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Salle de réunion

## **THE ROLE OF GENE FLOW AND ADAPTIVE INTROGRESSION IN THE LAKE MALAWI CICHLID ADAPTIVE RADIATION**

par

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🔍 With its more than 500 evolutionarily young and ecologically diverse species, the Lake Malawi cichlid adaptive radiation provides an outstanding system to study fundamental questions about the evolution of biodiversity and species formation. Intriguingly, all species are in principle capable to hybridize and produce fertile offspring.

🔍 Using whole genome sequencing data of 130 individuals from 71 species, we test for gene flow and genomic introgression across Lake Malawi cichlid species. F4-statistic (a form of ABBA-BABA test) reveals massive signatures of genetic exchange both within the radiation and with riverine outgroups. We present a method to disentangle the correlated signals of multiple F4-tests to obtain independent estimates of introgression for both internal and external branches of a phylogeny. More generally, these “tree distortion scores” can be seen as branch-specific measures of how well the genetic ancestry is described by a species tree.

🔍 In Malawi cichlids, genetic exchange is commonly between genetically distant species with similar ecology, consistent with adaptive introgression. To test this, we map the genomic distribution of introgressed segments and correlate the (mostly short) segments with gene function and signatures of selection, which yields exciting candidate genes implicated in ecological speciation. Finally, we report a few large genomic regions (10s of megabases) of introgression between major clades of the radiation, some still segregating within species today. We employ florescent in-situ hybridization to show that these regions constitute large inversions.