# Organization of the genital tract of the japanese oyster, *Crassostrea gigas*.

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## INTRODUCTION

This work is a part of a study aimed at the control of the artificial reproduction in the *Crassostrea gigas* hatcheries.
This poster presents some data about the gametic pathway and the genital tract of this species. Indeed, although publications deal with this subject in bivalvia, only those of Galstoff (1969), Vilela(1975), Nascimento et Lunetta (1978) and Morales-Alamo and Mann (1989) provided this kind of informations, but on *Crassostrea virginica*, *Crassostrea angulata* and *Crassostrea rhizophorae*.

## MATERIAL AND METHODS

To built a coherent picture of the evacuationg system of the gametes, we have correlated results of :

* macroscopic observations of gonads injected with a microfil silicon rubber (Canton Biomedical products, Boulder, Col.,) into the genital tract from the genital orifice. A complementary macroscopic study was performed by injecting eosine into the gonopore,
* histological examinations of tranversal and longitudinal serial paraffin sections of the gonad.

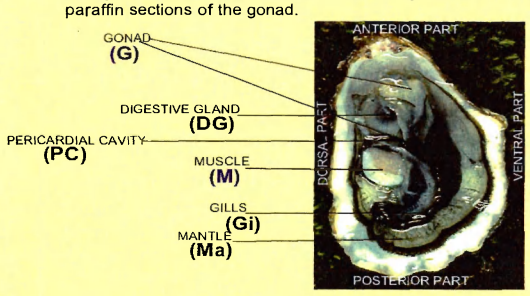



**Figure 1** : Oyster flesh in its left valve

## RESULTS

Macroscopical and histological studies show that the gonad develops between the disgestive system (Digestive gland, stomach, intestine) and the mantle, inside an interstitial tissue with energetic reserves (Figures 1, 2, 3).


**Figure 2** : Mature oyster

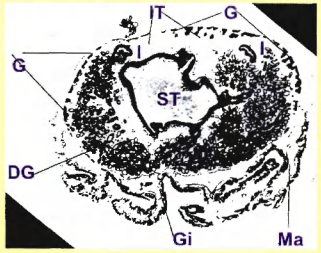



**Figure 3** : Tranversal section of an oyster which gonad is very reduced

**I : Intestine , ST : Stomach , IT : Interstitial Tissue**

The gonad appears as a complex tubular gland. The ramified tubules, in which the gametes develop, arise from the external surface of the gonad towards the digestive gland, inside the interstitial tissue. This tissue is very well abundant during the sexual rest and regresses as the gametes increase in number and size (Figures 4, 5, 6).
The japanese oyster is a successive hermaphrodite. But the oysters populations routinely contain around 5% of simultaneous hermaphrodites. In Brittany (France), during the middle spring, this percentage increases to 30 % (See LANGO et *al.*, in this Symposium).

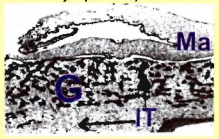



**Figure 4** : Tranversal sections of the mantle and gonad

**Figure 5** : Tubules with spermatocytes and mature spermatozoon

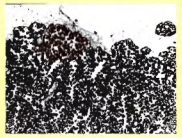
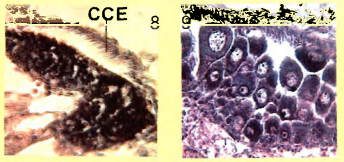


**Figure 6** : Tubules full of mature oocytes

On transversal sections of the genital gland, we can observe that the gonadic tubules born from the peripheric evacuating tracts (Figure 7). On their external side, the genital tracts are limited by a simple prismatic or cuboidal ciliated epithelium (Figures 8 and 9) which would correspond to the internal surface of the mantle. Their internal side is lined by a germinal layer which develops as ramified tubules in the depth of the interstitial tissue surrounding the digestive gland.


**Figure 7** : Gonadic tubules(GT) and evacuating tracts (ET).




**Figures 8 and 9** : male (8) and female (9) gametes developping along the internal side of the evacuating tract which is limited by a cubic ciliated epithelium (CCE).

The organisation of the superficial network of the genital tracts is very well revealed by the injection of a colouring matter and especially by the microfil resine injection (Figure10). The network of the tracts is divided in two main arborescent parts : one on the left side of the oyster and the other one on the upper right side (Figure 11).
From the anterior part of the animal, the gamete tracts progressively join together to form larger main gonoducts which come together and form a principal collector, located against the pericardial cavity which lines till the gonopore.

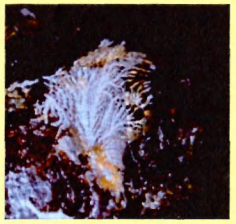


**Figure 10** : The genital tracts of the right side of the japanese oyster gonad appears white, after a microfil resine injection.

**Figure 11** : The left and right arborescent genital tracts of the japanese oyster gonad.

## CONCLUSION AND FUTURE

**The evacuating tracts are all around the gonad. They appear as spaces between the mantle and the gonadic tissue. This evokes the structure of the biliary canalicules which are in the liver of Mammals. This is an original organisation compared to other species of interest for aquaculture, the scallop *Pecten maximus*, for example : the structure of the oyster genital gland is more tubular than organized in *acini* which, on the contrary, are contained in the scallop genital gland ; In oyster, the gametes collector looks long compared to te collector of the scallop. It would now be interesting to precise what are the relationship between the genital tract, the main gamete collector and the urinary tracts.**
**All the information provided herin helps us to practise biopsies, especially in order to** determine the sex of alive oysters **artificially conditionned to spawn out of the normal spawning seasons.**

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