

<http://www.pjbs.org>

PJBS

ISSN 1028-8880

**Pakistan
Journal of Biological Sciences**

ANSI*net*

Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Herbal Remedies: A Good Source of Treatment Against Fungal Skin Infections

Mehmet Ozaslan

Department of Biology, Gaziantep University, Gaziantep, Turkey

Dermatophytes are the fungal pathogens of humans and animals infecting the keratinized tissues e.g., skin, nails and hairs, they are most likely found in hot humid areas (Nweze, 2010). These fungi can easily digest the keratinized tissue by releasing sulphite, exo- and endoproteases (Monod, 2008). Sulphite being a reducing agent broke the disulphide bonds of keratin protein and made them more vulnerable to fungal proteases enzymes. The diseases caused by dermatophytes are also known as dermatoses and their prevalence depend upon the activity of peoples (Ansart *et al.*, 2007). As travelers of tropical countries (Africa and America) have dermatophytosis, depending upon their activity status as tourist, migrant etc. Almost 20-25% of world population has skin mycoses (fungal disease) and its prevalence is determined by cultural and socio-economic status of population (Havlickova *et al.*, 2008). For example, tinea pedis (also known as athlete's foot) mycosis is mostly present in developed countries, while tinea capitis (ringworm of scalp) has high prevalence in developing countries. Moreover, its prevalence also depends on the genetic history of humans, as tinea versicolor (type of mycoses) begins earlier in persons with positive family history than with negative family history (He *et al.*, 2008). Furthermore, in positive family history peoples, it has long duration and large chances of recurrence. In past these diseases were treatable with synthetic antimicrobial drugs but now due to inadequate drug exposure and incomplete therapy courses; fungus has developed resistance against them (Martinez-Rossi *et al.*, 2008). For this fungus has modified its enzymes, it enhanced the drugs efflux and become adapted to drug-induced stresses. Thus there should be an alternative way to treat dermatophytosis. Plants are traditionally used for the treatment of various diseases (Karim *et al.*, 2011; Sohail *et al.*, 2011a; Sohail *et al.*, 2011b). These days research has been done on the plant based antimicrobial soaps, the herbal soaps derived from aloe, neem and *Tithonia* showed the potential to treat *Candida albicans* (Kareru *et al.*, 2010). Hence plant based antifungal products may offer a new and effective way to treat skin infections.

To facilitate the plant based antifungal drug establishment Oladele *et al.* (2012) examined the comparative efficiency of three herbal soaps in treating the dermatophyte infected human patients. A very large proportion (73.1%) of patients was of middle age

(20-30 years) and only few, almost 13% of total population (67%) had got tertiary school education. Hence high fungal prevalence was observed in less educated poor community, as educational condition reflected their socioeconomic status. Moreover, age factor showed high infection rate in metabolically more productive stage. Majority (74.6%) of studied patients showed tinea infections, their causal agents belonged to genera *Cryptococcus* and *Epidermophyton*, while the causal agents of ~37.3% infections were not known. These patients were treated with three herbal soaps, made up of leaves, stem barks, roots, fruits and seeds extracts of plants. These soaps were different in composition as soap A was made up of 1 plant only, while B and C were made up of 5 and 3 folk medicinal, antifungal plants respectively. A four week treatment with these soaps showed a significant reduction in skin lesions, when compared to control (no plant input in soap) group. The control soap showed 53.8% tendency to slightly lower the lesions, while lesions' strong reduction was observed in herbal soap treated patients. As all of the soaps were able to reduce the lesions but least effects were produced by soap C; it moderately cleared the 31.6% lesions. Where, its completely cleared lesions yet showed some signs of illness (visible edges etc.). Whereas the other two soaps A and B could clear lesions completely and more pronounced effects were produced by soap A. As soap A treated patients' 61.1% lesions were without visible edges, while soap B cleared 52.9% lesions were without visible edges. Hence difference in A and B's activity was not significantly different and both these soaps caused a complete disappearance of lesions with no microscopic signs of infection. It was also observed that soap B was slightly but non-significantly more effective than A in reducing the microscopic signs of infection. As soap B caused reduction was 11.8% while A reduced 11.1% lesions. This can be said that both soaps (A and B) were equally effective in reducing the fungus caused skin lesions and might provide antifungal protection to peoples of hot areas. Furthermore, a good educational support could also favor the reduction in fungus infections, as in this study poorly educated people were majorly infected.

Fungus act as disease causing agent and peoples of hot humid areas with positive family history and poor health facilities are its major victims. Oladele *et al.* (2012)

through their study on antifungal plants provided a new base for helping dermatophyte infected patients. According to their results plant derived herbal soaps could reduced the skin lesions without any aid of other synthetic drugs. Moreover, a good educational base is also needed to minimize fungal prevalence. More studies on these soaps may enable dermatologist to effectively treat fungus related skin problems.

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