

DISTRIBUTION AND ABUNDANCE OF THE CROWN-OF-THORNS STARFISH  
(*ACANTHASTER PLANCI*) AROUND TONGATAPU ISLAND, TONGA

by M.P. Francis<sup>1</sup>

Introduction

*Acanthaster planci* infestations have been reported from many locations in the South Pacific Ocean but Tonga has attracted little attention because of its isolation. During six man-days of searching Weber and Woodhead (1970) found *Acanthaster* "rare to common" on Tongatapu Island where "common" was defined as 6 to 25 starfish observed per man-day. Endean and Chesher (1973) cite personal communication with the Tongan Department of Agriculture in 1970 regarding a proposed *Acanthaster* control programme. The programme, however, never proceeded. The present survey covers the situation six years later.

Method

The coastline and several reefs to the north of Tongatapu were surveyed between 16.4.76 and 16.6.76 by snorkel diving (see Figure 1). Survey site N was searched at depths between ten and twenty metres using SCUBA equipment. All observed starfish were recorded and intensive searches were made in the immediate vicinity of any feeding scars. At each site a subjective estimate was made of the abundance of live hard corals.

Tongatapu Island is surrounded by a wide shallow fringing reef. On all but the northern (sheltered) side of the island the reef edge is raised to form a barrier one to two metres above the level of the reef flat. Prevailing south-easterly winds hindered searches outside this barrier, and survey sites F to M were therefore situated on the reef flat.

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<sup>1</sup>Atenisi Institute, Nuku'alofa, Tonga; present address: Joint Centre for Environmental Sciences, University of Canterbury, New Zealand. Atoll Res. Bull. No. 255: 63-68, 1981.

### Results

Survey Site	Live Coral Abundance	<i>Acanthaster</i> <sup>1</sup> Relative Abundance
A	Abundant	0
B	Common	0
C	Rare	0
D	Absent	0
E	Abundant	0.5
F	Common	0
G	Rare	0
H	Rare	0
I	Rare	0
J	Rare	0
K	Absent	0
L	Rare	0
M	Common	0
N	Common (10-20 m depth)	3.0
O	Common	5.3
P	Rare	0
Q	Common	0.5
R	Rare	0
S	Abundant	0.7
T	Common	0.7
U	Common	0

<sup>1</sup>Relative abundance is the number of starfish seen per twenty minutes searching (see Pearson and Endean, 1969).

### Discussion

No *Acanthaster* were found on the coast exposed to the prevailing winds (sites F to M). Coral growth is inhibited inside the barrier by exposure to air at low tide, and outside the barrier by heavy surge. The reef outside the barrier drops slowly to a shelf at ten metres, but live coral is stunted and scattered above this depth. *Acanthaster* may occur at greater depths. The absence of *Acanthaster* from exposed reefs, and their preference for sheltered reefs, is consistent with the observations of Dana, Newman and Fager (1972) who found the starfish usually associated with "leeward seaward reefs" and "areas of moderate to luxuriant coral growth".

More than 70% of the sites examined had no *Acanthaster* and the maximum relative abundance was 5.3. Pearson and Endean (1969) consider a relative abundance less than ten to constitute a normal population. By this definition Tongatapu has normal numbers of the starfish, and the presence of luxurious growths of *Acropora hyacinthus* and *Porites* spp. in sheltered areas suggests there has been no infestation in recent years.

References

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