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The first wasps from the Upper Jurassic of Australia (Hymenoptera: Evanioidea, Praeaulacidae)

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Abstract

The Hymenoptera fossils discovered in the Upper Jurassic Talbragar Fish Bed in Australia are described and illustrated. *Gulgonga beattiei* **gen. et sp. nov.**, described from a single specimen, is assigned to the apocritan subfamily Praeaulacinae based primarily on wing venation, mesosomal structure, metasomal articulation, ovipositor shape and antennal form. It is the second member of Praeaulacidae known from Australia; all other praeaulacids have been found in the northern hemisphere. A second Talbragar wasp fossil is assigned to *Apocrita incertae sedis* because it is too poorly preserved for proper identification.

Key words: Apocrita, Praeaulacinae, Talbragar Fish Bed, *Gulgonga beattiei*, new genus, new species, fossil insects

Introduction

The Talbragar Fish Bed near Gulgong, New South Wales, is one of only two insectiferous fossil sites of Jurassic age in Australia. While best known for its fossil fish (Woodward 1895, Wade 1941, Bean 2006) and conifers (Walkom 1921, White 1981), in recent years a considerable number of insect fossils has also been recovered (Beattie 2007, Beattie & Nel 2012, Beattie & Avery 2012, Oberprieler & Yeates 2012). The insect fauna of the Talbragar Fish Bed is of Upper Jurassic age (Kimmeridgian, 151.55 ± 4.27 Ma; Bean 2006) and thus forms an important link between the older Lower Jurassic (Sinemurian–Toarcian, 196.5–175.6 Ma) Mintaja (Hill River) fauna in Western Australia (Martin 2008) and the younger Lower Cretaceous (Aptian, 118–115 Ma) Koonwarra fauna in Victoria (Jell & Duncan 1986). The Talbragar Fish Bed lies at the junction of a terrestrial and an aquatic ecosystem of southern Gondwana. Like the Mintaja Lagerstätte, its stratigraphy indicates a shallow freshwater environment (Dulhunty & Eadie 1969, Percival 1979, White 1981, Beattie & Avery 2012). In contrast to Mintaja, however, most insect specimens are fully articulated and often remarkably well preserved.

The insect fauna of the Talbragar Fish Bed is dominated by an apparent single species of Protopsyllidiidae, but other Hemiptera (Auchenorrhyncha and Heteroptera) are present in lower numbers. Coleoptera are also numerous, comprising mainly the suborders Archostemata and Polyphaga. Other orders represented are Odonata, Plecoptera, Orthoptera, Neuroptera, Mecoptera and Diptera (Beattie & Avery 2012). Cockroaches (Blattodea) have thus far not been found. Recent discoveries include a dragonfly and a damselfly naiad (R. Beattie pers. comm. 2011) and a number of culicomorph pupae (Diptera) (P. Cranston pers. comm. 2012). Over 400 insect specimens have been collected but only four are so far formally described: *Griphologus lowei* (Etheridge & Olliff, 1890), originally interpreted as a cicada but currently treated as *incertae sedis* (Handlirsch 1906), a dragonfly (*Austroprotolindenia jurassica* Beattie & Nel, 2012), a brachyceran fly (*Calosargus talbragarensis* Oberprieler & Yeates, 2012) and a nemomychid weevil (*Talbragarus averyi* Oberprieler & Oberprieler, 2012). The first hymenopterons are described below.

The fossil record of Australian Hymenoptera is very small, consisting of only five described species. Two species of the symphytan family Xyelidae, *Archexyela crosbyi* Riek, 1955 and *Archexyela ipswichensis* Engel,