PRE-GROWING OF CUPPED OYSTER (*Crassostrea gigas*) IN THE CENTRAL ADRIATIC SEA USING DEVICES IN OPEN SEA*

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INTRODUCTION

In Adriatic Sea, shellfish aquaculture is almost totally based on mussels rearing in long-lines systems, not far away from the coastline. Even if oysters (*Crassostrea gigas* and *Ostrea edulis*), have to be considered a high value product if compared to mussels, oysters aquaculture, which can be successfully achieved in the same systems (Roncarati et al., 2012a, b), is still on a small-scale level for both species.
One of the main bottlenecks is represented by the necessity to start rearing from pre-grown spats (T12-T15) that present high prices (4-5 times the price of T2-T3 spats) and is poorly available on market.
The present trial aimed to assess the possibility to perform in open sea conditions the nursery stage from T2-T3 to T10-T12 spats, that is normally performed in land based farm (Flupsy or similar).

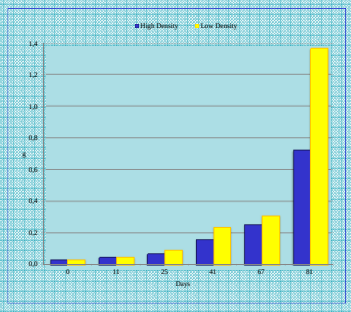
MATERIALS AND METHODS

For the trial, 50,000 cupped triploid oysters (0.033 g medium weight and 5 mm medium length) have been grown at two different densities (H, L) from April 07th to July 1st.
Nursery stage has been carried out using in 2 litres plastic cylinders, placed in Ostriga® lanterns. Two cylinders were put in each tray of the lanterns.
In each cylinder the surface covered with net was 600 cm² (65% of total surface) and the mesh side was 1 x 1 mm or 4 x 4 mm depending on spat size.
Every 15 days, oysters were controlled, cleaned and sampled. Initial cylinder densities were respectively 2,500 and 5,000 oyster spats.
On May 22nd (third control), grading took place and oysters of both the densities were divided in two sizes. Before and after grading, the "High density" has been maintained the double of the "Low density".
In the area where the trial has been performed, sea current was quite strong and continuous.
For growth control, medium body weight and total length were registered. Mortality rate of oysters was also monitored.

Different phases of oysters grading

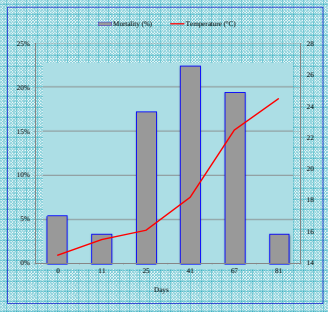
Cylinders used for the trial

Trend of mean body weight sampled at different times



Oysters sampled at the end of the trial

Trend of mortality rate in relation to seawater temperature



Weight sampling of weight of oysters

RESULTS AND DISCUSSION

With "Low density", final medium weights of small and large spats were respectively 0.66 g (LT 18.6 mm) and 2.82 g (LT 37.6 mm).
With "High density", final medium weights of small and large spats were respectively 0.62 g (LT 19.5 mm) and 1.34 g (LT 28.4 mm).
When seawater temperatures increased over 16° C, mortality started on all oysters batches. Final survival rate (45.7%) was similar for both densities. Even if the initial control was negative, the mortality is probably due to the herpes virus OsHv-1 µvar (Dundon et al., 2011; Segarra et al., 2008).
Pre-growing in open sea long-line systems can be successfully carried out.
Growth and quality parameters were encouraging, but growth was low if compared to nursery stages performed in land-based farm. Even if current in the area is quite strong, water flow in the cylinders is supposed to be insufficient. Further trials should be made with containers with at least 80% of the total surface covered with net.
Low density is recommended because of the higher growth rate and the lower size variability.
Even if size grading has to be considered a stress factor for the juveniles, it should be carried out with higher frequency to allow smaller individuals to grow better, because the largest specimens are presumably dominant competitors (Qu et al., 2009).
In previous trials, the mortalities due to the herpes virus were lower when oysters were more than 5-10 grams medium weight before the increasing of temperature over 16° C (May). Consequently, to reduce the impact of the herpes virus, spats should be grown earlier (January), from T6 size and in low density conditions to be able to reach such weight by the end of April.
Starting from T6 spats will also allow to use directly nets with mesh 4 x 4 mm with an increased water exchange in the cylinders.

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