

Article

Spawning Induction of First-Generation (F1) Greater Amberjack *Seriola dumerili* in the Canary Islands, Spain Using GnRHa Delivery Systems

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Abstract: The development of a sustainable aquaculture industry requires the closing of the life-cycle of a potential species in captivity, and the establishment of breeding selection programs using hatchery-produced breeding stocks. The greater amberjack *Seriola dumerili* is a cosmopolitan pelagic species that has been considered as a good candidate for the species diversification of aquaculture production in the Mediterranean region. However, commercial production is still very limited due to bottlenecks in reproduction, larval rearing and management control during grow out. The aim of the present study was to examine the reproductive development of hatchery-produced greater amberjack and to develop a spawning induction protocol based on the use of gonadotropin releasing hormone agonist (GnRHa) in a controlled-release delivery system. The results showed that hatchery-produced greater amberjack undergo normal gametogenesis and can be induced to undergo maturation, ovulation and spawning after multiple administrations of GnRHa implants, over an extended spawning period lasting from May to September in the Canary Islands, Spain. The use of GnRHa-delivery systems resulted in multiple spawns of fertilized and viable eggs. Egg production was high and egg quality adequate for the implementation of larval rearing for commercial purposes. The handling required to administer the GnRHa implants during the prolonged spawning season did not result in any negative effect on the welfare and reproductive performance of the fish based on evaluation of several biochemical parameters. The developed reproduction control method shows great potential to advance the commercial production of greater amberjack, by enabling the use of hatchery-produced broodstocks for further breeding selection.

Keywords: *Seriola dumerili*; greater amberjack; induced spawning; GnRHa implants; broodstock; F1 fish; hatchery reared

1. Introduction

The greater amberjack *Seriola dumerili* is a cosmopolitan pelagic species [1] with high growth rate and excellent flesh quality [2–4]. It has been considered a good candidate for the species diversification of aquaculture production in the Mediterranean region [5]. However, commercial production is still very limited [2], due to bottlenecks in reproduction, larval rearing and health control during grow out. Recent research has evaluated the potential of wild-caught broodstock to mature and be induced to