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Eawag Seminar Invitation

Genomics of the Alpine whitefish radiation

Speakers **Dr. Philine Feulner,** *Dept. Fish Ecology & Evolution, Eawag*

When **September 24, 16.00 – 17.00**

Where **Online via Zoom, contact seminars@eawag.ch for access details.**

Abstract The Alpine whitefish are a lineage that have diversified particularly fast and are especially species rich in Swiss lakes. Alpine whitefish are economically highly relevant for fisheries in Switzerland and their endemic diversity is impacted by management practices and anthropogenic changes to their habitats. Hence, these fish are an intriguing study system to understand the forces generating biodiversity as well as the threats to losing such fascinating diversity. In our research, we have built new genomic resources, such a whitefish reference genome assembly, and generate and analyse large-scale genomic data sets. Our phylogenomics approach analysing 21 species of the over 30 species occurring in Swiss lakes revealed distinct lake system specific radiations and ecomorphological diversifications patterns. A population genomics contrast between two widely distributed ecomorphs, identified multiple parallel allele frequency shifts underpinning those repeated ecomorph differentiations. While we are currently still working on a better understanding of which genetic variants are ecologically relevant, the ability to use historical scale collections for genomic approaches have provided us with first insights into the dynamics of change in Alpine whitefish. From historical fish scales samples, we have reconstructed the genome of an extinct whitefish species from Lake Constance. Subsequently, we identified about 11% of the genome of the extinct species, in the genomes of three contemporary whitefish species. This shows that all four species in the lake hybridized during a period of intense anthropogenic eutrophication of the lake, and before one of the species went extinct. This result uncovers the impact of anthropogenic ecosystem changes on the genomic composition of the Alpine whitefish assemblage.