

# Type Specimens of Jacobi's 'Fukien' Leafhoppers and Description of Three New Species from China (Insecta: Auchenorrhyncha: Cicadellidae: Ledrinae, Penthimiinae)

YALIN ZHANG<sup>1</sup>, LINGHUAN YANG<sup>1</sup>, MICHAEL D. WEBB<sup>2</sup> & QIANG SUN<sup>1</sup>

<sup>1</sup> Key Laboratory of Plant Protection Resources and Pest Management, Ministry of Education, Entomological Museum, Northwest Sci-Tech University of Agriculture and Forestry, Yangling, Shaanxi 712100, China – <sup>2</sup> Department of Entomology, The Natural History Museum, Cromwell Road, South Kensington, SW7 5BD, United Kingdom [mew@nhm.ac.uk]

**Abstract.** Information is given on the Ledrinae and Penthimiinae described by D. Jacobi from 'Fukien' (China) in 1944. Types of the following species are studied: *Ledra imitatrix*, *Thlasia funebris*, *T. cingulata*, *Titura colorata* (Ledrinae) and *Penthimia castanaica* and *P. nigerrima* (Penthimiinae). In addition, the three following new Chinese Ledrinae are described from Jacobi's collection: *Thlasia jacobii* Zhang & Yang sp.n., *T. longicornis* Zhang & Yang sp.n. and *T. emmrichi* Zhang & Yang sp.n.

**Key words.** Cicadellidae, Ledrinae, Penthimiinae, Jacobi, types, description, China.

## Introduction

The collection of Auchenorrhyncha from Fukien (China) made by J. Klapperich in 1937 and deposited in the Zoologisches Forschungsinstitut und Museum Alexander Koenig (ZFMK) formed the subject of an article by D. Jacobi in 1944, in which several new species were described but no types designated. A subsequent reassessment of Klapperich's material in ZFMK was undertaken by B. Mannheims, who, on finding Jacobi's determination and type labels lacking, matched specimens to Jacobi's species descriptions. From these specimens, Mannheims labelled a holotype for those species described from a single specimen or (in error) selected and labelled a holotype and paratypes for those based on a series of specimens (syntypes). In the latter cases, some type specimens were transferred from ZFMK to the Museum für Tierkunde in Dresden (MTD), as was Jacobi's original intention (JACOBI 1944: 6). Subsequently, MANNHEIMS (1965) published his work, listing the species identified by Jacobi, together with their species number (as given in JACOBI 1944) and, when present, a working number, which was present on some specimens identified by Jacobi (see below). MANNHEIMS (1965) also listed the types he had identified, plus other specimens from Klapperich's 'Fukien' collection not seen by Jacobi. Those types deposited in MTD (see above) were later included in a list of all cicadellid types in MTD by EMMRICH (1973).

The first author, during his visit to The Natural History Museum in London, borrowed the material from MTD from the above collection to promote the study of Chinese leafhoppers. Among the loaned specimens were the types identified by Mannheims of Jacobi's ledrine and penthimiine species. Subsequently, the remaining type specimens of these species, from ZFMK, were studied. The identity of the borrowed material is discussed below with details of the male genitalia given for the first time. In addition to the 'Fukien' type material examined, three Chinese specimens of *Thlasia* from Jacobi's collection in MTD were also studied. These proved to be new species and are described below.

## Methods

In his 'Fukien' paper JACOBI (1944) gave code numbers (I–III) for the locality data of material he examined (see the 'Remarks' section of each Jacobi species listed below). An explanation of these numbers was given in the introduction to his paper thus: I: 'Fundort Kuantun mit I (April–Mai)'; II: 'Shaowu mit II (Mai–August)'; III: 'Kwangtseh mit III (Juli – September)'. In addition to the above data on Klapperich's specimens, given for the Jacobi species below, each specimen also bears an identification label giving the species name followed by 'Mannheims det. 1965'; the specimens from MTD additionally bear labels reading 'Staatl. Museum für Tierkunde, Dresden' and 'Mus. A. Koenig Bonn Tausch'. For the type information quoted below from MANNHEIMS (1965), 'B' refers to ZFMK and 'D' refers to MTD.

In addition to the above data on Klapperich's specimens, given for the Jacobi species below, each specimen also bears an identification label giving the species name followed by 'Mannheims det. 1965'; the specimens from MTD additionally bear labels reading 'Staatl. Museum für Tierkunde, Dresden' and 'Mus. A. Koenig Bonn Tausch'. For the type information quoted below from MANNHEIMS (1965), 'B' refers to ZFMK and 'D' refers to MTD.

## Systematic Part: I. Ledrinae

### General remark

The type material of four Jacobi 'Fukien' ledrine species, *Ledra sternalis*, *L. depravata*, *Thlasia symmetrica* and *Tituria costalis* (ZFMK), were not studied in the present work, but are listed below for completeness.

### *Ledra depravata* Jacobi

*Ledra depravata* Jacobi, 1944: 37, figs. 13a–b.

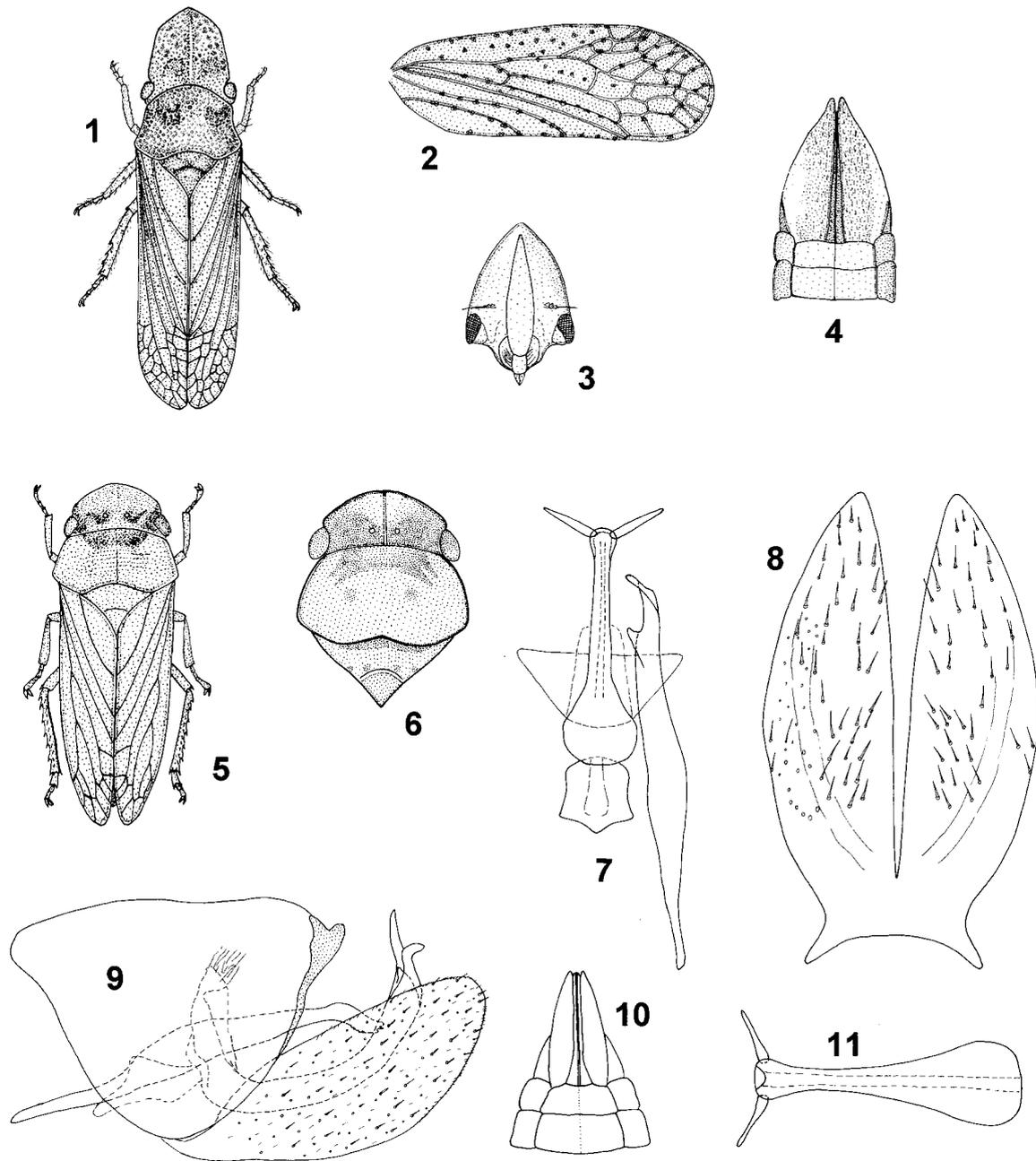
**Remarks.** Described from 'I: 2♂♂'. MANNHEIMS (1965) listed the following types and other material: '1♂ (B), 1♂ (D) + 1'. Not examined.

### *Ledra imitatrix* Jacobi

(Figs. 1–4)

*Ledra imitatrix* Jacobi, 1944: 38, figs. 14a–b.

**Description.** Length of ♂ 10.0 mm. Dorsum brown to reddish brown, tegminal veins brownish orange; venter yellowish brown. Head and thorax densely tuberculate dorsally. Vertex elongate, 2.0 mm long, and 2.2 mm wide, tectiform; coronal suture distinct; ocelli situated basally on vertex



**Figs. 1–4.** *Ledra imitatrix* Jacobi. 1: Dorsal habitus. 2: Fore wing. 3: Face. 4: Apical part of female abdomen, ventral view.

**Figs. 5–11.** *Thlasia cingulata* Jacobi. 5: Female dorsal habitus. 6: Male head and thorax, dorsal view. 7: Aedeagus, connective and paramere, ventral view. 8: Male subgenital plate, ventral view. 9: Male genital capsule, left lateral view. 10: Apical part of female abdomen, ventral view. 11: Aedeagus, dorsal view.

nearer to each other than to eyes. Face concave, twice as long as width; frontoclypeus elongate, clypeus small. Pronotum 1.8 mm shorter than vertex, convex with anterolateral corners depressed, slightly wider posteriorly than head; lateral margins concave, lateral carina indistinct. Tegmen with reticulate venation apically. Female pregenital sternite with posterior margin subtruncate medially.

**Remarks.** Described from 'III: 3♀'. MANNHEIMS (1965) listed the following types and other material: '2 (B), 1 (D) + 1 + 1'.

**Material.** Syntypes 2♀: CHINA, Fukien (=Fujian), Kwangtseh, 27.viii.1937, 24.ix.1937 (ZFMK), bearing the number '114a' in Jacobi's (?) hand. – Non-types: 1♀, same data, but 03.x.1937 (MTD).

#### *Ledra sternalis* Jacobi

*Ledra sternalis* Jacobi, 1944: 36, figs. 12a–b.

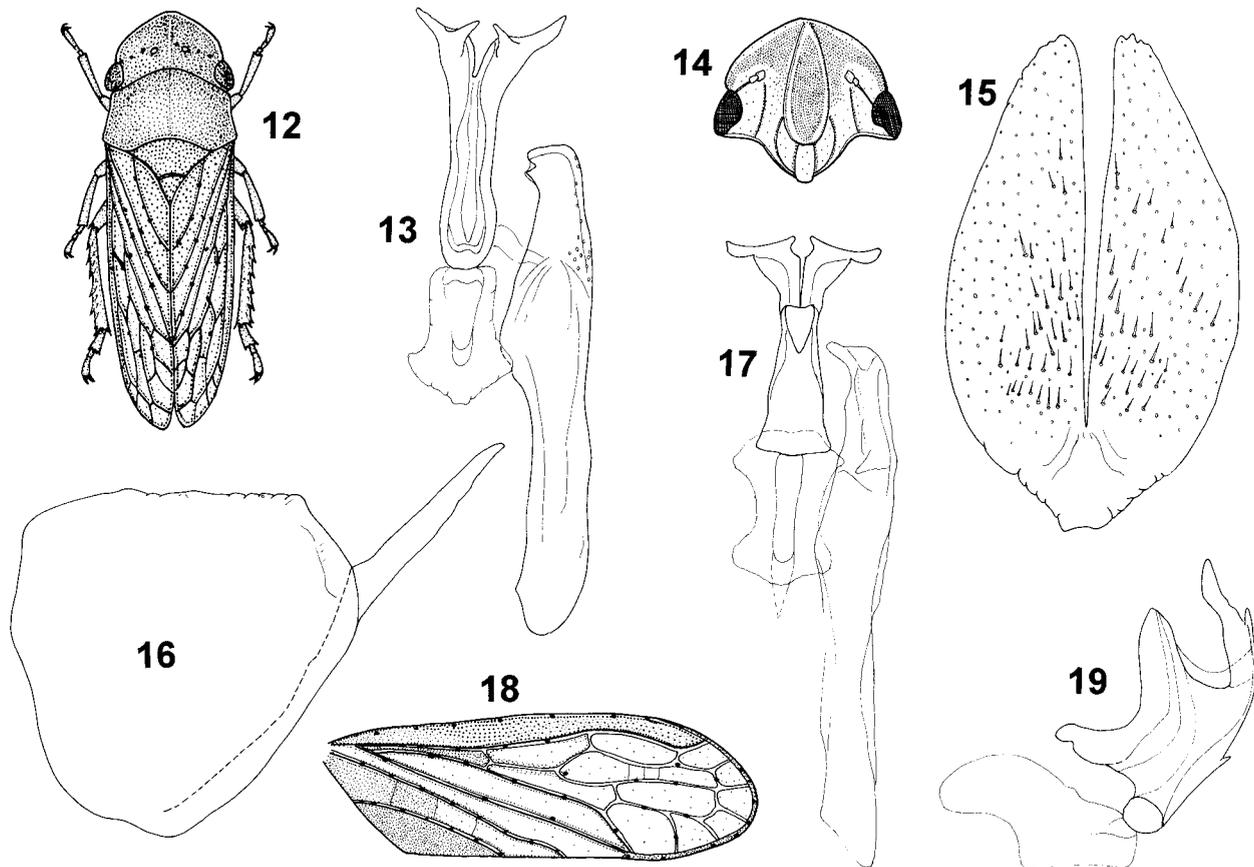
**Remarks.** Described from 'III: 1♂'. MANNHEIMS (1965) listed the following type: '1♂ (B)'. Not examined.

#### *Thlasia cingulata* Jacobi

(Figs. 5–11)

*Thlasia* [sic] *cingulata* Jacobi, 1944: 40

**Description.** Length of ♂ 7.0 mm, ♀ 7.8 mm. Yellowish brown; area adjacent eye on face, ocellular area and anteromedial area on pronotum, dark brown. Dorsum coarsely punctate. Head foliaceous, anterior margin rim-



**Figs. 12–19.** *Thlasia emmrichi* sp.n. 12: Dorsal habitus. 13: Aedeagus, connective and paramere, ventral view. 14: Face. 15: Male subgenital plate, ventral view. 16: Male pygofer. 17: Aedeagus, connective and paramere, dorsal view. 18: Fore wing. 19: Aedeagus and connective, left lateral view.

like; eyes small; vertex length 0.7 mm, width 2.2 mm; declivous; sides extended beyond eyes; depressed area lateral of ocellus and near eye; ocelli situated centrally at approximately basal one third; coronal suture indistinct. Face with lateral margins strongly insinuate; clypeus narrow; clypellus with sides convex; antennae situated at level with upper corners of eyes. Pronotum length 1.2 mm, width 2.8 mm; sides long and strongly carinate; some depressed areas anteriorly; transversely rugose; anterior margin relatively straight. Forewing appendix very narrow. Male pygofer triangularly produced with two short processes from dorsoposterior corner one from inner surface. Subgenital plate fused to valve, broadest at midlength tapered to apex, outer margin convex, inner margin straight in ventral view; numerous irregularly arranged short spine-like setae on ventral surface. Aedeagus broadly 'U'-shaped in lateral view, shaft elongate, cylindrical with a pair of short apical processes directed dorsolaterally. Paramere elongate with a subapical medial projection; apex foot-like; basal part narrow. Connective short with high dorsomedial keel. Female pregenital sternite with posterior margin slightly sinuate medially.

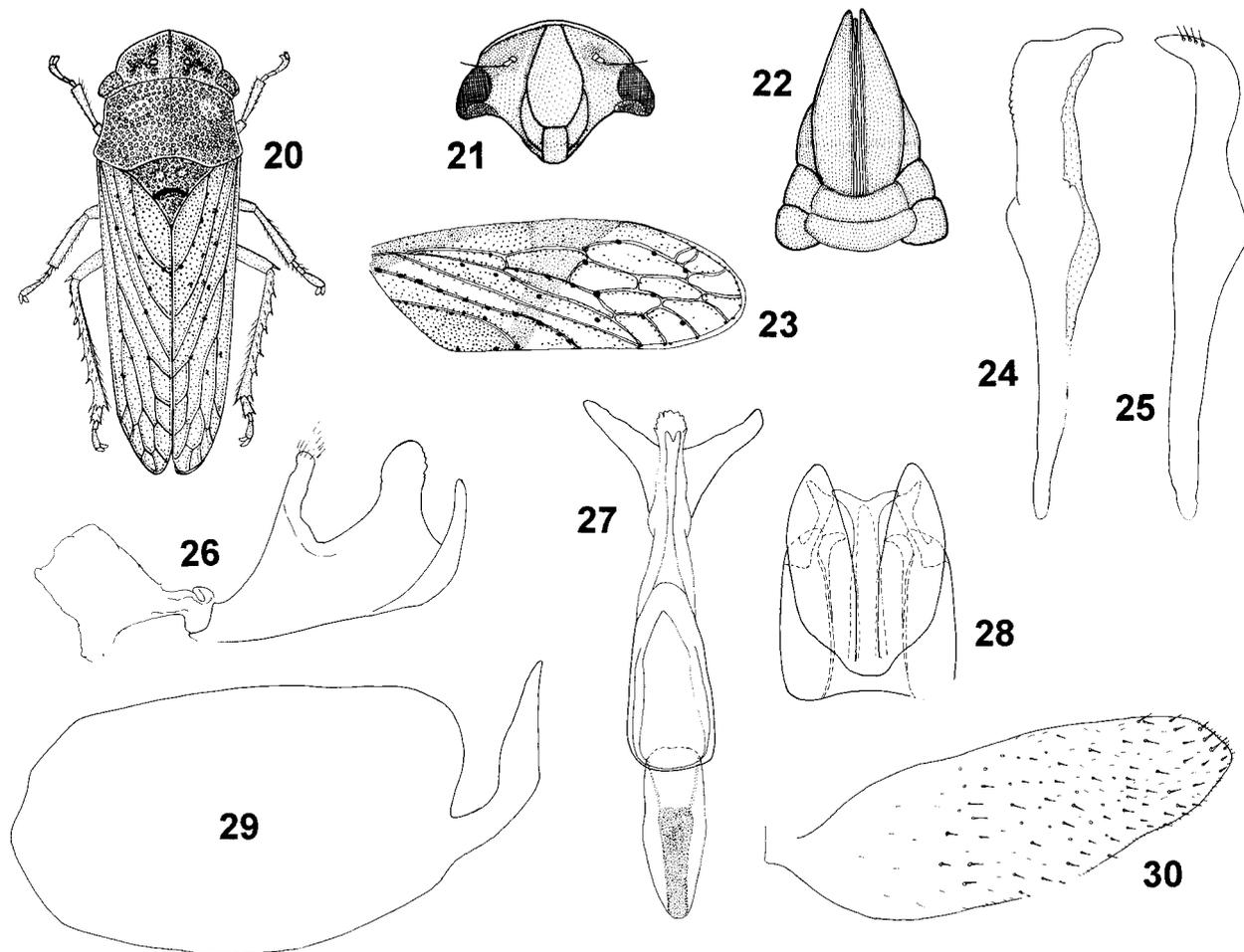
**Remarks.** Described from 'I: 7♂♀'. MANNHEIMS (1965) listed the following types and other material: '4 (B), 3 (D) + 0 + 1'.

**Material.** Syntypes 4♂, 1♀: CHINA, Fukien (=Fujian), Kuatun (2300m), 3♂ 10.iv.1938 (MTD, ZFMK x2); 1♀ 27.iv.1938 (MTD); 1♂ 6.iv.1938 (ZFMK). – Non-types: 1♀, same as above except 4.vi.1938 and bearing the number '120' in Jacobi's (?) hand (ZFMK).

***Thlasia emmrichi* Zhang & Yang sp.n.** (Figs. 12–19)

**Description.** Length of ♂ 7.0 mm. Pale brown; head with marginal rim yellow; upper facial area, clypeus and a few tubercles on veins of tegmina, dark brown. Dorsum coarsely punctate. Head foliaceous, anterior margin rim-like; eyes small. Vertex length 1.0 mm, width 2.0 mm; declivous; sides extended beyond eyes with depressed area lateral of ocellus and near eye; ocelli situated centrally at approximately basal one third; coronal suture indistinct. Face with lateral margins strongly insinuate, clypeus narrow, clypellus with sides convex, antennae situated at level with upper corners of eyes. Pronotum length 1.3 mm, width 2.4 mm; sides long and strongly carinate; some depressed areas anteriorly, transversely rugose; anterior margin relatively straight. Tegmen with appendix very narrow. Male pygofer triangularly produced with a very long posterior process from ventral margin. Subgenital plate fused to valve, broadest at midlength tapered to apex, outer margin convex, inner margin straight in ventral view; numerous irregularly arranged short spine-like setae on ventral surface. Aedeagus laterally compressed; shaft short, a pair of robust subapical processes from posterior surface each with a small subapical projection from medial surface. Paramere elongate with apex foot-like; basal part robust. Connective short, with high dorsomedial keel.

**Diagnosis.** This species is similar to *T. funebris* and *T. longicornis* in its short and laterally broad aedeagus and elongate pygofer process. It differs from these species in its longer vertex (length 0.50 × width) and from the former



**Figs. 20–30.** *Thlasia funebris* Jacobi. **20:** Male dorsal habitus. **21:** Face, ventral view. **22:** Apical part of female abdomen, ventral view. **23:** Tegmen. **24–25:** Paramere, lateral and dorsal view respectively. **26:** Aedeagus and connective, lateral view. **27:** Aedeagus and connective, dorsal view. **28:** Male genital capsule, ventral view. **29:** Male pygofer, left lateral view. **30:** Right male subgenital plate, ventral view.

species in having the pygofer process straight rather than dorsally curved and in having a small subapical projection from each subapical aedeagal process, and from the latter species in having the aedeagal process shorter and stouter.

**Derivatio nominis.** This species is named in honor of Dr. Emmrich in the Staatliches Museum für Naturkunde in Dresden for his kind help in loaning specimens and also his contribution to the taxonomy of Auchenorrhyncha.

**Material.** Holotype ♂: China, '1916 2', coll. Jacobi (MTD).

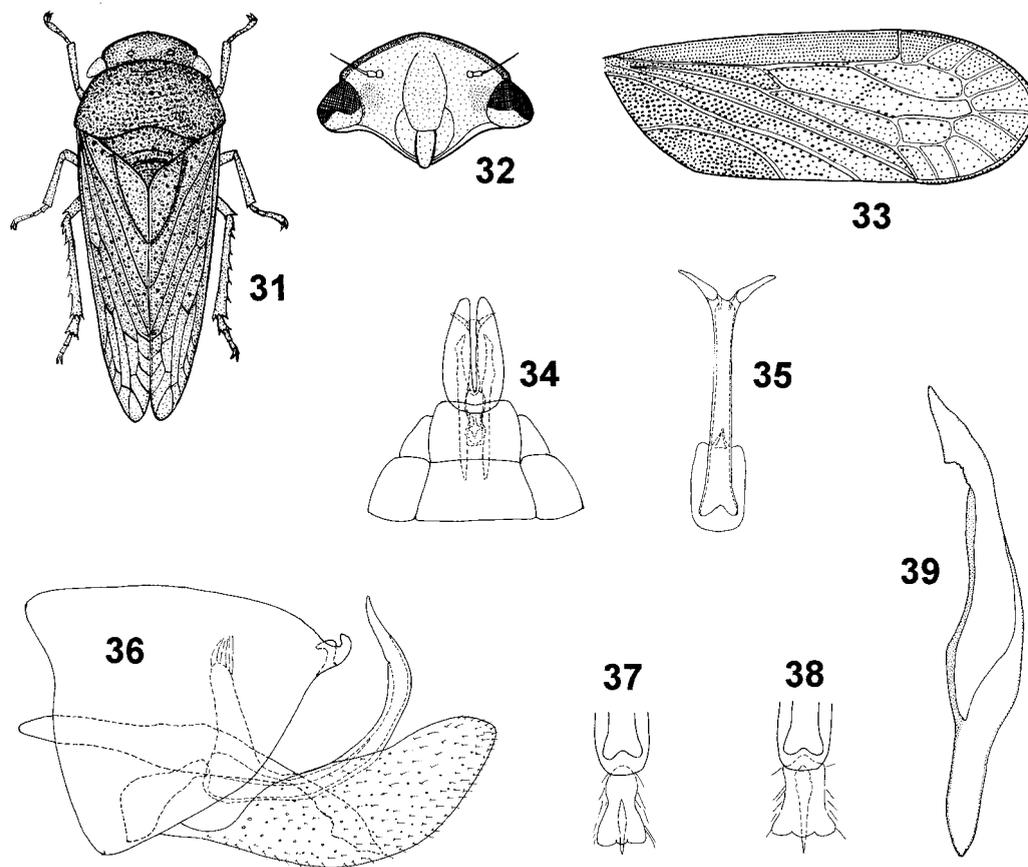
***Thlasia funebris* Jacobi** (Figs. 20–30)

*Thlasia* [sic] *funebris* Jacobi, 1944: 40.

**Description.** Length of ♂ 7.8 mm, ♀ 8.0 mm–9.0 mm. Venter and vertex dark brown (male), pale brown with upper area of face dark brown (female), marginal rim of head yellow; pronotum and scutellum pale brown; tegmen brownish hyaline with dark brown tubercles. Dorsum coarsely punctate. Head foliaceous, anterior margin rim-like; eyes small. Vertex length 1.0 mm (slightly longer in female), width 3.8 mm; declivous, sides extended beyond eyes, depressed area lateral of ocellus and near eye; ocelli situated centrally at approximately basal one third; coronal suture indistinct. Face with lateral margins strongly insinuate; clypeus narrow; clypellus with sides convex; antennae

situated at level with upper corners of eyes. Pronotum width 2.8 mm, length 1.6 mm; sides long and strongly carinate; some depressed areas anteriorly; transversely rugose; anterior margin relatively straight. Tegmen with additional cross veins in corium beyond outer apical cell; appendix very narrow. Female pregenital sternite with posterior margin slightly produced each side of midline. Male pygofer oblong, a long process ventroposteriorly, swollen medially and then gradually tapering to apex. Subgenital plate fused to valve, broadest at midlength tapered to apex, outer margin convex, inner margin straight in ventral view; numerous irregularly arranged short spine-like setae on ventral surface. Aedeagal shaft laterally compressed, short with a pair of moderately long processes subapically on posterior surface, directed laterally. Paramere elongate with apex foot-like; basal part narrow. Connective short, with high dorsomedial keel.

**Remarks.** Described from 'I: 3♀'. MANNHEIMS (1965) listed the following types and additional material: '2 B, 2 D +5 +5'. He also incorrectly labelled the female specimen dated 04.vi.1938 and the male dated 10.v.1938 as types. Based on the specimens originally described (3♀), Jacobi presumably did not consider the males described here (from Fukien but undescribed by Jacobi) as the same species. Two of these males (10.v.1938 and 12.v.1938) bear the number '119' in Jacobi's (?) hand.



**Figs. 31–39.** *Thlasia jacobii* sp.n. **31:** Dorsal habitus. **32:** Face. **33:** Tegmen. **34:** Apical part of male abdomen, ventral view. **35:** Aedeagus, ventral view. **36:** Male genital capsule, left lateral view. **37–38:** Connective and base of aedeagus, ventral and dorsal view respectively. **39:** Paramere.

**Material.** Syntypes 5♀ (3♀ originally listed): CHINA, Fukien (=Fujian), Kuatun (2300m), 20.v.1938 (x2) (ZFMK, MTD), 11.v.1938 (x1), 24.v.1938 (x2) (ZFMK). – Non-types: same data as types except, 1♀, 04.vi.1938 (MTD); 4♂, 08.v.1938 (MTD x1), 10.v.1938 and 12.v.1938 (x2) (ZFMK).

***Thlasia jacobii* Zhang & Yang sp.n.** (Figs. 31–39)

**Description.** Length of ♂ 8.0 mm. Dark reddish brown dorsally, paler ventrally; head with marginal rim blackish brown. Dorsum coarsely punctate. Head foliaceous, anterior margin rim-like; eyes small. Vertex length 0.7 mm, width 2.3 mm; declivous, sides extended beyond eyes, depressed area lateral of ocellus and near eye; ocelli situated centrally at approximately basal one third; coronal suture indistinct. Face with lateral margins strongly insinuate; clypeus narrow; clypellus with sides convex; antennae situated at level with upper corners of eyes. Pronotum length 1.8 mm, width 3.2 mm; sides long and strongly carinate; some depressed areas anteriorly; transversely rugose; anterior margin relatively straight. Tegmen with additional cross veins in corium beyond outer apical cell; appendix very narrow. Male pygofer triangularly produced, two short processes from dorsoposterior corner, one from inner surface. Subgenital plate fused to valve, broadest at midlength tapered to apex,

outer margin convex, inner margin straight in ventral view; numerous irregularly arranged short spine-like setae on ventral surface. Aedeagus broadly ‘U’-shaped in lateral view; shaft cylindrical, elongate, expanded basally with a pair of short stout apical processes directed dorsolaterally. Paramere elongate; apex foot-like with a distinct subapical heel; basal area robust. Connective short, with high dorsomedial keel.

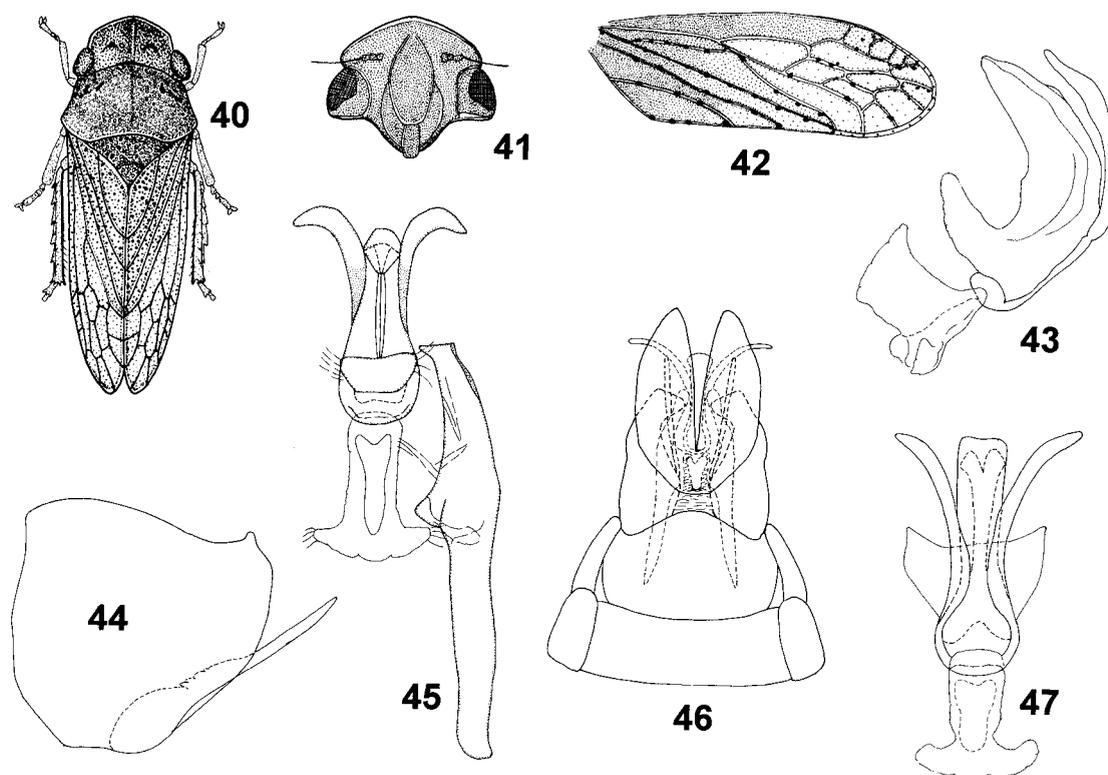
**Diagnosis.** This species is similar to *T. cingulata* in its triangular shaped pygofer in lateral view with a short process and its cylindrical aedeagal shaft but can be distinguished by its shorter vertex (length  $0.30 \times$  width), more elongate aedeagal shaft in lateral view and more robust paramere.

**Derivatio nominis.** This species is named in honor of Jacobi.

**Material.** Holotype ♂: CHINA, ‘1916 2’, coll. Jacobi (MTD).

***Thlasia longicornis* Zhang & Yang sp.n.** (Figs. 40–47)

**Description.** Length of ♂ 7.0 mm. Head and thorax dark brown with marginal rim of head yellow; tegmen with few brown tubercles on veins. Dorsum coarsely punctate. Head foliaceous, anterior margin rim-like; eyes small. Vertex length 0.8 mm, width 2.1 mm; declivous; sides extended beyond eyes; depressed area lateral of ocellus and near eye; ocelli situated centrally at approximately basal one third;



**Figs. 40–47.** *Thlasia longicornis* sp.n. 40: Dorsal habitus. 41: Face. 42: Tegmen. 43: Aedeagus and connective, lateral view. 44: Male pygofer, left lateral view. 45: Aedeagus, connective and paramere, dorsal view. 46: Apical part of male abdomen, ventral view. 47: Aedeagus and connective, ventral view.

coronal suture indistinct. Face with lateral margins strongly insinuate; clypeus narrow; clypellus with sides convex; antennae situated at level with upper corners of eyes. Pronotum length 1.8 mm, width 3.2 mm; sides long and strongly carinate; some depressed areas anteriorly; transversely rugose; anterior margin relatively straight. Tegmen with additional cross veins in corium beyond outer apical cell; appendix very narrow. Male pygofer with a long posterior process from anterior posterior corner. Subgenital plate fused to valve, broadest at midlength tapered to apex, outer margin convex, inner margin straight in ventral view; numerous irregularly arranged short spine-like setae on ventral surface. Aedeagal shaft laterally compressed, moderately long with a long process arising basally from each side of posterior margin. Paramere elongate with apex foot-like. Connective short, with high dorsomedial keel.

**Diagnosis.** This species is similar to *T. funebris* and *T. emmrichi* in its short and laterally broad aedeagus and elongate pygofer process. It differs from these species in its more elongate aedeagal processes and from the former species in its longer vertex (length  $0.38 \times$  width), straight rather dorsally curved pygofer processes and from the latter species by its shorter vertex.

**Derivatio nominis.** This species is named for its elongate aedeagal processes.

**Material.** Holotype ♂: CHINA, '1916 2', coll. Jacobi (MTD).

#### *Thlasia symmetrica* Jacobi

*Thlasia* [sic] *symmetrica* Jacobi, 1944: 40.

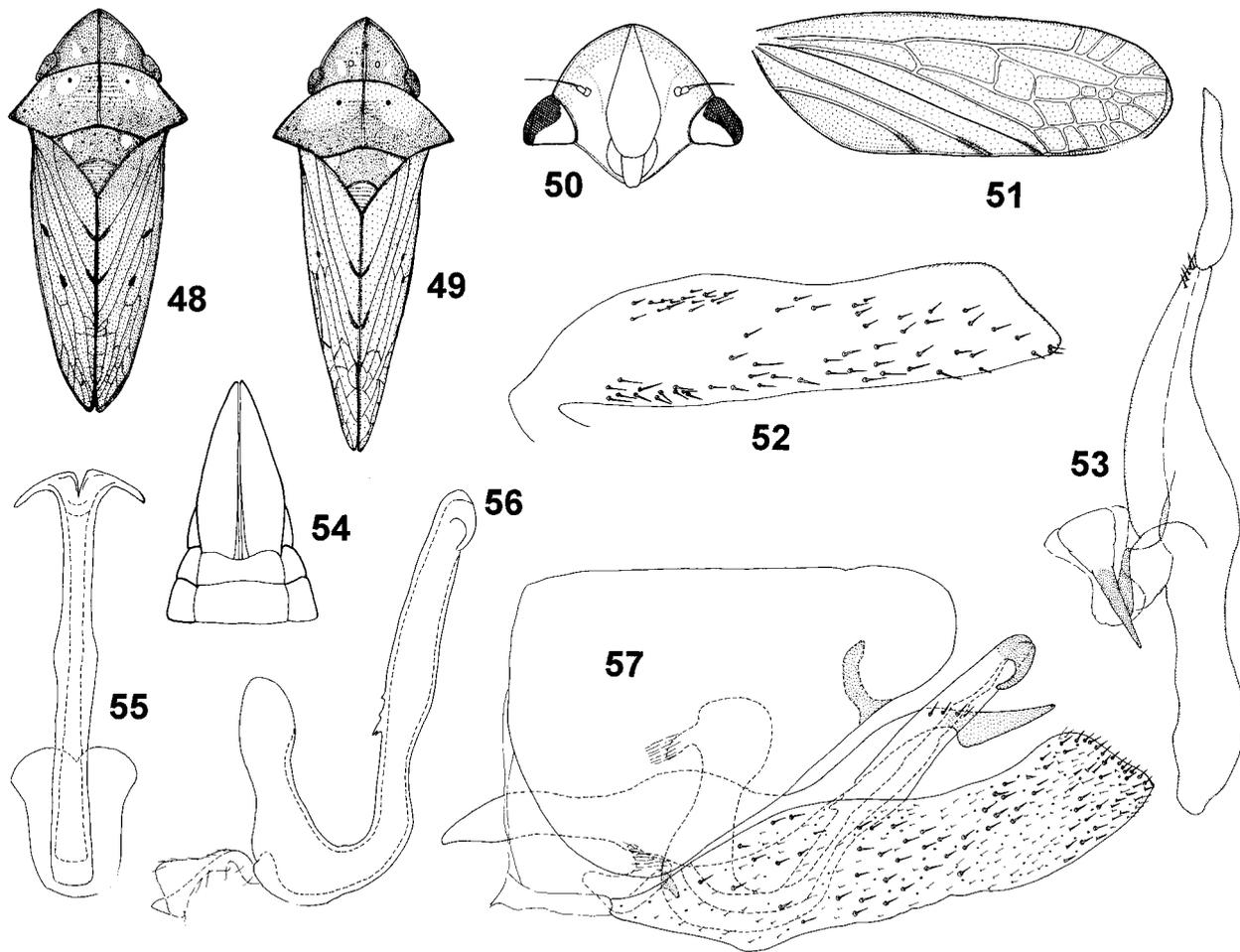
**Remarks.** Described from 'III 1♀'. MANNHEIMS (1965) listed the following types: '1♀ (B)'. Not examined.

#### *Titura colorata* Jacobi

(Figs. 48–57)

*Titura colorata* Jacobi, 1944: 38.

**Description.** Length of ♂ 11.5 mm, ♀ 14.5 mm. Head and thorax brown dorsally, venter, spot lateral of ocellus and pronotum anteriorly, yellow; upper areas of face and sometimes on clypeus, reddish. Tegmen with veins A1 and A2 dark brown apically and vein M touched with two dark brown spots. Vertex length ♂ 1.5 mm, ♀ 2.0 mm, interocular width ♂ 4.2 mm, ♀ 4.1 mm, shorter and narrower than pronotum, foliaceous, slopping from mid-line to lateral margins, triangular, median longitudinal carina distinct; ocellus situated on anterior inter-



**Figs. 48–57.** *Tituria colorata* Jacobi. 48–49: Dorsal habitus, male and female respectively. 50: Face. 51: Tegmen. 52: Left male subgenital plate, ventral view. 53: Connective and paramere, dorsal view. 54: Apical part of female abdomen, ventral view. 55–56: Aedeagus posterior and left lateral view, respectively. 57: Male genital capsule, left lateral view.

ocular line; densely rugose. Pronotum with lateral corners strongly triangularly produced and upturned apically; a faint median longitudinal ridge, more distinct posteriorly, variable; punctate and coarsely rugose. Tegmen densely punctate, appendix very narrow, apical veins reticulate. Female pregenital sternite shorter than preceding segment, posterior margin slightly concave medially. Ovipositor not extended to apex of pygofer. Male pregenital sternite longer than preceding segment posterior margin subtruncate. Pygofer, in lateral aspect, broad basally, tapered to truncate dorso-posterior corner; a hook-like internal process arising near apex of ventral margin, curved dorsad. Subgenital plate strap-like, inner margin straight in ventral view, outer margin sinuate, with dense spine-like setae. Aedeagus with a well developed basal apodeme, shaft elongate, cylindrical with a pair of short apical processes, directed laterally; a few teeth slightly basad of midlength centrally on anterior surface. Paramere elongate, foot-like apically. Connective short with a high dorso-medial keel.

**Remarks.** Described from 'III: 1♂, 3♀'. MANNHEIMS (1965) listed the following types: 'III: 2 (B), 2 (D)'.

**Material.** CHINA, Fukien (= Fujian), 1♂, 24.ix.1937 (MTD), 1♀, 03.x.1937 (MTD), 2♀, same (ZFMK), bearing the number '115' in Jacobi's (?) hand.

### *Tituria costalis* Jacobi

*Tituria costalis* Jacobi, 1944: 39.

**Remarks.** Described from 'III: 1♀'. MANNHEIMS (1965) listed the following type: '1♀ (B)'. Not examined.

## Systematic Part: II. Penthemiinae

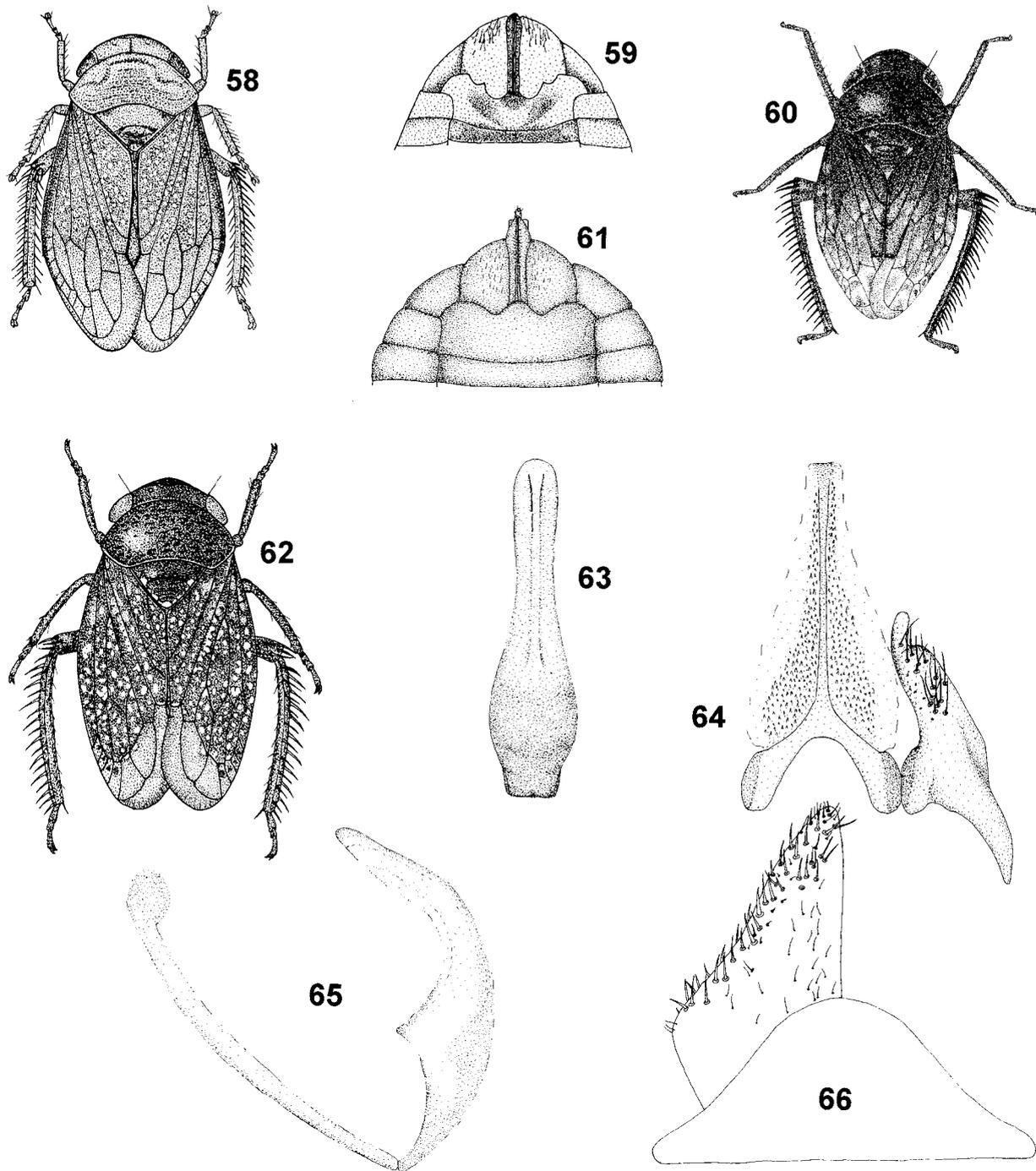
### *Penthimia castanaica* Jacobi

(Figs. 80–81)

*Penthimia castanaica* Jacobi, 1944: 48

**Remarks.** Described from 'I, III: 5♀♀' with data: 'Fundort Kuatan mit I (April – Mai)' and 'Kwangtseh mit III (Juli–September)'. MANNHEIMS (1978) listed the following types: '3♀, (B), 2, ♀ (D)'. This species can be distinguished by its relatively large size (7.2 mm), reddish-brown colour with dorsum without spots and venter marked with blackish-brown and the female pregenital sternite with a lateral tooth each side of a medial lobe (Fig. 59).

**Material.** Syntype ♀: CHINA, 'Fukien (=Fujian), Kwangtseh, 17.ix.1937 (MTD).



**Figs. 58–59.** *Penthimia castanaica* Jacobi. **58:** Dorsal habitus. **59:** Apex of female abdomen, ventral view.

**Figs. 60–61.** *Penthimia* sp. 'A'. **60:** Dorsal habitus. **61:** Apex of female abdomen, ventral view.

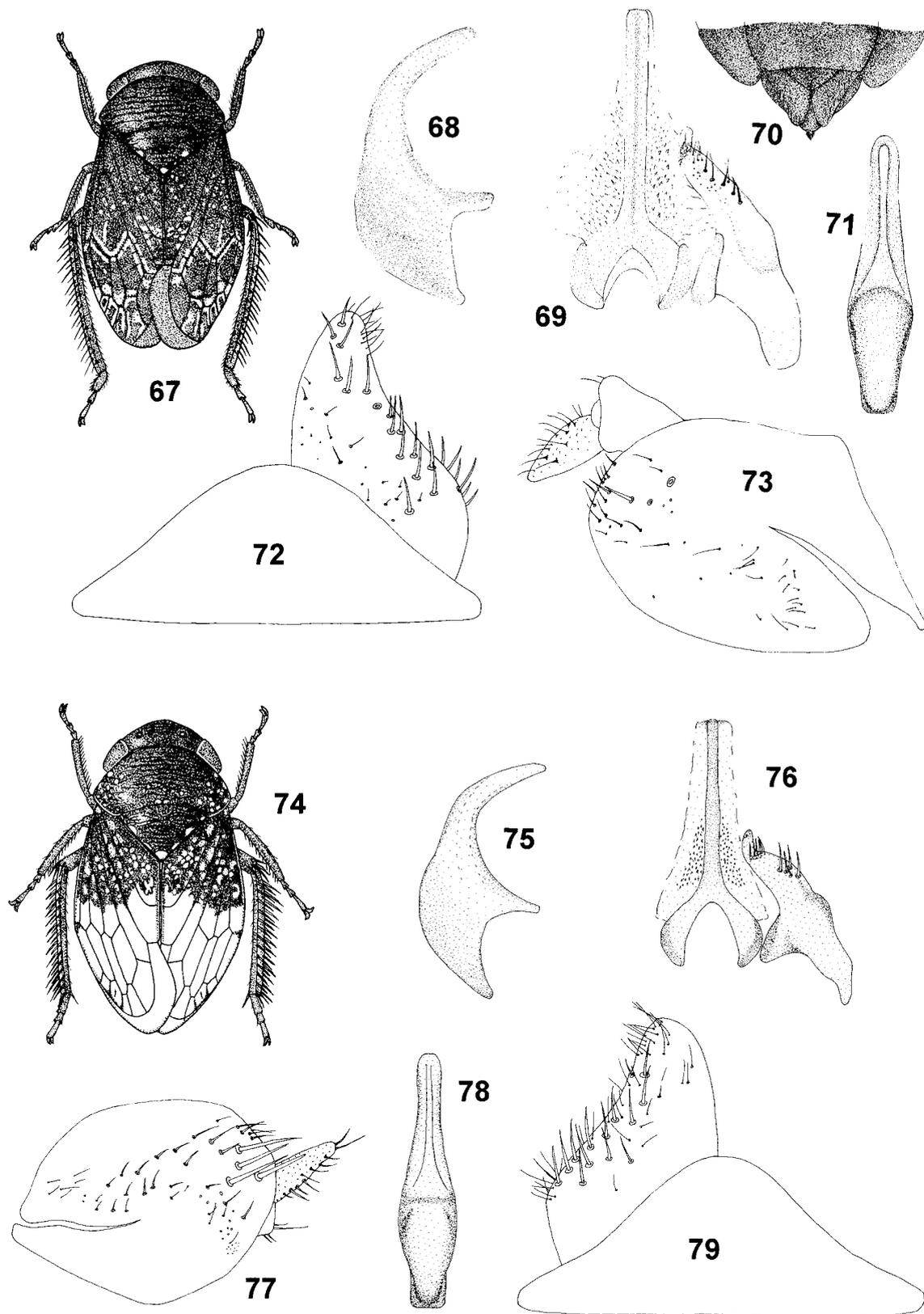
**Figs. 62–66.** *Penthimia* sp. 'B'. **62:** Dorsal habitus. **63:** Aedeagus, posterior view. **64:** Paramere and connective, dorsal view. **65:** Aedeagus and connective, left lateral view. **66:** Valve and left subgenital plate, ventral view.

### *Penthimia nigerrima* Jacobi

*Penthimia nigerrima* Jacobi, 1944: 48

**Remarks.** Described from 'I–III: 10♂♀. MANNHEIMS (1965) listed the following types: '5 (B), 5 (D)'. From the type series examined it is possible to recognise five species. Normally one of these species would be identified as *nigerrima* and a lectotype designated. However, in this case this action is considered inappropriate as a revision of the sub-

family from the Oriental region is needed to clarify the identities of several described *Penthimia* species (see below). To identify *nigerrima* at this stage may result its future synonymy when other described species are better known. In consequence *nigerrima* remains a species of uncertain identity and the five species recognised in its type series are referred to as species A–E below. All these species and *castanaica* Jacobi appear distinct from the



**Figs. 67–73.** *Penthimia* sp. 'C'. 67: Dorsal habitus. 68: Aedeagus, right lateral view. 69: Paramere and connective, dorsal view. 70: Apex of male abdomen, ventral view. 71: Aedeagus, posterior view. 72: Valve and right subgenital plate, ventral view. 73: Male pygofer and anal tube, right lateral view.

**Figs. 74–79.** *Penthimia* sp. 'D'. 74: Dorsal habitus. 75: Aedeagus, right lateral view. 76: Paramere and connective, dorsal view. 77: Male pygofer and anal tube, left lateral view. 78: Aedeagus, posterior view. 79: Valve and left subgenital plate, ventral view.

species described by DISTANT (1907) from India (types in BMNH examined) but need to be compared to the following *Penthimia* species: *arcuata* Cai & Shen, *densa* Kuoh and *nitida* (Lethierry) from mainland China, *flavinotum*, *formosana*, *guttula* and *theae* (all Matsumura) from Taiwan, *maikoensis* Matsumura from Japan and *fuscomaculosa* Kwon & Lee from Korea.

***Penthimia* species A** (Figs. 60–61)

**Remarks.** This species is similar to *Penthimia attenuata* Distant in its relatively small size (4.0–4.6 mm), dark appearance and shape of the female pregenital sternite (Fig. 61). In the absence of males no further identification is possible at this stage.

**Material.** Syntypes of *P. nigerrima*, 2♀: CHINA, Fukien (=Fujian), Shaowu, 500m, 27.v.1937 (ZFMK), 29.5.1937 (MTD).

***Penthimia* species B** (Figs. 62–66)

**Remarks.** The ZFMK syntype bears the number '130' in Jacobi's (?) hand. This species can be distinguished by its relatively large size (6.3–6.6 mm) with numerous and relatively evenly spaced yellowish-brown fore wing spots (Fig. 62). Compared to the other species figured here, the aedeagus (Fig. 65) is relatively narrow.

**Material.** Syntypes of *P. nigerrima*, 2♂: CHINA, Fukien (=Fujian), Kwangtseh, 17.ix.1937 (ZFMK), (?07.viii.1937 (MTD).

***Penthimia* species C** (Figs. 67–73)

**Remarks.** The ZFMK syntype bears the number '130' in Jacobi's (?) hand. This species, which is similar to *P. densa* Kuoh, can be distinguished by the following combination of characters: moderately large size (5.2–5.5 mm), blackish-brown, scutellum with 2–3 very small yellowish spots on lateral margin and one apically, forewings with a few small yellowish-brown spots over basal half, a more denser area of yellow marks across wing from apex of clavus, and outer apical cells and apex of outer subapical cells marked with whitish-hyaline. Male genitalia as in Figs. 68–73.

**Material.** Syntypes of *P. nigerrima*, 2♂: CHINA, Fukien (=Fujian), Kuatun, 2300 m, 15.iv.1938 (ZFMK), 25.iv.1938 (MTD).

***Penthimia* species D** (Figs. 74–79)

**Remarks.** This species can be distinguished by its relatively small size (4.5–4.8 mm) and apical 2/3 of the fore wing whitish hyaline. In addition, the following characters apply: overall blackish-brown, pronotum with a few yellowish spots laterally (MTD specimen) or with a yellowish crescent shaped mark medially at posterior margin (ZFMK specimen); scutellum with 3 yellowish spots on lateral margin and one apically; basal area of forewing with a few yellowish-brown spots. Male genitalia as in Figs. 75–79.

**Material.** Syntypes of *P. nigerrima*, 2♂: CHINA, Fukien (=Fujian), Shaowu, 500 m, 25.v.1937 (ZFMK), 09.vii.1937 (MTD).

***Penthimia* species E**

**Remarks.** The examined syntype bears the number '130' not (?) in Jacobi's hand. This species can be distinguished by the following combination of characters: relatively small size (4.9 mm), head blackish brown; pronotum yellowish brown with a medial yellowish crescent shaped mark at posterior margin; scutellum brown with a whitish spot apically and on lateral margin, a dark brown triangle at each basal corner and a small dark brown basal spot each side of midline; fore wings with basal half brown with pale spots, apical half whitish hyaline; sternum dark brown, tibia yellow dorsally.

**Material.** Syntype of *P. nigerrima*, 1♂: CHINA, Fukien, Shaowu, 500 m, 18.vii.1937 (ZFMK).

**Acknowledgements**

For their help with the loan of specimen we would like to thank Dr R. Emmrich (MTD) and Dr K. Lampe (ZFMK).

**References**

- DISTANT, W.L. 1907. The fauna of British India including Ceylon and Burma. Rhynchota. Vol. IV Homoptera and appendix (Pt.), ed. Lt.Col.C.T. BINGHAM. – Taylor and Francis, London, 501pp.
- EMMRICH, R. 1973. Das Typen-Material der Zikaden (Homoptera, Auchenorrhyncha) des Staatlichen Museums für Tierkunde Dresden. I. und II. Teil: Cicadelloidea und Membracoidea. – Entomologische Abhandlungen **39**: 247–267.
- JACOBI, D. 1944. Die Zikadenfauna der Provinz Fukien in Südchina und ihre tiergeographischen Beziehungen. – Mitteilungen der Münchner Entomologischen Gesellschaft **34**: 5–66.
- MANNHEIMS, B. 1965. Die Cicaden-Typen im Zoologischen Forschungsinstitut und Museum A. Koenig. – Bonner Zoologische Beiträge **16**: 352–356.