**Phenotypic plasticity in acclimation mechanisms for improved oxygen uptake in fish: its role in fish ecology and aquaculture.**

Due to global warming and eutrophication in natural ecosystems and intensification in closed recirculating aquaculture systems fish are subjected to higher temperatures and low or fluctuating oxygen concentrations. Avoidance or escape from these environmental conditions is often not possible. Acclimation however is. Phenotypic acclimation response mechanisms help fish to acclimate to the an average higher temperatures and lower oxygen concentrations. Indeed, the early life acclimation response of fish to higher temperature might lead to a shift in thermal tolerance window. In fact these early life acclimation mechanisms make fish more robust for temperature and oxygen fluctuations and may improve their performance, health and welfare in ecosystems in transition and intensive aquaculture.  The aim of this thesis project will be to review the literature for the role of early life mechanisms in fish determining (epigenetically) the scope for oxygen uptake in later life.

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