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Aquaculture of edible species in French Polynesia

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Abstract — In French Polynesia, the research on rearing edible species has began in 1971. The aims were : to develop the local production of sea foods to satisfy the domestic market and to create new activities and employments in rural areas.

The institutions involved in this development are : E.V.A.A.M. (Etablissement pour la Valorisation des Activités Aquacoles et Maritimes), S.M.A. (Service de la Mer et de l'Aquaculture) and I.F.R.E.M.E.R. (Institut Français de Recherche pour l'Exploitation de la Mer). E.V.A.A.M. and S.M.A. are French Polynesian territorial agencies. I.F.R.E.M.E.R., is a French metropolitan Government agency.

The first step in the research /development process had been to select the more suitable species. After a few years of screening, nine candidates were selected :

- Mollusc : **Saccostrea echinata, Crassostrea rhizophorae, Perna viridis.**
- Freshwater prawn : **Macrobrachium rosenbergii.**
- Seawater Shrimp : **Penaeus monodon, P. indicus, P. stylirostris, P. vannamei.**
- Finfish : **Lates calcarifer.**

The second step has been to control, on a routine basis and at a pilot-scale the different phases of the rearing : maturation, larval rearing and grow-out. The last was to transfer the technology to the private sector.

Nowadays, edible mollusc and finfish cultures are still experimental, but three intensive shrimp farms (1ha each) and three *Macrobrachium* farms (10 ha, 2,5 ha, 2,8 ha) are producing at a commercial scale. In 1988, 40 tonnes of shrimps and 20 tons of fresh water prawns have been harvested; the pilot hatchery of the C.O.P. produces the seeds and a local feed mill the food. The territory of French Polynesia is now constructing a commercial hatchery that will allow the development of new farms.

So the future of aquaculture in Polynesia must be an increase in the crustacean production, but also in the development of net-pen for fishes.

The aquaculture of edible species in French Polynesia is still a new activity, without any real tradition. It really started during the 1970's when the French state agency was in charge with marine resources management,

CNEXO (C.O.P.) to develop aquaculture technics for the tropical and subtropical countries. The French Polynesian Territory and its fishery agency (**E.V.A.A.M. - S.M.A.**) were associated, from the beginning, to the different research programmes aimed at the selection of the best candidate species, their propagation and the different culture methods.

Most of the experimentations and pilot scale studies were conducted in Tahiti and since no species of commercial interest were found in Polynesian waters, all species had to be imported from countries all around the Pacific region and raised in captivity. The Territory profited by these activities and one can now really speak of a polynesian aquaculture, adapted to local conditions and the socio-economical context. If the quantities of fresh water prawns, shrimps, molluscs and finfish produced may look as insignificant compared to world production, the technologies used are modern and compared very advantageously to others. An increasing part of the local market is being satisfied and the initial promoting role played by the **IFREMER** is rapidly being taken over by the **E.V.A.A.M. - S.M.A.** and the private sector.

1. THE INSTITUTIONS

They are the backbone of all the aquaculture activities and help directly or indirectly to the development of the productive sector by specific actions.

- The Oceanological Center of the Pacific (**C.O.P.**)
 - Selection of adapted species and culture methods
 - Constitution and management of the brood stocks needed
 - Pilot scale experimentation
 - Studies on feed formulation and processing technics
 - Technical assistance
 - Training of **E.V.A.A.M.** Technicians
 - Evaluation of the problems encountered by the existing farms, cultures and other related activities.

- The agency for the valorization of aquacultural and marine activities (**E.V.A.A.M.-S.M.A.**).
 - Technical assistance to grow-out farms
 - Management of demonstration farms and cultures
 - Production of juveniles of all cultured species in the **COP** facilities and, by the end of 1989, in their own facilities
 - Promotion of aquacultural technics and enforcement of the Territorial politic for aquaculture (legal and economical aspects, land and lagoon uses).

— The « Huilerie de Tahiti »

This semi-private feed mill, in addition to coprah oil production and the manufacture of cattle and poultry feeds, produces fish and shrimp feeds with the COP technical assistance.

2. THE PRODUCTION

— Freshwater prawns

- Selected species : *Macrobrachium rosenbergii*
- Evolution

YEAR	POSTLARVAE PRODUCED (X10 ⁶)	CULTURE AREA (HA)	YIELDS (MT)
1976	1	3	2
1980	3	5	6
1982	5	15	13
1988	5	15	20

- The farms : AQUAPAC 10 hectares
LAGARDE 2.5 hectares
E.V.A.M.M. 2.5 hectares.

● The slight increase of the production is mainly due to a better management of the farms and an optimization of discontinuous culture system. Production will not increase much more until more postlarvae can be produced by the Territorial hatchery which is built-up. New farms can also be constructed.

- Sale price of postlarvae 10 US \$/1000
- Sale price of prawns 15-20 US \$/kg

— Shrimps

- Selected species *Penaeus Vannamei*
 P. stylirostris
 P. monodon
- Evolution

YEAR	POSTLARVAE (X 10 ⁶)	CULTURE AREA (HA)	YIELDS (MT)
77	1.8	0.7	1.5
80	1.2	3.0	3.0
83	3.8	3.0	4.5
86	3.8	3.0	10.0
88	11.6	6.0	40.0

The farms :	SOPOMER	1.0 ha
	TAIARAPU Aq.	1.0 ha
	AQUAPAC	1.0 ha
	E.V.A.A.M.	2.3 ha
	COP	0.7 ha

- Many reasons for the increase of the production :
 - increase of the grow-out ponds total area,
 - intensification of the cultures,
 - regular supply of postlarvae of the difficult species,
 - producers master the technics
- Sale price of postlarvae : 9 US \$/1000
- Sale price of shrimps : 15-20 US \$/kg

— Bivalves

- Evolution

YEAR	SPAT PRODUCED (X 10 ⁹)	YIELDS (MT)
79	3.0	4.0
81	1.5	5.5
83	5.2	4.0
85	2.5	18.0
88	2.8	6.0

- The production is carried out in the very few propitious protected bays and shallow coastal lagunas of the Society Islands under the supervision of **E.V.A.A.M.**

- The production is very irregular due to the low productivity of the waters and the very variable hydrological conditions, mainly salinity and temperature.

- Sale price of spat : 10 US \$/1000
- Sale price of mussels : 4 US \$/Kg

— Finfish

- Selected species : *Lates calcarifer*
- Since 1987, experimental productions in pen-nets at the **COP** : 1.5 MT/year

— Feeds

- The production follows the demand to reach 200 MT in 1988
- The quality of the pellet is improving regularly
- Sale price : 0.9-12 US \$/Kg.

3. WHAT FUTURE FOR THE POLYNESIAN AQUACULTURE ?

— Increase of the production to meet the demand of the local market which is far from being satisfied.

	PRODUCTION 88 (HT)	IMPORTS 88 (MT)
Fresh water prawn	20	50
Shrimp	40	90
Mussel	6	60
Fish	> 4 000	2 000

For prawn and shrimp, this goal should be reached within a few years by :

- increasing the yields of the existing farms,
- building new farms according to the demand. For mussels, the rational use of the few propitious sites should allow a 50 MT production.

For finfish, now that the production of juveniles is possible in French Polynesia, the economic feasibility should be confirmed by a pilot-scale project in collaboration with **E.V.A.A.M.**

Regular and sufficient supply of juveniles of the different species.

This production is now realized in the **COP** facilities but it is limited by the size of the installations and the other tanks assigned to the personnel. The construction of the Territorial hatchery is underway; It will be managed by **E.V.A.A.M.** with the technical assistance of **COP** and will also include all the facilities to maintain the different broodstocks. This will enable the **COP** to reorient its activities toward new subjects and the improvement of the actual technics.

— Conditions for a successful Polynesian aquaculture.

Different measures should be planned :

- a middle and long term plan for the development of aquaculture,
- an easier access to potential sites,
- territorial support for the supply of juveniles,
- financial incentives for the potential investors.

Now that the production is increasing, the technics are mastered and the local market is conditioned to the aquaculture products, the private sector still hesitates to enter this new activity due to the limited local market and the large investments required. The exportation of aquaculture products might be the solution but the production costs are still high and make the products incompetentive.