Sex-specific Genomic Divergence in Myvatn's Sticklebacks

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Evolutionary processes like selection, drift, mutation and gene flow can be sex-specific. In this project, I explored sex-specific population genomics and divergence in a whole-genome variant data set from lake Myvatn (Iceland) three-spine stickleback population, in order to have a better picture of the demographic process at play. To do this, I analysed two sets of stickleback genomic variants. The first set was done on autosomal DNA variants by overall genomic divergence through pairwise FST and genetic diversity measures as well as sex-biased dispersal (through correlations of pairwise genetic and geographic distance matrices) reflecting variation in bi-parentally inherited regions between the sexes. The second set was done by analysing divergence in maternal and paternal lineages through haplotype networks constructed from mtDNA and chromosome Y variants. In addition to the haplotype networks, FST and admixture analyses were conducted on Y chromosome data from the males. The results of this project suggest potentially male-biased dispersal, though the effect was not statistically significant. There was no significant divergence in FST and diversity measures, nor in the maternal lineage. Some of the variants used to construct the Y chromosome haplotype network show patterns of divergence, but the FST and admixture analyses done on a bigger set of variants do not pick up this signal. Some signs of restricted gene flow was, however, found between two of the lake's five habitats in the Y chromosome. This was the first project looking for sex-specific divergence patterns in the context of lake Myvatn's sticklebacks. Overall, the results do not indicate any particular patterns specific to sex, and both males and females share a common genetic diversity, geneflow and dispersal. In order to further understand sex-specific processes, it would be interesting to expand the analyses to a bigger geographical scale on more stickleback populations and/or on a longer time period.

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