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A new genus and species of Cicadellini (Hemiptera: Cicadellidae) from China

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The leafhopper genus *Atkinsoniella* was originally established by Distant (1908) for two species with *A. decisa* as type species. So far, 75 valid species are known worldwide and of these, 63 are from China (Yang *et al*. 2011). Because *Atkinsoniella* is a very large and morphologically heterogeneous genus it is desirable to recognize smaller groups of species with distinctive characteristics.

Atkinsoniella jiaoi was described based on 1 male and 1 female specimens from Dashahe Nature Reserve of Guizhou, China (Yang *et al*. 2005). This species differs from other species of *Atkinsoniella* by the following features of male genitalia: the male pygofer process geniculate and segmented; aedeagus stubby; paraphysis slender, broadened distally in ventral view with short, angulate lateral processes; style not extended posteriorly beyond the apex of connective and with developed preapical lobe. In this paper, a new genus, *Biprocessa*, is established to accommodate *Atkinsoniella jiaoi* Yang & Li, 2005. A new species, *B. shielda* **sp. nov.**, is also described and illustrated.

Material and methods

The male and female genital structures were prepared according to the techniques described by Oman (1949) and Mejdalani (1998), respectively. The dissected parts are stored in small vials with glycerin and attached below the specimens. The morphological terminology adopted herein follows mainly Young (1986) and Dietrich (2005), except for the female genitalia (Nielson 1965; Davis 1975; Mejdalani 1998). All specimens studied are housed in the Institute of Entomology, Guizhou University, Guiyang, China (GUGC).

Taxonomy

Biprocessa gen. nov. (Figs 1–21)

Type species: *Atkinsoniella jiaoi* Yang & Li, 2005, here designated.

Diagnosis. The new genus can be recognized by the following combination of features: (1) male pygofer (Figs 2 and 15) with dense microsetae basiventrally. Pygofer process geniculate, extending posterodorsally, apical half segmented distinctly; (2) aedeagus (Figs 4–5, 17–18) stubby; (3) paraphysis (Figs 4–5, 17–19) slender, in lateral view ventral margin angulate, in ventral view apical portion truncate; (4) style (Figs 7 and 21) short, not extended posteriorly beyond stalk of connective, preapical lobe developed.

Description. Length. 7.2–7.6mm.

Coloration. Body pale to orange-yellow, with black spots.

External features. Head anterior margin round; median length of crown less than transocular width; ocelli located on imaginary line between anterior eye angles; lateral frontal suture extending onto crown, attaining ocelli; distance between ocelli equal to or slightly more than distance to adjacent eye; frontoclypeus flattened medially, muscle impressions distinct; transclypeal suture distinct medially. Pronotum broader than head, disk with inconspicuous transverse concavity anteriorly; mesonotum with surface of scutellum slightly convex; forewing with base of second apical cell more proximal than base of third; hindleg with femoral setal formula 2:1:1.

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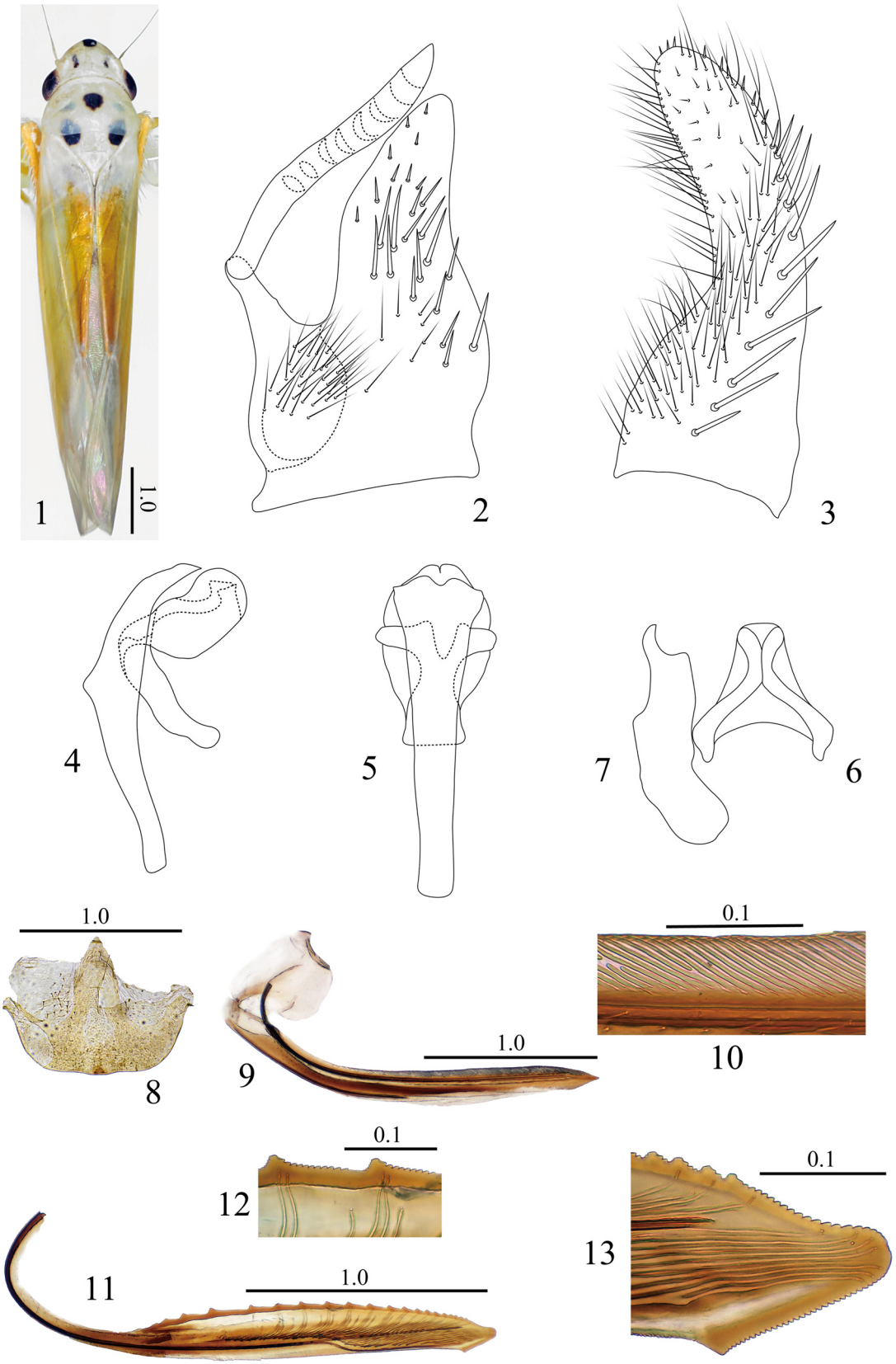
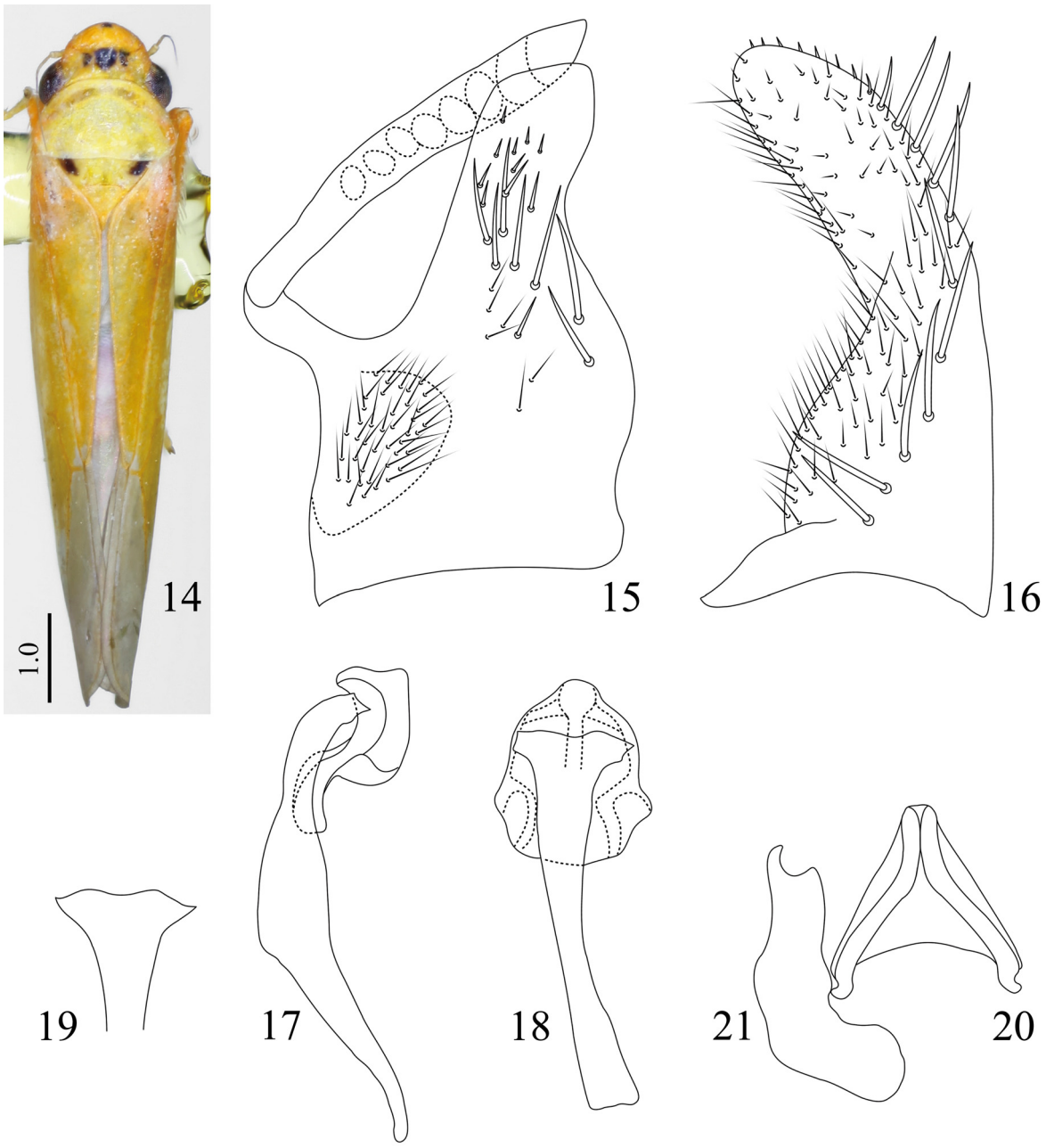


FIGURES 1–13. *Biprocessa jiaoi* (Yang & Li, 2005) **gen**. **nov**. & **comb**. **nov**. 1, body, dorsal view. 2–7, male genitalia. 2, pygofer, lateral view. 3, subgenital plate, ventral view. 4, aedeagus and paraphysis, lateral view. 5, aedeagus and paraphysis, ventral view. 6, connective, ventral view. 7, style, ventral view. 8–13, female genitalia. 8, sternite VII, ventral view. 9, valvifer I and valvula I, lateral view. 10, dorsal sculptured area of median portion of valvula I, lateral view. 11, valvula II, lateral view. 12, teeth of median portion of valvula II, lateral view. 13, apical portion of valvula II, lateral view. Scale bars in millimeters.



FIGURES 14–21. *Biprocessa shielda* **gen**. **nov**. & **sp. nov.** 14, body, dorsal view. 15–21, male genitalia. 15, pygofer, lateral view. 16, subgenital plate, ventral view. 17, aedeagus and paraphysis, lateral view. 18, aedeagus and paraphysis, ventral view. 19, apical portion of paraphysis, caudal-ventral view. 20, connective, ventral view. 21, style, ventral view. Scale bars in millimeters.

Male genitalia. Pygofer (Figs 2 and 15) gradually narrowed posteriorly; disk with long and short macrosetae, with dense microsetae basiventrally; pygofer process abruptly bent dorsally and extending posteriorly beyond acute apex of pygofer, clavate, whole process geniculate, distinctly segmented distally. Subgenital plates (Figs 3 and 16) produced posteriorly slightly beyond pygofer, with uniseriate oblique submedial row of macrosetae and long or short microsetae on ventral surface. Aedeagus (Figs 4–5, 17–18) stubby, extended little or no farther posterad than paraphysis. Paraphysis (Figs 4–5, 17–19) slender, longer than aedeagus, in lateral view with ventral margin angulate on median portion, in ventral view, apex widened with pair of angulate lateral projections. Connective (Figs 6 and 20) Y-shaped. Style (Figs 7 and 21) short, not extended posteriorly beyond stalk of connective, apical portion curved and abruptly narrowed, preapical lobe developed.

Female genitalia (based on *Biprocessa jiaoi*). Abdominal sternite VII (Fig. 8), in ventral view, with posterior margin approximately transverse. Internal sternite VIII membranous. Pygofer, in lateral view, moderately produced, surface with macrosetae on posterior portion and extending anteriorly along ventral margin. Valvulae I (Figs 9–10) in lateral view, with dorsal margin of shaft approximately rectilinear behind basal curvature; apex of shaft acute and slightly curved

ventrally; dorsal sculptured area strigate, extending from basal portion of shaft to apex; ventral sculptured area strigate, restricted to apical portion; ventral interlocking device distinct on basal 2/5 of shaft. Valvulae II (Figs 11–13) in lateral view, expanded beyond basal curvature, dorsal margin slightly convex, ventral margin approximately rectilinear; apex narrowly rounded, anteapical dorsal margin slightly concave and anteapical ventral margin obliquely straight; preapical prominence developed; dorsal margin of expanded area bearing about 20 triangular teeth; all teeth and dorsal and ventral margins of apical portion of shaft bearing denticles. Ducts dense, extending toward teeth and toward apical blade portion. Gonoplacs, in lateral view, expanded at apical half, surface with few setae on apicoventral margin.

Distribution. China (Guizhou, Yunnan)

Remarks. This new genus is similar to *Atkinsoniella* Distant, 1908 in some respects. Several species, such as *A. albimacula*, *A. alcmena*, *A. chloritta*, *A. cuspidata*, *A. nigripennis* and *A. opponens*, have long and strongly bent pygofer processes as in *Biprocessa*. However, in *Biprocessa* the pygofer process is distinctly segmented. Also, in the mentioned species of *Atkinsoniella*, the aedeagus is usually as long as the paraphysis, the paraphysis in ventral view is usually acute apically, and the styles extend posteriorly much beyond the apex of the connective. In *Biprocessa*, the aedeagus is much shorter than the paraphysis, the paraphysis is slender, in ventral view with pair of angulate lateral processes, and the styles do not extend posteriorly beyond the connective apex. Several species of *Atkinsoniella*, i.e., *A. aurantiaca*, *A. curvata*, *A. cyclops*, *A. flavipenna*, *A. punica*, *A. rinkihonis*, *A. thalia*, *A. thaloidea* and *A. uniguttata*, have similar color pattern with the species of *Biprocessa*. They are difficult to distinguish based on external characters, but can easily distinguished by the male genitalia features. In the above mentioned species of *Atkinsoniella*, the male pygofer processes are developed but not segmented; the aedeagus extends posteriorly distinctly farther than the paraphysis, and the styles extended much beyond the apex of the connective.

Etymology. The genus name is derived from "*bi-*" and "*processa*" due to the two lateral angular processes on the paraphysis. The gender of the genus is feminine.

Species of *Biprocessa* gen. nov.

Biprocessa jiaoi (Yang & Li, 2005) **comb. nov.**; China (Guizhou)
Biprocessa shielda **sp**. **nov**.; China (Yunnan)

Biprocessa jiaoi (Yang & Li, 2005) comb. nov.

Atkinsoniella jiaoi Yang & Li, in Yang, Song & Li, 2005: 138.
(Figs 1–13)

Type-locality: Guizhou (China)

Description. Length. 7.2–7.6mm.

Coloration. Head and thorax pale in dorsal view. Vertex with a small round black spot; ocelli, area around ocelli, and eyes black. Pronotum with median small black spot; basal angles of mesonotum with small spot (indistinct in some females). Forewing pale to orange-yellow, inner and outer margins usually deep orange-yellow or orange-red. Face, thoracic sternum and legs pale; abdomen yellow in ventral view.

External features. Width between ocelli slightly more than to adjacent eye. Other features as in generic diagnosis.

Male genitalia. Pygofer (Fig. 2) angulate posterodorsally; disk with median and apical portion with macrosetae; pygofer process with apical 2/3 bent dorsally. Subgenital plates (Fig. 3) scabbard-shaped. Aedeagus (Figs 4 and 5) with pair of inner sclerotized processes apically, and with developed basal process extending anterior-dorsally. Paraphysis (Figs 4 and 5), in ventral view, gradually widen posteriorly, with apical margin concave medially, apical lateral projections short. Connective (Fig. 6) broadly Y-shaped with lateral margins slightly concave. Style (Fig.7) extending posteriorly as far as apex of connective.

Female genitalia. Abdominal sternite VII (Fig. 8), in ventral view, posterior margin approximately transverse, slight convex medially; surface with relatively concentrated setae distributed on bilateral portion of anterior half. Valvifers I, in lateral view, with posterodorsal margin nearly angulate and posteroventral margin rounded. Valvifers II with small group of clustered setae near articulation point. Other features as in generic diagnosis.

Material examined. 1 male (Holotype) and 1 female (Paratype), China, Guizhou Province, Daozhen County, Dashahe, 22 to 26 May 2004, coll. Song Qiong-zhang, Zhang Bin and Xu Fang-ling; 1 female, China, Guizhou Province, Maolan, 23 May 1998, coll. Li Zi-zhong; 1 female, China, Guizhou Province, Shibing County, Yuntaishan, 20 May 2009,

coll. Yang Zai-hua; 2 males, China, Guizhou Province, Suiyang County, Kuankuoshui, 2 to 5 June 2010, coll. Song Qiong-zhang.

Biprocessa shielda sp. nov. (Figs 14–21)

Type-locality: Yunnan (China)

Description. Length. ♂, 7.2–7.6mm.

Coloration. Body yellow. Vertex with a small round black spot; between ocelli with large shield-shaped black spot; ocelli with circled black markings; eyes black. Mesonotum with basal angles with black spot. Forewing with apical membrane infuscate. Legs with tarsi apices dark brown.

External features. Head with anterior margin roundly produced. Ocelli equidistant between each other and adjacent eye. Other features as in generic diagnosis.

Male genitalia. Pygofer (Fig. 15) narrowed apically, posterior margin nearly oblique, posterodosal margin nearly angulate, dorsal margin concave near apex; disk with macrosetae mostly on median and apical portion; pygofer process with apical 3/4 bent dorsally. Subgenital plates (Fig. 16) with apical half curved dorsally. Aedeagus (Figs 17 and 18), in ventral view broad and short; in lateral view, arched and nearly S-shaped, basal process short. Paraphysis (Figs 17–19) slender, in ventral view, slightly constricted medially, apical margin slightly concave medially, apical lateral projections developed. Connective (Fig. 20) Y-shaped with lateral margins straight. Style (Fig. 21) not exceeding posterad as far as apex of connective.

Female genitalia. Unknown.

Material examined. Holotype, male, China, Yunnan Province, Gaoligongshan, 4 to 5 June 2009, coll. Yang Zai-hua and Li Bin. Paratype, 1 male, same data as holotype.

Etymology. This new species is named for shield-shaped black spot of the crown.

Remarks. This new species is similar to *B. jiaoi* (Yang & Li, 2005). It differs in having a black spot between the ocelli (Fig. 14), the pronotum (Fig. 14) without a median black spot, the male pygofer (Fig. 15) with posterior margin oblique and distinct concavity on the dorsal margin, the paraphysis (Figs 18 and 19) with apex broader, and the aedeagus (Fig. 17) S-shaped and without a long basidorsal process.

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