

DYTISCIDAE:
VI. Rediscovery of *Colymbetes minimus* ZAITZEV,
and description of its male genitalia
(Coleoptera)

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Abstract

Colymbetes minimus ZAITZEV (Coleoptera: Dytiscidae) is a high altitude species confined to Tibet and Qinghai. Its rediscovery is reported, and its male copulatory organ is illustrated for the first time. Although this aberrant species can be assigned clearly to the genus *Colymbetes* CLAIRVILLE, its position within the genus remains to be explored.

Key words: Coleoptera, Dytiscidae, *Colymbetes minimus*, China.

Introduction

Colymbetes CLAIRVILLE, 1806 is a small Holarctic dytiscid genus with 21 species (NILSSON & HOLMEN 1995, NILSSON 2001). The beetles usually inhabit stagnant water, including overflooded river margins and pools in temporary streams, or wadis. Adults are elongate, moderately large and usually show a unique clytral sculpturing consisting of parallel transverse striae. According to ZIMMERMAN (1981) the phylogenetic relationship between *Colymbetes* and *Rhantus* is a close one. Moreover, that author stressed that *Colymbetes minimus* represents the most basally situated species among the genus and is remarkably similar to *Rhantus*.

Colymbetes minimus is an extremely rarely collected high altitude endemic of Tibet and Qinghai. Its description by ZAITZEV (1908) was based on specimens collected by S. Hedin (SW Tibet) and P.K. Kozlov: E Tibet, source of River "Hwang-Ho" [Huang He], end of May and end of June, 1901, from an altitude of ca. 4600 m a.s.l. During the following 90 years it has not been collected again. Here, I report on the rediscovery of this species and provide a description of its male genital organ.

***Colymbetes minimus* ZAITZEV**

Colymbetes minimus ZAITZEV 1908: 420; ZIMMERMANN 1920: 212; FENG 1933: 328; GSCHWENDTNER 1936: 93; WU 1937: 217; ZAITZEV 1953: 301; ZIMMERMAN 1981: 2-5; NILSSON 1995: 67, 2001: 45.

Rhantus minimus (ZAITZEV): FENG 1932: 29.

MATERIAL EXAMINED:

CHINA: QINGHAI: 2 ♀♀: E Qinghai, Qingshuihe, 4200 m a.s.l., 1.- 5.VII.1992 (Coll. Hendrich); TIBET: 2 ♂♂: 25 km W Amdo, Couna Lake, brook, 4400 m a.s.l., 14.XIII.1998, leg. X. Guo (Naturhistorisches Museum Wien).

ADULT: Habitus (Fig. 1). Length 10.5 - 11.5 mm. Protarsus of male slightly expanded (Fig. 2). Male genitalia of typical "*Colymbetes*-type": median lobe of aedeagus (Fig. 4) only slightly curved and rather long, distally slightly hooked ventrally (ventral = concave side of median

lobe). Parameres (Fig. 3; ZIMMERMAN 1981: 39) broad at base and strongly narrowing or stylate towards apex; with few short yellow setae at apex.

BIOLOGY: This species is restricted to high altitudes. It was collected from a brook by X. Guo (Löffler, pers. comm.).

DISTRIBUTION: China (Tibet, Qinghai).

Discussion

Based on a phylogenetic analysis of adult characters, ZIMMERMAN (1981) suggested that *C. minimus* is the sister species of the rest of *Colymbetes*, also pointing out that *C. minimus* very much resembles species of *Rhantus*.

ZIMMERMAN (1981: 5) related the discontinuous body outline of *C. minimus*, which he found was a "unique feature" of this species, to ecology. He noted that a similar body outline is present in the rheobiont *Agabus cordatus* LECONTE and in *Deronectes neomexicanus* ZIMMERMAN & SMITH, concluding that *C. minimus* was perhaps more stream-adapted than other *Colymbetes*. The few available data contradict this, but an extensive field survey surely is needed. However, knowledge from other regions and on of water beetle species suggests that a discontinuous body outline frequently, but not necessarily exclusively, evolves in running water habitats. Some species of subalpine Bidessini of *Liodes* s.l. (BALKE 2001) from of New Guinea have a rather interrupted body outline, but inhabit pools rather than rivers. Neotropical *Rhantus* from Andean high altitudes also inhabit lentic situations, but may have a discontinuous body outline (BALKE 1992).

Based on adult morphology of the genus *Colymbetes*, ZIMMERMAN (1981) distinguished three natural Nearctic groups: representatives of the first group, *C. dahuricus* and *C. paykulli*, share several derived characters. Species of the *C. sculptilis*-group with *C. dolabratus*, *C. exaratus* LECONTE, and *C. sculptilis* are very similar. Since LI and LIII larvae of *C. sculptilis* (JAMES 1970) would key out in the near of *C. striatus* / *C. dolabratus* (NILSSON & CUPPEN 1988), *C. striatus* probably also may belong to this group. The third group with *C. densus* and *C. strigatus* holds an intermediate position between groups 1 and 2. A fourth *Colymbetes*-group with *C. fuscus* probably is represented by species such as *C. semenovi*, *C. tshitscherini*, or *C. schildknechti* DETTNER (DETTNER 1983).

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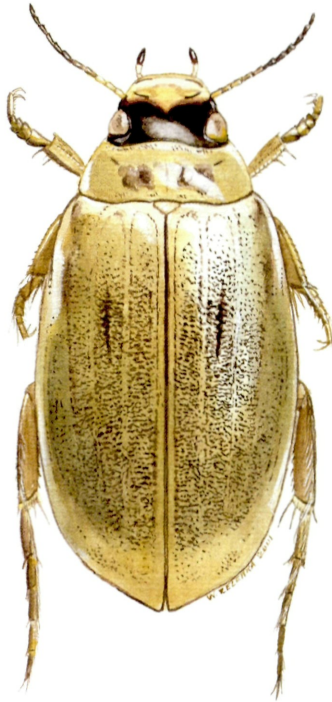
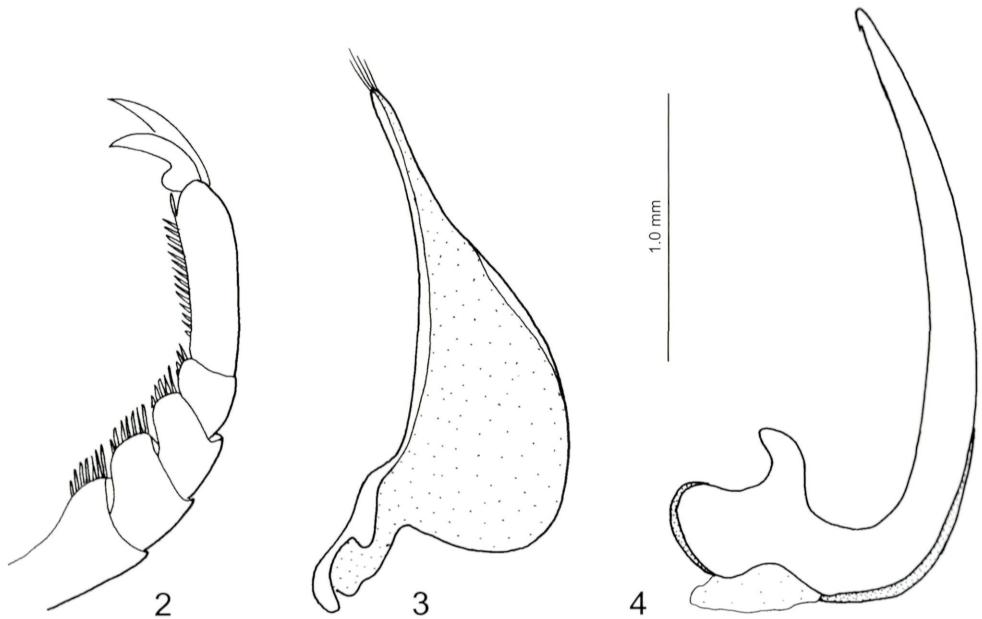


Fig. 1: Habitus of *Colymbetes minimus* (© copyright NMW).

References

- BALKE, M. 1992: Taxonomische Untersuchungen an neotropischen Wasserkäfern der Gattung *Rhantus* Dejean. - *Reichenbachia* 29 (6): 27-39.
- BALKE, M. 2001: Die Schwimmkäfer Neu Guineas. Artenreichtum, Phylogenie, Biogeographie und Lebensweise (Coleoptera: Dytiscidae). - Berlin: Dissertation.de Verlag, 167 pp., 56 pls.
- DETTNER, K. 1983: *Colymbetes schildknechti*, a new water beetle from Sardinia with a key to European species of the genus *Colymbetes* (Coleoptera, Dytiscidae). - *Aquatic Insects* 5: 39-44.
- FENG, H.T. [Xuetang] 1932: Catalogue of Chinese Dytiscidae. - *Peking Natural History Bulletin* 7: 17-37.
- FENG, H.T. [Xuetang] 1933: Additions and corrections to the Catalogue of Chinese Dytiscidae. - *Peking Natural History Bulletin* 8 (2): 323-333.
- GSCHWENDTNER, L. 1936: Monographie der paläarktischen Dytiscidae VII. Colymbetinae (Colymbetini: *Rhantus*, *Nartus*, *Melanodytes*, *Colymbetes*, *Meladema*). - *Koleopterologische Rundschau* 22: 61-102.
- JAMES, H.G. 1970: Immature stages of five diving beetles (Coleoptera: Dytiscidae), notes on their habits and life history, and a key to aquatic beetles of vernal woodland pools in southern Ontario. - *Proceedings of the entomological society of Ontario* 100 (1969): 52-97.
- NILSSON, A.N. 1995: Noteridae and Dytiscidae: Annotated check list of the Noteridae and Dytiscidae of China (Coleoptera), pp. 35-96. - In Jäch, M.A. & Ji, L. (eds.): *Water Beetles of China, Vol. I*. - Wien: Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, 410 pp.



Figs. 2 - 4: *Colymbetes minimus*, male; 2) protarsus, 3) paramere, 4) median lobe of aedeagus.

NILSSON, A.N. 2001: Dytiscidae (Coleoptera). - In: World Catalogue of Insects, Vol. 3. - Stenstrup: Apollo Books, 395 pp.

NILSSON, A.N. & CUPPEN, J.G.M. 1988: The larvae of North European *Colymbetes* Clairville (Coleoptera, Dytiscidae). - Entomologisk Tidskrift 109: 87-96.

NILSSON, A.N. & HOLMEN, M. 1995: The aquatic Adephaga (Coleoptera) of Fennoscandia and Denmark, II. Dytiscidae. - Fauna Entomologica Scandinavica 32: 1-192.

WU, C.-F. [Hu, Jingfu] 1937: Catalogus insectorum sinensium, Vol. III. - Peiping (Beijing): The Fan Memorial Institute of Biology, 1312 pp.

ZAITZEV, Ph.A. 1908: Beitrag zur Kenntnis der Wasserkäfer von Chinesisch-Centralasien. - Ezhegodnik zoologicheskago Muzeya Imperatorskoi Akademii Nauk, Sankt Petersburg 13: 417-426.

ZAITZEV, Ph.A. 1953: Nasekomye zhestkokrylye. Plavuntsovye i vertyachki. - Fauna SSSR 4 (N. S. 58): 1-377.

ZIMMERMAN, J.R. 1981: A revision of the genus *Colymbetes* of North America (Dytiscidae). - The Coleopterists Bulletin 35 (1): 1-52.

ZIMMERMANN, A. 1920: Dytiscidae, Haliplidae, Hygrobiidae, Amphizoidae. - In Schenkling, S. (ed.): Coleopterorum Catalogus, Vol. 4, pars 71. - Berlin: W. Junk, 326 pp.

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