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Seven new species of *Paleanotus* (Annelida: Chrysopetalidae) described from Lizard Island, Great Barrier Reef, and coral reefs of northern Australia and the Indo-Pacific: two cryptic species pairs revealed between western Pacific Ocean and the eastern Indian Ocean

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Abstract

Morphological investigation into the paleate genus *Paleanotus* Schmarda 1861 of the family Chrysopetalidae from northern Australian coral reefs, primarily Lizard Island and outlying reefs, included a complex of very small, slender individuals (length < 5 mm). This complex resolved into 7 new species, described herein: *Paleanotus inornatus* n. sp., *P. adornatus* n. sp., *P. chrysos* n. sp., *P. aquifolia* n. sp., *P. latifolia* n. sp., *P. silus* n. sp., and *P. silopsis* n. sp. A key is provided to the new species and *Paleanotus* distinguished from *Treptopale* and *Hyalopale*, two closely related genera. Diagnostic features of the apical structure and shape of the notochaetal main paleae plus median paleae shape and raised rib pattern, differentiates each species from the other. Gametous states are described. Two cryptic species pairs (*Paleanotus silopsis* n. sp. and *P. silus* n. sp.; *Paleanotus aquifolia* n. sp. and *P. latifolia* n. sp.) were identified. In each case one species is restricted to either the NE or NW Australian coast. In each pair the most eastern point for the NW Australian species range occurs at Darwin, western Arnhemland, Northern Territory. Additional material for each species pair extends their respective ranges northwards: NW Australia to Thailand, Andaman Sea, eastern Indian Ocean or NE Australia, Great Barrier Reef to the Philippines, western Pacific Ocean. Cryptic morphology and potential genetic diversity is discussed in *Paleanotus inornatus* n. sp. and *P. adornatus* n. sp. that possess overlapping widespread distribution patterns across northern Australia and Indo-Pacific reefs. The smallest bodied taxon, *Paleanotus chrysos* n. sp. is the only species with a Coral Sea range encompassing Lizard Island, Heron Island and New Caledonia.

Key words: Morphology, taxonomy, crypticism, NE/NW Australia, biogeography

Introduction

Chrysopetalids are small, fragmentable worms possessing distinctive silvery to bright golden coloured paleae (flattened notochaetae) held in tight segmental fans that imbricate down the dorsum. They are found worldwide between 60º N-S and are associated with crevicular habitats from a wide range of marine environments, intertidal to ~5000 m. It is one of the most common polychaete families associated with fringing mainland and off shore coral reefs of the Indo-Pacific and Western Atlantic (Watson 2010). A number of chrysopetalid taxa possess planktonic larvae (e.g., *Paleanotus* Blake 1975; *Arichlidon* Watson *et al.* 2014) and are among primary colonizers in settlement studies on tropical reefs e.g., GBR, western Pacific (Hutchings & Murray 1982); eastern Indian Ocean (Peyrot-Clausade 1974); eastern Pacific (Peyrot-Clausade 1976) and the Caribbean, West Atlantic (CW pers.obs.).

Chrysopetalidae was erected by Ehlers (1864) to contain the paleate genera *Paleanotus* Schmarda, 1861, *Bhawania* Schmarda, 1861, *Chrysopetalum* (Ehlers, 1864) and *Palmyra* (Savigny in Lamarck, 1818); the latter taxon since referred to the family Aphroditidae (Watson Russell 1989). Subsequently a further 10 genera have been described (see Watson Russell 2000; Rouse & Pleijel 2001). Recent genetic investigation has found that the rare families Nautiliniellidae Miura & Laubier, 1989 (inquiline in deep-sea mussels) and Calamyzidae (*Calamyzas amphictenicola* Arwidsson, 1932 parasitic on tube dwelling ampharetids in shallow waters) are derived

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