

An examination of the medicinal potential of *Scaevola spinescens*: Toxicity, antibacterial, and antiviral activities

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ABSTRACT

Background *Scaevola spinescens* is an endemic Australian native plant with a history of use as a medicinal agent by indigenous Australians. Yet the medicinal bioactivities of this plant are poorly studied. **Materials and Methods** *S. spinescens* solvent extracts were tested for antimicrobial activity, antiviral activity and toxicity in vitro. **Results** All extracts displayed antibacterial activity in the disc diffusion assay. The methanol extract proved to have the broadest specificity, inhibiting the growth of 7 of the 14 bacteria tested (50%). The water, ethyl acetate, chloroform, and hexane extracts inhibited the growth of 6 (42.9%), 5 (35.7%), 5 (35.7%), and 4 (28.6%) of the 14 bacteria tested, respectively. *S. spinescens* methanolic extracts were equally effective against Gram-positive (50%) and Gram-negative bacteria (50%). All other extracts were more effective at inhibiting the growth of Gram-negative bacteria. All extracts also displayed antiviral activity in the MS2 plaque reduction assay with the methanol, water, ethyl acetate, chloroform, and hexane extracts inhibiting 95.2 $\pm$ 1.8%, 72.3 $\pm$ 6.3%, 82.6 $\pm$ 4.5%, 100 $\pm$ 0% and 47.7 $\pm$ 12.9% of plaque formation, respectively. All *S. spinescens* extracts were nontoxic in the *Artemia franciscana* bioassay with no significant increase in mortality induced by any extract at 24 and 48 h. The only increase in mortality was seen for the water extract at 72 h, although even this extract displayed low toxicity, inducing only 41.7 $\pm$ 23.3% mortality. **Conclusions** The lack of toxicity of the *S. spinescens* extracts and their inhibitory bioactivity against bacteria and viruses validate the Australian Aboriginal usage of *S. spinescens* and indicates its medicinal potential.

KEYWORDS

Antiviral . Australian medicinal plants . maroon bush . medicinal plants . MS2 bacteriophage . *Scaevola spinescens*

REFERENCES