

A THORNY PROBLEM FOR AUSTRALIA'S BARRIER REEF

The crown-of-thorns sea star (*Acanthaster planci*) is a common inhabitant of the South Pacific. Adults have a diameter of about 0.5m and 13 to 16 arms. Their common name is derived from their large, venomous spines that can cause swelling, pain, and nausea in humans.

The crown-of-thorns sea star has been a problem in the waters off Australia and other South Pacific coasts. It feeds on coral polyps, and in one day, a single individual can extract polyps from 0.1m² of reef. Over the last 20 years, the crown-of-thorns sea star has experienced a dramatic population increase. Thousands of sea stars move slowly along a reef, leaving a white, almost sterile, limestone coral skeleton in their trail. They have seriously damaged over 500 km² of Australia's Great Barrier Reef.

One or more hypotheses may explain why there is a problem now, when these sea stars and coral polyps have coexisted for millions of years. Some believe that the population increase in sea stars may be partially due to the destruction of sea star predators—in particular, the giant triton gastropods. Tritons are valued for their beautiful shells, and blasting to create shipping channels has disrupted their habitat. Pesticides and other pollutants are also believed to be

destroying predators of crown-of-thorns larvae. Another hypothesis suggests that the apparent increase in the sea star population may be a natural fluctuation in population size.

The reefs of the South Pacific are a source of economic wealth in the form of fisheries and tourism; therefore, the proliferation of crown-of-thorns sea stars has been the subject of intense study and control efforts. The Australian government has spent in excess of \$3 million and has not yet achieved satisfactory control. Control measures have included scuba divers injecting formaldehyde into adult crown-of-thorns sea stars, the erection of wire fences to divert sea star populations from reefs, and the use of computers to predict movements of colonies and local population explosions. One of the difficulties in these control efforts stems from sea star larvae being planktonic and widely dispersed by oceanic currents.

The original relationship between crown-of-thorns sea stars, coral polyps, and possibly, sea star predators is an interesting example of a balanced predator-prey relationship. What is unfortunate is that humans often do not appreciate such balances until they have been altered.