Evaluation of leaf extracts of several tree species for activity against *Salmonella*

Gado, D. A.[1], Ahmed, A.S.[1], Botha, F.S.[1], Ehlers, M.[2], McGaw, L. J.[1]

[1] Phytomedicine Programme, Department of Paraclinical Sciences, University of Pretoria, Private Bag X04, Onderstepoort 0110, South Africa. E-mail: Dbarms2g@yahoo.com, [2] Department of Medical Microbiology, Health Sciences Faculty, University of Pretoria, PO Box 667,Pretoria 0001,South Africa.

Introduction

Handling and consumption of contaminated foods (meat, milk and eggs) are considered a major source of infection in humans[1]. Gastroenteritis that is not self-limiting is mostly treated with a wide range of antibiotics. Indiscriminate use of these antibiotics has resulted in an upsurge of resistant and multi-resistant strains of bacteria[2]. This complicates treatment, especially in patients with Human Immunodeficiency Virus (HIV), necessitating the search for novel, cheaper, safer and efficacious antibacterial products. Recent *in vitro* studies have revealed that many indigenous South African plants possess antimicrobial properties against gastrointestinal disorders and diarrhoea-causing organisms.

Aim/objectives

The aim of the study was to identify South African plant species with good antibacterial activity against *Salmonella* serovars and other intestinal pathogens.

Materials and Methods

PLANT SPECIES; *Protorhus longifolia, Searsia leptodictya, Carissa macrocarpa, Combretum bracteosum, Kirkia wilmsii, Loxostylis alata, Noltea africana, Blighia unijugata, Brachychiton acerifolium and Brachychiton bidwillii*

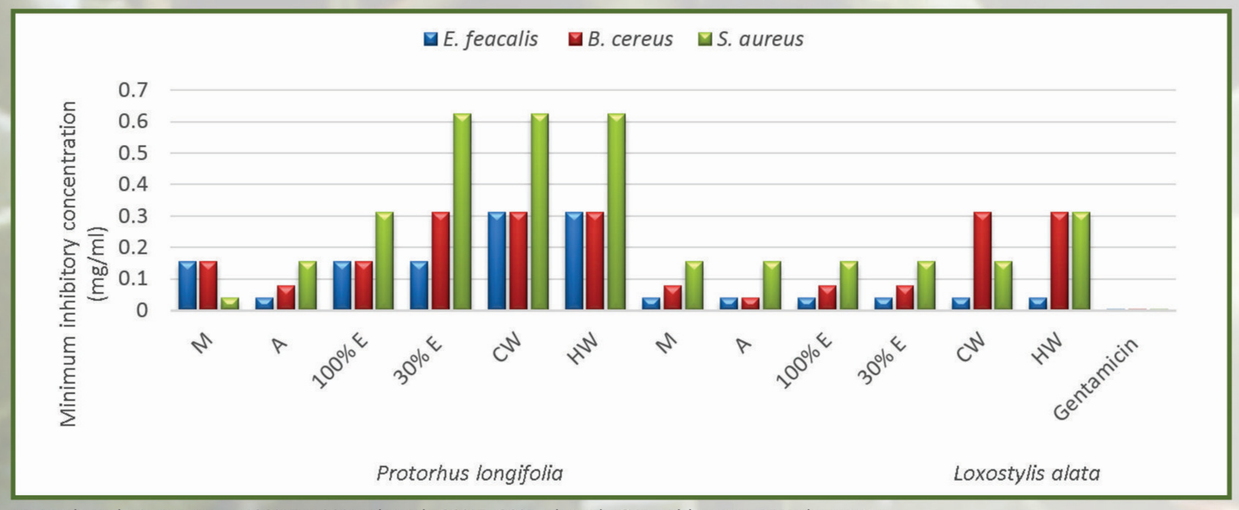
EXTRACTANTS; Methanol, 100% Ethanol, 30% Ethanol, Acetone, Hot water, Cold water

Minimum Inhibitory Concentration (MIC):
Two-fold serial microdilution method[3];
Staphylococcus aureus (ATCC 29213), *Enterococcus faecalis* (ATCC 29212), *Bacillus cereus* (ATCC 21366), *Escherichia coli* (ATCC 25922), *Salmonella* Typhimurium (ATCC 39183) and *Pseudomonas aeruginosa* (ATCC 27853).

Protorhus longifolia

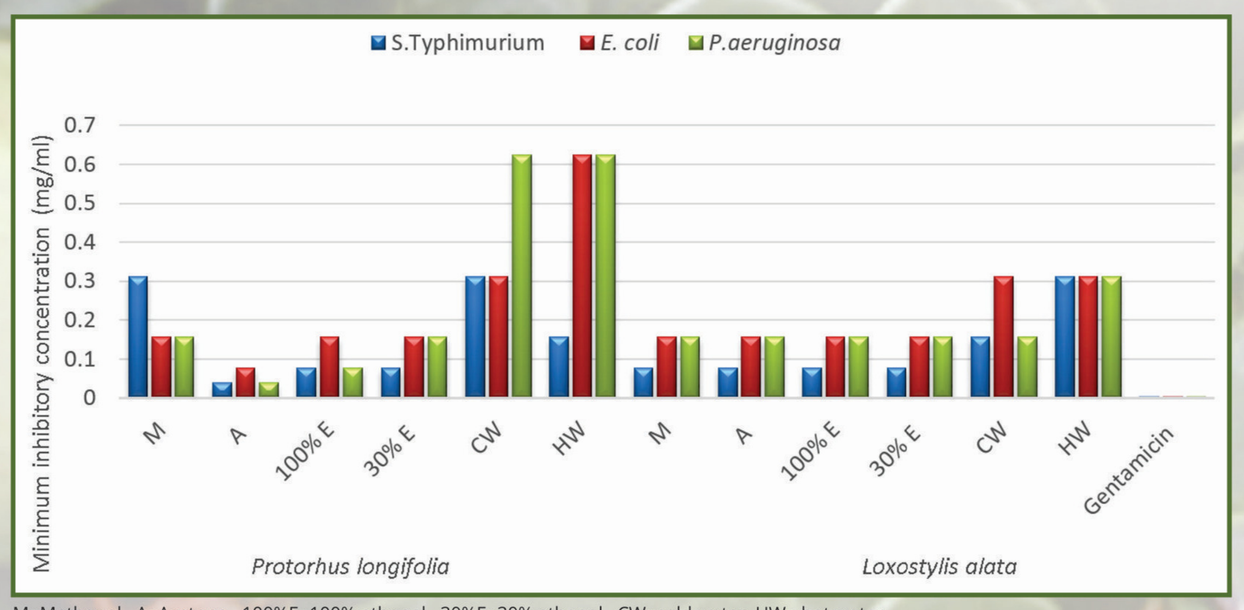
Results and Discussion

- The average MIC values of the plant extracts against the different bacteria ranged from 0.2 mg/ml to 1.4 mg/ml.
- The Gram-positive bacteria (*S. aureus, B. cereus* and *E. faecalis*) were more susceptible to the plant extracts (Fig. 1) than the Gram-negative bacteria (*E. coli, S.* Typhimurium and *P. aeruginosa*) (Fig. 2).
- *P. longifolia* and *L. alata* extracts were the most active with high total antimicrobial activity against nearly all the bacteria tested with MIC values as low as 0.02 mg/ml. *L. alata* was selected for further work to isolate compounds active against *Salmonella* species.



M=Methanol A=Acetone 100%E=100% ethanol 30%E=30% ethanol CW=cold water HW= hot water

Fig.1. MIC for selected plants against Gram-positive bacteria

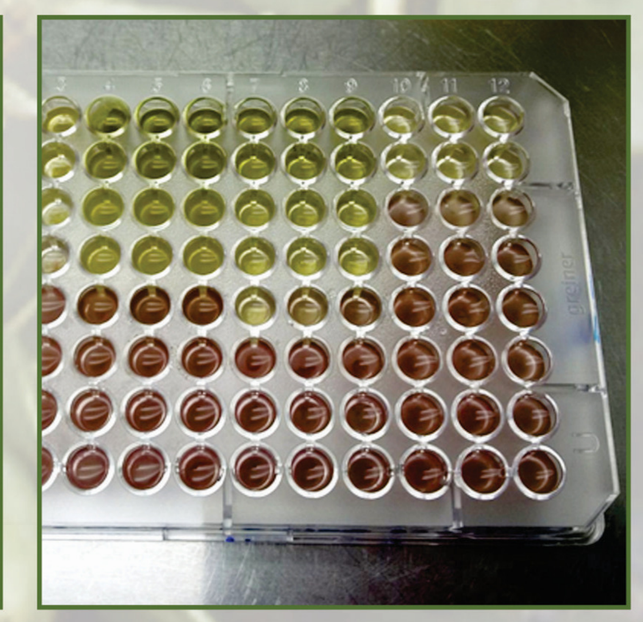


M=Methanol A=Acetone 100%E=100% ethanol 30%E=30% ethanol CW=cold water HW= hot water

Fig.2. MIC for selected plants against Gram-negative bacteria

Conclusion

These findings validate the traditional use of these selected plants and could be sources of alternatives for new treatment regimes in treating GIT disorders. Further investigation of potential safety and antibacterial compound isolation is in progress on *L. alata* which had promising activity.



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Acknowledgements

- University of Pretoria Doctoral Support Bursary
- National Veterinary Research Institute, Vom Nigeria