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Experience with ongrowing juvenile blackspot sea bream (*Pagellus bogaraveo*) born in captivity, in tanks at different temperatures

M. Olmedo*, J.B. Peleteiro*, F. Linares, B. Alvarez-Blázquez*, C. Gómez* and A. Ortega*****
*Centro Oceanográfico de Vigo, Instituto Español de Oceanografía, Cabo Estay, Canido, Apdo. 1552, 36208 Vigo, Spain, e-mail: mercedes.olmedo@vi.ieo.es
**Centro de Investigacions Mariñas, Apdo. 13, 36620 Vilanova de Arousa, Pontevedra, Spain
***Centro de Experimentación en Acuicultura, Couso, Ribeira, 15960 La Coruña, Spain

SUMMARY – The results of experiences conducted on blackspot sea bream (*Pagellus bogaraveo*) during the growing stage have shown that an increase in water temperature improves growth in individuals from 2 to 20 g weight. On this basis, this work was designed in order to check if growth in this species may be accelerated over a longer period of time. A study was conducted on the effect of water temperature on fattening of the blackspot sea bream, comparing growth in fish kept in tanks with water at room temperature (13.6-19.2°C) with the growth of others kept in water heated at a constant temperature of 19±0.5°C. This experience was conducted with two batches of 300 fish, born in captivity, with an initial weight of 20.25±8.87 g and 48.74±14.16 g. These in turn, were distributed into groups in order to be able to make a comparison between the different conditions. Bimonthly samplings were made on size and weight, over the 18 months of the experience. The average weight attained by the smaller sized fish was 300.78±71.78 g for those cultured at room temperature, and 304.09±72.16 g for fish cultured in warm water. The larger sized individuals attained weights of 355.06±96.43 g and 359.42±78.93 g in water at room temperature and warm water respectively. Estimated daily growth rates [G = (Ln Pf/Pi)*100/t] were 0.30% and 0.31% for the groups of small fish, and 0.27% for all the larger sized fish. The results show no significant differences ($p < 0.05$) between the growth for the batches of fish fattened at the temperature ranges studied.

Key words: Blackspot sea bream, *Pagellus bogaraveo*, captivity, juveniles, ongrowing.

RESUME – *"Expérience de grossissement de juvéniles de la daurade rose (*Pagellus bogaraveo*) née en captivité, dans des bassins à différentes températures". Les résultats des expériences faites avec la daurade (*Pagellus bogaraveo*) au stade de préengraissage ont prouvé qu'une hausse de la température de l'eau augmente la croissance des poissons d'un poids d'entre 2 et 20 g. Sur cette base, nous avons mis en œuvre ce travail afin de vérifier si la croissance de cette espèce pouvait être accélérée pendant une période plus longue. On a réalisé une étude de l'effet de la température de l'eau sur l'engraissement de la daurade et nous avons établi une comparaison de la croissance de poissons maintenus dans des réservoirs d'eau à température ambiante (13,6-19,2°C) avec celle d'autres poissons maintenus dans de l'eau préchauffée à une température constante de 19±0,5°C. Nous avons réalisé l'expérience avec deux groupes de 300 poissons nés en captivité avec un poids initial de 20,25± 8,87 g et 48,74±14,16 g. Ces poissons ont été encore répartis en deux groupes afin de faire une comparaison des différentes conditions. On a établi des échantillonnages bimensuels de taille et de poids pendant les 18 mois de l'expérience. Les poids moyens atteints par les poissons de moindre taille ont été de 300,78±71,78 g pour les poissons cultivés dans l'eau à température ambiante et 304,09±72,16 g pour ceux cultivés dans l'eau chaude. Les plus grands ont atteint des poids de 355,06±96,43 g et 359,42±78,93 g dans l'eau ambiante et chaude respectivement. Les taux de croissance journalière [G = (Ln Pf/Pi) * 100/t] calculés ont été de 0,30% et 0,31% pour les groupes de petits poissons et 0,27% pour les poissons plus grands. Les résultats ont montré qu'il n'y a pas de différences significatives ($p < 0,05$) entre la croissance des deux groupes de poissons engraissés selon les degrés des températures étudiées.*

Mots-clés : *Dorade rose,* Pagellus bogaraveo*, captivité, juvéniles, engraissement.*

Introduction

Sea bream (*Pagellus bogaraveo*) rearing is currently under consideration as an alternative to other species now being reared, due to its high commercial value, scarcity in the market and biological characteristics, which make it suitable for life in captivity. This is one of the priority species selected in our lines of research, and the results obtained in terms of growth in captivity (Peleteiro *et al.*, 1994),

spawning and larval culture (Peleteiro *et al.*, 1997; Olmedo *et al.*, 1998) appear to show a great potential in the species for rearing.

Initial results for ongrowing (Greco *et al.*, 1989; Chereguini *et al.*, 1990; Peleteiro *et al.*, 1994; Genovese *et al.*, 1998) were obtained from individuals caught in the natural environment. Ongrowing of this species, currently under study, is not as fast as for other sparids, such as Gilthead bream (Cejas *et al.*, 1993). This is probably due to the fact that there is no ideally specific food for this species and culture conditions are still not the most adequate.

It has already been shown that, during the prefattening stage, growth in sea bream improves as temperature increases (Olmedo *et al.*, 1997). This experience was designed to check if an increase in temperature could accelerate growth in the ongrowing state and, in this manner, attain the commercial size more rapidly.

Material and methods

The individuals used in this experience were from wild reproducing spawn stock at the Martesanal company, located in Valdoviño (La Coruña). These individuals were prefattened at the Oceanographic Centre in Vigo.

The experience was conducted with two batches (A and B) of 300 individuals each, with an initial weight of 20.25±8.87 g and 48.74±14.16 g. These batches were divided into groups and transferred to 2 x 2 x 1 m tanks, with water at room temperature or with water at a controlled temperature of 19±0.5℃.

The fish were fed with two types of food: Rodabex 5-7 mm, and Europa-16, 7 mm, both supplied by the company TROUW España, SA, with automatic food dosage. Daily food ration was 0.5-0.7% of fish weight.

Samplings were taken at two month intervals for size and weight, measuring the length to the caudal peduncle to the nearest mm below, and weight to 0.1 g. Individuals were previously anaesthetised with MS-222 (80 mg/l).

Growth curves and corresponding equations were drawn for all groups. Daily growth curves were also calculated [G= (Ln Pf/Pi)*100/t], where Pf is the final weight and Pi the initial weight, and t the time passed expressed in days.

Data were analysed by an ANOVA and comparison was made of the growth curve slopes (t-test).

Results and discussion

Average weight attained by the smaller sized individuals over the 18 month period of the experiment, were 300.78±71.78 g for those reared in water at room temperature (13.6-19.2°C), and 304.09±72.16 g in warm water (19±0.5°C) and 355.06±96.43 g and 359.42±78.93 g for the larger sized individuals in water at room temperature and warm water respectively (Fig. 1).

Analysis of the results showed that the average weights of the individuals reared at room temperature do not differ ($p < 0.05$) in weight from those reared at controlled temperature.

To estimate growth, linear regression was applied, and the corresponding equations were obtained. (Figs 2 and 3). These equations were very similar to those obtained by Peleteiro *et al.* (1994), for wild sea bream ongrown from 170 g to 460 g.

Daily growth rates [G = (Ln Pf/Pi)*100/t] calculated were 0.30% and 0.31% for the groups of small fish, and 0.27% for all the larger individuals.

Tank mortality did not exceed 7%. Considering that blackspot sea bream is a species highly

sensitive to handling and stress, it is essential to maintain individuals under more controlled conditions (semi-dark and at greater depth) than other species, in order to improve survival.

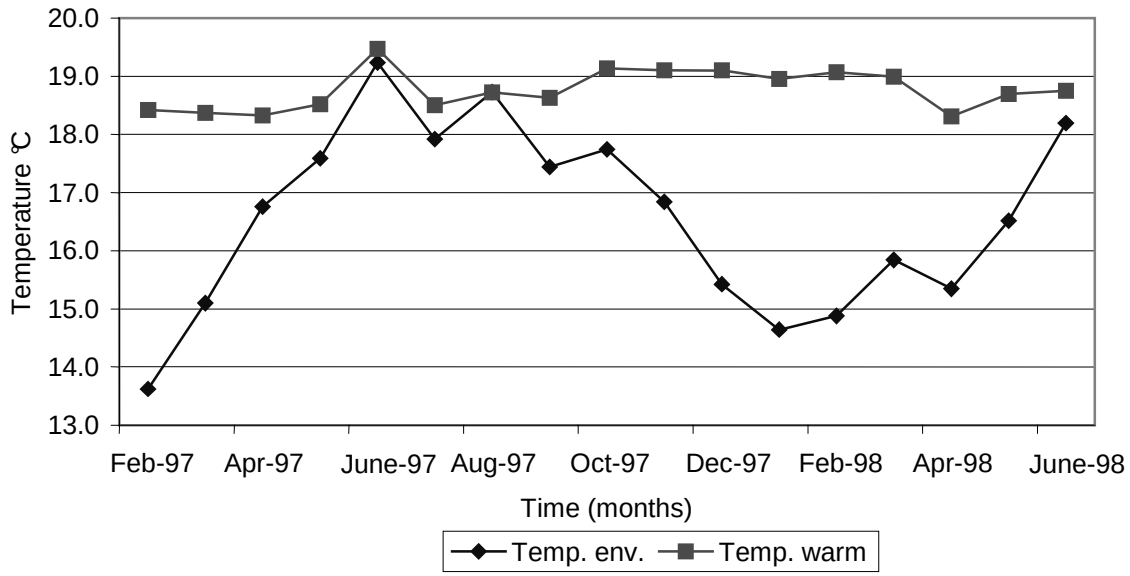

Fig. 1. Average temperatures throughout the experience.

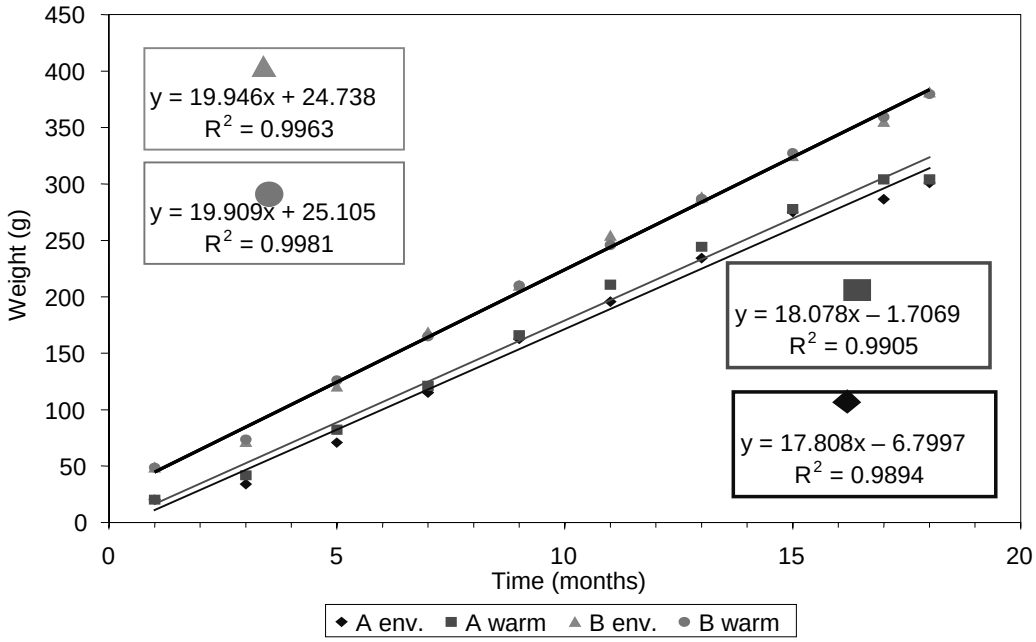

Fig. 2. Growth in weight.

Conclusions

During the study period on the ongrowing stage of sea bream individuals, with initial weights of 20-40 g, maintaining the fish at a constant temperature of 19±0.5°C exerted no influence on growth when compared with growth in fish maintained at room temperature.

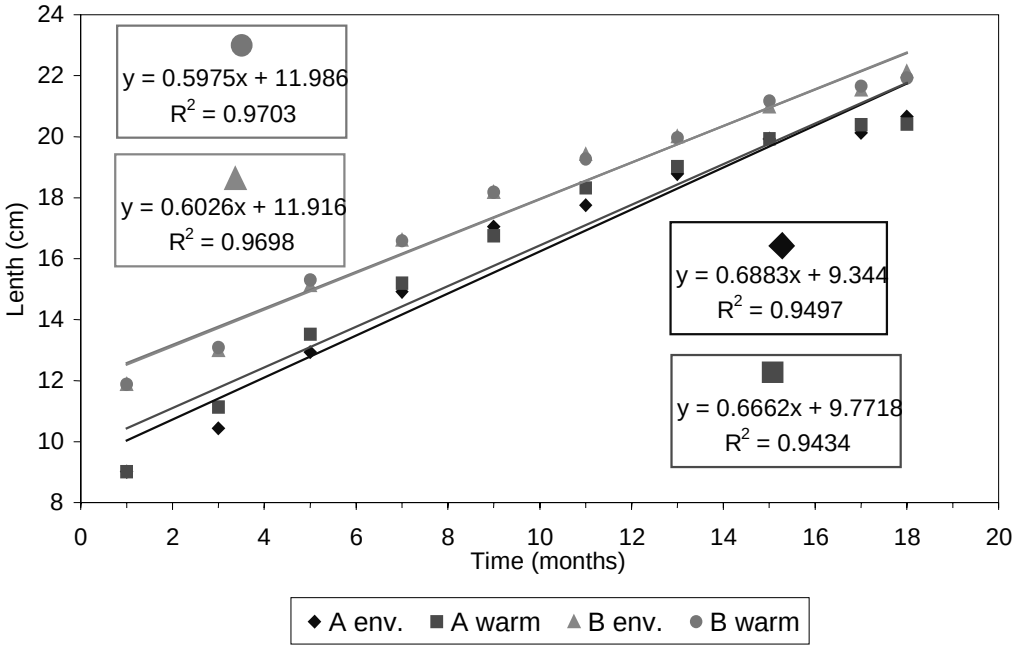

Fig. 3. Growth in size.

Sea bream growth, considered to be slower than in other sparid species experimented on, may be improved by administering a food specific for the species, able to meet its nutritional requirements. It would also be necessary to study aspects regarding the rearing conditions, such as the light and depth in tanks.

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