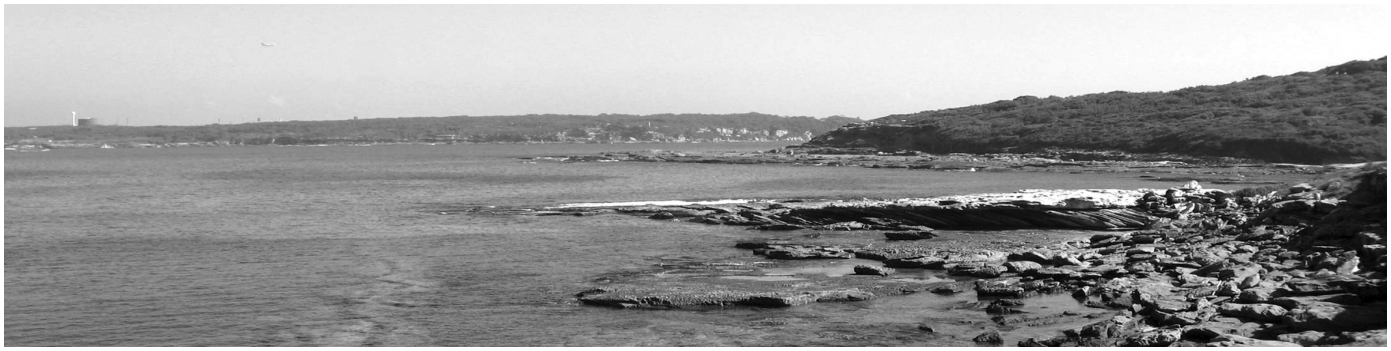
Otras costas

CAPE BANKS: A shore from the other side of the world

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The sandstone shores of the outermost headlands of Botany Bay (New South Wales, Australia) are part of the Cape Banks Scientific Marine Research Area (hereafter Cape Banks). Cape Banks was established as a research site in the 1940s and since then, it has become one of Australia's best known sites for research in marine biology and ecology. The reserve is partially surrounded on the landward side by the Botany Bay National Park which forms a barrier against direct impacts of coastal urbanization.

Rocky shores in this area are dominated by Triassic sedimentary rocks known as Hawkesbury sandstone. This is characteristically light coloured, ranging from cream to red tones and grey in weathered surfaces. A variety of wave-cut formations can be found at Cape Banks, including platforms, crevices, caves, rock-pools and boulders. In addition, the orientation of the headlands in relation to prevailing winds influences the exposure to ocean swell, generating an assortment of sheltered and exposed intertidal and shallow subtidal habitats.

As a marine ecologist used to working on European shores, my first visit to the intertidal platforms of Cape Banks was filled with surprises. The most striking observation was the variety of colours, sizes and shapes of marine invertebrates (i.e. gastropods, crustaceans, etc.). The great diversity of animals on these shores is explained by the overlap of subtropical and temperate species. It is common in shores in Europe to see 2 to 3 species of limpets. In Cape Banks, there are up to 13 species of limpets.

The upper parts of the shore are dominated by gastropods such as *Littorina unifasciata* and *Nodolittorina pyramidalis* and by barnacles (e.g. *Chamaesipho tasmanica*). The most common grazers are snails *Austrocochlea porcata*, *Bembicium nanum*, *Nerita atramentosa* and the sea star *Patriella exigua*. In contrast to what is common in many shores of the Iberian Peninsula (e.g. North of Portugal, Galicia, Asturias, etc.), these shores have, noticeably, a different distribution of seaweeds. In Sydney, the shores are not dominated by fucoids and foliose seaweeds are restricted to much lower levels of the shore. The mid shore is dominated by grazers that create large areas of rock primarily colonized by crusts (e.g. *Hildenbrandia prototypus*) and micro-algal biofilms.

The lower areas of the shore and the sublittoral fringe platforms are occupied by several habitat-forming species such as the articulated *Corallina officinalis*, the fucoid *Hormosira banksii,* the ascidian *Pyura stolonifera* and the brown kelp *Ecklonia radiata*.

CORALLINE TURFS



Corallina officinalis in Cape Banks

Corallina officinalis are found in many temperate and boreal shores across the world. Its characteristic thalli comprise extensive crustose holdfasts bearing branched, articulated fronds providing one of the most interesting and complex intertidal habitats. Assemblages of benthic organisms living in meadows of coralline turfs of Cape Banks have been extensively studied in the past decade. These studies revealed strong relationships between benthic organisms (e.g. gastropods, amphipods) and the structurally complex fronds. In fact, the number of species of gastropods living in coralline meadows, at

Cape Banks, is two times greater than on other shores where similar assemblages have been studied (e.g. Chile, Ireland and Japan).

NEPTUNE'S NECKLACE

The mats of *Corallina* are often interspersed with seaweed known as neptune's necklace. *Hormosira banksii*, also known as bubbleweed, is one of the most common species of seaweeds found on the intertidal platforms across South-east Australia and New Zealand. Its characteristic olive-green fronds made of strings of rounded vesicles (like rows of beads attached to each other by very short stalks). The beads store gas, which allows them to float up in water and helps them to obtain more sunlight and to move with the flow of the current.



Gastropods living in *Hormosira* beds

Hormosira banksii is an important habitat-forming species that has prompted many studies, revealing associations with several species of gastropods, including Turbo undulatus, which is the focus of a small-scale commercial fishery in New South Wales

CUNJEVOI

Cunjevoi is an Aboriginal name for the solitary ascidian *Pyura stolonifera*, which were once a common food-source for Aboriginal people living in these areas. Cunjevoi looks like a small brown cylinder, often covered with green algae. The siphons close tightly during low tide, retaining water that is released like a thin 'squirt' if the animal is disturbed. Cunjevoi clump together in large numbers, forming extensive mats on the rocky platform. They are collected by fisherman who, cut off the top of the test (outer covering) and use the soft internal tissue as bait. The base is left attached to the rock, but usually disappears after a couple of weeks.

ECKLONIA RADIATA

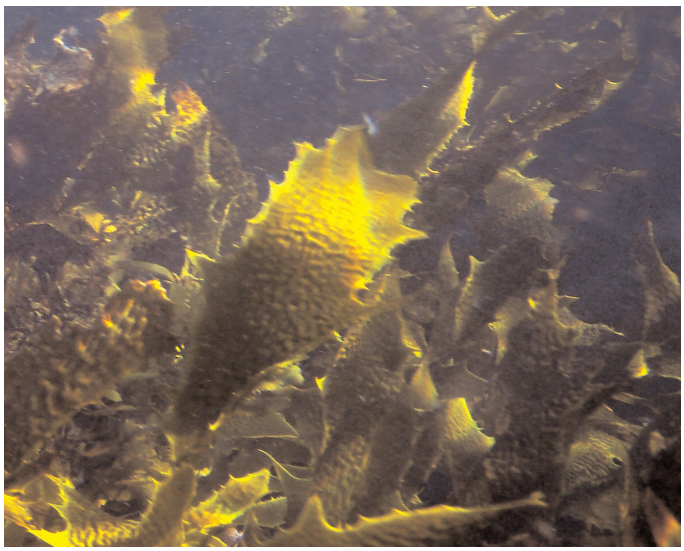
Submerged rocky reefs are covered by forests of *Ecklonia radiata*. This large macro-alga is common across temperate reefs of the southern hemisphere. It is



Cunjevoi (Pyura stolonifera)

attached to the substratum by a holdfast, which appears similar to the branching roots of a tree. The kelp holdfast provides habitat for a wide range of invertebrates that take advantage of the protected micro-environment it creates. Above the holdfast is a 1m long flexible stipe, which is much darker in colour. The blades are yellowish brown and often crinkled and frayed. This species of kelp is particularly small when compared to other kelp species common in other parts of the world.

Briefly, Cape Banks is a great showcase of temperate



Kelp forests of *Ecklonia radiata*

reefs of the Southern seas, with an extraordinary diversity of colour and shapes of organisms, living in close association with their habitats.

For further information visit the website of Centre for Research on the Ecological Impacts of Coastal Cities: www.eicc.bio.usyd.edu.au.