to an array of environmental pressures such as pollutants or fine sediments that temperature might interact with.

In this study, we use a common garden approach to i) investigate individual phenotypic variation in early life in response to environmental constraints, and ii) explore how temperature might modulate the impacts of fine sediments on life history traits. We compare four charr populations originating from thermally contrasted lakes by rearing embryos at an optimum or stressful temperature and in the presence or absence of a realistic sediment load. We examine inter- and intra-population differences in fitness-related traits and physiological markers linked to oxidative stress at hatching. We report a synergistic interaction between our stressors of interest, such that temperature exacerbated the negative effects of sediments on survival and energy expenditure during development. Populations exhibited differences in life history plasticity although the performance of individuals seemed globally reduced.

While having strong implications for the conservation of charr populations in the Alps, our work highlights the importance of re-evaluating the impact of environmental stressors under different thermal scenarios.

A9.29 DISPERSAL-ASSOCIATED TRAITS IN ANEMONEFISH: THE EFFECT OF MATERNAL BODY SIZE ON LARVAL GROWTH AND SWIMMING PERFORMANCE

THURSDAY 5 JULY, 2018 **11:15**

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Larval dispersal is a critical phase in the life cycle of many marine organisms, potentially having life-long effects on the environmental conditions an individual will experience. In marine fishes, the relationships among larval swimming performance, body size and active dispersal patterns are still poorly understood. Furthermore, how maternal effects may modulate dispersal capacity via effects on offspring swimming ability has not been thoroughly examined. Here, in an emblematic coral reef fish, we studied the effects of maternal phenotype on the variability in two dispersal-associated larval traits: swimming performance and body size (TL, total length). In French Polynesia, we collected eggs from a wild population of orange-fin anemonefish, *Amphiprion chrysopterus*, reared them in aquaria and measured individual TL and swimming performance throughout development, using constant acceleration tests, from 0 to 48 hours (hph), and up to 9 days post hatching. TL and swimming performance were highly variable throughout larval ontogeny and generally increased with age. TL and swimming performance were also positively correlated after 48 hph. Larger mothers tended to produce larger offspring (greater TL within 24 hph). However, offspring of larger mothers also showed larger variability in TL. Larval swimming performance also increased positively with maternal size after 48 hph. These dispersal-associated traits may be vital in defining marine dispersal phenotypes in fish. The strong link between maternal phenotype and offspring swimming performance may affect the relative importance of individuals in natural populations and has to be considered in management and conservation plans.

A9.30 EFFECT OF SWIMMING ON GROWTH, PHYSIOLOGICAL PERFORMANCE AND EXPRESSION OF GROWTH AND STRESS MARKER GENES IN COMMON CARP

THURSDAY 5 JULY, 2018 **11:30**

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Induced swimming has the potential to improve the growth performance of fish. The present study aimed to test this hypothesis by measuring the growth, metabolic efficiency and physiological capacity of common carp to different exercise regimes. The trial was undertaken in three large (1600 L) raceways flumes. Three groups of 100 fish were raised at three swimming regimes, 0.0 (control), 1.5 and 2.5 body lengths per second (BL/s), for up to 4 weeks. The results showed a significant increase in the body weight gain (%) for the group exercised constantly at 2.5 BL/s compared to control. In addition, fish reared at 2.5 BL/s for 4 weeks had a higher hepatosomatic index. Analysis of body composition also revealed that the muscle water content was lower and the protein store in the liver was higher for the 2.5 BL/s exercised fish. Except for the significant increment in hepatic protein content in 2.5 BL/s group; glycogen, protein and lipid energy store in hepatic and muscular tissue showed no difference among experimental groups. Quantitative real-time PCR based expression level of potential marker genes controlling growth (insulin-like growth factor-I, growth hormone, growth hormone receptor, somatolactin) and stress response (cortisol receptor, heat shock protein 70, cytochrome oxidase) revealed clear regulatory roles for inducing growth and physiological performance in response to exercising activity. Overall, our data suggest that sustained exercise at 2.5 BL/s enhanced growth and physiological fitness of fish without compromising energy store, aerobic metabolism, ion-regulation as well as ammonia dynamics.

A9.31 FREE-RANGING CHANNEL CATFISH ADOPT COST-EFFICIENT NEUTRAL BUOYANCY IN FLOWING CONDITION

THURSDAY 5 JULY, 2018 **11:45**

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Many species of fish reduce swimming costs by keeping gases in their swimbladders that provide enough buoyancy to counteract their body weight (i.e. neutral buoyancy) in no flow conditions. On the other hand, fishes in rivers with high flow conditions are widely assumed to avoid rapid currents by staying near the riverbed with