Trade-off between reproductive success and physiological status

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Abstract: Reproductive success is a central concept in evolutionary biology. It measures the number of offspring produced by an individual to the next generation and indirectly helps to assess adaptive value of individual choices and strategies in the face of natural and sexual selections. Yet reproductive strategies are time-consuming and energetically costly: both parents invest in gametes production, intrasexual competition and parental care. Considering that energetic stores are limited, we can wonder about how individuals can balance out in the tradeoff between investment in the reproduction and their energetic status. In *Salmo trutta*, intrasexual competition and parental care are intense; hence, the energetic status should be determinant for the access to mating and gaining reproductive success.

To answer these questions, we designed an experiment where fifty fish were placed in an experimental channel during the reproductive season and their reproductive behaviour was monitored over this time. By estimating offspring survival and by using parentage analysis, I assessed the reproductive success of each individual. To test the influence of energy expenditure on reproductive success, body condition and metabolic status inferred from plasma samples (fatty acid, triglycerides, glucose, amino acids) were measured before and after the reproduction. My first results showed that individuals that lost the largest proportion of plasmatic triglycerides and fatty acids are those that presented the higher reproductive success. Reproductive success was also influenced by body size. These results confirm the existence of a strong trade-off between energy expenditure and reproductive success, and open a way to assess both efficiency and cost of various behavioural tactics through statistical modelling.