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## ***Papuadocus blodiwai* gen. nov., sp. nov. (Crustacea: Amphipoda: Maeridae), a new bathyal species associated with sunken wood in the Bismarck Sea (Papua New Guinea)**

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### **Abstract**

A new species belonging to a new genus of Maeridae, *Papuadocus blodiwai* gen. nov., sp. nov., is described from bathyal bottoms of the Bismarck Sea (Papua New Guinea). This genus/species can be distinguished from most other known maerids by right and left maxillas 1 with asymmetrical palps and by gnathopod 2 not sexually dimorphic. Its closest relative is the genus *Bathyceradocus* also characterized by asymmetrical maxillas 1, but differing by the presence of gill on coxae 7. These observations lead to the conclusion that the diagnosis of the family Maeridae has to be amended to receive both *Bathyceradocus* and *Papuadocus* genera. All the collected specimens lived in association with sunken wood, at 500–580 m depth.

**Key words:** Amphipoda, Maeridae, *Papuadocus*, new genus and species, sunken wood, Bismarck Sea, Papua New Guinea

### **Introduction**

Little is known about the deep-sea fauna from the Bismarck Sea (Papua New Guinea). To fill in this gap, several oceanographic expeditions have been launched since 2010 in the Bismarck Sea (BS) and along the north coast of Papua New Guinea by the Muséum National d'Histoire Naturelle (MNHN), the Institut de Recherche pour le Développement (IRD) under the umbrella of the research programme 'Tropical Deep-Sea Benthos' (see Richer de Forges *et al.* 2013).

The numerous benthic samplings carried out during these expeditions showed the recurrence of wood fragments in most samples, thus demonstrating that sunken woods is a frequent habitat in the Bismarck Sea, as already mentioned for other areas of the western Indo-Pacific Ocean by Samadi *et al.* 2010. The wood-associated fauna is known since the Challenger expedition (Murray 1895) but the presence of animals on benthic plant remains has been casually documented in the deep-sea. Until the highlighting of their phylogenetic relationships with relatives from chemosynthetic environments (Distel *et al.* 2000; Thubaut *et al.* 2013), these plant-associated organisms were mainly looked at as zoological/ecological curiosities and only anecdotally mentioned, except for taxonomical purposes.

In the case of amphipods, different species have been already mentioned as living in association with organic substrates: the Lysianassidae *Paronesimoides lignivorus* Pirlot, 1933 in a wood fragment at 2053 m (see Pirlot 1933), *Onesimoides carinatus* Stebbing, 1888 in wood fragments between 820 and 2053 m, *O. chelatus* Pirlot, 1933 in a wood fragment at 2053 m and in *Nypa*-palm fruits at 4940–4970 m, *O. mindoro* Lowry & Stoddart, 1993 inside an old piece of wood at 804–812 m (see Barnard 1961; Lowry & Stoddart 1993, 1994, 1996); the Melitidae *Melita lignophila* Barnard, 1961 on sunken tree trunk at 915 m (see Barnard 1961) and *Exotimelita lignicola* Tandberg, Rapp, Schander & Vader, 2013 in a wood fall of Siberian pine at 2800 m, close to an hydrothermal vent field (see Tandberg *et al.* 2013); the Maeridae (formerly classified in Melitidae, see Krapp-Schickel 2008)

*Telson* (Fig. 7) deeply cleft (cleft 0.71 telson length), reaching 0.6 length of uropod 3 rami, with two submarginal setae near outer margin of each lobe; lobes more or less convergent, without apical setae.

**Remark on male paratype.** The unique male (MNHN-IU-2013-1619) collected in the Bismarck Sea is slightly longer than the two females sampled at the same station. Except for primary sexual characters, its general morphology is similar to that of females and its gnathopods 2 are not sexually dimorphic (Fig. 8).

### Molecular identification

A mtCOI sequence (a 657 base pair fragment) was obtained for each of the five specimens of *P. blodiwai* **gen. nov., sp. nov.** examined in the present study. These sequences are available in GenBank under the following accession numbers: KJ672111 (holotype), KJ672107, KJ672108, KJ672109, KJ672110 (paratypes). Following the definition given by Pleijel *et al.* 2008, the holotype female of this new species (MNHN-IU-2013-1647) is designed as the hologenophore of these sequences. No variation was detected between individual sequences, including juveniles, male and female of the new species. More molecular results will be published later in a forthcoming paper dedicated to *Bathyceradocus* cryptic species from diverse areas of the Indo-Pacific region. In accordance with the preceding morphological observations, these analyses show that, within the family Maeridae, *Papudocus* **gen. nov.** is phylogenetically closest to the genus *Bathyceradocus* than to *Maera* and *Quadrimaera* genera (Corbari *et al.*, unpublished data).

### Ecological/biological notes

The five specimens of *P. blodiwai* **gen. nov., sp. nov.** were collected in channels and grooves, inside wood fragments (no specimens observed on the surface of these fragments). This new species lives in the same habitat (sunken woods) than the bathyal/abyssal *Bathyceradocus* species (*B. stephensi* in Pirlot 1934, Barnard 1961; *B. iberiensis* in Andres 1977; *B. wuzzae* in Larsen & Krapp-Schickel 2007). Barnard 1961 analysed the stomach content of a *B. stephensi* specimen and observed that it contained comminuted woody material. Andres 1977 also mentioned that *B. iberiensis* is a wood-consumer. As living in a similar benthic habitat than the preceding species, it is probable that such a feeding behaviour is also exhibited by the BS specimens. As afore-mentioned, the holotype of the new species is a brooding female, with an apparently undamaged marsupium. Its brood pouch contained 20 rounded eggs.

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