

LANDING DATA AND MEAT TRADE WITH *CHICOREUS RAMOSUS* & *PLEUROPLOCA TRAPEZIUM* IN THE GULF OF MANNAR AND PALK BAY, SOUTHEASTERN COAST OF INDIA

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ABSTRACT

Monthly surveys were carried out at coastal villages of the Gulf of Mannar and the Palk Bay, on the southeastern coast of India. Sixteen potential landing centres were identified, 12 in Gulf of Mannar region and 4 in the Palk Bay region. The average monthly landings at all the 16 landing centres were calculated. The *Chicoreus ramosus* and *Pleuroploca trapezium* fishery is mainly associated with lobster fishery. Monsoonal winds (northeast and southwest) influence these fisheries and hence the fishing season differs from one centre to another. The export value of the meat of these two gastropods has attracted the attention of the fisherfolk and it has emerged as an additional source of income for them. In addition to the fishermen involved in fishing these gastropods, there are about 60 other persons engaged in the gastropod meat trade. The mode of their activity and the problems of the trade is discussed.

INTRODUCTION

The exploitation of *Chicoreus ramosus* and *Pleuroploca trapezium*, is nowadays increasing rapidly, along the southeastern coast of India. Over the past several decades, the operculum and shells of these gastropods have been fetching a good value but only recently attention has been drawn to the value of their meat. The demand for meat is mainly from exporters and it has now become an additional source of income for the fisherfolk. However, it is important to study these snails because of their role in the seafood trade. Knowledge of these resources will be useful for the proper management and conservation of these valuable gastropods.

STUDY AREA

A survey was conducted in all the coastal villages situated in the Palk Bay and the Gulf of Mannar region, the southeastern coast of India, during June 1992. Potential gastropod landing centres were selected and then monthly surveys were conducted, from July 1992 to June 1993. The total number of crafts involved in fishing of these gastropods, people engaged in skin diving, and the post harvesting activities were recorded.

Potential landing

97 landing centres were enumerated in the study area. Of the 97 landing centres, only 16 were identified as potential centres (Fig. 1). Four centres belong to the Palk Bay and 12 to Gulf of Mannar region. Table 1 shows the total potential landing centres, fishing season, number of craft and divers engaged in gastropod fishing.

Landing data

Appendices 1 & 2 show the monthly landings of *C. ramosus* and *P. trapezium* in all potential landing centres from July 1992 to June 1993. Maximum landings of both species of gastropods were during the post monsoon season. Intensive diving and fishing took place in all fishing villages in this season. The total landings of these two gastropods have increased now, compared with the previous surveys made by Patterson Edward and Ayyakkannu (1992a & 1992b).

Fishing seasons

Fishing for gastropods is not regular, except in a few places (Table 1). Most of these are permanent landing centres but in places like Moontru Chatram and Kunthukal the fisherfolk from Kilakarai, Vallinoorkam and Vaipar make temporary seasonal visits.

Table 1.

Potential landing centres, fishing season, and fishing effort in all areas of Palk Bay and Gulf of Mannar region.

| Fishing village | Season | No. of fishing crafts | No. of Divers (appr.) |
|-----------------|-------------|-----------------------|-----------------------|
| Thondi | Jan. - Mar. | 18 | - |
| Mandapam | July - Dec. | 16 | 50 |
| Pamban | Dec. - Jun. | 22 | 50 |
| Thangachimadam | Jan. - Mar. | 13 | - |
| Moontruchatram | Dec. - Feb. | 40 | - |
| Kunthukal | Dec. - Jul. | 25 | - |
| Vethalai | Whole year | 12 | 200 |
| Kilakarai | Whole year | 60 | 100 |
| Ervadi | Whole year | 5 | - |
| Vallinoorkam | Feb. - Jul. | 100 | - |
| Munthal | Mar. - Jul. | 65 | - |
| Mukair | Mar. - Jul. | 26 | - |
| Naripaiyoor | Mar. - Jul. | 15 | - |
| Rocemanagar | Mar. - Jul. | 8 | - |
| Vaipar | Whole year | 40 | - |
| Tuticorin | Whole year | 45 | 600 |

Factors influencing gastropod fishing

The gastropod fishery along the southeastern coast of India was mostly associated with lobster fishery (Ayyakkannu, 1992). Though lobster was fished throughout the year in different places in the Gulf of Mannar region, the demand for lobster was not steady. It fluctuated because of problems with export trade and therefore fishermen hesitated to pay much attention to lobster fishing. Ayyakkannu (1992) reported that there is no special gear or traps for fishing *C. ramosus* and *P. trapezium*, but fishing occurred with lobster nets, trawler nets and skin diving. All catches of the gastropods were considered as by-catches, and hence if lobster fishing was affected by any factor, it ultimately affected gastropod fishery. This situation is changing nowadays and fishermen fish exclusively for gastropods since they fetch higher prices. Winds from northeast (October to February) and southwest (middle May to September) have a great influence on the fishing of gastropods. Fishermen face difficulties due to rough sea in the Gulf of Mannar during the period of the northeast monsoon and fishing for these gastropods is carried out only when the sea is calm.

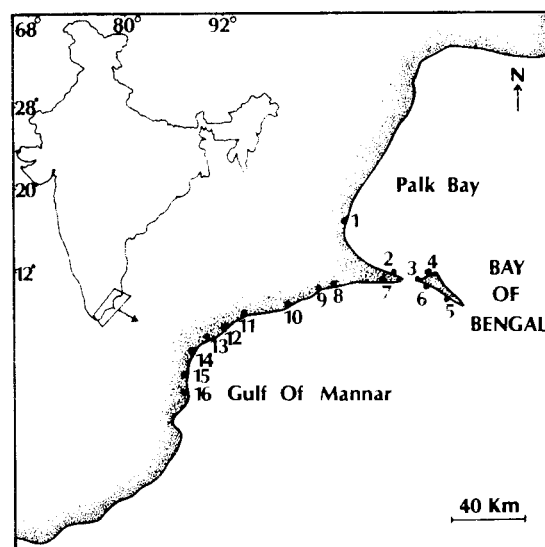


Figure 1. The potential Landing centers of Gulf of Mannar and Palk Bay Regions.

1. Thondi, 2. Mandapam, 3. Pambam, 4. Thangachimadam, 5. Moontruchatram, 6. Kunthukal, 7. Vethalai, 8. Kilakarai, 9. Ervadi, 10. Vallinoorkam, 11. Munthal, 12. Mukair, 13. Naripaiyoor, 14. Rocemanagar, 15. Vaipar, 16. Tuticorin.

But, in places like Vethalai, Ervadi and Tuticorin in the Gulf of Mannar region, fishing is carried out even during the monsoon season.

The southwest monsoon is felt very much along the west coast, but it influences gastropod fishery in the Gulf of Mannar region too. The effect of the southwest monsoon is pronounced in places like Vallinoorkam, Munthal, Mukair, Naripaiyoor, and Rocemanagar. On inquiry, the fishermen revealed that the gastropods migrate from deeper water to the coastal waters because of winds of the southwest monsoon. The same could be inferred from inquiries made by Khokiattiwong (1992) among the fishermen from the coastal areas of Thailand. Though the migratory behaviour of the gastropod is not well-documented, it has, however, been observed that *C. ramosus* migrated into shallow coastal region for spawning (Xavier Ramesh, *et al.*, 1992; Khokiattiwong, 1992).

Status of diving

During and after the northeast monsoon, gastropod fishing is being carried out regularly by skin diving in Vethalai, Kunthukal, Moontruchatram, and

Tuticorin. During this period considerable landings of *C. ramosus* and *P. trapezium* were noticed. Communal spawning of *C. ramosus* made a large number of animals to aggregate in a smaller area and attach themselves to each other. They appear like a small mountain on the sea bottom, and hence access to *C. ramosus* is very easy in a short period. In the Gulf of Mannar region, about 1000 divers were engaged in diving for gastropods during the postmonsoon period. They usually dive to depths between 20 and 28 metres when the water is clear.

Meat Trade

When TMMP was instituted in May 1991, the meat of several hundreds of *C. ramosus* and *P. trapezium* was ignored. One of the objectives of the TMMP is to focus on the value of muricid meat in order to create an awareness among the people of this seafood resource. Within a very short period attention was focused on meat of these gastropods, which were exclusively exported to Southeast Asian countries. The present survey revealed that about 60 persons are actively involved in meat trade in both Palk Bay and Gulf of Mannar region.

Collection of Gastropods

The meat trade agents usually send their workers to the landing centres for purchasing gastropods. The value of the gastropods is based on the size and condition of the shell. Encrusted and bored shells fetch a low price. Normally money is paid in advance to the fishermen in order to procure the snails easily and without competition. Fishermen getting money from the meat agents are obliged to sell the gastropods caught by them to the particular agent. In the Gulf of Mannar, the gastropods are auctioned, e.g. in Vaipar.

Transportation

After the purchase of the animals from different coastal villages, they are packed in gunny bags and transported to the backyard of the meat agent by bicycle or by bus.

Separation of meat from the shells

The operculum is removed by a scalpel-like device of iron, and the shells are arranged in a large size pot (aluminium or tin). Potable, or sea water is poured to submerge the shells, and they are boiled. After 20 to 30 minutes of boiling the shells are taken

out and the soft portions separated with a scalpel-like device. The viscera, gonads and the digestive glands are removed and the edible portions separated. After being washed in potable water, the meat is ready for sale to the merchants. They usually keep the meat packed in ice in a plastic or aluminium container. The merchants then sell the collected meat to the agents belonging to seafood processing companies. The stored meat is transported daily for processing by the company's worker.

Table 2, shows the quantity of *C. ramosus* and *P. trapezium* meat collected in Palk Bay and the Gulf of Mannar. Generally, more *C. ramosus* than *P. trapezium* meat is collected. Totally, 73.5 tons of meat was collected from both species for export

Table 2 Collected meat quantity (in tons) of *C. ramosus* and *P. trapezium* in all potential landing centres

| Month | <i>C. ramosus</i> | <i>P. trapezium</i> | Year | |
|--------------|-------------------|---------------------|------|------|
| July | 3.8 | 3.5 | 1992 | |
| August | 2.1 | 1.7 | | |
| September | 1.9 | 1.2 | | |
| October | 2.2 | 1.8 | | |
| November | 1.5 | 1.9 | | |
| December | 3.4 | 2.2 | | |
| January | 4.6 | 3.1 | | 1993 |
| February | 4.8 | 3.6 | | |
| March | 4.4 | 3.8 | | |
| April | 3.9 | 3.2 | | |
| May | 4.2 | 3.1 | | |
| June | 4.8 | 2.8 | | |
| Total | 41.6 | 31.9 | | |

CONCLUSION

The exploitation of *C. ramosus* and *P. trapezium* has rapidly increased due to the demand for their shells, operculum and meat. At present, gastropod fishing is mainly done in or around the coral habitats. Detailed survey should be made to find new fishing grounds. The postharvest technology of these gastropods is not hygienic. Fishermen should be properly educated about cleaning and storage of the meat. The government should also encourage the entrepreneurs and those involved in meat trade to promote export of these gastropods.

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APPENDIX 1

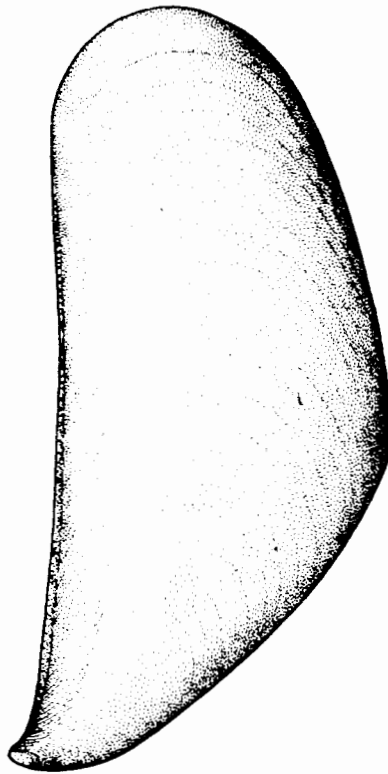
Monthly landings (tons) of *C. ramosus* in all the potential landings centres.

| Name of landing site | 1992 | | | | | | 1993 | | | | | |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-------------|-------------|-------------|-------------|
| | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | Jun. |
| Thondi | — | — | — | — | — | — | 3.6 | 4.2 | 2.8 | — | — | — |
| Mandapam | 1.2 | 1.8 | 1.4 | 1.5 | 1.3 | 0.6 | — | — | — | — | — | — |
| Pamban | — | — | — | — | — | 1.6 | 12.8 | 9.5 | 7.4 | 12.3 | 14.9 | 15.8 |
| Thangachimadam | — | — | — | — | — | — | 14.2 | 13.9 | 1.3 | — | — | — |
| Moontruchatram | — | — | — | — | — | 8.5 | 6.9 | 5.4 | — | — | — | — |
| Kunthukal | 3.4 | — | — | — | — | 7.6 | 6.2 | 8.4 | 5.1 | 4.5 | 6.4 | 4.8 |
| Vethalai | 10.8 | 6.3 | 4.3 | 7.4 | 6.2 | 12.4 | 11.9 | 11.3 | 8.5 | 5.4 | 3.7 | 4.2 |
| Kilakarai | 8.4 | 5.5 | 4.8 | 3.6 | 5.1 | 4.7 | 9.2 | 8.5 | 7.9 | 5.2 | 4.2 | 8.4 |
| Ervadi | 5.8 | 4.7 | 4.9 | 5.2 | 3.6 | 2.1 | 6.4 | 5.6 | 4.8 | 3.9 | 4.2 | 2.1 |
| Vallinoorkam | 6.7 | — | — | — | — | — | — | 9.5 | 11.6 | 12.3 | 10.7 | 9.2 |
| Munthal | 4.6 | — | — | — | — | — | — | — | 10.2 | 8.9 | 8.5 | 7.7 |
| Mukair | 2.9 | — | — | — | — | — | — | — | 2.8 | 4.2 | 3.7 | 5.3 |
| Naripaiyoor | 2.1 | — | — | — | — | — | — | — | 1.6 | 3.2 | 2.8 | 4.7 |
| Rocemanagar | 5.4 | — | — | — | — | — | — | — | 2.8 | 6.4 | 5.9 | 7.2 |
| Vaipar | 4.6 | 2.3 | 5.9 | 4.6 | 3.8 | 8.7 | 9.6 | 7.2 | 5.9 | 3.5 | 2.4 | 6.8 |
| Tuticorin | 15.5 | 18.4 | 17.4 | 12.0 | 8.6 | 14.9 | 22.5 | 17.5 | 11.3 | 10.9 | 11.9 | 12.6 |
| Total | 71.4 | 38.7 | 38.7 | 34.3 | 28.6 | 61.1 | 103.3 | 101.0 | 84.0 | 80.7 | 79.3 | 88.8 |

APPENDIX 2

Monthly landings (tons) of *P. trapezium* in all the potential landings centres.

| Name of landing site | 1992 | | | | | | 1993 | | | | | |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | Jun. |
| Thondi | — | — | — | — | — | — | 1.6 | 1.5 | 2.8 | — | — | — |
| Mandapam | 1.6 | 2.8 | 1.9 | 0.6 | 1.4 | 0.5 | — | — | — | — | — | — |
| Pamban | — | — | — | — | — | 5.3 | 6.2 | 5.7 | 4.3 | 2.1 | 1.8 | 1.4 |
| Thangachimadam | — | — | — | — | — | — | 3.6 | 2.9 | 3.2 | — | — | — |
| Moontruchatram | — | — | — | — | — | 9.6 | 4.8 | 5.3 | — | — | — | — |
| Kunthukal | 2.6 | — | — | — | — | 6.1 | 7.3 | 5.2 | 4.8 | 6.5 | 4.8 | 7.8 |
| Vethalai | 9.6 | 4.2 | 3.6 | 7.2 | 1.5 | 1.3 | 5.8 | 6.4 | 7.6 | 3.2 | 4.9 | 3.4 |
| Kilakarai | 5.3 | 10.1 | 4.8 | 3.2 | 4.4 | 0.6 | 9.4 | 5.3 | 6.8 | 2.4 | 3.8 | 6.0 |
| Ervadi | 2.4 | 2.6 | 3.6 | 5.4 | 6.8 | 3.1 | 3.3 | 6.4 | 5.3 | 6.8 | 5.3 | 2.1 |
| Vallinoorkam | 2.3 | — | — | — | — | — | — | 7.4 | 6.3 | 6.6 | 5.2 | 4.8 |
| Munthal | 4.8 | — | — | — | — | — | — | — | 10.2 | 8.6 | 7.6 | 5.3 |
| Mukair | 2.5 | — | — | — | — | — | — | — | 8.4 | 9.2 | 8.7 | 6.5 |
| Naripaiyoor | 2.2 | — | — | — | — | — | — | — | 3.4 | 4.3 | 6.5 | 4.6 |
| Rocemanagar | 6.8 | — | — | — | — | — | — | — | 2.6 | 2.3 | 5.2 | 7.8 |
| Vaipar | 7.5 | 4.2 | 4.8 | 3.6 | 2.8 | 5.3 | 6.5 | 7.6 | 5.5 | 4.8 | 6.4 | 3.2 |
| Tuticorin | 10.3 | 7.4 | 12.8 | 14.3 | 12.3 | 9.2 | 11.9 | 15.4 | 10.6 | 7.5 | 5.6 | 8.2 |
| Total | 57.9 | 31.3 | 31.5 | 34.3 | 29.2 | 41.0 | 60.4 | 69.1 | 81.8 | 64.3 | 65.8 | 61.1 |



Perna viridis (L., 1758). PMBC 1138.
Drawing by Patairat Singdam.