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Chemical Analyses of Sea Lamprey Pheromones and Lampricides

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ABSTRACT:

Bile acid pheromones and other small molecules such as amino acids, thyroid hormones, and neuropeptides in sea lamprey were analyzed using LC-MS/MS. A new extraction and LC-MS/MS analysis method was developed for petromyzonol tetrasulfate, a potential antagonist for sea lamprey pheromone 3kPZS. The sample extraction method was also optimized for the analysis of amino acids, and the method for thyroid hormone extraction from sea lamprey tissues was modified to enable thyroid hormone quantification in more complex whole fish tissue samples from sturgeon. Furthermore, plasma metabolomes of male and female sea lamprey at different maturation states were analyzed using targeted and non-targeted metabolomics approaches. A complete metabolomics workflow was developed for the LC-MS/MS analysis, data processing, metabolite annotation and pathway analysis. This workflow can be adapted to analyze the TFM metabolites in liver tissue extracts from sea lamprey.