



Review of the leafhopper genus *Striatanus* Li & Wang (Hemiptera: Cicadellidae: Evacanthinae) with description of one new species from China

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Abstract

The genus *Striatanus* Li & Wang is reviewed with redescription of the three known species and description of a new species, *Striatanus erectus*, **sp. nov.**, from China. In addition, photographs and illustrations of all species of the genus are provided as well as a key to all species.

Key words: Homoptera, Auchenorrhyncha, morphology, identification, distribution

Introduction

Evacanthinae is a relatively small subfamily of Cicadellidae previously considered as a tribe in the subfamily Cicadellinae (Oman *et al.* 1990). Dietrich (2004) reinstated this group to subfamily status including, in addition to Evacanthini, the tribes Nirvanini, Balbillini and Pagaroniini. This subfamily is distributed both in the Holarctic and the Oriental regions, and the diversity of genera is greater in the Oriental region than in the Holarctic (Oman *et al.*, 1990; Viraktamath & Webb, 2007). However, some recently published genera of Evacanthini from the Oriental region need to be redefined and may be synonymised in the future (Viraktamath, 2007, pers. comm. with the third author).

Li & Wang (1995) established the genus *Striatanus* with description of three species from southwestern China, e.g., *S. curvatanus*, *S. dentatus* and *S. tibetaensis*. Herein we revise the genus based on examination of the type specimens of the related species, provide illustrations and photographs for all three aforementioned species, and describe a new species, *Striatanus erectus* **sp. nov.**. In addition, we provide a key to this and three related genera, *Pythamus* Melichar, *Riseveinus* Li, and *Vangama* Distant, and a key to species of the *Striatanus*.

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
CAU	China Agricultural University, Beijing, China
NWAFU	The Entomological Museum of Northwest A & F University, Yangling, China

Taxonomy

Striatanus Li & Wang

Type species: *Striatanus curvatanus* Li & Wang, 1995: 189

Head, pronotum and scutellum nearly black. Forewing yellowish brown, with tinted dapples; veins whitish yellow, distinct. Head and thorax with sparse, short, whitish hair. Head (Figs 1, 2) conically produced, vertex distinctly longer than wide, about as long as pronotum and scutellum together or shorter; lateral margin carinate; median longitudinal carina lamellate; submarginal carina mesad of ocelli on head; area between median carina and submarginal carina distinctly concave. Face (Figs 2, 3) including eyes, much 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, shagreened; lora reaching apex of clypellus, shagreened, flat; gena strongly declivous laterally. Pronotum (Figs 1, 2) broad, wider than head; basal area very slightly carinate medially, lateral margin carinate, hind margin slightly indented medially. Scutellum (Figs 1, 2) triangular, about as long as pronotum, with transverse depression distinct. Forewing (Figs 1, 37) punctate near costal margin, veins prominent; anal vein 1A and 2A fused medially; four apical cells; appendix very narrow (Fig. 37). Hindwing (Fig. 38) venation complete. Hind femoral macrosetae 2+1+1.

Male pygofer (Fig. 4) with ventral process. Subgenital (Fig. 9) plate elongate, macrosetae irregularly distributed, row of hair-like setae submarginally; apex rounded. Style (Fig. 8) somewhat elongate, basal articulating arm very short, anterior lateral arm elongate, apophysis foot-like, with several setae and elongate lateral angle. Connective (Fig. 7) Y-shaped. Aedeagal shaft (Fig. 6) in lateral view curved dorsad, with at least pair of processes anteriorly near middle of aedeagal shaft; gonopore subapical.

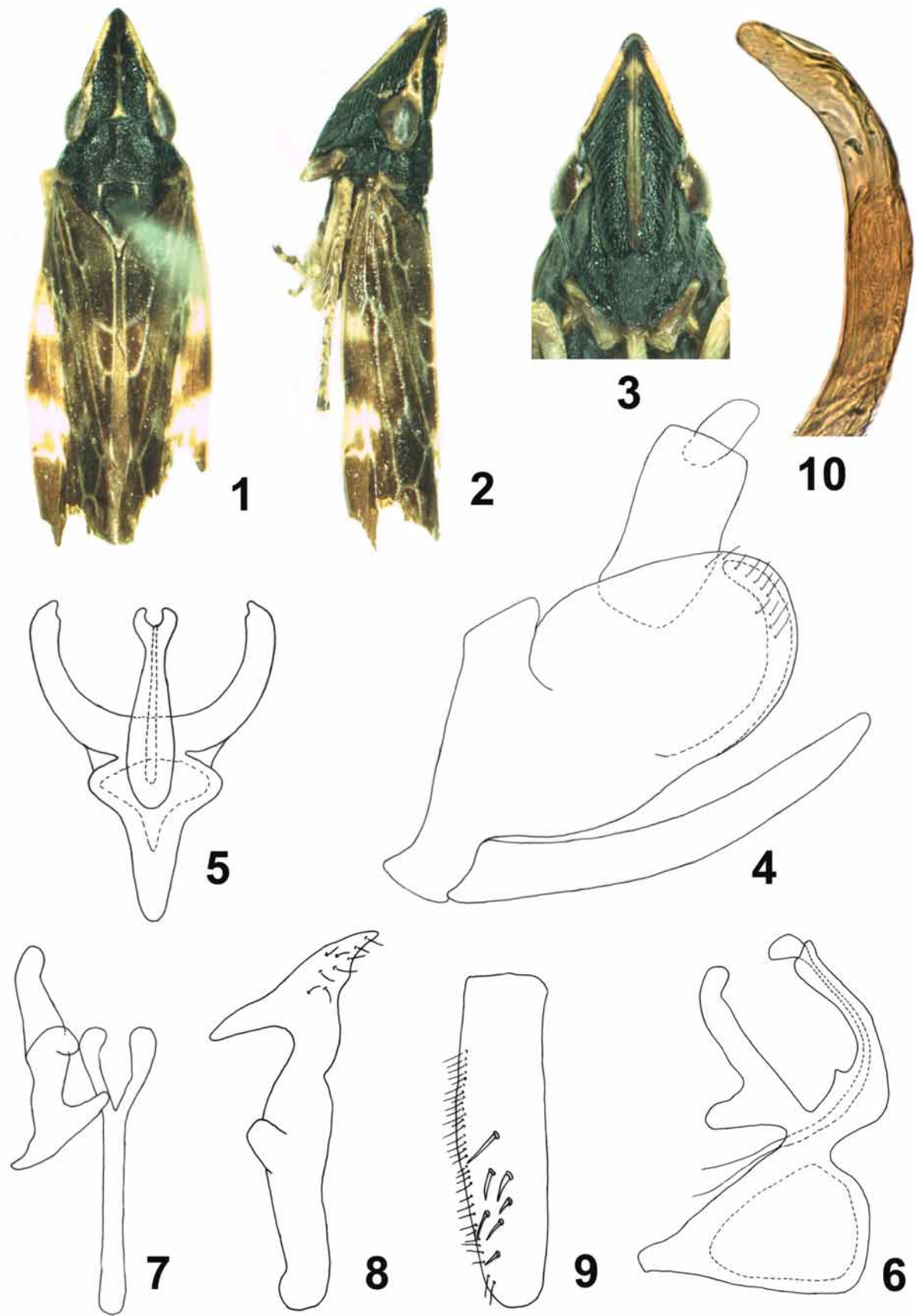
Remarks: This genus is similar to *Pythamus* Melichar, *Riseveinus* Li, and *Vangama* Distant in appearance, but they can be distinguished from each other by the length and shape of head, the shape of claval veins of the forewing, and the presence or absence of a ventral process on the male pygofer. Keys to *Strianatus* and related genera, and to species of *Strianatus* are given below.

Key to *Strianatus* and related genera

1. Claval veins of forewing separate *Pythamus* Melichar
- . Claval veins of forewing fused medially for a short distance then separated 2
2. Head strongly produced and pointed anteriorly, three or more times as long medially as dorsal distance between eyes *Vangama* Distant
- . Head shorter, not strongly pointed, about 2-2.7 times as long as dorsal distance between eyes dorsally 3
3. Male pygofer with ventral process *Striatanus* Li & Wang
- . Male pygofer without ventral process *Riseveinus* Li

Key to species of the genus *Striatanus* (male)

1. Ventral process of male pygofer in lateral view nearly straight and very long, with nearly one fourth its length extending beyond pygofer apex (Fig. 24) *Striatanus tibetaensis*
- Ventral process of male pygofer in lateral view curved dorsad and short, extending to or slightly beyond pygofer apex 2
2. Ventral process of male pygofer in lateral view slightly curved dorsad (Fig. 14), with sinuate ledge in apical part (Fig. 20); aedeagal shaft in lateral view with pair of stout digitate processes pointing to base of aedeagus besides paired anterior processes at midlength (Fig. 16) *Striatanus dentatus*
- Ventral process of male pygofer in lateral view strongly curved dorsad, without ledge; aedeagal shaft in lateral view with only paired anterior processes near midlength 3
3. Ventral process of male pygofer in lateral view of uniform width and apex rounded (Fig. 10); apical half of aedeagal shaft in lateral view curved cephalad, with small denticle distad of anterior process (Fig. 6) *Striatanus curvatanus*
- Ventral process of male pygofer in lateral view gradually tapered apically and apex somewhat truncate (Fig. 42); apical half of aedeagal shaft in lateral view nearly straight, without denticle distad of anterior process (Fig. 35) *Striatanus erectus* **sp. nov.**



FIGURES 1–10. *Striatanus curvatanus* Li & Wang 1. habitus, dorsal view; 2. habitus, lateral view; 3. face; 4. male pygofer, lateral view; 5. aedeagus, ventral view; 6. aedeagus, lateral view; 7. connective and style; 8. style; 9. subgenital plate; 10. pygofer ventral process, lateral view.

Striatanus curvatanus Li & Wang

(Figs 1–10)

Striatanus curvatanus Li & Wang, 1995: 189; 1996: 112

Measurements (male): Body length: 8.0 mm; head width (incl. eyes): 1.4 mm; head length: 1.4mm.

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

Male pygofer (Fig. 4) in lateral view with apical margin broad and rounded; ventral process (Figs 4, 10) strongly curved dorsad, not extending beyond apical margin of pygofer. Aedeagal shaft (Fig. 6) in lateral view curved cephalad, with small denticle apicad of aedeagal process.

Material examined: 1♂ (Paratype, IZAS), China: Sichuan Prov., Emeishan, Jiulaodong, 1800–1900m, 17-August-1957, coll: Huang Keren; 1♂ (NWFU), China: Shaanxi Prov., Taibaishan, Shapo, 4-July-1982.

Distribution: China (Sichuan, Shaanxi).

Remarks: This species was first described from Guizhou Prov. and Sichuan Prov., China. It is similar in appearance with other species of this genus, but can be distinguished by its aedeagal shaft which is curved cephalad, with small denticle apicad of aedeagal process in lateral view (Fig. 6).

Striatanus dentatus Li & Wang

(Figs 11–20)

Striatanus dentatus Li & Wang, 1995: 190; 1996: 113

Measurements (male): Body length: 8.0–8.2 mm; head width (incl. eyes): 1.4–1.7mm; head length: 1.5–1.9 mm.

Vertex (Figs 11, 12) greatly elongate, apex attenuated, as long as pronotum and scutellum together .

Male pygofer (Fig. 14) in lateral view with apex tapered; ventral process (Figs 14, 20) slightly curved dorsad, apical part with sinuate internal ledge. Aedeagus complex (Fig. 16), shaft recurved near apex with one pair of digitate lateral processes concealing shaft, strongly recurved, another pair of processes arising anteriorly near midlength and strongly recurved, gonopore apical.

Material examined: 1♂ (IZAS), China: Yunnan Prov., Mengyang, 24-August-1957, coll: Zang Lingchao; 1♂ (NKU), China: Yunnan Prov., Ruili, 3-September-1979, coll: Ling Zuopei.

Distribution: China (Yunnan).

Remarks: This species can be distinguished from other species of the genus by the shape of the ventral process of male pygofer and the aedeagus.

Striatanus tibetaensis Li & Wang

(Figs 21–30)

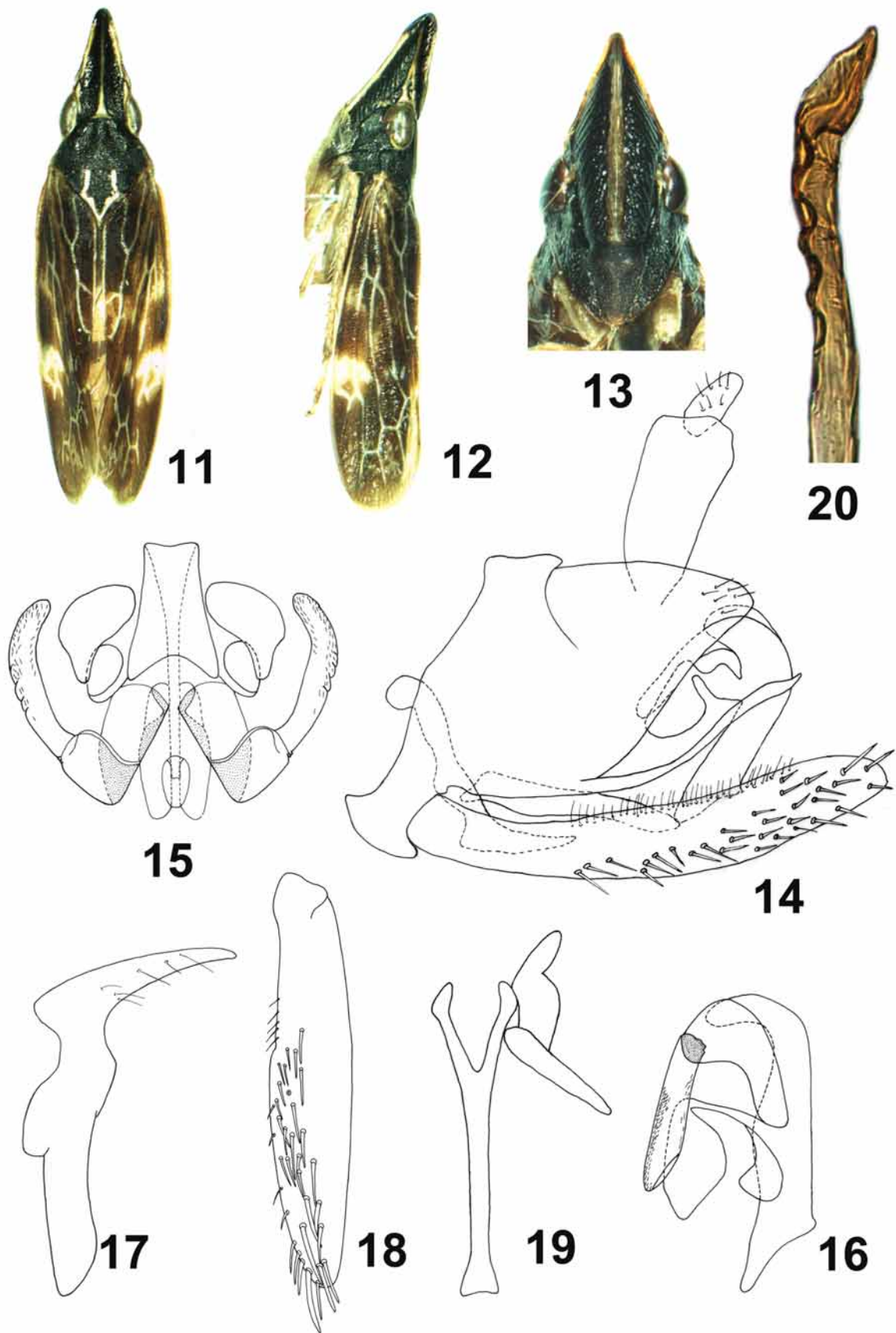
Striatanus tibetaensis Li & Wang, 1995: 191; 1996: 114

Measurements (male): body length: 8.0 mm; head width (incl. eyes):1.4 mm; head length: 1.6 mm.

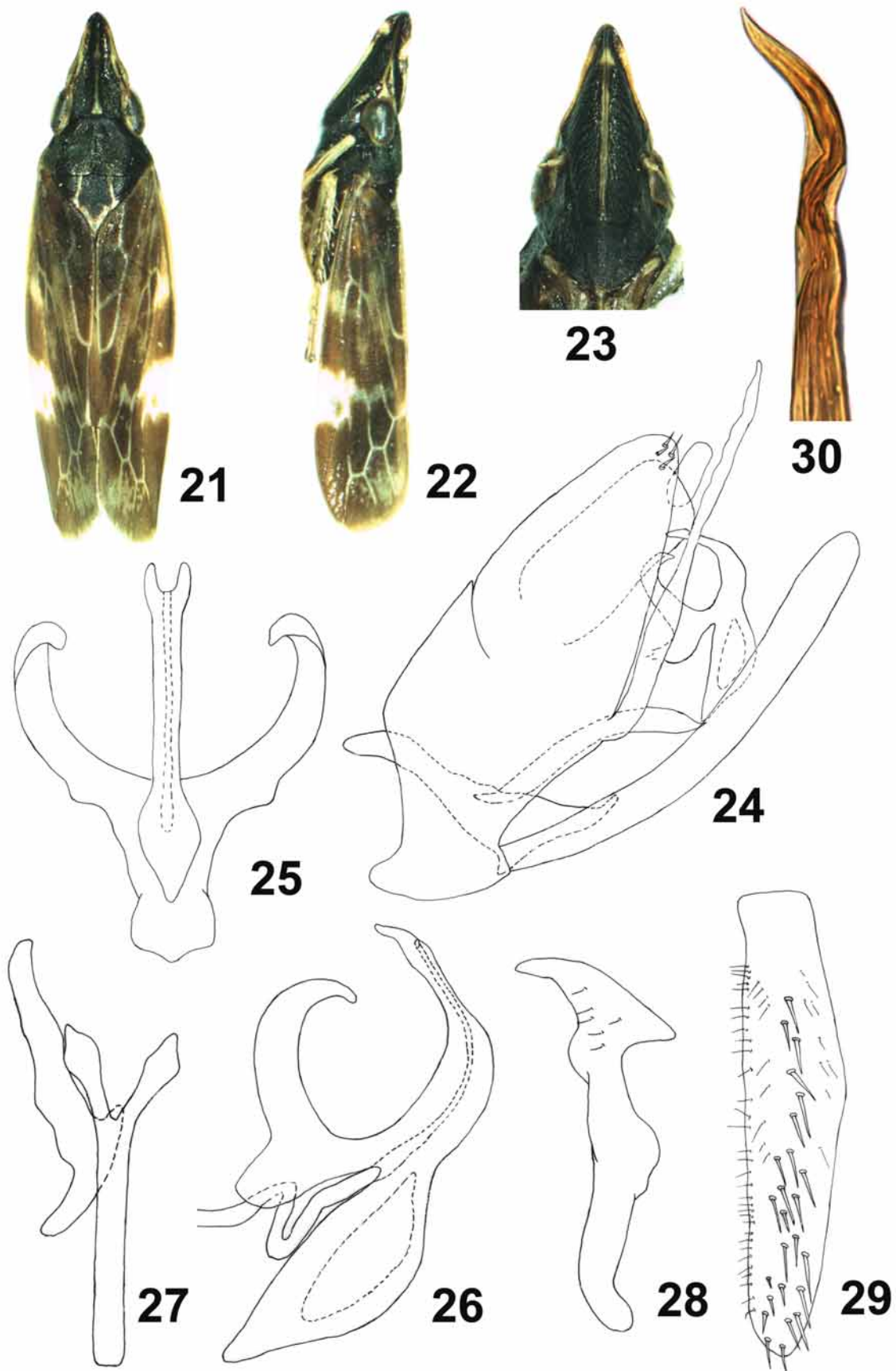
Vertex elongate (Figs 21, 22), but shorter than pronotum and scutellum together.

Male pygofer (Fig. 24) in lateral view with apex tapered; ventral process (Figs 24, 30) very long and straight, with nearly one fourth its length extending beyond pygofer apex. Aedeagus (Figs 25, 26) simple, with pair of processes anteriorly near middle of aedeagal, shaft in lateral view; gonopore subapical.

Material examined: 1♂ (Holotype, CAU), China: Xizang Autonomous Region, Yigong, 2300m, 29-July-1976, coll: Li Fasheng.



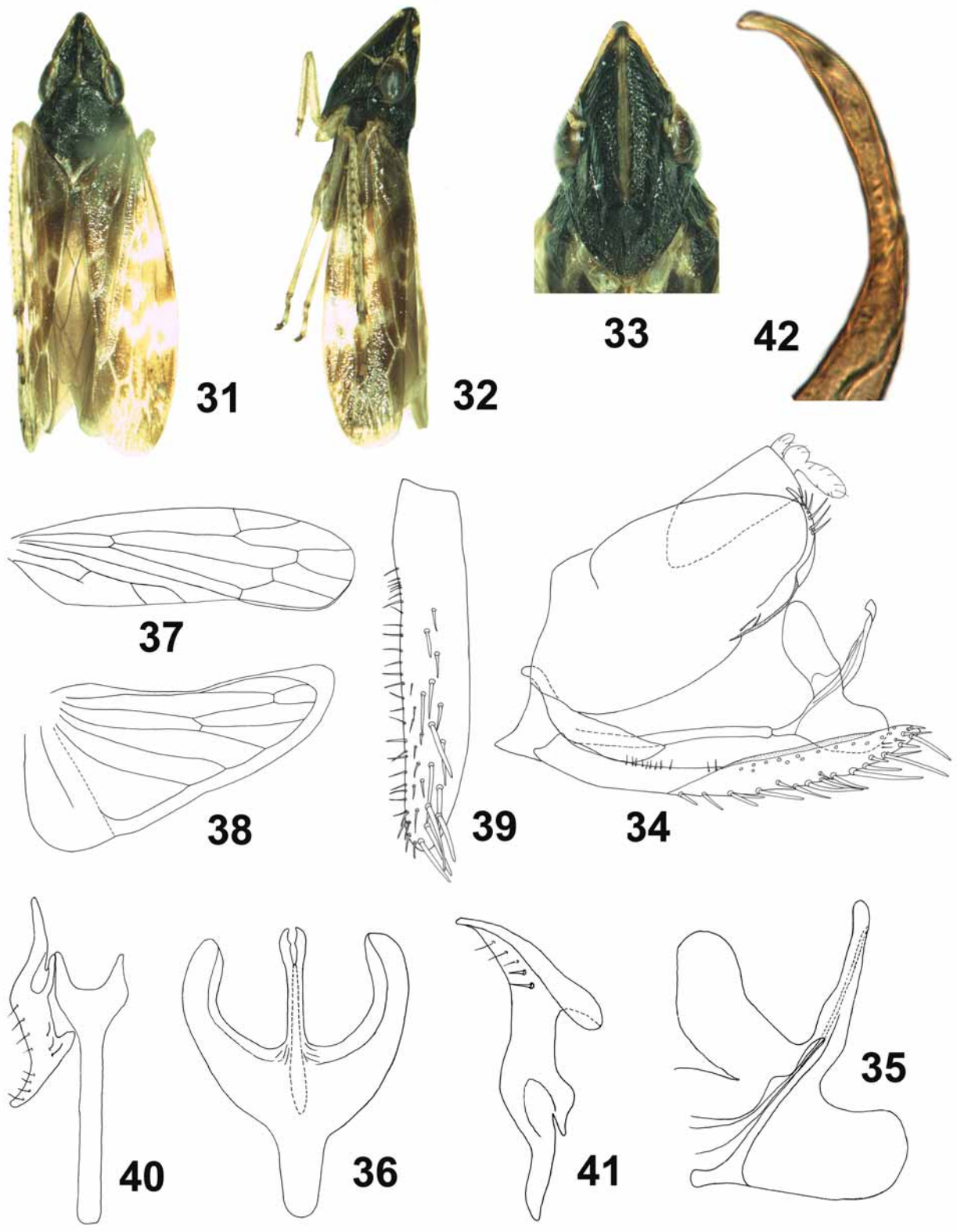
FIGURES 11–20. *Striatanus dentatus* Li & Wang 11. habitus, dorsal view; 12. habitus, lateral view; 13. face; 14. male pygofer, lateral view; 15. aedeagus, ventral view; 16. aedeagus, lateral view; 17. style; 18. subgenital plate; 19. connective and style; 20. pygofer ventral process, lateral view.



FIGURES 21–30. *Striatanus tibetaensis* Li & Wang 21. habitus, dorsal view; 22. habitus, lateral view; 23. face; 24. male pygofer, lateral view; 25. aedeagus, ventral view; 26. aedeagus, lateral view; 27. style; 28. subgenital plate; 29. connective and style; 30. pygofer ventral process, lateral view.

Distribution: China (Xizang).

Remarks: This species can be readily distinguished from other species of the genus by its very long and straight ventral process of the male pygofer (Figs 24, 30).



FIGURES 31–42. *Striatanus erectus* sp. nov. 31. habitus, dorsal view; 32. habitus, lateral view; 33. face; 34. male pygofer, lateral view; 35. aedeagus, ventral view; 36. aedeagus, lateral view; 37. forewing; 38. hindwing; 39. subgenital plate; 40. connective and style; 41. style; 42. pygofer ventral process, lateral view.

***Striatanus erectus* sp. nov.**

(Figs 31–42)

Measurements (male): body length: 7.5–7.8 mm; head width (incl. eyes): 1.6–1.8 mm; head length: 1.5–1.6 mm.

Vertex (Figs 31, 32) less elongate, distinctly shorter than pronotum and scutellum together.

Male pygofer (Fig. 34) in lateral view with apex rounded; ventral process (Figs 34, 42) strongly curved dorsad, apical part tapered apically, with apex somewhat truncate. Aedeagus (Fig. 35) strongly posteriorly produced basally; apical half of aedeagal shaft in lateral view nearly straight, gonopore subapical.

Etymology: The name of this species is derived from the nearly straight aedeagal shaft.

Type specimens: Holotype: ♂ (IZAS), China: Yunnan Prov., Pingbian, Daweishan, 1500m, 22-June-1956, coll: Huang Keren.

Remarks: This species resembles *Striatanus curvatanus* Li & Wang externally, but can be distinguished from the latter by the shape of the ventral process of male pygofer and aedeagus.

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References

- Dietrich, C.H. (2004) Phylogeny of the leafhopper subfamily Evacanthinae with a review of Neotropical species and notes on related groups (Hemiptera: Membracoidea: Cicadellidae). *Systematic Entomology*, 29, 455–487.
- Li, Z.Z. & Wang, L.M. (1995) Two new genera and three new species of Evacanthinae (Hemiptera: Cicadellidae) from China. *Entomotaxonomia*, 17, 189–194.
- Li, Z.Z. & Wang, L.M. (1996) The Evacanthinae (Hemiptera: Cicadellidae) of China. *Guizhou technology publishing company, Guiyang, China*. 134 pp.
- Oman, P.W., Knight W.J. & Nielson M.W. (1990) Leafhoppers (Cicadellidae): a bibliography, generic Check-list and index to the world literature 1956–1985. CAB International Institute of Entomology, Wallingford, U.K. 368 pp.
- Viraktamath C.A. & Webb, M.D. (2007) Review of the leafhopper genus *Pythamus* Melichar (Hemiptera: Cicadellidae: Evacanthinae) in the Indian subcontinent. *Zootaxa*, 1546, 51–61.