African Journal of Biotechnology Vol. 5 (10), pp. 958-959, 16 May 2006
Available online at http://www.academicjournals.org/AJB
ISSN 1684–5315 © 2006 Academic Journals

Short Communication

Antibacterial assessment of whole stem bark of *Vitex doniana* against some enterobactriaceae

KILANI A. M

Department of Botany and Microbiology, Faculty of Science University of Lagos, Akoka, Nigeria. E-mail: adetunjikilani2005@yahoo.com.

Accepted 7 March, 2006

The effects of methanolic extracts of the stem bark of *Vitex doniana* against some *Entrobacteriaceae* was investigated. Clinical isolates of *Salmonella typhi*, *Shigella dysentariae* and *Escherichia coli* were treated with extracts of the stem bark of *V. doniana* for antimicrobial activity using *in vitro* agar diffusion method and the minimum inhibitory concentration. The stem bark extracts were able to inhibit the growth pattern of the tested microorganisms. In all cases *Shigella dysentariae* showed the highest sensitivity. The results suggest that *V. doniana* may be valuable in the management of dysentery and gastroenteritis infections.

Key words: *Vitex doniana*, antimicrobial susceptibility, traditional medicine.

INTRODUCTION

Vitex doniana (*Verbernaceae*) commonly known as black plum or "Ori-nla" is wide spread in the south western Nigeria as a perennial trees. Earlier workers have reported the use of the fruits and leaves for medicinal purposes (Sofwora, 1993; Babalola, 1993). In Nigeria, from information available from the indigenous traditional healers, a decoction of the chopped stem bark part of *V. doniana* is prepared and taken orally for treatment of gastroenteritis. It is administered for ailments including diarrhea and dysentery. It is also taken to improved fertility and the juice may be squeezed into the eyes to treat eye troubles. The use of *V. doniana* suggests that it may possess antimicrobial activity.

This study was designed to screen the potentiality of *V. doniana* collected from south western Nigeria for antimicrobial effects on the most prevalent enteric pathogenic organisms (*Salmonella typhi*, *Shigella dysentariae* and *Escherichia coli*)

MATERIALS AND METHODS

Extraction of *V. doniana* stem bark

The plant is abundantly distributed in various areas of southwestern Nigeria. Samples of leaves, stem and fruits were collected from the sites and taken to the Herbarium, Department of Botany and Microbiology, University of Lagos; Akoka, Nigeria where the plant was authenticated.

The stem bark of the *V. doniana* was scrapped by cutlass about 10-15 cm deep. These were ground and kept in refrigerator. The finely powder stem bark were extracted twice with 10% (w/v) methanol and agitated on vortex mixer. The methanolic extracts was dried under vacuum with water bath and re-dissolved in methanol.

Antimicrobial assay

Clinical bacterial strains of *salmonella typhi*, *Shigella dysentarae* and *E. coli* were studied for their susceptibilities to *V. doniana* stem bark methanolic extract. All strains were isolated from clinical specimens obtained from patients in Lagos University teaching hospital and General Hospital, Ikeja, Lagos, Nigeria. Strains were identified by convention standard methods (Cowan, 1991; NCCLS, 1995).

The following media were used throughout the study: Nutrient agar (oxoid), Nutrient both (oxoid), Muella Hintons agar (LabM), MacConkey agar (Oxoid), Salmonela-shilgella agar (Oxoid). The test organisms were grown on nutrient agar and maintained on slants. Overnight broth cultures of the isolates were diluted to give 10^4 cfu/ml and this were used as inocula in this study.

The extract activity was tested by paper disc assay method (Oluronke et al., 1999) with some modification. The nutrient agar plates were flooded with each of the standardized test organisms. The disc, previously sterilized with ultraviolet, was soaked with the extract for 1 h. This was gently placed on the surface of the

Table 1. Susceptibility of bacteria to the *V. doniana* stem bark methanolic extract.

Microorganism	No of isolates tested	No of sensitive isolates	% of sensitive isolates	Average zone of inhibition diameter (mm)
Salmonella typhi	30	18	60	11.5
Shigella dysentarae	30	28	93.33	22
E. coli	30	25	83.33	16

Table 2. Minimum inhibitory concentration (MIC) of the *V. doniana* stem bark methanolic extract against the microorganisms.

Microorganism	No of isolates tested	MIC (mg/ml)	% Susceptible at recommended Break Points
Salmonella typhi	18	0.31-2.5	44.4
Shigella dysentarae	28	0.02 –0.08	100
E. coli	25	0.04 – 0.38	88

MIC results interpreted by NCCLS (1995) criteria using 0.31 mg/ml as susceptible break point.

inoculated agar plates with a sterile forceps in duplicated apart. Plates were read after 24 h incubation at 37°C. Activities of the extract were estimated by measuring the linear diameter of inhibition zone. The minimum inhibitory concentration (MIC) of the extract was determined using standard tubes dilution method (NCCLS, 1995; Oluronke et al., 1999).

RESULTS AND DISCUSSION

Antimicrobial activity of the extracts on the test organisms in this study revealed inhibition of growth, though the susceptibility pattern of the test organisms to the extract was not uniform (Table 1). *Shilgella dysentarae* showed highest sensitivity followed by *E. coli* while *Salmonella* typhi was the least sensitive. The results of the minimum inhibitory concentrations of the extract on the test organisms are shown in Table 2. The MIC ranged between 0.2 to 2.5 mg/ml. When sprayed with ferric chloride, the inhibition zone turned deep blue indicating the presence of phenolic compounds.

The present study showed that methanolic extract of the stem bark of *V. doniana* has antimicrobial properties against the test organisms. This finding therefore supports the use of *V. doniana* by traditional medicine practitioners in the treatment of dysentary and gastroenteritis.

A number of plants have been indicated to possess antimicrobial properties from their traditional medicinal uses (NCCLS, 1995). Antimicrobial activity of the *V. doniana* extract could be attributed to the presence of phenolic compounds that have been liked with antimicrobial properties (Elujoba, 1996; NCCLS, 1995). The low MIC values confirm high activity of the extract at low concentrations especially to *Shigella dysentarae*. This study forms the preliminary screening of the antimicrobial activities of the methanolic extract of stem bark of *V. doniana*. Further investigation, using bioassay-guided fractionation will be conducted to isolated active constitutes.

REFERENCE

Sofwora A (1993). Medicinal plants and traditional medicine in Africa. Spectrum books ltd. 2nd Edn. pp26-100

Agdebahunsi JM (1993). Plant utilization in indigenous medicinal systems. African Marburgenisa 26: 14-15.

Babalola EO (1993). The persistence of African Traditional medicine in contemporary Nigeria Society. African Marburgensia 26: 4.

Cowan MM (1991). Plant products as antimicrobial agents. Clinical Microbiology Review. 13: 564-582.

Elujoba AA (1996). Standardization of Phytomedicines Proceedings on an international workshop on commercial production of an indigenous plant, Lagos. Nigeria. p19.

Leven M, Vandan-baerge DA, Markerm I, Vilienttrice A, Lomiveas EC (1979), Screening of higher plants for Biological activities. Plants Medical: 36: 311-312.

National committee for Clinical laboratory Standards (NCCLS). Performance Standards for antimicrobial Susceptibility testing (1995) 15(14): 100 – 56

Oluronke. T, Hong-xixu SFL (1999). Antimicrobial activities of extract from Nigeria chewing Sticks. Phytother. Res. 13: 675-679.

World Health Organization (WHO 1978). The Promotion and Development of Traditional Medicine. Report of a WHO meeting Technical Report series 622.