Identification of Antimicrobials of Annona muricata to Prevent Wound Infection

Jayasankar, Dheiksha (School: Sir Winston Churchill Secondary School)

Antibiotic-resistant bacteria is a rising global health concern. The emergence of antibiotic-resistant strains of Staphylococcus aureus such as methicillin-resistant S. aureus (MRSA) is of major concern. With the rise of antibiotic-resistant bacteria, new antibiotic compounds must be found, perhaps from non-traditional sources, such as plants, which have historically been used for medicinal purposes, including infections. Annona muricata, also known as Soursop and Brazillian Paw Paw, is a fruit native to the Central American and Caribbean region and can be cultivated in tropical areas. Different parts of the plant have been shown to have anti-diabetic, anti-cancer and anti-parasitic properties; however, the antibacterial properties have not been studied. This research investigated whether the leaves of A. muricata contained antibacterial compounds that can be used to generate new antibiotics. Using standard biochemistry-based fractionation processes, potentially antibiotic compounds in soursop leaf fractions were discovered and tested on Staphylococcus epidermidis, Clostridium sporogenes, Listeria monocytogenes and MRSA using Kirby-Bauer assays and colony-forming unit (CFU) assay. The results of the Kirby-Bauer and CFU assay were interpreted by measuring the diameter of the clearance, percentage colony coverage, and kinetic growth. Fractions of A. muricata showed large clearances in the Kirby-Bauer assay and 0.1%-5% of colony coverage (relative to control) in CFU assays. Kinetic growth analysis revealed that certain fractions stop the growth of bacteria. Further testing in this project is required for the potential identification of the compound.

Awards Won: