



Review of the leafhopper genus *Singapora* Mahmood (Hemiptera: Cicadellidae: Typhlocybinae: Erythroneurini)

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Abstract

General characteristics of *Singapora* Dworakowska and a key to known species of the genus are provided. Six new species, *Singapora candela*, *S. excedens*, *S. falcata*, *S. longiantrosa*, *S. triacantha* and *S. yingjiangica* **spp. nov.** are described and illustrated, with two new records, *S. shivae* Dworakowska from China and *S. bannaensis* Song & Li from Thailand.

Key words: Homoptera, Auchenorrhyncha, taxonomy, morphology, China, Thailand

Introduction

The leafhopper genus *Singapora* was established by Mahmood (1967) with *S. nigropunctata* Mahmood from Singapore as its type species. The genus is recorded from Middle Asia and the Oriental region with twelve species described, seven of which are known in China. One species of this genus, *S. shinshana* (Matsumura, 1932), is widespread in China and is a notorious pest injuring a wide variety of plants, such as peach, pear, hawthorn, apple, pawpaw and many other species of Rosaceae. Previously known hosts of this genus also include *Derris robusta*, *Pueraria lobata*, *Pterocarpus indicus*, etc. In the present work, six new species are described and illustrated. A key to males of *Singapora* is provided.

Material and methods

Morphological terminology follows Young (1952) except for the nomenclature of the wing, which follows Dworakowska (1993). The body measurements are from the apex of the vertex to the tip of forewing. Abdomens and genitalia were removed from specimens and cleared in a 10% KOH solution heated for 1–2 minutes. Cleared material was then rinsed in water and stored in glycerine. A Nikon SMZ1500 dissecting microscope was used for viewing and an Olympus BH-2 stereoscopic microscope for drawing. Specimens examined are deposited in the following institutions: Entomological Museum, Northwest A&F University (NWAUFU), Yangling, China; China Agricultural University (CAU), Beijing, China and Queen Sirikit Botanical Garden (QSBG), Chiang Mai, Thailand.

Singapora Mahmood, 1967

Type species: *Singapora nigropunctata* Mahmood
Singapora Mahmood, 1967a: 20; Chiang & Knight, 1990a: 240
Erythroneuropsis Ramakrishnan & Menon, 1973a: 37

Measurement. length male 3.80mm.

Material examined. Holotype: ♂, China, Yunnan Prov., Yingjiang, Tongbiguan, 24°36'44"N, 97°39'30"E, 1338m, 03 v 2012, coll. Cao Yanghui.

Deposition. Entomological Museum, NWFU, Yangling, China.

Remarks. The new species is similar to *S. fopingensis* Chou & Ma, but the body is much larger, the pygofer side is shorter, anal tube appendage has the base broader and apex sinuate, the manubrium of the connective is shorter and broader, and the aedeagal apical processes are longer and less curved.

Etymology. The new species is named for its type locality "Yingjiang".

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Reference

- Chiang, C.C. & Knight, W.J. (1990) Studies on taiwanese Typhlocybinae (Homoptera: Cicadellidae) (IV) tribe Erythroneurini. *Bulletin of the National Museum of Natural Science*, 2, 191–255.
- Chou, I. & Ma, N. (1981) On some new species and new records of Typhlocybinae from China (Homoptera: Cicadellidae). *Entomotaxonomia*, 3 (3), 196–210.
- Dworakowska, I. (1970m) On some genera of Erythroneurini (Auchenorrhyncha, Cicadellidae, Typhlocybinae). *Bulletin de l'Academie Polonaise des Sciences. Serie des Sciences Biologiques*, 18 (11), 697–705.
- Dworakowska, I. (1970n) On the genera *Asianidia* Zachv. and *Singapura* Mahm. with the description of two new genera (Auchenorrhyncha, Cicadellidae, Typhlocybinae). *Bulletin de l'Academie Polonaise des Sciences. Serie des Sciences Biologiques*, 18 (12), 759–765.
- Dworakowska, I. (1983) The leafhopper *Ranbara* gen. n. (Cicadellidae, Typhlocybinae) and remarks on *Singapura* Mahm. with description of one new species from Thailand. *Thai Journal of Agricultural Science*, 16, 115–124.
- Dworakowska I. (1984) Studies on Typhlocybinae of Malaysia and Singapore (Homoptera, Auchenorrhyncha, Cicadellidae). *Reichenbachia*, 22 (1), 1–21.
- Dworakowska, I. (1993) Remarks on *Alebra* Fieb. and Eastern Hemisphere Alerini (Auchenorrhyncha: Cicadellidae: Typhlocybinae). *Entomotaxonomia*, 15 (2), 91–121.
- Ghuri, M.S.K. (1975) A new species of *Singapura* Mahmood (Homoptera, Cicadelloidea) attacking *pterocarpus macrocarpus* in Thailand. *Bulletin of Entomological Research*, 65 (3), 373–375.
<http://dx.doi.org/10.1017/s0007485300006039>
- Ghuri M.S.K. (1985) A new species of *Singapura* Mahmood attacking *Derris robusta* in Assam, with a key to species (Homoptera: Cicadellidae). *Turkiye Bitki koruma Dergisi*, 9 (1), 3–11.
- Mahmood, S.H. (1967) A study of the typhlocybinae genera of the Oriental region (Thailand, the Philippines and adjoining areas). *Pacific Insects Monograph*, 12, 1–52.
- Matsumura, S. (1932) A revision of the Palaearctic and Oriental Typhlocybid-genera with descriptions of new species and new genera. *Insecta Matsumurana*, 6 (3), 93–120.
- Ramakrishnan, U. & Menon, M.G.R. (1973) Studies on indian Typhlocybinae (Homoptera: Cicadellidae). 4. Seven new genera with fourteen new species of Erythroneurini. *Oriental Insects*, 7 (1), 15–48.
<http://dx.doi.org/10.1080/00305316.1973.10434202>
- Song, Y.H. & L, Z.Z. (2010) A new species and a new record species of the genus *Singapura* Mahmood (Homoptera, Cicadellidae, Typhlocybinae) from China. *Acta Zootaxonomica Sinica*, 35 (4), 725–729.
- Viraktamath C.A. & Dworakowska I. (1979) Indian species of *Singapura* (Homoptera: Cicadellidae: Typhlocybinae). *Oriental Insects*, 13 (1–2), 87–91.
<http://dx.doi.org/10.1080/00305316.1979.10433546>
- Young, D.A. (1952) A reclassification of Western Hemisphere Typhlocybinae (Homoptera, Cicadellidae). *The University of Kansas Science Bulletin*, 35 (1), 3–217.