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Antidandruff Activity of Plant Extracts on *Malassezia furfur* Isolated from Human Scalp

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Antifungal activity of selected Indian medicinal plant extracts against the dandruff causing pathogen. Plant extracts were prepared from *Citrus limon, Emblica officinalis, Trigonella foenum graecum, Vitis vinifera, Papaver somniferum and Allium cepa* in different concentration. The prepared aqueous plant extracts were added to the wells of *Malassezia furfur* inoculated plates. The results were showed that *Citrus limon* extract has maximum zone of inhibition than other plant extracts, and there was no effect on *Papaver somniferum* and *Allium cepa.*

Key words: Antidandruff activity, medicinal plants, *Malassezia furfur*.

Microorganisms affect the people in different ways. Fungi had been recognized as causative agent of human disease earlier than bacteria, fungal infection had been described as early as in 1839. Mycotic infections are encountered unequally and ubiquitously all over the world with varied manifestations (Dulta Asis, 1994). About 1,00,000 species of fungi, were identified and about 50 are pathogenic for humans. Mycotic infection of the skin by the dermatophytes may be categorized into superficial and deep fungal infection. *Malassezia furfur* (Pityrosporum ovale), a lipophilic fungus, affects he hair and cause diseases called dandruff (Ranganathan *et al.*, 2001) and also called Pityriasis versicolar, Tinea circinata, Seborrheic dermatitis (Tollesson, 1997). Dandraff is a condition, which causes small white flakes of skin that separate and fall from the scalp (Chakraborthy, 2000). This may be prevented by some medicinal plants such as *Citrus limon*, *Emblica officinalis*, *Trigonella foenum-graecum*, *Vitis vinifera*, *Papaver somniferum* and *Allium cepa*, which is commonly available in local areas.

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MATERIAL AND METHODS

Sample collection and maintenance of the culture

Scalp scrapings were collected by using sterile combs and the scrappings were collected in sterile Eppendorf tubes from females belonging to the age group of 20 – 25 years (Bennet, 1992). The scalp scrappings were inoculated in Potato Dextrose Agar and Dixon agar medium for the cultivation and maintenance of *Malassezia* species. The inoculated plates and slants were incubated at 28°C for seven days. The seven days old culture was then used for the present study. The *Malassezia* species was confirmed by biochemical tests such as urease, carbohydrate fermentation and gelatin liquefaction tests (Guillot, 1996).

Preparation of plant extracts

Aqueous extracts of *Citrus limon*, *Emblica officinalis* and were prepared from the fruits, *Papaver somniferum, Trigonella foenum* –

graecum and *Vitis vinifera* were prepared from the seeds and for *Allium cepa* the bulbs were used. The fruits, seeds and bulbs were washed distilled water separately and finally with sterile water. 40 ml fruit juice of *Citrus limon* was prepared directly by squeezing the fruit. 40 g of seeds, bulbs and 5 ml of distilled water were taken and ground with the help of pestle and mortar. Then, the extracts obtained were filtered and the filtrate was centrifuged at 5000 rpm for 10 minutes. The supernatant was collected and the macerate was squeezed out into sterile test tubes using sterile absorbent cotton (Meera *et al.*, 1999)

Then, the collected plant extracts were used and also in different concentrations viz., 25, 50 75 and 100 percentage of the prepared extracts were kept in boiling water bath for 30 minutes at 50°C to avoid contamination.

Antifungal assay

Potato Dextrose Agar medium was sterilized and then cooled. The media was poured into petriplates and the *Malassezia* culture was spreaded onto the petriplates. Then, 5 mm wells were made. The prepared different concentration of aqueous plant extracts were added to the wells *M.furfur* inoculated plates and placed without disturbance for the diffusion of the extracts. Control plates without the plant extracts were also maintained. Then, the plates were incubated at 28°C for 4 days. The extent of inhibition was observed and measured in mm. All data on the antifungal activity were the average of triplicate analysis.

RESULTS AND DISCUSSION

The effective inhibition of *Malassezia* species by the plant extracts were shown in table – 1. The plant extracts exhibited concentration dependent activity. *Citrus limon* extract showed a maximum activity against the fungi at all the concentrations. The activity of *Emblica officinalis* was slightly lesser than Citrus limon. *Trigonella foenum – graecum* and *Vitis vinifera* was showed much lesser activity than the former according to the concentrations (Balaraju *et al.*, 2008). All the plant extracts showed maximum activity to their level in the undiluted from (100%) and the function decreased correspondingly. Plants contain a spectrum of secondary metabolites, such as phenols, coumarins, flavanoids, quinines, tannins and their glycosides, alkaloids and essential oil etc. the importance of these substances as microbial agents against the pathogens has been emphasized by several workers (Mahadevan, 1979). The test plants of this study also be rich in these secondary

Table 1. Effect of different percentage of plant extracts on the growth of *M.furfur*

Plant species	Zone of inhibition (in mm)			
	25%	50%	75%	100%
Citrus limon	8	24	30	34
Emblica officinalis	4	20	26	27
Trigonella foenum graecum	-	14	18	20
Vitis vinifera	-	10	15	17
Papaver somniferum	-	-	-	-
Allium cepa	-	-	-	-

Values are mean

metabolites. Further phytochemical studies for the identification and elucidation of active constituents may provide useful lead to the development of new and effective antifungal compounds (Terreaux *et al.*, 1998). *Papaver sominiferum* and *Allium cepa* had no effect on the pathogenic organism. In the present study revealed that the locally available plant extracts such as *Citrus limon, Emblica officinalis, Trigonella foenum graecum* and *Vitis vinifera* can be used as the low cost home remedy for dandruff.

REFERENCES

1. Balaraju. K., Arokiaraj. S., Agastian. P., Antimicrobial activity of leaf extracts of *Pterocarpus santalinus, L. J. Pure & Appl. Micro.* 2008; **2**(1): 161-164.
2. Bennet, J.E., Infections caused by *Malassezia furfur, Medical Mycology*; 1992; **8**: 170-182.
3. Chakruborthy. U., Why do people get dandruff? Did you know? The New Indian Express, 25th Dec. 2000.
4. Dutta Asis., Mycotic infections are encountered unequally and ubiquitously all over the world with varied manifestations. *J. Med. Res.*, 1997; **35**: 208-211.
5. Guillot. J., Identification of *Malassezia sp*. A practical approach. *J. clin. Mycol.*, 2000; **38**: 1263-1266.
6. Mahadevan, A., Plants contain a spectrum of Secondary metabolities. *J.clin. Microbial.* 1979; **38**: 2385-2387.
7. Meera, P., Anitha Dora, P., Karunyal, J., Antibacterial effect of selected medicinal plants on the bacteria isolated from fruit juices *Geobios.*, 1999; **26**: 17-20.
8. Ranganathan, S., Gogul Shangar, S., Ranjith, M.S. Fungal disease of the skin. The Hindu Magazine, 22nd April, 2001.
9. Terreaux, C., Gupta, M.P., and Hostettonann, R., Antifungal Benzoic acid derivatives from *Piper dilatatum. Phytochemistry*; 1998; **49**(2): 461-464.
10. Tollesson, A., *Malassezia furfur* infantile seborrhoeic dermatitis. *Pediator Dermatol*, 1997; **14**(6): 423-425.