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adaptive radiation



genomic era



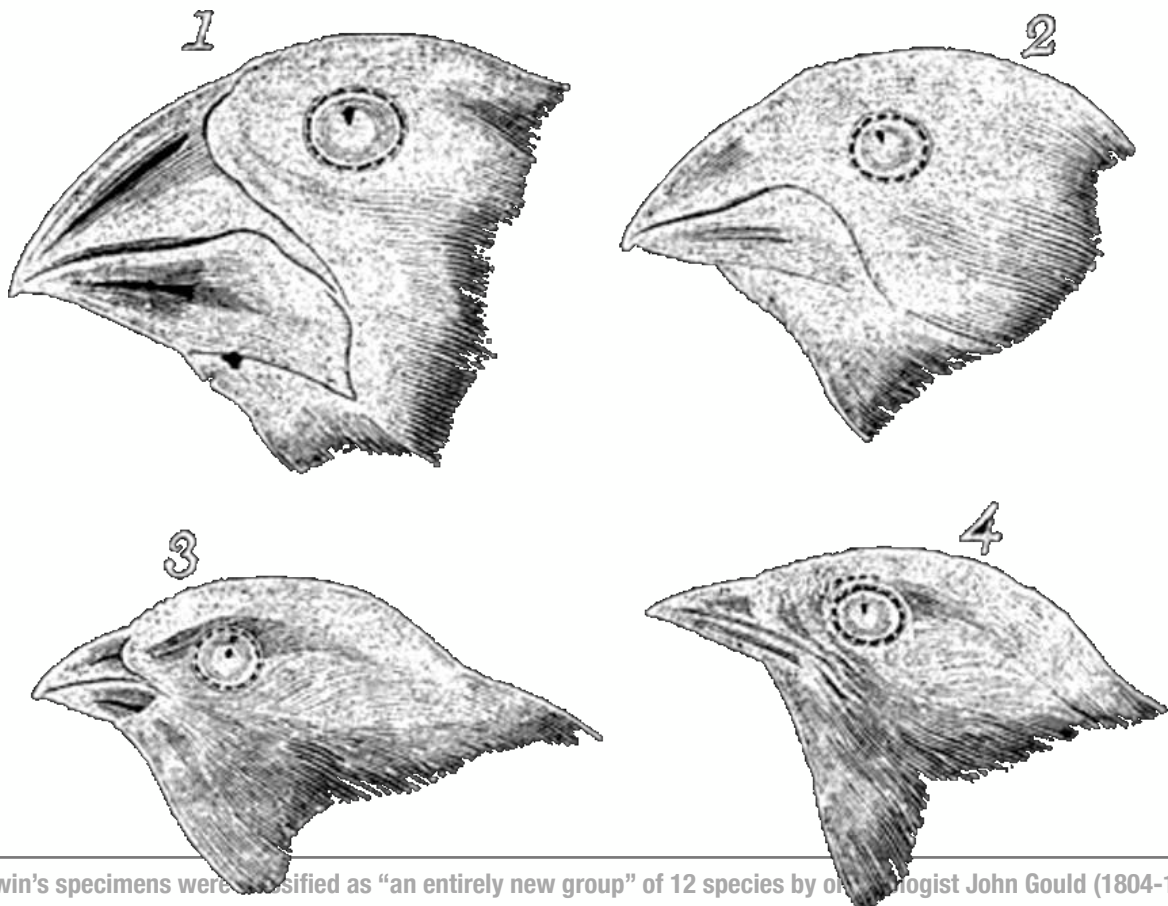
••• D Berner & W Salzburger (2015) Trends in Genetics

adaptive radiation

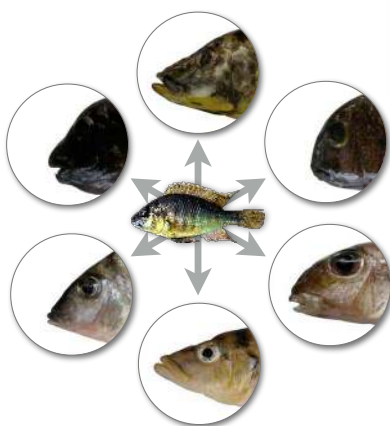
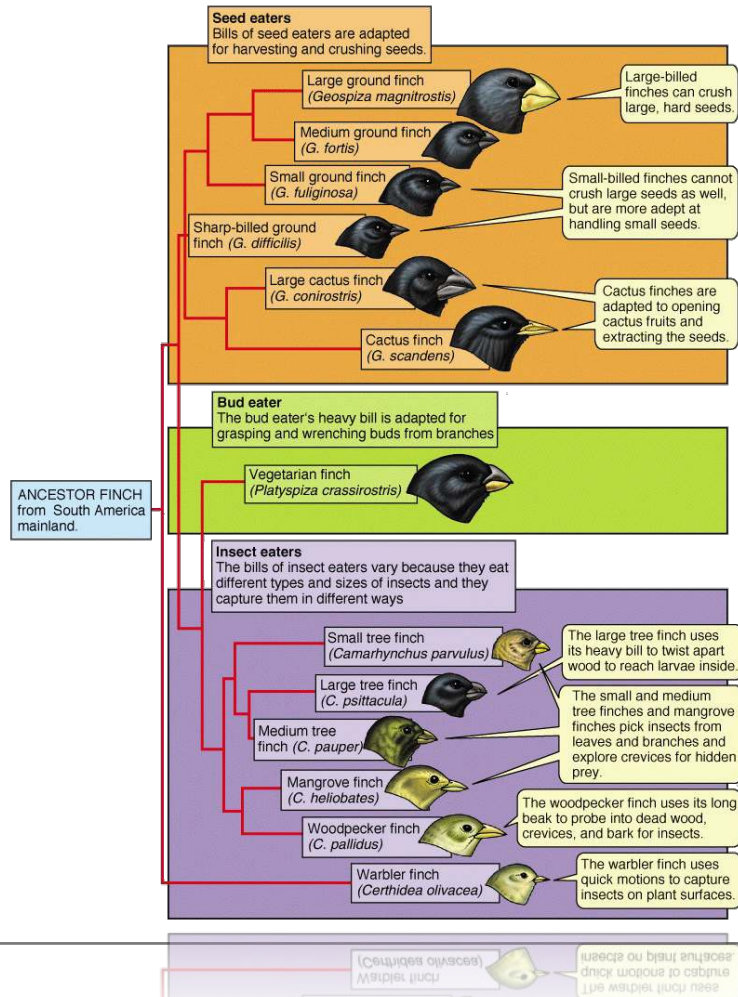
"radiating genomes"

macro-evolutionary patterns

cichlid fishes



① Darwin's specimens were classified as "an entirely new group" of 12 species by ornithologist John Gould (1804-1881)



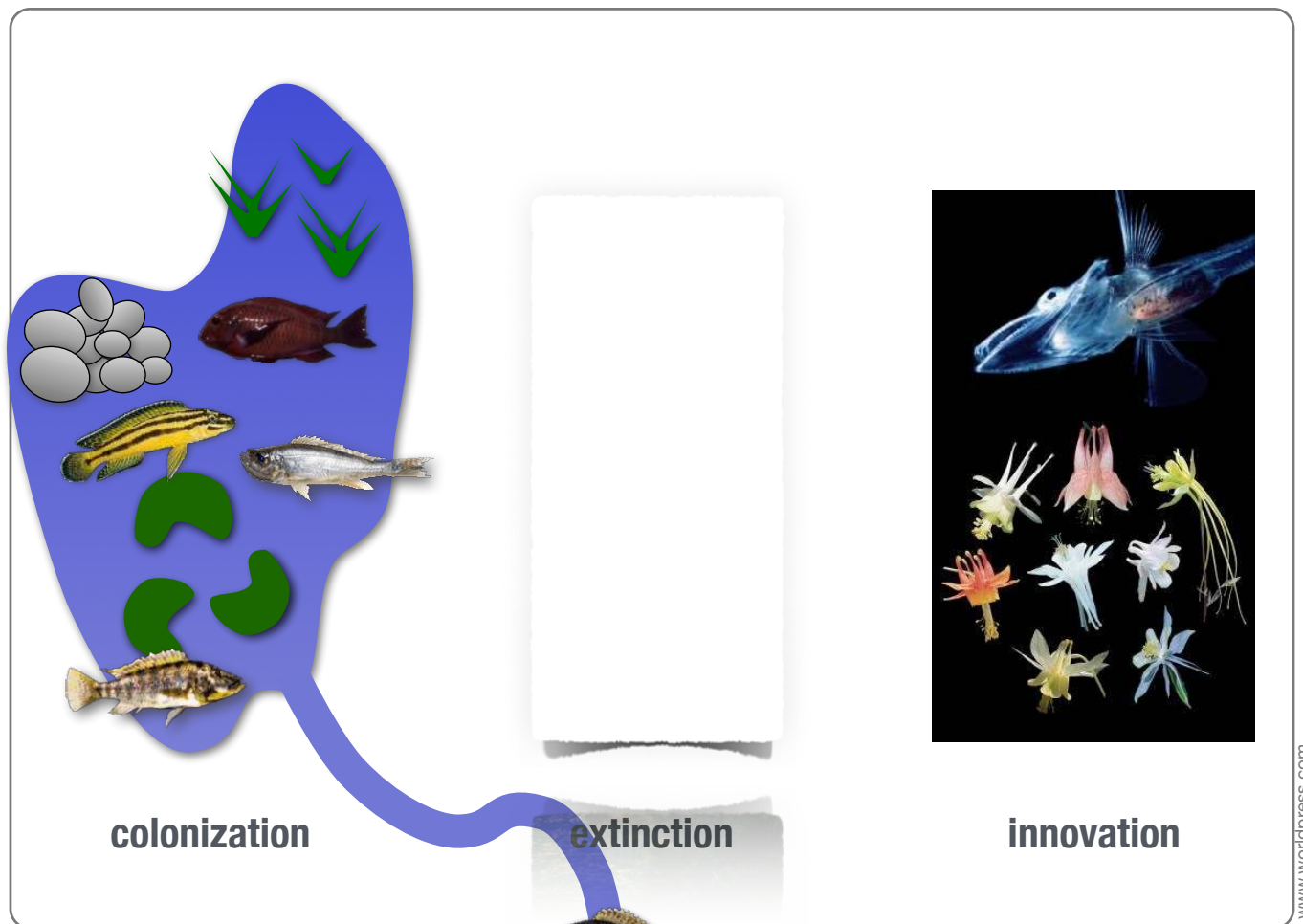
common ancestry



phenotype-
environment
correlation

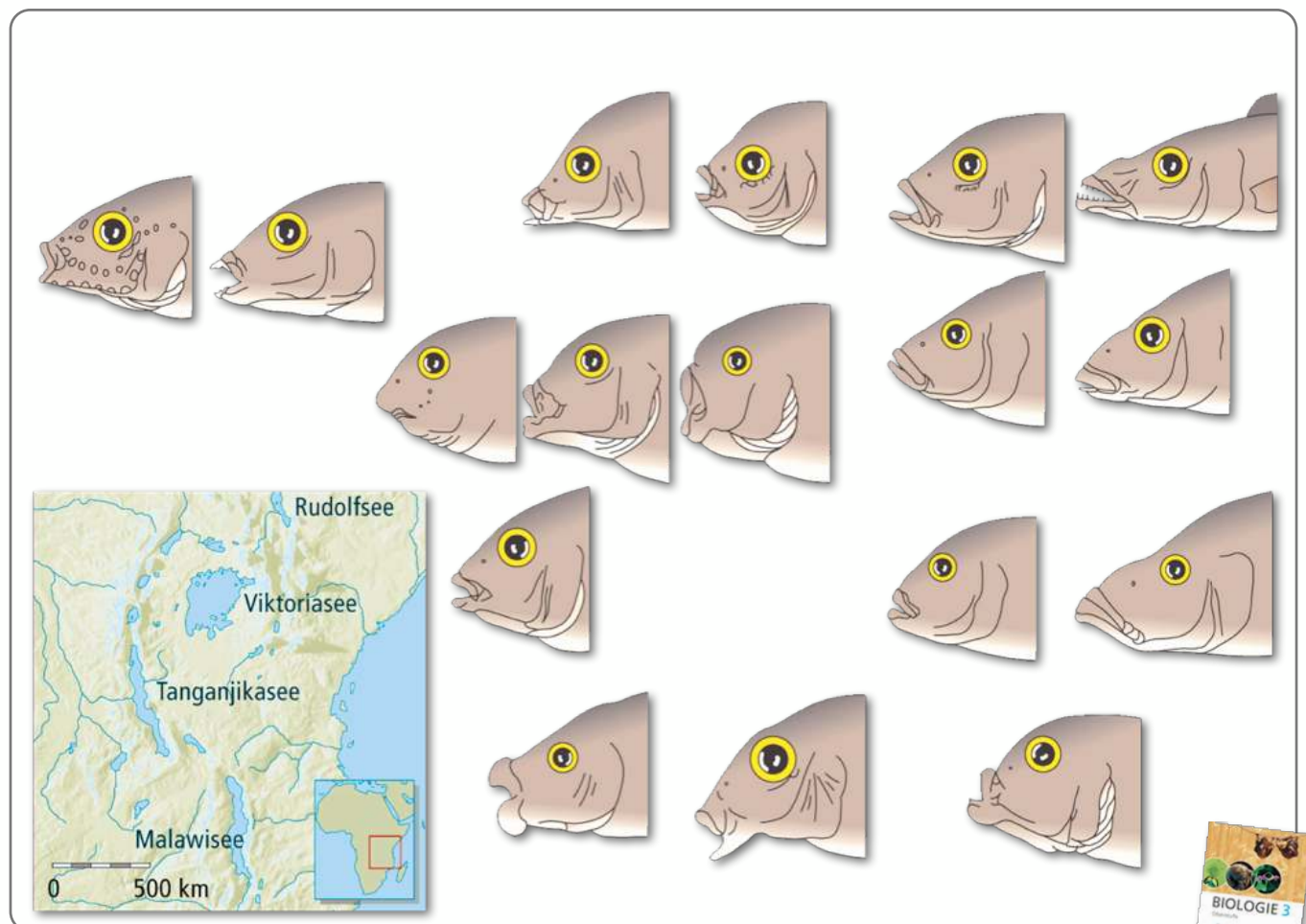


rapid speciation



www.worldpress.com

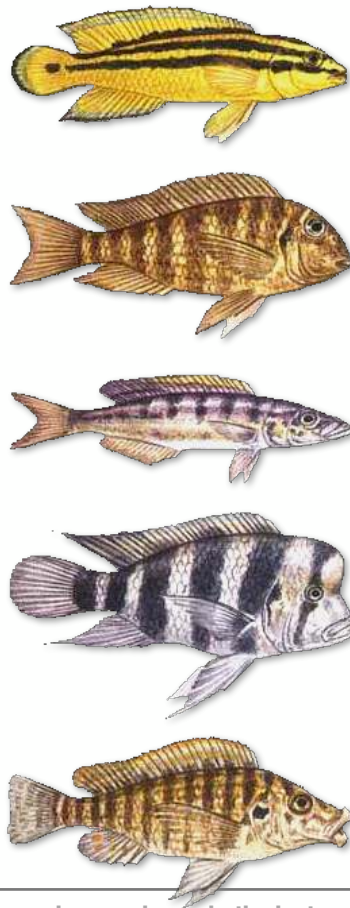
① for more information, check Dolph Schluter's book "Ecology of Adaptive Radiation" (2000)



... H Hofer & W Salzburger (2008) Biologie III



Lake Tanganyika



Lake Malawi

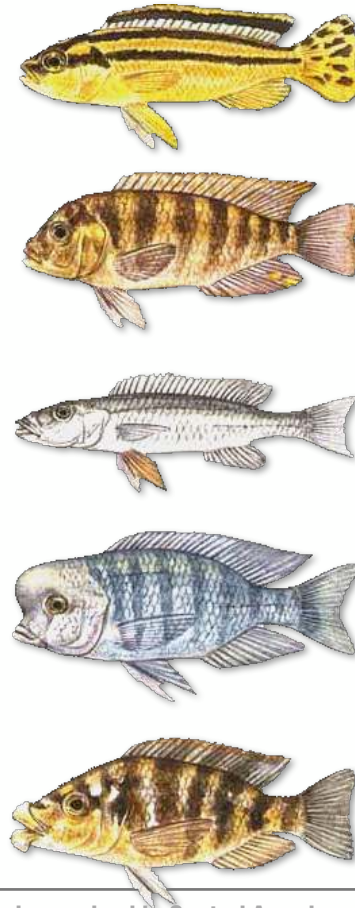


image: M Stiassny & A Meyer (1999) Sci Am

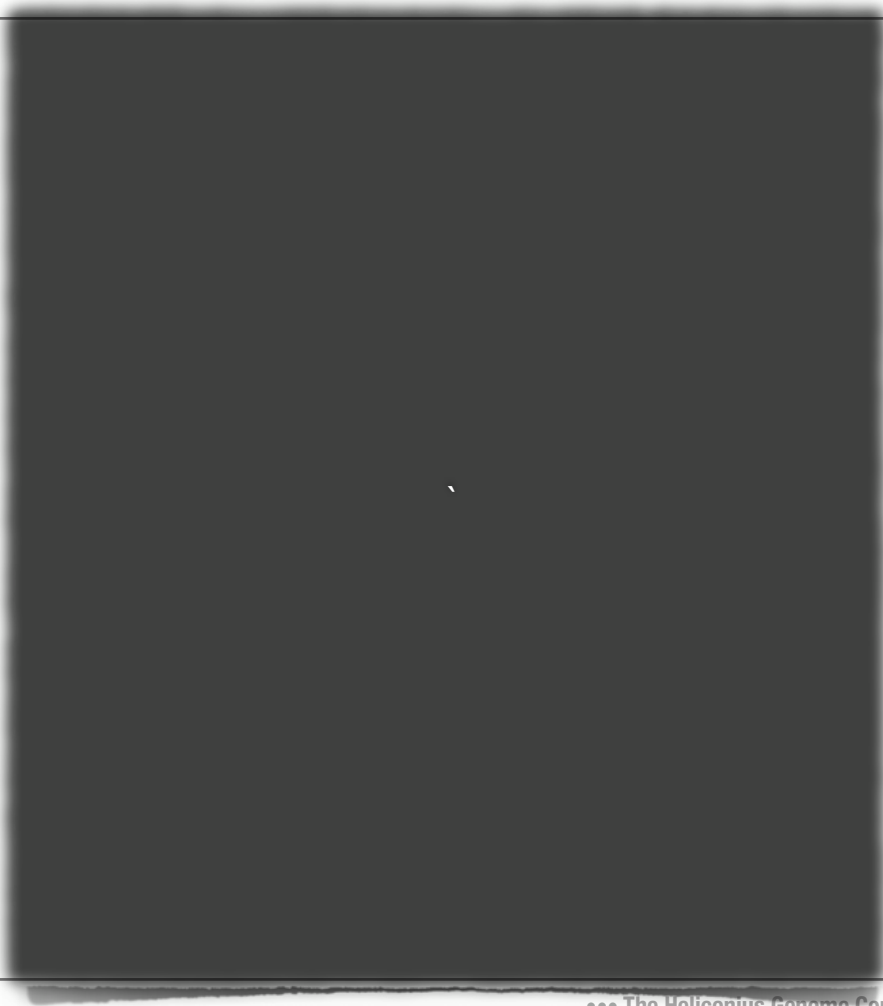
① Thick-lipped cichlid species, as shown in the last row, have also evolved in Central American species flocks

Radiating



... J Alföldi et al. (2011) Nature

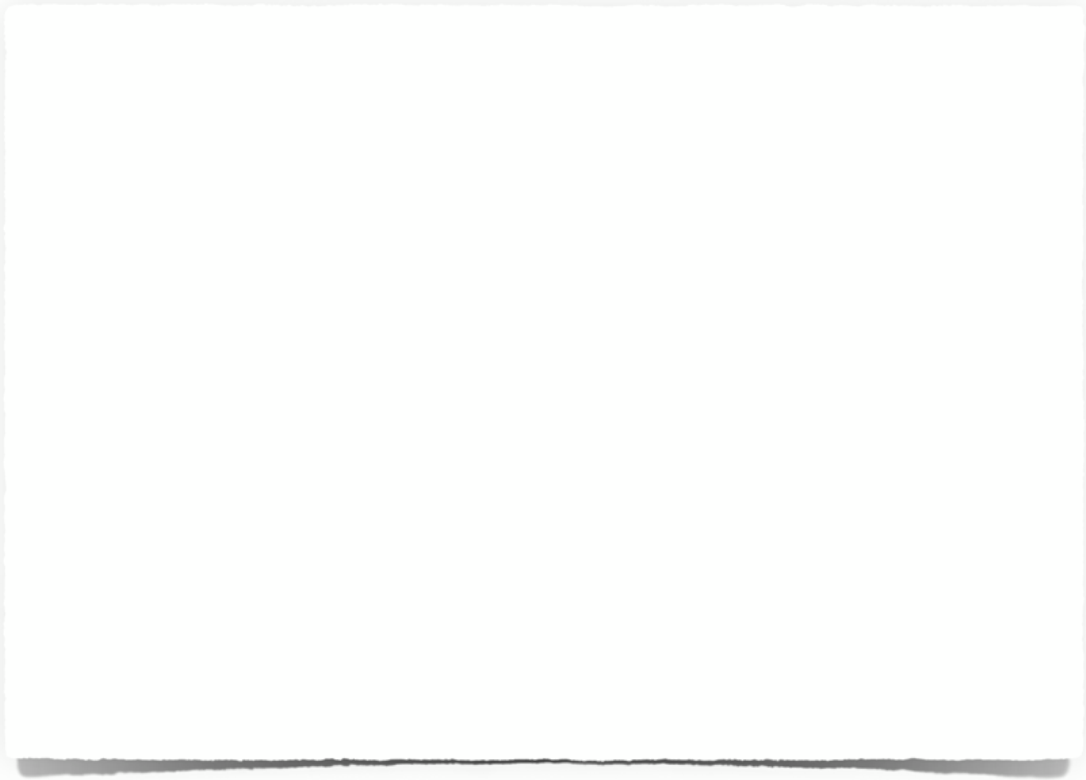
... R Reed et al. (2011) Science



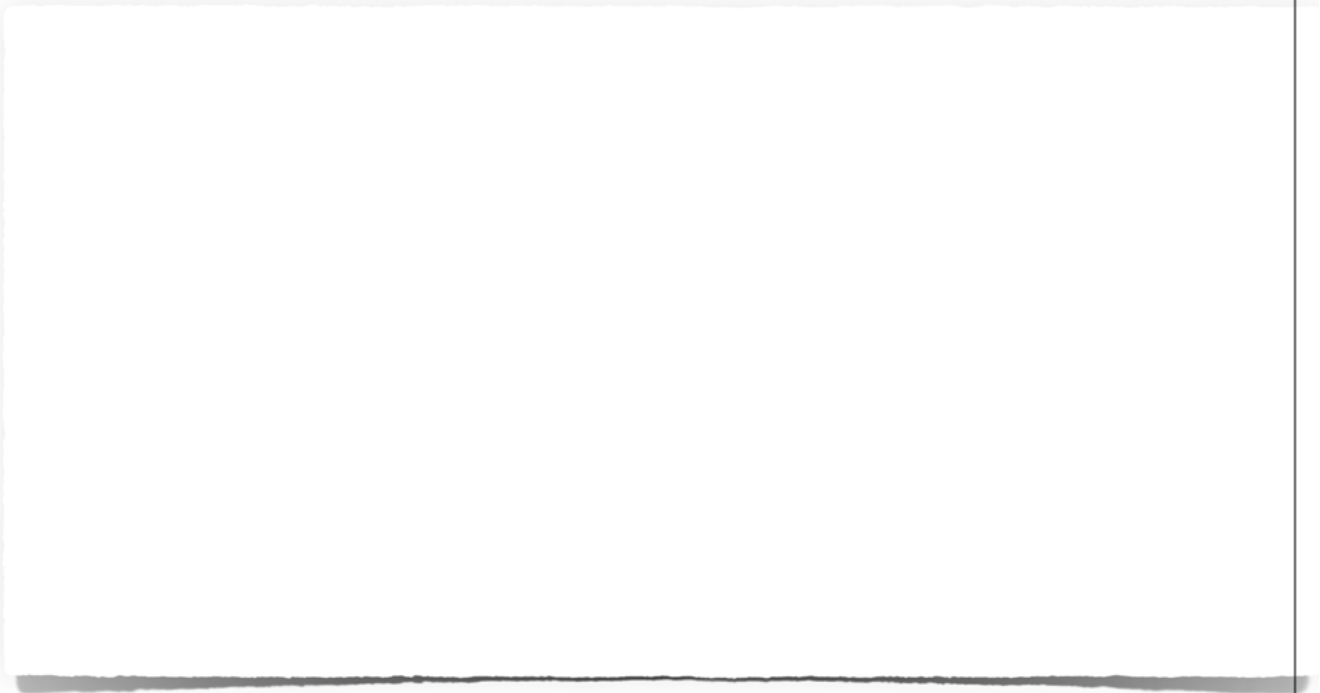
••• The Heliconius Genome Consortium (2012) Nature



••• FC Jones et al. (2012) Nature



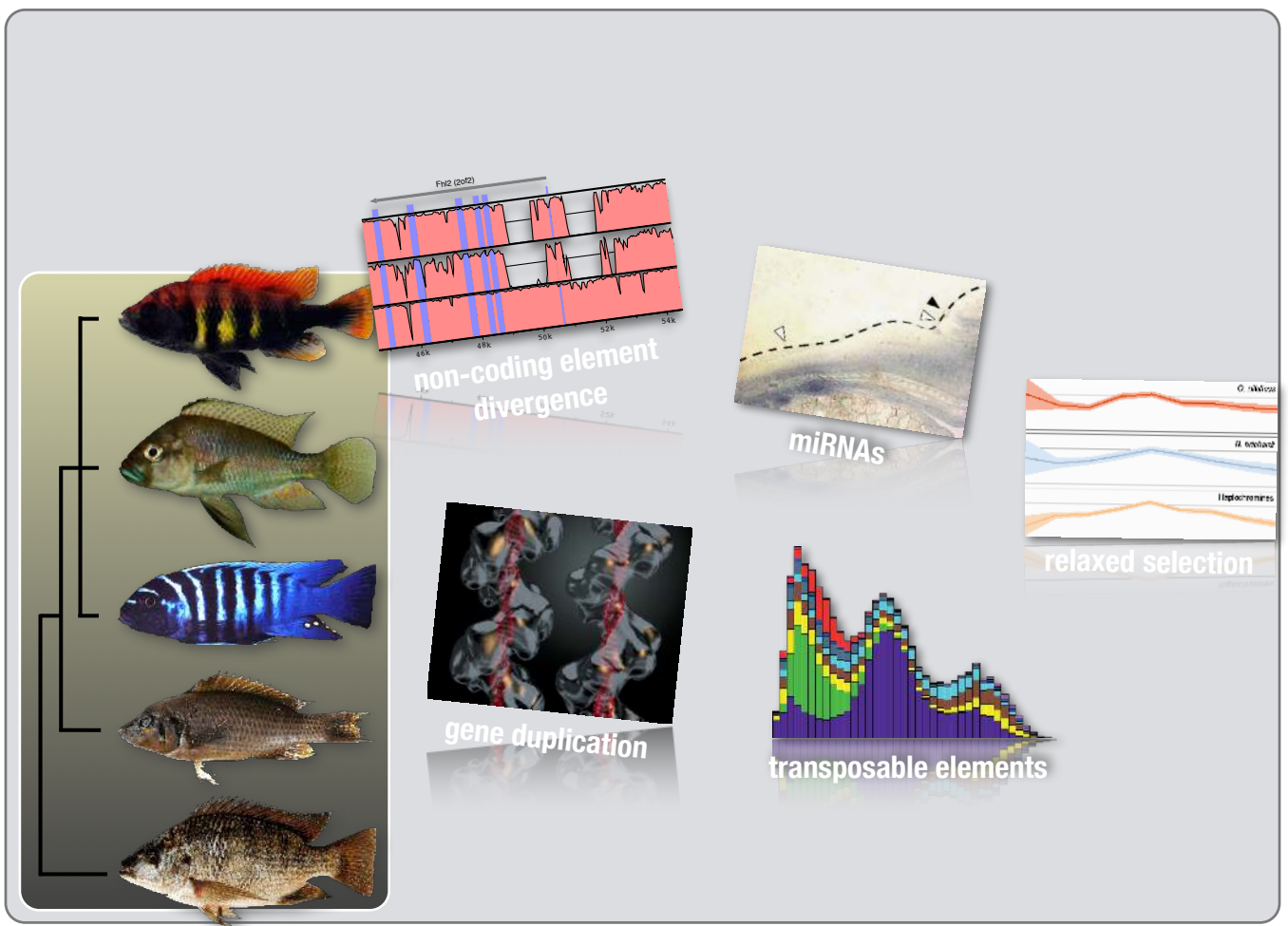
... FC Jones et al. (2012) Nature



... S Lamichhaney et al. (2015) Nature

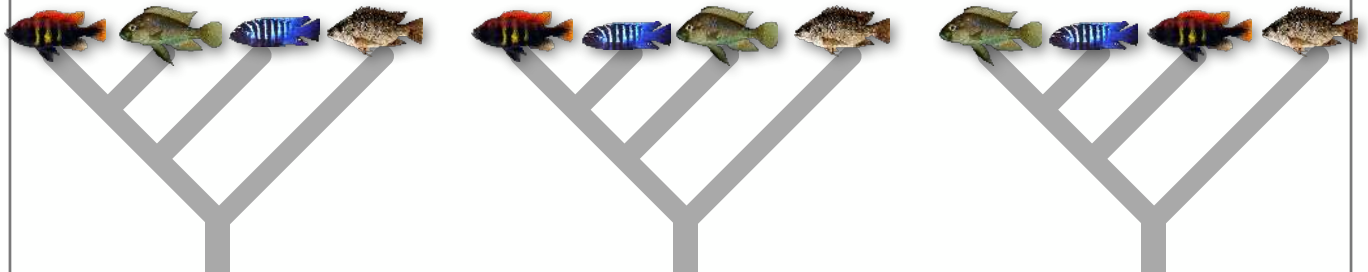


... S Lamichhaney et al. (2015) Nature



... D Brawand et al. (2014) Nature

SNP phylogenies

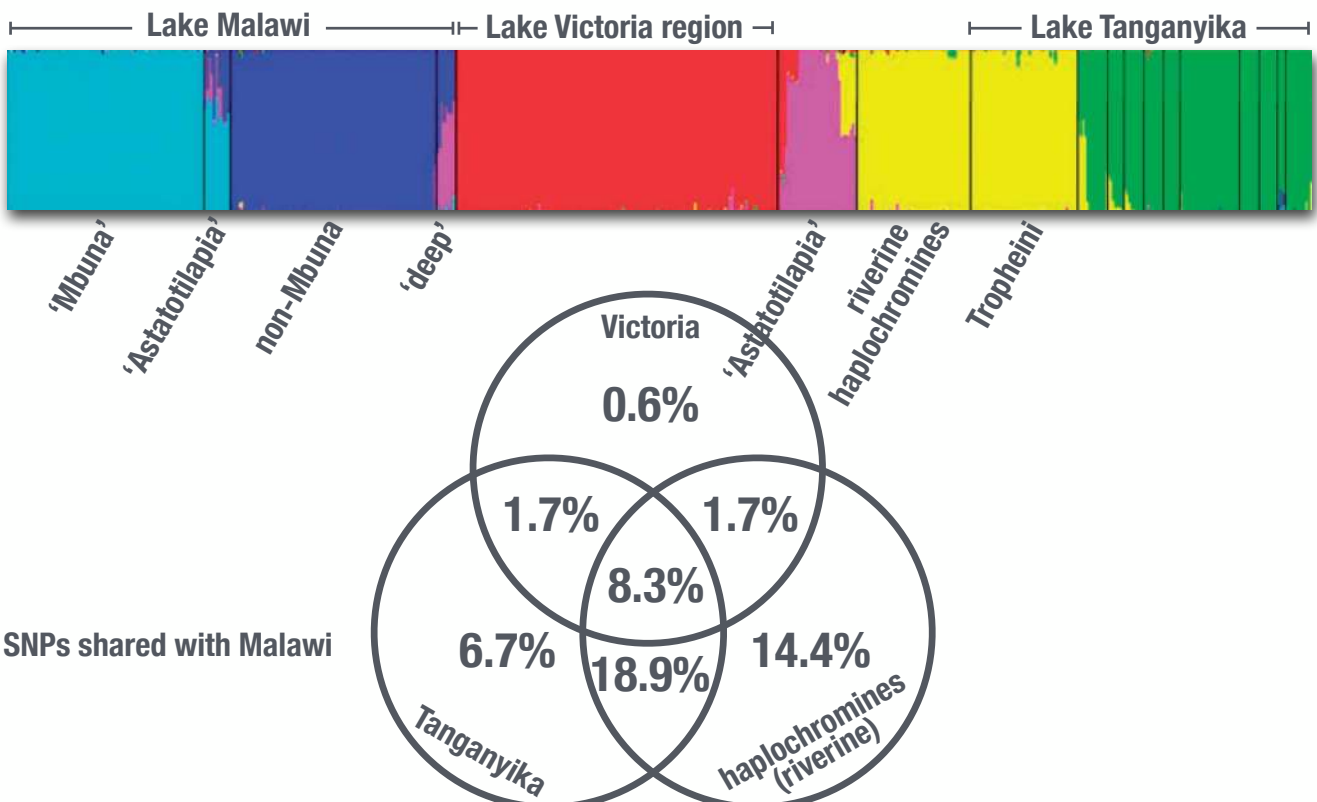


20.4 %

45.2 %
(11.5 % unresolved)

22.8 %

... D Brawand et al. (2014) Nature



... YHE Loh et al. (2013) Molecular Biology and Evolution

	<i>genomes</i>	<i>gene duplications</i>	<i>mobile elements</i>	<i>regulatory changes</i>	<i>accelarated coding evolution</i>	<i>miRNAs</i>	<i>inversions</i>	<i>hybridization introgression ILS</i>
	1	n/r	YES	maybe	n/r	n/r	n/r	n/a
	5 (>100)	YES	YES	YES	YES	YES	n/r	YES
	1 (>100)	n/r	n/r	n/r	n/r	n/r	n/r	YES
	1 (>100)	n/r	YES	maybe	n/r	YES	n/r	YES
	1 (>100)	n/r	n/r	YES	n/r	n/r	YES	YES

... D Berner & W Salzburger (2015) Trends in Genetics