

In vitro Evaluation of Antifungal Activity of *Leptadenia arborea* against caused to tinea capitis

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Abstract: The present study was designed to investigate antifungal activity of *Leptadenia arborea* (Forssk) Schweinf.; (Asclepidaceae) (leaves and stem). The ethanolic of leave and stem plant extract were seasoned against standard fungi *Microsporum canis* using cup-plate agar diffusion method. Ethanolic extract of stem showed highest activity against *Microsporum canis*.

Key words: *leptadeina heterophylla*, antifungal, *Microsporum canis*, ethanolic

I. Introduction:

Microbial infections are major public health problems in the developed countries. Antibiotics are used to treat these infections. Due to indiscriminate use of commercial antibiotics, the incidence of multiple antibiotic resistance in human pathogens is increasing. This has forced the scientists to search for new antimicrobial substances from various sources like medicinal plants. Medicinal plants constitute the main source of new pharmaceuticals and health care products (Ivanona, *et al.*, 2005). About 80% of individuals from developed countries use traditional medicine which has compounds derived from medicinal plants (Hema, *et al.*, 2012). Herbal and natural products have enormous popularity as self-medication products (Greenwald, 1998). Herbal medicines are the oldest remedies known to mankind. Herbs had been used by all cultures throughout history but India has one of the oldest, richest and most diverse cultural living traditions associated with the use of medicinal plants (Montbriand, 2000). Medicinal plants are an important therapeutic aid for various ailments (Gordon and David, 2001). Fungi are everywhere. There are approximately 1.5 million different species of fungi on Earth, but only about 300 of those are known to make people sick. Fungal diseases are often caused by fungi that are common in the environment. Fungi live outdoors in soil and on plants and trees as well as on many indoor surfaces and on human skin. Most fungi are not dangerous, but some types can be harmful to health (Garcia-Solache and Casadevall, 2010; Hawksworth, 2001). *Microsporum canis* produces septate hyphae, macroconidia, and few or rare microconidia. Macroconidia are typically long spindle-shaped, with 5-15 cells, verrucose, thick-walled and often have a terminal knob. The septal walls are thin. Microconidia are rare, unicellular and clavate to pyriform in shape. Raquet hyphae, nodular bodies, and chlamydo spores may be present. Macroconidia and/or microconidia are often not produced on primary isolation media and it is recommended that sub-cultures be made onto boiled polished rice grains to stimulate sporulation (Summerbell, *et al.*, 2007; Larone, 2002).

Leptadenia arborea is a member of family Asclepiadaceae. It's widespread in the Sudan and known as Shaaloub. Traditionally the plant is used in India as galactagogue for both women and cows (Narasimhamurthy, 1969). In the Sudan the powdered stem is used for nose and tooth swelling. The aerial part of *Leptadenia arborea* has been shown to contain pinosresinol, syringaresinol, leucanthevitol and E-ferulaldehyde. These known compounds are being reported for the first time from this plant. Among them, syringaresinol leucanthevitol and E-ferulaldehyde. These known compounds are being reported for the first time from this plant. Among them, syringaresinol has shown an inhibitory effect against acetylcholinesterase (El-Hassan *et al.*,

2003). The aim of this study is to investigate the antifungal activity of *Leptadenia arborea* (leaves and stem) to ascertain the rationale for its use in traditional medicine.

II. Material And Methods:

Plant material:

The leaves and stems of *Leptadenia arborea* were collected from the neyalla in western sudan. The plant was identified in the Botany department, Faculty of science and technology, Omdurman Islamic University by Prof. Hatil Hashim AL-kamali and by comparison with herbarium of the department. The plant was spread and dried in the shade for three weeks and then pulverized with mechanical grinder.

Preparation of plant extracts:

The dried plant powder was extracted by ethanol in the ratio of (1:5). The extract was filtered through Whatman filter paper IV. Then it was left to dry at room temperature. The weight of the solid residue was recorded and taken as yield of crude extracts.

Preparation of fungal suspension:

The fungal cultures were maintained on Sabouraud dextrose agar, incubated at 25 °C for 4 days. The fungal growth was harvested and washed with sterile normal saline and finally suspension in 100ml of sterile normal saline, and the suspension were stored in the refrigerator until used.

In vitro testing of extracts for antifungal activity:

The cup-plate agar diffusion method was adopted according to (Kavanagh, 1972) with some minor modifications to assess the antibacterial activity of the prepared extracts. One ml of the standardized bacterial stock suspension $10^8 - 10^9$ C.F.U./ml were thoroughly mixed with 100ml of Sabouraud dextrose agar which was maintained at 45 °C. 20ml aliquots of the inoculated nutrient agar were distributed into sterile Petri-dishes. The agars was left to dry and in each of these plates 4 cups (10 mm in diameter) were cut using a sterile cork borer (No. 4) and agar discs were removed. Alternate cups were filled with 0.1 ml sample of each extracts using automatic Microlitre-pipette, and allowed to diffuse at room temperature for two hours. The plates were then incubated in the upright position at 25 °C for Three dayes. Two replicates were carried out for each extracts against each of the test organisms. Simultaneously addition of extracts was carried out as controls. After incubation, the diameters of the resultants and growth inhibition zones were measured, averaged and the mean values were tabulated.

III. Result And Discussion:

Table 1: Antifungal activity of (leaves and stem) ethanolic extract of *Leptadenia arborea* against standard *Microsporum canis*

M D I Z (mm)	Control (Ethanol)	Leaves ethanolic extract	Stems ethanolic extract
40%	-	16	28
20%	-	16	28
10%	-	-	24

M D I Z = Mean diameter of growth inhibition zone = average of two replicates in millimeters. Tested concentration of extract: 100mg/ml (0.1ml/well); According Almagboul (1992), the microorganism were sensitive to plant extract when the inhibition zone ≥ 15 mm and resistant when the inhibition zone < 15 mm.

IV. Conclusion

The ethanolic extract of *Leptadenia arborea* (leaves and stem) showed antifungal activity against *Microsporum canis*. The effect of this plant on more pathogenic organism, and toxicological investigation and Further purification, however, need to be carried out also further phytochemical investigation of active constituents present in ethanolic extract and possibly other fractions are required

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