



Variation in the external morphology of *Turbo militaris* Reeve, 1848

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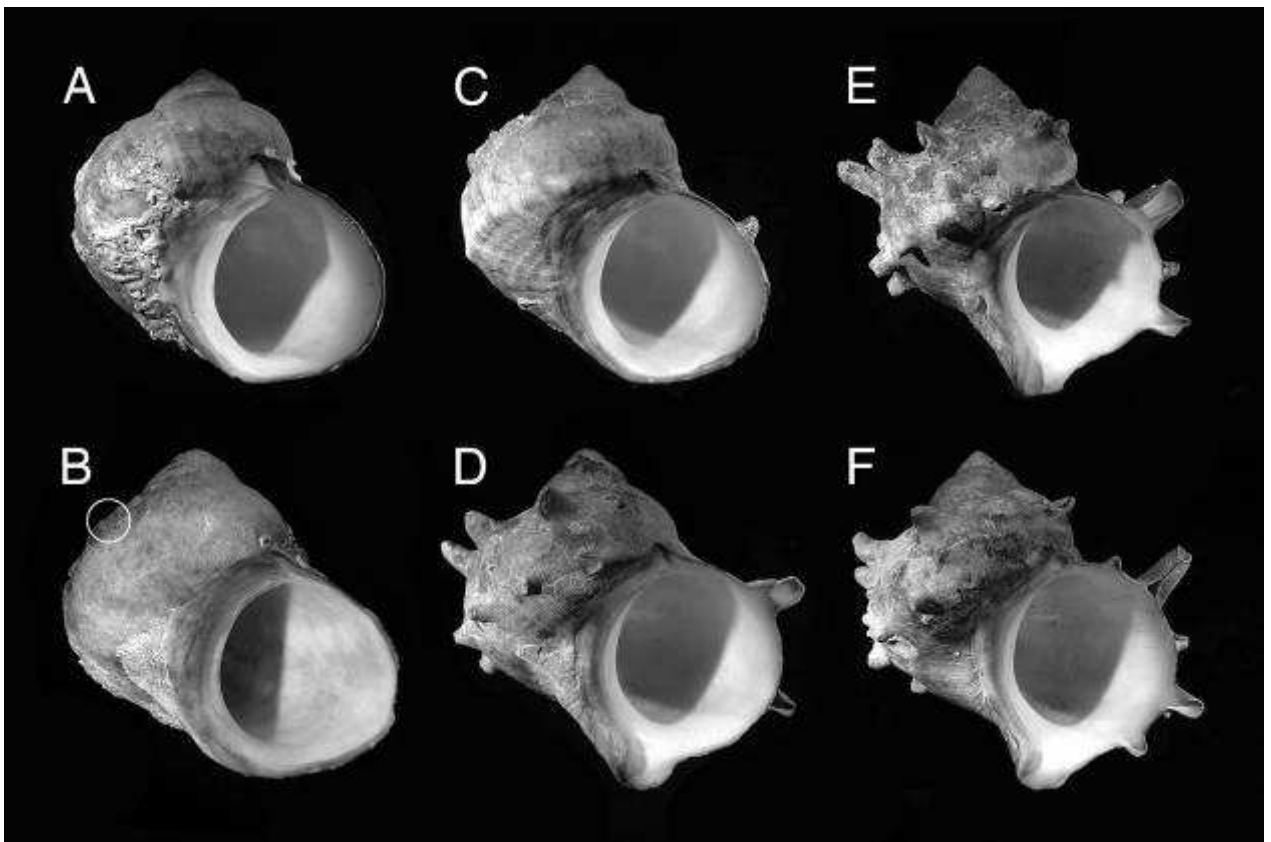
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While it is a well documented fact that *Turbo militaris* shells display marked variability in external morphology, mainly with respect to the presence or absence of spines, recent studies at Coffs Harbour have indicated that this variability can be extreme. Most published descriptions of *T. militaris* indicate that there are both smooth and spiny forms - the latter generally having two rows of spines on the body whorl - as well as forms that inter-grade between these two extremes (e.g. Wilson, 1993; Beechey, 2007). However, in our current research into patterns of distribution of turbinids in the Solitary Island Marine Park (SIMP), we have found a much wider range of morphological variation. This is illustrated in the six photographs appearing below which show a gradation from a completely smooth shell (A) through to one with five rows of spines on the body whorl (F). To make the comparison as valid as possible, we have selected shells of similar size (shell heights between 75-81 mm). The shells vary not only in terms of the number of spines they bear, but also in the development of the anterior canal which is almost non-existent in smooth forms

but prominent in spiny forms.

On his web pages, Des Beechey indicates that different forms are commonly found next to each other on the same shore (Beechey, 2007). Our results confirm this but also show that the ratio of smooth to spiny forms is site-dependent and variable at a site over time. For example, surveys conducted in the lower intertidal region of five headlands in February 2007 indicated that spiny-shelled specimens comprised from 32-65% of the population. These figures changed at most sites, quite dramatically in some cases, by our next survey in April (e.g. Ararawarra Headland - 49% in Feb., 25% in April). Interestingly, we have yet to find smooth specimens subtidally where robust, spiny forms predominate (e.g. C-F).

Preliminary inspection of a random sample of 60 specimens from subtidal sites across the SIMP indicates that morphology is not simply a function of sex. There was a 1:1 sex ratio in this sample with both sexes displaying the full range of external shell morphology (from 2-5 spines). In our continuing work, we plan to quantify the range of variation in *T.*



A - No spines, shell height 79 mm, Station Creek; **B** - 1 row of incipient spines (circled), 78 mm, Station Creek; **C** - 1 row of spines, 75 mm, Station Creek; **D** - 2 rows of spines, 79 mm, South West Solitary Island; **E** - 3 rows of spines, 77 mm, Split Solitary Island; **F** - 5 rows of spines, 81 mm, South Solitary Island.

militaris shells using geometric morphometric analysis and will determine if shell morphology is correlated with key environmental gradients. These investigations will focus on the strong cross-shelf patterns revealed in the pilot sampling for the project.

References

- Beechey, D. (2007), (updated 1 July 2007). The seashells of New South Wales. Retrieved 19 July 2007 from <http://seashellofnewsw.org.au/index.htm>
- Wilson, B. R. (1993). Australian Marine Shells. Volume 1. Odyssey Publishing: Sydney. 408 pp.



Yes, No, Probably: *Engina australis* in Victoria

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According to specimens in the Australian Museum, the distribution of *Engina australis* (Pease, 1872) is restricted to NSW, from Ballina in the north to Twofold Bay in the south (Beechey, 1996). The old record of this species from Port Fairy, Western Victoria, (Pritchard & Gatliff, 1898) has never been confirmed.

Soon after the publication of the *E. australis* note, (Beechey, 1996) Dr Geoff MacCauley showed me specimens of an *Engina*-like species that he had collected at Port Fairy, and of which he has subsequently collected more. These specimens were found deep within the crevices between the basalt boulders forming the reefs near Griffith Island. The specimens are very similar to *E. australis* in shape and size, the sculpture is slightly different, and the colour is entirely creamy white or dull white depending on their age. None were alive, though several looked very fresh. Absence of reddish-brown and yellow maculations immediately separate these specimens from *E. australis*. It is possible that they are related to the uncommon NSW *Pisania gracilis* (Sowerby, 1859) and *P. unicolour* (Angas, 1867), both of which are pale fawn in colour (Ponder, 1972; Wilson, 1994). The old Port Fairy record of *E. australis* may well have been based upon specimens similar to those collected by Geoff MacCauley.

Very recently, when sorting shell sand collected in 2005 from the beach at Semaphore, near Adelaide, South Australia, I picked out a half-grown 7 mm long specimen of *E. australis*. Though a little beach rolled, and with a large bore-hole in the body whorl, it is typical in shape, sculpture and colour to NSW shells. Is this an indication that *E. australis* occurs in South Australian waters, or that it may have done so, perhaps briefly, in the not too distant past? The specimen has been deposited in the Museum Victoria mollusc collection.



Engina australis, typical specimen from NSW

References:

- Beechey, D. 1996. Correcting the distribution of *Engina australis* after 98 years. *Australian Shell News* 93:3
- Ponder, W.F. 1972. Notes on some Australian species and genera of the family Buccinidae (Neogastropoda). *Journal of the Malacological Society of Australia* 2(3): 249-265
- Pritchard, G.B. & Gatliff, J.H. 1898. Catalogue of the marine shells of Victoria. Part 1. *Proceedings of the Royal Society of Victoria* 10(2): 236-284.
- Wilson, B.R. 1994. *Australian Marine Shells. Prosobranch Gastropods*. Vol. 2. Odyssey Publishing: Kallaroo, Western Australia. 370 pp.

Correction

In the last issue of this Newsletter, No. 131, there was an error in the article about introduced land snails. On page 11, the two images beside the species at the top of the page are of the last species on the page, and vice versa. You can fix this by cutting out the

images and putting them in the right place, or by cutting out the text and moving that. Whichever way you do it, the text on the back of the page will then be wrong. Alternatively, just write on the page to show how it should be.