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**Taxonomic and biogeographical review of the genus *Trechus*
Clairville, 1806, from the Tibetan Himalaya and the southern
central Tibetan Plateau (Coleoptera: Carabidae: Trechini)**

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Abstract

This paper summarizes the taxonomic and biogeographical knowledge of *Trechus* species known so far from the Transhimalaya of Central Tibet and from the southern adjacent Tibetan Himalaya of Tibet and Nepal. Nine species groups are proposed, 25 new species as well as three additional new subspecies are described: The species group of *Trechus antonini* Deuve, 1997, with ten species newly described: *T. astrophilus* **sp. n.**, *T. budhaensis* **sp. n.**, *T. lama* **sp. n.**, *T. rarus* **sp. n.**, *T. religiosus* **sp. n.**, *T. singularis* **sp. n.**, *T. tsampa* **sp. n.**, *T. tseringi* **sp. n.**, *T. yak* **sp. n.**, with an additional subspecies *T. yak shogulaensis* **ssp. n.**, and *T. yeti* **sp. n.**, all from South Central Tibet; the monotypic species group of the newly described *Trechus chaklaensis* **sp. n.** from South Central Tibet; the species group of *Trechus dacatraianus* Deuve, 1996, with two species newly described: *T. bastropi* **sp. n.**, and *T. mieheorum* **sp. n.**, both from South Central Tibet; the species group of *Trechus franzianus* Mateu & Deuve, 1979, with four species newly described: *T. aedeagalis* **sp. n.** from Far West Nepal, *T. eremita* **sp. n.** from West Nepal, *T. muguensis* **sp. n.** from West Nepal, and *T. sculptipennis* **sp. n.** from Far West Nepal; the monotypic species group of the newly described *Trechus rolwalingensis* **sp. n.** from the upper Rolwaling Valley of Central Nepal, with an additional subspecies *T. rolwalingensis daldunglana* **ssp. n.** from the lower Rolwaling Valley; the monotypic species group of the newly described *Trechus solhoeyi* **sp. n.** from South Central Tibet; the monotypic species group of the newly described *Trechus stratiotes* **sp. n.** from north eastern Saipal Himal of Far West Nepal, with an additional subspecies *T. stratiotes malikasthana* **ssp. n.** from south eastern Saipal Himal; the species group of *Trechus thibetanus* Jeannel, 1928, with three species newly described: *T. dongulaensis* **sp. n.**, *T. glabratus* **sp. n.**, and *T. namtsoensis* **sp. n.**, all from South Central Tibet; the species group of *Trechus wrzecionkoi* Deuve, 1996, with two species newly described: *T. korae* **sp. n.**, and *T. martinae* **sp. n.**, both from South Central Tibet. The following two synonymies are proposed: *Trechus franzianus* Mateu & Deuve, 1979 = *Trechus surdipennis* Mateu & Deuve, 1979, **syn. n.**; *Trechus thibetanus* Jeannel, 1928 = *Trechus pseudocameroni* Deuve, 1996, **syn. n.** A key to all species known of South Central Tibet and the Tibetan Himalaya is presented for the first time, and the distributional data of all these species are mapped. The distributional maps highlight the extremely limited distribution of all wingless *Trechus* species. *In situ* speciation following the geographical separation of the range of the ancestral species and lack of subsequent range expansion of strictly edaphic species is postulated. *Trechus* species do not only exhibit a stronger local endemism, but the individual species groups are also endemic to several parts of the Himalayan-Tibetan Orogen. This indicates that the evolution of these *Trechus* species groups is directly linked to separate geological formations. Based on geological knowledge, the evolution of the species groups endemic to the Tibetan Himalaya and the Transhimalaya started already in the Miocene after these mountains were lifted up to high montane elevations. The recent distributional area of the species can therefore not be the result of range expansion during the Holocene from Pleistocene refugia outside the Tibetan Himalaya or the Transhimalaya. Instead the existence of glacial refugia can be postulated to be in the lower parts of the same mountain slope on which the species occur today. These results clearly challenge the theory of a Tibetan inland ice sheet stretching through the Himalayan transverse valleys during the Last Glacial Maximum.

Key words: Taxonomy, biogeography, fauna of China, fauna of Nepal, key to species, new species, new synonymy, endemism, glacial refuge