



## Preface: Beetle diversity on the Qinghai-Xizang Plateau: the Mêdog region

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Situated at the dramatic confluence of the Himalaya, the Qinghai-Xizang Plateau, and the South Asian Subcontinent, the Mêdog region constitutes a distinct geological and ecological transition zone. Defined by the “Great Bend” of the Yarlung Tsangpo, the area is characterized by an extreme topographic gradient. Bounded by the glacial peaks of Namcha Barwa (7,782 m) to the north and tropical river valleys to the south, the elevation descends over 7,400 m within a linear distance of merely 50 km. This substantial vertical relief creates a compressed spectrum of altitudinal vegetation zones, functioning as a vertical biodiversity transect that ranges from alpine cryospheres to tropical rainforests. Driven by the northward surge of warm, humid Indian Ocean currents through the Yarlung Tsangpo Grand Canyon, the region receives annual precipitation of 3,000–4,000 mm. These environmental conditions have forged a highly biodiverse landscape, facilitating extensive evolutionary radiation and speciation within the regional insect fauna.

Of particular significance is the region’s ecological complexity. As the intersection of three global biodiversity hotspots, Mêdog offers a critical window for examining the transitional interplay between tropical and alpine ecosystems. Tectonically situated at the collision zone of the Indian and Eurasian plates and shaped by six major fault zones, this complex geomorphology, combined with climatic oscillations, is hypothesized to have resulted in Mêdog becoming a “cradle of evolution”. It has fostered high rates of endemism, particularly among flightless insects restricted to specific altitudinal bands. The fauna functions as a biogeographical mosaic, maintaining Palearctic relict elements while incorporating Oriental species and numerous local endemics. Consequently, the community structure exhibits marked differentiation along the vertical gradient, transitioning from psychrophilic species in glacial zones to hydrophilic rainforest taxa.

Notwithstanding the general role of insects as pollinators and trophic staples, the Coleoptera, the most species-rich order on Earth, serves as a particularly sensitive bioindicator of microhabitat integrity, spanning from the leaf litter of the rainforest floor to the scree of the high plateau. Systematically documenting this diversity bridges critical gaps in the biological baseline of China’s southwest, contributing essential data for biodiversity conservation in an era of global climate change.

The present volume chronicles the primary findings of recent expeditions focused on the beetles of Mêdog. Based on historical baselines, collaborative efforts employing pitfall traps, sweep netting, and light trapping by academic and local research institutions have substantially expanded the regional faunistic record. These surveys have given rise to the formal description of numerous species new to science, such as the handsome fungus beetle *Humerus medogicus* Chang & Ren, 2013 (Endomychidae), the rove beetle *Labomimus medogensis* Zhang, Li & Yin, 2019 (Staphylinidae), and the leaf beetle *Lilioceris medogensis* Xu & Liang, 2024 (Chrysomelidae) (Chang & Ren 2013; Zhang *et al.* 2019; Xu & Liang 2024). These discoveries conjointly modify the entomological records of Xizang and provide insight into the origin, evolution, and dispersal of the Plateau’s coleopteran fauna. For example, the strict host-specificity of *Lilioceris medogensis* for *Smilax* Linnaeus emphasizes the specialized trophic associations evolved within this isolated refuge.

Collectively, these surveys have established a substantial scientific collection of over 140,000 specimens along with a digital database, creating a verifiable platform for later works. On the occasion of the publication of this special issue, acknowledgment is due to the extensive efforts of the scientists who conducted fieldwork in the region’s rugged interior, braving the notorious leech bites and navigating steep, wash-out-prone mountain trails. Comprising 51 taxonomic contributions, this volume consolidates scattered discoveries into a comprehensive

faunistic monograph. It is anticipated that these findings will alleviate the “taxonomic impediment” in the region, ensuring that the rich biodiversity of Mêdog is not just recognized in theory but accurately documented, serving as a robust reference for elucidating the region’s complex evolutionary history and underpinning evidence-based preservation approaches for the future.

## References

- Chang, L.-X. & Ren, G.-D. (2013) *Humerus medogicus*, new genus and new species from Xizang, China (Coleoptera: Endomychidae). *Annales Zoologici*, 63, 95–100.  
<https://doi.org/10.3161/000345413X666138>
- Xu, Y. & Liang, H. (2024) Three new species and five new records within the genus *Lilioceris* (Coleoptera, Chrysomelidae, Criocerinae) from China. *ZooKeys*, 1189, 55–81.  
<https://doi.org/10.3897/zookeys.1189.111064>
- Zhang, Y.-Q., Li, L.-Z. & Yin, Z.-W. (2019) Fifteen new species and a new country record of *Labomimus* Sharp from China, with a checklist of world species (Coleoptera: Staphylinidae: Pselaphinae). *Zootaxa*, 4554 (2), 497–531.  
<https://doi.org/10.11646/zootaxa.4554.2.7>