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Sugarcane and rice planthoppers of the genus *Pyrilla* STÅL in southern China (Insecta: Homoptera: Auchenorrhyncha: Lophopidae)

With 16 Figures

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Abstract. A new species of planthopper, *Pyrilla sinica,* is described and illustrated from southern China. The scanning electron micrographs of the antennal sensilla and the pretarsus of the adult male and the wax glands of the adult female are provided. The recent China records of *P. perpusilla* (WALKER) are corrected; and the first Cambodia record of *P perpusilla* is reported.

Introduction

Six species of *Pyrilla* were previously described from India, Sri Lanka, Thailand, Java and Sumatra (WALKER, 1851, 1862; STÅL, 1859; KIRBY, 1891; DISTANT, 1914; BAKER, 1925). FENNAH (1963) revised the species of *Pyrilla* of India and Sri Lanka based on population samples from different localities. He synonymized *P. lycoides* (WALKER) and *P pusana* DISTANT as junior synonyms of *P perpusilla* (WALKER) and recognized 10 and 5 subspecies of *P. perpusilla* (WALKER) and *P aberrans* (KIRBY), respectively, leaving 4 valid species.

The species described here has not been previously recognized as a distinct taxon. Recently, I (LIANG, 1996) reported the first record of *P. perpusilla* from Fujian, Jiangxi, Hainan, Guangxi, and Yunnan in southern China based on 42 specimens (17 males and 25 females). At that time, authentic specimens of *P perpusilla* were unavailable to me for study. After reexamining these Chinese specimens and other new *Pyrilla* material from the Oriental region, I discovered that of the 42 specimens, only 1 female from Yunnan was *P. perpusilla;* while others from Fujian, Jiangxi, Hainan, Guangxi, and Yunnan actually represent an undescribed species.

Members of the genus *Pyrilla* are moderately large, elongate and slender, brownish ochraceous planthoppers. They can be readily distinguished from all other Oriental lophopids by the following combination of characters: head strongly prolonged into a long, slender, porrect cephalic process in front of eyes; fore femora and tibiae normal, not foliaceously dilated; hind tibiae with 2 lateral spines and numerous apical spines; hind tarsomere I long, large, with a dense vestiture of adhesive setae ventrally, apex with 3 spines (2 on outer side, 1 on inner side); and the structures of the male genitalia. *Pyrilla* appears most closely related to *Lophops*.

Pyrilla species are of economic importance and have been the focus of extensive morphological, biological and ecological research (QADRI & AZIZ, 1950). *P perpusilla* is a major pest of sugarcane and

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rice in India (RAHMAN & NATH, 1940; BRAR & BAINS, 1979; KALODE, 1983). This species not only attacks sugarcane, but also may attack maize, wheat, barley, oats, guinea grass and other gramineous crops (RAHMAN & NATH, 1940; O'BRIEN et al., 1987; WILSON & O'BRIEN, 1987). WILSON & CLARIDGE (1985) noted that *P perpusilla,* a sugarcane and rice pest, attacks rice only under favourable conditions.

In this paper, I describe the new species *Pyrilla sinica,* provide illustrations of head, pronotum and male genitalia, and present the scanning electron micrographs of the antennal sensilla and the pretarsus of the male adult and the wax glands of the female adult. In addition, the recent China records of *P. perpusilla* (WALKER) by LIANG (1996) are corrected; and the first Cambodia record of *P perpusilla* is given.

The abbreviations used for the depositories of specimens studied in the course of this work are as follows:

AMNH – American Museum of Natural History, New York, USA;
BPBM – Bernice P. Bishop Museum, Honolulu, Hawaii, USA;
CAUIC – China Agricultural University Insect Collection, Beijing, China;
IZCAS – Institute of Zoology, Chinese Academy of Sciences, Beijing, China;
NU – Department of Biology Insect Collection, Nankai University, Tianjin, China;
SIE – Shanghai Institute of Entomology, Chinese Academy of Sciences, Shanghai, China;
SMTD – Staatliches Museum für Tierkunde, Dresden, Germany.

The morphological terminology followed is that of KRAMER (1950), MARSHALL & LEWIS (1971) (antennal sensilla) and DOERING (1956) (pretarsal structures).

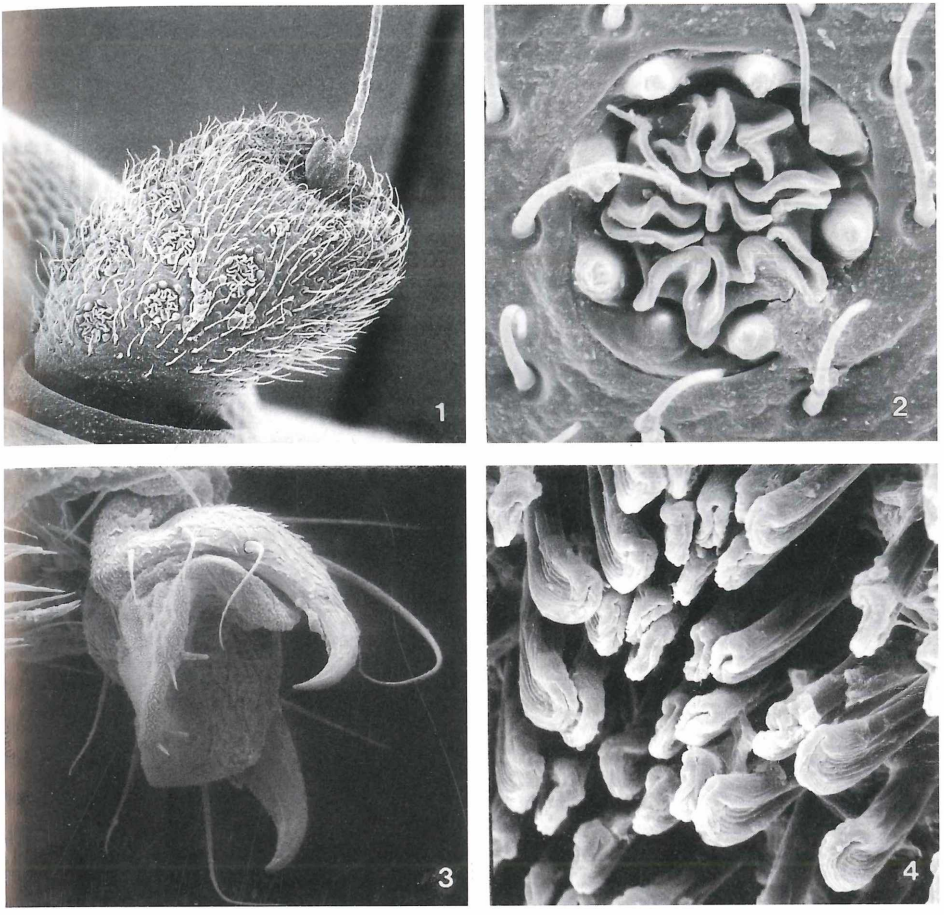
Specimens examined with the scanning electron microscope were mounted on stubs with double-sided sticky tape and then coated with carbon and gold-paladium.

***Pyrilla sinica* spec. nov.** (Figs. 1–16)

Pyrilla perpusilla (WALKER); LIANG, 1996: 145, 148 (in part).

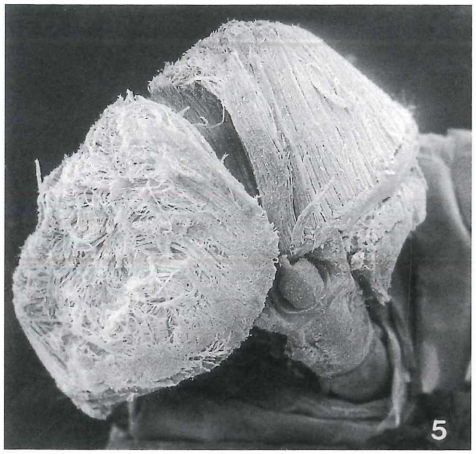
Diagnosis: *Pyrilla sinica* differs from other *Pyrilla* species in its aedeagus (Fig. 16) with four strong, directed dorsally, spinose processes. *P. sinica* is allied to the sugarcane and rice pest *P perpusilla* (WALKER) from North Bengal, India, Sri Lanka, Thailand, SW China (Yunnan), and Cambodia, but may be recognized by its longer cephalic process with broader apex and the shape of the male genitalia, especially the aedeagus.

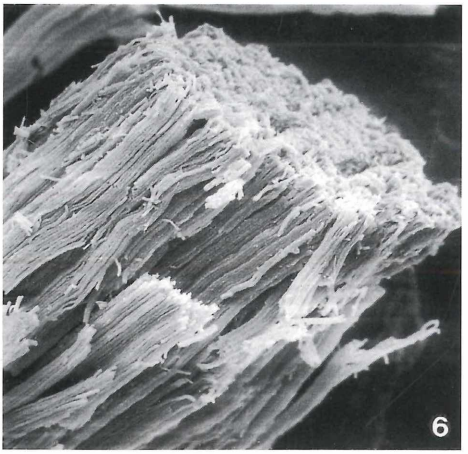
Description: Length from apex of cephalic process to apex of forewings male 12.6–14.2 mm, female 14.8–16.2 mm. Length of cephalic process male 3.1–3.7 mm, female 3.8–4.5 mm.
General coloration brownish ochraceous; mesonotum with lateral areas and the disk between carinae brown or brownish; forewings speckled with minute fuscous spots on veins; hindwings pale hyaline; antennae with scape fuscous, Bourgoin organ and flagellum brown; an indistinct stripe across gena below antennae and eyes and across propleurae brown; rostrum suffused with fuscous apically and ventrally; fore and middle tibiae with four transverse fuscous stripes; all claws and tips of lateral and apical spines on hind tibiae and tarsi black.
Head including eyes (Figs. 9–11) narrower than pronotum; cephalic process long, upturned, narrowed to apex, apex expanded laterad and somewhat broad; vertex elongate, with lateral carinae nearly parallel and anterior transverse carina sinuate; frontal projection with prominent central keel on dorsal surface; frons very elongate, greatly produced in front of eyes, with lateral carinae in addition to carinate margins, the lateral carinae nearly parallel, area between two lateral carinae longitudinally excavate, carinate margins are continuous with transverse carina of vertex; clypeus with obsolete central and marginal carinae. Ocelli present, very small. Eyes with shallow emargination posteriorly.

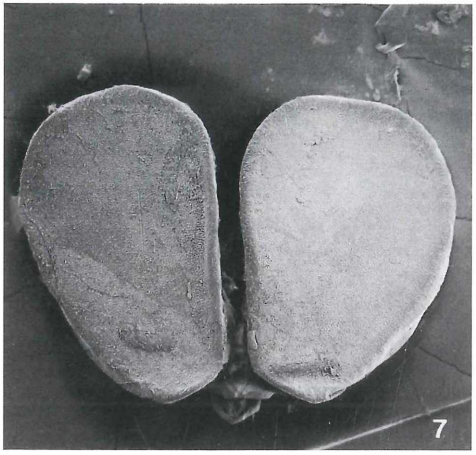


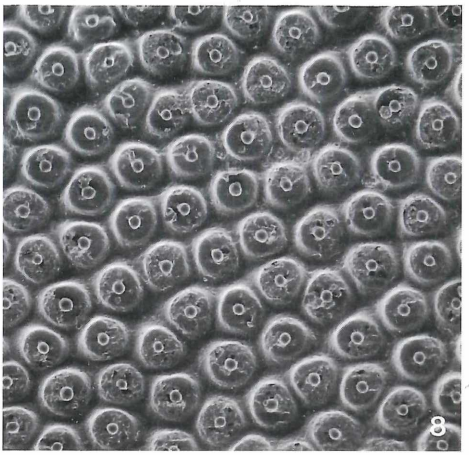
Figs. 1–4: *Pyrilla sinica* spec. nov.
1: Left antenna of male, frontal view, showing scape, pedicel bearing sensory plaque organs, and flagellum; 2: a sensory plaque organ showing cuticular infolds and peripheral denticles; 3: pretarsus of male, showing setae on unguis and arolium; 4: adhesive setae on the ventral surface of hind tarsomere I.

Antennae with scape very small and short; pedicel subglobose, with about 30 distinct sensory plaque organs distributed over the entire surface, each plaque having 6–8 cuticular infoldings around its edge and 2 or 3 central folds and bordered by 6–8 strongly developed protective denticles, denticle without longitudinal ridges on surface (Figs. 1, 2). Rostrum 3-segmented, short, not reaching hind coxae, apical joint very short. Pronotum (Fig. 9) distinctly separated from head, tricarinate on disc, lateral areas bent down, anterior margin concavely excavate on each side behind eyes, lateral margins obliquely straight, lateral angles shortly subacute. Mesonotum with anterior margin projected under posterior margin of pronotum, tricarinate on disc, lateral areas bent down. Forewings elongate, nearly parallel-sided, their apices truncately rounded, costal membrane with numerous transverse veins, apical area transversely veined. Hindwings wider than forewings. Legs moderately short, fore femora and tibiae normal, not foliaceously dilated, hind tibiae with a prominent spine beyond middle and a smaller spine near apex, spines at end of hind tibiae numbering approximately 40; hind tarsi with tarsomere I long, large, subglobose, with a dense vestiture of adhesive setae ventrally (Fig. 4); 3 spines at end of hind tarsomere I (2 outside, 1 inside); hind tarsomere II very small, apical margin rounded, without apical row of spines; pretarsus with 3 setae on each unguis and 2 pairs of setae on arolium (Fig. 3).





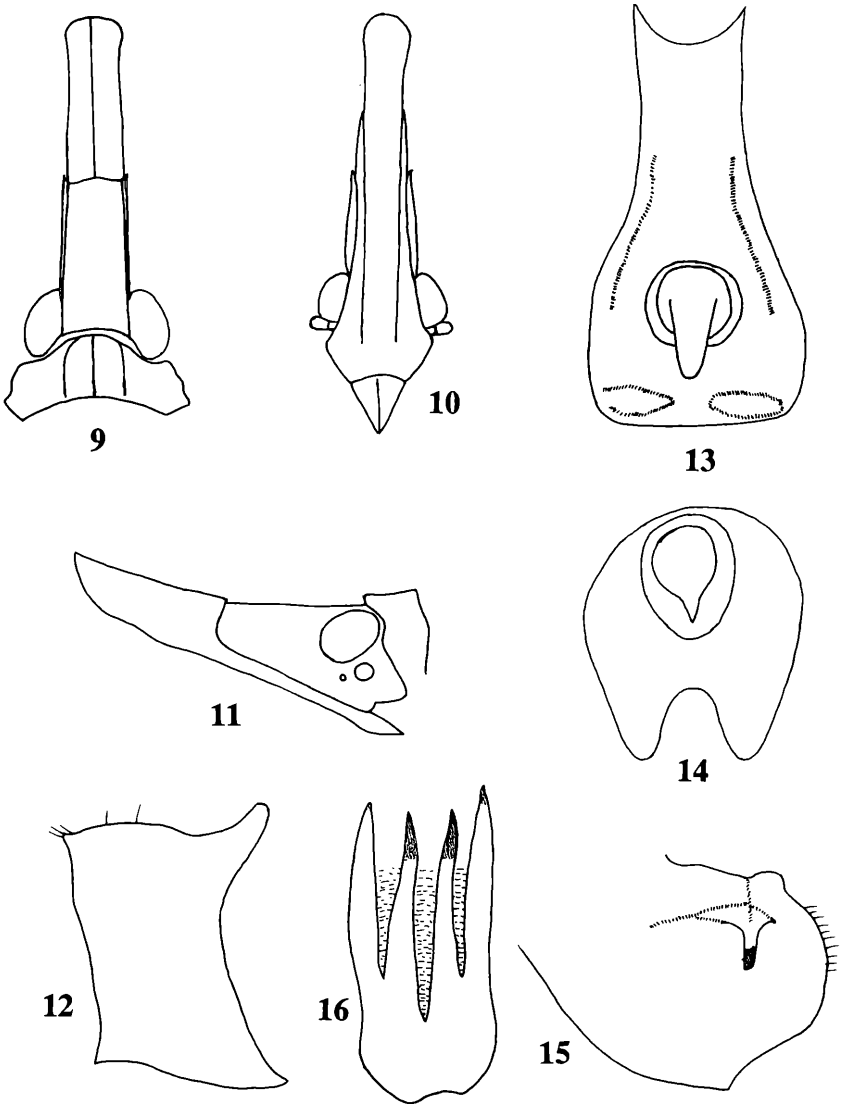




Figs. 5–8: *Pyrilla sinica* spec. nov.
5: Abdominal apex of an adult female, showing extruded wax threads; 6: wax threads secreted by an adult female; 7: wax plates (modified anal segment) of an adult female, frontal view; 8: wax glands on wax plates, dorsal view.

Male genitalia: Pygofer (Fig. 12) large and elongate, simple; anal segment (Figs. 13, 14) long and large, stalked, posterior two-thirds expanded laterad and broad in dorsal view, apex curved ventrad and forked in caudal view; genital style (Fig. 15) broad, with short, stout, lateral hook at upper portion near posterior margin; aedeagus (Fig. 16) with 4 strong, directed dorsally, spinose processes.
Female genitalia: Anal segment modified apically into large elongate oval wax plates (Fig. 7), often bearing large amount of wax threads on either surface (Figs. 5, 6). The fine structures of wax glands as in Fig. 8; plates bearing a large number of circular depressions on either surface; each depression with short papilla in centre which has a circular aperture at its apex. According to QADRI & AZIZ's (1950) light stereomicroscopic studies on *P. perpusilla,* this papilla leads internally into a minute duct which continues as an intracellular canal into the wax glands. The wax glands are unicellular. Each one is highly enlarged and is full of a waxy secretion. The wax threads on the oval wax plates are removed with the help of hind legs in order to cover the egg mass.

Material studied: Holotype ♂, CHINA, FUJIAN PROVINCE: Jianyang, Huangkeng, Changba, 340–440 m, 22. viii. 1960, Y. ZUO (IZCAS). Paratypes. CHINA, FUJIAN PROVINCE: 1 ♀, Chongan, Chengguan, 250–300 m, 8. vi. 1962, G.-T. JIN & Y.-M. LIN; 6 ♂♂, 1 ♀, Chongan, Xingcun,



Figs. 9–16: *Pyrilla sinica* spec. nov., male holotype.
9: Head and pronotum, dorsal view; 10: head, ventral view; 11: head and pronotum, lateral view; 12: pygofer, lateral view; 13: anal segment, dorsal view; 14: anal segment, caudal view; 15: left genital style, lateral view; 16: aedeagus, caudal view.

230–250 m, 1,4. vi. 1960, G.-T. JIN & Y.-M. LIN (all in SIE); 2 ♀♀, same locality, but 210 m, 6. vi & 13. ix. 1960, Y.-R. ZHANG (IZCAS); 1 ♂, Chongan, Wuyi, 16. vi. 1965, L.-C. WANG (NU); 1 ♀, Chongan, Xingcun, Longdu, 580 m, 27. vi. 1960, Y. ZUO; 1 ♀, same locality, but 580–640 m, 19. vi. 1960, Y.-R. ZHANG (both in IZCAS); 1 ♂, Dehua, Shuikou, 13. xi. 1974, F.-S. LI (CAUIC); 5 ♀♀, Jianning, 28,31. v & 5,6. vi. 1959, G.-T. JIN & Y.-M. LIN; 1 ♂, Jianyang, Aotou, 970 m, 2. vii. 1960, G.-T. JIN; 1 ♀, Jianyang, Huangkeng, 350 m, 5. vii. 1960, G.-T. JIN & Y.-M. LIN (all in SIE); 3 ♂♂, 3 ♀♀, Jianyang, Huangkeng, Tangtou, 310–350 m, 24. viii. 1960, Y. ZUO (2 ♂♂, 2 ♀♀ in SMTD; 1 ♂, 1 ♀ in IZCAS); 1 ♀, Ninghua, 19. v. 1959, G.-T. JIN & Y.-M. LIN (SIE); 1 ♂, Wuyi, 30. viii. 1953 (IZCAS); 1 ♂, Tongmuguan, 970 m, 3. vi. 1960, G.-T. JIN & Y.-M. LIN; 1 ♀, Yongan, Xiyang, 25. iv. 1962, G.-T. JIN (both in SIE). CHINA, JIANGXI PROVINCE: 1 ♀, Mt. Jiulian, Hualu, 16. ix. 1986, P.-Y. ZHENG &

G.-P. GAN (SIE). CHINA, HAINAN PROVINCE: 1 ♀, Qiongzhong, 6. iii. 1959, G.-T. JIN & Y.-M. LIN (SIE); 1 ♂, Shuiman, 640 m, 25. v. 1960, X.-Z. ZHANG; 2 ♀♀, Yinggen, 200 m, 6. vii. 1960, C.-Q. LI (all in IZCAS). CHINA, GUANGXI PROVINCE: 1 ♀, Jinxiu, Zhongliang, Linzucun, 600 m, 21. xi. 1981, G.-T. JIN & F.-L. LI (SIE). CHINA, YUNNAN PROVINCE: 1 ♀, Jinping, Changpotou, 700 m, 24. v. 1956, K.-C. HUANG et al. (IZCAS).

Other specimens examined (not syntypes): CHINA, FUJIAN PROVINCE: 1 ♂ (head missing), Jianning, Mt. Jinraoshan, 14. vi. 1959, G.-T. JIN & Y.-M. LIN (SIE); 1 ♂, Jianyang, Huangkeng, Tangtou, 310–350 m, 24. viii. 1960, Y. ZUO (IZCAS). CHINA, HAINAN PROVINCE: 1 ♀, Tongshi, 340 m, 27. v. 1960, C.-Q. LI (IZCAS). CHINA, PROVINCE UNKNOWN: 1 ♂, Yen-ping, 8. ii. 1917, Ac. 5148 (AMNH).

Etymology: This species is named for its occurrence in China.

Biology: No information is currently available on the biology of *P. sinica* in China. It is hoped that the description of this insect will stimulate research on its host plants and life history.

Distribution: China (Fujian, Jiangxi, Hainan, Guangxi, and Yunnan Provinces).
To date, *P. sinica* has been found in five southern provinces in China, from Fujian Province in the east through to Yunnan Province in the west; however, its apparent absence in several other southern Chinese provinces, e.g. Guangdong, Hunan, Sichuan, and Guizhou Provinces may reflect a lack of collecting.

Pyrilla perpusilla (WALKER)

Pyrops perpusilla WALKER, 1851: 269.
Zamila lycoides WALKER, 1862: 305, pl. 15, fig. 3. [Synonymized by FENNAH, 1963: 720.]
Pyrilla perpusilla (WALKER); Distant, 1907: 220; FENNAH, 1963: 720, fig. 1 A–D; LIANG, 1996 145, 148 (in part).
Pyrilla pusana DISTANT, 1914: 326. [Synonymized by FENNAH, 1963: 720.]

Distribution: India, Sri Lanka, Thailand, SW China (Yunnan Province), Cambodia (new record).
The recent China records of *P. perpusilla* (WALKER) from Fujian, Jiangxi, Hainan, Guangxi, and Yunnan in part by LIANG (1996) are here considered misidentifications of *P. sinica* spec. nov. (see Introduction). The distribution of this species in China likely will expand because the sugarcane and rice are cultivated widely across southern China. I recently discovered 2 examples (1 male and 1 female) of *P perpusilla* from Cambodia among undetermined lophopid material in the BPBM; this is the first record of the species in Cambodia.

Specimens examined: CHINA, YUNNAN PROVINCE: 1 ♂, 1 ♀, Jinghong, 30. ix. 1979, Z.-P. LING; 3 ♂♂, 2 ♀♀, Jinghong, Damenglong, 30. ix. 1979, J.-X. CUI (all in IZCAS; NU); 1 ♀, Xishuangbanna, Ganmanta, 580 m, 22. iv. 1957, F.-J. PU (IZCAS). CAMBODIA: 1 ♂, 1 ♀, Kirirom, 700 m, 1–6. iv. 1961, N.R. SPENCER (BPBM).

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