

A contribution to
An analysis of medium to long-term impacts on the Australian Oceans

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1.1 Bioprospecting

Bioprospecting is the exploration of biodiversity for new resources of social and commercial value. It is carried out by a wide range of established industries such as pharmaceuticals, manufacturing and agriculture as well as a wide range of comparatively new ones such as aquaculture, bioremediation, biomining (using microbes to extract metals), biomimetic engineering (principles from biology are applied to synthesise materials or machines that mimic biological processes) and nanotechnology. A keyword search in Scopus using: “uncertainty”, “scenario”, “future” and “marine”, “reef” and “bioprospecting” defined 45 results published during the last 10 years. Articles were sorted by relevance, all were reviewed and if they included projections of tourism in Australia then projections were included.

Australia registered a decrease of New Marine Natural Products from Invertebrates between the 1990s and the 2000s which is against the trend for tropical high diversity region. Three hypothesis for this are proposed: 1) creation of stronger restrictions blocking external researchers from access (Queensland requires local partners to provide access to native biota), 2) restriction of trawling which is the cheapest method to obtain organisms and 3) lower funding for research (Leal, Puga, Serôdio, Gomes, & Calado, 2012).

There is potential for the development of a substantial industry based on development of products from seaweeds for human use (i.e. health products, food, cosmetics) from seaweeds in Southern Australia (Lorbeer, Tham, & Zhang, 2013). In 2008/2009 Australia was a net importer of seaweed products, with 5,000 t valued at over AUD 17 million. Southern Australia has high species diversity making it a good location for bioprospecting. Several strategic approaches to utilise diversity of algal species are suggested including surveys of the resource, cultivation in land based tanks and integrated aquaculture with marine animals.

Leal, M. C., Puga, J., Serôdio, J., Gomes, N. C. M., & Calado, R. (2012). Trends in the discovery of new marine natural products from invertebrates over the last two decades - where and what are we bioprospecting? *PLoS ONE*, 7(1). doi:10.1371/journal.pone.0030580

Lorbeer, A. J., Tham, R., & Zhang, W. (2013). Potential products from the highly diverse and endemic macroalgae of Southern Australia and pathways for their sustainable production. *Journal of Applied Phycology*, 25(3), 717-732. doi:10.1007/s10811-013-0003-x