



ANTIDANDRUFF ACTIVITY OF FRUIT PEEL

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ABSTRACT

This study was carried out to give remedy for dandruff at low cost without any side effects. Samples were collected from the infected persons and cultured on sabouraud's dextrose agar medium and fungal pathogens were isolated and identified. Then the ethanolic and chloroform extracts (100, 200, 300, 400, 500 μ l) of fruit peel such as Lemon and apple peel were prepared for their anti-dandruff activity. These two extract were added to the wells on the *Aspergillus niger*, *Aspergillus flavus*, and *Candida albicans* inoculated plates and observed for the zone of inhibition. The ethanolic (500ul) of lemon peel showed higher antimicrobial activity against *Candida albicans*(15mm) followed by *Aspergillus niger* (10mm) and *Aspergillus flavus* (11mm). Ethanolic extract of lemon peel scored better antifungal activity than apple peel. Compared to chloroform extract the ethanolic extract exhibit better antifungal activity. This fruit applicable may be applicable instead of synthetic antidandruff shampoo.

INTRODUCTION

Dandruff is a common scalp condition that affects most people at something during and after puberty, an average the scalp skin replaces itself about once every 28 days. If turnover speeds upto every 11days the net result in dandruff. Flanking of the scalp is a symptom of seporrhoeic dermatitis also called dandruff [1]. Dandruff is not a new problem, according to the "Aquatic ape" theory our excessive scalp, skin shedding is a result of our previous adaption to loss of water. Dandruff is affected by changes in the weather and is usually better in summer and worse in winter. Dandruff can happen at any age but is most commonly found in people between the age of 12 and above. A form of dandruff known as cradle cap occurs in new borns infants [2].

There are two different causes of dandruff such as internal and external. Internal causes includes hormonal imbalance, poor health, excessive perspiration, poor hygiene, allergic hypersensitive lack of rest, emotional

stress, excessive consumption of sugar, fat, starch, improper nutrition and hereditary predisposition. External causes are excessive use of hair gels, colours, cold weather and dry indoor heating, tight fitting hats and scarves, infrequent shampooing of the hair or inadequate rinsing, stress and anxiety tension scanting with occasional itching [3]. The main causes of scalp infections are various pathogens or microorganisms like bacteria, fungus, virus or parasites. Among these microorganisms, the most common pathogens involved in skin and hair infections are bacteria and fungus [4]. The present study was carried out according to evidences based on antifungal effect of fruit peel on dandruff.

MATERIALS AND METHODS

Sample collection

Samples were collected by using sterilizing cotton swabs from dandruff infected persons. The sterile swab was gently rotated on the dandruff region. Sterile condition was maintained during the sample collection. The collected samples were immediately transferred to the laboratory for isolation and identification of fungal species.

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Isolation and identification of fungi

After the sample collection sabouraud's dextrose agar medium was used to isolate fungal pathogens from dandruff. The SDA medium was prepared and sterilized in the autoclave at 121° C for 15 minutes under pressure for 15 minutes. Then the medium was allowed to cool. The SDA medium and mixed well. The cooled medium was poured into the sterile petriplates. It was allowed to solidify. After solidification, the swab was lawned on the surface of SDA medium. Then the plates were incubated at 25-28°C for 2-7 days. After incubation, pure culture was obtained and maintained by inoculating the colonies on SDA medium [5].

Fruit material collection

The fruits of lemon and Apple were collected from the shops at Mannargudi, Thiruvavur, District, Tamil Nadu, India. Fruits were washed in the tap water followed by sterilized distilled water, shade dried and then powdered.

Preparation of fruit peel extract

The fruit peel is cut and crushed till it attains a roughage state. 5gm of the ground/crushed fresh fruit is mixed with 100ml of distilled water in a Soxhlet extraction apparatus for 4hrs at 100° C. The fruit peel taken and mixed with 100ml of absolute alcohol and chloroform. The mixture was agitated at room temperature for 8hrs in a room wrist action shaker. The mixture was allowed to stand for 12hrs and alcohol and chloroform was evaporated without heat. The residue was then mixed with 100ml of distilled water at 80°C. Ethanol and chloroform extract was prepared [6].

Antifungal assay by well diffusion method

This SDA medium was prepared and autoclaved at 121° C for 15 minutes. Then the medium was poured into different petriplates and allowed to solidify. After

solidification, the isolated different fungal species were spreaded on the petriplates separately. The well was made in the agar plates by using cork borer. Then poured the different concentration of fruit extracts. The plates without peel extracts were maintained as control. Then the plates were incubated at 24°C for 3 days. After incubation, the diameter of any resulting zone of inhibition was measured [7].

RESULTS

Identification of fungi

The fungal pathogens were identified from dandruff infected person such as *Aspergillus niger*, *Aspergillus flavus*, and *Candida albicans* by using Lactophenol cotton blue staining technique and KOH mounting technique.

Antifungal activity

Ethanol (500µl) and chloroform extract (500µl) of Lemon peel were used for analysis of antifungal activity. Among the two extracts of ethanol extract of Lemon peel was showed high activity against *Candida albicans* (15mm) followed by *Aspergillus niger* (10mm) and *Aspergillus flavus* (11mm) and chloroform extract (500µl) of lemon peel showed moderate activity against *Aspergillus flavus* (9mm) followed by *Candida albicans* (8mm) and *Aspergillus niger* (8mm), (Table-1).

Ethanol and chloroform extract of Apple peel fungal pathogens Ethanol and chloroform extract of Apple peel were evaluated for its antifungal activity. Here also the ethanol extract of Apple peel was showed higher activity against *Aspergillus flavus* (13mm) followed by *Candida albicans* (9mm) and *Aspergillus niger* (10mm) and chloroform extract (500µl) of apple peel showed moderate activity against *Aspergillus niger* (8mm) followed by *Aspergillus flavus* (7mm) and *Candida albicans* (6mm), (Table-2).

Table 1: Zone of inhibition in Lemon peel extracts

S.no	Name of the Fungi	Chloroform (concentration) µl/mm					Ethanol (concentration) µl/mm				
		100	200	300	400	500	100	200	300	400	500
1	<i>A.niger</i>	0.0	2	5	6	8	0.0	4	6	8	10
2	<i>A.flavus</i>	0.0	4	6	7	9	0.0	6	8	10	11
3	<i>C.albicans</i>	0.0	3	5	6	8	0.0	6	7	13	15

Table 2: Zone of inhibition in Apple peel extracts

S.no	Name of the fungi	Chloroform (concentration) µl/mm					Ethanol (concentration) µl/mm				
		100	200	300	400	500	100	200	300	400	500
1	<i>A.niger</i>	0.0	2	4	7	8	0.0	4	6	8	10
2	<i>A.flavus</i>	0.0	4	6	8	7	0.0	5	7	11	13
3	<i>C.albicans</i>	0.0	2	4	6	8	0.0	3	5	7	9

DISCUSSION

This present study revealed that the use of fruits peel of Lemon and Apple extract were showed the best

antifungal activity against pathogens isolated from dandruff. There has been renewed interest in screened high plants for novel biologically active compounds,



particularly those that effectively intervene the human ailments. There is a great demand of fruit juices in treatment of various illnesses such as arthritis, heart diseases and muscle aches and drug [8].

The phytochemical composition varies greatly with the different varieties of Lemon and there by helps in developing new antimicrobials against various infectious diseases. Orange peel extract contains mucilage flavor and the three of glycosides, Limonene is one of the terpenoids

in some vegetables, fruits, and food that plays as a antioxidant in juice [9].

The natural products have relevant advantages over synthetic compounds they are easily available, comparatively cheaper, can be consumed without any side effects and are also nutritious. Hence this study aids in choosing the most suitable fruit peel available against dandruff in the Indian market and also helps in comparing while assessing the grade of the new product tested for antidandruff activity.

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