

Winged pearl shell newly found in Tonga

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A number of grown winged pearl shell were found attached to the ropes of a FAD on Vava'u, Tonga. It was previously believed that winged pearl shell were not found in Vava'u. These specimens might have originated from the pearl culture trial carried out by a Japanese pearl firm, Tasaki Pearl Co. This firm introduced winged pearl shell, gold-lip pearl shell, black-lip pearl shell, and Japanese pearl shell from Japan. The project consisted of introductions in 1975, 1976, 1977, and 1979, at the request of the King of Tonga. Winged pearl shell cannot currently produce round pearls, because its gonad (in which pearl nucleus is inserted) is too small, and too complicated in organ structure for successful surgery.

Winged pearl shell can, however, produce "blister" pearls. The colour and size of these *mabe* pearls is renowned. Consequently, its market price is considerably higher than that of other pearls shells, and its production is currently increasing remarkably. Artificial seed (hatchery) production of winged pearl shell has been carried out successfully only by Tasaki

Pearl Co. in Amami, Japan in 1970's. The seed introduced to Vava'u from Japan was supplied from this hatchery.

There is no evidence that the winged pearl shell found in Vava'u is from these Japanese introductions. This may need an amino-acid analysis by electrophoresis or a comparative study of genes. Tonga Fisheries Division carried out a stock survey of this newly-found resource in Vava'u in November 1989 in association with FAO South Pacific Aquaculture Development Project. The survey aimed to assess the feasibility of winged pearl shell culture and pearl production. As a result of the survey, experimental spat collection was encouraged to increase settlement in the area.

This programme started in December with three sets of spat collectors deployed in different locations off Vava'u. The collectors will be examined and re-installed periodically. Spat collection, materials of collectors, spawning season, and growth rate of shell will be examined.

Survey of Pearl Oyster Resources at Nukulaelae Atoll, Tuvalu

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A survey of pearl oyster stocks was carried out in April, 1990, to determine the potential for pearl oyster culture in the lagoon.

The survey involved intensive searching for pearl oysters, by free-diving or SCUBA diving, at 19 sites in and around the lagoon. The survey was carried out by a 4-man diving team (G. Preston, South Pacific Commission; T. Gentle, Tuvalu Fisheries; M. Kamatie, Kiribati Fisheries and M. Naseli, Tuvalu Fisheries), assisted by local residents with local experience of pearl oyster collection. Good coverage of the different habitat types in the lagoon, and a comprehensive distribution of sampling effort, was achieved. Consultations were also held with local residents to gather anecdotal information on the abundance and exploitation history of the resource.

Pearl oyster stocks were determined to be low, especially relative to other countries where pearl oysters have been commercially exploited or cultured. Only four live specimens were found during the field work, although it was possible to examine other live and dead shell that had already been collected by island residents. Present stock levels are not adequate to support the establishment of farming activities on even a very small scale. There is no evidence that stocks were ever vastly more abundant than they are now, or that they have been greatly reduced by human collection activity.

Despite the low abundance of pearl oysters, Nukulaelae lagoon appears to present some localised areas of suitable pearl oyster habitat. The fact that these are populated by other bivalve species suggest that physical, chemical or biological conditions in the lagoon are limiting pearl oyster population growth. In the report of the survey, it is speculated that the limitation may be acting at an early point in the pearl oyster life cycle, since the few adults taken from the lagoon during the survey, as well as shells belonging to private individuals, appeared to demonstrate good growth and to reach relatively large sizes.

Further research is required to determine whether pearl oyster population growth could be promoted by enhancing larval settlement and growth using spat collectors and juvenile husbandry methods. The constraints of initiating such a project on Nukulaelae are discussed in the report, and an alternative approach suggested. This involves initial deployment of spat collectors in Funafuti for research purposes, and the gradual extension of this research to Nukulaelae and perhaps other Tuvaluan atolls depending on results, logistics and institutional arrangements.