

SWIMMING AND THE CONTROL OF REPRODUCTION IN MEDITERRANEAN AQUACULTURE

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The European sea bass (*Dicentrarchus labrax*) is an economically important fish species for Mediterranean aquaculture. One of the consequences of culture conditions promoting rapid growth is the advancement of the time of puberty in sea bass males, resulting in an increase in the rate of precocious sexual maturation and, consequently, in a significant economic loss for the industry. To date, photoperiod manipulation during juvenile stages has represented the only attempt at manipulating precocious maturation in male sea bass. Given that previous studies in the European eel and rainbow trout had shown that sustained swimming can delay ovarian development, in the present study we investigated whether swimming can reduce precocious maturation in juvenile male sea bass. Fish (N = 100; 3.91±0.22 g body weight) swam at their optimal swimming speed for a total of 10 weeks in a 3,600 L oval swim flume that also accommodated the resting controls (N = 100) in a separate chamber under low water flow conditions. At the end of the 10 week swim trial, fish were sacrificed and blood, testes and skeletal muscle samples were obtained. Our results indicate that swimming caused a significant (p<0.05) reduction of the gonadosomatic index (GSI), that was associated with a delay in spermatogenesis, as assessed by histological analyses. However, no significant changes in the plasma levels of the androgen 11-ketotestosterone (11-KT) were detected in male sea bass subjected to swimming. . Our results provide the first evidence that swimming may delay testicular development in juvenile sea bass. Consequently, the results from this study strongly suggest that reproductive development in male sea bass can be manipulated by swimming and introduce sustained swimming as a possible strategy to reduce precocious sexual maturation in male sea bass.