



Sunken Treasures

words and photos by John Huisman

Until recently, if you believed what you read, you might have concluded that there are next-to-no seaweeds in Western Australia's tropical north. However, a series of surveys undertaken over the past 20 years has revealed a remarkably diverse flora, with many hundreds of species recorded including more than 70 that are new to science. Sometimes all you need to do is look.



Western Australia's marine environment is celebrated worldwide for its spectacular habitats, iconic wildlife, and as home to one of the most diverse collections of marine species in the world. In part, this is undoubtedly due to the State's unique geography, with a coastline aligned roughly north-south and spanning some 22 degrees of latitude, encompassing habitats ranging from the colder, granite dominated temperate southern coasts, to the warm waters of the tropical coasts with their fringing coral reefs. The north-south latitudinal range of WA spans a distance of some 2500km, but the coastline travels a very convoluted path, with numerous bays, inlets, and offshore islands and atolls, all creating small but significant habitat variations that provide specialised niches for marine creatures. If one measures the actual coast at the high water mark, and not a straight line approximation, the WA coastline spans an impressive 24,000km, a distance equal to more than half the circumference of the Earth. About 75 per cent of this length (18,000km) lies north of the Tropic of Capricorn, from just south of Coral Bay on the Ningaloo coast to the WA-Northern Territory border. Based on this measure alone, and knowing that the ranges of most species are governed by temperature tolerances (and therefore latitude), one might reasonably expect the WA tropics to host an incredibly rich marine biodiversity. We know this to be true, but how do we know this to be true?

Before attempting to answer that question, let's look at how biodiversity is measured. The simplest way is to count the number of species known to exist in a given area; the area with the greatest number of species is regarded as the most diverse. This approach is somewhat simplistic as it doesn't take into account the diversity at higher taxonomic levels.



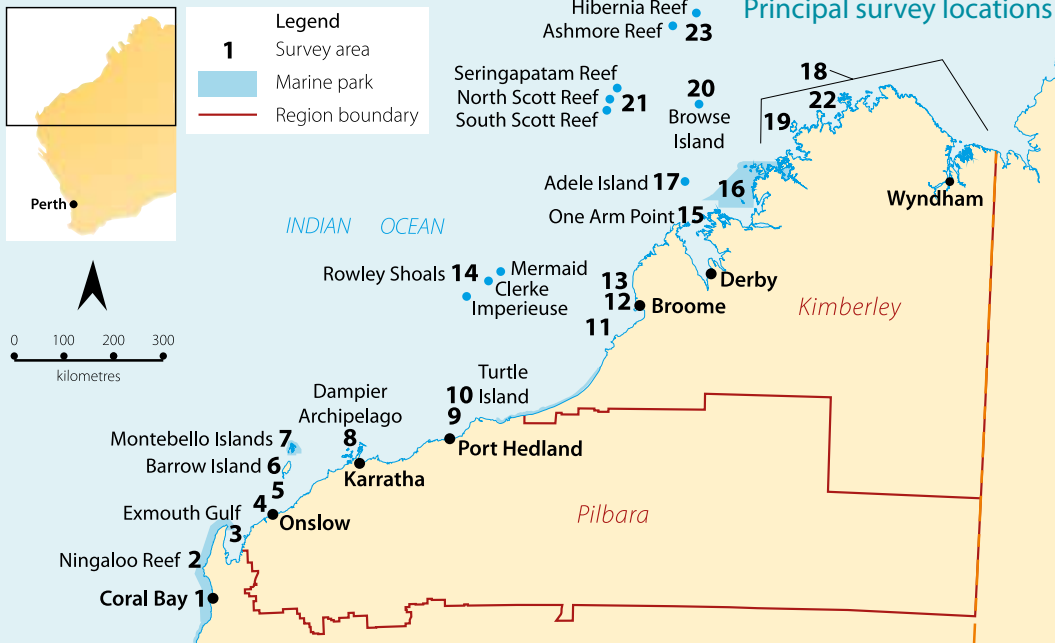
For example, is an area with 100 species in one genus more diverse than one with 99 species in 10 genera? Probably not, and that's why biologists often talk of 'species richness' rather than 'biodiversity'. The next question is, how do we know which species exist in a particular area? The only way this can be reliably assessed is by detailed surveys, undertaken by taxonomists trained to recognise the various species, and by collecting what are known as 'voucher specimens' that are then lodged in Parks and Wildlife's WA Herbarium (in the case of plants, algae or fungi) or the WA Museum (for animals). Voucher specimens are extremely important; in the case of species new to science they are an essential requirement in the process of describing the species, as they provide an exemplar (known as a 'type' specimen) that the name of the species is permanently tied to. Vouchers can also future-proof species records, as they enable taxonomists to reassess identifications in the light of subsequent taxonomic revisions.

WA's tropical marine diversity is primarily known through surveys undertaken by the WA Museum and Parks and Wildlife, with contributions from CSIRO and universities. However, this knowledge is not spread evenly across the

Left top The rare coralline red seaweed *Rhizolamellia collum*, found at Scott Reef.

Left Marine researchers using scuba to explore the subtidal habitat of Scott Reef.

Above A new species of the red seaweed *Martensia*, which was found on reef flats in the Kimberley.



Above The red seaweed *Kallymenia maculata*, first collected from Makassar Strait, Indonesia in 1899 and not seen again until the survey of Ashmore Reef in 2013.

Far left A new genus of red seaweed that grows in the dark recesses of undercut reefs in the Kimberley.

Left A new species of the iridescent red seaweed *Champia*, found at Cassini Island.



“The seaweed flora of the WA tropics is now known to include more than 450 species, and the number will probably surpass 500 once studies are completed.”

taxonomic groups, and often a particular group is only well-surveyed if an expert in that group has taken part. This can also result in the unusual situation where certain groups can be virtually ignored, leading to a serious under-representation in diversity assessments.

SEEING RED (AND BROWN AND GREEN)

A prime example of this phenomenon is seaweeds. WA has been of great importance historically in the recognition of Australia’s seaweeds, but this has essentially concentrated on the State’s south-west. Until recently, the tropical north coast has been relatively unknown. If you counted the number of seaweed species recorded from the north in literature published before the 1990s, the result would be a paltry eight, and this in an area that earlier authors suggested

would host about 200 species. The number of recorded species jumped slightly to 28 in that decade, but it was not until I took part in a series of surveys that there was a dedicated interest in collecting and describing the seaweed flora.

WHERE ARE WE NOW?

Surveys have been carried out during the past two decades at numerous places, from Coral Bay just north of the Tropic of Capricorn to the northern Kimberley and offshore atolls, venturing as far north as Hibernia Reef. While we knew that these surveys would lead to many discoveries, the results have far exceeded expectations. The seaweed flora of the WA tropics is now known to include more than 450 species, and the number will probably surpass 500 once studies are completed. From the collections so far, six new genera have been described, and another five

genera and more than 70 species new to science have been recognised. The results will be published in two books, the first describing the green and brown seaweeds, which is available now (see ‘In review’ on page 15), and the second describing the red seaweeds is due for release in 2016. Rather than the depauperate marine flora that past perceptions might have suggested, we now recognise that WA’s tropical coasts host an impressively rich marine plant life, one that places it as one of the most diverse regions of the world. Sometimes all you have to do is look.

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