



A taxonomic study of Chinese Empoascini (Hemiptera: Cicadellidae: Typhlocybinae) (I)

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Abstract

A new genus of Chinese Empoascini (Hemiptera: Cicadellidae: Typhlocybinae), *Radicafulcus* Qin & Zhang, **gen. n.** with one new species, *R. breviprocessus* Qin & Zhang, **sp. n.** from Sichuan Province (S.W. China) is described and illustrated. *Baguoidea* Mahmood 1967 is redescribed and a new species, *B. yunnanensis* Qin & Zhang, **sp. n.** is described from Yunnan Province (S.W. China). Two genera (*Faiga* Dworakowska 1980 and *Sikkimasca* Dworakowska 1994) are reported for the first time from China, and the type species of these genera are re-illustrated.

Key words: Homoptera, Auchenorrhyncha, taxonomy, new taxa, China

Introduction

Empoascini is a large tribe of Typhlocybinae, comprising more than 1000 described species in 67 genera worldwide (Qin & Zhang, 2008). The Chinese Empoascini, with 20 known genera so far (Qin & Zhang, 2008), have been studied by Matsumura (1931), Kuoh (1966), Dworakowska (1982), Zhang (1990) and Qin & Zhang (2008). However, the empoascine fauna of China remains inadequately studied, and the number of described genera and species likely represents only a small fraction of the actual diversity of the fauna, considering recent field work and examination of specimens deposited in the Entomological Museum, Northwest A & F University, China.

In the present paper, we describe a new genus and new species of Empoascini, redescribe and add a new species to the genus *Baguoidea*, and also report two newly recorded genera from China.

Material and methods

The specimens examined, including holotypes of new species, are deposited in the Entomological Museum, Northwest A & F University, Yangling, Shaanxi, China (NWAUFU).

Habitus photos were taken by using a Scientific Digital micrography system equipped with an Auto-montage imaging system and a QIMAGING Retiga 4000R digital camera (CCD). Multiple photographs were compressed into final images. The body measurements are from apex of vertex to tip of forewing. The morphological terminology used in this description follows Zhang (1990) except for the nomenclature of the wing, for which we follow Dworakowska (1993).

***Radicafurcus* Qin & Zhang, gen. nov.**

Type species. *Radicafurcus breviprocellus* Qin & Zhang, sp. n., here designed.

Description. Body small, depressed, and brown. Head broader than pronotum (Fig. 1). Vertex long, anterior margin distinctly produced medially, in profile regularly curving into convex and slightly elongated face (Fig. 2), coronal suture long and distinct (Fig. 1). Fore wing broadened in apical third, all apical veins arise from longitudinal m cell, 3rd apical cell stalked, veins RP and MP' nearly parallel (Fig. 3). Hind wing with very small area bordered by re-emerging AA and AP' veins; vein CuA unbranched apically (Fig. 4).

Abdominal apodemes developed and parallel sided (Fig. 14). Male pygofer short and wide, narrowing caudad (Figs. 5, 6), laterocaudal margin of pygofer lobe truncated accompanied by row of rigid microsetae terminally; ventral appendage absent (Figs. 5, 6); dorsal bridge long but less sclerotized in middle dorso-caudad (Fig. 6). Subgenital plate longer than pygofer side, broad at base, setae of basal group undifferentiated, lateral macrosetae not numerous, arranged in single row and reaching apex of plate (Figs. 5, 7, 13). Paramere slim, caudal part strongly narrowing and curved, subapex bearing small dentifer and few setae (Figs. 7, 12). Connective lamellate (Fig. 7). Aedeagus broad at base, with asymmetrical unpaired ventral process arising subbasally, shaft tubular, preatrium very short, without dorsal apodeme, gonopore subapical at left side (Figs. 8-10). Anal tube process short and broad (Figs. 5, 11).

Etymology. The name alludes to the ventrobasal bifurcation of the aedeagus. Gender: masculine.

Remarks. The new genus is similar to *Ifuaria* Dworakowska, 1994 in having 3 apical veins in fore wing arising from cell m, the 3rd apical cell stalked, veins RP and MP' nearly parallel; the abdominal apodemes parallel sided; the ventral pygofer appendage absent, and the lateral macrosetae of the subgenital plate arranged in a single row. However, the new genus differs from the latter in having fore wing cell c narrower than cell r (c cell broader than r cell in *Ifuaria*), the laterocaudal margin of the pygofer lobe truncated (angulately produced in *Ifuaria*); the subgenital plate lacking macrosetae in the basal group (with macrosetae in basal group in *Ifuaria*), the aedeagus not fused with the base of the connective (fused in *Ifuaria*), and in having cell aa in the hind wing apparently smaller than that of *Ifuaria*.

The new genus is similar to *Chlorita* Fieber in Chinese empoascine fauna by using the key of Qin & Zhang (2008). It differs from *Chlorita* by the body is slim and depressed (broad in *Chlorita*), by the fore wing with all apical veins arise from longitudinal m cell, 3rd apical cell stalked (in *Chlorita* veins RP and MP' arise in r cell and only MP'+CuA' in m cell, 3rd apical cell not stalked), by the anal tube process short and broad (anal tube process much longer in *Chlorita*).

***Radicafurcus breviprocellus* Qin & Zhang, sp. n.**

(Figs. 1-14)

Type materials. Holotype, male (NWAUFU), Mt. Emei, Sichuan Province, 29 Oct. 1999, 700-900 m, coll. Daozheng Qin. Paratypes, 1 male, same data as holotype; 1 male, 1100 m, 1 male, 1400 m, 31 Oct. 1999, other data as holotype.

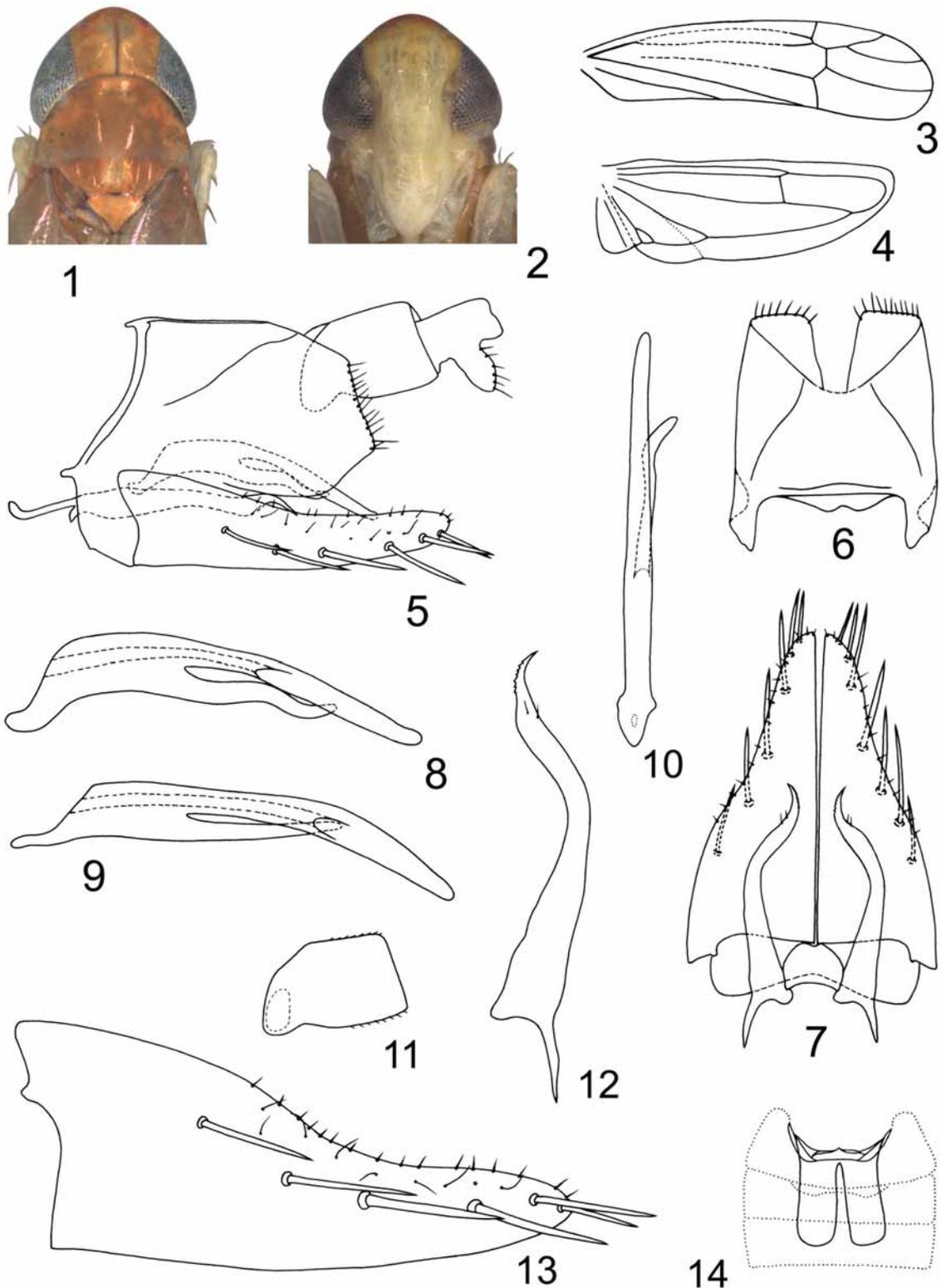
Description. Length, male 3.0-3.1 mm.

General color beige to reddish brown. Eyes black. Ocelli surrounded by reddish patches. Coronal suture blackish brown, not reaching anterior margin of crown. Face yellow. Pronotum surrounded with irregular arch of patches anteriorly and laterally, Scutellum centrally with quadrate sordid cream patch, scutoscutellar sulcus black. Fore wing and hind wing hyaline. Dorsum of abdomen tan, venter of abdomen, legs and subgenital plate yellow. In some specimens transition of vertex to face with tinge of red.

Abdominal apodemes of segment III reaching middle of segment V (Fig. 14). Male pygofer with about 14 rigid microsetae at apex of lobe (Fig. 5). Subgenital plate with basolateral protrusion well developed, 6-7 uniseriate lateral macrosetae, about 15 marginal microsetae and several fine microsetae in irregular two rows starting caudad of lateral macrosetae (Figs. 5, 13). Paramere with apex acuminate and bearing 7 teeth preceded by 2 fine microsetae (Fig. 12). Aedeagus branched at ventral third, ventral branch short, sinuate or

slightly curved dorsolaterad (Figs. 8, 9). Anal tube process nearly reaching half height of pygofer, apex rounded (Figs. 5, 11).

Etymology. The species name alludes to the short ventrobasal branch of the aedeagus.



FIGURES 1–14. *Radicafurcus breviprocellus* Qin & Zhang, **sp. n.**, 1, head and thorax, dorsal view; 2, face; 3, fore wing; 4, hind wing; 5, male terminalia, lateral view; 6, pygofer side, dorsal view; 7, subgenital plates, parameres, connective and sternite 9, ventral view; 8, 9, aedeagus, lateral view; 10, same, dorsal view; 11, anal tube process, lateral view; 12, paramere; 13, subgenital plate, dorsal view; 14, abdominal apodeme.

***Baguoidea* Mahmood**

Baguoidea Mahmood, 1967: 40. Type species. *Baguoidea rubra* Mahmood, 1967, by original designation.

Redescription. Body relatively robust, red. Head equally wide as pronotum or slightly wider (Fig. 15). Vertex short, rounded anteriorly, profile of transition vertex to face rounded, coronal suture distinct (Fig. 15). Face short (Fig. 16), apparently convex in lateral aspect, lateral frontal suture present. Fore wing narrow, 3 apical veins arise from longitudinal m cell, 2nd apical cell slightly broadened towards apex, veins RP, MP' stalked, 4th apical cell shortest, c and r cells nearly equal in width, both narrower than m and cua cells (Fig. 17); in hind wing area bordered by vannal veins small, vein CuA unbranched apically (Fig. 18).

Abdominal apodemes well developed with tips widely divergent posteriorly (Fig. 27). Male pygofer elongate, apical half of pygofer strongly narrowing caudad, with rigid macrosetae on each side of pygofer lobe, dorsal margin produced with lobe directed caudad (Figs. 19, 21), ventral appendage present (Figs. 19–21); dorsal bridge quite long, caudo-dorsal part with vertical sclerotization cephalad (Fig. 21). Subgenital plate far exceeding pygofer side, broad at base, anterior margin straight in apical half, ventral margin curved dorsad leading to the plate narrowing terminally, with long, stout and bluntly terminated macrosetae in one row in basal group and laterally in one to two rows on disc followed by densely arranged macrosetae apically (Fig. 26). Paramere serrate apically, setae and sensory pits basad of serrations (Fig. 25). Connective fused with base of aedeagus (Figs. 22, 23). Aedeagus without preatrium and dorsal apodeme, shaft tubular, compressed, ending in paired apical processes which are directed laterad, each having teeth at apex, gonopore apical (Figs. 22, 23). Anal tube process broad, curved and narrowing apically with subapical ligament connection from dorsal margin (Fig. 24).

Remarks. The original description and illustrations of Mahmood (1967) were obscure; in particular, his illustrations and description of the genus do not match very well, particularly those of the pygofer. Mahmood stated: “pygofer with a lobe-like structure produced caudad, pygofer process ventral in origin, of varying shape, directed dorsal and caudad”, but his illustration appears to show a long, thin projection of the pygofer directed caudo-dorsad and does not appear to show any ventral pygofer process. The main diagnostic features of the genus described by Dworakowska (1973) were as follows: “the most characteristic feature in head structure is absence of lateral frontal suture and in male genitalia apparatus joining penis-connective shifted away from end of manubrium”. *Baguoidea* specimens deposited in NWAUFU match the Mahmood description of the pygofer and pygofer process (Figs. 19, 20) but, in contrast to Dworakowska's description, the lateral frontal suture is well developed (Fig. 16) and the male genitalia have the connective fused with the base of the aedeagus (Figs. 22, 23). Therefore the genus is redescribed here, and a new species, *B. yunnanensis* Qin & Zhang from Yunnan, China, is described.

Baguoidea belongs to the *Usharia* Dwor. group and differs from *Homa* Dist. in having veins RP, MP' of the fore wing stalked (separate in *Homa*), the abdominal apodemes well developed with tips divergent from each other (vestigial with tips not divergent in *Homa*), and the subgenital plate with dense macrosetae apically (without apical macrosetae in *Homa*).

Distribution. China (Yunnan Province), Philippine, Malaysia.

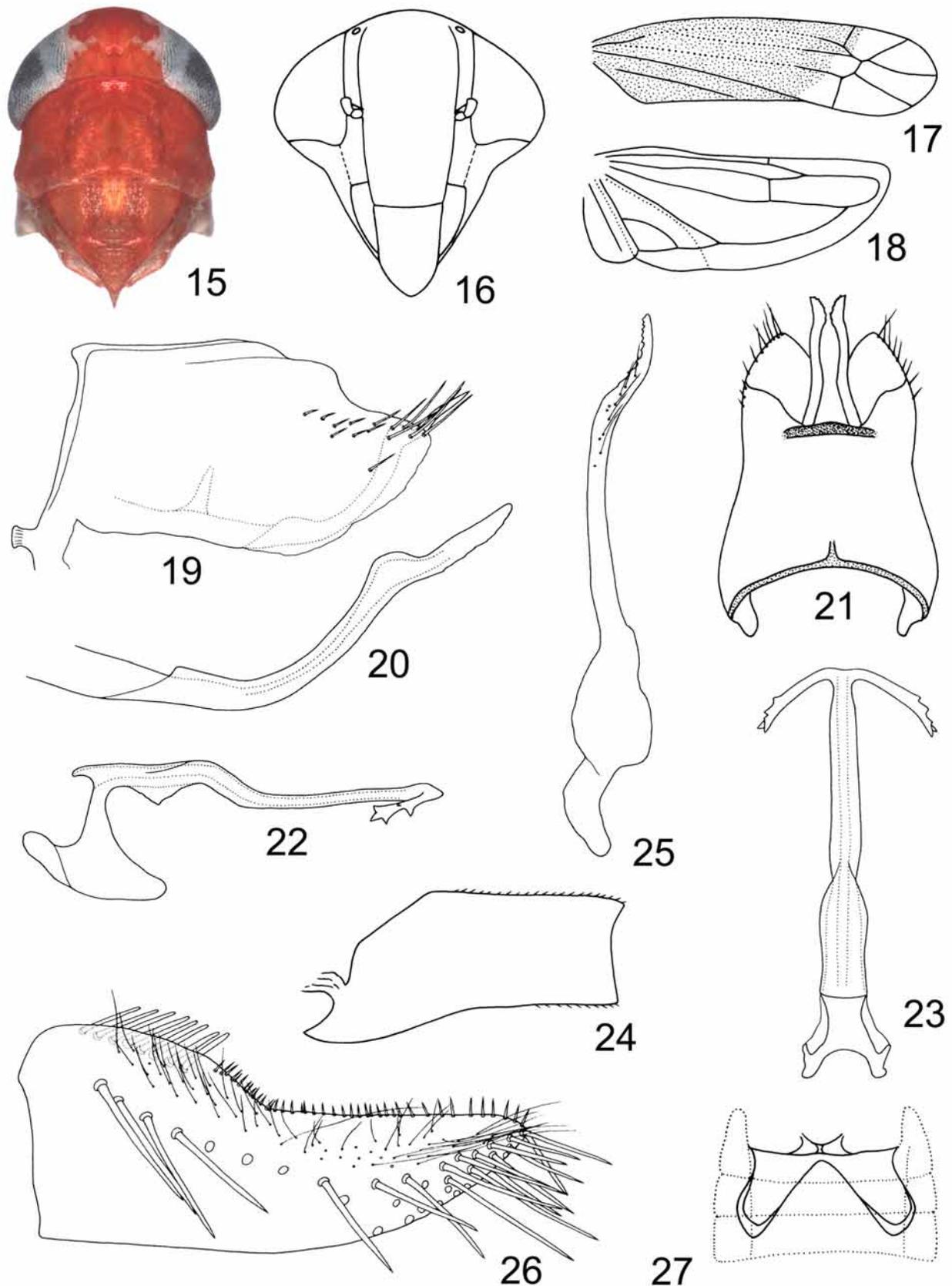
***Baguoidea yunnanensis* Qin & Zhang, sp. n.**

(Figs. 15–27)

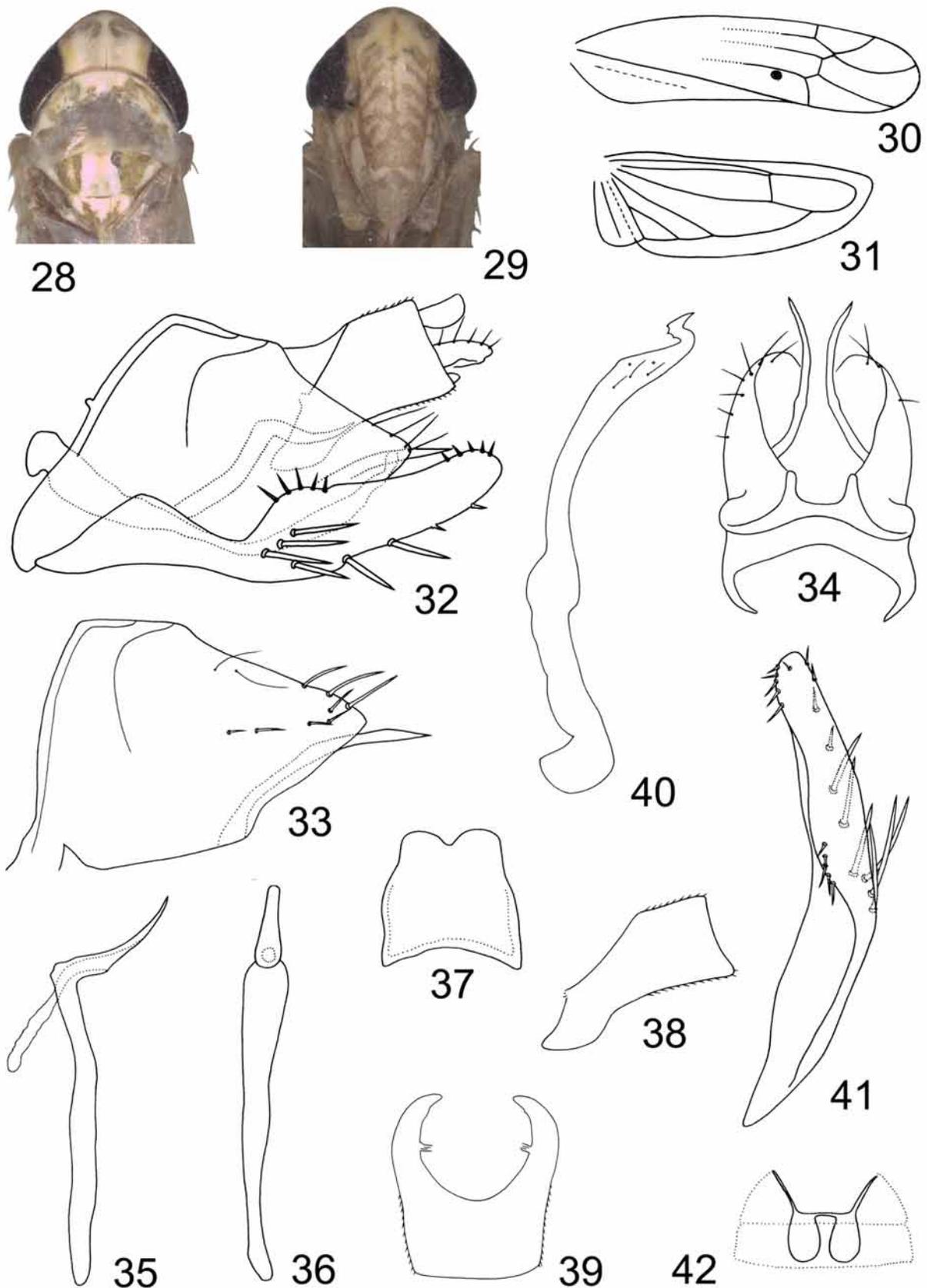
Type material. Holotype, male (NWAUFU), 16 Jul. 1999, 800–1000 m, Yaoqu, Mangla, Xishuangbanna, Yunnan Province, coll. Irena Dworakowska.

Description. Size. male 3.8 mm.

Ground color red. Vertex with irregular off-white patch medially at each side; eyes greyish with dark patches as in Fig. 15; ocelli surrounded by yellowish patches. Scutellum with small yellow patch medially. Fore wing transparent in apical third; hind wing transparent with red tinge basally.



FIGURES 15–27. *Baguoidea yunnanensis* Qin & Zhang **sp. n.**, 15, head and thorax, dorsal view; 16, face; 17, fore wing; 18, hind wing; 19, pygofer side and ventral pygofer appendage, lateral view; 20, apex of ventral pygofer appendage, lateral view; 21, pygofer side and ventral pygofer appendage, dorsal view; 22, aedeagus, lateral view; 23, same, dorsal view; 24, anal tube process, lateral view; 25, paramere; 26, subgenital plate, dorsal view; 27, abdominal apodeme.



FIGURES 28–42. *Faiga dropia* Dworakowska, 28, head and thorax, dorsal view; 29, face; 30, fore wing; 31, hind wing; 32, male terminalia, lateral view; 33, pygofer side and ventral pygofer appendage, lateral view; 34, same, dorsal view; 35, aedeagus, lateral view; 36, same, dorsal view; 37, connective; 38, anal tube process, lateral view; 39, same, dorsal view; 40, paramere; 41, subgenital plate, lateral view; 42, abdominal apodeme.

Abdominal apodemes reaching midlength of segment V (Fig. 27). Male pygofer with about 14 rigid setae on each side of pygofer lobe and posterior setae longer terminally; dorsal lobe-like structure rounded (Fig. 19); ventral pygofer appendage sinuate and bent dorsocaudad, dorsally slightly expanded before apex, apically irregularly serrated at ventral margin (Figs. 19, 20). Subgenital plate with ventral margin curved dorsad in apical half, with row of 8 blunt macrosetae in basal group, 41–43 marginal microsetae, 9 lateral macrosetae in one row on disc followed by about 24 densely and irregular scattered macrosetae apically and numerous fine microsetae arranged in 2–4 irregular rows (Fig. 26). Parameres with 9 apical teeth, about 11 setae and a few sensory pits (Fig. 25). Aedeagal shaft with paired apical processes directed laterad, each with 5 teeth (2 near apex + 3 at tip) (Figs. 22, 23). Anal tube process strongly narrowing in apical part (Fig. 24).

Remarks. *Baguoidea yunnanensis* Qin & Zhang **sp. n.** differs from *B. rubra* Mahmood in having a row of lateral macrosetae on the pygofer disc followed by densely and irregular scattered macrosetae apically (two rows of lateral macrosetae on disc followed by densely and regular apical macrosetae in *B. rubra*), and the fine microsetae of the plate numerous in 2–4 irregular rows (fine microsetae few in number in *B. rubra*). The new species also differs from *B. rufa* (Melichar) in having the fore wing mottled with red (red in basal 2/3 and transparent in apical third) (entirely red in *B. rufa*), and the aedeagal shaft with paired apical processes each having 2 teeth near apex and 3 teeth at tip (all teeth are restricted to very tip in *B. rufa*).

Etymology. The species name alludes to the locality of the type material (Yunnan Province).

Distribution. Currently known only from southwest China (Yunnan Province).

Faiga Dworakowska

Faiga Dworakowska, 1980: 163. Type species. *Faiga dropia* Dworakowska, 1980, by monotypy.

Distribution. China (Yunnan Province), India.

Note. Only the type species is known in *Faiga* and is restricted to the Oriental Region at present.

Faiga dropia Dworakowska, new record from China

(Figs. 28–42)

Faiga dropia Dworakowska, 1980: 165.

Material examined. 2 males, 7 Jun. 1991, Sanchahe, Mengyang, Yunan Province, coll. Rungang Tian, Wanzhi Cai & Yinglun Wang, by light trap.

Distribution. China (Yunnan Province), India.

Sikkimasca Dworakowska, 1994

Sikkimasca Dworakowska, 1994: 105.

Type species. *Sikkimasca annulata* Dworakowska, 1994, by monotypy.

Distribution. China (Hainan Province), Sri Lanka.

Note. Only the type species is known in *Sikkimasca* and is restricted to the Oriental Region at present.

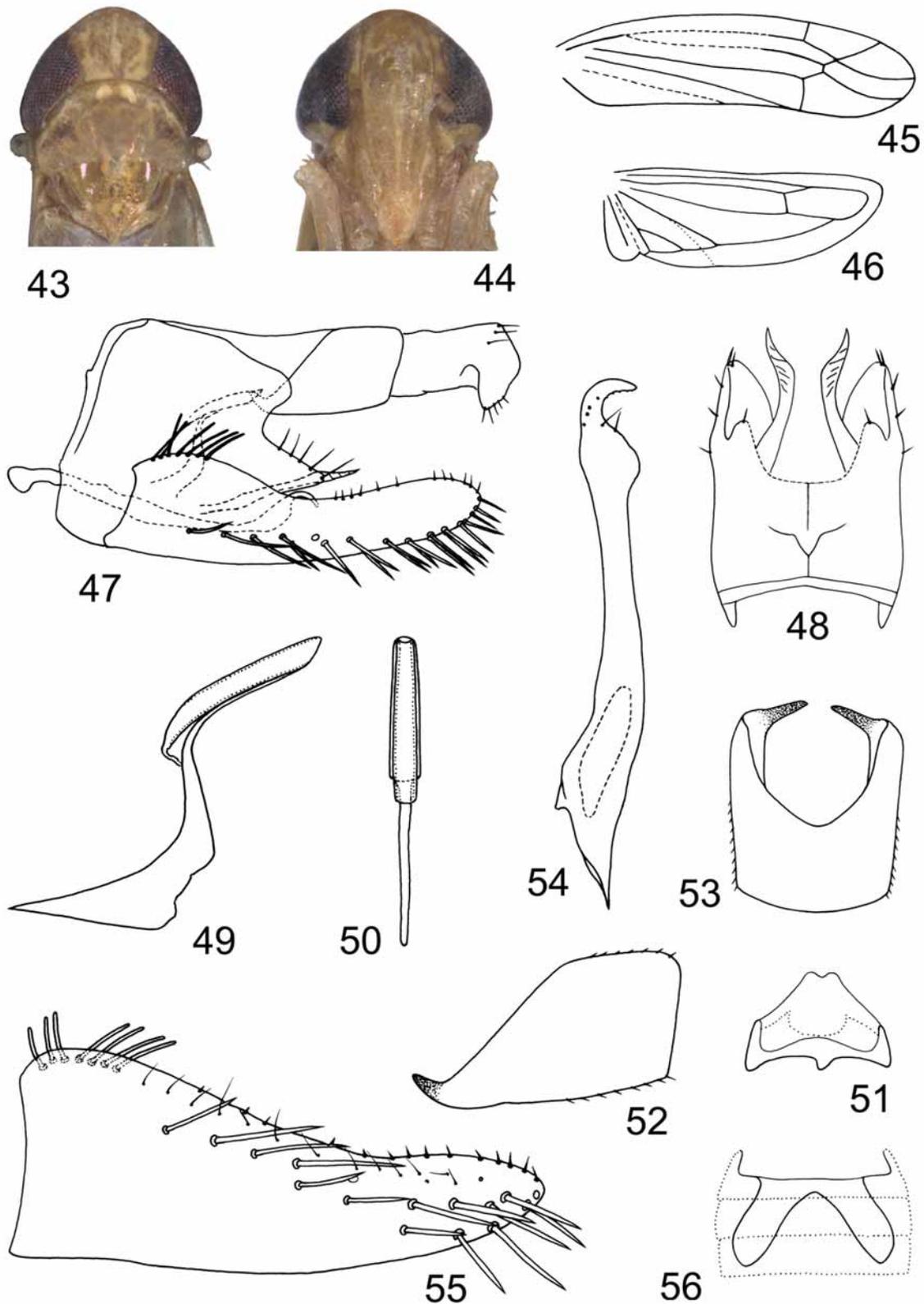
Sikkimasca annulata Dworakowska, new record from China

(Figs. 43–56)

Sikkimasca annulata Dworakowska, 1994: 106.

Material examined. 2 males, Bawangling, Hainan Province, 25 May 1983, coll. Yalin Zhang, by light trap.

Distribution. China (Hainan Province), Sri Lanka.



FIGURES 43–56. *Sikkimasca annulata* Dworakowska, 43, head and thorax, dorsal view; 44, face; 45, fore wing; 46, hind wing; 47, male terminalia, lateral view; 48, pygofer side and ventral pygofer appendage, dorsal view; 49, aedeagus, lateral view; 50, same, dorsal view; 51, connective; 52, anal tube process, lateral view; 53, same, dorsal view; 54, paramere; 55, subgenital plate, dorsal view; 56, abdominal apodeme.

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