



17 α -Methyltestosterone implants accelerate spermatogenesis in common snook, *Centropomus undecimalis*, during first sexual maturation



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ABSTRACT

The common snook, *Centropomus undecimalis*, is an emerging species for intensive fish culture, however, some reproductive aspects of this species, especially the development of the testes and the action of androgen hormones on spermatogenesis have not been studied. The objective of this study was to evaluate the effects of 17 α -methyltestosterone (MT) on spermatogenesis and steroidogenesis during the first sexual maturation of the common snook. The fish, which were reproduced in captivity, had a body weight of 305.80 \pm 35.60 g and a total length of 34.11 \pm 1.08 cm. We used ethylene-vinyl-acetate (EVAc) implants with four concentrations of the hormone MT: T1 (0.3 mg/kg); T2 (3.0 mg/kg); T3 (15.0 mg/kg) and T4 (30.0 mg/kg), and a control group that did not receive the hormone. The gonads increased ($P < 0.05$) in relation to the concentrations of MT. Histological analysis revealed a progression of spermatogenesis in the MT treatments, especially in T3 and T4. Sperm release was attained in some fish treated with MT. However, there was a partial suppression of the levels of testosterone (T) and 11-ketotestosterone (11-KT) in plasma in the MT treatments, indicating a negative feedback on steroidogenesis. However, this suppression of T and 11-KT in plasma did not prevent an increase in the gonadosomatic index and the progression of gametogenesis. There was also an increase of estradiol (E2) in plasma in the treatments with the highest MT concentrations. The results suggest that the application of EVAc implants with MT at concentrations of 15 and 30 mg/kg stimulates the development and growth of the testes and accelerates spermatogenesis.

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1. Introduction

The common snook (*Centropomus undecimalis*) is one of the largest fish in the Centropomidae family. It has fast growth, high market value, excellent flesh quality and is important to sport fishing in the American continent [1,2]. It is also considered an emerging species for intensive fish culture in the Americas [3]. The species is a protandrous hermaphrodite [4] and great efforts have been made to understand and improve its reproductive process in captivity.

Recent studies with this species, of induced spawning [5,6], parental contribution [3], egg and larval quality [7,8] and sex control [9,10], have contributed to its reproductive control. However, it is known that semen production of males in captivity is limited [11]. Thus, research is needed about development of the testes and the action of androgen hormones on gametogenesis in captivity. Studies that evaluated gonadal steroids in common snook in the natural environment found an increase of androgen hormones and development of the testes in relation to the reproductive season [11,12]. They also found that the hormone 11-ketotestosterone (11-KT) is the most abundant androgen in the plasma of males during the spawning season.

Androgen hormones can induce spermatogenesis in immature fish and during puberty [13]. These hormones are mainly produced in the gonads and variations in plasma concentrations regulate gonadal development [14] and stimulate GnRH production in the

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