

In vitro antibacterial activity of selected marine weeds on selected bacteria

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Introduction

Selective utilization of marine weeds as potential source of pharmaceutical agents has been increasing in recent years. Many of the seaweeds possess bio-active components which inhibit the growth of some of the Gram positive and Gram negative bacterial pathogens. The algal extracts were used as a curative and preventive agent for various diseases such as antibiotics, antihelminthics, cough remedies and antihypertensive.

Methodology

In vitro antibacterial activity of ethanolic extracts of fresh and dried material of *Enhalus* spp., *Sargassum* spp., *Turbinaria* spp. and *Halimeda* spp. were evaluated. The marine weeds were collected from North sea of Jaffna District, Sri Lanka. Fresh and dried ethanol extracts of the four marine weeds were evaluated for activity against 4 bacterial species namely *Staphylococcus aureus* ATCC 29213, *Enterococcus faecalis* ATCC 29212, *Pseudomonas aeruginosa* ATCC 27853 and *Escherichia coli* ATCC 25922 by nutrient agar well diffusion method. Twenty grams of properly washed fresh and dried and milled leaves of were soaked in 150 mL of absolute ethanol (99.98 %) for 5 successive days separately at room temperature (31±3 °C). Solvent was removed by rotating evaporator and crude extracts were used for evaluation of antimicrobial activity. Plates were incubated for 48h at 37 °C and the inhibition zone that formed around the well were measured (mm). Triplicates were maintained for each experiment.

Results



Antimicrobial activity of *Enhalus* spp against *Enterococcus faecalis* ATCC 29212



Antimicrobial activity of *Turbinaria* spp against *Enterococcus faecalis* ATCC 29212



Positive control Streptomycin against *Enterococcus faecalis* ATCC 29212



Negative control Sterile distilled water

Diameter of the inhibition zone of selected marine weeds against four bacterial species

	Diameter of the inhibition zone (mm)			
	<i>Enterococcus faecalis</i> ATCC 29212	<i>Staphylococcus aureus</i> ATCC 29213	<i>Escherichia coli</i> ATCC 25922	<i>Pseudomonas aeruginosa</i> ATCC 27853
Streptomycin (100µg mL ⁻¹)	28.575 ± 0.359	24.31 ± 0.101	22.67 ± 0.409	24.71 ± 1.034
<i>Enhalus</i> spp	14.4 ± 0.163	14.1 ± 0.179	14.5 ± 0.166	0
<i>Turbinaria</i> spp	12.5 ± 0.166	13.2 ± 0.249	13.5 ± 0.166	11.5 ± 0.221

Conclusion

Ethanol extract of *Enhalus* sp showed more antimicrobial activity than *Turbinaria* spp. Dried ethanol extracts of all plant samples did not show antibacterial activity. Streptomycin (100µg mL⁻¹) and sterile distilled water were as the positive and negative control respectively. The results indicates that there is scope for using these marine weeds as a source of antimicrobial substances.