Sexual maturation in farmed Atlantic salmon: A review

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Abstract

The sexual maturation of Atlantic salmon Salmo salar is a multifactorial process in which fish acquire somatic characteristics to reproduce. In salmon farming has been described a high variability in the trait age at maturation derived from wild reproductive strategies. Early maturation is a phenotype that generates serious economic repercussions on both, sea cage and on land-based aquaculture systems. In view of the challenges of this problem for the global salmon farming industry, it is essential to thoroughly understand the influencing factors of early and late maturation to find efficient alternatives for managing the phenomenon. This review briefly describes sexual maturation in S. salar, its variability in cultures, and the factors influencing the maturation age trait at the physiological, genetic and environmental levels. The control of early maturity through changes to the natural photoperiod and through the use of genetic markers are discussed.

Keywords: sexual maturation, Salmo salar, multifactorial, reproduction, cultures, variability, photoperiod, physiological, genetic markers, GWAS.

Introduction

Sexual maturation in S. salar is a complex and multifactorial process whose purpose is to acquire the somatic and behavioral conditions necessary to perform reproductive functions. In both wild and domesticated populations, there is variability in the age at maturation a characteristic known as a life history trait – which can occur at an early or late stage in both males and females. These reproductive strategies were adopted by wild congeners to increase their reproductive success, perpetuate the species, and promote population sustainability.

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