



The groundhopper fauna (Orthoptera: Tetrigidae) of Shiwanshan (Guangxi, China) with description of three new species

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Abstract

This paper deals with 7 subfamilies, 30 genera and 82 species of Tetrigidae from Shiwanshan, Guangxi in China. Among them three new species of the subfamily Metrodorinae are described, namely *Mazarredia convexaoides* Deng & Zheng **sp. nov.**, *Mazarredia shiwanshanensis* Deng & Zheng **sp. nov.** and *Bolivaritettix shiwanshanensis* Deng & Zheng **sp. nov.** Also, new synonyms are presented: *Miriatroides quadrivertex* Zheng & Jiang, 2002 **syn.nov.** is synonymized with *Spadotettix hainanensis* Günther, 1939, thus genus *Miriatroides* Zheng & Jiang, 2002 with the genus *Spadotettix* Hancock, 1910. Finally, brief comments on faunistic characters of Tetrigidae from Shiwanshan are given.

Key words: Grasshoppers, *Mazarredia*, *Bolivaritettix*, new taxa, faunistic components, checklist

Introduction

The Shiwanshan is a mountain range in Guangxi (southern China). The whole range stretches from the southwest to the northeast, across from 107°05' to 108°20' E longitude and from 21°38' to 22°30' N latitude. It is in the southern most part of the mainland China, lying to the southeast of the Yunnan-Guizhou Plateau, and extending from the southern part of Guangxi into the northern part of Vietnam. Its highest peak is 1,462 m above sea level. It covers counties, such as Fangcheng, Shangsi, Qinzhou, Longzhou and Ningming, which are all located in a low coastal region within the Tropic of Cancer and adjacent to the South China Sea, so they all have a warm and humid climate, and lush vegetation. As a result, the Shiwanshan is rich in biological diversity, especially for insects. Although the general species diversity index from the Shiwanshan National Natural Reserve (NNR) ranks second in China—just after the Nujiang Canyon, the tetrigid fauna (Orthoptera: Tetrigidae) of the Shiwanshan region is almost completely unknown to the academia. Therefore, the aim of our study is to investigate tetrigids in the region.

The study is based on the specimens collected from June to October in 2012 and 2013 in the Shiwanshan region. Altogether, we recorded 82 species belonging to 30 genera and 7 subfamilies. Three new species of Metrodorinae are described: *Mazarredia convexaoides* Deng & Zheng **sp. nov.**, *Mazarredia shiwanshanensis* Deng & Zheng **sp. nov.** and *Bolivaritettix shiwanshanensis* Deng & Zheng **sp. nov.** Finally, brief comments are also made on faunistic characteristics of Tetrigoidea from the Shiwanshan.

Material and methods

Specimens collected in Shiwanshan NNR covered Fangcheng, Shangsi, Qinzhou and Longzhou counties, altogether 31 localities (Map 1, Table 1) on 300–600 m elevation. Specimens are deposited in the following

Zheng, **sp. nov.**, *Teredorus guangxiensis* Zheng & Shi, 2003, *Coptotettix fangchengensis* Zheng & Jiang, 2002, *Hedotettix shangsiensis* Zheng & Jiang, 2003, *Tetrix grossifemura* Zheng & Jiang, 1997, *Euparatettix fanchengensis* Zheng, 2005, *Bannatettix guangxiensis* Zheng & Jiang, 1997. (5) Eurytopic components: Eurytopic species are also in very low proportion, only 3.66%, including three species, i.e. *Criotettix bispinosus* (Dalman, 1818), *Hedotettix gracilis* (Haan, 1843) and *Tetrix tenuicornis* (Sahlberg, 1891).

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References

- Bei-Bienko & Mishchenko, L.L. (1951) *Locusts and Grasshoppers of the USSR and adjacency countries*, Fam. Tetrigidae. Moscow and Leningrad Akademy Nauk, SSSR, 83–107.
- Blackith, R.E. (1992) *The Tetrigidae (Insecta: Orthoptera) of South-East Asia*. Japaga, 'Rockbottom', Ashford, Co. Wicklow, 248 pp. [Ireland]
- Bland, R.G. (2003) The Orthoptera of Michigan—Biology, keys, and descriptions of grasshoppers, katydids and crickets. *Michigan State University Extension*, Extension Bulletin E-2815, 125–131.
- Bolívar, I. (1887) Essai sur les acridiens de la tribu des Tettigidae. *Annales de la Société Entomologique de Belgique*, 31, 175–313.
- Brunner von Wattenwyl, C. (1893) Revision du système des orthoptères et description des espèces rapportées par M. Leonardo Fea de Birmanie. *Annali del Museo Civico di Storia Naturale di Genova*, 33, 1–230, pls. 1–6.
- Buzzetti, F.M. & Devriese, H. (2008) On some Oriental Orthoptera, mostly from Myanmar (Insecta: Orthoptera: Ensifera, Caelifera). *Bollettino del Museo Civico Storia naturale di Verona*, 32, 161–169
- Cao, C.Q. & Zheng, Z.M. (2011) A survey of Tetrigoidea from Emeishan, Sichuan, China (Orthoptera) with descriptions of two new species. *Acta Zootaxonomica Sinica*, 36 (3), 737–741
- Deng, W.A., Zheng, Z.M. & Wei, S.Z. (2007a) *Fauna of the Tetrigoidea from Yunnan and Guangxi*. Guangxi Science & Technology Press, Nanning, 458 pp.
- Deng, W.A., Zheng, Z.M. & Wei, S.Z. (2007b) A taxonomic study of the genus *Macromotettix* Günther (Orthoptera: Tetrigoidea: Metrodoridae). *Zootaxa*, 1620, 63–68.
- Deng, W.A., Zheng, Z.M. & Wei, S.Z. (2007c) One new species of *Hyboella* Hancock (Orthoptera: Tetrigoidea: Metrodoridae) from Guangxi. *Journal of Guangxi Agricultural and Biological Science*, 26 (1), 60–62.
- Deng, W.A., Zheng, Z.M. & Wei, S.Z. (2007d) A review of the genus *Mazarredia* Bolívar (Orthoptera: Tetrigoidea: Tetrigidae: Metrodorinae) from China. *Zootaxa*, 1645, 47–56
- Deng, W.A., Zheng, Z.M. & Wei, S.Z. (2008) Two new species of the genus *Hyboella* Hancock (Orthoptera: Tetrigoidea: Metrodoridae) from China. *Acta zoologica cracoviensia*, 51B (1–2), 1–6.
- Eades, D.C., Otte, D., Cigliano, M.M. & Braun, H. (2014) Orthoptera Species File Online. Version 5.0/5.0 Available from: <http://Orthoptera.SpeciesFile.org> (accessed 18 May 2014)
- Günther, K. (1938a) Revision der Acrydiinae. I. Sectiones Tripetalocera, Discotettigiae, Lophoterrigiae, Cleostratae, Bufonidae, Cladonotae, Scelimenae verae. *Mitteilungen Zoologischen Museum Berlin*, 23, 299–437.
- Günther, K. (1938b) Revision der Acrydiinae, II. Scelimenae spurise. *Stettiner Entomologische Zeitung*, 99, 117–148 & 161–230.
- Günther, K. (1939) Revision der Acrydiinae (Orthoptera), III. Sectio Amorphopi (Metrodora Bol. 1887, aut.). *Abhandlungen und Berichte aus den Staatlichen Museen für Tierkunde und Völkerkunde in Dresden*, A 20 (NF Bd. 1), 16–335.
- Hancock, J. L. (1912) Tetriginae (Acridiinae) in the Agricultural Research Institute, Pusa, Bihar, with descriptions of new species. *Memoirs of the Department of Agriculture, India*, Entomology Series, 4 (2), 131–160.
- Hancock, J.L. (1915) Indian Tetriginae (Acrydiinae). *Records of Indian Museum Calcutta*, 11 (1), 55–137.
- Holt, B.G., Lessard, J.-P., Borregaard, M.K., Fritz, S.A., Araujo, M.B., Dimitrov, D., Fabre, P.-H., Graham, C.H., Graves, G.R., Jønsson, K.A., Nogués-Bravo, D., Wang, Z., Whittaker, R.J., Fjeldså, J. & Rahbek, C. (2013) An update of Wallace's zoogeographic regions of the World. *Science*, 339 (6115), 74–78.

<http://dx.doi.org/10.1126/science.1228282>

- Ingrisch, S (2001) Orthoptera of Nepal expeditions of Prof. J. Martens (Mainz) (Insecta, Orthoptera). *Senckenbergiana biologica*, 81, 147-186
- Ingrisch, S (2006) Orthoptera (Insecta) fauna of the Nepal Himalayas: current knowledge. In: Hartmann, M. & Weipert, J. (Eds.), *Biodiversität & Naturlausstattung im Himalaya. Bd. II. Naturkundemuseum, Erfurt*, pp. 73–118.
- Jiang, G.F. & Zheng, Z.M. (1998) *Grasshoppers and Locusts from Guangxi*. Guangxi Normal University Press, Guilin, 322–327.
- Kim, T.W. & Kim, J.I. (2004) A Taxonomic Study of Korean Tetrigidae (Orthoptera: Caelifera: Tetrigoidea). *Entomological Research*, 34 (4), 261–267.
<http://dx.doi.org/10.1111/j.1748-5967.2004.tb00121.x>
- Kim, T.W. & Puskás, G. (2012) Check-list of North Korean Orthoptera Based on the Specimens Deposited in the Hungarian Natural History Museum. *Zootaxa*, 3202, 1–27
- Kirby, W.F. (1910) *A synonymic catalogue of Orthoptera. Vol. III. Orthoptera Saltatoria. Part II. (Locustidae vel Acridiidae)*. The Trustees of the British Museum, London, 674 pp.
- Kirby, W. F. (1914) *The Fauna of British India including Ceylon and Burma. Vol. 1. Orthoptera, Acridiidae*. Taylor & Francis, London, 276 pp.
- Li, X.D., Deng, W.A., Zheng, Z.M., Lin, M.P. & Lu, C.W. (2014) Two new species of the genus *Xistra* Bolivar (Orthoptera: Tetrigidae) from China. *Neotropical Entomology*, 43 (3), 209–217.
<http://dx.doi.org/10.1007/s13744-014-0197-x>
- Liang, G.Q. & Zheng, Z.M. (1998) *Fauna Sinica, Insecta. Vol. 12. Orthoptera, Tetrigoidea*. Science Press, Beijing, 278 pp.
- Liang, G.Q, Jiang, G.F. & Liu, J.W. (2007) A new species of the genus *Zhengitettix* (Orthoptera, Scelimenidae) from Guangxi, China. *Acta Zootaxonomica Sinica*, 32 (3), 659–660.
- Mahmood, K., Idris, A.B. & Salmah, Y. (2007) Tetrigidae (Orthoptera: Tetrigoidea) from Malaysia with the description of six new species. *Acta Entomologica Sinica*, 50 (12), 1272–1284.
- Nagy, A. & Nagy, B. (2000) The orthoptera fauna of the Villany Hills (South Hungary). *Dunántúli Dolgozatok Természettudományi Sorozat*, 10, 147–156
- Shishodia, M.S. (1991) Taxonomy and zoogeography of the Tetrigoidea (Orthoptera: Tetrigoidea) of North Eastern India. *Records of the Zoological Survey of India, Occasional Papers*, 140, 1–203.
- Storozhenko, S.Y. & Paik, J.Ch. (2007) *Orthoptera of Korea*. Dalnauka, Vladivostok, 232 pp.
- Storozhenko, S.Yu. (2013) Review of the subfamily Tripetalocerinae Bolivar, 1887 (Orthoptera: Tetrigidae). *Zootaxa*, 3718 (2), 158–170.
<http://dx.doi.org/10.11646/zootaxa.3718.2.4>
- Zheng, Z.M. & Jiang, G.F. (1997) Three New Species of Tetrigidae From Guangxi (Orthoptera:Tetrigoidea). *Zoological Research*, 18 (4), 377–381.
- Zheng, Z.M. & Jiang, G.F. (2002) One new genus and seven new species of Tetrigoidea from southern region of Guangxi. *Zoological research*, 23 (5), 409–416.
- Zheng, Z.M. & Ou, X.H. (2003) Four new species of Metrodoridae (Orthoptera: Tetrigoidea) form Hengduan mountains region western of Yunnan. *Entomotaxonomia*, 25 (3), 159–166.
- Zheng, Z.M. (2005) *Fauna of the Tetrigoidea from Western China*. Science Press, Beijing, 501 pp.
- Zheng, Z.M. & Shi, F.M. (2009) A survey of grasshoppers from South Eastern of Xizang (Orthoptera). *Journal of Shaanxi Normal University (Natural Science Edition)*, 37 (5), 67–70.