



***Empoasca (Empoasca) paraparvipenis* n. sp. and some new records of the subgenus from China (Hemiptera: Cicadellidae: Typhlocybinae: Empoascini)**

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Abstract

Empoasca (Empoasca) paraparvipenis Zhang and Liu n. sp. is described and illustrated from Guizhou, Yunnan and Sichuan Provinces (SW. China), and three species of the nominate subgenus are reported for the first time from China. A species checklist of the subgenus is also provided.

Key words: Homoptera, leafhoppers, morphology, checklist

Introduction

The leafhopper genus *Empoasca* was established by Walsh (1862) and is worldwide in distribution. The genus includes 11 subgenera (Oman *et al.* 1990), of which 4, i.e. *E. (Distantasca)*, *E. (Kybos)*, *E. (Matsumurasca)* and *E. (Empoasca)*, have been reported from China. The Chinese *Empoasca (Empoasca)* has been studied by Matsumura (1931), Dworakowska (1972, 1982), Chou & Ma (1981), Cai & Shen (1999), Kuoh (1966, 1981) and Zhang & Xiao (2000), and includes 21 species recorded from China to date. In this paper, a new species of the subgenus, *Empoasca (Empoasca) paraparvipenis* n. sp., is described and illustrated, three species of this subgenus are recorded for the first time from China, and a species checklist of the subgenus in China is provided.

The nominotypical subgenus encompasses the majority of species of the genus which feed mainly on herbaceous plants and shrubs (Hamilton, 1972), but the available information remains inadequate at present to define this subgenus. However, based on diagnostic characters of other subgenera established by DeLong (1931), McAtee (1934), Anufriev (1973), Dworakowska (1972, 1976, 1977a, 1982), Dworakowska & Virakamath (1978) and Thapa (1985), the authors suggest that subgenus *Empoasca (Empoasca)* is mainly characterized as follows: predominant color of body pale green to yellowish ornamented with few symmetrical cream-colored markings on head and thorax; crown in dorsal view distinctly longer medially than next to eye, coronal suture not extended beyond midlength of crown; forewing venation with apical cells 2 and 3 both quadrate basally; ventral pygofer appendage present and free of pygofer lobe for at least half its length, apex reaching or slightly surpassing posterior margin of the lobe; anal tube process prominent; subgenital plate with base moderately wide, outer margin straight or slightly convex, basal marginal setae well differentiated, distal marginal setae continuous from near midlength to apex, fine setae scattered throughout length of plate and macrosetae seldom uniseriate reaching apex of plate; connective with anterior margin bilobed; aedeagus with dorsoatrium very short or absent, occasionally with paired preatrial processes near base of shaft; parameres with apical extension slender, elongate and tapering, apical portion serrate in most species.

Material and methods

All the material studied, including types of the new species, are deposited in the Entomological Museum, Northwest A & F University (NWAUFU) except one male and one female paratype of the new species are deposited in the British Museum of Natural History, London (BMNH). We follow Dworakowska (1993) for the nomenclature of wings and Zhang (1990) for methods and terminology in this study.

Results

Empoasca (Empoasca) paraparvipenis Zhang and Liu n. sp.

(Figs. 1–14)

Type material. Holotype, ♂ (NWAUFU), Liuzhi, Guizhou Prov., China, 10 Aug. 2004, coll. Tong Long. Paratypes (1♂ 1♀ in BMNH, rest in NWAUFU), 2♂ 4♀, same data as holotype; 4♂ 2♀, Mt. Emei, Sichuan Prov., China, 30 Oct. 1999, 1000m; 2♂, Mengyuan, Yunnan Province, China, 18 Dec. 1999, 1000m, coll. Daozheng Qin; 2♂ 4♀, Mengyuan, Yunnan Prov., 11 December 1999, 1000m, coll. I. Dworakowska.

Length. Male: 3.2–3.8 mm, female: 3.5–3.9 mm.

Ground colour of body yellow. Crown with light green patch on each side of coronal suture. Eyes black. Pronotum with irregular patches on anterior margin of pronotum and under eyes. Forewing and hindwing semitransparent. Abdomen orange yellow. Legs light yellow to orange.

Abdominal apodemes long, reaching the base of segment 6. Male pygofer slightly narrowing caudad, ornamented with 11–14 rigid setae on each side of pygofer lobe; ventral pygofer appendage slightly curved dorsocaudad, exceeding caudal margin of lobe. Anal appendage stout, swollen distinctly medially, apex rounded. Subgenital plate sinuate, with numerous macrosetae and fine setae somewhat irregularly; inner margin with 4–5 long stout setae subbasally and 22–25 short microsetae on apical half. Paramere with 4 teeth on dentifer, 2–4 setae subapically. Connective broad, with anterior margin deeply emarginate medially. Aedeagal shaft as long as preatrium, broad at base, gradually tapering and curved at basal 2/5; apex with pair of lateral processes directed caudoventrad in profile; shaft with another pair of processes basally, directed caudodorsad; gonopore subterminal on ventral surface.

Etymology. The species name is derived from the combination of “para-” and “parvipenis” which refers to the similarity of the new species to *Empoasca (Empoasca) parvipenis* Dworakowska 1994.

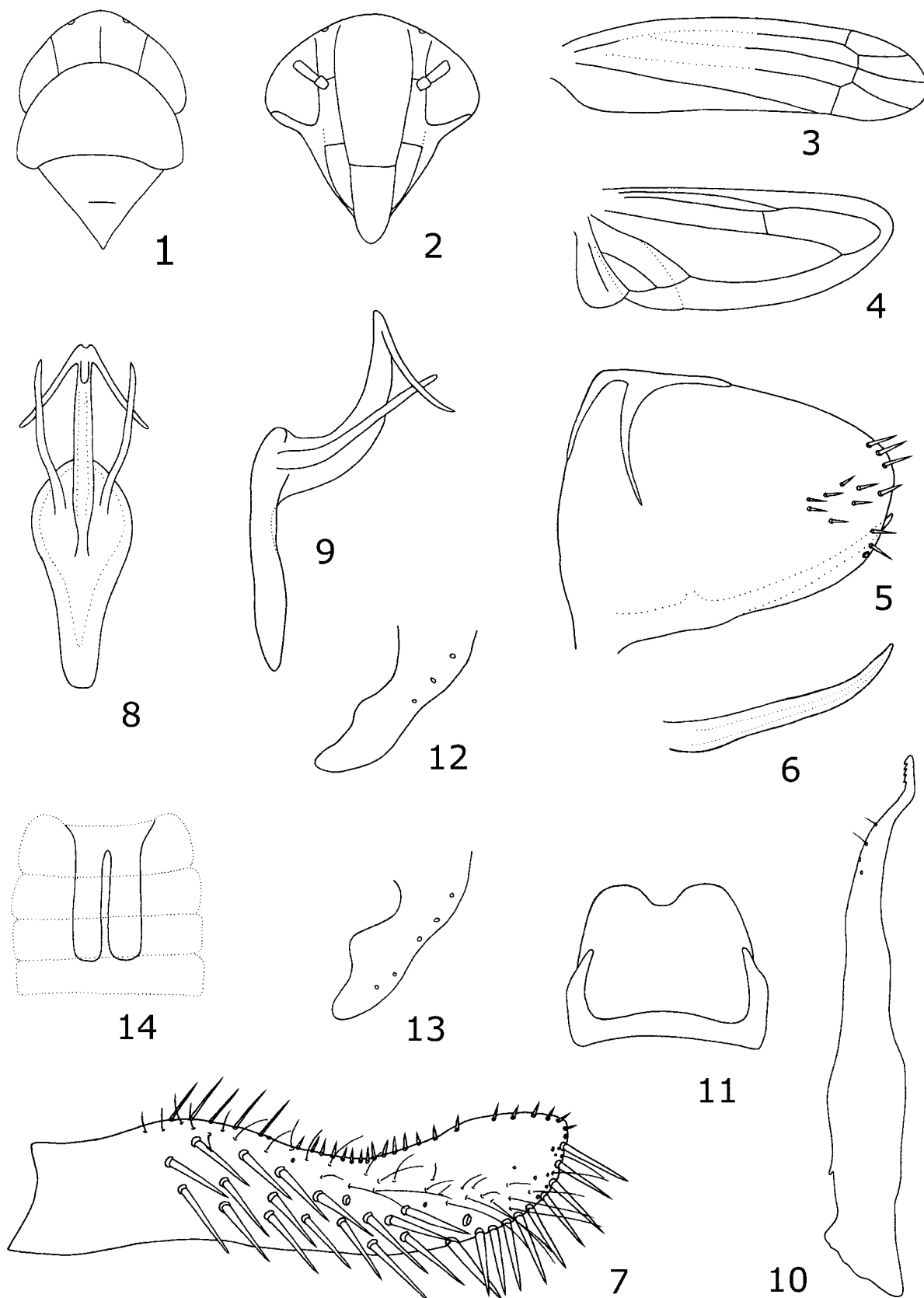
Distribution. Known only from the type locality in Guizhou, Yunnan and Sichuan (SW. China).

Discussion. *Empoasca paraparvipenis* n. sp. is similar to *E. parvipenis* Dworakowska, 1994. It differs from the latter in having the anal appendage broadened medially, and the aedeagal shaft having fairly long bifurcations and lacking terminal tooth-like or papillose tubercles on its ventral margin.

Host. *Empoasca (Empoasca) paraparvipenis* is a destructive pest of *Camptotheca acuminata* Decne (family Nyssaceae) which is about 20–25 metres high and occurs mainly in the Yangzi River Valley in southern China, and is economically important for Chinese medicine. The damage is manifested by extensive stippling on the surface of leaves on the host plant. The ecology and control of this species have been studied by Long Tong (2006). The third author collected the same species in Yunnan and Sichuan Provinces during a field trip with Dr. Irena Dworakowska in 1999. This material, together with the specimens from Long Tong, represent the new species described above.

Empoasca (Empoasca) alinka Dworakowska, 1981, new record

Empoasca (Empoasca) alinka Dworakowska, 1981: 153



FIGURES 1–14. *Empoasca (Empoasca) paraparvipenis* Zhang and Liu **n. sp.**, 1, head and thorax, dorsal view; 2, face; 3, forewing; 4, hindwing; 5, male pygofer, lateral view; 6, ventral pygofer appendage; 7, subgenital plate; 8, aedeagus, caudal view; 9, same, lateral view; 10, paramere; 11, connective; 12, anal tube process, left lateral view; 13, same, in different position; 14, abdominal apodemes

Specimens examined: China: 1♂, Jianfengling, Hainan Prov., 18 May 1983, 2♂, Jianfengling, Hainan Prov., 19 May 1983; 5♂, Bawangling, Hainan Prov., 25 May 1983; 1♂, Yancheng, Hainan Prov., 1 June 1983, 1♂, Yancheng, Hainan Prov., 14 May 1983; 1♀, Xinglong, Hainan Prov., 23 April 1983; 1♀, Tongshi, Hainan Prov., 7 June 1983, coll. Yalin Zhang, light trapped.

Distribution: China (Hainan), India.

***Empoasca (Empoasca) kudlata* Dworakowska, 1981, new record**

Empoasca (Empoasca) kudlata Dworakowska, 1981: 155

Specimens examined: China: 1♂, Jianfengling, Hainan Prov., 17 May 1983, 2♂, Jianfengling, Hainan Prov., 19 May 1983, coll. Yalin Zhang, light trapped.

Distribution: China (Hainan), India.

***Empoasca (Empoasca) affinis* Nast, 1937, new record**

Empoasca affinis Nast, 1937: 25; Dworakowska, 1977b: 285

Specimens examined: China: 1♂, Yili, Xinjiang Prov., 19~20 August 1979, 700m, coll. Tong Chen.

Distribution: China (Xinjiang), India, Poland, Bavaria, Frisian Islands.

Species checklist of Chinese *Empoasca (Empoasca)*

E. (Empoasca) affinis Nast, 1937. China (Xinjiang), India, Poland, Bavaria, Frisian Islands

E. (Empoasca) alinka Dworakowska, 1981. China (Hainan), India

E. (Empoasca) altaica Vilbaste, 1965. China (Henan), Russia, Mongolia, Korea

E. (Empoasca) cisiana Dworakowska, 1971. China (Guangdong)

E. (Empoasca) fabae (Harris, 1841). China (Guangdong, Guangxi, Shaanxi), North America, South America

E. (Empoasca) flavescens (Fabricius, 1794). China (Northeast China, Inner Mongolia, Henan, Hebei, Shaanxi, Shandong, Jiangsu, Anhui, Zhejiang, Hubei, Hunan, Guizhou, Sichuan, Fujian, Guangxi, Taiwan, Guangdong, Tibet), Russia, Korea, Japan, India, Sri Lanka, Africa, Europe, North America

E. (Empoasca) furcata Vilbaste, 1968. China (Shaanxi), Japan, Korea

E. (Empoasca) hiromichi (Matsumura, 1931). China (Zhejiang, Jiangsu), Japan

E. (Empoasca) jigongshana Cai & Shen, 1999. China (Henan)

E. (Empoasca) kaicola Dworakowska, 1982. China (Homan)

E. (Empoasca) kudlata Dworakowska, 1981. China(Hainan), India

E. (Empoasca) limbifera (Matsumura, 1931). China. (Henan, Ningxia, Sichuan, Guizhou, Anhui, Guangxi, Hubei, Yunnan), Japan

E. (Empoasca) lipcowa Dworakowska, 1982. China (Fujian)

E. (Empoasca) lutowa Dworakowska, 1971. China (Shaanxi), Korea

E. (Empoasca) matsudai Dworakowska, 1972. China (Henan), Japan, Korea

E. (Empoasca) mochidai Dworakowska, 1972. China (Jiangsu), Japan

E. (Empoasca) motti Singh Pruthi, 1940. China (Yunnan), India, Nepal

E. (Empoasca) paraparvipenis Zhang and Liu, 2008. China (Guizhou, Yunnan, Sichuan)

E. (Empoasca) reducta Dworakowska, 1976. China (Taiwan), Vietnam

- E. (Empoasca) rybiogon* Dworakowska, 1971. China (Zhejiang, Jiangsu), Korea
- E. (Empoasca) shokella* (Matsumura, 1931). China (Taiwan)
- E. (Empoasca) todo* (Matsumura, 1931). China (Guizhou), Japan, Russia
- E. (Empoasca) vietnamica* Dworakowska, 1972. China (Guangdong), Vietnam
- E. (Empoasca) vitis* (Goethe, 1875). China (Fujian, Jiangsu, Anhui, Hubei, Zhejiang, Henan, Hunan, Guangdong, Guangxi, Sichuan, Yunan, Guizhou, Hainan), Japan
- E. (Empoasca) yanhuana* Kuoh, 1981. China (Tibet)

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