



Two new species of genus *Deferunda* Distant (Hemiptera: Fulgoromorpha: Achilidae) from southwest China

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Abstract

Two new species of *Deferunda* Distant, 1912 (Hemiptera: Fulgoroidea: Achilidae: Plectoderini), *D. diana* **sp. nov.** (China: Yunnan) and *D. qiana* **sp. nov.** (China: Guizhou, Yunnan), from southwest China, are described. The generic characters are modified, including the addition of male genitalia characters. A key for identifying the known species of *Deferunda* is provided.

Key words: Fulgoroidea, Oriental region, planthopper

Introduction

The achilid genus *Deferunda* Distant (Hemiptera: Fulgoroidea: Achilidae: Plectoderini) was established by Distant (1912) based on specimens of *D. stigmatica* Distant, 1912 from Bengal. Eleven species have now been recorded in the genus: *D. acuminata* Chou & Wang, 1985 (China) (in Chou *et al.* 1985), *D. albomaculata* (Muir, 1922) (India), *D. incompta* Dlabola, 1961 (Tajikistan), *D. lineola* (Matsumura, 1914) (Japan?), *D. majella* (Kirkaldy, 1906) (Australia), *D. philippina* (Melichar, 1914) (Philippines), *D. rubrostigmata* (Matsumura, 1914) (Japan; Korea; China), *D. stigmatica* Distant, 1912 (India), *D. striata* Wang & Liu, 2008 (China) (in Wang *et al.* 2008), *D. trimaculata* Wang & Peng, 2008 (China) (in Wang *et al.* 2008), and *D. truncata* Chen, Yang & Wilson, 1989 (China) (Fig. 23).

To date, five species in the genus are known from China, namely *D. rubrostigma* (Yunnan, Hunan, and Taiwan), *D. acuminata* (Hainan), *D. truncata* (Taiwan), *D. trimaculata* (Hainan), and *D. striata* (Hainan) (Matsumura, 1914; Chou *et al.*, 1985; Chen *et al.* 1989; Wang *et al.* 2008) (Fig. 23).

During the course of studying species biodiversity of the suborder Auchenorrhyncha in southwest China, two specimens belonging to undescribed species of the genus *Deferunda* were found. The purpose of this paper is to describe two new species and to provide an identification key to the known species of *Deferunda*.

Materials and methods

Morphological techniques and terminology follows Chen *et al.* (1989); male genitalia follows Yang and Chang (2000). Dry specimens were used for the description and illustration. External morphology was observed under a stereoscopic microscope and characters were measured with an ocular micrometer. The genital segments of the examined specimens were macerated in 10% KOH and drawn from preparations in glycerin jelly using a Leica MZ 12.5 stereomicroscope. Illustrations were scanned with Canon CanoScan LiDE 200 and imported into Adobe Photoshop 8.0 for labeling and plate composition. Spinal formula means the numbers of apical spines of the hind tibiae and 1st and 2nd hind tarsomeres.

Specimens examined are deposited in the Institute of Entomology, Guizhou University, Guiyang, Guizhou Province, China (IEGU).

Taxonomy

Deferunda Distant, 1912

(Figs 1–22)

Majella Kirkaldy, 1906:421 preoccupied by *Majella* Ortmann 1893

Deferunda Distant, 1912:186; Fennah, 1950: 104; Chen *et al.*, 1989: 57; Wang *et al.*, 2008: 775.

Okatropis Matsumura, 1914:272, synonymised by Fennah 1950: 104.

Majellana Metcalf, 1948:63, *nom. nov.* for *Majella* Kirkaldy, synonymised by Fennah 1950: 104.

Type species. *Deferunda stigmatica* Distant, 1912: 186, by original designation.

Description. The distinctive characters used by Fennah (1950) and Chen, Yang and Wilson (1989) are modified as follows.

Head and thorax. Head with eyes (Figs 1, 13) distinctly narrower than pronotum (0.7:1). Vertex not declivous, produced before eyes two-thirds to a half length of vertex, disk strongly depressed, wider between basal angles than long in middle line (0.88–1.3:1), wider between basal angles than at apex (5:1), posterior margin subtruncate or slightly concave, anterior half of median carina obsolete, basal half prominent, lateral margins distinctly foliate, highly elevated, diverging posteriorly. Frons (Figs 2, 14) slightly convex in profile, longer in middle line than widest part (1.16–1.36:1), basal margin roundly convex or truncate one-fifth as wide as broadest part; median carina simple, with basal half obsolete, lateral margins strongly foliate basally, extending laterad beneath antennae, hence incurved into suture, disk of frons depressed at basal third, or apparently so on account of deeply foliate margins. Postclypeus shorter than frons in middle line about 0.50–0.83:1, nearly straight in profile. Eyes concave beneath. Ocelli detached from eyes. Antennae subovate. Rostrum relatively short, reaching median trochanters, with apical and subapical segments equal in length. Pronotum shorter than vertex (0.52–0.64:1), almost as long behind eyes in middle line, disk slightly depressed between median and lateral carina, anterior margin angularly or rounded convex, lateral carinae diverging posteriorly, reaching hind margin, 1.6–2.0 times length of median line, each lateral lobe with four obsolete ridges. Mesonotum longer than vertex and pronotum combined (1.88–2.11:1). Forewing (Figs 3, 15) costal margin slightly convex, longer than wide (2.4–3.1:1), Sc+R forked in basal third of forewing, Cu₁ forked level with union of claval veins, M forked level with node, Cu₁ deeply convex distad of claval apex, almost reaching M, hence slightly detached; with a callus in costal cell, six apical areoles distad of stigma, apical part behind apex of clavus dropping and covering apex of abdomen. Spinal formula of hind leg 8–7(8)–6(5).

Male genitalia. Anal segment in dorsal view (Figs 5, 16) rounded with apical margin truncate or emarginated, anal style moderately long. Pygofer in profile (Figs 6, 17) distinctly shorter dorsally than ventrally, anterior margin concave, posterior margin convex caudad, pygofer in ventral view (Figs 7, 18) with a pair of medioventral processes. Aedeagus (Figs 11, 12, 21, 22) with phallobase dividing into four lobes at apex, ventral lobe usually cleft at apex medially. Phallic appendages slender, very long, tubular, tapering apically. Genital styles (Figs 8–10, 19, 20) narrow at base, and widening apically, each nearly triangular, outer margin usually with one or two teeth apically and subapically. Connective (Figs 8, 19) very long.

Host plant. Unknown.

Distribution. Oriental, Palaearctic and Australian regions (Fig. 23).

Checklist of species of *Deferunda* Distant, 1912

Deferunda acuminata Chou & Wang, 1985; south China (Hainan).

Deferunda albomaculata (Muir, 1922); India.

- Deferunda diana* Chen & He, **sp. nov.**; southwest China (Yunnan).
Deferunda incompta Dlabola, 1961; Tajikistan.
Deferunda lineola (Matsumura, 1914); Japan?.
Deferunda majella (Kirkaldy, 1906); Australia.
Deferunda philippina (Melichar, 1914); Philippines.
Deferunda qiana Chen & He, **sp. nov.**; southwest China (Guizhou, Yunnan).
Deferunda rubrostigmata (Matsumura, 1914); Japan, Korea, southeast China (Taiwan).
Deferunda stigmatica Distant, 1912; Bangladesh ("Bengal").
Deferunda striata Wang & Liu, 2008; south China (Hainan).
Deferunda trimaculata Wang & Peng, 2008; south China (Hainan).
Deferunda truncata Chen, Yang & Wilson, 1989; southeast China (Taiwan).

Key to species of the genus *Deferunda* of the world

- 1 Frons centrally with a conversed V-shaped dark marking (Fig. 2) 2
 - Frons without any dark marking (Fig. 14) 8
 2(1) Hind tibiae without lateral spine (Distant 1912) *D. stigmatica* Distant
 - Hind tibiae with a lateral spine at middle near to base 3
 3(2) Anterior margin of vertex truncate (Chen *et al.*, 1989: Fig. 28: A); apical third of forewing without milky-white spots (Chen *et al.*, 1989: Fig. 28: D) *D. truncata* Chen, Yang & Wilson
 - Anterior margin of vertex acute (Fig. 1); apical third of forewing with milky-white spots (Fig. 3) 4
 4(3) Vertex subequal to pronotum in middle line (Melichar 1914) *D. philippina* (Melichar)
 - Vertex distinctly longer than pronotum in middle line (Fig. 1) 5
 5(4) Lateral margins of frons without narrow dark stripes (Fig. 2) *D. diana* **sp. nov.**
 - Lateral margins of frons with several narrow dark stripes (Matsumura 1914: Fig. 5: b; Chou & Wang 1985: Fig. 28: b; Chen *et al.* 1989: Fig. 27: B) 6
 6(5) Vertex relatively short, as long in middle line as broad at base, median carina bordered with short longitudinal black stripes apically (Matsumura 1914) *D. lineola* (Matsumura)
 - Vertex relatively long, longer in median line than broad at base, median carina bordered with longitudinal dark stripes from apex to base (Matsumura 1914: Fig. 5: a; Chou & Wang 1985: Fig. 28: a; Chen *et al.* 1989: Fig. 27: A) 7
 7(6) Forewing with Cu₁a deeply convex distad of clavus, reaching M (Chen *et al.* 1989: Fig. 27: D)
 *D. rubrostigma* Matsumura
 - Forewing with Cu₁a straight or slightly convex distad of clavus, not reaching M (Figs 3, 15; Chou & Wang 1985: Fig. 28: a) *D. acuminata* Chou & Wang
 8(1) Forewing with irregular yellowish brown transverse markings (Wang *et al.* 2008: Figs 10, 20, 21)
 *D. striata* Wang & Liu
 - Forewing without above markings (Figs 3, 15; Wang *et al.* 2008: Figs 2, 18) 9
 9(8) Lateral margins of frons with five narrow dark brown stripes (Wang *et al.* 2008: Fig. 1); forewing with costal margin red, apical region having three red triangular markings (Wang *et al.* 2008: Figs 2, 18)
 *D. trimaculata* Wang & Peng
 - Lateral margins of frons without above stripes (Fig. 14); forewing without above marking (Figs 3, 15) 10
 10(9) Apex of clavus sanguineous with a large bluish-black spot; base of first apical cell sanguineous (Kirkaldy 1906)
 *D. majella* (Kirkaldy)
 - Forewing not as above 11
 11(10) Body relatively small, body length including forewing ♂ 4.5mm, ♀ 4.7mm; pygofer with medioventral processes diverging apically (Dlabola 1961: Fig. 32) *D. incompta* Dlabola
 - Body relatively large, body length including forewing ♂ 5.10-5.35mm, ♀ 5.50-5.70 mm; pygofer with medioventral processes parallel apically (Fig. 18) 12
 12(11) Vertex with median carina bordered with dark brown stripes at apex (Fig. 13); frons and basal half of clypeus yellowish white (Fig. 14); gena with a dark brown spot near beneath antenna; hind tibiae with a brown marking apically; genital style in lateral view with two processes on outer margin apically and subapically (Fig. 20)
 *D. qiana* **sp. nov.**
 - Vertex with median carina bordered with longitudinal dark brown stripes from apex to base (Muir 1922); frons light brown, clypeus dark brown (Muir 1922); gena without dark brown spot; hind tibiae with two brown mark-

ings (Muir 1922); genital style in lateral view with one process on outer margin subapically (Muir 1922)
..... *D. albomaculata* (Muir)

***Deferunda diana* sp. nov.**

(Figs 1–12)

Description. Body length (from apex of vertex to tip of forewings): male 4.40–4.60 mm (N=10), female 4.75–4.95 mm (N=12); forewing length: male 3.55–3.75 mm (N=10), female 3.80–4.00 mm (N=12).

Coloration. General color yellowish white to fuscous. Vertex (Fig. 1) yellowish white with two longitudinal stripes along middle line from base to apex, fuscous, lateral carinae brown. Frons (Fig. 2) with apex brown, basal half with an inverse V-shape marking, blackish brown. Clypeus brown. Rostrum brown except apex fuscous. Genae yellowish white, with three fuscous transverse stripes before eyes, one dorsad, areas beneath antenna with a brown marking. Eyes blackish brown, ocelli reddish brown. Antennae yellowish brown to brown. Pronotum (Fig. 1) yellowish brown, lateral areas with five fuscous spots, areas behind eyes blackish, areas between lateral carinae fuscous. Mesonotum (Fig. 1) yellowish brown, with irregular brown to fuscous markings. Forewing (Fig. 3) pale brown to brown, distributing irregular brown to fuscous markings, along veins, with narrow black stripes, many white spots scattered, most of them near veins, callus blackish brown, tinged with reddish orange margin. Hindwing (Fig. 4) pale brown, veins brown, with a brown marking at anal region. Thorax with ventral areas brown to fuscous. Legs yellowish brown to brown, with fuscous spots. Abdomen blackish brown, except lateral margin and posterior margin of each segment, brown. Genital segment yellowish brown to brown.

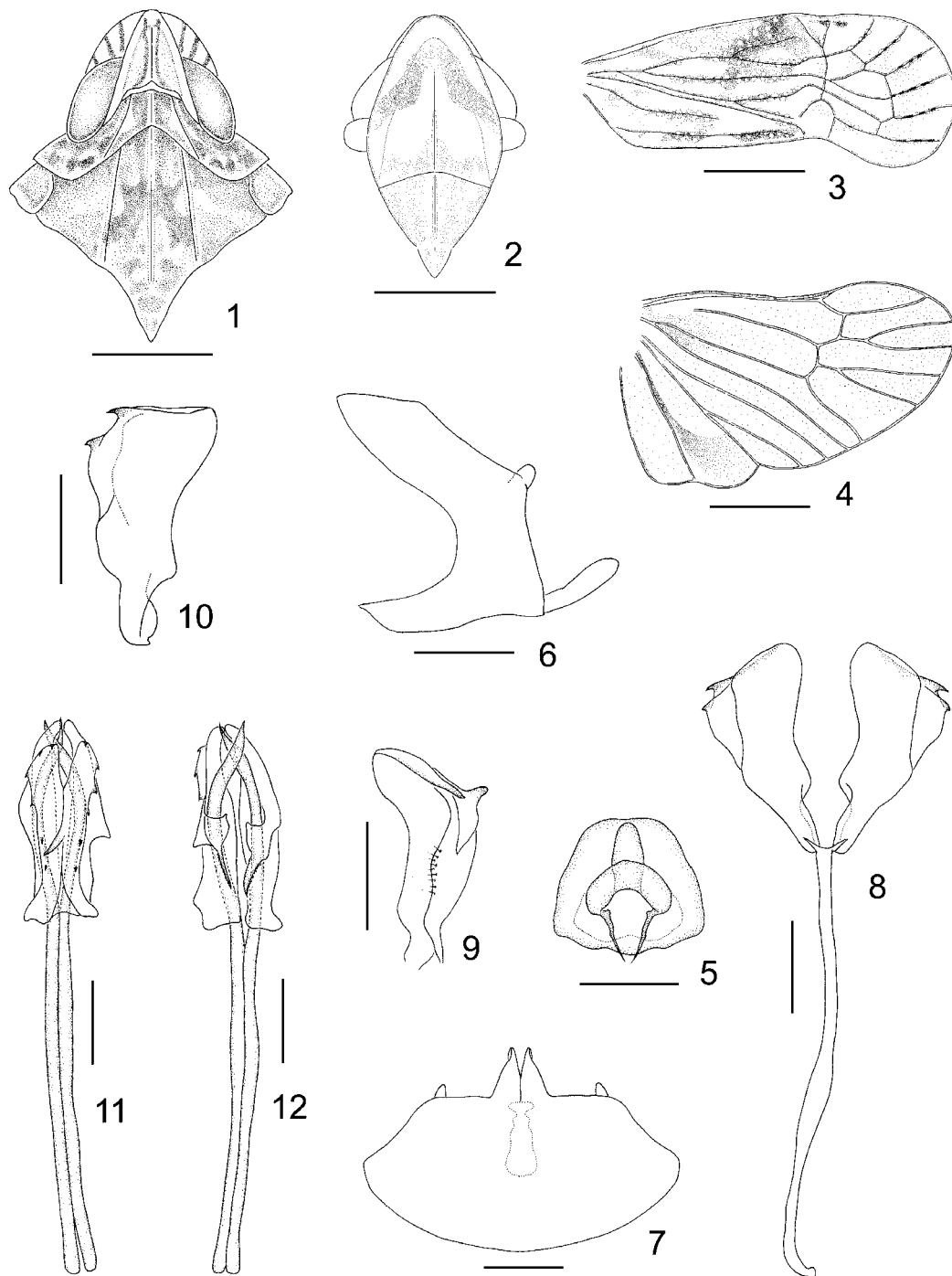
Head and thorax. Vertex narrower between basal angles than long in middle line (0.88:1), disk strongly depressed, apex slightly acute, anterior margin slightly truncate, posterior margin sinuate, angularly concave medially, median carina with basal half distinct, lateral carinae strongly keeled. Frons longer in middle line than widest part (1.16:1), widest near apical third, basal margin slightly roundly convex, apical margin concave medially, median disk distinctly depressed, median carina with basal half obsolete, lateral margins strongly foliate. Pronotum shorter than vertex (0.52:1). Mesonotum longer in middle line than vertex and pronotum combined (1.88:1). Forewing longer than widest part (2.51:1).

Male genitalia. Anal segment in dorsal view (Fig. 5) almost rounded, apical margin nearly truncate, anal style short, not extending out apical margin of anal segment. Pygofer in profile (Fig. 6) distinctly shorter dorsally than ventrally, anterior margin strongly concave, posterior margin declined, produced caudad in a short, rounded process at middle, pygofer in ventral view (Fig. 7), medioventral processes stout, relatively short, triangular, tapering apically, two processes connected basally, median cleft narrow and shallow. Aedeagus (Figs 11, 12) with phallobase not quite bilaterally symmetrical, tubular, dividing into four lobes at apex, in ventral view (Fig. 11), ventral lobe cleft at apex medially, with a strong spine-like process at middle line, directed basad, each side produced into six spines laterally, lateral lobes elongate, right side with a large tooth medially; in dorsal view (Fig. 12) dorsal lobe reduced, two processes arising from base, directed basad, which with outer margin having many small teeth. Phallic appendages (Figs 11, 12) just reaching to apex of phallobase, with apical portion slightly incurved, tapering apically. Genital styles (Figs 8–10) narrow at base, and widening apically, each nearly triangular, apical margin nearly truncate, outer margin with two teeth apically and subapically.

Type material. Holotype: ♂, Tenchong (25°01'N, 98°30'E), Yunnan Province, China, 13 Aug. 2006, Q.-Z. Song and Z.-G. Zhang. Paratypes: 4♂♂, 3♀♀, same data as holotype; 1♂, 4♀♀, Xiaguan (25°42'N, 100°10'E), Dali, Yunnan Province, China, 4 Aug. 2006, Q.-Z. Song; 3♂♂, 5♀♀, Pianma (26°01'N, 98°37'E), Lushui, Yunnan Province, 1800m, 16 Aug. 2000, X.-S. Chen; 1♂, Xishan Park (25°04'N, 102°42'E), Kunming, Yunnan Province, 1950m, 31 Aug. 2006, P. Zhang. (IEGU)

Etymology. The specific name refers to the type locality, Yunna Province, China, and the word “dian” is the transliteration of the Chinese shortened form for Yunnan Province.

Host plant. Unknown.



FIGURES 1–12. *Deferunda diana* (1) Head and thorax, dorsal view; (2) Frons and clypeus; (3) Forewing; (4) Hindwing; (5) Anal segment, dorsal view; (6) Pygofer, lateral view; (7) Pygofer, ventral view; (8) Genital styles and connective, ventral view; (9) Genital style, lateral view; (10) Genital style, ventral view; (11) Aedeagus, ventral view; (12) Aedeagus, dorsal view. Scale bars = 0.5 mm (Figs 1, 2), 1.0 mm (Figs 3–4), 0.2 mm (Figs 5–12)

Distribution. Southwestern China (Yunnan) (Fig. 23).

Remarks. This species is similar to *D. rubrostigma* but differs from the latter in: each lateral margin of frons with only one transverse bar, apex of frons brown (in the latter, each lateral margin of frons with three transverse bars, apex of frons milk-white); two medioventral processes of pygofer connected basally, median cleft shallow (in the latter, two medioventral processes of pygofer distinctly separate basally, median cleft very deep); dorsal lobe of phallus with two processes basally, which bear many teeth along outer margin (absent in the latter).

***Deferunda qiana* sp. nov.**

(Figs 13–22)

Description. Body length (from apex of vertex to tip of forewings): male 5.10–5.35 mm (N=7), female 5.50–5.70 mm (N=10); forewing length: male 3.30–3.45 mm (N=7), female 3.60–3.75 mm (N=7).

Coloration. General color yellowish white to brown. Vertex (Fig. 13) yellowish white with two longitudinal stripes along middle line from apical 2/3 to apex, fuscous, lateral carinae brown. Frons (Fig. 14) yellowish white, lateral margins with three fuscous spots. Clypeus with apical half brown to fuscous. Rostrum yellowish white except apex fuscous. Genae yellowish white, with three transverse fuscous stripes before eyes, one dorsad, area beneath antenna with a fuscous marking. Eyes reddish brown, ocelli yellowish brown, tinged with reddish orange margin. Antennae yellowish brown, with apex brown dorsally. Pronotum (Fig. 13) yellowish brown, lateral areas with five spots, brown. Mesonotum (Fig. 13) yellowish brown, with irregular brown markings. Forewing (Fig. 15) yellowish brown, distributing irregular brown to fuscous markings, along veins, with narrow brown stripes, many white spots scattered, most of them near veins, callus dark brown, infused with reddish orange markings. Hindwing pale brown, veins brown, with a brown marking at anal region. Thorax with ventral areas anterior to middle legs fuscous, region posterior to middle legs yellowish brown. Legs yellowish white to yellowish brown, apex of tibiae with brown spots. Abdomen fuscous, except lateral margin and posterior margin of each segment, yellowish white to yellowish brown. Genital segment yellowish brown to brown.

Head and thorax. Vertex wider between basal angles than long in middle line (1.18:1), disk strongly depressed, anterior margin acute, posterior margin sinuate, angularly concave medially, median carina with basal half distinct, lateral carinae strongly keeled. Frons longer in middle line than widest part about 1.36:1, widest at apical 1/4, basal margin slightly rounded, apical margin concave medially, disk depressed, median carina distinct, lateral margins foliate. Pronotum shorter than vertex (0.64:1). Mesonotum longer in middle line than vertex and pronotum combined (2.11:1). Forewing longer than widest part about 2.71:1.

Male genitalia. Anal segment in dorsal view (Fig. 16) rounded with apical margin emarginate medially, anal style relatively long, extending out apical margin of anal segment. Pygofer in profile (Fig. 17) distinctly shorter dorsally than ventrally, anterior margin broadly concave, posterior margin roundly convex caudad at middle, pygofer in ventral view (Fig. 18), medioventral processes stout, relatively long, subtriangular, apex slightly rounded, two processes separate basally, median cleft broad and deep. Aedeagus (Figs 21, 22) with phallobase bilaterally symmetrical, tubular, dividing into four lobes at apex, in ventral view (Fig. 21), ventral lobe slightly cleft at apex medially, each with four or five spines at ventral side subapically, two large forked processes arising from near middle of lateral margin, inner branch having three teeth at apex, outer branch with apex acute, curving ventrad apically, lateral lobes elongate, dorsal lobe reduced. Phallic appendages (Fig. 21) reaching to middle of phallobase, slightly widening apically, each apex with a stout spine-like process, curving laterally. Genital styles (Figs 19, 20) narrow at base, and widening apically, each nearly triangular, apical margin slightly emarginated, outer margin with a stout, finger-like tooth subapically.

Type material. Holotype: ♂, Yantang (26°08'N, 106°39'E), Huishui, Guizhou Province, China, shrubbery or grasses, 31 May 2008, X.-S. Chen. Paratypes: 3♂♂, 5♀♀, same data as holotype; 1♂, 1♀, Ceheng (25°00'N, 105°48'E), Guizhou province, 8 July 1977, Z.-Z. Li; 1♂, Luodian (25°25'N, 106°44'E), Guizhou Province, 16 Sep. 1994, X.-S. Chen; 3♀♀, Ceheng, Guizhou Province, 1 July 2006, Z.-G. Zhang; 1♀, Bazong, Luodian, Guizhou Province, 1 June 2008, X.-S. Chen; 1♂, Lijiang (26°52'N, 100°14'E), Yunnan Province, 11 Aug. 2000, X.-S. Chen. (IEGU)

Etymology. The specific name refers to the type locality, Guizhou Province, China, and the word “qian” is the transliteration of the Chinese shortened form for Guizhou Province.

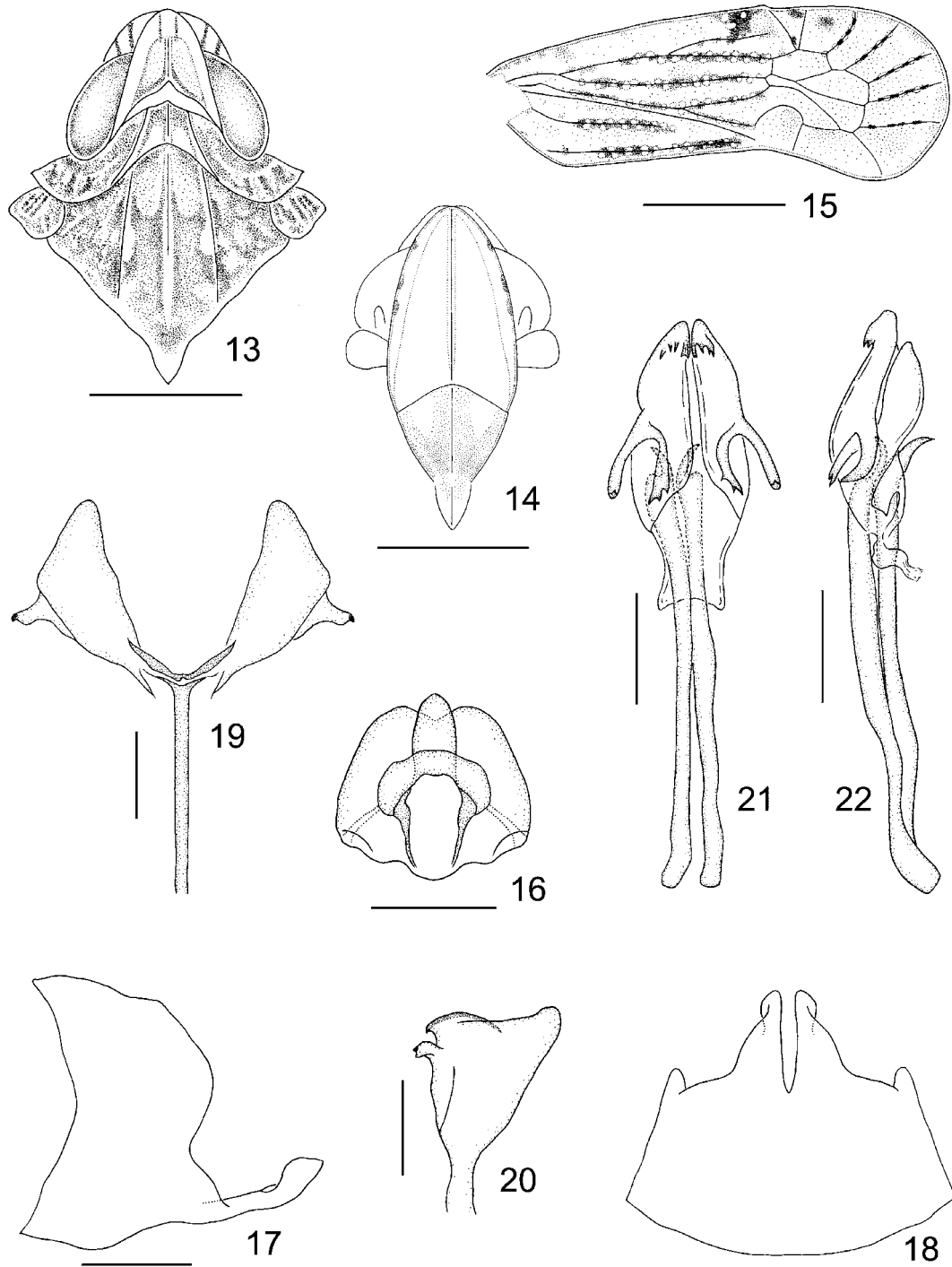
Host plants. Unknown.

Distribution. Southwestern China (Guizhou and Yunnan) (Fig. 23).

Remarks. This species is closely related to *D. albomaculata* (Muir, 1922) (India: Assam), but can be distinguished by the vertex with median carina bordered with dark brown stripes at apex (the longitudinal dark brown stripes from apex to base in *albomaculata*); frons and basal half of clypeus yellowish white (frons

light brown, clypeus dark brown in *albomaculata*); gena with a dark brown spot near beneath antenna (absent in *albomaculata*); hind tibiae with a brown marking apically (two in *albomaculata*); genital style in lateral view with two processes on outer margin apically and subapically (only one in *albomaculata*).

This species is also similar to *D. acuminata* (China: Hainan), but differs from the latter in: frons yellowish white, without inverse V-shape marking (in the latter, frons yellowish brown, basal half with an inverse V-shape marking); ventral lobe of phallus with two large forked processes laterally (absent in the latter).



FIGURES 13–22. *Deferunda qiana* (13) Head and thorax, dorsal view; (14) Frons and clypeus; (15) Forewing; (16) Anal segment, dorsal view; (17) Pygofer, lateral view; (18) Pygofer, ventral view; (19) Genital styles and connective, ventral view; (20) Genital style, lateral view; (21) Aedeagus, ventral view; (22) Aedeagus, lateral view. Scale bars = 0.5 mm (Figs 13, 14), 1.0 mm (Fig. 15), 0.2 mm (Figs 16–22)

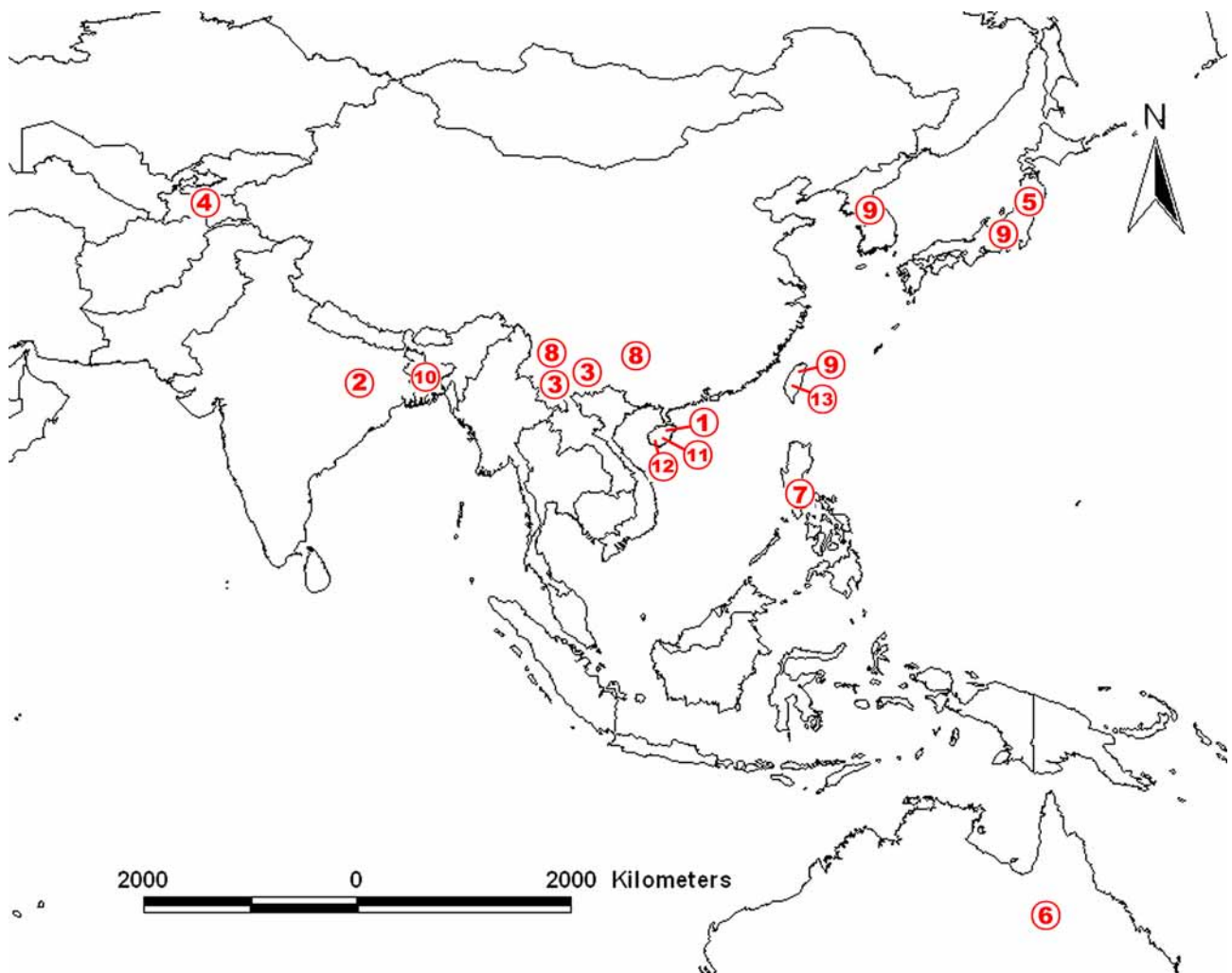


FIGURE 23. Geographic distribution of *Deferunda* species: *D. acuminata* (①); *D. albomaculata* (②); *D. diana* (③); *D. incompta* (④); *D. lineola* (⑤); *D. majella* (⑥); *D. philippina* (⑦); *D. qiana* (⑧); *D. rubrostigmata* (⑨); *D. stigmatica* (⑩); *D. striata* (⑪); *D. trimaculata* (⑫); *D. truncata* (⑬).

Discussion

Kirkaldy (1906) erected the achilid genus *Majella* for an Australian species, *Majella majella*; Metcalf (1948) pointed out that the name *Majella* was preoccupied by *Majella* Ortmann, 1893 and replaced it with the new name *Majellana*. Fennah (1950) synonymised *Majella* Kirkaldy, *Majellana* Metcalf and *Okatropis* Matsumura with *Deferunda* based on examination of a topotype of *Majella majella* Kirkaldy and a specimen of *Okatropis rubrostigma* Matsumura. According to the shape of frons, Dlabola (1961) erected a subgenus, *D. (Tugaia)* for *D. (T.) incompta* from Tajikistan. The genus *Deferunda* is readily distinguishable by the extreme foliation of the basal portion of the lateral carinae of frons and by the tegminal venation (Fennah 1950). In total, 13 species are included in the genus: *D. acuminata* Chou & Wang, 1985, *D. albomaculata* (Muir, 1922), *D. diana* Chen & He, *D. incompta* Dlabola, 1961, *D. lineola* (Matsumura, 1914), *D. majella* (Kirkaldy, 1906), *D. philippina* (Melichar, 1914), *D. qiana* Chen & He, *D. rubrostigmata* (Matsumura, 1914), *D. stigmatica* Distant, 1912, *D. striata* Wang & Liu, 2008 (in Wang *et al.* 2008), *D. trimaculata* Wang & Peng, 2008 (in Wang *et al.* 2008), and *D. truncata* Chen *et al.*, 1989.

The Chinese fauna of *Deferunda* is abundant with seven species recorded: *D. rubrostigma* (Matsumura) (Yunnan, Hunan and Taiwan), *D. acuminata* Chou & Wang (Hainan), *D. truncata* Chen, Yang & Wilson (Taiwan), *D. trimaculata* Wang & Peng (Hainan), *D. striata* Wang & Liu (Hainan), *D. Diana* Chen & He

(Yunnan), and *D. qiana* Chen & He (Guizhou and Yunnan) (Matsumura, 1914; Chou *et al.*, 1985; Chen *et al.* 1989; Wang *et al.* 2008; this paper). Chen *et al.* (1989) erected a monotypic genus, *Planusfrons* Chen *et al.*, for *P. patula* Chen *et al.* from Taichung and Pingtung, Taiwan, southeast China. However, *P. patula* closely resembles members of *Deferunda* in terms of external appearance, most characters and male genitalia, except the lateral carinae of frons are not foliately raised at base. It seems that *P. patula* may also belong in *Deferunda*, but further study of the Chinese fauna is necessary before such a decision can be made. In the meantime, our redefinition of the generic characteristics of *Deferunda* will assist this study.

Deferunda lineola was described by Matsumura (1914) for a male specimen from "Caucasus". However, while Liang & Suwa (1998) designated lectotypes for Matsumura's species, they found the locality of *D. lineola*, which was written on underside of the label of the holotype in Matsumura's handwriting, was "Caeasus" (not "Caucasus" as in the original description) (also see Hokkaido University website). According to Matsumura (1914), most specimens of Fulgoromorpha he described were collected from Japan and Taiwan and a few from Singapore (one species) and Vietnam (one species). Therefore, we can conclude that *D. lineola* was not distributed in Caucasus. However, the meaning of the spelling "Caeasus" is uncertain.

All 13 described species within the genus *Deferunda* are widely distributed in the Oriental region (China, India, Bengal and Philippines), Palearctic region (Tajikistan, Japan and Korea) and Australian region (Australia) (Fig. 23). Among them, most are distributed in the Oriental region, especially in south China.

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