

a can of juveniles (P30) can fetch P90-150 at harvest after a month.

February to October is the period when *agiis* juveniles are plentiful. But Bayhon says that most of the time, *agiis* is abundant year round. When *agiis* is not available in his area, he gets his juveniles from Hinigaran, Negros Island, but he complains that *agiis* from Negros are harder shelled than *agiis* from his home place.

*Agiis* is harvested with the use of a nylon mesh net sewed to resemble a cone almost 5 m long attached to a bamboo frame. At the muddy bottom, *agiis* (including mud) are scooped into the net, and pushed to the farthest end of the



*A gatherer uses one hand to push agiis into the a net*



*A gatherer, at right, rinses the net of harvested agiis while another transfer agiis to the boat*

cone while continuously rinsing it of mud as *agiis* is pushed to the closed end of the net. The *agiis* are further rinsed and transferred to boats.

### Feeding

Bayhon polycultures shrimp with milkfish and mudcrab in 110-ha ponds. At a stocking density of 3 shrimp per m<sup>2</sup>, he feeds 10 cans live *agiis* per day in combination with trash fish at age 1.5 months or at weight 20 g of shrimp. If he feeds *agiis* in the

☞ page 28

## Trochus: the mollusc for buttons

By **MB Surtida**

Except for those who trade it, little is known about trochus, also called top shell (*Trochus niloticus*). It can be referred to as the button mollusc because its shell is a highly priced export commodity that is manufactured into buttons for fashion houses in many developed countries like Italy, Japan, United States, the United Kingdom, and Austria.

The trochus is a marine mollusc that resembles a spinning top. The iridescent, inner layer of the top shell called mother-of-pearl is the preferred part for manufacturing buttons. Aside from its shell being exported to developed countries, the trochus meat is edible and cooked, dried or canned occasionally for consumption. In 1994, it was estimated that 80% of the trochus harvest in the South Pacific were taken for subsistence purposes. Thus, trochus growing is a possible entry for social and economic development in coastal areas in the South Pacific and Southeast Asia.

### The trochus characteristics

Trochus lives on coral reefs and reef flats. Its natural range is limited to a region from Ryukyu, through the Philippines, Indonesia, to Fiji, Vanuatu and northern Australia. But its geographical range has been "greatly enlarged by artificial distributions." They have been introduced successfully in many South Pacific countries because of its commercial value.

Trochus are mostly found in slabs of dead coral covered by small algae, diatoms, and marine protozoans (foraminifers). Large trochus stay in reefs that are exposed to wind. They usually cling to reef flats with their muscled feet. The depth they usually inhabit are the first ten meters but researchers have found some in 24 m depth.

Many countries in the South Pacific have been successful in collecting broodstock, inducing them to spawn, rearing larvae, and growing them to the preferred harvest size of 65-100 mm. Trochus broodstock are usually sizes 65-120 mm. It has been found that trochus spawns year-round every 2-4 months but in some places, spawning is defined during the warm months, October - April.

Twelve hours after fertilization, trochus eggs hatch. From trocophore to pediveliger stage, larvae are stocked 4-8 larvae per ml. Water is gently aerated and changed at least once daily. Larvae are then reared to veliger stage then transferred to juvenile rearing tanks.

One month prior to transfer of larvae to juvenile rearing tanks, algal cultivation should be started. The juveniles will be stocked in these rearing tanks when algae have grown on the walls and

☞ page 31

## TROCHUS . . . from page 21

plastic panels (35,000 pediveliger larvae per 1,000 l rearing tank). When juveniles are size 5 mm dia, they are transferred to 5,000 l splasher pools. Again when juveniles reach 10 mm dia they are transferred to be reared in 10,000 l concrete raceway tanks. In 8 months, juveniles reach 26 mm dia, and in two years, they reach market size of 70 mm.

### Trochus production

Countries in the South Pacific are the principal source of trochus but other producer countries are Indonesia, the Philippines, India, and Thailand. The Japanese trochus, called “Macassar” is considered the best quality shell, it serves as a standard for prices of the other quality shells. Purchase price of the “Macassar” was US\$2,000 per ton in 1982, while South Pacific trochus was US\$1,200-1,650 per ton. In 1982, Japan imported 2,069 tons. Manufacturers of trochus buttons are Japan, Korea, Indonesia, Taiwan, United States, and Italy. In northern Italy, 210 firms produce buttons. In 1997, world export price of trochus was US\$6,000-7,5000 per ton.

Demand for trochus in the world market fluctuates. A market survey of 56 designers, fashion houses, button distributors, and upmarket retailers in Italy, France, Germany, the United Kingdom, Japan and the USA in 1997 had several findings regarding trochus demand:

- (a) economic constraints and fashion trends varies by country: in the US, economic considerations are the main factors while in France, fashion trends appear to be dominant
- (b) the fashion industry anticipates a high demand
- (c) substitution of alternative materials (plastic buttons) will not produce a major shock in the industry
- (d) more than half of the market believes that direct purchases for finished buttons from producing countries would be beneficial to them
- (e) consumers’ environmental concerns would affect demand.

### Conclusion

The market projections and the state of aquaculture technology show the potential of trochus as an aquaculture commodity - a dollar earner and a source of food for subsistence coastal dwell-



*The inner layer of the top shell is made into buttons*

ers. As a dollar earner for developing countries, however, production would be dependent on high technology foreign manufacturers because processing from other countries such as the South Pacific cannot match “the long established and vertically integrated nature of the larger Japanese, Italian, and Spanish companies.” A study of the world market and the intricacies of marketing and processing of trochus can be studied and perhaps appreciated as a potential commodity for aquaculture in the Philippines and other neighboring countries.

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## WINDOW PANE . . . from page 23

rakes and dredges, dynamite fishing and compressor diving. Trawling kills recruits and broodstock of *kapis* and destroys the substrate. Mechanical rakes and dredges have the same effect, while dynamite fishing reportedly caused massive *kapis* mortalities even in deeper waters. Compressor diving is also destructive if the divers are not selective of the *kapis* they gather. Siltation caused by heavy floods and typhoons contribute to mortality. Silt covers the entire shell and clogs the mantle and gills.

But there is hope yet; there are efforts to revive the industry by reseeding formerly abundant natural beds. SEAFDEC/AQD, for example, has been helping the local government units in southern Iloilo (see boxed story on page 25).

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