



## ***Apatrobus osuzuyamanus* sp. nov., a new patrobine species from Japan, with a comparative study of the male genital morphology of the tribe Patrobini (Coleoptera: Carabidae)**

KÔJI SASAKAWA<sup>1</sup> & WATARU TOKI<sup>2</sup>

*The University of Tokyo, Graduate School of Agricultural and Life Science, Laboratory of Forest Zoology, Yayoi 1-1-1, Bunkyo-ku, Tokyo 113-8657, Japan. E-mail: <sup>1</sup>ksasa@fr.a.u-tokyo.ac.jp; <sup>2</sup>tokiw@fr.a.u-tokyo.ac.jp*

### **Abstract**

*Apatrobus* (*Apatrobus*) *osuzuyamanus* **sp. nov.** is described from Kyushu, western Japan (type locality: Mt. Osuzuyama [32°16'N, 131°25'E]). This species is distinguished from *A. (A.) ohtsukai* Morita by a larger body, a pair of small depressions on the pronotum, and the shape of the aedeagal apex. Based on a comparative study of the male genitalia of several species, the homology of the genital sclerites of the tribe Patrobini are revised and a new terminology is proposed. The implications of present results for Patrobini taxonomy are briefly discussed.

**Key words:** endophallus, genitalia, ground beetles, homology, sclerites, terminology

### **Introduction**

*Apatrobus* Habu and Baba 1960 (sensu Zamotajlov 2003), one of the most differentiated genera of the tribe Patrobini (Coleoptera: Carabidae), is distributed throughout the Far East to the Himalayan region (Zamotajlov 2003). This genus contains 32 known species separated into three subgenera: *Apatrobus* s. str., *Apenetretus* Kurnakov 1960 and *Parapatrobus* Zamotajlov 1992 (Zamotajlov 2003). In Japan, there are 23 species, belonging to either *Apatrobus* or *Apenetretus* (Morita 1985; Zamotajlov 2003).

We found an *Apatrobus* species on a mountain in Kyushu, at a location where no members of the genus have previously been recorded. Based on an examination of all *Apatrobus* species documented from Kyushu, we conclude that the species that we found is new to science. In addition, through a comparative study of the male genitalia of various Patrobini species, we identified inconsistencies in the homology and terminology of the components of male genitalia of the Patrobini. In Carabidae, male genital structures have characters habitually used for inferring phylogenetic relationships; therefore, misunderstandings in character homology could result in erroneous taxonomic conclusions (e.g., Sasakawa 2005).

Our aim is twofold. First, we describe the new *Apatrobus* from Japan, with description for the first time of the morphological characteristics of the male endophallus (everted inner sac of male aedeagus) of the tribe Patrobini. Second, we revise the homology assignments of the components of the male genitalia of the Patrobini, and propose a new terminology. We finally discuss the implications of our results for the taxonomy of Patrobini.

### **Materials and methods**

The specimens examined are deposited in the collections of the first author (KS) or the following public collections: Laboratory of Forest Zoology, Graduate of Agricultural and Life Sciences, The University of Tokyo,