


# The observed oogenesis impairment in greater amberjack *Seriola dumerili* (Risso, 1810) reared in captivity is not related to an insufficient liver transcription or oocyte uptake of vitellogenin

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## Abstract

The greater amberjack *Seriola dumerili* is an excellent candidate for the Mediterranean aquaculture, due to its large body size and high growth rate, as well as its high flesh quality and commercial value worldwide. For its successful incorporation in the aquaculture industry, an in-depth understanding of the reproductive function of the species under rearing conditions is necessary, since completion of oogenesis in captivity is currently a bottleneck for the commercial production of the species. Liver and ovary samples from wild and captive-reared greater amberjack females were collected at three different phases of the reproductive cycle: early gametogenesis (EARLY, late April-early May), advanced gametogenesis (ADVANCED, late May-early June) and spawning (SPAWNING, late June-July). The cDNAs of three vitellogenins (VtgA, VtgB and VtgC) were partially sequenced and a qRT-PCR for their expression was used to compare ovarian maturity stage and liver vitellogenin transcript levels between wild and captive-reared individuals. An extensive atresia of late vitellogenic follicles, which prevented any further oocyte development and spawning was observed in captive-reared individuals during the ADVANCED phase. The expression levels of the three vitellogenins, as well as the amount of yolk globules in vitellogenic oocytes, did not differ significantly between captive-reared and wild females, indicating that the observed oogenesis impairment in greater amberjack reared in captivity was not related to an insufficient liver synthesis or a reduced oocyte uptake of vitellogenin.

## KEYWORDS

greater amberjack, oogenesis, reproductive dysfunctions, *Seriola dumerili*, vitellogenin

## 1 | INTRODUCTION

The greater amberjack *Seriola dumerili* (Risso, 1810) is an excellent candidate for aquaculture production due to its large body size and fast growth rate, the high quality of its flesh (Nakada, 2000; Sicuro & Luzzana, 2016) and the high consumer acceptability worldwide (Lovatelli &

Holthus, 2008; Sicuro & Luzzana, 2016). The greater amberjack is a large migratory pelagic fish, with a cosmopolitan distribution in tropical and temperate waters (Bauchot, 1987; Cervigón, 1993; Smith, 1997), and females exhibit a group-synchronous ovarian development with a multiple spawning pattern (Díaz, García & Agulleiro, 1997; Marino, Mandich, Massari, Andaloro & Porrello, 1995).