

Some perspectives on the *Acanthaster* phenomenon.

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Abstract

Although outbreaks of *Acanthaster planci* have occurred in many, widely separated coral reefs of the Indo-Pacific over the past 30 years, research on the phenomenon and its causes has almost exclusively centred on the Great Barrier Reef. However, because of the GBR's physical, ecological and oceanographic complexity, the low level and subtle nature of anthropogenic effects, and the low number of outbreak events (ie. two), correlative studies on possible causes have not been possible.

This study takes a wider view of the phenomenon by examining the recent history of *A. planci* in other parts of the Indo-Pacific, particularly in the geographically isolated groups in the South Pacific. Outbreak episodes in isolated groups are more likely to be independent, primary events. The groups investigated are smaller in size, less complex oceanographically, and anthropogenic effects are more extreme, ranging from minimal to very severe. The number of 'independent' outbreak events examined also provides some statistical 'pseudo-replication' for correlative studies.

Outbreak histories were reconstructed from oral histories, published and unpublished reports, and dedicated studies in Fiji, Western Samoa, Vanuatu, Cook Islands, Kiribati, Tuvalu, and from published and unpublished reports in Tokelau, New Caledonia, French Polynesia, Niue, Solomon Islands, in Papua New Guinea in the South Pacific, and in Johnson Island, Hawaii, the Marianas, Carolines and Japan in the Northern Pacific. The timing of the onset of outbreak episodes was established where possible, and recruitment times were estimated (by backdating these 2 years). Annual recruitment of juveniles was directly monitored in the Suva Reef in Fiji since 1977. The outbreak histories in the main study groups and subgroups were related to their characteristics (geomorphology (low / high islands), geography, and extent of anthropogenic impacts (eg. coastal populations, development, fisheries, agriculture, run-off, and pollution).