

Systematics, Ecology and Phylogeny of the Anamixidae (Crustacea: Amphipoda)

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ABSTRACT. Thirteen new species and one new genus are described in the commensal amphipod family Anamixidae, bringing the total to 33 species in three genera. Thirteen species are recorded from the Pacific Ocean, eight from the Indian Ocean and four from the Caribbean. Developmental stages are documented in four species of *Anamixis* Stebbing, 1897 and one species of *Nepanamixis* n.gen. Developmental stages in *Nepanamixis* are profoundly different from those of *Anamixis* and *Paranamixis* Schellenberg, 1938. All new taxa are fully described and figured. Previously described taxa are reviewed and illustrated where necessary.

The cryptic Anamixidae are found in coral reefs and other hard-bottomed, shallow, tropical waters. An unusual tropical relic, *A. tangaroa* n.sp., is described from cold waters in the Bass Strait, Australia. Current species distributions and information probably reflect collecting bias as many areas remain uncollected.

Cladistic analysis of the Anamixidae proved informative in the *Nepanamixis*–*Anamixis* group where adequate specimens of new and existing species were available for examination. Results were less informative for *Paranamixis*.

THOMAS, JAMES DARWIN, 1997. Systematics, ecology and phylogeny of the Anamixidae (Crustacea: Amphipoda). Records of the Australian Museum 49(1): 35–98.

Amphipods of the family Anamixidae are commensals in sponges and ascidians and occur throughout the world's tropical and subtropical marine systems. They exhibit an unusual life history pattern involving two highly dissimilar developmental stages that occur simultaneously in the host (Thomas & Barnard, 1983). These two stages are so different they were previously assigned to separate families. Initial, or, "leucomorph" developmental stages (male and female) of different anamixid species are nearly identical, while the transformed, or "anamorph" stage (always

male) is distinct for each species. In a remarkable transformation, leucomorph males pass via a single moult to anamorph males. This transformation is accompanied by a number of extreme morphological changes that explain their placement in separate families prior to this discovery. Leucomorphs outnumber anamorphs in the host approximately 10:1. Nearly all leucomorph females are ovigerous. It is not known which male stage (or both) interacts reproductively with the female. The fate of post-brood females remains unknown.