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Two new deep-sea stalked barnacles, *Arcoscalpellum epeeum* sp. nov. and *Gymnoscalpellum indopacificum* sp. nov., from the Coral Sea, with descriptions of the penis in *Gymnoscalpellum* dwarf males

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Abstract

The present study describes a new species of *Arcoscalpellum* Hoek, 1907, and a new species of *Gymnoscalpellum* Newman & Ross, 1971, collected by deep-sea expeditions led by the Muséum national d'Histoire naturelle (Paris) in the Coral Sea off New Caledonia, Papua New Guinea (PNG), the Solomon Islands and Vanuatu. *Arcoscalpellum epeeum* **sp. nov.** differs from all described species of *Arcoscalpellum* by the presence of a long, sharp, sword-shaped carina, which extends beyond the apices of the terga by 1/3 to 1/4 of their length. The species is dioecious, with large females and dwarf males that are sac-like, lack shell plates and are housed in paired receptacles at the inner edges of the scutal plates. *Arcoscalpellum epeeum* **sp. nov.** was collected in the waters of New Caledonia and Vanuatu. *Gymnoscalpellum indopacificum* **sp. nov.** differs from the six currently described species of *Gymnoscalpellum* by having a very small inframedian latus and a branched upper latus. The species is dioecious, with large females and dwarf males, the latter composed of 4 shell plates and housed in paired receptacles at the inner edges of the scutal plates. The penis of the dwarf males of *G. indopacificum* **sp. nov.** is about 0.8 of the total length of the male and has five side branches extending out along its length. *Gymnoscalpellum indopacificum* **sp. nov.** is distributed in the waters of Papua New Guinea, the Solomon Islands and Vanuatu, and represents the first record of this genus in the Indo-Pacific region.

Key words: Crustacea, new species, Indo-Pacific region

Introduction

In previous centuries, several key biological expeditions have explored the diversity of marine organisms in the Indo-Pacific deep-sea oceans. The expeditions by *Challenger* (1873–1876), *Investigator* (1884–1887), *Valdiva* (1898–1899), *Siboga* (1899–1900), *Albatross* (1907–1910), Th. Mortensen's Pacific Expedition (1914–1916) and *Galathea* (1950–1952) are among the most famous. However, these expeditions did not extensively explore the South Pacific deep sea or areas such as New Caledonia, Vanuatu and the Solomon Islands.

Since the early 1980s, the Muséum national d'Histoire naturelle (Paris), in association with the Institute of Research and Development (under the umbrella of the *Tropical Deep Sea Benthos* TDSB programme), has been privileged to undertake scientific explorations of such magnitude and intensity that they may be compared to these famous "historical expeditions". The deep-sea benthos of tropical seas has been generally neglected by zoologists and oceanographers and still represents one of the major frontiers for the discovery of marine biodiversity. The core aim of the TDSB programme, therefore, has been to fill this gap and its explorations confirm the Indo-Pacific as a major reservoir of unknown forms of life from all taxonomic groups in the region (Bouchet *et al.* 2008; Richer de Forges *et al.* 2013).

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