

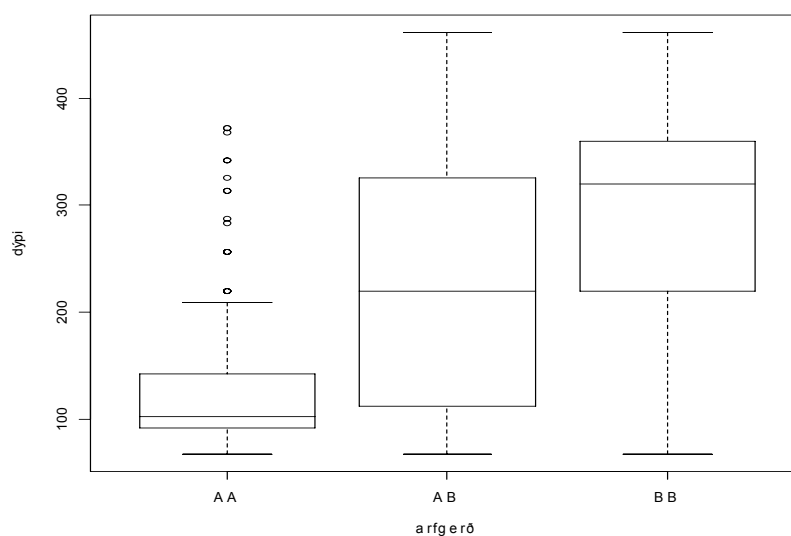
Sexual maturity, size, depth and the influence of selection on the *Pan I* locus in Atlantic cod, *Gadus morhua*.

Helga Kristín Einarsdóttir, helgaei@hi.is and Einar Árnason, einaram@hi.is. Institute of Biology, HÍ

The *Pan I* gene translates into a trans-membrane protein in microvesicles, neuroendocrine and nonneuroendocrine. It has been demonstrated that the locus is subject to natural selection but as the role of the protein is unknown, it is hard to predict which factors influence the selection process. By examining correlations between the *Pan I* genotypes and other factors (such as size, depth *et.c.*) it might be possible to shed some light on the physiological function of the protein and how the environment influences it.

In this study, 476 individuals were genotyped with PCR and restriction enzyme analysis. A spacer area on the mitochondria chromosome was sequenced in a part of the sample population and used as a comparison, as mutations there should be random and non-selective. The spacer area of each individual was sequenced from both left and right to make sure the sequences were correct. The haplotypes were then grouped into clades according to their internal relation. These clades were compared to the same factors as the *Pan I* genotypes to be certain that the results were reliable.

The samples came from Iceland and the Faroe Island in 2004. The DNA was extracted from gills preserved in 96% ethanol.



Mynd 1. A boxplot of depth, at which the fish was caught, vs *Pan I* genotype.

Some interesting correlation between the *Pan I* genotypes and other factors was discovered. A significant difference was among *Pan I* genotypes with regard to length and the depth at which the fish was caught. There was also a significant difference between the different maturity levels of cod and all of the other factors tested for (weight, length, depth, gender, *Pan I* genotype). However, there were no relationships among mtDNA clades and other various explanatory variables. The mtDNA variation served as a null model and therefore the *Pan I* patterns are explained as being due to selection.