A review of Chinese species of Leptomastidea Mercet (Hymenoptera: Encyrtidae)

ZHANG Yan-Zhou[1,*], XU Zhi-Hong[2]

(1. Institute of Zoology, Chinese Academy of Sciences, Beijing 100101, China;
2. School of Agricultural and Food Science, Zhejiang Forestry College, Hangzhou 311300, China)

Abstracts: Six species of Leptomastidea are taxonomically studied from China. *L. herbicola*, *L. rubra*, *L. shafeei* are recorded from China for the first time. A key to Chinese species of Leptomastidea is given and photomicrographs are provided to illustrate morphological characters of the species. The specimens are deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing.

Key words: Hymenoptera, Encyrtidae, Leptomastidea, taxonomy, new record, China

INTRODUCTION

In the family Encyrtidae (Insecta: Hymenoptera), Leptomastidea Mercet is a world-widely distributed genus currently with 23 species (Noyes, 2008), while most of them are from the Old World. Leptomastidea is placed in tribe Anagyrini (Hymenoptera: Encyrtidae: Tetracneminae) (Trjapitzin, 1989; Noyes and Hayat, 1994; Noyes, 2000; Prinsloo, 2001). All known species of Leptomastidea are primary endoparasitoids of Pseudococcidae (Homoptera) and are of potential importance in biological control (Noyes and Hayat, 1994). The present work aims to study all available Chinese species of Leptomastidea, to facilitate the species recognition by providing a dichotomous key to Chinese species and to summarize the available information on host and distribution.

Morphological terminology generally follows that of Noyes and Hayat (1994) and Noyes (2000). Absolute measurements are used for body length. Relative measurements are used for other dimensions. All specimens examined, unless specified, are deposited in Institute of Zoology, Chinese Academy of Sciences (IZCAS), Beijing, China.

TAXONOMY

Genus Leptomastidea Mercet

Leptomastidea Mercet, 1916: 112. Type species: Leptomastidea aurantiaca Mercet by monotypy.

Tanaomastix Timberlake, 1918: 362. Type species: Paraleptomastix abnormis Girault by original designation. Synonymized with Leptomastidea by Mercet, 1924: 252.

Generic diagnoses have been given by Noyes and Hayat (1994), Noyes (2000), and Zhang and Huang (2004). Key to African species see Prinsloo (2001) and to Palaearctic species see Trjapitzin (1989).

Key to Chinese species of Leptomastidea (females)

1 Fore wing hyaline or with an oblique infuscate band below submarginal vein only …… 2
— Fore wing with infuscate bands or stripes other than the oblique infuscate band below submarginal vein …… 3
2 Fore wing with postmarginal vein clearly longer than stigmal vein (Fig. 3) …… *L. shafeei*
— Fore wing with postmarginal vein hardly longer than stigmal vein …… *L. minyas*
3 Fore wing with an oblique infuscate band and with two transverse infuscate bands or stripes (see Fig. 329 in Noyes, 2000) …… *L. abnormis*
— Fore wing with two oblique infuscate bands or with two oblique infuscate bands and another oblique stripe near apex (Figs. 5, 7) …… 4
4 Fore wing with two oblique infuscate bands and an oblique stripe near apex (Fig. 7) …… *L. herbicola*

基金项目：国家自然科学基金项目（30870321）；国家基础科学人才培养基金（中国科学院动物研究所动物分类学特殊学科点，NSFC-J0630964/J0109）项目

作者简介：张彦周，男，河南开封人，博士，副研究员，从事昆虫系统学与生物防治研究

*通讯作者 Author for correspondence. E-mail: zhangyz@ioz.ac.cn

收稿日期 Received: 2008-09-27; 接受日期 Accepted: 2009-02-19

— Fore wing with two oblique infuscate band below submarginal vein and marginal vein separately (Fig. 5) 5
5 Fore wing about 3 times as long as broad ..... L. rubra
— Fore wing 4 times as long as broad ..... L. longicauda

1 Leptomastidea abnormis (Girault) (Fig. 1)

Paraleptomastix abnormis Girault, 1915: 184.
Tanaomastix abnormis (Girault): Timberlake, 1918: 362.
Leptomastidea abnormis (Girault): Mercet, 1924: 254, 255—256; Xu and Huang, 2004: 153—154.
Leptomastidea aurantiaca Mercet, 1916: 113.
Synonymized with *abnormis* by Mercet, 1924: 255.

Noyes (2000) treated *Leptomastidea jeanneli* Mercet, 1924 as a synonymy with *L. abnormis*. Prinsloo (2001) resurrected *L. jeanneli* as a valid species on basis of differences in the shape of the fuscous bands of forewing. This species is described and illustrated in some recent literatures (Noyes, 2000; Prinsloo, 2001).

Host: *Dysmicoccus brevipes*, *Dysmicoccus ryani*, *Ferrisia virgata*, *Phenacoccus gossypii*, *Planococcus* sp., *Planococcus citri*, *Planococcus kraunhiae*, *Planococcus vitis*, *Pseudococcus* sp., *Pseudococcus calceolariae*, *Pseudococcus citriculus*, *Pseudococcus comstocki*, *Pseudococcus cryptus*, *Pseudococcus ficus*, *Pseudococcus kenyae*, *Pseudococcus longispinus*, *Pseudococcus maritimus*, *Pseudococcus njalensis*, *Saccharicoccus sacchari* (Homoptera: Pseudococcidae).

Distribution: China (Fujian and Guangxi), Algeria, Argentina, Australia, Azerbaijan, Bermuda, Brazil, Canada, Canary Islands, Chile, Costa Rica, Cuba, Cyprus, Dominican Republic, Egypt, Ethiopia, France, Georgia, Ghana, Greece, Israel, Italy, Japan, Kenya, Mexico, Morocco, New Zealand, Peru, Sierra Leone, South Africa, Spain, Tajikistan, Turkmenistan, USA, Uzbekistan.

Material examined: China, 2 ♀♀, Fuzhou, Fujian, i. 1999, coll. WU Qiang; 1 ♀, Nanning, Guangxi, 2. v. 1993, coll. XU Guang (Det. by Xu, 2004).

2 Leptomastidea herbicola Trjapitzin (Figs. 6—8) New record in China

Leptomastidea herbicola Trjapitzin, 1965: 888—890.
Leptomastidea herbicola Trjapitzin: Trjapitzin, 1989: 145.

Diagnosis: Female (length 1.0—1.5 mm). Head yellowish; pronotum yellowish; dorsum of thorax varying from brown yellowish to dark brown except visible part of pronotum yellowish; ventral part of thorax anteriorly yellowish; gaster often dark brown; antenna dark brown except apex of pedicel yellow; F3—F6 varying form brownish yellow to yellow brown; tegula apically black; fore wing infuscate as in Fig. 7; legs generally dark brown except fore coxae (sometimes apically brownish), fore tibia and tarsi, mid tibia and mid tarsi and tarsi yellow; hind tibia often brownish. Head about 2× as wide as front-vertex; ocelli forming an angle of about 90°; antenna (Fig. 6) with scape somewhat expanded and flattened, nearly 4× as long as broad; pedicel about as long as F1; all funicular segments conspicuously longer than broad; clava about as long as F5 and F6 combined; fore wing wide, about 3× as long as broad (Fig. 7). Gaster with ovipositor hardly exserted, ovipositor about half mid tibia length (OL: 35; MT: 70). Male (length about 1.0 mm). Very similar to female but for antenna (Fig. 8) and genitalia.

Host: Unknown.

Distribution: China (Fujian, Jilin, Liaoning and Shan'xi), Russia.

Material examined: China, 2 ♀♀, Jiangle, Fujian, 7. vii. 1991, coll. LIU Chang-ming; 1 ♀, Changchun, Jilin, 7. viii. 1999, coll. LIN Nai-quan; 2 ♀♀, 1 ♂, Shenyang, Liaoning, viii. 1991, coll. YU Xing-Guo; 1 ♀, Qinling, Shan'xi, 22. vii. 1973, coll. LIAO Ding-Xi.

3 Leptomastidea shafeei Hayat and Subba Rao (Figs. 2, 3) New record in China

Leptomastidea indica Shafee, Alam and Agarwal, 1975: 24.
Leptomastidea shafeei Hayat and Subba Rao, 1981: 114. (Replacement name for *Leptomastidea indica* Shafee, Alam and Agarwal, 1975 nec Subba Rao, 1967)

Diagnosis of *Leptomastidea shafeei* has been given by Noyes and Hayat (1994).

Host: mealybug (Pseudococcidae) (Hayat, 1986).

Distribution: China (Yunnan), India, Indonesia, Thailand.

Material examined: China, 1 ♀, Xishuangbanna, Yunnan, 25. xi. 2002, coll. ZHEN Wen-Quan; 1 ♀, Xishuangbanna, Yunnan, 19. viii. 2007, coll. ZHENG Guo.

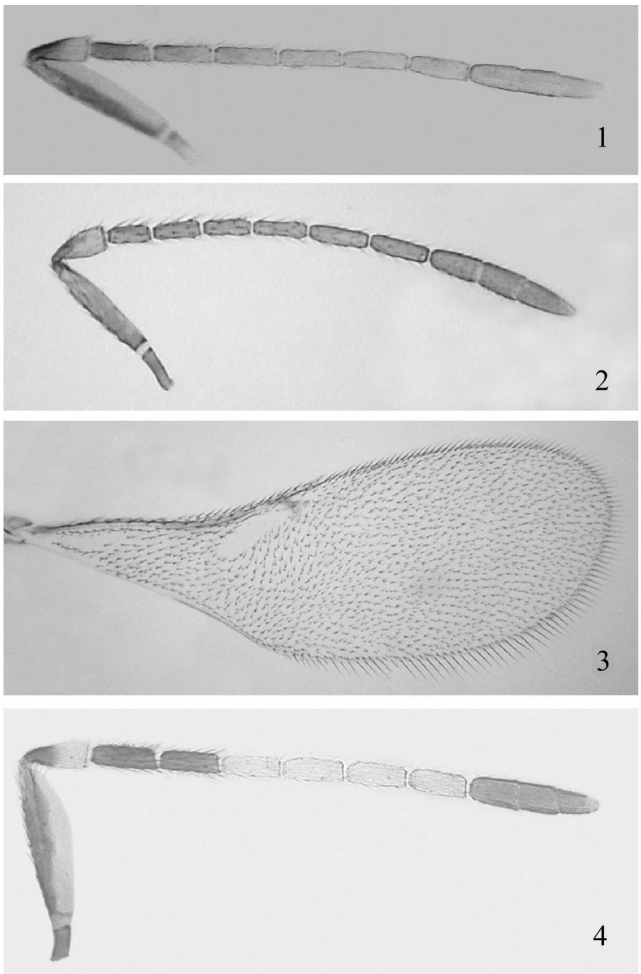
4 Leptomastidea longicauda Xu

Leptomastidea longicauda Xu in Xu and Lou, 2000: 152.
Leptomastidea longicauda Xu: Xu and Huang, 2004: 153—154.

Host: Unknown.

Distribution: China.

Comments: The authors have reexamined the holotype of *L. longicauda* Xu, which was mounted on a slide. In the original description, it was incorrectly stated that the ovipositor is much exserted and about as long as gaster. In fact the ovipositor is clearly shorter



Figs 1—8 Leptomastidea spp.
1: Leptomastidea abnormis antenna, female; 2—3: L. shafeei: 2, Antenna, female; 3, Fore wing, female; 4—5: L. rubra: 4, Antenna, female; 5, Fore wing, female; 6—8: L. herbicola: 6, Antenna, female; 7, Fore wing, female; 8, Antenna, male.

than gaster and about half mid tibia length. L. longicauda is very close to L. rubra and probably a synonym of L. rubra. For the present we are remaining it as a valid species only based on variation of forewing and pending a detailed taxonomic study.

5 Leptomastidea minyas Noyes and Hayat

Leptomastidea minyas Noyes and Hayat, 1994: 152.

Host: Unknown.

Distribution: China (Hainan Island), India.

6 Leptomastidea rubra Tachikawa (Figs. 4, 5)

New record in China

Leptomastidea rubra Tachikawa, 1956: 141.

Leptomastidea rubra Tachikawa, Tachikawa, 1963: 63—64; Trjapitzin, 1989: 145; Noyes and Hayat, 1994: 466.

Diagnosis: Female (length 1.0 - 1.5 mm). Head yellowish; thorax reddish yellow; gaster yellowish, sometimes dorsa-laterally marked dark brown; antennal scape dark brown; ventral margin yellowish, apex of pedicel yellow, F3 — F6 (sometimes F2 apically) yellowish; fore wing infuscate as in Fig. 5; legs generally yellowish except mid and hind femora marked dark brown stripes; hind tibia brownish. Head about 2× as wide as frontovertex; ocelli forming an angle of about 100°; antenna (Fig. 4) with scape somewhat expanded and flattened, about 3× as long as broad; pedicel about as long as F1; all funicular segments conspicuously longer than broad; clava about as long as F5 and F6 combined; fore wing often more than 3× longer than broad; venation as in Fig. 5. Gaster with ovipositor hardly exserted, ovipositor slightly less than half mid tibia length (OL 30, MT 68). Male (length usually less than 1.0 mm). Very similar to female but for antenna and genitalia.

Host: Paracoccus flavidus, Pseudococcus comstocki, Pseudococcus copiosus, Pseudococcus longispinus, Puto pibselae, Trionymus multivorus (Pseudococcidae); ? eriococcid (Eriococcidae) (Trjapitzin, 1989).

Distribution: China (Beijing, Shaanxi and Shan'xi), Greece, Israel, Japan, Russia, Turkmenistan, Uzbekistan.

Material examined: China: 1 ♀, Fengxian, Shan'xi, 4. ix. 1999, coll. LIN Nai-Quan; 1 ♀, 4 ♂♂, Wutai Mt., Shanxi, 14. vii. 2006, alt. 1 600 m, coll. ZHANG Yan-Zhou; 1 ♀, Shunyi, Beijing, 26. vii. 1983, coll. HUANG Da-Wei.

References

Girault A A. 1915. Four new encyrtids from Sicily and the Philippines. Entomologist, 48: 184—186.

Hayat M., Subba Rao B R. 1981. A systematic catalogue of Encyrtidae (Hymenoptera: Chalcidoidea) from the Indian subcontinent. Colemania, 1(2): 103—125.

Hayat M. 1986. Family Encyrtidae. In: Subba Rao B R., Hayat M. eds. The Chalcidoidea (Insecta: Hymenoptera) of India and the adjacent countries. Part II. Oriental Insects, 20: 67—137.

Mercet R G. 1916. Calcídidos de España. Boletín de la Real Sociedad Española de Historia Natural, 16: 112—117.

Mercet R G. 1924. Los géneros Leptomastidea, Callipteroma y Gyranusa. Boletín de la Sociedad Española de Historia Natural, 24: 252—260.

Noyes J S., Hayat M. 1994. Oriental mealybug parasitoids of the Anagyrini (Hymenoptera: Encyrtidae). CAB International, Oxon, UK. viii+554 pp.

Noyes J S. 2000. Encyrtidae of Costa Rica (Hymenoptera: Chalcidoidea). 1. The subfamily Tetracneminae, parasitoids of mealybugs (Homoptera: Pseudococcidae). Memoirs of the American Entomological Institute, 62: 1—355.

Noyes J S. 2008. Universal Chalcidoidea Database. http://www.nhm.ac.uk/jdsml/research-curation/projects/chalcidoids/ [accessed Sep. 1, 2008].

Prinsloo G L., 2001. The afrotropical species of Leptomastidea Mercet (Hymenoptera: Encyrtidae) parasitoids of mealybugs. Journal of Hymenoptera Research, 10(2): 147, 159—161.

Shafee S A., Alam M., Agarwal M M., 1975. Taxonomic survey of encyrtid parasites (Hymenoptera: Encyrtidae) in India. Aligarh Muslim University Publication, Zoological Series on Indian Insect Types, 10: 1—125.

Subba Rao B R. 1967. Description of some new species of encyrtids from India. Bulletin of Entomology, Entomological Society of India, 8(1): 1—7.

Tachikawa T. 1956. The encyrtid parasites of Pseudococcus flavidus Kanda, with a list of the known species and their hosts of the genera Anagyrus, Leptomastidea and Achrysophagus of the world (Hymenoptera). Memoirs of Ehime University, (6), 1(2): 137—155.

Tachikawa T. 1963. Revisional studies of the Encyrtidae of Japan (Hymenoptera: Chalcidoidea). Memoirs of Ehime University, (6), 9: 1—264.

Timberlake P H. 1918. New genera and species of Encyrtinae from California parasitic in mealybugs (Hymenoptera). University of California Publications in Entomology, 1(8): 347—367.

Trjapitzin V A. 1965. New encyrtid species (Hymenoptera, Encyrtidae) from the Maritime Territory. Entomologicheskoe Obozrenie, 44(4): 885—906.

Trjapitzin V A. 1989. Parasitic Hymenoptera of the Fam. Encyrtidae of Palearctics. Opredeliteli po Faune SSSR, 158: 1—489. Zoologicheskim Institutom Akademii Nauk SSR, Leningrad.

Xu Z H., Lou J X. 2000. Notes on one genus of parasitoids on mealybugs new to China with two new species (Hymenoptera: Encyrtidae). Journal of Zhejiang University (Agriculture and Life Sciences), 26(2): 215—218.

Xu Z H., Huang J. 2004. Chinese fauna of parasitic wasps on scale insects. Shanghai Scientific and Technical Publishers, Shanghai, 524 pp.

Zhang Y Z., Huang D W., 2004. A review and an illustrated key to genera of Encyrtidae (Hymenoptera: Chalcidoidea) from China. Science Press, Beijing, 166 pp.

中国拟细角跳小蜂属分类学研究

(膜翅目：跳小蜂科)

张彦周[1,*]，徐志宏[2]

(1. 中国科学院动物研究所，北京 100101；2. 浙江林学院农业与食品科学学院，杭州 311300)

摘要：对中国拟细角跳小蜂属 Leptomastidea 分类研究进行了回顾，并记述了分布于中国的拟细角跳小蜂属 6 种，其中草居拟细角跳小蜂 L. herbicola，红胸拟细角跳小蜂 L. rubra 和谢氏拟细角跳小蜂 L. shafeei 为中国新记录种。文中提供了分种检索表、形态特征图。研究标本保存在中国科学院动物研究所。

关键词：膜翅目；跳小蜂科；拟细角跳小蜂属；分类；新记录；中国

中图分类号：Q969　　文献标识码：A　　文章编号：0454-6296(2009)04-0420-04

(责任编辑：袁德成)