CULTURE OF COCKLE, ANADARA SPP., ON THE WEST COAST OF SOUTHERN THAILAND

By Sanchai Tandanavanitj
Phuket Marine Biological Center, Phuket P.O. Box 60, Phuket 83000, Thailand

ABSTRACT

During 1976-79, there was only one large area of cockle farming in Satun Province near the Thai-Malaysian border. Later, 1979-81, cockle seeds of Anadara granosa L., 1758 were transplanted further north from Malaysia to Trang, Phang-nga and Ranong on the west coast of Thailand. However, only minor recruitment was observed from the transplanted stocks. Apparently, the larvae were carried offshore, or they settled in unsuitable habitats, or they were transported by south going currents and settled in Malaysia. Suitable habitats are rare along the Andaman Sea coast of southern Thailand which is devoid of coherent muddy habitats. In 1985, spat of Anadara nodifera was transplanted from the Gulf of Thailand (Petchaburi Province) to the Andaman Sea (Phang-nga Bay). But culture was not satisfactory. The mortality was high and there was little recruitment.

INTRODUCTION

Cockle culture was established early in the inner part of the Gulf of Thailand, especially in the Samut Sakorn and Petchaburi Provinces (Toukwinas 1983). The method of culture was traditional. Villagers collected seeds from areas in the vicinity and transplanted them to a small-scale culture area in front of the communities. The main species in culture was Anadara nodifera (E. von Martens).

Cockle culture on a commercial scale began 1976 with a joint-venture between Chinese-Malaysians and the farmers in Satun, the most southern province on the west coast of Thailand close to the Malaysian border. Cockle seeds of Anadara granosa Linnaeus, 1758 were imported from Malaysia and transplanted for culture in Puyu village. The culture became a success, and this activated a number of farmers to start their own business. As a result, the culture areas in Satun expanded, and the culture spread to other provinces further north: Trang, Phang-nga, and Ranong during 1979-81. Anadara granosa generally reach maturity at 18-20 mm length when they are 6-7 months old (Pathansali 1966; Bloom 1983). The cockles are able to spawn many time before they reach the marketable size. However, even if a great number of cockles must have spawned in the culture areas, surprisingly few spat have been recorded during 1980-83 in all 6 provinces along the West Coast, viz., Ranong, Phang-nga, Phuket, Krabi, Trang and Satun (Fig. 1C).

The natural distribution of A. granosa is largely limited to areas along the west coast of Peninsular Malaysia extending from the State of Kedah in the north to the State of Johore in the south (Ng 1984).

SUMMARY OF COCKLE CULTURE IN THAILAND

Absence of recruitment
After spawning, the cockle larvae spend approximately 21-35 days in the plankton before settling on the sea bed (Saivathcharint et al. 1988). Available data on oceanic currents (Fig. 1A &B) predicted that settling should occur in certain areas, but it turned
out that major recruitment failed to take place. Cockle spat could hardly be found on the west coast of Southern Thailand, even if a large number of larvae were released from broodstocks in many commercial culture areas during that time. The absence of recruitment is not fully understood. Several factors have to be considered: oceanic currents, tides, characteristics of shoreline, and fishing activity.

Most larvae probably drifted to the open sea. If larvae managed to return to the shoreline, the habitat may have been unsuitable. From Ranong to Satun there are stretches of sandy beaches without large muddy areas for hundreds of kilometres. Finally, push-nets have been operated in the muddy areas and may have destroyed some of the spat.

Culture in Phang-nga Bay
From 1981-83 there was a large culture area of about 3,000 rai (480 hectares) where cockles were farmed in Phang-nga Bay. A. granosa from Malaysia proved successful in culture. Most of the culture took place in the inner part of the bay. However, a study of the water currents in Phang-nga Bay (Limpsecichol & Khokhriiwi 1991) indicated that the larvae possibly drifted to the south east of the bay. That is about 2-3 weeks after spawning, and the spat settled on the outside of the bay facing the open sea.

Spat of Anadara nodifera was transplanted from Petchaburi Province to Phang-nga Bay in 1985. The reason for this action was that the Malaysian Government had banned export of cockle seed. Only adult cockle could be sold to Thailand. Because of this policy, the farmers had trouble to maintain their farms in the southern part of Thailand. The seed supply became insufficient. The only natural seed bed in Thailand is located in Petchaburi Province on the east coast. Therefore, experiments on transplantation of Petchaburi cockle to many areas of southern Thailand were established. The experiment in Phang-nga was started in 1985 (Senakasp et al. 1986) by transplanting 60 tons of cockle seeds from Petchaburi to a culture site of 100 rai (16 hectares) at Ban Khao Khaw in Phang-nga Bay. The results from the experiments were not satisfactory due to high mortality. However, an unexpected event was that all of the cockles moved 250-300 m out from the shoreline in 12 months. It is assumed that the site selection of the culture might have been wrong. The substratum was probably exposed to air for too long time during low tide. The cockles reacted by moving to a greater depth.

Culture in Satun Province
The culture areas in Satun Province covered 600 hectares in 1976-79. But cockle spatfall was not recorded in Satun and nearby areas during the South-West monsoon. There is reason to believe that most of the larvae settled in Malaysia. Studies of oceanic currents in Satun Province (Limpsaiichol & Khokhriiwi 1991) and current patterns along the west coast (Charoenlaph unpub. report) showed that the major direction of the current was westerly towards the open sea, and that a minor current near the shore moved south towards the Straits of Malacca. This interpretation is supported by Ng (1984) who showed that before the cockle culture in Satun was started, very low production of cockle had been recorded in the states of Perlis and Kedah, that is, the states on the north of west coast of Malaysia, just South of Satun. Most likely, the larvae from Satun were moved southwards by the current and settled in the muddy areas of Perlis and Kedah. Two years later they had grown to marketable size, and were then harvested (Bloom 1985).
Figure 1.

A. Surface currents during the South-West Monsoon

B. A. Surface currents during the North-East Monsoon

C. Distribution of muddy bottoms (black) on the west coast of Thailand

REFERENCES

Charoenlaph, T. no year. Preliminary report of a study of current patterns along the West Coast of Phuket Island, Thailand. 26 pp.