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A broodstock development program for Arctic charr

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Arctic charr (*Salvelinus alpinus*) have the potential to be an important aquaculture species that compliments other salmonids. However, it has not reached its potential so far primarily because of a lack of a supply of fingerlings with consistent growth characteristics for grow-out facilities. In collaboration with Icy Waters International we have developed a broodstock development program for Arctic charr. This is based in Whitehorse, Yukon, where two strains of Arctic charr, Nauyuk Lake and Tree River are currently maintained. We have used these strains to produce 12 groups of families based on pure strains (2), reciprocal crosses (male x female) to produce hybrids (2), and all possible combinations of reciprocal backcrosses (8). These family groups have been monitored for growth over 2 years and significant differences have been observed. One particular backcross group consisting of 10 families was selected for intensive study. 500 fish were sampled. Using microsatellite markers, the fish were allocated to individual families and their sex predicted from a male-specific allele in the parental strain. There was no significant difference in length or weight with respect to sex. We are conducting QTL analyses for growth, temperature tolerance, skin color, body shape and resistance to pathogens. This ongoing program will enable the fledgling Arctic charr aquaculture industry to have a steady supply of high quality, well defined broodstock, the lack of which has been a major impediment to its growth is the past.