brown to dark brown. Tegmina subhyaline, yellowish brown, near end of clavus with distinct black marking.

Vertex longer submedially than wide at base about 1.3:1, at apex narrower than at base, lateral carinae slightly convex, Y-shaped carina moderately distinct, submedian carinae uniting at apex, basal compartment wider at hind margin than greatest length about 1.2:1. Frons in middle line longer than wide at widest part about 2.4:1, widest just below level of ocelli, lateral carinae shallowly convex, median carina simple. Post-clypeus at base wider than apex of frons, about as wide as long. Antennae surpassing frontoclypeal suture, basal segment longer than wide about 1.5:1, shorter than second about 1:2. Post-tibial spur with about 18 teeth.

Anal segment of male long, lateroapical angles closely approximated, each produced ventrad in a slender spinose process, slightly directed laterally. Pygofer with posterior margin shallowly incised near base, laterodorsal angle obtusely rounded, not reflected mesad, in posterior view with opening wider than long, lateral margins not very prominent. Phallus rather short, tubular with several small teeth on dorsal margin near apex. Orifice on lower side near apex. Diaphragm rather broad, dorsal margin evenly convex medially. Genital styles short, inner angle strongly produced mesad, inner margin strongly concave at apical half, outer margin nearly straight.

|                   |                |                |
|-------------------|----------------|----------------|
| Male              | (macropterous) | (coelopterous) |
| Length of body    |                | 1.66 mm.       |
| (includ.teg.):    | 2.86-3.00 mm.  |                |
| Length of tegmen: | 2.36-2.50 mm.  | 1.00 mm.       |
| Female            |                |                |
| Length of body    |                | 1.83-2.10 mm.  |
| (includ.teg.):    | 3.10-3.26 mm.  |                |
| Length of tegmen: | 2.60-2.76 mm.  | 1.13-1.30 mm.  |

Specimens examined: 8♂♂, 8♀♀, Liukuei, Kaohsiung Hsien, 31-XII-1984, C.T. Yang.

Host plant: Unknown.

Distribution: Taiwan, Philippines, Micronesia, Sri Lanka, Fiji, Australia, Samoa, Tahiti, New Hebrides, Gilbert Is., New Caledonia.

## 62. Genus *Dicranotropis* Fieber

*Dicranotropis* Fieber, 1866, *Verh. Zool. Bot. Ges. Wien.*, 16:521.

—: Ossiannilsson, 1978, *Fauna ent. scand.*, 7(1):152.

—: Kuoh, 1983, *Econ. Ins. Fauna China*, 27:83.

Three recorded species placed in *Dicranotropis* have not been collected by the author. Their generic placement is quite unclear so far.

Type species: *Delphax hamata* Boheman  
(subsequent designation by Distant, 1906).



**Key to the species of *Dicranotropis***  
(modified from Ishihara, 1949)

1. Body mostly black, shining; tegmina blackish, with an oblong round hyaline marking at center of anterior margin and with black veins; length 4 mm. (includ. teg.) ..... *fumosa* Matsumura
  - Body mostly grayish; length 3.5 mm. (includ.teg.) or less ..... 2
2. Body mostly grayish except lateral carinae and anterior margin of pronotum which are fuscous; frons at the upper half somewhat darker in color; length ♀ 3.5 mm. (includ.teg.) ..... *jamiana* Matsumura
  - Body concolorously grayish brown; genital styles broader at base, widely divergent apically, apices backwardly pointed; length ♂ 2.5 mm. (includ.teg.) .....  
..... *botelensis* Matsumura

(123) *DICRANOTROPIS FUMOSA* Matsumura

*Dicranotropis fumosa* Matsumura, 1910, *Schad. u. nutz. Ins. Formosas*, :18.

–: Matsumura, 1911, *Mem. Soc. Ent. Belg.*, 18:136.

–: Esaki et Ishihara, 1943, *Kyusyu Imp. Univ. Dept. Agric.*, 13:49.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:72.

The description is reproduced from Matsumura [1911].

“Pitchy brown, shining. Vertex and base of frons yellowish, somewhat shorter than wide. Carinae between vertex and frons obscure, side-pieces of base yellowish. Antennae shining, yellowish. Rostrum yellowish. Pronotum slightly wider than vertex, mesonotum as long as vertex and pronotum combined. Tegmina hyaline with four wide, cross, black bands, apical one protruding to apical margin at middle. Legs pale yellowish, femur with indistinct long stripe. Abdomen blackish, ventral side of female genitalia brownish, apex of anal segment and anal style yellowish.

Female

Length of body (includ.teg.): 4 mm.

Length of body (exclud.teg.): 3.5 mm.

Specimen examined: No specimen has been collected by the author.

Host plant: *Saccharum officinarum* L.

Distribution: Taiwan, Oriental regions, Japan.

(124) *DICRANOTROPIS JAMIANA* Matsumura

*Dicranotropis jamiana* Matsumura, 1940, *Ins. Matsum.*, 15(1&2):50.

–: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:73.

The description is reproduced from Matsumura [1940].

“Closely allied to *D. botelensis* Mats., but differs from it as follows:

Body somewhat slenderer, grayish in colour, Vertex fuscous, the keels somewhat paler. Frons at the anterior half somewhat darker. The lateral keels and the anterior margin of pronotum fuscous. Tegmina subhyaline, tinged with gray. Abdomen fuscous, at the venter largely brownish.

♂. The hind margins of the ventral segments white; genital segment pitchy black, so as seen from behind higher than broad, the styli at the apices brownish, sharply pointed, at the bases right angularly situated to each other; anal tube with the style white, with no spinous appendage below it.

♀. Mesonotum ochraceous, the keels and the same of pronotum paler. Abdomen brown, on the lateral sides of dorsum with each a longitudinal series of white spots; ovipositor on the sides infuscated. Length, 3 mm. (♂), 3.5 mm. (♀)."

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

#### (125) *DICRANOTROPIS BOTELENSIS* Matsumura

*Dicranotropis botelensis* Matsumura, 1940, *Ins. Matsum.*, 15(1&2):49.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:73.

The description is reproduced from Matsumura [1940].

"♂ Grayish testaceous, with not marking. The fork at the apex of frons very narrow, its end nearly reaching to the lower end of eye. At the apex of the first joint of antenna with a fuscous ring. Tegmina subhyaline, with a pale testaceous tinge, the veins brownish with very fine granules and hairs, at the membrane the veins being broadly suffused with grayish brown. Mesopleura with brownish spot. Abdomen on the lateral sides of dorsum somewhat brownish. Genital segment at the lower half brownish, the hind margin of the genital opening transversely oval, the styli broader at the bases, widely diverging from each other and at the apices backwardly pointed and somewhat converging to each other; at the hind margin below roundly excavated; in the middle below the anal tube with 2 slender spinose projections above, at the apices somewhat diverging from each other. Length, 2.5 mm. (incl. tegm.)"

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

### 63. Genus *Delphacodes* Fieber

*Delphacodes* Fieber, 1866, *Verh. Zool. Bot. Ges. Wien.*, 16:524.

Two species are reproduced here have not been collected by the author. Their generic placement is quite unclear so far.



Type species: *Delphacodes mulsanti* Fieber  
[subsequent designation by Kirkaldy, 1904].

(126) *DELPHACODES ESAKII* Matsumura et Ishihara  
Fig. 132.

*Delphacodes esakii* Matsumura et Ishihara, 1945, *Mushi*, 16:63.

—: Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:56.

The description is reproduced from Matsumura et Ishihara [1945] .

“♂ Most part of vertex pale brown, along both sides of median carina whitish yellow. Eyes dirty brown. Frons pale brown, lateral margins dark brown. Ocelli brown. Clypeus pale brown. Antennae pale brown, apex of basal segment and base of second somewhat darker. Genae pale brown. Tegmina semihyaline, most part of corium brown vein C white, claval area pale brown, which apical half brown, membrane pale brown, after middle with distinct brown area. Veins with granulose. Legs pale brown, pygofer brown, genital styles more or less dark.

Vertex nearly quadrate, Y-shaped carina distinct. Frons longer in middle line than wide at widest part about 5:2, widest at middle, median carina forking at extreme base. Postclypeus as wide at base as frons at apex. Antennae slightly reaching over frontoclypeal suture, second segment longer than first about 2:1, with 4-5 distinct sensoria. Pronotum shorter in middle line than vertex, lateral carinae running along hind margin of eyes, not really attaining hind margin. Tegmina short, slightly longer than abdomen about 11:8. Relative length of each hind tarsal segment about 6:3:4.  
♀ Unknown.

Male

Length of body (includ.teg.): 4.4 mm.

Length of body (exclud.teg.): 3.4 mm.

Width of head including eyes: 0.9 mm.

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

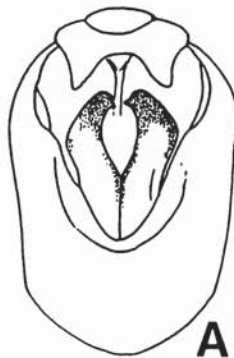


Fig. 132. *Delphacodes esakii* Matsumura et Ishihara A, male genitalia, posterior view (after Ishihara 1949).

(127) *DELPHACODES KOTONIS* (Matsumura)

*Delphacodes kotonis* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:58.  
*Liburnia kotonis* Matsumura, 1940, *Ins. Matsum.*, 15(1&2):49.

This description is reproduced from Matsumura, [1940].

“Head brown, the vertex paler, the antennae and the clypeus fuscous, the rostrum testaceous. Thorax and tegulae black, the pro- and mesonotum on the disk each with broad longitudinal white stripe, which becomes broader towards the apex of mesonotum. Pectus largely testaceous, pro- and mesonotum being black, the metapleura with a fuscous spot. Tegmina subhyaline, the hind half of membrane tinged with pale brown, the veins brownish, those of the membrane broadly suffused with smoky gray; all the veins very obsoletely granulated. Abdomen largely black, with testaceous spots. Legs testaceous, the anterior and middle coxae black, on both ends being white.

♂. Genital segment pale brownish, the anal style short and fuscous in colour; hind margin of the genital segment in the middle with a short spinous projection; genital style fuscous, lamellate, somewhat longer than the central spine, at the apices suddenly pointed; below the anal tube with a short spine; genital opening circular in outline, its lateral margins being broadly white.

♀. Pygophor and ovipositor testaceous, the anal tube on the dorsum largely fuscous and the anal style also fuscous. Length, 3.5 mm. (♂), 4 mm. (♀).”

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

64. Genus *Phyllodinus* Van Duzee

*Phyllodinus* Van Duzee, 1897, *Bull. Buffalo Soc. Nat. Sci.*, 5:240.

The generic position of the species listed here is doubtful; they have not been collected by the author.

Type species: *Phyllodinus nervatus* Van Duzee  
 (by monotypy)

(128) *PHYLLODINUS KOTOSHONIS* (Matsumura, 1940)

*Phyllodinus kotoshonis* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:77.  
*Jamiphax kotoshonis* Matsumura, 1940, *Ins. Matsum.*, 15(1&2):50.

The description is reproduced from Matsumura [1940].

“♀ Dark brown, beneath black, the face brownish, the keels and antennae paler, the central keel of pro- and mesonotum as well as the hind margin of the latter white;



the hind part of mesonotum brownish. Tegmina subhyaline, at the anterior margin brownish, the membrane slightly yellowish, the veins concolorous with the tegmina, granulated with black, at the junction of corium and membrane with a broad black band, which continues as a bowband along the hind margin to the apex, and together presenting there a semicircular ring; in the apical hyaline region with 2 scarcely incurved oblique black bands, which run upon the 2nd apical vein and the outer branch of the 3rd. Legs black, the femora brownish, at the bases of tibiae testaceous. Metanotum and the basal part of abdomen at the venter testaceous, the metapleura with a black spot. Pygophor dark brown, with very short grayish hairs, the ovipositor being pale brownish. Length, 9 mm."

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

(129) *PHYLLODINUS AFFINIS* (Schumacher)

*Phyllodinus affinis* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:77.

*Pundoluoya affinis* Schumacher, 1915, *Suppl. Ent.*, 4:141.

—: Schumacher, 1915, *Mitt. Zool. Mus. Berlin*, 8:132.

—: Esaki et Ishihara, *Cat. Araeopid. Imp. Jap.*, 46.

Ishihara [1949] notes "From the original description of this species, I could not find decisive generic characters and I have some doubt whether this species may belong to the Genus *Dicranotropis* Fieber, 1866, or to the Genus *Perkinsiella* Kirkaldy."

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

(130) *PHYLLODINUS ARITAINOIDES* (Schumacher)

*Phyllodinus aritainoides* Ishihara, 1949, *Sci. Rep. Matsuyama Agric. Coll.*, 2:76.

*Pundaluoya aritainoides* Schumacher, 1915, *Suppl. Ent.*, 4:141.

—: Schumacher, 1915, *Mitt. Zool. Mus. Berlin*, 8:132.

—: Esaki et Ishihara, 1943, *Cat. Araeopid. Imp. Jap.*, 46.

Ishihara [1946] notes "This species undoubtedly belongs to the present Genus *Phyllodinus* Van Dusee, 1987, and closely resembles *P. nigromaculosus* Muir, 1917, or *P. sauteri* Muir, 1917, and there is some possibility that one of the latter two species is synonymized with the present species. The description of this species, however, has touched neither the sexuality nor the genitalia, so decisive identification of this species may be hardly possible now."

Specimen examined: No specimen has been collected by the author.

Host plant: Unknown.

Distribution: Taiwan.

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## VII. CHINESE ABSTRACT

### 臺灣稻蝨科(二)

楊仲圖

摘要

本報告為臺灣稻蝨科之第二部份，主要分類 *Stenocraninae* 亞科與 *Delphacinae* 亞科，另 *Tropidocephalini* 族一些新材料亦一併增補於此。計列臺灣稻蝨一百三十種，分隸於六十四屬，其中有十六新屬，五十四新種，二十八新記錄種及四十八舊有種。舊有種中有二十九種重新敘述與繪圖，另十九種作者尚未採得標本，但為完整計亦抄錄列入。

每屬 (*Dicranotropis* Fieber, *Delphacodes* Fieber 與 *Phyllodinus* Van Duzee 除外) 皆重新限定，除依據外部形態外並增加雄性性器特徵，某些屬之性器特徵其依據僅局限於臺灣種類。附臺灣稻蝨科之屬，種及第五齡若蟲檢索表。



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| <i>taiwanella</i> (Matsumura) (Unkanella) . . . . .     | 3, 260     |
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| <i>taiwanensis</i> Muir (Purohita) . . . . .            | 10         |
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| <i>terrea</i> n.sp. (Sinolcame) . . . . .               | 73         |
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## X. A CHECK LIST OF ENGLISH AND CHINESE NAME OF INSECT COLLECTED LOCALITIES

|                       |     |                           |      |
|-----------------------|-----|---------------------------|------|
| Anmashan . . . . .    | 駁馬山 | N. Tungyaanshan . . . . . | 北東眼山 |
| Arisan . . . . .      | 阿里山 | Orchid Island . . . . .   | 蘭嶼   |
| Bat cave . . . . .    | 蝙蝠洞 | Oulanpi . . . . .         | 鵝鑾鼻  |
| Chiapaotai . . . . .  | 佳保台 | Paishan . . . . .         | 白沙   |
| Chiasien . . . . .    | 甲仙  | Paolai . . . . .          | 寶來   |
| Chishan . . . . .     | 旗山  | Peipu . . . . .           | 北埔   |
| Chuhkow . . . . .     | 觸口  | Peitou . . . . .          | 北斗   |
| Chushan . . . . .     | 竹山  | Pingtung . . . . .        | 屏東   |
| Fuli . . . . .        | 富里  | Puli . . . . .            | 埔里   |
| Henchum . . . . .     | 恒春  | Shalu . . . . .           | 沙鹿   |
| Hsenping . . . . .    | 扇平  | Shantimen . . . . .       | 山地門  |
| Jihyuetan . . . . .   | 日月潭 | Shitou . . . . .          | 溪頭   |
| Kantyulin . . . . .   | 柑子林 | Sungho . . . . .          | 松鶴   |
| Kuoshing . . . . .    | 國姓  | Tadushan . . . . .        | 大肚山  |
| Kenting . . . . .     | 墾丁  | Taichung . . . . .        | 台中   |
| Fengkong . . . . .    | 楓港  | Taipei . . . . .          | 台北   |
| Kuantaochi . . . . .  | 關刀溪 | Tali . . . . .            | 大里   |
| Kuantzuling . . . . . | 關仔嶺 | Tienchih . . . . .        | 天池   |
| Kuanwu . . . . .      | 觀霧  | Tienlun . . . . .         | 天輪   |
| Kukuan . . . . .      | 谷關  | Tsaoliing . . . . .       | 草嶺   |
| Lanshu . . . . .      | 蘭嶼  | Tungkong . . . . .        | 東港   |
| Lishan . . . . .      | 梨山  | Tunglian . . . . .        | 通樑   |
| Litao . . . . .       | 利稻  | Tungpu . . . . .          | 東埔   |
| Liukuei . . . . .     | 六龜  | Tungshin . . . . .        | 東勢   |
| Makung . . . . .      | 馬公  | Wushe . . . . .           | 霧社   |
| Meifeng . . . . .     | 梅峰  | Yakou . . . . .           | 埡口   |
| Mukwa . . . . .       | 木瓜  | Yangmingshan . . . . .    | 陽明山  |
| Nanhua . . . . .      | 南化  | Yuching . . . . .         | 玉井   |
| Nanjenshan . . . . .  | 南仁山 | Yushih . . . . .          | 幼獅   |

行政院國家科學委員會專刊(六)

## 臺灣稻蟲科(二)

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