

## Short Communication

# Antimicrobial activity of a decoction used by Southwestern Nigeria traditional healers on selected dermatophytes

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**The antifungal activity of a herbal decoction used by south western Nigeria traditional healers in the treatment of superficial mycoses and related infectious diseases was tested against clinical isolates of *Candida albicans*, *Trichophyton rubrum* and *Microsporium* sp. All the test organisms were susceptible to the herbal decoction. *Candida albicans* were highly susceptible, while *Microsporium* species were least susceptible. Qualitative detection of some antimicrobial phytochemicals may account for the antifungal efficacy exhibited by the studied decoction.**

**Key words:** Traditional healers, herbal decoction, and antimicrobial activity.

## INTRODUCTION

A traditional healer can be described as a person who is recognized by the community in which he lives as competent to provide healthcare by using herb, animals, and mineral substances as well as certain other substances (Sofowora, 1998). Thus, majority of the world's population in developing countries still rely on herbal medicine to meet their health needs. Although the World Health Organization supports the appropriate use of herbal medicine and encourages the use of safe and effective remedies, it has also stated that most herbal medicine need to be studied scientifically (Ukueze and Abariku, 1998). WHO has therefore published guideline with the main purpose of defining the basic criteria for evaluation of quality, safety and efficiency of herbal medicine and thus assist researchers and others to undertake documentation in respect of such products, since the major criticism usually levelled against traditional healers is that their portions are not standardized, documented, specified and dosage are imprecise (Iwu, 1986). This study investigated the reputed efficiencies of a herbal decoction which has been experienced and passed on from one generation to the other in some part of Western Nigeria.

The present study is in pursuance of the assessment and verification of the scientific basis of some known and claimed practices in herbal medicine in developing country especially in Nigeria. The aim of carrying out this study is to examine the antifungal activities of a widely appraised aqueous decoction against some common dermatophytes (*Candida albicans*, *Trichophyton rubrum* and *Microsporium* sp.).

## MATERIALS AND METHODS

### Collection and authentication of the herbal materials

Herbal materials were collected from two regions in the western part of Nigeria namely Ogbomoso (Oyo state) and Ejigbo (Osun state) based on the interview with the traditional healers on the constituents of the test decoction. The plant constituents were authenticated at the University of Lagos herbarium, Akoka, Nigeria.

### Processing of the herbal decoction

The old inflorescence of palm tree (*Elaeis guineensis*) and ripe cocoa pod with the seed removed were sorted, washed and chipped into smaller pieces. The two plant materials were dried in oven and later burnt to ashes which 20 g were added to boiled water (1 liter) and stirred for 15 - 30 min under flame. Other ingredients added were 20 g of black soap and 2 g of sodium salt "Obu-Otoyo". The resulting colloidal semi-solid black substance formed was allowed

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**Table 1.** Antifungal activities of the studied decoction.

Organism	No of isolates	Average zone of inhibition diameter (mm)	Minimum inhibitory concentration (MIC) range (mg/ml)
<i>Candida albicans</i>	30	32.0	0.04 – 0.08
<i>Trichophyton rubrum</i>	30	25.5	0.16 – 0.63
<i>Microsporium furfur</i>	30	22.0	0.63 – 2.5

**Table 2.** Phytochemical analysis of the test decoction.

Alkaloids	Tannins	Flavonoids	Antraquinones	Cyanogenic glycosides	Cardiac glycosides	Saponins
++	++	++	++	++	--	++

++ = Present.

-- = Absent.

to cool and kept at room temperature until needed for use.

### Organisms

The fungal cultures were clinical isolates of *C. albicans*, *T. rubrum* and *Microsporium* sp. obtained from medical microbiology laboratory of Lagos University Teaching Hospital: Idi-Araba Lagos. They were preserved on agar slants at 25°C as stock.

### Screening of the herbal for antifungal activity

The herbal was standardized by weighing 10 g and dissolved in 100 ml of the sterile distilled water. Sterile filter paper disks (Whatman filter paper No. 1) were dipped in the standardized test agents and allowed to soak. Surface – spread plates were prepared using 1 x 10<sup>5</sup> cells/ml of each of the three seeded with young broth culture of each of the standardized organisms. The disks soaked with the test agents were aseptically transferred using sterile forceps on to the surface of inoculated plates in duplicates. The disks were sufficiently spaced to prevent overlapping of zones of inhibition. Sterile distilled water was used as a control. Plates were incubated at 25°C for 48 – 72 h before being examined for inhibitory effect.

### Determination of minimum incubatory concentration

The minimum inhibitory concentration of the test decoction was carried out using tube dilution method (Deborah et al., 2006; Omoregbe, 2005). Using 10 sterile capped test tubes using sterile distilled water as diluent, doubling serial dilutions were made from the test decoction to obtain graded concentrations of 10, 5, 2.5, 1.25, 0.63, 0.32, 0.16, 0.08, 0.04 and 0.02 mg/ml and a tube containing only sterile distilled water as the control. The different dilutions of the test decoction to be evaluated were adsorbed on sterile paper discs and aseptically placed on the surface of the inoculated sabroud dextrose agar plates in duplicates. The plates were incubated at 25°C for 24 – 48 h. The lowest concentration of the test decoction that inhibited the growth of the test organisms was taken as the minimum inhibitory concentration.

### Phytochemical screening

Constituents of the herbal decoction were extracted immediately after the preparations. Screening procedures were carried out using standard methods as describe by Sofowora (1993), Treases and

Evans (1989) and Harborne (1973) with slight modification. The extract was suction filtered and process repeated until all soluble compounds had been extracted. Extract was evaporated to dryness *in vacuo* at 45°C. A portion of the residue was used to test for the following antimicrobials plant constituents; alkaloids, tannins, glycol-side, anthraquinones flavonoids, cyanogenic glycoside and saponins.

## RESULT AND DISCUSSION

The profile of herbal decoction used in this study is shown in Tables 1 and 2. Generally there were inhibitions of growth of the test organisms as indicated on culture plates by cleared zone. The activity of the herbal decoction on the test organisms was not uniform (Table 1). In all cases *C. albicans* showed high sensitivity (32 mm average zone of inhibition) followed by *T. rubrum* (25 mm) and *microsporium* sp. (22 mm) was least sensitive. These results was also in conformity with minimum inhibitory concentration values ranging between 0.04 to 2.5 mg/ml for all the isolates with *C. albicans* showing high susceptibility to the product least graded concentrations.

The phytochemical screening test revealed that the herbal decoction exhibited positive reactions attributable to alkaloids, tannins, flavonoids, cyanogenic glycoside and saponins. However, the glycosides present were not hydrolysed and the anthraquinones were found to be present in free and combined forms.

Herbal medicines have genuine utility and over 80% of rural population depends on it for primary health care. The World Health Organization has been advocating the needs for orthodox medical practitioners to interact with traditional herbal healers with a view to identifying and exploiting aspects that provide safe and effective remedies for ailments of both microbial and non-microbial organisms (WHO 1978). The present study has demonstrated that the test decoction has antifungal properties against common mycoses observe in Nigeria. Discussion with herbal medicine practitioners in southwestern Nigeria revealed that they normally use the decoction in the

treatment of skin infection and mouth-thrush. This is in conformity with the result obtained in this study; since the decoction is found to possess antimicrobial properties against *C. albicans*, *T. rubrum* and *microsporium* sp. which are some of the organisms associated with this infection. No previous scientific study has been carried out on the herbal preparation studied. Thus this study presents a preliminary report of the efficacy of this herbal preparation used by southern Western Nigeria in the treatment of superficial mycoses and mouth thrush as demonstrated by *in vitro* activities against the prevalence clinical isolates tested.

Phytochemical screening results indicated the presence of plant metabolites well known for antimicrobial activity such as alkaloids, tannins anthraquinones, flavonoids, cyanogenic glycoside and saponins. This study has therefore offer a scientific basis for the use of this herbal decoction in the treatment of superficial and associated fungal infections. Rather detailed study on this herbal decoction is necessary to determine toxicity, side effects stability and standard dosage forms.

## REFERENCES

- Deborah KB, Mecky IN, Olipa D, Cosam GJ, Zakaria HM (2006). Screening of Tanzania Medicinal Plants for Anti-Candida activity. BMC Complementary and Alternative Medicine 6: 1-29.
- Harborne JB (1973). Phytochemical Methods London, Chapman and Hall, Ltd pp 49-188.
- Sofowora AE (1998). Bioactive compounds Medicinal Plants and Traditional Medicine in Africa. 3<sup>rd</sup> eds. Spectrum Books Ltd pp 52-57.
- Treases GE, Evans WC (1989). Pharmacognosy 11<sup>th</sup> ed. Brailliar Tirden Can. Macmillan publishers.
- Ukueze NO, Abariku PO (1998). Antimicrobial Activity of Certain medicinal plants used in traditional medicine in Nigeria-A preliminary study. J. Microbiol 6: 32-40.
- World Health organization (WHO) (1978). The Promotion and Development of traditional medicine, Report of a WHO meeting Technical report series p. 622.
- Omogbe RE, Ikuebe OM, Ihimire IG (1995). Antimicrobial activity of some medicinal plant extracts on *Escherichia coli*, *Salmonella paratyphi* and *Shigella dysenteriae*. Afr. J. Med. Sci 25:373-375.