



The biogeography of Indo-West Pacific tropical amphipods with particular reference to Australia*

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Abstract

The extant distribution of amphipods in the tropical Indo-Pacific can be understood only by reference to the positions of shallow seas during the past two hundred million years. Amphipods attributable to extant families, even genera, were in existence in Mesozoic times. A number of amphipod families can be recognized as Gondwanan in origin, but Laurasian families, except in fresh waters, are more difficult to identify. The tropical amphipod fauna of Australia/New Guinea is thought to have evolved *in situ* until at least 15 Ma, when the continent reached proximity with Asia. Parsimony Analysis of Endemicity of Indo-Pacific amphipod families supports this hypothesis.

Key words: Crustacea, Amphipoda, Biogeography, Indo-West Pacific, Great Barrier Reef, Australia, biogeography

Introduction

Using the paradigm of ‘dispersal and founder principle’ to explain modern marine distributions, is not tenable (Myers 1994, 1996; Heads 2005). We must attempt to understand sequences of vicariant events in earth history, if we are to understand species distributions in tropical areas. Arguments have in the past been advanced that to understand the distribution of living species, events occurring millions or tens of millions of years ago should be discounted, because supposed speciation rates would mitigate against such long time scales. We now know that this argument is untenable. Roughgarden (1995) documents a fossil *Anolis* Daudin from the Dominican Republic, dated at 20 Ma or even 40 Ma, that is indistinguishable from living Hispaniola species. Within the Amphipoda, Weitschat *et al.* (2002) have described a corophioid amphipod from Oligocene amber that, while not attributable to a known species, appears to be entirely consistent morphologically with modern corophioid taxa (see Myers & Lowry 2003).

The distribution data presented here for amphipods, illustrate important biogeographic tracks that require documentation, regardless of the geological explanation hypothesised.

World distribution patterns of the Amphipoda

One of the most characteristic biogeographic features of shallow water marine organisms, including amphipods, is the distinctive difference between the tropical fauna of the Atlantic and that of the greater Indo-Pacific. In the Amphipoda, differences are mainly at specific level with a few at generic level. Atlantic