Evidence for sex-specific genetic architecture of gut length in Lake Malawi cichlid fishes

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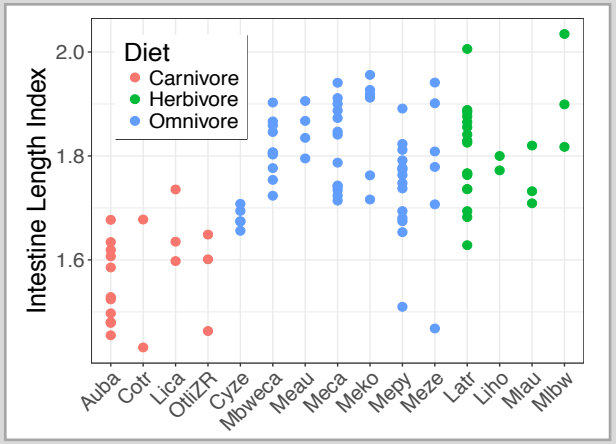
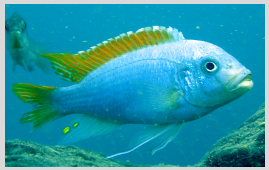
Carnivore cichlid species have shorter guts than omnivore and herbivore species



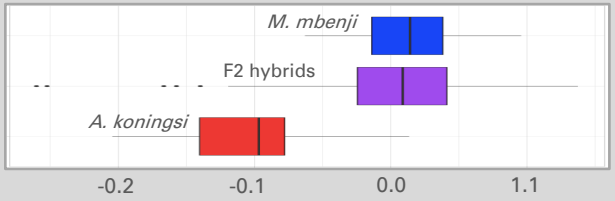
Parental species of F2 hybrid cross

Aulonocara koningsi
invertivore
short gut

Metriaclima mbenjii
generalist omnivore
long gut



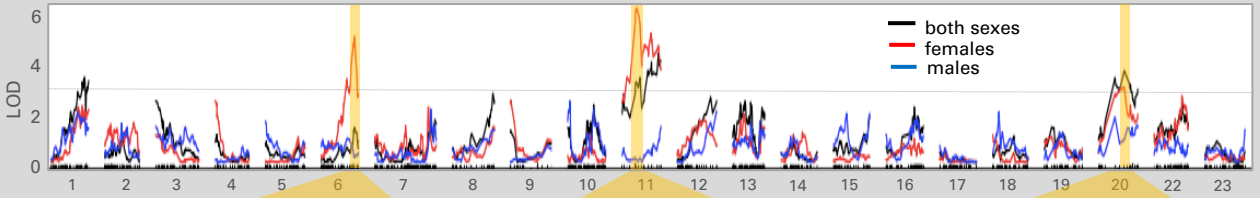
Standardized gut length



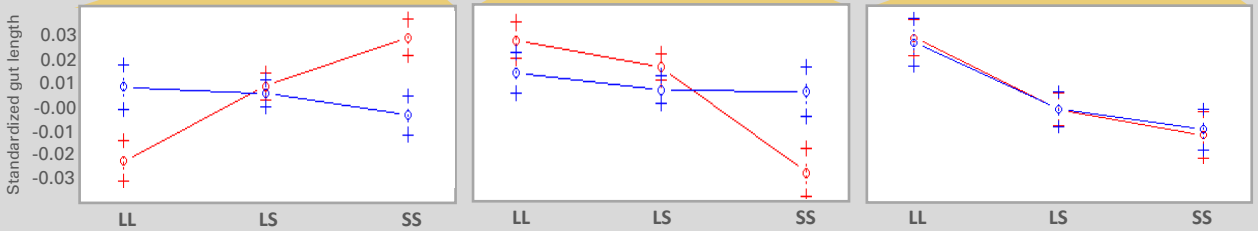
QTL mapping of standardized gut length

- ddRADseq of 430 F2: 2554 robust markers, 1307 cM linkage map, 22 linkage groups (LG)
- 220 females, 202 males

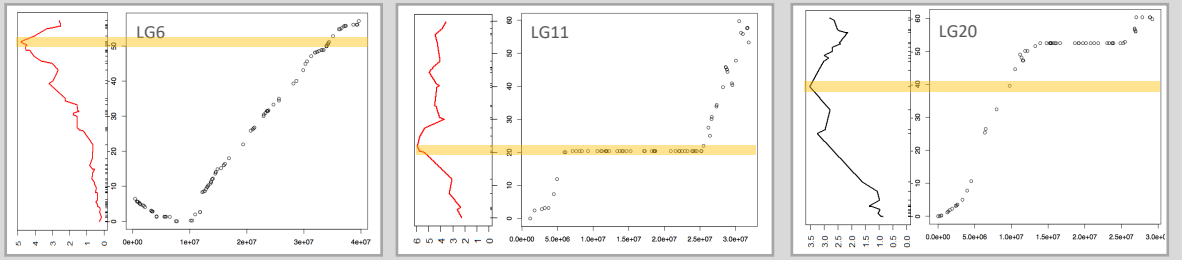
Simple Interval Mapping



Phenotypic effects



Marker positions with respect to *M. zebra* reference genome, UMD2a



- The two top peaks in the QTL scans are female-specific QTL, one of these peaks lands on a genomic inversion between the parental species (LG11)
- This analysis represents the first identification of naturally evolved, adaptive genetic variants associated with gut length

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