



One of a thousand - a new species of *Trigonopterus* (Coleoptera, Curculionidae, Cryptorhynchinae) from New Guinea

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Abstract

A new species of *Trigonopterus* Fauvel, 1862 is described: *Trigonopterus vandekampi* **sp. n.**. It occurs relatively commonly on foliage of lowland rainforests in West New Guinea. The genus *Trigonopterus* is hyperdiverse, but the majority of its species are undescribed. This description is the first one including both important morphological and molecular characters and provides a foundation for forthcoming studies on the functional morphology of this species.

Key words: New Guinea, *Trigonopterus*, weevils, hyperdiversity, DNA barcoding

Introduction

Trigonopterus Fauvel is a genus of flightless weevils placed in the Cryptorhynchinae, Curculionidae (Alonso-Zarazaga & Lyal, 1999; Morimoto, 1978). It is distributed from Eastern Sumatra to Samoa and from New Caledonia to the Philippines, with the center of its diversity in New Guinea. Species are usually very similar to each other externally, and genitalia need to be examined for safe identification. Remarkably, these structures have never been included in any description of the 90 named species. Many of them were named in the 19th century (e.g. Pascoe, 1871, 1885; Faust, 1898, 1899). The last four species were described 28 years ago by Thompson (1982) - since then, not a single one has been added.

At present, only 40 species of *Trigonopterus* are formally described from New Guinea. Of these, only four species were recorded from the mainland of West New Guinea (Setliff, 2007). Types of all relevant Papuan species have been examined and a revision of the previously described species is in preparation.

Riedel *et al.* (2010) explored the potential of DNA taxonomy using *cox1* (aka “DNA barcoding”) as a rapid identification tool: *Trigonopterus* species were clearly delineated by both molecular and morphological data, and both data sets were fully congruent with each other. That survey also resulted in the discovery of 51 *Trigonopterus* species in the Cyclops Mountains of New Guinea, most of them undescribed. This finding lent further support to the perception that *Trigonopterus* is a hyperdiverse genus, with the majority of its species still unrecognized and undescribed. The partly unsorted material at hand, mainly from New Guinea, suggests extensive local endemism. It is estimated that this material contains a minimum of 300 species, but more likely 500 species. Additional field work keeps adding new species in large numbers and so far a saturation point of species discoveries still appears out of sight. Therefore, an estimate of more than 1.000 for the total number of *Trigonopterus* species can be considered relatively conservative.

One of the most common species collected in the Cyclops Mountains was used in a detailed morphological study applying 3D-models based on micro computer tomography (van de Kamp & Riedel, in prep.). For this reason, there is an immediate need to provide a name for this particular species, before a more comprehensive monograph could be completed.

The following description is the most comprehensive of all *Trigonopterus* species published so far: it combines molecular data (*cox1*-sequences that alone characterize the species sufficiently) with diagnostic characters of male and female genitalia. The latter are not a novel character in insect systematics, still this