REPRODUCTION OF BLACKSPOT SEA BREAM (Pagellus bogaraveo B.). IN CAPTIVITY

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ABSTRACT

This study analyzes the results of two blackspot seabream (Pagellus bogaraveo B.) breeding stocks during the last four years (1999/2002). One of this stocks is made up by individuals from the natural environment and the other one by individuals born in captivity (1997) and subject to different stabling conditions. The original stock (1991) was placed in 32 m³ tanks during an 8-year period, in which they were subject to different conditions until 1997, year in which the first lays were obtained. This stock was subsequently combined with a stock with a similar origin. They were placed together in a 120 m³ tank and the first lays at industrial level were obtained.

The stock was separated again (2002) and kept in 120 m³ tanks to the present.

The study of data obtained from the daily lays is graphically presented and the influence of the photoperiod and temperature on the last years lays is analyzed. The morphometric characteristics of eggs and larvae born from this stock were also checked, and the number of eggs/ml for volumetric calculations was determined.

RIASSUNTO

In questo lavoro si fa un riassunto (analisi) del comportamento di due stocks di riproduttori d'orata (Pagellus bogaraveo B.) durante gli ultimi quattro anni (1999/2002), uno dei quali d'origine selvaggia e l'altro di individui nati in cattività (1997) e stabulati sotto diverse condizioni.

Lo stock originario (1991) si è mantenuto in serbatoi di 32 m³ durante un periodo di 8 anni, periodo in cui sono passati attraverso diverse condizioni di stabulazione fin che nel 1997 vennero ottenute le prime deposte. Questo stock e un altro di simili caratteristiche per quanto riguarda l'origine si unirono posteriormente in un serbatoio di 120 m³, e si ottengono da questo momento in avanti le prime deposte a livello industriale.

Posteriormente lo stock venne separato di nuovo (anno 2002) mantenendo fino l'attualità ogni gruppo separato in due serbatoi di 120 m³.

Lo studio dei dati ottenuti delle deposte quotidiane, si rappresentano grafficamente e si analizza l'influenza del fotoperiodo e la temperatura nelle deposte degli ultimi anni.

Inoltre si verificarono le caratteristiche morfometriche delle uova e delle larve nate da questo stock e si calcolò il nº di uova/ml. per i calcoli di volumetria.

INTRODUCTION

Blackspot seabream is one of the species to which more research effort has been devoted during recent years in Spain. It is also probably one of the species that has had a greater demand in the aquaculture sector, both due to the results obtained in the development of its culturing technology and to the poor state in which this species fishing grounds are nowadays in the north, south and northwest waters (Fig 1) of the Iberian Peninsula (Peleteiro et al. 2000).

Due to its behavior and biological characteristics (Sánchez 1982; Krug 1990), this is one of the species with more possibilities to be repopulated along the Spanish coast. Recent information obtained regarding this aspect shows us the interest manifested by some Spanish autonomous communities for this species, which has a great socio-economic importance, to become selected for repopulation programs which can solve the current overexploitation state of some fishing grounds.

Experiences carried out during the last years with this species (Peleteiro et al. 2000), have clarified that it is an alternative to the culturing of consolidated species such as turbot in Galicia (NW Spain).

One of the current key factors for the development of this species culturing is reproduction control. This aspect had not been treated before due to the fact that the scarce number of functional breeding stocks made it very difficult to have readily available individuals for manipulation.

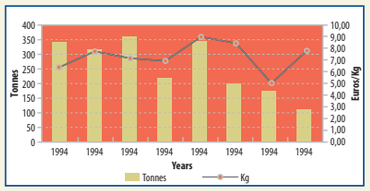


Fig. 1

Nowadays, the culturing technology has been transferred to the industrial sector and there are companies specialized in large-scale blackspot seabream culturing. This allows us to have a stock to be manipulated.

The first experiences with this species started in 1991 (Peleteiro et al., 1994), but we had to wait to 1997 to obtain solid results and think about culturing it at a commercial level.

MATERIAL AND METHODS

For this species culture two stocks were used: one from the natural environment and one born in captivity, with which there was an attempt to close the production cycle. All the individuals that made up both breeding stocks were individually marked with microchips. The natural lay season for this species starts in February and lasts to nearly May (Krug 1986,1990; Fernández Pato et al., 1990).

Originally, the stock which was housed in 32 m³ tanks (years 1991-1999) was formed by individuals from the natural environment (IEO). Some of these individuals had been fished being adults in commecial vessels and had been adapted to captivity, some others had been captured as juveniles and fattened at our facilities. This stock of 50 individuals underwent a controlled thermoperiod (14ºC) during the whole year for a 4-year period. During this period no lays were recorded. It also underwent an induction with LHRHa with progressive doses of 5.10 and 15 µ/kg (Peleteiro et al. 1997) but a positive answer was not obtained.

The first lays in captivity were obtained in 1997, once the fish was put again at ambient temperature.

This stock was mixed later (years 1999-2001) with a similar stock of 60 individuals (CIMA). They were housed in a 120 m³ circular tank placed in Valdoviño, Ferrol belonging to Luso Hispana de Acuicultura S.L., in which the first large-scale lays were obtained and somehow paved the way for this culturing industrial development.

At the present (years 2001-2002), the breeding stock which came from the natural environment has been separated again to their original state, obtaining a stock of 53 individuals in a 120 m³ circular tank (CIMA) and a stock of 40 individuals to which 20 individuals from the natural environment were added and they were housed in a 120 m³ rectangular tank (IEO).

Lays obtained by natural fertilization were collected in a 500 micron mesh collector and moved to open circuit incubators in which eggs in bad condition were removed until the embryonic development and eclosion were completed.

The lot formed by born in captivity individuals which had started to lay at age four (Peleteiro et al., 2000), suffered a great perivisceral fattening (12.5% fat) due to an improper feeding, which caused the suspension of the lays. Althought this stock feeding has notably improved during the last year, we have not obtained any positive result to date.

RESULTS AND CONCLUSIONS

Figure 2 shows the total eggs and larvae production from 1999 to 2002. Apart from the biological material needed to carry out the necessary experiences for the improvement of the culturing, feeding and other techniques the excess material was delivered to Luso Hispana de Acuicultura, a private company, for its exploitation.

The morphometric characteristics of eggs (ø 1,19±0,00215mm) and larvae were determined (table 1), as well as the necessary number of eggs/cc for the assessment of lays per volume which was determined to be of 870±46 eggs/cc.

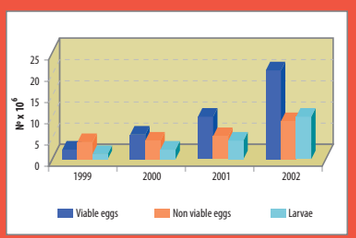
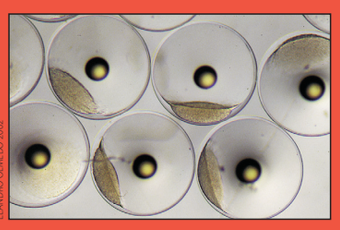


Fig. 2



The period of natural lay in captivity was determined. This period covers form the beginning of February to the end of May with some variations depending on the year, and there is a slight trend to be ahead each year in captivity, and the relation between temperature and feasible eggs production (Fig. 3).

Given the results obtained from previous experiences and using other sea bream behavior as a reference, we have decided to carry out for the next spawning period for this species a control of the photoperiod and thermoperiod to advance, in this case, the lays period relative to the natural period. This will allow us to obtain lays throughout the year and would open the possibility for new hormonal induction experiences.

Hours*	Total length	Vitelline sac length	Vitelline sac width	Oil globule diametre
0	3,70 ± 0,0935 mm	1,27 ± 0,0561 mm	0,52 ± 0,0663 mm	0,25 mm
24	4,13 ± 0,1983 mm	0,98 ± 0,0438 mm	0,43 ± 0,0335 mm	0,25 mm
41	4,28 ± 0,0718 mm	0,98 ± 0,6455 mm	0,44 ± 0,0391 mm	0,25 mm
65	4,50 ± 0,1089 mm	0,60 ± 0,0320 mm	0,41 ± 0,0421 mm	0,22 mm
95	4,72 ± 0,0893 mm	0,47 ± 0,0244 mm	0,31 ± 0,0294 mm	0,20 mm
115	4,80 ± 0,1065 mm	0,30 ± 0,0238 mm	0,27 ± 0,0238 mm	0,15 mm

Table I

* Hours age larva

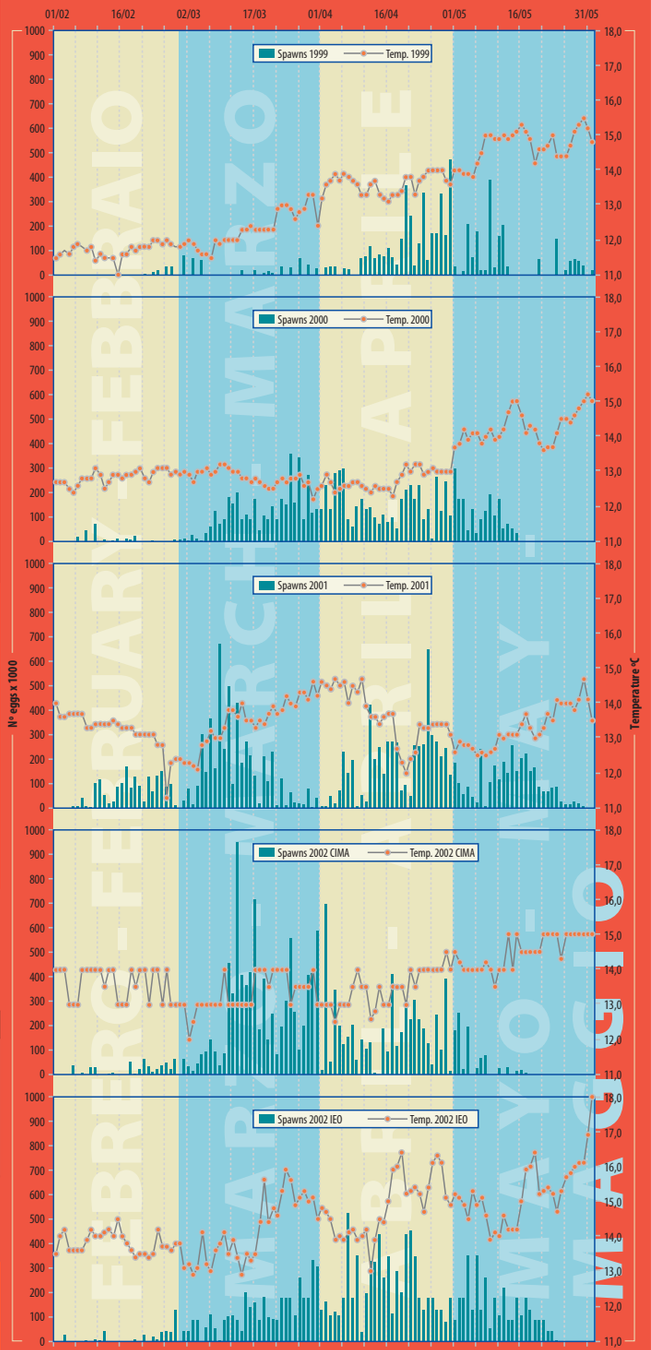


Fig. 3

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