

Three-spined stickleback, *Gasterosteus aculeatus*, as a sentinel species for historical mercury pollution in Flemish rivers and streams.

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Although metal pollution in the surface waters encounters decreasing trends, it is far from gone. Amongst others, mercury-pollution originating from metal processing factories from the past, is still traceable in aquatic food webs of the Flemish rivers and streams.

The overall goal of this project is to discover whether there is a significant inheritability of the adaptive traits of populations towards the presence of sub-lethal mercury concentrations. The three-spined stickleback, *Gasterosteus aculeatus*, has been selected as a sentinel species for this research because of its wide dispersion, and tolerance towards polluted environments.

During a first field campaign, three rivers known for their historical mercury pollution and one near-to-pristine stream were sampled at four different levels; water, sediment, invertebrates and fish. The sampled sticklebacks were dissected, and the liver, gill and muscle were stored for further analysis. For each type of sample, a custom-made protocol was ran to prepare the samples for analysis.

In a first place, we wanted to have an estimation of the mercury load which is still present at those four levels of the food web in each river. Secondly, these background mercury levels were correlated to pollution-specific endpoints in stickleback, namely the activity of genes which play an important role in the anti-oxidant stress response. Total RNA was extracted from liver, gill and muscle tissue samples, reverse-transcribed, and consequently used in real-time qPCR for gene-expression analysis. Novel primer pairs were designed for this purpose, and as such tested for their applicability in future studies to come.

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