The last lighthouse

Those who explore the shallow reefs of Jurien Bay, Shoalwater Islands, Marmion or Ngari Capes marine parks would be familiar with the giant creeper. This large, white gastropod with a long tapering spire is commonly seen lying exposed on the shallow seabed in sandy gutters and reef hollows across south-western Western Australia. Known to scientists as *Campanile symbolicum*, the local abundance of this species is somewhat deceptive; as the last living species of a once-diverse family known as lighthouse shells, it is both rarer and more unusual that it seems.

by Alan Kendrick and Michael Rule

The giant creeper (*Campanile symbolicum*) is endemic, or unique, to Western Australia, living only within a restricted range of shallow temperate marine waters between Geraldton and Esperance. Growing to more than 20cm in length, it is typically seen lying exposed or partially buried on the seabed in depths of less than 5m. Only a few studies have been carried out on this species and some aspects of its biology and behaviour are still poorly understood.

Tending to occur in aggregations, giant creepers are probably most active at night when they feed on algae. During spring they produce crescent-shaped gelatinous egg masses that are 10 to 12cm long which are anchored to algae, seagrass or rocks. While each mass may contain thousands of eggs, what happens after they hatch is still largely a mystery. Giant creepers may undergo direct development without the planktonic, or free-floating, larval stage that is common to many molluscs. It could be that the larvae remain on the seabed near where they hatch and rapidly grow into juvenile forms of the adult shell. Interestingly, surveys rarely find small juveniles among aggregations of adults and it may be that they seek different and more hidden habitats to avoid the attention of predators. Like many organisms that produce numerous eggs, it is likely that few young giant creepers survive to reach adulthood.

A SPECTACULAR PAST

For a long time the unique nature of the giant creeper was disguised because its shell is similar to other relatively common gastropod families like the Cerithidae, which burrow in soft sediments. However, the discovery of some unusual anatomical

Left Giant creepers only occur in coastal waters of temperate WA, including Ngari Capes Marine Park. *Photo – Ann Storrie*
Inset A giant creeper in shallow water at Ngari Capes Marine Park with a large bonnet limpet (*Hipponix australis*) attached near the aperture of the shell.
Photo – Michael Rule/Parks and Wildlife

Above Marmion Marine Park.
Photo – Len Stewart/Lochman Transparencies

Top right Giant creepers are abundant in sandy reef hollows at Ngari Capes Marine Park.
Photo – Michael Rule/Parks and Wildlife

Right Fossil specimens of the extinct *Campanile giganteum*, which grew to about 1m in length.
Photo – British Museum of Natural History

features led to the giant creeper being recognised as the single living species of the once-diverse molluscan family Campanilidae, commonly known as lighthouse shells. The evolutionary history of lighthouse shells can be traced through fossils right back to the Tethys Sea, which formed in equatorial regions between the ancient landmasses of Laurasia and Gondwana about 200 million years ago.

From the Paleocene to the Eocene, about 60 to 40 million years ago, these algae-grazing gastropods evolved into extraordinary forms, which now occur as fossils in sedimentary deposits at widespread locations across the globe. The Eocene Paris basin formation in France famously produces superbly preserved fossils of *Campanile giganteum*, which grew to about 1m in length and was one of the largest gastropods that ever lived. More than 40 fossil campanilid species are now known and it is believed more are likely to be discovered. However, for reasons still unknown, this diversity did not last; perhaps these large lumbering gastropods could not compete with the increasing number of smaller species. The fossil record suggests that the range of campanilids contracted to south-east Asia, Australia and New Zealand by the Miocene, about 20 million years ago, and further still to southern Australia by the Pliocene, five to three million years ago. Fossil giant creepers occur in late Pliocene fossil deposits under the dusty mallee scrub of the Roe Plain, which overlooks the Great Australian Bight. A rich fossil assemblage indicates that this area formed a shallow marine environment, probably comprising seagrasses and reefs similar to much of south-western WA today.

A LIMITED DISTRIBUTION

All other campanilid species are now extinct and the range of the giant creeper has contracted to its current distribution in south-western WA. Organisms that occupy a limited geographic range are known as endemic to that area, and these species are often of greater conservation significance than more widely distributed species. Endemic species can be especially vulnerable if they are confined to particular habitat types or they occur in naturally discontinuous habitats. The risk to these species can increase markedly if their habitats are heavily influenced by people. Many species with limited distributions share similar ecological or life history characteristics that increase their vulnerability. Evolutionary history can also provide evidence as to why a species only occupies a limited geographic range, and this is certainly the case in relation to the spectacular geological past of the lighthouse shells.

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