



## **A new *Glossocephalus* (Crustacea: Amphipoda: Hyperiidea: Oxycephalidae) from deep-water in the Monterey Bay region, California, USA, with an overview of the genus**

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### **Abstract**

A new species of *Glossocephalus*, *G. rebecca* sp. nov., is described from deep-water in the Monterey Bay region of California, Eastern Pacific Ocean. It seems to be associated exclusively with the mesopelagic ctenophore *Bathocyroe fosteri*. This association has been observed from 541–830 m depth. It is readily distinguished from *G. milneedwardsi* Bovallius, 1887 by the shape of the eye fields. The retina is organised into a crescent-shaped organ, occupying about one-quarter of the back half of the head, with the crystalline cones projecting both anteriorly and laterally. An updated review of the genus is provided, taking into account the new species, together with an overview of *G. milneedwardsi*, and three new records of associations with ctenophores for *G. milneedwardsi*. New observations on the interaction of *G. milneedwardsi* with one of its ctenophore hosts, *Mnemiopsis* sp., are also documented.

**Key words:** Amphipoda, Hyperiidea, Oxycephalidae, *Glossocephalus*, taxonomy, new species, host interaction

### **Introduction**

The new species, described here, was first detected by Browne *et al.* (2007) as genetically distinct from the only other known species of the oxycephaliid amphipod genus *Glossocephalus* Bovallius, *G. milneedwardsi* Bovallius, 1887. It was immediately clear from *in situ* photographs and video footage of the specimen that it possessed unusual eyes, likely adapted for living in light restricted meso- and bathypelagic depths, readily distinguishing it from *G. milneedwardsi*, an epipelagic species. Subsequent examination of specimens from the same general locality and depth provided additional morphological characters to distinguish it from *G. milneedwardsi*. This species is new to science and is unusual among the family Oxycephalidae as it is the only known species from the group adapted to living in deeper waters. It is intriguing to consider that its close association with the mesopelagic ctenophore *Bathocyroe fosteri* may have contributed to the evolution of the unique eye characteristics observed in this species. The discovery of this new species also highlights the importance of faunal surveys in oceanic mid-waters combined with molecular phylogenetic studies such as those conducted by Browne *et al.* (2007) and Hurt *et al.* (2013).

While researching the systematics of this species it became evident that a review of the genus *Glossocephalus* was long overdue. There are few good illustrations of species in the literature and the mouthparts have not been studied or illustrated, except for Bovallius (1890) who mentions, briefly, that the mandibles are “best developed in the genera *Tullbergella* and *Glossocephalus*” and provides a figure of the maxilliped of *G. spinigera*, a junior synonym of *G. milneedwardsi*. While the figure of the maxilliped agrees more or less with that found in *G. milneedwardsi* (Fig. 4), his comment regarding the mandibles is inaccurate. The mandibles for this species are not particularly well developed, and more significantly, males lack the prominent 3-articulate palp found in all other genera of the family (Fig. 4). Thus an updated review of the genus *Glossocephalus* is provided, taking into account the new species together with an overview of *G. milneedwardsi* and three new records of associations with