

Spat collection of giant clams *Tridacna maxima* : first results and promises from Eastern Tuamotu lagoons

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French Polynesia Fisheries agency « service de la pêche » has developed a program based on management, exploitation and restocking of giant clams, *Tridacna maxima*. I

In order to set up a rational exploitation scheme of this resource and sustainable incomes for targeted islanders, fisheries and aquaculture research has been investigated. An original and suited model of development has been designed and implemented for this species :

spat collection techniques, transport, rearing and restocking techniques have been designed and mastered in Tatakoto and Fangatau lagoons, with a view to get sustainable exploitation of giant clams on different markets

GIANT CLAM IN FRENCH POLYNESIA

The international trade market of giant clams is regulated by the CITES (International Convention on the Trade of Endangered species). World Ornamental market for giant clams is :

✓ average 200 000 clams per year, from which 50% only for *Tridacna maxima*

In French Polynesia, *Tridacna maxima*, the most represented species, is :

- ✓ Regulated by a resolution setting 12 cm as the size limit of the shell for fishing, transport, holding, marketing and consumption,
- ✓ Overexploited in some islands, but well-represented in a few lagoons of Eastern Tuamotus and Australes archipelagos
- ✓ Consumed on Tahitian local market at a level of around 70 tonnes of flesh, that is about 300 000 individuals every year.

Worldwide highest densities



Remarkable clustered structures (locally called « mapiko ») and natural densities up to 500 clams per m² in Tatakoto

FANGATAU ET TATAKOTO : TWO ATOLLS PILOT FROM EASTERN TUAMOTUS

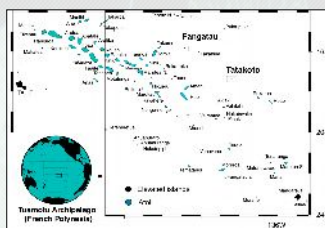


Figure 1: Fangatau and Tatakoto location

Caractéristiques générales de Fangatau et Tatakoto

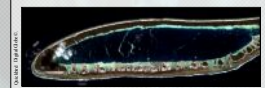
- ✓ North-East Tuamotu (Fig. 1)
- ✓ Small size atolls, shallow lagoon without any pass
- ✓ Lagoons with exceptional richness of giant clams
- ✓ Local economy based on copra and recent exploitation of giant clam flesh on tahitian market



Fangatau

- 150 inhabitants
- 9.9 km² lagoon
- Reef aperture rate of 6.4%
- Exploitable stock (> 12 cm) of 364 +/- 85 tons of flesh
- Around 4 tons of flesh exported to Tahiti every year since 10 years

- 250 inhabitants
- 19.62 km² lagoon
- Reef aperture rate of 12.1%
- Exploitation stock (> 12 cm) of 307 +/- 69 tons of flesh
- Around 20 tons of flesh exported to Tahiti every year since 10 years



Tatakoto

GIANT CLAMS COLLECTION, CULTURE, TRANSPORT AND RESTOCKING STUDY

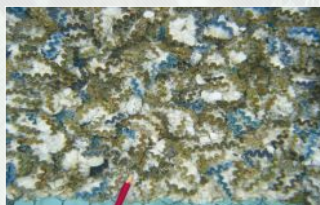
Giant clam spat collecting method

A specific approach : classic spat collection methods (for pearl oysters, oysters and mussels) have been fitted to giant clams

- Low depth submerged rafts (<2m) placed in the most lighted zone (for the zooxanthellae of giant clams mantle)
- Artificial shade cloth is laid down horizontally (face to sunlight) and hold tight (as *T. maxima* is usually anchored to hard substrate)



Lay down of a collection device for giant clams



Collected spats on collector

Spat collection : some results

- Spat shell length structure observed on collectors is related with the wild populations clam shell length structure (Fig. 2&3)
- Aged stock and spat collecting frequency low in Fangatau
- Young and well productive stock in Tatakoto : spat collecting is more frequent (reef aperture rate is two times higher thus increasing ocean-lagoon exchanges, therefore spawning).

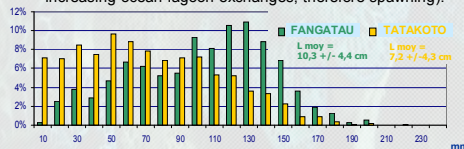


Figure 2 : Wild giant clams size structure in Fangatau and Tatakoto

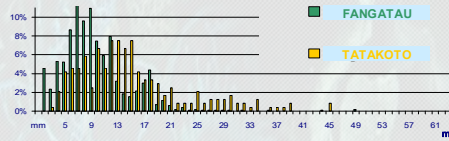


Figure 3 : Spat collecting profile one year after laying the devices

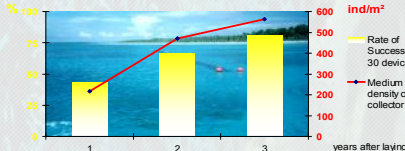


Figure 4 : Spat collection rate and density of giant clams spats

Transport method between islands

- ✓ Dry transport with preliminary freshwater bath to eliminate major epibionts
- ✓ Gel pack addition in freight box to low temperature and therefore slow down metabolism
- ✓ Maximum transport duration should be less than 12 hours for a 95% minimum survival rate.

Restocking results

- ✓ Total restocking of 36 355 collected giant clams, sizes ranging from 5 to 9 cm
- ✓ Best result is obtained on clustered shells habitat, with a global rate of 57.7% of clams alive settled 54 months after restocking
- ✓ New settlement of 20 to 30% of new spats is observed on giant clams reseeded on clustered habitat

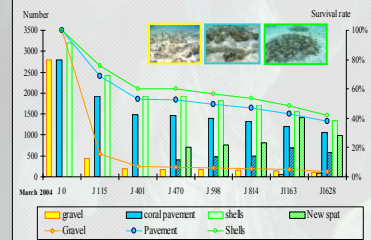


Figure 5 : Restocking type influence on survival of giant clams obtained after 4.5 years.

DEVELOPMENT OF GIANT CLAM AQUACULTURE BASED ON SPAT COLLECTION : PERSPECTIVES

Spat collection giant clams : which markets from short to long term duration ?

- ✓ On a short term period : niche market of marine ornamentals for a quality product and an eco-friendly image
- ✓ On a short term period : local eco tourism market for submarine gardens and for an exceptional image of the country
- ✓ On a mid-term period : international live giant clams flesh Market to be estimated (Japan, China, etc...)
- ✓ On a long term period : local flesh market Based on restocking of collected spats Model to be specified and planned out with islanders



Regulations suited to sustain development from remote islands

- ✓ Objective of new aquaculture regulation
 - spat collection development in suited sites
 - sustainable exploitation of the resource
 - collecting, rearing and restocking livestock traceability
- ✓ Main objectives of the future regulation on exportation :
 - banned wild adult stocks capture, (no traceability, nor warranty for the quality of the product)
 - promote sustainable development of a spat collection and culture based industry from remote islands
- ✓ This specific giant clam industry based on sustainable aquaculture and its unique characteristics must now become a succes story. Last but not least, it may help as a strong marketing key for eco tourism image in French Polynesia.



Restocking on clustered type habitat : « mapiko » reconstructed