



Leaf extract of *Azadirachta indica* (neem) as herbal cure of dandruff

Maleeha Umer*, Rashida Sultana, Tehseen Ijaz and Amtul Aala

Department of Botany, Abdus Salam School of Sciences, Nusrat Jahan College Rabwah, Chenab Nagar, Pakistan

Abstract

The leaf extract of *Azadirachta indica*, neem plant was examined for anti-dandruff activity using microbiological tests such as MIC determination by well, disc and spread method and methylene blue reductase test. Leaves were grinded and filtered. The filtered extract (3 ml and 5 ml) was mixed with Sabouraud's medium. After solidification of medium dandruff isolated from human hairs was spread over and petri plates were incubated for 5 days at 35 °C. The results obtained clearly demonstrated that neem leaf extract (5 ml) could be effective in control on dandruff growth.

Keywords: Leaf extract, *Azadirachta indica*, anti-dandruff, Sabouraud's medium

Short Communication

*Corresponding Author, e-mail: maleeha.umer@njc.edu.pk

1. Introduction

Pityriasis capitis is medical terminology of dandruff. During this dermal condition tiny pieces of skin scales get separated from scalp and fall off. Dandruff effected people in most cases face self-esteem issues [1]. Reddening, itching and flaking with over production of sebum are among most common symptoms of dandruff. Scalps with dandruff are more susceptible to hair loss as compared to dandruff free scalps. According to previous studies more than fifty percent of adult population is victimized by dandruff. Among different types of scalp disorders, 25% are dandruff issues [2]. A survey reports that about fifty million people suffer from dandruff annually and more than three hundred million dollar is spent on various types of treatments of dandruff [3]. *Malassezia* is the causal fungi of dandruff. Besides *Malassezia*, *Candida albicans* and *Pityrosporum* also cause dandruff. Among various species of this fungi, most prominent on human scalp are *M. furfur*, *M. restricta* and *M. globosa*. These are lipophilic fungi [4]. Colonies of this fungus are cream colored, yellowish and orange depending on species. At young age these colonies are smooth and bulged but with maturity become dry and squeezed. This fungi grows very fast and within five days of incubation at 30-37 °C gets mature [5].

Herbal treatment of dandruff is more beneficial as compared to chemical treatments as there are chances of side effects. In view of above mentioned dandruff condition a study was planned to examine if leaf extract of neem plant can be used as herbal remedy of dandruff. It is very much renowned plant due to its medicinal and anti-microbial properties. Neem leaves can be used to clean air born

bacterial contaminations in residential areas [6]. Neem seeds are used to cure various eye and ear infections. Aqueous extracts of neem are very much beneficial in viral diseases [7]. Fruit of neem causes infertility.

2. Materials and methods

Dandruff was isolated from 12 volunteer students and was maintained at Sabouraud's agar medium. Neem leaves were rinsed and surface sterilized using HgCl₂. They were grounded in distilled water using mortar pestle. Extract was filtered using wattman filter paper. Two concentrations of neem leaf extract were used.

2.1. Minimum inhibitory concentration determination (MIC)

Minimum inhibitory concentration was determined using three methods, spread, disc and well method.

2.1.1. Spread method

MIC in spread method was determined by mixing 3 ml and 5 ml neem leaf extract in petriplates having Sabouraud's medium [8]. After mixing of leaf extracts and media tween 20 was used for emulsification. After emulsification, media with leaf extracts was placed for solidification. When media was solidified, dandruff at the rate of 10³ CFU was inoculated on each petri plate. While plates without leaf extracts and just with dandruff on media were taken as control group. At the end of inoculation plates were incubated for 5 days at 37 °C. After 5 days zone of inhibition was calculated.

2.1.2. Well method

A well of 10 mm diameter was made in solidified Sabouraud’s medium with cork borer. In wells neem leaf extracts of 3 ml and 5 ml concentrations were poured. Then dandruff was inoculated at same rate as for spread method. Plates were incubated at 37 °C for 5 days. After incubation period zone of inhibition was calculated.

Disc method

In disc method small circular discs were first dipped in 3 ml and 5 ml leaf extracts and were then placed on solidified Sabouraud’s medium. Dandruff was inoculated and plates were incubated as in case of well method.

Methylene blue reductase test

Dandruff grown on spread method was taken after 5 days and was stained with methylene blue [9] and observed under microscope. Dead cells retained blue color while living cells did not retain blue color.

3. Results and discussions

Neem leaves extract at 5 ml showed more inhibition of dandruff through well diffusion and disk diffusion method as compared to 3 ml concentration of neem extract. This suggests that more the concentration of neem leaves extract more will be dandruff inhibition. Results of MIC test revealed complete death of dandruff cells at 5 ml concentration as compared to 3 ml concentration (Figures 3,4). While control group showed live dandruff cells as no methylene stain was absorbed by them (Figure 5). Our present study reports that neem leaves extract is very effective herbal remedy against dandruff cure. Also our work supports previous findings regarding neem’s anti fungal properties. It is cheap and easily accessible means of treatment because neem trees are available in almost all areas. Using neem leaves for dandruff treatment, side effects of chemicals can be avoided.

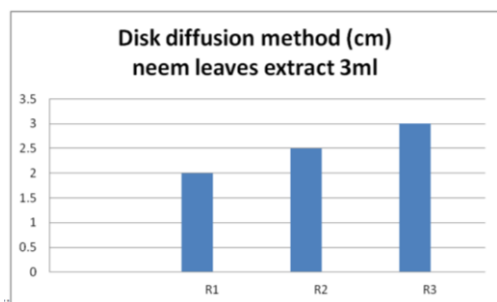


Figure1: Effect of 3 ml neem leaves extract on dandruff through disk diffusion method

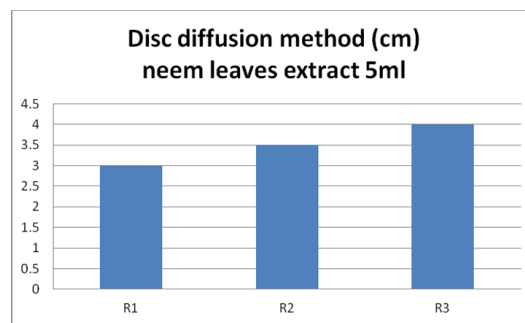


Figure 2: Effect of 5 ml neem leaves extract on dandruff through disk diffusion method

Table 1: Effect of 3 ml neem leaves extract on dandruff through well diffusion method

R1	2
R2	2.9
R3	3.5

Table 2: Effect of 5 ml neem leaves extract on dandruff through well diffusion method

R1	3.5
R2	4
R3	3

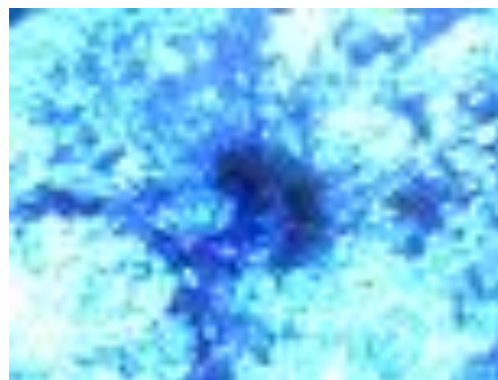


Figure 3: Microscopic image of dead dandruff at 5 ml Neem leaves extract spread method



Figure 4: Microscopic image of dead dandruff at 3 ml Neem leaves extract spread method



Figure 5: Microscopic image of live dandruff cells from control group

4. Conclusions

Dandruff can be caused by several things, including dry skin; sensitivity to hair products; and skin conditions such as seborrheic dermatitis or eczema. The overgrowth of a yeast-like fungus can also cause dandruff. This overgrowth can be caused by stress, hormones, too much oil on the scalp, or problems with the immune system. The neem extract used in the present study is proposed as an effective treatment of dandruff.

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