

Abstract

Photoperiod is an environmental regulator of growth and sexual maturation in Atlantic cod as well as other species of fish. In this study, cod juveniles are exposed to a novel cold cathode light (CCL) system in order to study the effects on growth as well as a possible delay of sexual maturation later in the production process. CCL emit a single wavelength green light with improved distribution pattern in water compared to standard white light systems used in aquaculture. By starting continuous light treatment (24L:D0) at an early stage, while juveniles are still in hatchery tanks, “light adaptation” may occur, making photoperiod regulation more effective after transfer of the fish to sea-cages.

The aim of the study was to determine the effects of light treatment (24L:D0) using a new light technology (CCLs) on Atlantic cod juveniles at an early stage and study the relationship between growth and the concentration of insulin-like growth factor-I (IGF-I) in Atlantic cod plasma. The levels of IGF-I in plasma are measured using a radioimmunoassay (RIA) method. The light treatment did not significantly affect growth or survival of the Atlantic cod juveniles, but importantly, the CCL regime resulted in reduced incidence of skeletal deformities. In contrast to numerous studies on fish, no correlation was found between growth rate and plasma IGF-I levels.

Key words: Atlantic cod, photoperiod, growth, IGF-I, cold-cathode light