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## New data on the genus *Micromus* Rambur, 1842 from China (Neuroptera, Hemerobiidae), with a key to Chinese species

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### Abstract

A review of the genus *Micromus* Rambur from China is presented. A new species, *Micromus setulosus* sp. nov., which was found in Ningxia province, is described. The male of *Micromus pallidius* (Yang, 1987) and the female of *Micromus perelegans* Tjeder, 1936 are described for the first time in China. Keys to the adult males and females of the *Micromus* from China are also given.

**Key words:** Hemerobiidae, Microminae, *Micromus*, new species, China

### Introduction

The genus *Micromus* Rambur was erected in 1842 based on the type species *Hemerobius variegatus* Fabricius. Tjeder (1936) described the first species in genus *Micromus*, *M. perelegans* from China with only one male specimen from Gansu province. Nowadays, no comprehensive species listing is available, characterization and subdivision of the large and widespread genus *Micromus* has long been a problem and is reflected in its extensive list of generic synonyms (Banks 1913; Ghosh 1977; Krüger 1922; Nakahara 1915, 1919, 1955, 1960; Navás 1912, 1922, 1923, 1929, 1932; Oswald 1993; Perkins 1899; Yang 1981). However, taking the unstable classification characteristics into consideration, more experts believed that they are all synonyms of *Micromus* (Carpenter 1940; Killington 1936; Kimmins 1936; Klimaszewski & Kevan 1988; Monserrat 2000; Nakahara 1960; Oswald 1993; Tjeder 1961). And after examining the specimens from China we also propose they all belong to the genus *Micromus* other than different genera.

Presently, about one hundred species are recorded in the world (Alayo 1968; Aspöck *et al.* 1980; Klimaszewski & Kevan 1988; Kuwayama 1962; Makarkin 1985; Monserrat 1990, 2000; New 1988a, 1988b; Tjeder 1936, 1961; Yang 1981, 1987, 1988, 1997, 1999, 2002; Yang & Liu 2001; Yang *et al.* 1995; Zimmerman 1957), with twenty-one species recorded from China, and one new species in this paper.

*Micromus* is diagnosed by the forewing characteristics as crossveins 2sc-r and 2m-cu absent (2m-cu present in these species where CuA and MP are not fused); crossveins 1cua-cup and 2cua-cup present; humeral area narrow and its margin lacking trichosores. All these characteristics above can be used to distinguish *Micromus* from all other genera except *Nusalala* and *Megalomina*. *Micromus* differs from *Megalomina* by the simple humeral veinlet, or at most possesses a short inconspicuous recurrent branch while in the genus *Megalomina*, the humeral trace prominently recurrent and multiply branched. Compared with *Nusalala*, CuA in forewing is either forked proximal to its fusion with M3+4, or not fused to M3+4, while in the genus *Nusalala*, basal M3+4 forming a short, oblique vein, proximal to its fusion with CuA and CuA simple proximal to its fusion with M3+4; and the presence of a pair of laterobacula associated with the parabaculum is also diagnostic (Oswald 1993).

*Micromus* belongs to the subfamily Microminae, and is a cosmopolitan genus which is distributed in North and Central America, Europe, Africa, Asia, and Australia. The species of the genus also can be found in numerous islands in the Atlantic, Indian and Pacific oceans (Oswald 1993).

In this paper, a new species of *Micromus*, *M. setulosus* sp. nov., is described from China. And the male of *M.*

## References

- Alayo, D.P. (1968) Los Neurópteros de Cuba. *Poeyana Instituto de Biología*, 2, 1–127.
- Aspöck, H., Aspöck, U. & Hölzel, H. (1980) *Die Neuropteren Europas*. Vol. 2. Goecke and Evers, Krefeld, West Germany, 355 pp.
- Banks, N. (1913) Synopses and descriptions of exotic Neuroptera. *Transactions of the American Entomological Society*, 39, 201–242.
- Carpenter, F.M. (1940) A revision of the Nearctic Hemeroibiidae, Berothidae, Sisyridae, Polystoechotidae and Dilaridae (Neuroptera). *Proceedings of the American Academy of Arts and Sciences*, 74, 193–280.  
<http://dx.doi.org/10.2307/20023398>
- Fabricius, J.C. (1793) Entomologia systematica emendata et aucta secundum classes, ordines, genera, species adjectis synonymis, locis observationibus, descriptionibus. Tome 2.C.G. *Proft, Hafniae*. pp. 519.
- Ghosh, S.K. (1977) A new genus and a new species of Neuroptera (Fam. Hemeroibiidae [sic]) from India. *Proceedings of the Indian Academy of Sciences*, 86, 235–237.
- Killington, F.J. (1936) A monograph of the British Neuroptera. *Ray Society*, 1, i–xix + 1–269.
- Kimmins, D.E. (1936) Odonata, Ephemeroptera, and Neuroptera of the New Hebrides and Banks Island. *Annals and Magazine of Natural History*, 18, 68–88.
- Klimaszewski, J. & Kevan, D.K.M. (1988) The brown lacewing flies of Canada and Alaska (Neuroptera: Hemeroibiidae). Part III. The genus *Micromus* Rambur. *Giornale Italiano di Entomologia*, 19, 31–76.
- Krüger, L. (1922) Hemeroibiidae. Beiträge zu einer Monographie der Neuropteren-Familie der Hemeroibiiden. *Stettiner Entomologische Zeitung*, 83, 138–172.
- Kuwayama, S. (1962) A revisional synopsis of the Neuroptera in Japan. *Pacific Insects*, 4, 325–412.
- Makarkin, V.N. (1985) Review of lacewings of the family Hemeroibiidae (Neuroptera) of the fauna of the USSR. I. The genera *Hemeroibius* L., *Micromus* Ramb., and *Paramicromus* Nakah. *Entomologicheskoe Obozrenie*, 64, 158–170, 237.
- Makarkin, V.N. (1994) The Oriental Hemeroibiidae (Insecta: Neuroptera) described by Waro Nakahara. *Raffles Bulletin of Zoology*, 42, 917–926.
- Makarkin, V.N. & Wedmann, S. (2009) First record of the genus *Symphorobius* (Neuroptera: Hemeroibiidae) from Baltic amber. *Zootaxa*, 2078, 55–62.
- Monserrat, V.J. (1990) Revision de la obra de L. Navás, II: El genero *Micromus* Rambur, 1842 (Neuropteroidea, Planipennia: Hemeroibiidae). *Graellsia*, 46, 175–190.
- Monserrat, V.J. (1993) New data on some species of the genus *Micromus* Rambur, 1842. *Annali Mus.Civico Stor.Nat.G.Doria*, 89, 477–516.
- Monserrat, V.J. (2000) New data on the Brown Lacewings from Asia (Neuroptera: Hemeroibiidae). *Journal of Neuropterology*, 3, 61–97.
- Nakahara, W. (1915) On the Hemeroibiinae of Japan. *Annotationes Zoologicae Japonenses*, 9, 1–48.
- Nakahara, W. (1919) Revisional notes on the Japanese Hemeroibiidae. *Insect World*, 23, 135–137.
- Nakahara, W. (1955) Formosan Neuroptera collected by the late Dr. T. Kano. *Kontyû*, 23, 6–12.
- Nakahara, W. (1960) Systematic studies on the Hemeroibiidae (Neuroptera). *Mushi*, 34, 1–69.
- Nakahara, W. (1971) Some genera and species of the Hemeroibiidae (Neuroptera). *Kontyû*, 39, 7–14.
- Navás, L. (1912) Insectos neurópteros nuevos o poco conocidos. *Memorias de la Real Academia de Ciencias y Artes de Barcelona*, 10, 135–202.
- Navás, L. (1922) Insectos exóticos. *Brotéria (Zoológica)*, 20, 49–63.
- Navás, L. (1923) Algunos insectos del Museo de París. [1.a serie.] *Revista de la [Real] Academia de Ciencias Exactas Fisico-Químicas y Naturales de Zaragoza*, 7, 15–51.
- Navás, L. (1929) Insectos exóticos Neurópteros y afines del Museo Civico de Génova. *Annali del Museo Civico di Storia Naturale Giacomo Doria*, 53, 354–389.
- Navás, L. (1932) Neurópteros de Haití. *Boletín de la Sociedad Entomológica de España*, 15, 33–37.
- New, T.R. (1988a) A revision of the Australian Hemeroibiidae (Insecta: Neuroptera). *Invertebrate Taxonomy*, 2, 339–411.
- New, T.R. (1988b) Hemeroibiidae (Insecta: Neuroptera) from New Guinea. *Invertebrate Taxonomy*, 2, 605–632.
- Oswald, J.D. (1993) Revision and cladistic analysis of the world genera of the family Hemeroibiidae (Insecta: Neuroptera). *Journal of the New York Entomological Society*, 101, 143–299.
- Oswald, J.D. (2013) *Neuropterida Species of the World. Version 3.0*. Available from: <http://lacewing.tamu.edu/Species-Catalogue/> (accessed 31 December 2013)
- Perkins, R.C.L. (1899) Neuroptera. In: *Fauna Hawaiiensis being the land-fauna of the Hawaiian Islands*. Vol. 2. Cambridge University Press, London, pp. 31–89.
- Rambur, J.P. (1842) Histoire Naturelle des Insectes, Névroptères. Librairie encyclopédique de Roret. *Fain et Thunot*, Paris, pp. xviii + 534.
- Tjeder, B. (1936) Schwedisch-chinesische wissenschaftliche expedition nach den nordwestlichen provinzen Chinas, unter leitung von Dr. Sven Hedin und Prof. Sü Ping-chang. Insekten gesammelt vom schwedischen arzt der expedition Dr. David Hummel 1927–1930. 62. Neuroptera. *Arkiv för Zoologi*, 29A, 1–36.
- Tjeder, B. (1961) Neuroptera-Planipennia. The Lace-wings of Southern Africa. 4. Family Hemeroibiidae. *South African Animal*

- Life*. Swedish Natural Science Research Council, Stockholm, 8, 296–408.
- Yang, C.K. (1981) Neuroptera: Hemerobiidae. *In: the Series of the Comprehensive Scientific Expedition to the Qinghai-Xizang Plateau. Insects of Xizang (Tibet)*. Science Press, Beijing, pp. i + 301–304.
- Yang, C.K. (1987) Neuroptera. *In: Zhang, S. (Ed.), Agricultural insects, spiders, plant diseases and weeds of Xizang. Vol. 1.* Xizang Renmin Press House, Tibet, China, pp. 197–199.
- Yang, C.K. (1988) Neuroptera: Osmylidae, Dilaridae, Hemerobiidae, Chrysopidae, Mantispidae, Myrmeleontidae, Ascalaphidae, Corydalidae. *In: Huang, F.S. (Ed.), Insects of Mt. Namjagbarwa region of Xizang.* Science Press, Beijing, pp. ii + 198–199.
- Yang, C.K., Liu, Z.Q. & Yang, X.K. (1995) Neuroptera. *Insects of Baishanzu Mountain, Eastern China* (ed. by H. Wu). China Forestry Publishing House, Beijing, pp. ii + 198–199.
- Yang, C.K. (1997) Neuroptera: Hemerobiidae. *In: Yang, X.K. (Ed.), Insects of the Three Gorge Reservoir Area of Yangtze River.* Chongqing Press, Chongqing, China, pp. 584–586.
- Yang, C.K. (1999) Hemerobiidae. *In: Huang, B.K. (Ed.), Fauna of Insects Fujian Province of China. Vol. 3.* Fujian Science and Technology Press, Fuzhou, China, pp. 102–104.
- Yang, C.K. & Liu, Z.Q. (2001) Neuroptera: Hemerobiidae and Osmylidae. *In: Wu, H. & Pan, C.-W. (Eds.), Insects of Tianmushan National Nature Reserve.* Science Press, Beijing, pp. 296–299.
- Yang, C.K. (2002) Neuroptera: Hemerobiidae. *In: Huang, F.S. (Ed.), Forest Insects of Hainan,* Science Press, Beijing, pp. 279.
- Zimmerman, E.C. (1957) *Insects of Hawaii: a manual of the insects of the Hawaiian Islands, including an enumeration of the species and notes on their origin, distribution, hosts, parasites, etc. Vol. 6.* University of Hawaii Press, Honolulu, Hawaii, xi + 209 pp.