Quantification and Characterization of Proteins from Acanthaster planci Skin and Spine: Its Latent Role in Marine and Human Pathogens and Blood Clotting Inhibitions (Potential Management of Coral Infestation)

Gindap, Mary Carmelle Antonette

Acanthaster planci, coral-eating starfish, infests several islands of Antique, Philippines. Local government dealt with this problem by manually collecting and burning A. planci but this effort is unproductive. Thus, finding productive uses of A. planci was explored. A. planci skin and spine are the first lines of defense against predators. Hence, skin secretions and spine extracts were tested for antibacterial property while spine extracts for anticoagulant property. Furthermore, proteins suspected to cause these activities were quantified and characterized. Aseptically, skin secretion was scraped using spatula while spines were cut using scissors, centrifuged and maintained in low temperature. Agar-well diffusion assay showed that both supernatant liquid and precipitate of skin secretion and spine extract inhibited the growth of Escherichia coli and Pseudomonas aeruginosa, while skin secretions inhibited the growth of Staphylococcus aureus. Prothrombin test showed strong anticoagulant property of skin secretions. Protein content of skin secretions and spine extracts was quantified using Bradford Protein Assay and compared to Bovine Serum Albumin (standard). Both the skin secretions and spine extracts were rich in proteins ranging from 363, 636.36 ng/μL to 416,363.64 ng/μL with 97.39% linearity to the standard. Furthermore, wide array of protein bands were developed with molecular weights ranging from 17,375.60759 Da to 176,473.7035 Da which is 98.29% comparable to the standard as revealed by SDS-Polyacrylamide Gel Electrophoresis (PAGE). Skin secretions and spine extracts serve as innate defense against certain bacteria and as potential sources of antibacterial agents against human and marine pathogens, while skin secretions exhibited anticoagulant property.

Awards Won: