

MASTS Small grant SG41: What killed the barnacles?

Bhavani Narayanaswamy, Scottish Association for Marine Science, Scottish Marine Institute,
Oban

On three different seamounts dense, extensive covering of the seabed by barnacle plates was observed at similar water depths and slope aspects in both the Atlantic and the SW Indian Ocean. Corresponding living barnacles or communities were not observed at these sites implying the plate layer may have originated from former colonies of palaeo communities. Researchers on board were surprised at the sheer density of the barnacle plates lying on the surface of the seamounts.

The objectives of this piece of work were to determine

- 1) when these barnacles died - were they of similar ages in both the Atlantic and Indian Oceans?
- 2) what was the cause of their demise?

The shells were sent to the Scottish Universities Environmental Research Centre (SUERC) radiocarbon dating laboratory in East Kilbride. The shells were analysed using ^{14}C and were found to be of substantially different ages in the two oceans. At Senghor seamount in the North Atlantic, the plates were estimated to be 27,500 years old BP (SUERC, 2012), whilst those from the two seamounts in the SW Indian Ocean were beyond carbon dating methods, indicating an age of >54,000 years BP.

We are unclear as to why the barnacles died out as they did, however, discussions with a colleague (Dr John Buckeridge) based in Australia have resulted in our views changing dramatically. Great swathes of barnacle plates on the surface of the seamounts was not a surprise to Dr Buckeridge and neither was the ages of the plates; he had observed similar patterns in the Tasman Sea as well as from an un-named seamount off Madagascar whereby thousands of plates are scattered on the surface but only one or two living individuals were collected. In addition it is felt that since the plates are situated above the calcium compensation depth and are also heavy they are not likely to degrade quickly. In addition, if only 1% of the shell material was living even only 1000 years ago, and the life-span of these barnacles was 12 years, we would have an assemblage very much dominated by the dead.



Figure 1. Senghor barnacle plates covering the surface of a 92 mm diameter core from 1658 m water depth, E aspect of the seamount (left). B. Plates from the same core laid out together with some small fragments of coral rubble also present (right).



Figure 2 A selection of plates from Coral seamount (left) and Middle of What (Right). Label tape is 25 mm wide

Dr Buckeridge has identified the barnacles based on the plates that were sent. He has identified at least one new species of barnacle from the Southwest Indian Ocean and this will be written up and published as a paper.

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(b) Other than MASTS	£744
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