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TWO NEW SPECIES AND TWO NEW RECORD SPECIES OF DELPHACIDAE (HEMIPTERA, FULGOROIDEA) FROM CHINA

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Abstract Two new delphacid species, *Sogatellana curva* sp. nov. and *Miranus spinaphallus* sp. nov. (Hemiptera, Fulgoroidea, Delphacidae), both collected from Xishuangbanna, Yunnan, China are described and illustrated. *Syndelphax disonymos* (Kirkaldy) and *Sinolacme sinuosa* Yang are reported from the mainland China for the first time.

Key words Hemiptera, Delphacidae, new species, new record, China.

In the present paper, we describe two new delphacid species, *Sogatellana curva* sp. nov. (Yunnan, Xishuangbanna) and *Miranus spinaphallus* sp. nov. (Yunnan, Xishuangbanna) (Hemiptera, Fulgoroidea, Delphacidae) from China. We also report two delphacid species, *Syndelphax disonymos* (Kirkaldy, 1907) and *Sinolacme sinuosa* Yang, 1989 from the mainland China for the first time. The morphological terminology and ordinal placement follow Yang & Yang (1986), Kuoh *et al*. (1984) and Liang (2005). All specimens studied are deposited in the Institute of Zoology, Chinese Academy of Sciences (IZCAS), Beijing, China.

1 *Sogatellana* Kuoh, 1980

Sogatellana Kuoh, 1980. *Acta Zootax. Sin.*, 5 (2): 169; Kuoh, 1984. Econ. Ins. Fauna China. 27: 118; Yang, 1989. NSC Spec. Publ. No. 6: 196. Type species: *Sogatellana marginata* Kuoh, 1980.

Diagnosis. Vertex sub-medially longer than width at base about 1.3∶1.0, submedian carinae uniting at apex, basal compartment wider at base than its greatest length about 1.3∶1.0. Frons at midline longer than width at widest part about 2.1-2.4∶1.0, widest at apical third, median carina forked at base or not forked. Postclypeus as wide as or wider than frons at apex. Rostrum reaching meso-trochanters. Antennae cylindrical, surpassing frontoclypeal suture, basal segment longer than width at apex, shorter than second segment about 1.0∶2.3. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4.

Phallus tubular. Suspensorium ring-like, with indistinct arms dorsally. Diaphragm broad, with dorsal margin produced medially, median area near dorsal margin convex, rugged on surface. Genital styles broad, moderately long, only slightly divergent, inner angle always produced. Anal segment of male short, lateroapical angles moderately separated, each produced into 2 processes.

Distribution. Oriental Region.

Sogatellana curva sp. nov. (Figs.1-12)

Macropterous male.

Measurements. Body length 2 mm, body length (incl. teg.) 3.2 mm, tegmen length 2.7 mm.

Yellow-brown, tegmen light yellow-brown, nearly transparent.

Head (Fig.1) including eyes narrower than pronotum (about 1.0∶1.1), Y-shaped carina indistinct, vertex at midline shorter than width at base (1.0∶1.1), basal compartment at base wider than its greatest length (1.6∶1.0), and wider than stem of Y-shaped carina (2∶1), vertex sub-medially shorter than width at base about 1.0∶2.7. Frons (Fig.2) at midline longer than width at widest part about 2.4∶1.0, frons with lateral carinae nearly parallel, narrower basally, median carina forked at base. Postclypeus (Fig.2) at base wider than frons at apex, at midline shorter than frons (1.0∶1.9), in profile postclypeus not prominent. Rostrum notsurpassing meso-trochanters. Antennae with first segment about as long as width at apex, second segment as twice long as first

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segment. Pronotum (Fig.1) at midline about as long as vertex, and longer than width between lateral carinae at anterior margin about 1.2∶1.0. Mesonotum (Fig.1) longer than vertex and pronotum together, median carina not reaching distal scutellum, mesonotum at midline longer than scutellum (2.5∶1.0), and shorter than width at base (1.0∶1.5). Tegmen without pterostigma. Post-tibial spur with about 25 small teeth. Basitarsus longer than other two tarsi together.

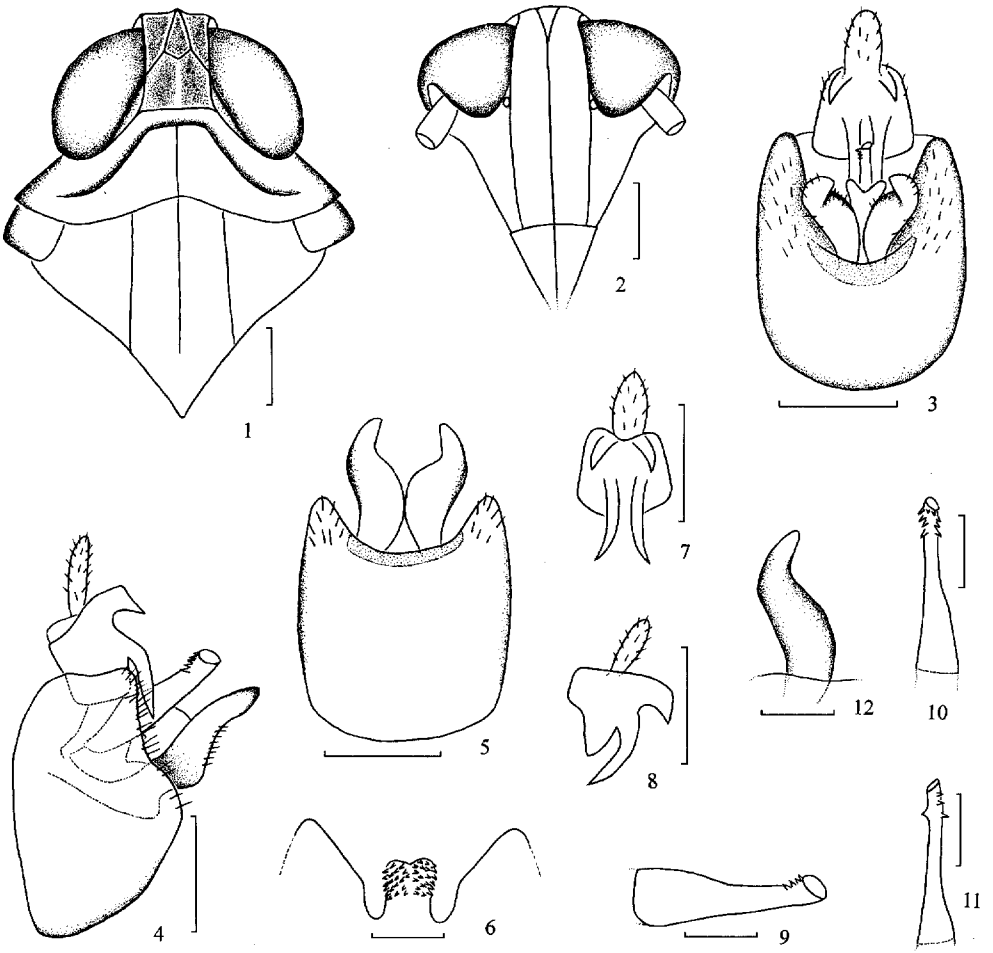
Pygofer (Figs.3, 5) with opening small, lateral margin not defined, ossified ventrally, medioventral process absent, lateral margins prominent, laterodorsal angles not produced. In profile (Fig.4), posterior margin with dorsal half straight slightly, ventral half produced caudad. Aedeagus (Figs.9-11) tubular, basal half thick and gradually slender, distal half even thin, apex with small teeth laterally. Suspensorium ring-like. Diaphragm (Fig.6) with dorsal margin shallowly bifurcate, deeply concave laterally, posteriorly hunched and with small teeth, mulberry-like. Genital styles (Fig.12) in ventral view with basal 2/3 thicker and slightly oblique outward, inner margin convex entad, outer margin slightly concave, reflexed entad at 1/3 near apex, gradually thinning from 2/3 near base to apex, obtusely round at apex.

Holotype ♂ (Macropterous), China, Yunnan, Xishuangbanna, Damenglong, 650 m, 5 June 1958, coll. WANG Shu-Yong.

Etymology. The name of this species is derived from the Latin *curcus*, meaning its genital styles of curved entad.

This species differs from other species of *Sogatellana* in its genital styles being slightly tortuose, thin at apex and outer apical angle not produced, aedeagus straight, and dorsal margin of diaphragm shallowly bifurcate, mulberry-like.

Distribution. China (Yunnan).



Figs.1-12. *Sogatellana curva* sp. nov. 1.Head and thorax, dorsal view. 2.Head, ventral view. 3.Pygofer, posterior view. 4.Pygofer, left lateral view. 5.Pygofer, ventral view. 6.Dorsal margin of diaphragm, posterior view. 7.Anal segment, ventral view. 8.Anal segment, left lateral view. 9.Aedeagus, left side. 10.Aedeagus, dorsal view. 11. Aedeagus, ventral view. 12. Genital style, left side, ventral view. Scale bars: 1-5, 7-8=0.2 mm; 6, 9-12=0.1 mm.

2 *Miranus* Chen *et* Ding, 2001

Miranus Chen *et* Ding, 2001. *Acta Zootax. Sin.*, 26 (3): 323. Type species: *Stenocranus varians* Kuoh, 1981.

Diagnosis. Vertex narrower at apex than at base, apical margin produced slightly, in profile vertex subacutely rounding into frons, submedian carinae uniting at apex, Y-shaped carina distinct. Frons narrower at base than width at apex, lateroapical angles expanded laterad, median carina simple. Frons at midline longer than width at widest part about 2.1-2.4:1.0, widest at apex. Postclypeus large, about as wide at base as or slightly wider than frons at apex. Rostrum almost reaching meta-trochanters. Antennae cylindrical, reaching frontoclypeal suture, first segment longer than width at apex, shorter than second segment about 1.0:2.0-2.3. Pronotum with lateral carinae attaining hind margin. Spinal formula of hind leg 5-7-4.

Pygofer with opening longer than wide. Diaphragm moderately broad, with dorsal margin convex medially, opening for genital styles with dorsal margin produced downward in a little process medially. Phallus long tubular, simple, with a lobe at base connecting diaphragm. Genital styles rather long, separated each other, in profile, base of genital styles curved strongly, and far from posterior margin of pygofer. Anal segment of male short and large, lateroapical angles each produced into a large, ventrad directed process, and widely separated.

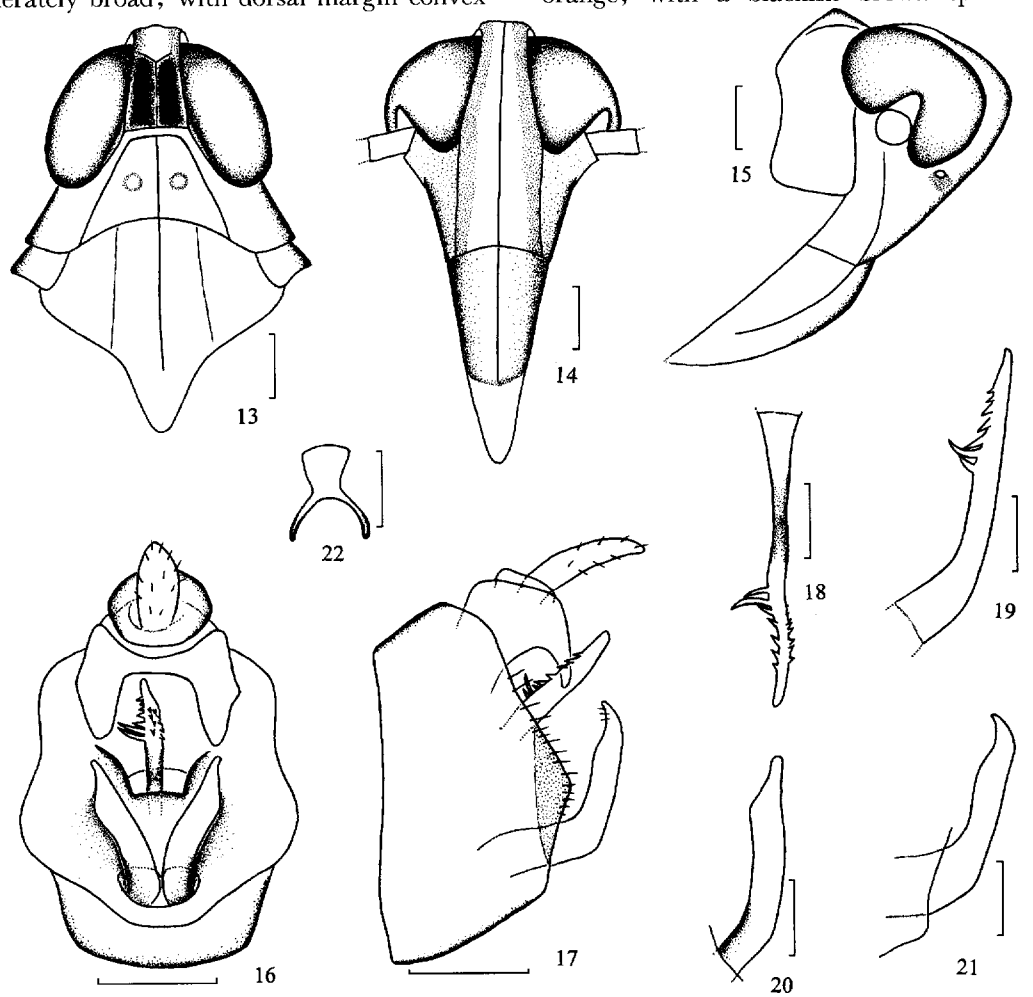
Distribution. Oriental Region.

Miranus spinaphallus sp. nov. (Figs.13-22)

Macropterous male.

Measurements. Body length 2.3 mm, body length (incl. teg.) 4.3 mm, tegmen length 3.5 mm.

General color light yellow slightly orange, distinct orange at dorsal abdomen. Body with a white stripe from vertex at base to apical postclypeus, genae orange, with a blackish brown spot before ocelli.



Figs.13-22. *Miranus spinaphallus* sp. nov. 13.Head and thorax, dorsal view. 14.Head, ventral view. 15.Head and pronotum, right lateral view. 16.Pygofer, posterior view. 17.Pygofer, left lateral view. 18.Aedeagus, dorsal view. 19.Aedeagus, left side. 20.Genital style, left side, posterior view. 21. genital style, left side, left-lateral view. 22. Suspensorium, dorsal view. Scale bars: 13-17=0.2 mm; 18-22=0.1 mm.

Tegmen light yellow, transparent, veins con-color with tegmen, with pterostigma brown.

Vertex (Fig.13) with Y-shaped carina feeble, basal compartment concave, at midline longer than width at base about 1.4∶1.0, submedian carinae arising from about middle, basal compartment at base wider than its greatest length about 1.0∶0.9, and wider than stem of Y-shaped carina about 1.0∶0.8, vertex sub-medially shorter than width at base (1.0∶1.6). Frons (Fig.14) at midline longer than width at widest part 2.4∶1.0, median carina not forked. Postclypeus (Fig.14) width at base slightly wider than frons at apex (1.1∶1.0), at midline shorter than frons (1.0∶1.6), in profile postclypeus (Fig.15) not prominent. Rostrum surpassing meso-trochanters, not attaining meta-coxae. Antennae surpassing fronto-clypeal suture, first segment longer than width at apex 1.5∶1.0, second segment as twice long as first segment. Pronotum (Figs.13, 15) with lateral carinae straight, at midline shorter than vertex (about 1.0∶1.2), and longer than width between lateral carinae at anterior margin (1.8∶1.0). Mesonotum (Fig.13) longer than vertex and pronotum together, with median carina not reaching distal scutellum, at midline longer than scutellum about 2.7∶1.0, and shorter than width at base about 0.8∶1.0. Basitarsus of hind leg longer than other two tarsi together, post-tibiae spur with 22 teeth.

Pygofer (Fig.16) with opening lateral margins sinuated, medioventral process absent, in profile (Fig.17) lateral margin produced caudad angulately at about 1/3 ventrally. Aedeagus (Figs.18-19) tubular, with a row of spinous processes at left-lateral dorsally, about 7 spines arranging straightly and gradually shortening from base to apex, in addition with a row of spinules at right of aedeagus ventrolaterally. Suspensorium (Fig.22) inverted fork-liked, with stem short and stout. Diaphragm with dorsal margin straight medially and reflected cephalad, opening for genital styles with a nipple-shaped process dorsally, slightly concave ventrally. Genital styles (Figs.20-21) simple, basal 3/4 slightly straight and apical 1/4 thinning gradually. Anal segment (Figs.16-17) with lateroapical angles each produced into a stout, ventrad directed process, obtuse apically.

Holotype ♂ (Macropterous), China, Yunnan, Xishuangbanna, Damenglong, 650 m, 19 Apr. 1958, coll. PU Fu-Ji.

Etymology. The name of this species is derived from the Latin *spina* and *phallus*, meaning its phallus with a row of spinous processes and a row of spinules.

This species can be separated from other species of *Miranus* by its aedeagus with a row of spinous processes laterodorsally from left view and a row of spinules ventrolaterally from right view.

Distribution. China (Yunnan).

3 *Syndelphax* Fennah, 1963

Syndelphax Fennah, 1963. *Proc. R. Ent. Soc. Lond.*, 32 (B): 15; Yang, 1989. *NSC Spec. Publ.*, No. 6: 269. Type species: *Delphax matanitu* Kirkaldy, 1907.

Diagnosis. Vertex as long as or slightly longer than width at base, slightly narrower at apex than at base, submedian carinae uniting at apex. Frons at midline longer than width at widest part about 2∶1. Postclypeus wider at base than frons at apex. Rostrum surpassing meso-trochanters. Antennae first segment cylindrical, and longer than width at apex, shorter than second segment. Pronotum with lateral carinae incomplete. Spinal formula of hind leg 5-7-4.

Pygofer in profile with laterodorsal angle moderately produced, in posterior view with opening wider than long, medioventral process absent. Aedeagus tubular, simple or with a few teeth subapically. Suspensorium elongate oval, ring-like. Diaphragm narrow, produced dorsomedially in a rather long process. Genital styles relative long, flattened and distal sub-truncate. Anal segment of male ring-like or collar-shaped, lateroapical angles approximated, each produced into a spinous process.

Distribution. Oriental, Australian, and Ethiopian Regions.

Syndelphax disonymos (Kirkaldy) New record to mainland China (Figs.23-33)

Delphax disonymos Kirkaldy, 1907. *Bull. Hawaii Sug. Pl. Assoc. Ent.*, 3: 151, 156.

Delphax matanitu Kirkaldy, 1907. op. cit., 151, 155.

Syndelphax disonymos (Kirkaldy), Yang, 1989. NSC Spec. Publ., No. 6: 270; Fennah, 1973-1975. *Ent. Scand. Suppl.*, 4: 109.

Brachypterous male.

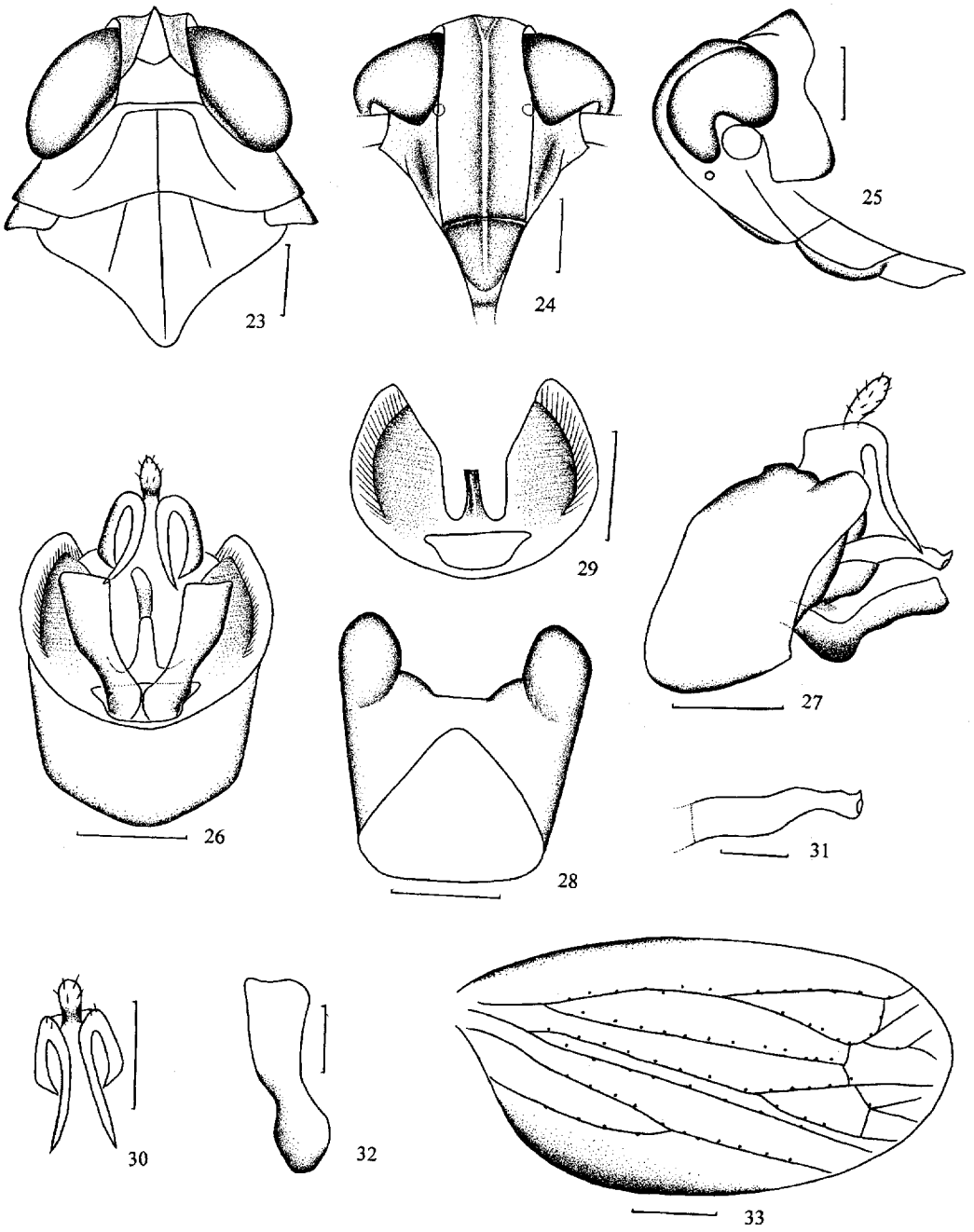
Measurement. Body length 2 mm.

General color yellow-brown, tegmen (Fig.33) black, opaque, veins with granules.

Head (Fig.23) including eyes slightly narrower than pronotum (1.0∶1.1), stem of Y-shaped carina indistinct, vertex at midline as long as width at base, basal compartment at base wider than its greatest length (1.6∶1.0), and wider than stem of Y-shaped carina (2∶1), vertex sub-medially shorter than width at base. Frons (Fig.24) widest at middle, narrowed at base, distal half of lateral carinae nearly parallel, me-

dian carina forked at base. Postclypeus (Fig.24) at base slightly wider than frons at apex (1.1:1.0), at midline shorter than frons about 1.0:2.1, in profile postclypeus (Fig.25) with median carina prominent. Antennae surpassing frontoclypeal suture, first segment longer than width at apex about 1.3:1.0, second segment longer than first segment about 2.3:1.0. Pronotum (Figs.23, 25) with lateral carinae not attaining hind margin, and at midline shorter than width between lateral carinae at anterior margin about 1.0:1.2. Mesonotum (Fig.23) at midline longer than scutellum (2.5:1.0), and shorter than width at base about 1.0:1.9. Post-tibial spur with 18 teeth. Basitarsus of hind leg longer than other two tarsi together.

Pygofer (Figs.26-28) with opening round, dorsal margin concave, ventral margin deeply concave, laterodorsal angles protruding caudad, arched outward then directed entad. Aedeagus (Fig.31) long, tubular, gradually thinning from base to apex, apex transverse, with a fine process dorsally, sinuate dorsally and con-



Figs.23-33. *Syndelphax disonymos* (Kirkaldy). 23.Head and thorax, dorsal view. 24.Head, ventral view. 25.Head and pronotum, left lateral view. 26.Pygofer, posterior view. 27.Pygofer, left lateral view. 28.Pygofer, dorsal view. 29.Diaphragm, posterior view. 30.Anal segment, posterior view. 31. Aedeagus, left side. 32. Genital style, left side, ventral view. 33.Right tegmina, brachypterous. Scale bars: 23-30, 33=0.2 mm; 31-32=0.1 mm.

cave ventrally, arched upward. Diaphragm (Fig.29) with dorsal margin concave deeply, posterior with a long process medially, reaching median genital styles, from lateral view prominent. Genital styles (Fig.32) broad flake-shape, narrow at base, broad and truncate at apex, reaching beyond dorsal margin of diaphragm. Anal segment (Figs.26-27, 30) of male sunk in dorsal emargination of pygofer, lateroapical angle each produced into a long spinous process, reaching median of genital styles.

Specimen examined. 1 ♂ (Brachypterous), China, Guangdong, Zhanjiang, Huguang, 4 Oct. 2003, coll. GUO Liang-Zhen.

Distribution. China (Guangdong, Taiwan), Sir Lanka, Australia, West Africa, Cayman Islands, Fiji, New Caledonia, Vietnam.

4 *Sinolacme* Fennah, 1978

Sinolacme Fennah, 1978. *Ann. Zool. Warsz.*, 34 (9): 229; Yang, 1989. NSC Spec. Publ., No. 6: 70. Type species: *Dicranotropis huensis* Fennah, 1956; Crispina Kuoh, 1982. *Acta Zootax. Sin.*, 7 (1): 78.

Diagnosis. Vertex sub-medially slightly shorter than width at base, apical margin transverse, submedian carinae not uniting at apex, Y-shaped carina distinct, basal compartment at base wider than its greatest length about 2:1, frons widest at level of ocelli, median carina forked at level of ocelli. Rostrum reaching slightly beyond meso-trochanters. Antennae cylindrical, distinctly surpassing frontoclypeal suture, basal segment longer than width at apex, shorter than second about 1:2. Pronotum with lateral carinae not attaining hind margin. Spinal formula of hind leg 5-7-4.

Pygofer with opening wider than long, medioventral process comprising 2 separated small processes. Phallus long, reflected cephalad at apex in a flagellum, terminating into 2 or 3 spinous processes. Suspensorium Y-shaped. Diaphragm narrow, with dorsal margin weakly concave. Genital styles sinuate. Anal segment of male short, collar-shaped, lateroapical angles each produced into a broad spinous process.

Distribution. Oriental Region.

Sinolacme sinuosa Yang New record from mainland China (Fig.34)

Sinolacme sinuosa Yang, 1989. NSC Spec. Publ., No. 6: 71.

Macropterous male.

Measurements. Body length 2.5 mm, body length (incl. teg.) 4.0 mm, tegmen length 3.0 mm.

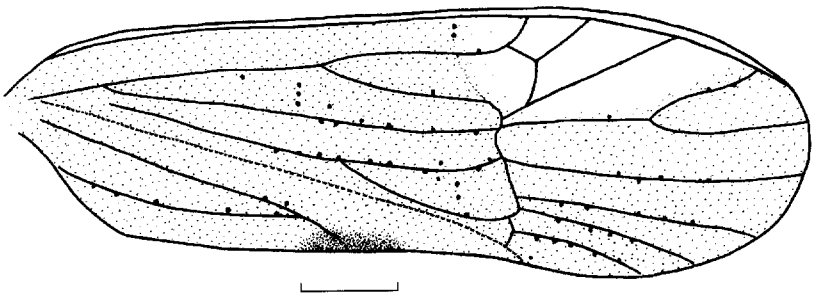
Vertex, Antennae, legs (except coxae of foreleg and midleg black) and ventral metathorax light yellow-brown. Frons, genae, thorax and abdomen dark castaneous, hind margin laterally of sternites rufous. Tegmen (Fig.34) mostly castaneous, translucent, only 4 cell on anterior margin of membraneous area transparent.

Vertex in profile sub-acutely rounding into frons. Vertex at midline shorter than width at base about 1.0 :1.3, submedian carinae arising from near middle, not uniting at apex. Basal compartment at base wider than its greatest length (2.3:1.0), and wider than stem of Y-shaped carina (2.8:1.0). Vertex sub-medially shorter than width at base (1:2). Frons at midline longer than width at widest part about 1.8:1.0, widest at middle, median carina forked at level of lower eyes. Postclypeus wider at base than frons at apex about 1.2:1.0, and at midline slightly shorter than frons about 1.0:1.2, in profile postclypeus with median carina prominent. Antennae reaching median postclypeus, first segment as twice long as width at apex, second segment longer than first segment about 1.6:1.0. Pronotum at midline shorter than vertex (about 0.7:1.0), and slightly shorter than width between la-teral carinae at anterior margin about 1.0:1.1. Mesonotum with lateral carinae feeble, at midline longer than vertex and pronotum together, longer than scutellum (2.5:1.0), and shorter than width at base about 1.0:1.6. Tegmen with pterostigma brown, with granules on veins. Basitarsus of hind leg longer than other two tarsi together.

Pygofer in posterior view with opening very small, lateral margins strongly convex medially, ventral margin shallowly concave with a pair of small processes. Phallus large, tubular, reflected cephalad at apex in a flagellum, terminating in 3 filamentous processes, 2 of them directed right, one directed left, at apical third with a stout process at right and a slender process dorsally. Diaphragm moderately short, dorsal margin nearly membraneous, wide V-shaped. Opening for genital styles with distinct conical process. Genital styles small, separated basally, apical half parallel, outer margin medially convex outward strongly, outer apical angle protruding, apex slightly concave. Anal segment with apical margin very wide, membraneous, separated basally, lateroapical angles each produced into a stout process, caudoventrad directed, blunt at apex.

Specimen examined. 1 ♂ (Macropterous), China, Guangxi, Yangshuo, 18 June 1963, coll. WANG Chun-Guang.

Distribution. China (Guangxi, Taiwan).



Figs.34. *Sinolacme sinuosa* Yang, right tegmina (macropterous). Scale bar=0.4 mm.

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飞虱科（半翅目）二新种和中国大陆二新纪录种

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摘 要 描记了采自云南西双版纳的飞虱科（半翅目）2新种：弯突淡背飞虱，新种 *Sogatellana curva* sp. nov. 和刺茎奇臀飞虱，新种 *Miranus spinaphallus* sp. nov.。新种弯突淡背飞虱 *Sogatellana curva* sp. nov. 与属内其它种的区别在于该种的阳基侧突略为弯曲，端部细且外端角不突出，而其它种阳基侧突的内端角和外端角都突出，另外该种膈背缘的形状不同于属内其它种；新种刺茎奇臀飞虱 *Miranus spinaphallus* sp. nov. 以阳茎左侧背面有一排刺状突起以及右腹侧面有一排小刺可与奇臀飞虱属其它种类相区别。报道了我国大陆的两个新纪录种，迪索西飞虱 *Syndelphax disonymos* (Kirkaldy)（分布：广东湛江）和蜿蜒茎刺飞虱 *Sinolacme sinuosa* Yang（分布：广西阳朔）。新种的模式标本和其它研究标本均保存在中国科学院动物研究所标本馆。

关键词 半翅目，飞虱科，新种，新纪录，中国.

中图分类号 Q969. 36