



Introduction: Beetle diversity of Nanling Priority Area for Biodiversity Conservation: papers celebrating the 10th anniversary of the Coleopterology Committee, Entomological Society of China

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Mountain systems are essential components of the Earth's surface, playing a critical role in biodiversity conservation and ecological sustainability (Antonelli *et al.* 2018; Perrigo *et al.* 2019). The Nanling Mountains, extending east to west across five provinces in southeastern subtropical China, represent the region's largest tectonic mountain belt, and harbor unique primary forests at this latitude. Recognized as a biodiversity hotspot of global significance, this region is characterized by exceptionally high levels of species endemism (Tang *et al.* 2006; López-Pujol *et al.* 2011a; Wang *et al.* 2024a; Xu *et al.* 2016; 2024). The core area of the Nanling, also known as the Wuling, consists of five contiguous mountain ranges: Yuechengling, Dupangling, Mengzhuling, Qitianling, and Dayuling. These ranges delineate a natural boundary between southern and central subtropical China, as well as a divide between the Yangtze River and Pearl River basins (Zhou *et al.* 2018; Zhuang *et al.* 2021). The Nanling Mountains have been extensively studied for their multifaceted ecological roles. They serve as a refugium, evolutionary museum, cradle of biodiversity, dispersal corridor, and geographic barrier for various floral and faunal taxa (Pang 1993; Xie *et al.* 2004; Chen *et al.* 2011; López-Pujol *et al.* 2011b; Qiu *et al.* 2011; Gong *et al.* 2016; Tian *et al.* 2018; Mi *et al.* 2021; Wang *et al.* 2023, 2024a). Despite these studies, significant knowledge gaps persist, particularly regarding insect biodiversity—the most species-rich group in the region. While some taxa, such as Lepidoptera, have been relatively well-treated on a regional scale (Wang & Kishida 2011; Wang & Tang 2012; Wang *et al.* 2018), and a recently published checklist (Li *et al.* 2023) partially covers the insect fauna of the Nanling range, our understanding of the overall insect diversity in this area remains far from comprehensive. This lacuna in knowledge significantly impedes taxonomic, phylogenetic, phylogeographic, and conservation efforts for the region's rich insect fauna. The importance of addressing this knowledge gap becomes even more apparent when considering recent findings on insect biodiversity patterns in China. It has been revealed that southwestern and southeastern China, which encompass the Nanling Mountains, sustain higher insect biodiversity and numerous older lineages, functioning as an evolutionary “museum” (Fan *et al.* 2024). This emphasizes the potential significance of the Nanling Mountains in preserving ancient insect lineages and contributing to overall insect diversity in China. Given the documented vulnerability of global biodiversity hotspots (Trew & Maclean 2021), the combined impacts of rapid climate change and habitat loss pose significant threats to species survival in the Nanling Mountains (Duan & Cao 2012; Liu *et al.* 2017; Li *et al.* 2019). In regions like Europe, where the insect fauna is comparatively well-understood, widespread declines in species and populations have been frequently observed (Wagner 2019). These declines may be even

more pronounced in understudied regions such as the Nanling. Therefore, prioritizing baseline surveys of insect fauna is imperative for biodiversity research to support more effective conservation efforts in this ecologically critical region.

Supported by the Guangdong Academy of Sciences and the Forestry Administration of Guangdong Province, extensive fieldwork has been conducted across all insect groups in the Nanling Mountains and surrounding areas under the leadership of principal investigator Prof. Xing-Ke Yang. These efforts have led to the discovery of numerous previously undescribed species. To systematically document the region's rich insect diversity, a comprehensive book series titled "*Insect Fauna of the Nanling Mountains*" is planned. This special issue of *Zootaxa*, curated by the Coleopterology Committee of the Entomological Society of China in celebration of its 10th anniversary, presents a collection of 50 papers that highlight significant advancements in our understanding of the local coleopteran fauna. Specifically, 153 new species across 20 families are described, with 105 species documented within the range of the Nanling Priority Area for Biodiversity Conservation, underscoring its significance as a critical biodiversity hotspot. A map illustrating the extent of the Nanling Area can be found in one of the collection papers featured in this issue (Zhang & Yin 2024a: fig. 1).

The most diverse family among the newly identified taxa is Staphylinidae (Cai & Tang 2024; Duan *et al.* 2024; Ma *et al.* 2024; Peng & Tang 2024; Sun *et al.* 2024; Yin & Zhou 2024; Zhang & Yin 2024a–d), accounting for 58 species. This is followed by Scarabaeidae (12 species; Huang *et al.* 2024; Li *et al.* 2024a; Wang 2024; Zhao *et al.* 2024), Chrysomelidae (11 species; Feng *et al.* 2024; Shen *et al.* 2024; Xu & Yang 2024; Zhang *et al.* 2024a), and Lycidae (10 species; Du *et al.* 2024; Fang *et al.* 2024). Additionally, several families contribute to the overall diversity, including Hydrophilidae (Jia & Yang 2024; Mai & Jia 2024), Coccinellidae (Tao *et al.* 2024; Wei *et al.* 2024), and Carabidae (Li *et al.* 2024b; Yin *et al.* 2024), each represented by eight species. Other families include Torridincolidae (seven species; Liang *et al.* 2024), Tenebrionidae (five species; Song *et al.* 2024; Wei & Ren 2024; Zhou *et al.* 2024), and Cerambycidae (Bi *et al.* 2024a, b; Lin & Wen 2024; Wang *et al.* 2024b) and Cantharidae (four species each; Lin *et al.* 2024; Tong *et al.* 2024). Furthermore, Rhagophthalmidae (Wang & Kundrata 2024) and Passandridae (Pan *et al.* 2024) each comprise three species, while Ripiphoridae (Jiang & Pan 2024; Jiang *et al.* 2024a), Psephenidae (Jiang *et al.* 2024b), Erotylidae (Liu *et al.* 2024a), Elmidae (Bian & Hu 2024), and Curculionidae (Lin *et al.* 2024) are represented by two species each. Lastly, Eupsilobiidae (Liu & Li 2024) and Elateridae (Qiu & Ruan 2024) contribute one species each to this rich assemblage (see Fig. 1). In addition, four new (sub)genera are described in the families Carabidae, Cerambycidae, and Ripiphoridae. Notably, this issue also includes several papers that, while not describing new taxa, focus on the morphology, biology, collecting techniques, and molecular identification of the immature stages of two families, i.e., Scarabaeidae (Wen *et al.* 2024; Zhang *et al.* 2024b) and Tenebrionidae (Guo *et al.* 2024; Liu *et al.* 2024b). These works provide valuable insights into the life histories and developmental stages of the studied groups, which aid in their identification and ecological understanding. Overall, this issue represents a significant advancement in our knowledge of beetle taxonomy and biodiversity, particularly within the Nanling Mountain Area. The descriptions of over 100 new species, along with the introduction of new (sub)genera and the exploration of larval stages, contribute to the ongoing efforts to document and understand the remarkable diversity of beetles in Nanling.

The successful maintenance of high academic standards for the papers included in this issue would not have been possible without the selfless dedications of the 86 invited reviewers, including seven who opted for anonymity. Each manuscript underwent rigorous peer review, typically by at least two referees, although there were instances where only one reviewer was available due to challenges in finding suitable experts. We extend our gratitude to the following individuals for their invaluable contributions, listed alphabetically by surname: Dirk Ahrens (Scarabaeidae), Peter Allsopp (Scarabaeidae), Kiyoshi Ando (Tenebrionidae), Jaime Rodrigo Pizarro Araya (Tenebrionidae), Ron Beenen (Chrysomelidae), Rostislav Bekchiev (Staphylinidae), Rolf Beutel (Coleoptera general), Aleš Bezděk (Scarabaeidae), Jan Bezděk (Chrysomelidae), Arnaldo Bordoni (Staphylinidae), Adam Brunke (Staphylinidae), Daniel Burckhardt (Passandridae), Chen-Yang Cai (Staphylinidae, Ripiphoridae), Christopher Carlton (Staphylinidae), Donald Chandler (Staphylinidae), Atilano Contreras-Ramos (Ripiphoridae), Giulio Cuccodoro (Staphylinidae), Prathapan Divakaran (Chrysomelidae), Alain Drumont (Cerambycidae), Arnaud Faille (Carabidae), Martin Fikáček (Torridincolidae), Garth Foster (Elmidae), Mikhail Gildenkov (Staphylinidae), Guillermo González (Coccinellidae), Borislav Guéorguiev (Carabidae), Adam Haberski (Staphylinidae), Jiří Hájek (Torridincolidae), Masakazu Hayashi (Elmidae), Lee Herman (Staphylinidae), Peter Hlaváč (Staphylinidae), Fang-Shuo Hu (Staphylinidae), Shota Inoue (Staphylinidae), Dariusz Iwan (Tenebrionidae), Lech Karpiński

(Cerambycidae), Sergey Kazantsev (Lycidae), Denis Keith (Scarabaeidae), Alexander Konstantinov (Chrysomelidae), Robin Kundrata (Elateridae), Chi-Feng Lee (Chrysomelidae), Richard Leschen (Coleoptera general), Yun Li (Lycidae), Martin Lillig (Tenebrionidae), Pol Limbourg (Scarabaeidae), Steve Lingafelter (Cerambycidae), Ivan Löbl (Staphylinidae), Liang Lü (Staphylinidae), Daniel Lukic (Scarabaeidae), Kimio Masumoto (Tenebrionidae), Christian Moeseneder (Scarabaeidae), Jacob Muinde (Chrysomelidae), Maxim Nabozhenko (Tenebrionidae), Tatsuya Niisato (Cerambycidae), Shûhei Nomura (Staphylinidae), Nobuo Ohbayashi (Cerambycidae), Janakiraman Poorani (Coccinellidae), Kaniyarikkal Prathapan (Chrysomelidae), Alexander Prosvirov (Elateridae), Angus Robert (Hydrophilidae), Simone Policena Rosa (Rhagophthalmidae), André Silva Roza (Rhagophthalmidae), Alexandr Rvkin (Staphylinidae), Harald Schillhammer (Staphylinidae), Joachim Schmidt (Carabidae), Michael Schmitt (Chrysomelidae), Michael Schülke (Staphylinidae), Riccardo Sciaky (Carabidae), Yoshihiro Senda (Staphylinidae), Petr Šípek (Scarabaeidae), Wisut Sittichaya (Curculionidae), Alexey Solodovnikov (Staphylinidae), Kazuki Sugaya (Carabidae), Petr Švácha (Cerambycidae), Karol Szawaryn (Coccinellidae), Kazuhiro Takahashi (Cantharidae), Marco Uliana (Scarabaeidae), and Dominik Vondráček (Scarabaeidae).

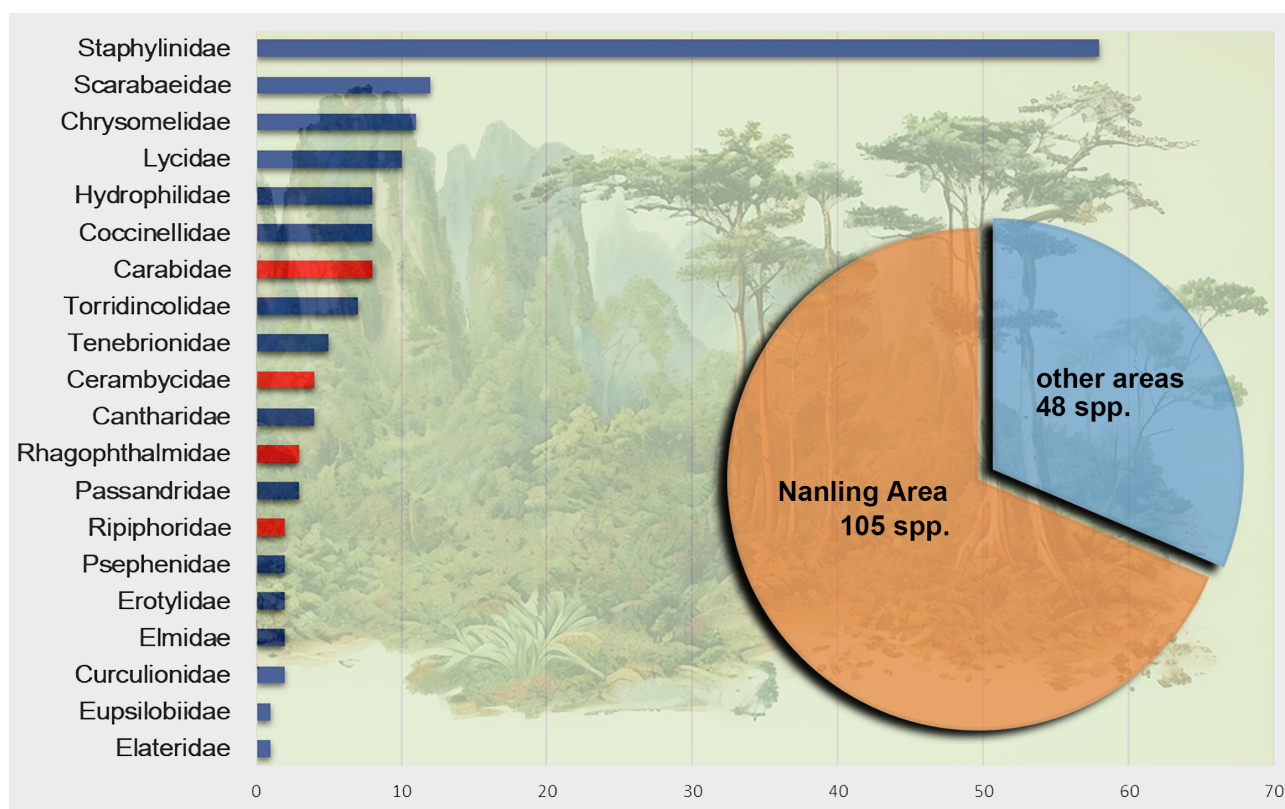


FIGURE 1. Distribution of newly described species by family and region. The bar chart on the left shows the number of species identified in each family, with Staphylinidae having the highest count. The bars highlighted in red indicate new generic taxon of the family. The pie chart on the right emphasizes that 105 species were discovered in the Nanling Area, compared to 48 species from other regions.

We extend our appreciation to all authors of the papers in this issue for their scholarly participation and enthusiastic support. Professors Zhi-Qiang Zhang and Chen-Yang Cai, along with Associate Professor Hao Xu, offered invaluable insights and engaged in critical discussions during the conceptualization and organization of the issue. The successful publication of this issue could not have been achieved without the editorial efforts of *Zootaxa*'s team, whose expertise ensured a seamless transition from manuscripts to published works. We are also indebted to Professor Zhi-Qiang Li, Deputy Director of the Institute of Zoology, Guangdong Academy of Sciences, for his unwavering support. Furthermore, we express our gratitude to Professors Xing-Ke Yang, Guo-Dong Ren, and Li-Zhen Li, former commissioners of the Coleopterology Committee, for their continuous guidance and encouragement throughout this academic endeavor. Their collective expertise and mentorship have been instrumental in bringing this project to fruition.

The papers presented in this issue are organized according to family, adhering to the classification in Bouchard *et al.* (2024). Within each family, papers are arranged alphabetically based on the focal generic taxa. This approach ensures a logical and taxonomically informed structure, and facilitates efficient navigation for readers interested in specific beetle groups. The publication of the current issue was funded by the GDAS Special Project of Science and Technology Development (grant nos. 2020GDASYL-20200102021 and 2020GDASYL-20200301003).

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