

Growth, seawater adaptation and stress response of diploid and triploid Atlantic salmon (*Salmo salar*) fed two different diets during smoltification

Triploidy in salmon will help farming industry, ensuring fish welfare and environmental sustainability

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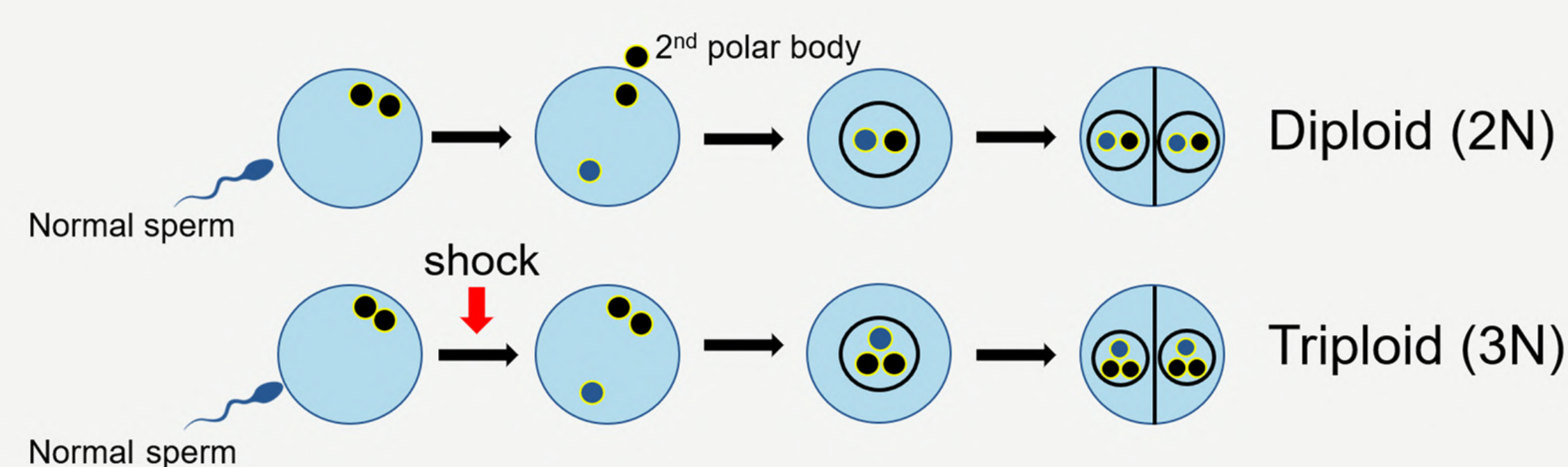


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INTRODUCTION

Triploidy is artificially induced for reproductive control and genetic containment, but are there any side effects on growth and stress status during smoltification? A panel of different physiological indicators was considered

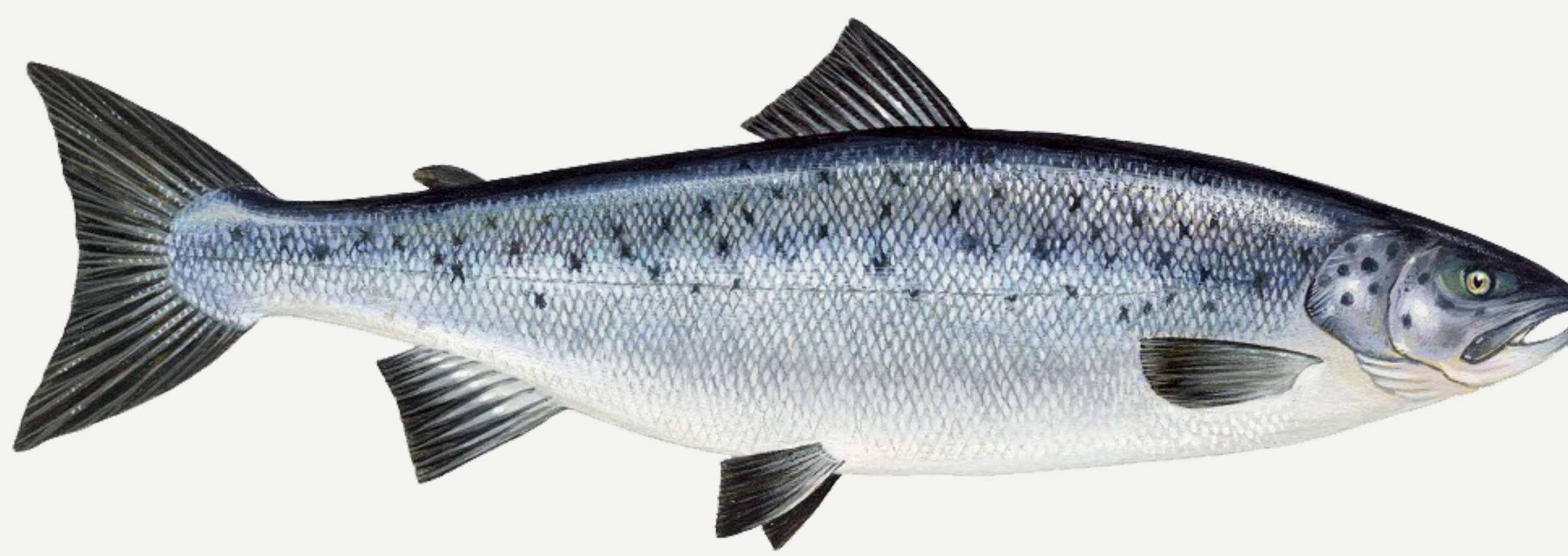
MATERIALS AND METHODS



- Radioimmunoassay for cortisol (HC) levels
- Real Time PCR for growth hormone (GH) and its receptor (GHrec), insulin-like growth factor I (IGF-I), Myostatin (MSTN) and heat shock protein 70 (HSP70) gene expression
- RNAscope® *in situ* hybridization for IGF-I mRNA
- Statistical analysis was carried out using a mixed model and means were compared using R software

MAIN OUTCOMES

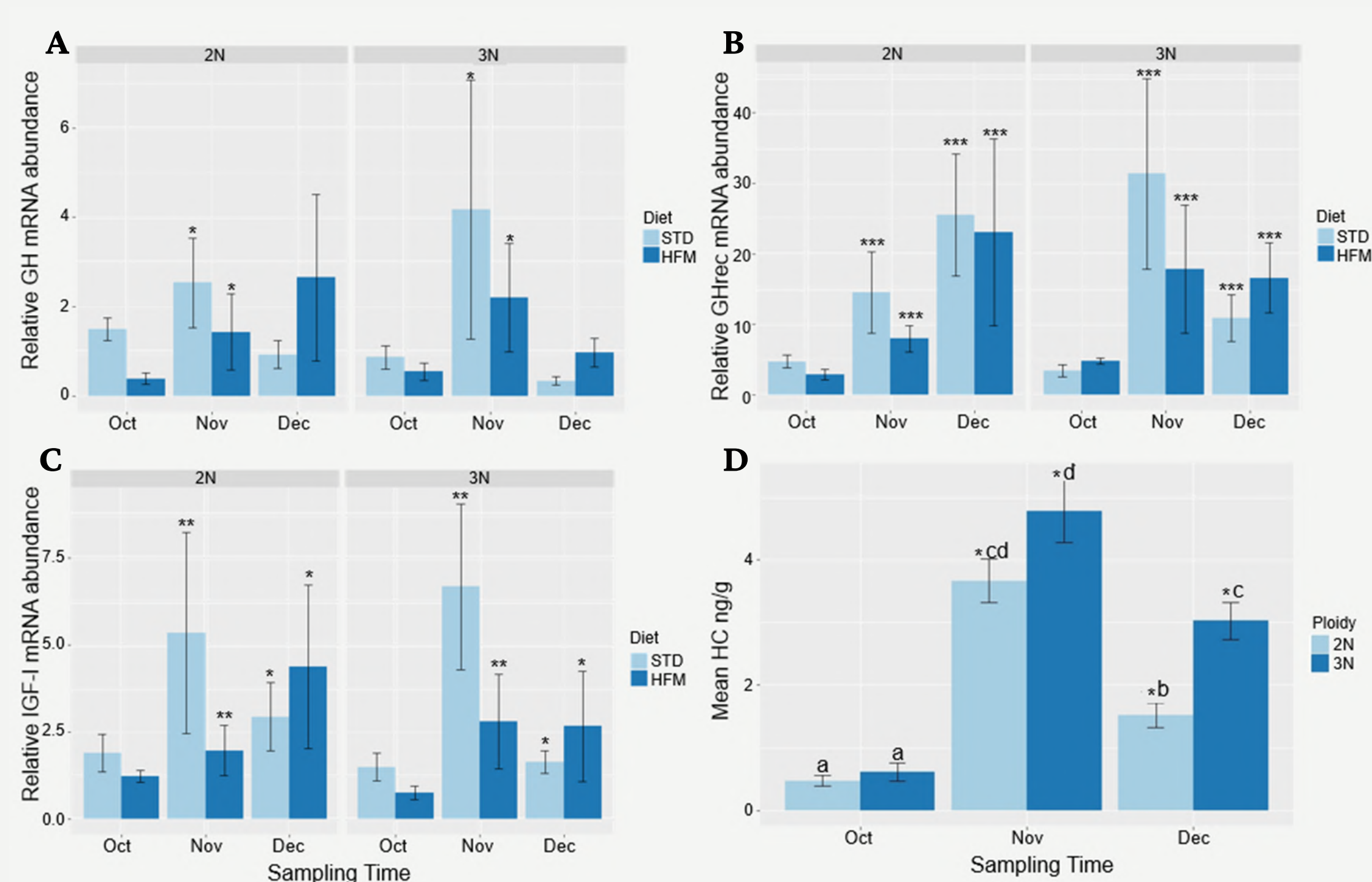
- 3N showed comparable growth and stress response to those of 2N
- GH/IGF-I axis and cortisol were strongly involved in the adaptation to marine life
- Diet did not affect seawater adaptation, growth and stress response
- The use of triploid salmon in aquaculture for reproductive control and genetic containment is feasible



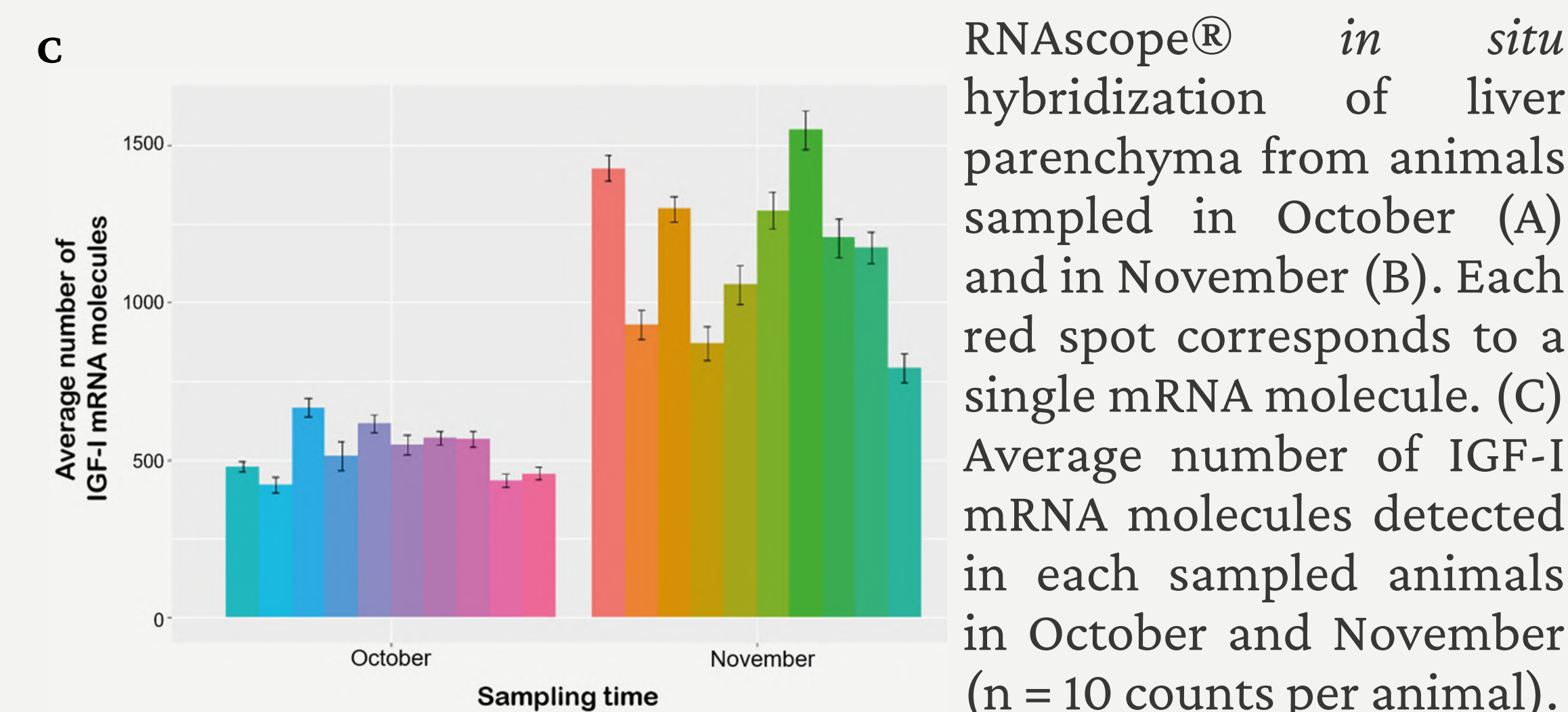
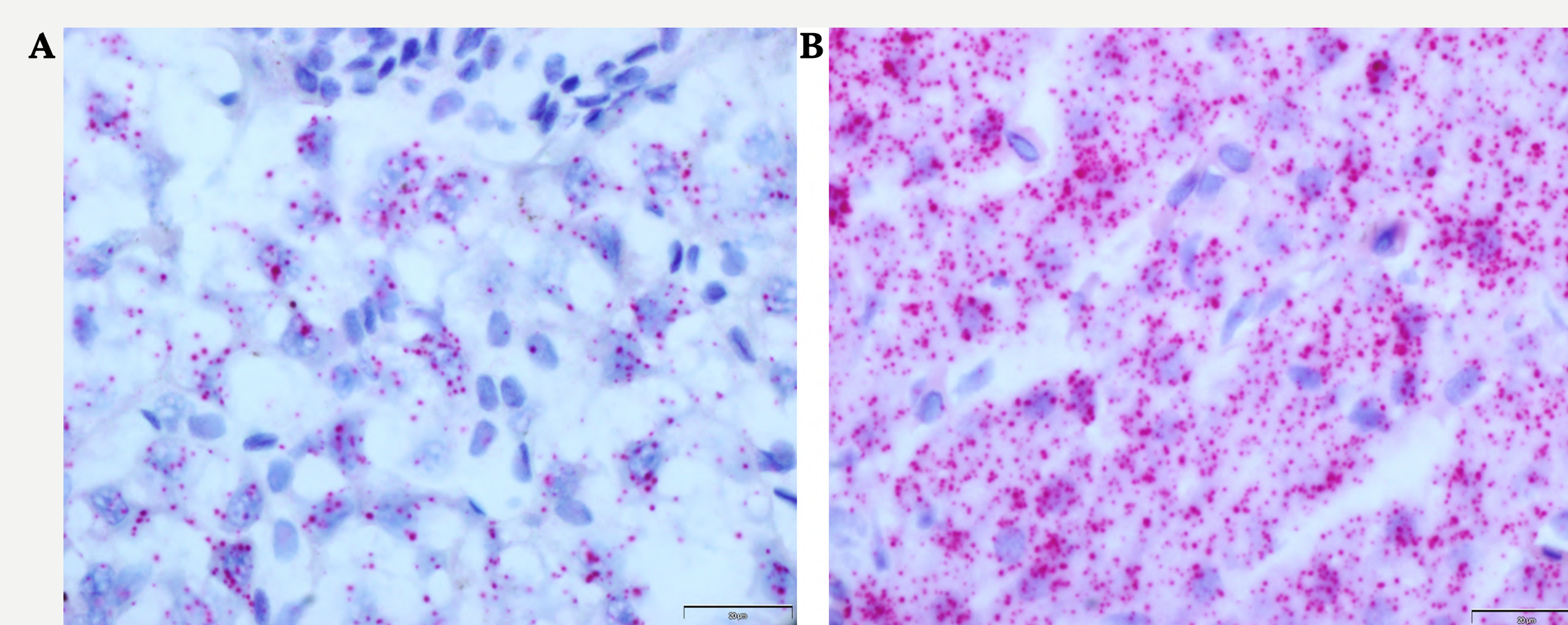
AIM

To evaluate significant physiological changes associated with triploidy that could negatively impact salmon growth, welfare and adaptation to seawater.

RESULTS



GH (A), GHrec (B) and IGF-I (C) muscle expression levels in animals differentiated by ploidy and diet. (D) HC muscle concentration levels according to ploidy. Statistical differences between means are represented as: '****' ($p < 0.0001$); '***' ($p < 0.001$); '**' ($p < 0.01$). Different letters correspond to significant differences with respect to ploidy.



RNAscope® *in situ* hybridization of liver parenchyma from animals sampled in October (A) and in November (B). Each red spot corresponds to a single mRNA molecule. (C) Average number of IGF-I mRNA molecules detected in each sampled animals in October and November ($n = 10$ counts per animal).

Acknowledgments

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