SHORT COMMUNICATION REPORT

ANTIBACTERIAL ACTIVITY OF SOME NIGERIAN MEDICINAL PLANTS

DABAI, Y. U. & *MUHAMMAD, S.
Department of Biological Sciences
Usmanu Danfodiyo University Sokoto, Nigeria.
*(Corresponding author)
samdiri@yahoo.co.uk

INTRODUCTION

Infectious diseases usually present clear symptoms, a likelihood that enables traditional healers to recognize and develop effective therapies against them. Traditional medical practitioners constitute a large proportion of the population of the people of Northern Nigeria who rely heavily on the use of traditional plants for physical and psychological health needs. The usage of plants in traditional medicine is on the increase, which perhaps made Sofowora (1984) to consider the chances of using antibacterial active traditional medicine to be high. Today, medicinal plants have become the focus of intense study recently on (Unningham 1988).

This report is a preliminary investigation on the medicinal value of some plants for their antibacterial activity using bioassay procedures. The selection of the plants screened was based on the reports of their uses by the inhabitants of Sokoto Township in the treatment of fever, diarrhoea and many ailments (Sofowora 1984).

MATERIALS AND METHODS

Plant Material: The plants were collected from Zuru, Kebbi State and Sokoto in (Northern Nigeria) during the rainy season; when their leaves are fresh and well grown. The collection was done with the help of two traditional healers for the indication of these plants.

Preparation of extracts: The leave of *Bantrinia thonningi, Angeiossus schimpeir* and *Cassia occidentalis* were collected, washed and kept in an oven at 60^{o}C for 24 hrs to dry. The leaves were pounded into powdery form, which was then sieved to obtain the fine sample.

Preparation of the Bark powder: The bark of *Bantrinia,* and *Angeiossus* and *Cassia occidentalis* were collected and kept in an oven at 70^{o}C overnight to dry. These were later grounded into powdery form and sieved to obtain fine sample. The bark powder collected was kept in a polythene bag in the laboratory prior to use.

Antibacterial Activity: The well plate (Ditch) diffusion method and Disk Diffusion assay were used to determine the growth inhibition of bacteria by plant extracts were used as described by Geo & Stephen (1998). The following 3 bacteria (*Staphlococcus aureus*, *Salmonella typhi,* and *Escherichia coli*) were obtained from clinical cases at Usmanu Danfodiyo University Teaching Hospital, maintained at 4^{o}C on Nutrient Agar slants and used for the studies. Using a sterile cork borer of 6 mm diameter, four holes per plate were made into the set Agar containing the bacteria culture. A total of 30 mg/ml.$^{-1}$, 60 mg/ml.$^{-1}$, 90 mg/ml.$^{-1}$ 120 mg/ml.$^{-1}$ of plant extracts were poured into four holes.

The plates were placed into the incubator at 37^{o}C for 24hrs. Antibacterial activity were recorded when the zone of inhibition is greater than 6 mm (Vlictinck *et al.* 1995). 2mm diameter Disk were soaked into the prepared extract concentrations and left over night and placed on a sterile filter to air dry. The Disc were placed on the set agar plate with the test bacteria streak on it. All the plates were incubated inverted at 37 ^{o}C for 24hrs. The zones of inhibition were measured after incubation.

The result of the assay with the leaves of *B. thonningi* using Ditch method shows little antibacterial activity on *S. aureus* and *E. coli.* There was a gradual increase in activity as the concentration increases from 30mg/ml – 120 mg/ml.$^{-1}$. A similar pattern was observed with Disc Diffusion method using the bark extracts of the test plant. However, a 4mm zone of inhibition was obtained at 120mg/ml on *S. aureus*. (Table 1)

The results of the antibacterial activity of *A. schimperi* on the test bacteria indicated that only *S. aureus* was sensitive. Also it shows a gradual increase in antibacterial activity as the concentration increases. A maximum of 3mm zone inhibition was obtained at the highest concentration used (120mg/ml) (Table 2). Similarly a gradual increase in activity was observed as the concentration increases for *S. aureus* on the Disc Diffusion method using the Bark extracts. A maximum of 3mm zone of inhibition was observed. As for *E. coli,* there was a very small activity observed of 1mm zone of inhibition across all the concentrations (Table 2).

The results of the antibacterial activity of *C. occidentalis* on the test bacteria using the Ditch method showed that *S. aureus* and *S. typhi* were sensitive to the extract across all concentrations, but *S. typhi* responded maximally in that the highest inhibition of 16mm was observed against the highest concentration (120mg/ml). *E. coli* was not sensitive. (Table 3). Similary pattern was observed with Disc Diffusion method where the highest inhibition (16mm) was observed against *S. typhy*. *E. coli* remain insensitive and *S. aureus* showed a high response to the extracts (Table 3).

The result from this work has revealed the medicinal potentiality of some of the plants in the treatment of diseases. *Cassia occidentalis* was found to be active on *Salmonella* species, *Bantrinia thonningi* was most active on *Staphylococcus aureus* while *E. coli* was active against two of the plants tested. A similar result was reported by Muhammad & Muhammad (2005).

TABLE 1: RESULTS OF ANTIBACTERIAL ACTIVITY OF THE LEAVES AND BARK OF *Bantrinia thonningi*

Test bacteria	Zone of inhibition (mm) Concentration (mg/ml)							
	30		60		90		120	
	leaves	Bark	leaves	Bark	leaves	Bark	leaves	Bark
S. aureus	6	1	7	2	8	2	8	4
E. coli	6	2	7	2	7	2	7	3
S. typhi	6	0	6	0	6	0	6	0

TABLE 2: RESULTS OF ANTIBACTERIAL ACTIVITY ON LEAVES AND BARK OF *Angeiossus schimperi*

Test bacteria	Zone of inhibition (mm) Concentration (mg/ml)							
	30		60		90		120	
	leaves	Bark	leaves	Bark	leaves	Bark	leaves	Bark
S. aureus	7	2	8	3	9	3	9	3
E. coli	6	1	6	1	6	1	9	1
S. typhi	6	0	6	0	6	0	6	0

TABLE 3: RESULTS OF ANTIBACTERIAL ACTIVITY ON L EAVES AND BARK OF *Cassia occidentalis*

Test bacteria	Zone of inhibition (mm) Concentration (mg/ml)							
	30		60		90		120	
	leaves	Bark	leaves	Bark	leaves	Bark	leaves	Bark
S. aureus	8	2	8	2	8	2	8	2
E. coli	6	0	6	0	6	0	6	0
S. typhi	8	2	8	2	16	10	22	16

The result of this study support to a certain degree, the traditional medicinal uses of the plants evaluated both for human and animal disease therapy (Sofowora 1984). The successful screening of these plants as potential sources of bioactive substances has urged us to continue further tests in order to isolate the active ingredients involved.

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