BRACKISH-WATER AQUACULTURE IN TAHITI Oct-Dec 90

by

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A number of agencies and private individuals are involved in developing a variety of pond aquaculture activities, using saline water, in French Polynesia. These activities include green mussel grow-out, turtle head-starting, a territorial hatchery to provide seed for private farmers, and private prawn farms. The French Institute for Ocean Research (IFREMER) provides support for many of these projects.

Jean-Michel Griessinger, Director of the IFREMER station, says that IFREMER has in the past tried culturing locally available species in Tahiti, but trials mostly did not work out. As a result, IFREMER has targeted on the several 'classic' species that it now works on, all of which have been introduced to French Polynesia from elsewhere. With the advances in aquaculture techniques made in recent years, it might be time to look at some of the local species again, but IFREMER will not be giving this a very high priority as it does not want to disperse its effort too thinly. It is nevertheless keen to support Pacific Island enterprises where it can, and will consider any requests for technical expertise from Pacific Island countries or from SPC.

The central IFREMER facility holds broodstock of imported seabass (barramundi, *Lates calcarifer*). It has had several induced spawnings in the past, but in November 1990 had their first 'natural' spawning, brought on by temperature change and a switch to a high-protein feed. The juveniles are reared on rotifers that are also cultured at the station.

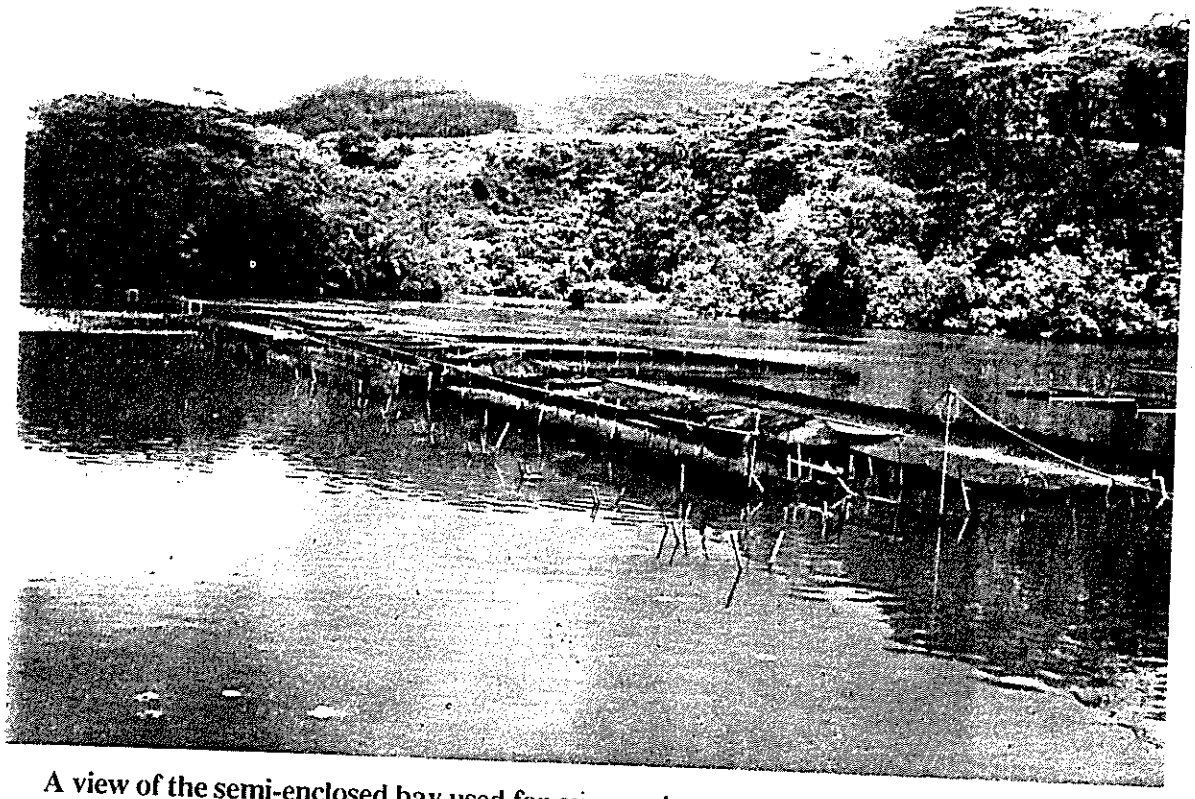
Barramundi (*Lates calcarifer*) are grown in floating sea cages in a sheltered part of the Tahitian lagoon. Solar panels power automatic feeders that provide regular, measured amounts of food to the fish.

IFREMER also continues to produce green mussel seed (*Perna viridis*) which are held until they are 1 cm long and then sold on, at 1,100 CFP per 1,000 spat, to the on-growing site, where they are reared in a natural semi-enclosed lagoon. The spat are placed in baskets with pieces of iron bar, to which they attach in a few days. The bars are then hung along racks in the lagoon. Feeding is natural, and experiments are being carried out at the moment with a system of fertilization of the water to enhance phytoplankton growth. There are problems with temperature, which can reach as high as 40° C at the bottom on a hot day, and with freshwater run-off which causes a zero-salinity layer to form at the surface. There are air bubblers at the inner part of the lagoon, partly to aerate the water but mainly to break down the thermal and saline stratification. During June—September, the water typically clarifies as plankton production stops, for unknown reasons. The fertilization experiment is partly intended to deal with this problem, but up till now attempts have usually been made to sell off the mussels at this time. They are sold when they reach a wet weight of about 20—30 g, i.e. 8—10 months old, at a price of 550 CFP francs/kg.

Green mussels (*Perna viridis*) are grown on from hatchery-produced spat on iron bars suspended in a shallow semi-enclosed part of the lagoon. These mussels are approaching marketable size.

The 3 ha lagoon should be able to produce about 8 tonnes of mussel per year, although this target has not been achieved so far.

The turtle head-starting scheme, run by the Fisheries and Aquaculture Extension Organisation (EVAAM), is at the same site. There are two batches of animals, one brought in as juveniles by a private individual, the other collected as eggs by the staff. Another collecting trip was made to Montpellier atoll in December, with the aim of bringing back ten nests of one hundred eggs each. The turtles are hatched and grown on with the aim of releasing half, and selling the other half on the commercial market in Papeete. The purpose is to restock wild stocks, and to start competing on the market with wild-caught turtle meat. Until recently, turtles were subject to size limits and seasons, but these were widely ignored. New legislation instituted recently makes it illegal for anyone to capture turtles without a licence from the Ocean and Aquaculture Service (SMA), which has the responsibility of managing fishery resources in French Polynesia.

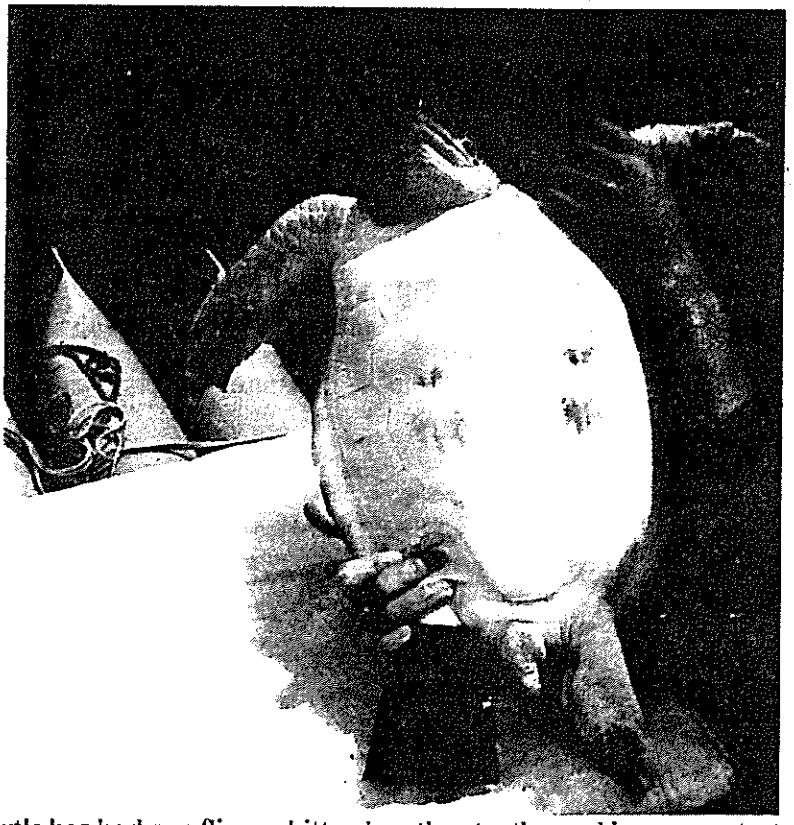


A view of the semi-enclosed bay used for on-growing mussels and turtles. The covered pens in the centre hold mussels that are being grown in phytoplankton-rich water from the fertilized enclosures behind. At the far right are the turtle pens.

The turtles already under culture are of two different age groups, the older from juveniles collected in 1989, the younger from eggs hatched in January/ February 1990. The smallest animals weigh about 1—4 kg, the biggest up to 14 kg, with a wide range of growth in each age class. They are kept in cages, with several animals of similar size to a cage, at a density of about one animal per cubic metre. The turtles are fed four times a day on prawn food pellets at the rate of six per cent of body weight per day for the small animals, falling to one or two per cent for the large. The animals that are to be put on the market will be reared to a weight of 40 kg, and are expected to fetch about 2,000 CFP francs/kg (meat only).

The main problem experienced so far is the animals biting each other. The bitten area necroses and goes white, attracting further bites. The staff normally treat the bites by protecting them from further attacks (using inner tubes), which works well and leads to recovery in a few days.

The biting is thought to be due not to overcrowding *per se*, but to the size of the cages, which do not allow the animals to swim very far. Some bigger cages, which will be stocked at the same density, will soon be built, in order to assess whether this is correct.



This captive turtle has had one flipper bitten by other turtles and is now protected by a 'shoe' made from an old inner tube.

Although IFREMER still produces small amounts of green mussel larvae, most larval production has now been passed over to the Territorial hatchery, which is run entirely by a local staff of 15, and which is presently producing seed of the prawns *Penaeus vanamei* and *Macrobrachium rosenbergi*. It also cultures feed organisms, including a local variety of the phytoplankton *Chaetoceros*. It will start with the green mussel *Perna viridis* next year, and ultimately *Lates calcarifer*, at which time IFREMER will cease production of these larvae.

Seed are produced for sale to local farmers, at the following prices:

Species	Price (CFP francs/1,000)	Planned annual production
P. vanamei	2,000	15 million
M. rosenbergi	1,250	6 million
P. viridis	1,100	3 million

(Figures for *P. viridis* are estimated only, as production has not started yet.)

There are three or four private farmers rearing prawns, all but one using the fresh-water *M. rosenbergi*, but all planning to transfer to the brackish-water *P. vanamei* in the near future. The transfer is because the product from seawater prawns is considered superior to fresh-water prawns, and because the strain of *P. vanamei* in Tahiti is highly disease-resistant. Once the transfer is complete, the hatchery will cease production of *Macrobrachium* spat.

Gerard Cuzon of IFREMER is working on nutrition issues, trying to develop aquaculture feeds that can be locally fabricated. This is being done for prawns at a factory that used to process coconut oil, although fabrication is entirely from imported raw materials. Different-sized feed pellets are manufactured to suit different sizes of animal, and the composition is adjusted to suit different species. (A modified version of the prawn pellets is being used to feed the head-started turtles, although attempts are still being made to improve these, in particular to make them float).

Finally, IFREMER is associated with a newly-established private company, Pacifique Aquaculture Services, run by J. F. Virmaux. The company is owned 65 per cent by Mr Virmaux and 35 per cent by France Aquaculture. France Aquaculture itself has changed hands, being now owned 70 per cent by SANOFI, a French-based international aquaculture conglomerate, and 30 per cent by IFREMER. IFREMER can thus be viewed as having a 10 per cent share in Pacifique Aquaculture Services (although the relationship is of course not quite so simple). Participation in a commercial venture of this type permits IFREMER to become involved in, or provide consulting services to, aquaculture projects elsewhere in the region on a commercial basis.