





IMPACT OF PHOTOPERIOD MANIPULATION ON THE FAST MUSCLE TRANSCRIPTOME AND GROWTH NORMS IN ATLANTIC COD Gadus morhua

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Understanding the effects of environmental factors the on development of aquaculture species is vital for optimizing rearing conditions. In this context, we investigated the influence of continuous and ambient light on the ontogeny trajectory of Atlantic cod (Gadus morhua) from 16-months of age leading up to puberty (~ 22 months).





Fig 1. Boxplots of weight before and after the light treatment for both ambient (pink and red) and continuous light (light blue and navy) regimes



Morphometric analyses revealed significant differences in weight and sexual maturation outcomes for both males and females (Fig. 1).

Atlantic cod under continuous light were larger and sexually immature, while those under ambient light displayed smaller with sizes concurrent sexual maturity.



In both males (Fig. 2) and females RNA-seq analysis revealed a number of differentially expressed genes with photoperiod in fast muscle. Under continuous light, upregulated genes to be involved appeared in Phosphoinositide 3-kinase (PI3K) and myosin complex as well as actin cytoskeleton, whereas downregulated genes were involved in catalytic and biosynthetic processes including autophagy-related pathways.

Fig 2. Volcano plot of differentially expressed genes between males exposed to continuous and ambient light.

Our data contribute to understand the molecular mechanisms underlying the regulation of sexual maturation by photoperiod in Atlantic cod.

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