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CROWN-OF-THORNS STARFISH

The "Crown-of-Thorns", Acanthaster planci, is a large multi-armed starfish found on coral reefs throughout the tropical waters of the Indian and Pacific Oceans, ranging from the East African Coast and the Red Sea in the west to the Hawaiian Islands and the Tuamotu Archipelago in the east.

This starfish possesses from 13 to 21 arms and attains a maximum diameter of about 20" (50 cms.). Its upper surface is covered with strong spines, which, in a 15" specimen, are about 1" long. These spines have a thin covering of skin which contains a toxic material. Injury incurred by treading on the spines or through careless handling causes severe local pain and often protracted vomiting.

Usually the tips of the spines are reddish or orange, while the upper surfaces of the arms are bluish grey. Centrally the upper surface of the body disc from which the arms arise often has a variegated colouring in which yellows and greens predominate. Amidst living corals the starfish may be difficult to detect by untrained eyes because the coloration of the creature blends with the hues of living corals and other reef organisms.

The Crown-of-Thorns may occur in shallow water of only a few inches depth or may be found as deep as 100 feet (30 metres).

The starfish feeds on coral polyps and appears to prefer the branching corals (Acropora spp., Pocellopora spp.) but will attack also the more massive boulder corals. It will not eat the polyps of the "fire-coral" (Millepora spp.). The Crown-of-Thorns can consume the living polyps of branching

corals at rates of from 17 square inches to 32 square inches a day and the animals appear to feed continuously. Feeding starfish leave behind a trail of white coral skeletons from which all the living tissue has been removed.

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Growth rate for A. planci, described in terms of diameter increase, is approximately 1 cm/month or just under ½"/month. A Crown-of-Thorns starfish 6" in diameter is about 1 year old. Breeding specimens are at least 2 years old and 12" in diameter. The life-span of the species is unknown but very large specimens must be about 3 years old, when growth rate seems to decrease.

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Natural predators of A. planci were studied by the Endean Project in certain areas of the Australian Great Barrier Reef.

- Damsel fish (Abudefduf sexfasciatus) were observed to consume the eggs of A. planci as these were released. Other species, too, could be expected to eat eggs drifting in reef waters.

- Only the Giant Triton, or trumpet shell, (Charonia tritonis) was discovered to prey on the Crown-of-Thorns. Investigations showed that each adult triton consumed approximately 1 adult starfish per week. It can consume up to 3 smaller, immature A. planci in three days. The Endean Report suggests that A. planci population control by the giant triton is exercised mainly on immature starfish.

Studies made to date on the Crown-of-Thorns' menace to Pacific coral reefs agree that the A. planci population has become too numerous for its normal predators to contain. In other words the ecological balance of species population on the coral reefs has broken down, from some cause still unknown, and this is endangering the reefs.

- Chesher/Westinghouse Report, based on study of reefs in Guam and T.T.P.I., (1969) suggests that man has weakened the chief predator of A. planci at larval stage by bombing, blasting and otherwise destroying the coral reef.

- Endean Report resulting from studies on the Australian Great Barrier Reef (1969), too, blames man, this time man the shell-collector, for reducing the Giant Triton population on the reef. This gastropod is the chief predator of the immature A. planci.

- The Cambridge Coral Starfish Research Group, which worked in 1969 in the Red Sea, has reported its findings on A. planci there and is continuing its investigations in 1970.

- Australian Academy of Science Report, also made on the Australian Great Barrier Reef, (1970) recognises that knowledge of the biology of reef fauna and its physical environment is meagre. It acknowledges also that at this time widespread or long-term control measures are not possible since practical methods of control are not available.

  The Report recommends that research work relevant to the problem should be encouraged and continued; it should include -

  - study of the general biology of A. planci and its predators;

  - detailed study of the embryonic and larval phases of its life cycle and of possible factors affecting its survival rate in the plankton phase;

  - examination of cores of recent sediments in an attempt to recognise ossicles and spines of A. planci and other echinoderms as an indication of earlier increases in numbers;

  - testing of selected reef waters to detect levels of chemical pollution, especially by residual pesticides.

Original Text: English.

ISSUED IN THIS SERIES

		Classification
1.	Annual Conference of O.I.E. held in Paris 13-18 May, 1968, Report of SPC Observer. September 1968.	Livestock Production and Health.
2.	South Pacific Commission Publications' Series. October 1968.	Publication
3.	Free Diving Without Breathing Apparatus - Its Accidents. March 1969.	Public Health
4.	"A" Level: Australia's Notification on Bovine Pleuropneumonia Regulations. March 1969.	Plant and Animal Quarantine
5.	Study Tour to Noumea, Brisbane, Territory of Papua and New Guinea and British Solomon Islands Protectorate. March 1969.	Tropical Crops
6.	"A" Level: Agricultural Education - Bulletin No. 1 April 1969.	Agricultural Education
7.	Introduction and Spread of Culicoides and Other Insect Species by Aircraft. May 1969.	Public Health
8.	Diarrhoeal Diseases in Adults. May 1969.	Public Health
9.	"A" Level: Agricultural Education - Bulletin No. 2. May 1969.	Agricultural Education and Extension
10.	"A" Level: Agricultural Education - Bulletin No. 3. November 1969.	Agricultural Education and Extension
11.	Agricultural Extension Workshop - Western Samoa. November 1969.	Agricultural Education and Extension
12.	Asian-Pacific Weed Science Society. December 1969.	Tropical Crops
13.	The Status and Potential of the Chilli Industry in the Solomon Islands. December 1969.	Tropical Crops
14.	Manpower Planning in the South Pacific. March 1970.	All

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25.	Crown-of-Thorns Starfish. July 1970.	Fisheries