Investigating the Effects of 2,3-Dihydroxybenzoic Acid Extraction from Salvinia molesta as Means for Treatment in Harmful Microorganisms

Bathman, Blake

The aquatic fern, Salvinia molesta is a global menace to waterways as it grows on water surfaces and prevents oxygen from getting into the water, creating a dead zone where no organisms can survive-Eutrophication. As in many plant species, this fern can have phenolic structures extracted from it such as 2,3-Dihydroxybenzoic acid. To extract this acid in the experiment, techniques using separate component distillation, and liquid chromatography were practiced. Phenolic compounds cause the inactivation of cellular wall enzymes and can be used in treatment with common and uncommon harmful microorganisms. The study was conducted to determine the ability of 2,3-Dihydroxybenzoic acid extracts, from Texan Salvinia molesta concentrations, as an antimicrobial solution. In this experiment five microorganisms were tested for antibiotic resistance, by the antimicrobial solution produced from S. molesta. To test the hypothesis, normal lab procedures were practiced for the cultivation and experimentation of these microorganisms; each species were extracted from tube slants, inoculated and allowed to culture for 72 hours, then swabbed onto two petri dishes per organism. Then, the antimicrobial solution was produced modeling the reaction for esterification, combining an organic acid (2,3-Dihydroxybenzoic acid), an alcohol (Methyl Benzoate was used instead), and an acid catalyst (Sulfuric acid). E. coli showed zones of inhibition from 7mm to 15mm, B. cereus from 9mm to 11mm, A. tumefaciens from 5mm to 15mm, E. aerogenes from 10mm to 15mm, and A. niger were inconclusive. The results from this experiment show economic incentive towards antimicrobial use, by positive extraction of Salvinia molesta.

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