



Photos: R.S.V. Pullin



## Biology and Culture of Cockles (Anadarinids)

Anadarinids are marine bivalve molluscs harvested commercially and on a subsistence basis in many warm temperate to tropical countries. They are frequently called mangrove cockles, blood cockles or simply cockles, although true cockles belong to a different bivalve family. In Asia the anadarinid cockles are known locally as *kerang* (Malay), *hoy kreng* (Thai) and *si-ham* (Cantonese).

Most species live in the intertidal zone or just below it and in soft mud and sandy mud. Various species are gathered on the Pacific coast of Colombia, and in west Africa as well as throughout much of the Indo-Pacific area from Australia to Thailand. They are also harvested in China and Korea. The important species are *Anadara granosa* in Malaysia, South Korea and Thailand; *A. broughtoni* in South Korea and *A. subcrenata* in Japan and South Korea. These three species are also cultured.

Usually the spat of cockles settle at a high density in mudflats from which they are collected by fishermen using simple wire baskets and sold to culturists. The culture grounds are also tidal flats. Culturists spread the seed uniformly and thin out the cockles as they grow, to a final density of 200-300/m<sup>2</sup>.

In Japan, *A. subcrenata* spat are caught directly with special collectors. These consist of poles about 10 m long driven into the mud and connected by crosspieces around 4 m long from which collectors are hung. A collector consists

*Top left:* Landing a harvest of *Anadara granosa*, Malaysia. *Top right:* Sampling an *Anadara granosa* harvest for undersized shells, Malaysia. *Below right:* Shucking cockles, *Anadara broughtoni* in Chungmu, South Korea.

of 19-gauge wire to which are attached "bristles" of palm fiber 6 m long, resembling a bottle brush. Three 2-m lengths of such wire are bunched together to form a collector.

Artificial spawning of cockles was carried out in Japan for a few years in the early 1970s but was abandoned because the supply of spat which set naturally was adequate to meet demand. In the case of *A. granosa*, there is considerable year to year variability in natural spat fall and recently these cockles have been spawned in laboratories in Malaysia (see p. 13) and Thailand (see p. 11). Whether they can be produced cheaply and on a large scale remains to be seen.

Predation and sudden mass mortality can reduce culture beds of *A. granosa* to 20% of their sowing density by harvest time 10-12 months later. Large abrupt changes in salinity can wipe out a significant proportion of a cockle population in a few days, while predators, such as drills (gastropods) and starfish, continually take their toll. Indeed, it is felt that major gains in productivity of cockle beds will only be made when

methods are found to prevent predators from gaining access to culture beds.

Further details on the lives and ecology of anadarinid cockles are contained in a comprehensive review undertaken for ICLARM by Dr. Malcolm Broom, entitled "The biology and culture of marine bivalve molluscs of the genus *Anadara*" recently published by ICLARM. The review covers general biology, population dynamics, reproduction, culture methods and pollution effects. For ordering details, see p. 17.

The review complements the project on Applied Research on Coastal Aquaculture being jointly undertaken by the Thailand Department of Fisheries and ICLARM, funded by the German Agency for Technical Cooperation (GTZ) (see p. 11).

Funding support for preparation of the review was provided by the International Development Research Centre of Canada through ICLARM's Selective Information Service project (see Newsletter April 1985, p. 12). This is the first of several reviews on topics found to be of broad interest to enquirers to the Information project.