



Mollusc Fisheries of Thailand

Summary

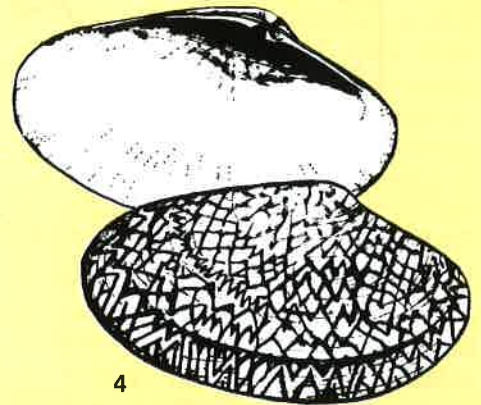
Shellfish production in Thailand has ranged between 50,000 and 300,000 mt over the past twenty years, with recent production around 120,000 mt/yr. Major species are green and horse mussels, making some 60% of total production. The other main types, in order, are short-necked clams, ark shells ("cockles") and oysters. Culture practices account for 80% of green mussel, cockle and oyster production. Culture began to boom in the mid-seventies following a decline in production of the fisheries. There is a small export trade to Hong Kong and Singapore. The Thais import about 10,000 tons of cockles from Malaysia each year.

Species

The major commercial shellfish (molluscs excluding squid and cuttlefish) varieties of Thailand and their proportion of recent production are the green mussel (*Perna viridis*, 45%), ark shell or cockle (*Anadara granosa*, 15%), horse mussel (*Modiolus senhauzenii*, 12%), oyster (*Crassostrea* sp., 12%), and the short-necked clam (*Paphia undulata*, 10%) (Figs. 1-5).



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4



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Fig. 1. Green mussel; 2. cockle; 3. horse mussel; 4. clam; 5. oyster. Fig. 9 (right). Oysters farmed on rocks.



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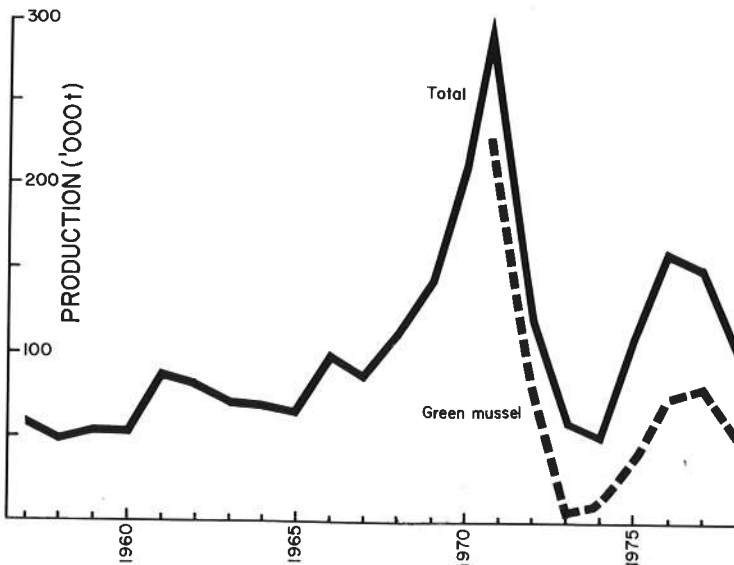


Fig. 6. Annual shellfish production, Thailand. Dotted line shows green mussel decline.

The remaining 6% includes both edible varieties, other oysters and clams, and ornamental pearl and window-pane shells. They are all bivalves except for a small harvest of *Trochus* and turban shells (*Turbo* sp.).

Annual Production

Since statistics first became available in 1957, production has been wildly variable, from 50,000 to nearly 300,000 mt (Fig. 6), which appears to reflect environmental variations, pollution and/or unreliability of data. The collapse of what appeared to be a rapidly expanding mollusc fishery in the early 1970s was said to have triggered off an awareness of the possibilities of aquaculture, which, by 1975, accounted for half total production. However, the major decline was due to the failure of only one fishery, green mussels, in 1972 and 1973.

The Fisheries

The inner (northern) neck of the Gulf of Thailand produces over 85% of the country's shellfish in five provinces—Petchaburi, Samut Songkhram, Samut Prakharn, Samut Sakhorn and Choburi. Half-way down the eastern side of the Gulf, Chanthaburi and Trat provinces are the only other significant production areas for oysters and mussels, while Satul, on the Andaman Sea, is a major cockle farming area. Chumphon province down the west side is becoming important as an area of green

mussel and oyster production (see map p. 8).

Mussels occur in waters with soft, muddy bottoms in broadly estuarine areas. Green mussels grow in 2-8 m depth, while horse mussels prefer shallower (< 3 m) depths including intertidal areas. Cockles inhabit deep soft mud flats, while clams need a harder, sandy substrate. Both require higher salinity than mussels and are not found where freshwater inundation occurs. Oysters occur in estuarine-associated areas, requiring a hard substrate for attachment.

Aquaculture

The collapse of mollusc fisheries in the early seventies seems to have resulted in rapid expansion of culture activity in the mid-seventies. Areas farmed increased six-fold between 1974 and 1976 to 5,000 hectares. Green mussels account for over 60%, and oysters 25%, of total mollusc aquaculture production, about 60,000 mt/yr.

Green mussel culture is presently carried out by collecting wild seed on vertical bamboo or mangrove date palm stakes, the latter being much more durable but only available in short (3-6 m) lengths. Stakes are set out at 5,000/ha (Fig. 7). Culture period is about 8 months, and production rate estimated at 40 t/ha. Successful hanging rope culture experiments in 1978 showed similar production rates, and the technique is expected to be popularized as stakes become scarcer and more expensive. Horse mussel seed is gathered from the mud flat and broadcast around farm beds at a rate of 5 t/ha providing a production rate similar to green mussels over a 6-month growing period.

Cockles and clams are likewise collected from public beds and re-distributed on farm sites. Being more



Fig. 7. Stakes using date palm trunks for the culture of green mussel.

valuable than mussels, the farms require guarding over the 12-18 month growing period (Fig. 8). Variability in growth rate has resulted in a process of periodic harvesting and seeding. Some 3-4 million shells/ha are seeded, yielding around 9 mt/ha/yr.

Around 10,000 t of cockles are imported from nearby peninsular Malaysia each year. An unknown proportion is cockle seed. Reliance on imported seed is an expensive hazard the Thais would like to overcome. Research programs are currently being planned to upgrade mollusc aquaculture methodology. Self-sufficiency in cockle seed production is one goal.

Oysters are collected on a variety of artificial substrates, such as pegs, blocks and pipes or on rocks (Figs. 9 and 10). Growing period seems to be around 1 yr. January-February is the peak settlement season. Cultured oysters attain good table size by August (7.5 cm) and average about 9.0 cm by the end of the year. The larger, fresh oysters are the most valuable bivalve produce in Thailand.

Processing and Marketing

All varieties are sold fresh in-shell as well as in 375 cc bottles. The following 1977 prices indicate their relative domestic value—green mussels, 8-9 Bht/kg and 30 Bht/bottle; horse mussels, 8-9 Bht/kg; oyster 40 (small) and 70-100 Bht/kg (large); cockles, 40 Bht/bottle.*

*20 Bht = 1 \$US.



Fig. 8 (above). Guardhouse over cockle farm, Satul Province. Fig. 10 (right). Oyster culture using cylindrical blocks of concrete.

Mussels and clams are also brined and then sun-dried. The export trade is based on brine-canned oysters and clams and dried mussels. Much of the horse mussel crop and other under-sized shellfish become feed for the maritime provinces' 12 million farmed ducks. Price in 1977 was 2 Bht/kg.

Almost all mollusc production passes through two or three middlemen between fisherman and domestic consumer. Prices are stable and demand is staying ahead of production.

Imports/Exports

Exports identifiable in the Fisheries Record of Thailand consist mainly of dried mussels, 85-200 t/yr, and processed cockles, 70 t/yr, to Hong Kong. The statistics also show "crustacean and mollusc products," over 5,000 t in 1977, but the proportion of molluscs is unknown.

Imports include a small unidentifiable mixture of crustacean and mollusc products, as well as the large trade in market-sized and seed cockles from Malaysia.

Development Prospects

The concentration of mollusc production in the inner Gulf of Thailand is most likely a reflection of population concentration and proximity to the capital, Bangkok. On the other hand, rapid population growth and

industrialization—over 1,500 factories dispose of most of their effluent into the four main rivers flowing into the inner Gulf—are said to have already taken their toll on production there.

Further down the Gulf and in the Andaman Sea, a number of provincial sites, totalling some 60,000 ha are available and suitable for enhancing production through aquaculture.

A decentralization program of this nature requires feasibility studies, development of appropriate techniques, extension work and the development of an extensive infrastructure to cater for distribution and marketing.

Other areas of the industry pinpointed for improvement include quality control and production of export oriented commodities.

Basic to any development is an understanding of the biology and dynamics of the exploited molluscs. The Brackishwater Division of the Thai Fisheries Department is gearing up for such research at some of its stations described in this issue.

Sources

Much of the data and the species drawings are from *Shellfisheries of Thailand: background and proposal for development*. Rabanal, H.R., U. Pongsuwana and A. Saraya, 1977. SCS/77/WP/61, with kind permission of the FAO/UNDP South China Sea Programme. Additional material from Thailand fishery statistics and observations by ICLARM staff.

