



Revision of *Charaea* (Coleoptera: Chrysomelidae: Galerucinae) from Taiwan

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Abstract

Eleven species of the genus *Charaea* Baly, 1878 are recorded for Taiwan. These are illustrated and a key to the species is provided. Three species, *Ch. houjayi* sp. nov., *Ch. maxbarclayi* sp. nov. and *Ch. haruoi* sp. nov., are described and compared with similar species. *Charaea kelloggi* (Gressitt & Kimoto, 1963) is reported from Taiwan for the first time. Colour photos of habitus and drawings of both male and female genitalia are presented.

Key words: Coleoptera, Chrysomelidae, Galerucinae, *Charaea*, taxonomy, new species, Taiwan

Introduction

The history of taxonomic research of the genus *Charaea* is long and complicated. The genus was described by Baly (1878) based on *Charaea flaviventris* Baly, 1878 as type species. Both genus and species were more or less forgotten for many decades, probably because this species was not known to subsequent specialists. Thus, subsequent new species were described in other genera, predominantly in *Calomicrus* Dillwyn, 1829 and *Exosoma* Jacoby, 1903 (cf. Beenen 2010). Maulik (1936) erected a new genus, *Taphinellina* Maulik, 1936, for *Taphinella bengalensis* Jacoby, 1900. *Taphinellina* was also more or less forgotten until Wilcox (1973) transferred the species treated by Gressitt & Kimoto (1963) in the genera *Euluperus*, *Exosoma* and *Calomicrus* into *Taphinellina*. Beenen (1992) redescribed *Taphinellina minutum* (Joannis, 1865) and initiated recent studies of *Charaea* taxonomy.

Medvedev & Samoderzhenkov, 1989: *L. clermonti* (Laboissière, 1929) and *L. mirabilis* Medvedev & Samoderzhenkov, 1989 have claws with very short obtuse appendix (in both males and females), while females of *L. malayana* (Medvedev, 2004) and *L. sp. nov.* (Bezděk et al., in press) have claws with a short, sharp appendix reaching the half of the claw. Males of *L. sp. nov.* have the inner branch somewhat longer and thus the claws look to be divided (Bezděk et al. in press).

4) Apical spurs on meso- and metatibiae. In *Luperogala*, the apical spurs are present in both sexes of *L. clermonti*, *L. malayana* and *L. sp. nov.* (Bezděk et al., in press). In *L. mirabilis* the spur is present only on the mesotibiae but absent on the metatibiae of both sexes. Presence/absence of metatibial spurs in *Luperogala* may not be an appropriate generic character (see Bezděk et al. in press).

5) Border of anterior margin of pronotum. In some *Charaea* species the anterior margin of pronotum has a narrow border while in others the border is indistinct or visible only in a limited area. Examination of the type specimen of the type species, *Charaea balyi* at the BMNH revealed that the anterior margin is narrow, but visible.

6) Prosternal process visible/invisible between procoxae. Variability of this character led to the classification of *Charaea* species either within *Exosoma* (prosternal process visible) or *Calomicrus* (prosternal process not visible). In Taiwanese species three alternatives of this character were detected: prosternal process invisible between procoxae, thinly visible but not elevated, or visible and elevated between procoxae. The type of *Charaea balyi* has the prosternal process visible and elevated between the procoxae.

Within Galerucinae some genera described more or less based on a single character exist. In accordance with these variable characters, their validity requires reassessment. Such studies will require reevaluation of generic limits and examination of type specimens of relevant taxa.

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References

- Baly, J.S. (1878) Descriptions of the phytophagous Coleoptera collected by the late Dr. F. Stoliczka during Forsyth's expedition to Kashgar in 1873–74. *Cistula Entomologica*, 2 (1875–1882), 369–383.
- Baly, J.S. (1890) Phytophaga. In: *Scientific results of the second Yarkand mission; based upon the collections and notes of the late Ferdinand Stoliczka, Ph. D. Coleoptera*. Office of Superintendent of Government Printing, Calcutta, pp. 25–36. [79 pp. 2 pls]
- Bameul, F. (1990) Le DMHF: un excellent milieu de montage en entomologie. *L'Entomologiste*, 46, 233–239.
- Beenen, R. (2010) Galerucinae. In: Löbl, I. & Smetana, A. (Eds.), *Catalogue of Palaearctic Coleoptera. Volume 6. Chrysomeloidea*. Apollo Books, Stenstrup, pp. 443–491. [924 pp.]
- Beenen, R. (2011) In: Errata for Volume 6. In: Löbl, I. & Smetana, A. (Eds.), *Catalogue of Palaearctic Coleoptera. Volume 7. Curculionoidea I*. Apollo Books, Stenstrup, pp. 35–63. [373 pp.]
- Beenen, R. & Lee, Ch.-F. (2010) Two new Erganoides species from P. R. China and Taiwan (Coleoptera: Chrysomelidae: Galerucinae). *Genus*, 21, 257–264.
- Beenen, R. & Warchałowski, A. (2010) *Charaea pseudominutum* n. sp., an undescribed but not unknown galerucine beetle (Coleoptera, Chrysomelidae, Galerucinae). *Entomologische Blätter*, 106, 57–62.
- Bezděk, J. (2010) Haplomela Chen, 1942, a new synonym of Hoplasoma Jacoby, 1884 (Coleoptera: Chrysomelidae, Galerucinae). *Entomologische Zeitschrift*, 120, 81–84.
- Bezděk, J. (2012) Taxonomic and faunistic notes on Oriental and Palaearctic Galerucinae and Cryptocephalinae (Coleoptera: Chrysomelidae). *Genus*, 23, 375–418.
- Bezděk, J. (2013) Revision of the genus Hesperopenna (Coleoptera: Chrysomelidae: Galerucinae). I. Generic redescription, definition of species groups and taxonomy of H. medvedevi species group. *Acta Entomologica Musei Nationalis Pragae*, 53, 715–746.
- Bezděk, J., Romantsov, P.V. & Medvedev, L.N. (in press) A review of *Luperogala* Medvedev & Samoderzhenkov, 1989 (Coleoptera: Chrysomelidae: Galerucinae), with description of a new species from Borneo. *Genus*.

- Chûjô, M. (1935) H. Sauter's Formosa-Ausbeute: Subfamily Galerucinae (Coleoptera: Chrysomelidae). *Arbeiten über Morphologische und Taxonomische Entomologie Berlin-Dahlem*, 2, 160–174.
- Chûjô, M. (1963) Chrysomelid-beetles from Formosa (Taiwan) collected by Dr. K. Baba in 1962. *Niponius*, 2, 21–30.
- Gressitt, J.L. & Kimoto, S. (1963) The Chrysomelidae (Coleopt.) of China and Korea, part 2. *Pacific Insects Monograph*, 1 (B), 301–1026.
- Kimoto, S. (1966) A list of the chrysomelid specimens of Taiwan preserved in the Zoological museum, Berlin. *Esakia*, 5, 21–38.
- Kimoto, S. (1969) Notes on the Chrysomelidae from Taiwan II. *Esakia*, 7, 1–68.
- Kimoto, S. (1986) The Chrysomelidae (Insecta: Coleoptera) collected by the Nagoya University scientific expedition to Taiwan in 1984. *Kurume University Journal*, 35, 53–62.
- Kimoto, S. (1987) The Chrysomelidae (Insecta: Coleoptera) collected by the Nagoya University scientific expedition to Taiwan in 1986. *Kurume University Journal*, 36, 183–194.
- Kimoto, S. (1989a) Chrysomelidae (Coleoptera) of Thailand, Cambodia, Laos and Vietnam IV. Galerucinae. *Esakia*, 27, 1–241.
- Kimoto, S. (1989b) The Taiwanese Chrysomelidae (Insecta: Coleoptera) collected by Dr. Kintaro Baba, on the occasion of his entomological survey in 1983 and 1986. *Kurume University Journal*, 38, 237–272.
- Kimoto, S. (1991) The Taiwanese Chrysomelidae (Insecta: Coleoptera) collected by Dr. Kintaro Baba, on the occasion of his entomological survey in 1987, 1988 and 1989. *Kurume University Journal*, 40, 1–27.
- Kimoto, S. (1996) Notes on the Chrysomelidae from Taiwan, China, XIII. *Entomological Review of Japan*, 51, 27–51.
- Kimoto, S. (2004) New or little known Chrysomelidae (Coleoptera) from Nepal, Bhutan and the northern territories of Indian subcontinent. *Bulletin of the Kitakyushu Museum of Natural History and Human History, Series A (Natural History)*, 2, 47–63.
- Kimoto, S. & Chu, Y.-I. (1996) Systematic catalog of Chrysomelidae of Taiwan (Insecta: Coleoptera). *Bulletin of the Institute of Comparative Studies of International Cultures and Societies*, 16, 1–152.
- Kimoto, S. & Takizawa, H. (1997) *Leaf beetles (Chrysomelidae) of Taiwan*. Tokai University Press, Tokyo, 581 pp.
- Maulik, S. (1936) *The fauna of British India including Ceylon and Burma. Coleoptera, Chrysomelidae (Galerucinae)*. Taylor and Francis, London, xv + 648 pp.
- Medvedev, L.N. (1998) New Chrysomelidae (Coleoptera) from Southeast Asia in the Hungarian Natural History Museum. *Annales Historico-Naturales Musei Nationalis Hungarici*, 90, 163–174.
- Medvedev, L.N. & Sprecher-Uebersax, E. (1998) New data on Chrysomelidae of Nepal (Insecta, Coleoptera). *Spixiana*, 21, 25–42.
- Medvedev, L.N. & Sprecher-Uebersax, E. (2005) A key to the leaf beetle genera of Nepal (Coleoptera, Chrysomelidae). *Entomologica Basiliensia et Collectionis Frey*, 27, 297–336.
- Nakane, T. (1958) The Coleoptera of Yakushima Island, Chrysomelidae. *Scientific Reports of the Saikyo University Natural Science and Living Science*, 2, 43–54.
- Reid, C.A.M. & Nally, S.C. (2008) Revision of the genus *Menippus* Clark in Australia (Coleoptera: Chrysomelidae: Galerucinae). *Australian Journal of Entomology*, 47, 87–101.
<http://dx.doi.org/10.1111/j.1440-6055.2008.00634.x>
- Seeno, T.N. & Wilcox, J.A. (1982) Leaf beetle genera (Coleoptera: Chrysomelidae). *Entomography*, 1, 1–221.
- Takizawa H., Nakamura, S. & Kojima, K. (1995) The Taiwanese chrysomelid beetles preserved in Hiwa Museum for Natural History (Chrysomelidae: Coleoptera). *Miscellaneous Reports of the Hiwa Museum for Natural History*, 33, 1–16.
- Wagner, T. (2003) Present status of a taxonomic revision of Afrotropical Monolepta and related groups (Galerucinae). In: Furth, D.G. (Ed.), *Special topics in leaf beetle biology. Proceedings of the Fifth International Symposium on the Chrysomelidae, 25–27 August 2000, Iguassu Falls, Brazil, XXI International Congress of Entomology*. Pensoft, Sofia-Moscow, pp. 133–146. [332 pp.]
- Wang, J. & Yang, X. (1998) [*Fauna of Chrysomelidae of Wuyishan Nature Reserve in China*]. China Forestry Publishing House, Place of publication not given, 213 pp. [in Chinese]
- Warchałowski, A. (2010) *The Palaearctic Chrysomelidae. Identification keys. Volume 2*. Natura Optima Dux Foundation, Warszawa, 1212 pp.
- Wilcox, J.A. (1973) Chrysomelidae: Galerucinae (Luperini: Luperina). In: Wilcox, J.A. (Ed.), *Coleopterorum Catalogus Supplementa. Pars 78(3)*. Second edition. W. Junk, s-Gravenhage, pp. 433–664.
- Yang, X.-K. (2002) Chrysomelidae: Galerucinae. In: Huang, P.-K. (Ed.), *Fauna of Insects of Fujian Province of China. Volume 6*. Fujian Science & Technology Press, Fuzhou, pp. 621–663. [894 pp.]
- Zoia, S. (2007) A revision of the *Pachnophorus* from the Afrotropical Region (Coleoptera, Chrysomelidae). *Fragmenta Entomologica*, 39, 1–156.
- Zoia, S. (2012) Eumolpinae (Coleoptera: Chrysomelidae) of Socotra Island. In: Hájek, J. & Bezděk, J. (Eds.), *Insect biodiversity of the Socotra Archipelago. Acta Entomologica Musei Nationalis Pragae*, 52 (supplementum 2), i–vi + 1–557. [pp. 449–501.]