Abstract No: BO-22

Potential antibacterial activity of selected marine algae against foodborne bacteria

H. M. B. M. M. D. Herath[1]*, P. N. Yapa[1] and M. K. K. D. Sandaruwan[2]

[1]Department of Biological Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale, Sri Lanka
[2]Department of Physical Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale, Sri Lanka
*bimalherath3@gmail.com

Bacterial foodborne diseases are becoming a growing public health concern worldwide, increasing the demand of antibiotics. Considering the safety of using natural antimicrobials, the objective of the present study was to evaluate the antibacterial activity of selected marine algae extracts against foodborne bacteria. Whole marine algae samples of *Chnoospora minima, Gracilaria foliifera, Gracilaria hikkaduwensis, Ulva prolifera, Sargassum polycystum,* and *Ulva lactuca* were collected from west sea coast of Sri Lanka. Crude algal extracts of distilled water, methanol, acetone and diethyl ether were separately tested for antibacterial activity against *Staphylococcus aureus* NCTC 6571, *Staphylococcus aureus* ATCC 25923, *Escherichia coli* NCTC 10418, *E. coli* ATCC 25922 and *Enterococcus faecalis*. Antibacterial activity was evaluated by using the standard well-diffusion method. Each tested strain was suspended in 3 ml of sterile distilled water with a turbidity optically comparable to that of the 0.5 McFarland standard (1.5×10^8 CFU/ ml) and 100 µl aliquots of each suspension were inoculated and uniformly spread on the surface of Muller Hinton agar plates in triplicates separately. After placing 50 µl of extracts into each well, plates were incubated at 37 °C for 24 - 48 hours and the diameter of the growth inhibition zone around the wells were measured. Further, minimum inhibition concentrations of each extract were also evaluated. Comparisons were performed using one-way ANOVA followed by Tukey's Pairwise Comparisons. It was revealed that the 0.75 g/ml of *G. foliifera* in distilled water and 0.05 g/ml methanol, acetone, diethyl ether extracts of *G. foliifera* exhibited antibacterial activity against *Enterococcus faecalis.* Further, 0.05 g/ml of acetone extracts of *U. proliifera, G. hikkaduwensis, C. minima* and *U. lactuca* showed inhibitory effect against *Enterococcus faecalis.* Acetone (0.05 g/ml), methanol (0.05 g/ml) and diethyl ether extracts (0.5 g/ml) of *G. folifera, S. polycystum* inhibited the growth of *E. coli* NCTC 10418 and *E. coli* ATCC 25922. Distilled water (0.05 g/ml) and methanol extracts (0.1 g/ml) of *G. foliifera, S. polycystum* showed inhibitory effect against *S. aureus* NCTC 6571 and *S. aureus* ATCC 25923. Further, all tested extracts of *C. minima* were shown antibacterial activity against *S. aureus*. Methanolic extracts (0.1 g/ml) of *G. hikkaduwensis, U. prolifera and U. lactuca* inhibited the growth of *S. aureus*. Results indicated that the potential of these marine algae to be used in isolation of bioactive compounds responsible for antibacterial activity.

Keywords: Antibacterial activity, Bioactive compounds, Crude extracts, Foodborne diseases, Marine algae