# Article

# Six new species of *Australocosmica* Köhler, 2011 from the Kimberley islands, Western Australia (Mollusca: Pulmonata: Camaenidae)

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## Abstract

The Western Australian Kimberley region harbours a diverse fauna of camaenid land snails characterised by marked patterns of narrow range endemism. The recently described genus *Australocosmica* comprised three species that are endemic to single offshore islands or island groups. Material of a further seven candidate species recognised by the late Alan Solem has been examined. Six of these manuscript species, NSP 40 (= *A. rotunda* n. sp.), NSP 76 (= *A. pallida* n. sp.), NSP 77 (= *A. buffonensis* n. sp.), NSP 78 (= *A. bernoulliensis* n. sp.), NSP 79 (= *A. crassicostata* n. sp.), and NSP 80 (= *A. nana* n. sp.), are here newly described based on examination of shell morphology and penial anatomy. Based on our findings, we are presenting an updated generic diagnosis of *Australocosmica*. Statistical analyses revealed that species exhibit similar shell characters (colouration, sculpture, dimensions), which render the delimitation of species based only on shells difficult. However, species were found to differ significantly in their penial anatomy. Although the material studied was not suitable for DNA extraction, the anatomical differences were considered sufficient to permit the description of distinct species.

**Key words:** Helicoidea, taxonomy, endemism, diversity, genital anatomy, shell morphology

## Introduction

The Kimberley region of north-western Australia is recognised as a national biodiversity hotspot, due largely to the number of endemic plant and animal species it supports. A relatively little-known, yet significant, component of this diversity and high endemism, are the terrestrial gastropods of the region (Gibson & Köhler, 2012). Surveys conducted between 1987 and 1989 in the rainforests of the Kimberley (McKenzie, 1991) uncovered a large diversity of land snail species (Solem, 1991; Solem & McKenzie, 1991). Earlier work in the Kimberley also showed that the snail fauna in the Kimberley is dominated by one family, the Camaenidae (Solem, 1979, 1981, 1984, 1985, 1988, 1991). A second zoological survey conducted between 2008 and 2010 (Gibson & McKenzie, 2012) and on-going taxonomic work (with the involvement of molecular data) have resulted in an enhanced documentation of the land snail fauna of the Kimberley (Gibson & Köhler, 2012). In particular, this survey resulted in the identification of five new camaenid genera and 83 species on 22 larger islands off the Kimberly coast (Köhler, 2010a, 2010b, 2011a, 2011b, 2011c; Köhler & Johnson, 2012; Köhler & Shea, 2012). These studies have revealed that mitochondrial data and penial anatomy are useful tools in the identification of species of Kimberley camaenids, while shell morphology is usually less informative because of a large overlap of the variation within and between populations and species. The present work is concerned with the genus *Australocosmica* Köhler, 2011, which was preliminarily recognised by Solem (1991) as "NGEN2". Its distribution is apparently restricted to the coastal regions and offshore islands of the north-western Kimberley region in or near the Prince Regent Reserve as well as between the York Sound in the north and the Collier Bay in the south (Köhler, 2011a). Currently, three species of *Australocosmica* are formally recognised (Köhler, 2011a): *A. augustae* from Augustus Island, *A. sanctumpatriciusae* from St Patrick Island and *A. vulcanica* from Vulcan Islands Group. In addition, Solem (1991) listed two further species under manuscript names, respectively, from the areas near Mt Trafalgar (NSP 39) and around the Walcott Inlet (NSP 40), without providing additional details on their anatomy. Material of a further five