

NMR-Based Metabolomics Reveals Dietary Effects in Liver Extracts of Arctic Charr (*Salvelinus alpinus*) and Tilapia (*Oreochromis mossambicus*) Fed Different Levels of Starch

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Abstract : The effect of dietary starch level on liver metabolism in Arctic charr (*Salvelinus alpinus*) and tilapia (*Oreochromis mossambicus*) was studied using ¹H-NMR based metabolomics. Fingerlings were fed iso-nitrogenous diets containing 0, 10 and 20 % starch for two months before liver samples were collected for metabolite analysis. Metabolite profiling was performed using 600 MHz NMR Chenomx software. In total, 48 metabolites were profiled in liver extracts from both fish species. Following the profiling, principal component analysis (PCA) and orthogonal partial least square discriminant analysis (OPLS-DA) were performed. These revealed that differences in the concentration of significant metabolites were correlated to the dietary starch level in both species. The most prominent difference in metabolic response to starch feeding between the omnivorous tilapia and the carnivorous Arctic charr was an indication of higher anaerobic metabolism in Arctic charr. The data also indicated that amino acid and pyrimidine metabolism was higher in Arctic charr than in tilapia.

Keywords : arctic charr, metabolomics, starch, tilapia

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