

KIMBERLEY CRUSTACEANS

On 6 April 2005, Diana Jones, the Curator of Crustaceans at the WA Museum, shared her extensive knowledge of marine life with the Kimberley Society. She used a PowerPoint presentation with many beautiful slides of the animals concerned. Her main interest is in barnacles, so these featured well in the talk. Biodiversity was discussed. It is the variety of all life forms, and includes genetic diversity, species diversity and ecosystem diversity. All these are essential elements in conservation.

The oceans are the cradle of life on earth. Of the 33 major animal groups, 23 are found in the sea and 13 of these are exclusively marine. In WA we have 12,500kms of coastline covering the tropics to the temperate zone, which results in a very diverse marine fauna. In southern Australian waters, which have been geographically and climatically isolated for around 40 million years, about 80-90% of the marine species are restricted to that area. i.e. they are endemic. Conversely, in the waters of northern Australia, which are connected by currents to the Indian and Pacific tropical regions, only around 10% of the marine species are endemic and 90% are widespread tropical Indo-West Pacific species. The Indo-west Pacific tropical region is incredibly species-rich, with a diversity far exceeding that of other tropical regions. Along the west coast there is an overlap zone where there exists a relatively high but decreasing diversity of tropical species from north to south. Tropical species are found down to Cape Leeuwin or even further, due to the effect of the warm Leeuwin Current travelling southwards off the coast. There are also a number of endemic species, for example, the Western Rock Lobster.

The habitats in the Kimberley are varied, and consist of rocky shores, very high tides, mangroves, muddy and sandy shores, and coral reefs. The WA Museum found 13 undescribed species on their first trip to the Kimberley islands.

BARNACLES. Goose barnacles, which are stalked barnacles, were shown on floating objects, hitch-hiking a ride. These are the barnacles that cause such problems on ships' hulls. They don't all live close to the surface though, as we saw a sea fan from a depth of 100 metres carrying barnacles. The mangroves around Broome were shown with barnacles on their leaves and trunks. On rocky shores there are barnacles such as *Tetraclita squamosa* which is volcano shaped and most common high up the rocks. Barnacles can also attach to other animals, such as *Balanus trigonus* which attaches to mussels as well as to boats. We are living in the Age of Barnacles and they have now reached their maximum diversity we believe. The relictual species now found on our shores originated as deep water animals. For example, the stalked barnacle *Ibla cumingi* is found on the shore deep in the crevices of rocks, and the stalked barnacle *Lithotrya valentiana* grinds its way into limestone boulders.

CRABS. There are crabs living on shore as well as in the ocean. The Seaweed or Decorator crab has hooks on its back and camouflages itself by attaching the weed to its carapace. It eventually eats it off, so they carry their larder on their back! Hermit crabs are common on the shores of the Kimberley and make a tremendous noise as they clamber around in the vegetation at night. There are Rock crabs that swiftly skitter across the rocks and in the shallow water there are swimming crabs, which have their back legs modified into paddles.

MANGROVES. The mangrove trees support a community of tiny barnacles, which live on the leaves and trunks and comprise 6 or 7 different species. Some mangrove crabs live in the mud in burrows that have a hood over the top. Their gills have become more like lungs and they have become almost terrestrial. These mud dwellers are shy and are seen only at night. There's one particular Mud Lobster that Diana has seen only twice in 27 years! Here we also find Fiddler Crabs of which there are 8 or 9 different species. The largest is bright red and the male has one claw enlarged for display to encourage mating, the other is smaller for feeding. These occur in the mud and are called *Uca flammula*, or Darwin Red Legs. Those in the sand are yellow (*Uca mjoebergi*) and the large claw is used in a curtsy display. The females semaphore in answer! Yet another is *Uca elegans*, found in the large salt flats behind the mangroves and described by Diana and Ray George in 1982. These crabs line their burrows with blue-green algae, which may be their food source.

EPIZOIC BARNACLES. These live on other animals, for example on shells, on Gorgonian corals and even on the flukes of dolphins. Some barnacles are found on sea fans, on bottles and even on a sea urchin at 70m deep. This was a naked stalked barnacle with no shelly plates. Some barnacles are even found on the feet of hermit crabs. Turtles carry huge numbers, and as many as 9 different species have been found on one turtle. These occur on the shell, underneath, on the flippers, in soft tissue, in the soft palate and some extend right down into the flesh, and are almost parasitic. The most primitive barnacles are stalked and live in deep water and the non-stalked barnacles are mainly found in shallow water and on the shore. Barnacles are crustaceans. They have a larval form which settles on its head and the antennae become cement glands. They have 6 pairs of legs, each divided into two hairy cirri (hence their name Cirripedia) which forms a feeding net.

CORAL REEFS. These reefs are full of life and there are many crustaceans associated with them. There are little shrimps which live in oyster shells as commensals. The mantis shrimps are prawn killers and of very bright colours, especially red, green and blue. The hunchbacked shrimp is camouflaged and lives in anemones, and soft corals and take any food scraps that they leave. The Beautiful Crab carries anemones on its claws for protection and the Banded Shrimp

is very secretive and has very long antennae. Some reef crabs are colourful and have black claws and are poisonous as they carry toxins such as are found in algal blooms. Marine biologists use dredging, diving and use of transects to obtain their data since there is a huge array of animals under the sea. The WA Museum was founded more than 100 years ago, and their collections show that biodiversity is increasing.

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