

**SCREENING OF ANTIDIARRHOEA MEDICINAL PLANTS FOR
INVITRO ANTIMICROBIAL ACTIVITY AGAINST CLINICAL AND
ENVIRONMENTAL ENTEROPATHOGENS**

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**A thesis submitted in partial fulfillment for the degree of Master of science
in
Botany (Microbiology) in the Jomo Kenyatta University of Agriculture
and Technology**

2008

ABSTRACT

Plants in traditional medicine have been widely used to treat diarrhoea diseases in Kenya. Ethnobotanical surveys are useful in the identification and selection of medicinal plants with potential therapeutic values. Since no ethnobotanical study has been conducted in Rachuonyo district of Nyanza province to identify the plants commonly used for the treatment of diarrhoea, this study interviewed 191 respondents and found that *Terminalia brownii* Fres. (barks), *Melia volkensii* Guerke (barks), *Melia volkensii* Guerke (leaves), *Aloe secundiflora* Engl. And *Albizia coriaria* Welw. ex Oliv. (barks) were most frequently used. The plants were collected and extracted using hexane, methanol, acetone and water and tested against clinical and environmental enteric pathogens. Phytochemical tests indicated that the plants contained tannins, triterpenoids, flavonoids, steroids, alkaloids, glycosides, phenols and saponins in varying amounts. The antimicrobial assay of the plant extracts showed that the highest (24 mm zone of inhibition) activity was by methanol extracts of *Terminalia brownii* barks against *Vibrio cholerae* (clinical isolate) while acetone extracts of *Melia volkensii* leaves had the least activity (7 mm) against *Shigella dysenteriae* (clinical isolate). The extracts were active at relatively low concentrations, with their minimum inhibitory concentrations ranging from 3.13 mg/ml for *Melia volkensii* bark against *Shigella dysenteriae* to 50 mg/ml for *Albizia coriaria* bark against *E.coli* ATCC 25922.

However, some of the plant extracts (*Aloe secundiflora*) were inactive against some of the test isolates, indicating that not all prescribed antidiarrhoeal plants

may be effective against enteric pathogens. The present study showed synergism between ampicillin, cefuroxime, gentamicin and cotrimoxazole with all plant extracts tested at various concentrations against some antibiotic-resistant bacteria (*V. cholerae*, *S. dysenteriae*, *Enterobacter aerogenes*, *Proteus mirabilis*, *Pseudomonas aeruginosa* and *Escherichia coli*). This indicates that the use of plant extracts together with antibiotics may enhance activity against drug-resistant pathogens. In the kill kinetics tests, the extracts of *Terminalia brownii* were bactericidal against *Staphylococcus aureus* while *Melia volkensii* and *Albizia coriaria* were bactericidal against *Escherichia coli*. This is interesting because *S. aureus* has been known to be therapeutically problematic especially in immunocompromised people. Hence, *Terminalia brownii* can be used in treating *S. aureus* infections in this group of people. The brine shrimp lethality tests revealed that the plants were of low toxicity and can be used for the treatment of diarrhoea diseases in humans and avoid possible detrimental health risks. The overall results of the present study authenticate the therapeutic values of the antidiarrhoeal medicinal plants and show that they can be used in further drug development.