

POTENTIAL OF ALMAKO JACK *Seriola rivoliana* AS A FAST-GROWING SPECIES FOR EUROPEAN AQUACULTURE DIVERSIFICATION.

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Abstract

The almako jack *Seriola rivoliana* has been identified as potential candidate for aquaculture diversification due to their fast growth, excellent flesh quality and significant international market opportunities. The present work describes the adaptation of *Seriola rivoliana* broodstock in the Instituto Canario de Ciencias Marinas from year 2006 to 2009 and subsequent maturation, spawning and first larval rearing results. Twenty sub adults were captured by local fisherman in the South coast of Gran Canaria in May 2006. Initial fish weight (1.76 ± 0.25 kg), was increased to 6.0 ± 1.1 kg in July 2009. Every year fish were sampled to determine individual growth in weight and size. In addition, the evolution of sexual maturity state was established by gonadal biopsies. From July to October 2009, the use of repetitive hormonal injection (LHRHa) results in ten successful spawns (total 2.75 Millions eggs) with 72% of buoyant eggs and 92.5% mean fertilization rate. First results of larval rearing under Semi-intensive conditions showed an average survival rate 2.5% after 30day after hatching (dah) while less than 0.3% survival was obtained under intensive conditions. At 90 dah juveniles from Semi-intensive systems reach 26.7 ± 4.7 g and 14.2 ± 5.2 g fish produced under intensive system.

Introduction

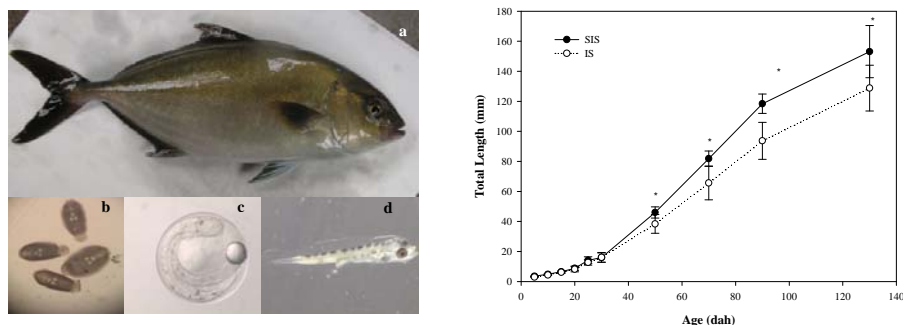
The almako jack *Seriola rivoliana*, is a circumtropical species belonging to the Carangidae family. In Eastern Central Atlantic regions can be found from Portugal (Azores and Madeira), Canary Islands to Cape Verde, (Fischer *et al.*, 1981), nevertheless, some individuals have been catch sporadically in the Mediterranean sea (Castríota *et al.*, 2002). A maximum standard length (SL) of 160 cm and a maximum weight of 59kg has been reported by IGFA, (2001). In the Canaries the most common sizes are between 55 and 80 cm (SL). Preliminary experiences with this species are limited to Ecuador in South America (Blacio *et al.*, 2003) and Hawaii (Laidley *et al.*, 2004) where an experimental production is being carried out. In order to promote the development of this species for aquaculture diversification in European waters, different experiences are being done with wild capture fish, adaptation to culture conditions and test with hormonal induce spawns have been carried out in the Canary Island. The aim of present work is to report the advances in the last three years of studies, such as viable spawns obtaining and first larval rearing trials with different techniques.

Materials & methods

Twenty sub-adults almako jack were captured by local fisherman in the South coast of Gran Canaria. Transported to on land facilities and kept in 10m^3 tanks. Fish were fed twice a week with commercial pellets (Vitalis Repro™), supplemented once a week with fresh food (squid and mussels). Once a year, standard length (SL), total weight (W) and condition factor $CF = (W/SL^3) \times 100$ were determined, also maturity stage was determined by gonads biopsy, and oocytes measurements. In July 2009, *S. rivoliana* eggs obtained from hormonally induced spawning (LHRH injection) were utilized to test semi-intensive (SIS: 4.5 eggs.l⁻¹ in 40m^3 tanks) and intensive (IS:125 eggs.l⁻¹ in 2m^3 tanks) larval rearing techniques. Larval rearing protocols followed similar methodology described by Roo *et al.*, 2009. Larval growth evolution in total length (TL) and dry weight (DW) was assessed measuring 25 larvae every 5 days until day 30dah.

Results and discussion

Survival of wild capture fish reach 75% of the initial population after three years in captivity. The main cause of mortality was a monogenean parasite (*Neobenedenia sp*) outbreak, previously reported in other *Seriola* species (Hirayama *et al.*, 2009), (Picture 1b). Initial fish weight 1.7kg (June 2006) was increased to 6.0kg in July 2009.



Picture 1: a) *Seriola rivoliana*; b) *Neobenedenia sp*; **Figure 1.** Larval growth in total length. c) Fertilized eggs; d) 3dah larvae.

Gonadal biopsies in years 2007/08 showed immature stages for both males and females, these results were associated to fish under first maturity size (>5kg) as it was reported by Laidley *et al.*, (2004). From July to October 2009, the use of repetitive hormonal injection (20µg/kg body weight LHRH) resulted in ten successful spawns (mean 275.000 eggs per spawn) with 72% of buoyant eggs and 92.5% fertilization rate. Hatching rate reach $79.03 \pm 11.37\%$ and larval survival at the time of yolk exhaustion was $52.39 \pm 19.5\%$. The results of first larval rearing trials under intensive and semi-intensives systems showed an average survival rate of at 30dah. Mean larval survival at 30dah was 2.5% in SIS and lower than 0.3% in the intensive one, recording massive mortalities in most of the test performed under this rearing system between 7 and 15dah. Larval growth in total length was significantly higher when semi-intensive system was applied (Figure 1) these results are in concordance with previous results reported by Roo *et al.*, 2009. Finally, at 90 dah juveniles from Semi-intensive systems reach $26.7 \pm 4.7g$ and $14.2 \pm 5.2g$ fish produced under intensive system, significantly higher in comparison to other species such as gilt head sea bream (1.5 g), red porgy (3.5g) or meagre (10g) at the same age and similar rearing conditions.

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