



## Review of the leafhopper genus *Riseveinus* Li (Hemiptera: Cicadellidae: Evacanthinae), with descriptions of two new species from China

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### Abstract

The Oriental leafhopper genus *Riseveinus* Li is redefined with the redescription of its type species *Riseveinus sinensis* (Jacobi), and descriptions of two new species: *Riseveinus asymmetricus* **sp. nov.** and *Riseveinus compressus* **sp. nov.** The female genitalia of the species of this genus are described for the first time. One new combination, *Riseveinus albiveinus* (Li) **n. comb.**, is also proposed. Photographs and a key to all aforementioned species are provided. The relationship of this genus to related genera is discussed.

**Key words:** Homoptera, Auchenorrhyncha, morphology, taxonomy, new combination, Oriental

### Introduction

Li & Wang (1995) established the Oriental evacanthine genus *Riseveinus* Li with *Dussana sinensis* Jacobi, 1944, as the type species. The genus resembles *Pythamus* Distant, *Striatanus* Li & Wang and *Vangama* Distant externally. In this paper, the genus is redefined with illustrations of habitus and male genitalia of all the species, and two new species, *Riseveinus asymmetricus* **sp. nov.** (China: Yunnan) and *Riseveinus compressus* **sp. nov.** (China: Taiwan) are described. One new combination, *Riseveinus albiveinus* (Li) **n. comb.**, is also proposed. The female genitalia of *Riseveinus sinensis* (Jacobi) are described for the first time.

Material examined is deposited in the following institutions abbreviated in the text as follows:

IZAS	The Institute of Zoology, Chinese Academy of Sciences, Beijing, China
NKU	Nankai University, Tianjin, China
NWAFU	The Entomological Museum of Northwest A&F University, Yangling, China
SHEM	Shanghai Entomological Museum, Shanghai, China

### Taxonomy

#### *Riseveinus* Li

*Riseveinus* Li, 1995: 189 (in Li & Wang); 1996: 118 (in Li & Wang)

Type species: *Dussana sinensis* Jacobi

Head, pronotum and scutellum chocolate brown, with pale yellow markings on head and scutellum; forewing dark brown with yellowish brown patches, venation lighter in colour. Head (Figs 1–5) triangularly produced anteriorly, about as long as or slightly shorter than pronotum and scutellum together; lateral margins carinate; median longitudinal carina lamellate; submarginal carina mesad of ocelli; area between median carina and

submarginal carina distinctly concave. Face (Figs 3–5) including eyes longer than wide; frontoclypeus with median longitudinal carina more strongly elevated in upper half than in lower half, laterally obliquely striate; clypellus broad and swollen at base, narrowed apically, shagreen; lora reaching apex of clypellus, shagreen, flat; gena strongly declivous laterally, entire face covered with pale setae. Pronotum (Figs 1–4) broad, wider than head; basal area very slightly carinate medially; lateral margins carinate and posteriorly divergent; hind margin slightly indented medially. Scutellum (Figs 1–2) triangular, about as long as pronotum, with transverse depression distinct. Forewing (Fig. 7) punctate near costal margin, veins raised, claval veins fused medially for 0.33 distance of the length; four apical cells; appendix very narrow. Hind wing (Fig. 8) with venation complete. Hind femoral spinulation 2+1+1; hind tibia with anterodorsal setae long, posterodorsal setae relatively sparse but stout (Figs 9–11).

Male pygofer without ventral process (Fig. 12). Subgenital plate elongate, macrosetae arranged in rows (Fig. 12). Style with basal articulating arm short, apophysis well developed, apical process foot-like with several setae and elongate lateral angle (Fig. 16). Connective Y-shaped, stem very long (Fig. 16). Aedeagal shaft in lateral view curved dorsad (Figs 13, 15), with or without ventral processes.

Female slightly longer than male; sternite VII distinctly extended posteriorly in midline (Fig. 6); ovipositor exceeding apex of pygofer (Fig. 6). First valvulae with longitudinal striations extending over distal one third and attaining dorsal margin (Figs 18, 20); second valvulae with prominent dentation on dorsal margin of distal third (Figs 17, 19).

**Remarks:** *Riseveinus* Li closely resembles *Striatanus* Li & Wang and *Vangama* Distant as they share the following characteristics: head and thorax generally black, marked with pale brown on carinae; head anteriorly triangularly produced, about as long as or longer than combined length of pronotum and scutellum, lateral margins carinate, median longitudinal carina on disc of vertex lamellate; 1A and 2A of forewing fused medially for short distance then separated; connective Y-shaped; aedeagus usually with paired ventral processes, or seldom with dorsal process. In addition, the styles of most species of these three genera are similar in shape, e.g., basal articulating arm short, anterior lateral arm elongate, apical process foot-like with several setae and elongate lateral angle. However, *Vangama* Distant can be easily distinguished from the other two genera by its much more elongate, strongly upwardly curved head which is at least 3 times as long as the dorsal distance between the eyes (and much longer than the pronotum and scutellum together); *Riseveinus* Li can be easily distinguished from *Striatanus* Li & Wang by the absence of the ventral process on the male pygofer.

### Key to species of the genus *Riseveinus* (males)

1. Head elongate, exceeding combined length of pronotum and scutellum ..... *Riseveinus albiveinus* (Li) **n. comb.**
- Head about as long as or shorter than pronotum and scutellum together ..... 2
2. Aedeagus with unpaired ventral process (Figs 13–16) ..... *Riseveinus asymmetricus* **sp. nov.**
- Aedeagus with pair of ventral processes ..... 3
3. Aedeagal shaft swollen at base, then narrowing towards apex, and with pair of slender apical processes, gonopore near subapex (Fig. 25) ..... *Riseveinus compessus* **sp. nov.**
- Aedeagal shaft not swollen at base, apex without processes, gonopore near middle (Figs 5–7) .....  
..... *Riseveinus sinensis* (Jacobi)

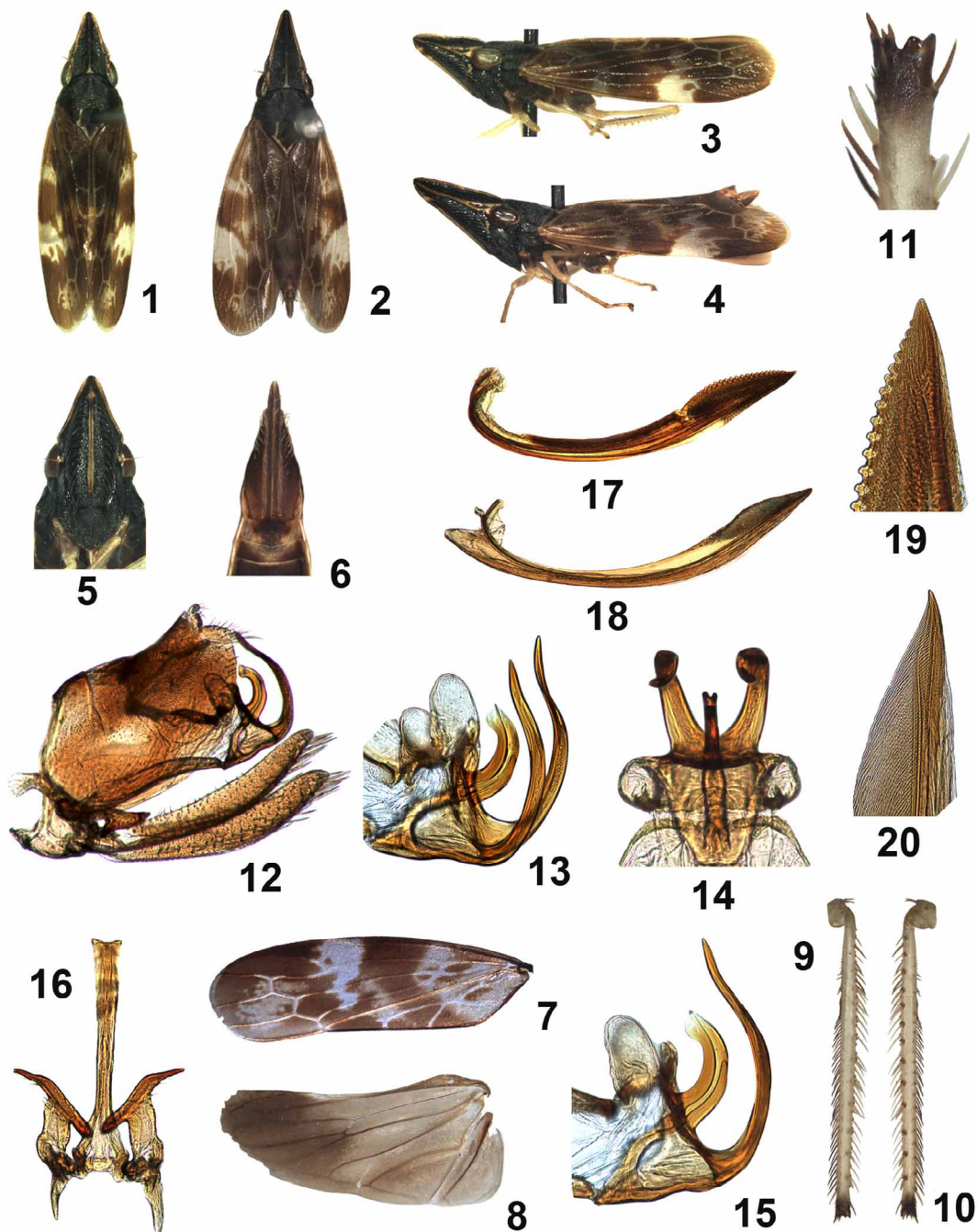
### *Riseveinus sinensis* (Jacobi)

(Figs 1–20)

*Dussana sinensis* Jacobi, 1944: 51

**Measurements:** ♂: body length: 9.0–9.5 mm; head width (incl. eyes): 1.6–1.8 mm; head length: 1.5–1.9 mm.  
♀: body length: 10.0–11.5 mm; head width (incl. eyes): 1.9–2.3 mm; head length: 2.5–3.2 mm.

Vertex (Figs 1, 2) elongate, nearly as long as pronotum and scutellum together.



**FIGURES 1–20.** *Riseveinus sinensis* (Jacobi) : 1. male habitus, dorsal view; 2. female habitus, dorsal view; 3. male habitus, lateral view; 4. female habitus, lateral view; 5. male face; 6. apex of female abdomen and wings, ventral view; 7. forewing; 8. hindwing; 9. hind tibia, anterior surface; 10. hind tibia, posterior surface; 11. apex of hind tibia, ventral surface; 12. male pygofer, lateral view; 13. aedeagus, posterior-lateral view; 14. aedeagus, dorsal view; 15. aedeagus, lateral view; 16. connective and style, dorsal view; 17. second valvula, lateral view; 18. first valvula, lateral view; 19. apex of second valvula; 20. apex of first valvula.

Pygofer caudally broadly rounded. Subgenital plate longer than pygofer, with multiseriate setae. Style with lateral angle of apical process longer than mesal angle, 0.66 as long as connective. Aedeagus with well developed bilobed dorsal apodeme, atrium ventrally produced, with ventral pair of long processes, shaft arcuate, compressed, with well marked gonoduct, apically rounded, gonopore elongate.

Female with hind margin of seventh sternum straight. Second pair of valvulae with 20 well spaced teeth on toothed area.

**Material examined:** 1 ♀ (SHEM), (China: Jiangxi Prov.), Kuling, 9-July-1935, coll. O. Plel; 1 ♀ (SHEM), Kuling, 18-September-1935, coll. O. Plel; 1 ♀ (SHEM), Kuling, 24-July-1935, coll. O. Plel; 1 ♀ (SHEM), Kuling, 15-July-1935, coll. O. Plel; 1 ♂, Kuling, 20-July-1935, coll. O. Plel; 1 ♀ (SHEM), Kuling, 25-July-1935, coll. O. Plel; 1 ♀ (SHEM), Kuling, 31-March-1935, coll. O. Plel; 1 ♂ (SHEM), Kuling, 15-July-1935, coll. O. Plel; 1 ♀ (IZAS), China: Fujian Prov., Chong'an, Xingcun, 28-May-1960, coll. Jin Lin; 1 ♀ (IZAS), China: Fujian Prov., Jianyang, Jietou, 1-July-1960, coll. Jin Lin; 1 ♂ (IZAS), China: Fujian Prov., Chong'an, Tongmu, 790-1155m, 24-June-1960, coll. Jin Yintao and Lin Yangming; 1 ♂ (IZAS), China: Fujian Prov., Chongan, Xingcun, sangang, 740m, 23-June-1960, coll. Zhang Yiran; 1 ♂ (ZSU), China: Kiangai Prov., Kuling (Mountain), Xiu Kiang District, 23~26-July-1933, coll. Y.W. Djou; 1 ♀ (NKU), China: Fujian Prov., Taiwu, 22-May-1965, coll. Wang Liangchen; 1 ♀ (NKU), China: Fujian Prov., Chong'an, Sangang, 2-August-1982, coll. Chen Chen; 1 ♀ (NWAUFU), China: Shaanxi Prov., Mt. Taibaishan, Haoping Temple, 18-July-1982, coll. Zhou Jingruo and Liu Lan; 1 ♀ (NWAUFU), China: Zhejiang Prov., Mt. Tianmushan, 10-August-2007, coll. Zhang Xinmin; 1 ♀ (NWAUFU), China: Hubei Prov., Shennongjia, 920m, 4-August-1988, coll. Yang Zhongqi; 1 ♀ (NWAUFU), China: Hubei Prov., Wufeng, Houhe, 1187m, 13-July-2006, coll. Lu Lin.

**Distribution:** China (Fujian, Hubei, Shaanxi, Zhejiang).

**Remark:** This species resembles *R. albiveinus* in having similar male genitalia and a longer head. However it can be distinguished from the latter by the less ventrally prolonged base of the aedeagus, in addition to characters mentioned under *R. albiveinus*.

### ***Riseveinus asymmetricus* sp. nov.**

(Figs 21–29)

**Measurements** (♂): Body length: 8.5 mm; head width (incl. eyes): 1.5 mm; head length: 1.5 mm.

Vertex (Figs 21, 22) slightly shorter than pronotum and scutellum together.

Pygofer longer than height, conically produced caudally. Subgenital plate exceeding caudal margin of pygofer, with few macrosetae, uniseriate in basal region becoming biseriate caudally. Style about 3/4 as long as connective, apical process with equally produced mesal and lateral angles. Aedeagus with stout bilobed dorsal apodeme, bearing unpaired, bilobed, lamellate process and one asymmetrically curved process, longer than shaft, with rather compressed apex; shaft broad at base, tapered to apex, gonopore apical.

**Type specimen:** Holotype: ♂ (IZAS), China: Yunnan Prov., Xishuangbanna, Menghun, 1200–1400m, 26-April-1958, coll. Hong Chunpei.

**Etymology:** The name of this species refers to the aedeagus with a single dorsal process.

**Remarks:** This species can be easily distinguished from other species of the genus by its unpaired asymmetrically curved aedeagal process (Figs 24–27).

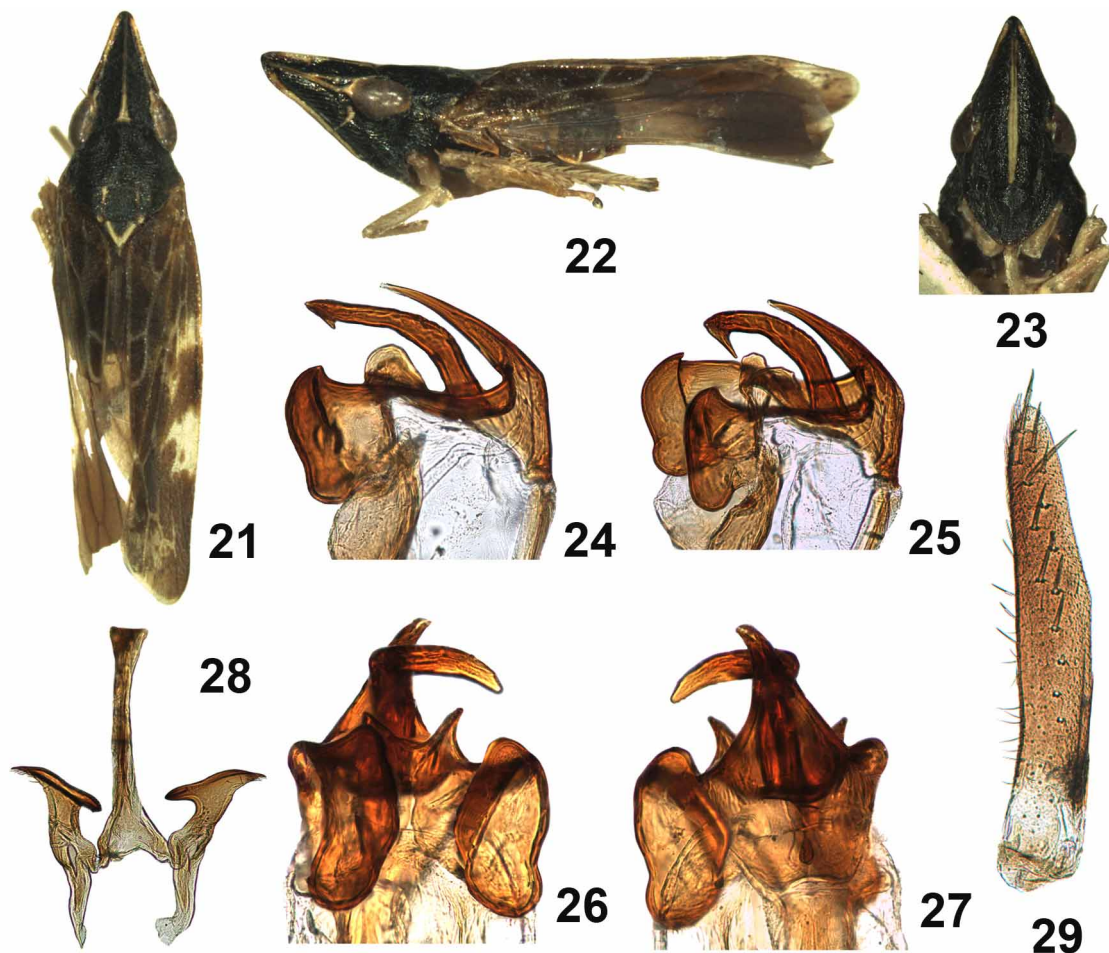
### ***Riseveinus compressus* sp. nov.**

(Figs 30–38)

**Measurements** (♂): Body length: 8.5 mm; head width: 1.6 mm; head length: 1.5 mm.

Vertex (Figs 30, 31) slightly shorter than pronotum and scutellum together.

Subgenital plate with uniseriate setae basally becoming multiseriate distally. Style as in *R. asymmetricus*, about 0.66 as long as connective, with both angles of apical process equally prolonged, mesal lobe broader. Aedeagus with dorsal apodeme well developed, bilobed, shaft strongly compressed in lateral view, with keel-like dorsal margin, terminated by two slender apical processes closer to ventral margin, gonoduct well marked, ventral pair of processes about as long as shaft, atrium elongate, gonopore subapical on ventral margin.



**FIGURES 21–29.** *Riseveinus asymmetricus* sp. nov.: 21. habitus, dorsal view; 22. habitus, lateral view; 23. face; 24. aedeagus, lateral view; 25. aedeagus, oblique laterodorsal view; 26. aedeagus, dorsal view; 27. aedeagus, ventral view; 28. connective and style, dorsal view; 29. subgenital plate.

**Type specimen:** Holotype: ♂ (NWAUF), China: Taiwan, Hualien, Mukwa, 9-July-1985, coll. C.L. Chen.

**Etymology:** The name of this species refers to the strongly compressed shaft of the aedeagus.

**Remarks:** This species can be easily distinguished from other species of the genus by the slender apical processes on the aedeagal shaft.

***Riseveinus albiveinus* (Li), n. comb.**

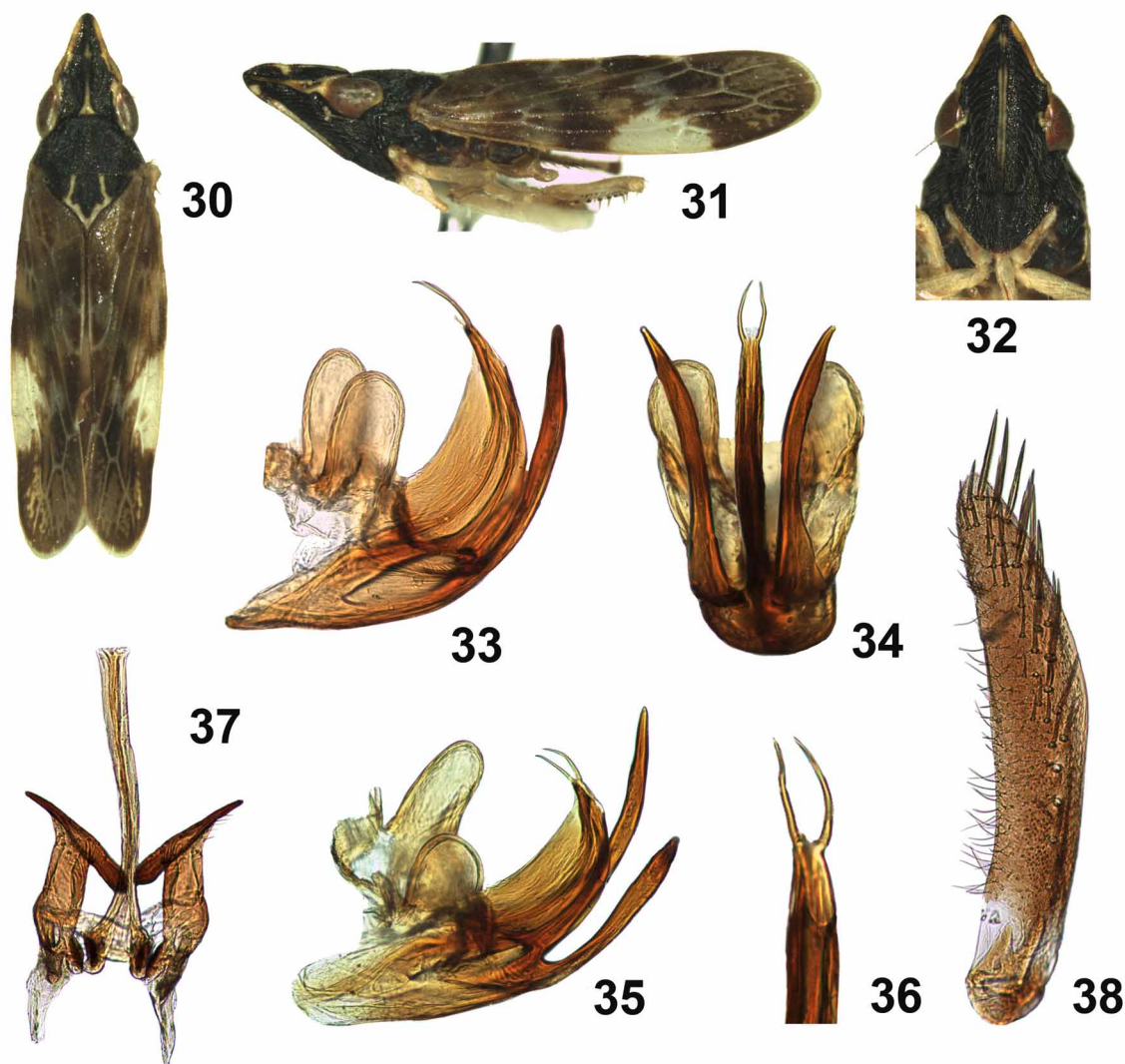
(Figs 39–51)

*Vangama albiveina* Li, 1993: 243 (in Li & Wang); 1996: 119 (in Li & Wang)

**Measurements:** ♂: Body length: 9.5 mm; head width (incl. eyes): 1.9mm; head length: 2.2 mm; ♀: body length: 10.0–10.5 mm; head width (incl. eyes): 1.9–2.1 mm; head length: 2.8–3.2 mm.

Sexually dimorphic, male with much longer head compared to female. Forewing with larger hyaline areas compared to other species of *Riseveinus*.

Male pygofer posteriorly narrowed and conically rounded with a few short setae, subgenital plate with two rows of macrosetae in addition to marginal hair-like setae. Style about 0.66 as long as connective, with lateral angle of apical process slender and pointed and as long as mesal angle. Aedeagus with well developed bilobed dorsal apodeme, atrium produced, shaft curved with apical gonopore, one pair of ventral processes longer than shaft and arising laterad of shaft basally.



**FIGURES 30–38.** *Riseveinus compressus* sp. nov.: 30. habitus, dorsal view; 31. habitus, lateral view; 32. face; 33. aedeagus, lateral view; 34. aedeagus, posteroventral view; 35. aedeagus, oblique anterior-lateral view; 36. apex of aedeagal shaft; 37. connective and style; 38. subgenital plate.

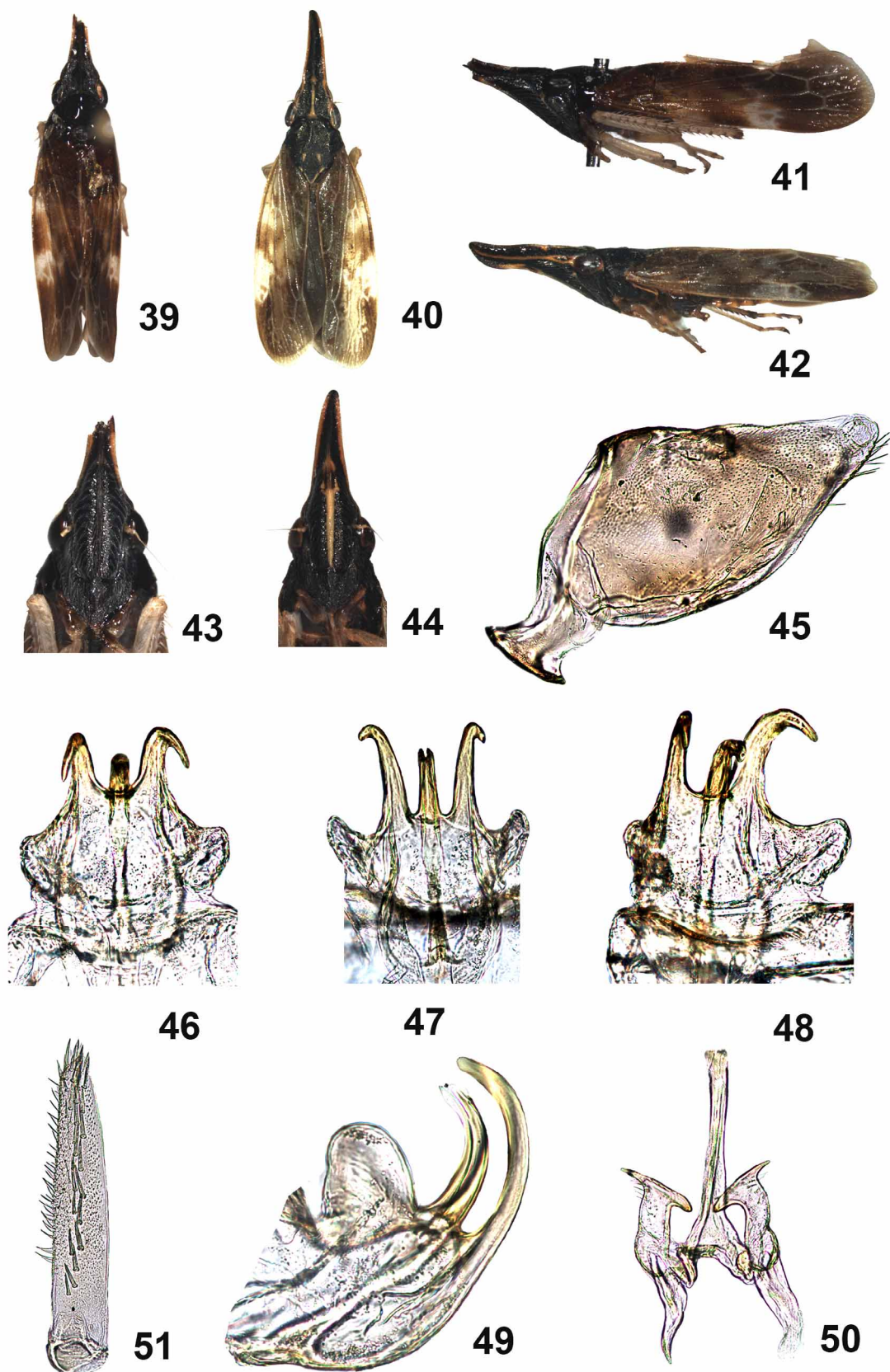
**Material examined:** 1♂ (NWAUFU), China: Guizhou Prov., Ci Kai, Dadan, 1800m, 5-June-1979; 1♀ (NWAUFU), China: Yunnan Prov., Kunming, 1900m, 6-July-1971, coll: Chou Io and Yuan Feng; 1♀ (NWAUFU), China: Hubei Prov., Xingshan, Chengguan, 25-May-1976, coll: Su Xiaoyuan.

**Distribution:** China (Hubei, Yunnan).

**Remarks:** Among the species of *Riseveinus* this species has the longest head, which may be the reason Li & Wang (1996) placed it in the genus *Vangama*. However, this species lacks the long ventral prolongation of the anal collar and has the two angles of the style elongated, features not present in *Vangama*. Therefore, the species is here transferred to *Riseveinus*. It differs from the closely related *R. sinensis* in having an acutely rounded pygofer apex compared to caudally truncate posterior margin in *R. sinensis*.

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**FIGURES 39–51.** *Riseveinus albiveinus* n. comb.: 39. male habitus, dorsal view; 40. female habitus, dorsal view ; 41. male habitus, lateral view; 42. female habitus, lateral view; 43. male face; 44. female face; 45. male pygofer, lateral view; 46,48. aedeagus, dorsal view; 47. aedeagus, ventral view; 49. aedeagus, lateral view; 50. connective and style; 51. subgenital plate.

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