

Effectiveness of aqueous and hydroalcoholic extracts of *Acanthospermum australe* against diarrhea-inducing bacteria

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Palavras Chave: *Acanthospermum australe*, diarrhea, antimicrobial activity, plant extracts.

Abstract

The aim was to evaluate the antimicrobial activities of the extracts of *A. australe* against diarrhea-inducing bacteria.

Introduction

Acanthospermum australe (Loefl.) Kuntze (Asteraceae) is widely used in folk medicine for the treatment of diarrhea, skin diseases, blennorrhagia, dyspepsia, parasitic worms and malaria, among other ailments.^{1,2} Typically, the leaves and roots of this plant are employed in the form of teas or applied as external dressings. Diarrhea is normally caused by infection of the intestinal tract by bacteria, viruses or parasites that are present in contaminated food or drinking-water or enter the system as a result of poor hygiene.³ In view of the above, the present study aimed to characterize the chemical profiles of the aqueous and hydroalcoholic extracts from leaves and roots of *A. australe*, to evaluate their antimicrobial activities against the diarrhea-inducing bacteria *Enterococcus faecalis*, *Shigella dysenteriae*, and *Yersinia enterocolitica*.

Results and discussion

The aqueous extract *A. australe* leaves gave the highest yield (28.5%) followed by the aqueous root extract (23%), the hydroalcoholic leaf extract (18.7%) and hydroalcoholic root extract (8.8%). The presence of saponins, flavonoids, tannins, and phenolic compounds in aqueous and hydroalcoholic extracts of *A. australe* were determined using the fitochemical methods.^{4,5} Activities of *A. australe* extracts against *Enterococcus faecalis* (ATCC 51299), *Shigella dysenteriae* (ATCC 13313) and *Yersinia enterocolitica* (ATCC 9610) were evaluated according to the methodology recommended by the CLSI.⁶ The presence of microbial growth was verified by the addition of the redox indicator triphenyl tetrazolium chloride (0.5% solution) or of the blue dye resazurin (0.02% solution). The aqueous leaf extract of *A. australe* showed bacteriostatic (10 mg.mL⁻¹) and bactericidal (20 mg.mL⁻¹) activities against *E. faecalis*, bacteriostatic

activity (20 mg.mL⁻¹) against *S. dysenteriae* but was ineffective against *Y. enterocolitica* (>20 mg.mL⁻¹). The hydroalcoholic leaf extract showed similar activities against *E. faecalis* but was ineffective (>20 mg.mL⁻¹) against *S. dysenteriae* and *Y. enterocolitica*. In contrast, the aqueous and hydroalcoholic root extracts were ineffective against *E. faecalis* and *Y. enterocolitica* (>20 mg.mL⁻¹). The aqueous extract showed bacteriostatic activity against *S. dysenteriae* (20 mg.mL⁻¹), and the hydroalcoholic root extract showed bactericidal activity against *S. dysenteriae* (20 mg.mL⁻¹).

Conclusions

The results presented herein demonstrate that the Gram-positive *E. faecalis* and the Gram-negative *S. dysenteriae* were susceptible to *A. australe* extracts, although bacteriostatic/bactericidal activities were only observed at concentrations considered too high for clinical application.

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