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REPORT: Precious Coral PEACESAT Discussion and Precious Coral
Workshop

by

I James V. Eade 1

UNDP Project RAS/72/122: South Pacific Offshore Prospecting

1 UNDP Marine Geologist

Precious Coral: A review (including information produced during the 1978 Precious Coral PEACESAT discussions and the 1978 Precious Coral Workshop held in Tonga) .

by James V. Eade

Introduction

During the 1977 CCOP/SOPAC cruises in Western Samoa, Cook Island and Tonga a few dredge hauls were made for deep water precious corals. The results of these cruises were negative but from the experienced gain it was obvious that we, at the Technical Secretariat, needed to know much more about precious corals, especially their distribution and the way they are collected. Subsequently, at the Sixth Session of the CCOP/SOPAC in Port Moresby during October 1977, the Technical Secretariat was requested to seek the services of an expert consultant to advise member countries on the economic potential of precious coral. Early in 1978 the services of Dr. Richard Grigg, Hawaii Institute of Marine Biology, were sought. While preparations were being made for a meeting with Dr. Grigg, information exchange sessions were organized using the PEACESAT (Pan Pacific Educational and Communication Experiments by Satellite) Network. Four sessions were held in the first six months of 1978. At these sessions, which were chaired by the CCOP/SOPAC technical Secretariat in Suva, Dr. Richard Grigg provided much useful information on the biology, distribution, harvesting, and use of precious coral in the Pacific.

In April 1978 a three day workshop was held in Nuku'alofa to cover all aspects of precious corals and to evaluate their potential as an economic resource in the South Pacific. Representatives from Western Samoa, Cook Islands, Tonga and the CCOP/SOPAC Technical Secretariat met with Dr. Grigg who had brought with him visual material to illustrate the industry in Hawaii. Underwater photographs and samples of both raw coral and coral jewelers were presented at the workshop. Following discussions which were generated by the presentation of this material, charts of Western Samoa, Cook Islands and Tonga were examined for possible sites where precious corals might occur. Before the meeting finished a list of conclusions from the meeting were prepared. These are presented as Appendix 1. During the discussions on the PEACESAT

Network and at the workshop in Nuku'alofa, 'I'onga all aspects of the current use of precious corals were discussed. Most of the information was provided by Dr. Grigg, however, several important items of information on precious coral distribution in the South Pacific came to light as the result of these discussions.

Definitions

The term Precious Coral (sometime referred as Jewel Coral) classically refers to the red corals of commerce. In this report the term is used to describe those corals whose skeleton is the raw material of the coral jewelers industry. As well as the red corals, these include the white and pink varieties and the non calcareous black and gold species. For convenience precious corals fall into two groups - the shallow water species which live in depths where they can be collected by scuba diving; and the deeper water species which live in water beyond these depths where they can only be collected by dredging or by submersibles. All these factors have one factor in common: they are hard and dense enough to take and hold a good polish. Hardness ranges from 2.5 to 4.0 on the Mohs scale.

History and Use

Skeletons of precious corals have been the object of curiosity and a source of commerce to man for thousands of years. Commercial activity in the Mediterranean Sea may have started as much as 7000 years ago. Here red coral has been the prize form and this has been collected by free diving, dredging and more recently submersible. The history of a coral industry in the Pacific apparently began about in Japan around 1830. Extensive fishing however, did not begin until some 40 years later. Since then the growth of the industry in the Western Pacific has been erratic. Discovery of new beds has resulted in rapid growth of the industry only to be followed by the equal rapid decline when those beds have been departed. The discovery of rich coral used on Milwaukee banks, 500 miles northwest of Midway Island led to a boom in the industry in the mid 1960's. Also in the 1960-s pink coral beds were discovered in Hawaii off the island of Oahu. Harvesting of

these beds has led to the establishment of a substantial precious coral industry in Hawaii. Legislation and selective harvesting methods have ensured that this resource will continue to be available in the future.

Distribution

In the Pacific Ocean Corallium species occur in commercial quantities in the Hawaiian island chain, and throughout the western Pacific around Japan, Bonin Islands, Ryukyu Islands, Taiwan, Philippines and south to the Halamahera Islands. It is also known to occur in small non-commercial quantities in the Solomon Islands, Western Samoa and American Samoa in the South Pacific. It is found growing on rocky sea-floor where there is no sediment deposition, where bottom currents are strong and between 100 and 400 meters water depth.

Gold coral has only recently been used for jewelers. This development has taken place in Hawaii. They are found in the same environment as Corallium and as well as off Hawaii they are also found in large quantities off Alaska.

Bamboo coral is another deeper water coral which has good potential as a jewel coral. Its use is currently being evaluated in Hawaii

The shallower water black coral occurs throughout the Pacific. Small industries producing locally collected and manufactured black coral jewelers have been established in most South Pacific countries. Few of these are using the deeper (150-200 feet) species which is the best quality and therefore most valuable black coral.

Sampling and Harvest Methods

The Deeper water species are either by dredging or by submersible. Dredging methods are by dragging over the bottom a stone, a river or beach boulders with lengths of old netting or rope attached. The boulder breaks the coral off the bottom and the nets or teased rope trailing behind pick up the pieces. This method has

been used by the Japanese for more than 100 years and is still used today. Tests have shown it to be the most efficient type of dredge despite much experimental work. Simple one stone nets and more complicated arrangements of several stones suspended from a horizontal bar are both commonly used.

Submersibles are used to harvest coral commercially in Hawaii and Taiwan. This method allows proper management of coral beds and ensures long term production. Where the dredging method has been used beds have been stripped clean. However properly controlled, dredging is a useful method for exploration.

Black coral is collected by free diving by-both breath-hold and scuba divers. However, as the best coral occurs between 150 and 200 feet, scuba diving and its associated risks are necessary.

Potential in the south pacific

Corallium is known to occur in three countries {Solomon Islands, Western Samoa, American Samoa) in the South pacific. However, very little exploration for Corallium has been done. From a study of bathymetry a preliminary search for likely sites for Corallium has been carried out in Western Samoa, Tonga and the Cook Islands. Many potential sites occur along the Tonga Platform between Tongatapu and Vavau. In Western Samoa potential sites were identified off the northwest and southeast ends of the island chain. A few potential sites have been identified in the Cook Islands but a lack of bathymetric data makes site identification difficult in this region.

Black coral has been found in many areas where artisans have already established small businesses making simple jewelers for sale mainly to tourists. This industry will grow as these artisans quality greater expertise and produce a better quality and product.

**CONCLUSION FROM THE SEMINAR ON PRECIOUS CORAL
HEALD IN NUKU' ALOFA, TONGA**

The precious coral industry in the Pacific is of great economic significance with annual retail sales over US\$400 000 000. Development of d local industry in South Pacific Island, countries therefore presents an opportunity that is of great importance and appropriate for development for development. The precious coral industry in Hawaii has grown eight-fold in the last seven years which demonstrates the potential in other South Pacific areas. This is especially important since black coral is reported to occur in Tonga, Fiji, Samoa, Papua-New Guines, and other South Pacific countries. In addition, the likelihood that deep water precious corals (pink, gold and bamboo) exist in the region is good.

The Sixth Session of CCOP/ SOPAC IN Port Moresby, Papua-New Guines during October, 1977 to convene a seminar on precious corals led by a recognized expert in this field.

This seminar was held in Tonga on 17 to 19 April sponsored by (CCOP/ SOPAC and the Government of the Kingdom of Tonga.

1. The seminar recognized that the state of knowledge, habitat, harvesting techniques and management methods are different for deep water precious corals than for shallow water black corals. They therefore require different approaches to resource development.
2. With respect to the deep water precious corals the recommendations of the seminar are as follows:
 - (a) An explanatory programme be organized utilizing echo-sounding surveys and bottom tangle-nets to establish the presence of deep water precious.
 - (b) Once the existence of this resource is established an evaluation a deep submersible (submarine) to delineate the extent and value of the precious coral.

- (c) A development programme be organized to co-ordinate the orderly exploitation of deep water precious corals to the greatest advantage of the South Pacific people including:
 - (i) Recovery of the precious coral.
 - (ii) Training of local artisans to manufacture jewelers from the raw materials.
 - (iii) Investigation and development of appropriate markets to merchandise the products
3. With respect to the shallow water black corals which are virtually ubiquitous in the south Pacific, recommendation of the meeting as follows of the meeting are as follows:
- (a) Resource surveys should be conducted between depths of 20-50 meters in areas where strong currents are found and along steep reef drop-offs.
 - (b) Once the abundance of the resources has been established, a programme to train local divers in the use of SCUBA should establish. This should be accompanied by the installing of decompression chamber at local hospitals.
 - (c) A training programme for local artisans to manufacture jewelers should also be established. This could be in co-operation with the coral jewelers industry in countries such as the United States, Italy or Japan such that local artisans could be sent to these countries to develop skills in cutting, polishing, and mounting coral jewellery.
 - (d) A marketing programme for black coral could be conducted simultaneously with marketing studies of deep water precious corals (pink, gold and bamboo) .
4. Development of the resources should include a management programme. Such a programme should lead to legislation controlling permits, fishing rights and other appropriate legal controls which will ensure proper conservation of the

resource. In areas where conservation has not been practiced precious corals have been rapidly depleted illustrating the need for proper conservation and enforcement.