



College of Marine Science
140 Seventh Avenue South
St. Petersburg, Florida 33701
(727) 553-3520
mya@marine.usf.edu

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Dear Mr. Hamilton,

The purpose of this letter is to inform you of the results we have recently obtained from our tests of the Powell Water Systems Electrocoagulation unit for removal of biological pathogens and indicators from sewage.

We performed a trial using a single sample of raw sewage obtained from a municipal wastewater treatment facility in southwest Florida. Samples were tested to determine the abundance of two types of bacteria and four types of viruses before and after treatment with the electrocoagulation unit. The electrocoagulation process resulted in significant decreases in the concentration of all microorganisms tested, and in several cases reduced the concentration of the pathogens to below the detection limits of our assays. Electrocoagulation led to an approximately 4 log reduction in the concentrations of both fecal coliforms and Enterococci (approximately 99.999% decrease). Concentrations of phages (viruses that infect bacteria) infectious for *Eschericia coli* and *Bacillus subtilis* decreased from several thousand plaque forming units (pfu) per milliliter to less than one pful per milliliter. In addition, concentrations of human polyomaviruses were reduced from approximately 10,000 copies per milliliter to below assay detection limits, demonstrating that electrocoagulation removed human pathogenic viruses.

In addition, we determined the efficiency of electrocoagulation for removing *Pepper mild mottle virus* (PMMoV), which is a plant pathogen that has recently been found at extremely high concentrations in human sewage. PMMoV was found in the raw sewage at approximately 60,000 copies per milliliter and electrocoagulation reduced the PMMoV concentrations to below detection limits. This is extremely encouraging since we typically see PMMoV concentrations in excess of 10,000 copies per milliliter in final effluent from most commercial treatment plants.

My laboratory has spent several years studying the types of viruses and bacteria present in raw sewage and treated wastewater, with the goals of identifying pathogens that present a risk to public health as well as effective indicators that can be used for water quality testing. In our preliminary experiment, the Powell Electrocoagulation unit reduced all the tested biological agents (including both bacteria and viruses) with greater efficacy than current wastewater treatment practices.

Thank you for facilitating this trial, and I hope that we can continue to work together in the future to further evaluate this very promising treatment process.

Sincerely,

A handwritten signature in black ink that reads "Mya Breitbart".

Dr. Mya Breitbart

TAMPA ST. PETERSBURG SARASOTA LAKELAND