



## MICROBIOLOGICAL CONTAMINATION OF SCALP HAIR IN FEMALE STUDENTS IN COLLEGE OF EDUCATION

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### Abstract

This study included scanning of (40) forty hair samples taken from scalp of female students from internal departments and college of education of girls at different ages ranged from (19-22) years old in Al-Shatra city. These samples transported to the laboratory of college by using of sterilized sealed containers manufactured specifically to dry samples, after that culturing of these samples by using different culture media to isolate different bacteria and fungi. The results showed appearance of (12) twelve different types of fungi classified into (8) eight genuses, the genus *Trichophyton* was predominant followed by *Aspergillus* and *Alternaria* followed by different genuses as *Phoma*, *Absidia*, *Scedosporium* while the isolated bacteria classified as normal flora as *Propionibacterium acnes*, *Moraxella* spp. and *Staphylococcus epidermidis*, and the remaining bacteria as pathogenic agents as *Staphylococcus aureus* and *Escherichia coli* which resulted from missed handling with hair or resulted from a specific disease.

**Key words** : Scalp, Fungi, contamination.

### Introduction

Dermatophytes have healthy importance because it contain pathogenic fungi which have ability to attack the keratinized tissues of human and animals as hair, skin and nails resulting in dermatophytosis and these included three genuses as follow (Microsporium, Trichophyton and Epidermophyton). dermatophytes classified according to the environments in which presented into three types as followed: anthropophilic dermatophytes in which human consider as natural host and can transmit from one person to another but rarely to animals for example : *T. tonsurans*, *E. floccosum*, *T. rubrum*; second type zoophilic dermatophytes that the animals consider as main hosts added to that can affect human as *Microsporium canis*, *T. mentagrophytes* and third type is Geophilic dermatophytes which represented as saprophytic fungi in soil and have ability to affect human and animal as *M. gypseum* Cutaneous mycosis which is fungal infection localized in epidermis and its constituents resulting in dermatophytosis which caused by *Epidermophyton* spp., *T. spp.*, *M. spp.* And cutaneous candidiasis which caused by *Candida albicans* and other *candida* spp. And this

infection can be detected by localized acute inflammation to this causative agents. Historically dermatophytes mean plant skin and this term defined as fungal parasitism on keratinized tissues as hair, skin and nails of human and animals causing fungal disease of skin known as worming or *Tinea*. The word *Tinea* as latin word mean Gnawing worm and this term used to fungal infections which start as small skin rash then spread as ring form. Several types of *Tinea capitis* which consider as predominant fungal infection in children by attacking of scalp and hair axes and the most predominant fungus *T. tonsurans*. animals play important role in spreading and transport of fungi caused *Tinea capitis* (Alteras *et al.*, 1984) found that the *Tinea capitis* in children aged from 2 – 11 months because of cats, while *Tinea corporis* characterized by red less sharp edges and may be contain characterized by red raised less sharp edges and may be contain pustule and this type include all skin fungal infections in smooth skin except hand planter and this type include *T. rubrum* (Velho *et al.*, 2000) Mohammed and Zainab, (2001) found that *T. rubrum* and *T. violaceum* and *M. canis* consider as chief fungal causative agents of *Tinea corporis* in

Libyea, in Bangladesh that Noorudin and Rashid, 1996 by collection of (151) samples from diseased conditions of *Tinea corporis*, *T. violaceum* was predominant infected fungus. *Tinea unguinum* consider as dermatophytes of nails which characterized by inflammatory reactions around the nails that lead to different changes according to type of fungus and these changes included enlargement of nails with discoloration and convert into colorlessness with fragility instead of healthy glistening nail. Many predisposing factors that increase the chance of infections are aging, diabetes melitus, narrow shoes and presence of (*Tinea pedis*) and *T. rubrum* and *T. mentogrophytes* are predominant in this case non – dermatophytes as candida can also cause *Tinea unguinum* also cause *Tinea unguinum* (Noble *et al.*, 1998). *Tinea unguinum* consider as chronic disease (Zias, 1972) while *Tinea pedis*, synonymes (foot athletes) known as fungal infection of skin of foot which characterized by lesions in the space between fingers, the patients suffering from burning and itching of foot fingers and the important fungus *E. floccosum* (Noble, 1998). the disease status of *Tinea pedis* not restricted to younger group only but the epidemiological studies indicate that in Poland *Tinea pedis* spread between farmers have infection rate 16.3 – 32.6 (Spiewak *et al.*, 1998) and in other farmer group at age ranged from (18 – 88 ) years old was 55 % and 47 % in non- farmers persons from the same age group (Spiewak szostak, 2000). clinical characteristics of dermatophytosis resulted from destruction of keratin, host inflammatory response according to types of fungi inoculum size, site of infection and host immunity (Ellis, 1994). other studies showed that there are individual variations according to dermatophytes infection for example in America and Canada, *T. tonsurans* is predominant in areas localized by black children due to nature of waved hair or due to difficult economic condition (poor families) (Bronson *et al.*, 1983). The most suitable environment for growth of dermatophytes in hot and dry areas so that its widely spread in tropics and sub-tropical areas (Hainer, 2003).

### Materials and Methods

This study conducted in Al-Shatra city–college of Education of Girls and internal departments–Thi-Qar university by collecting of (40) forty scalp hair samples by sterile sealed plastic containers then transport these samples to college laboratory. By using of specific fungal media for isolation and identification of different types of fungi with (PDA) was a suitable media according to Warcup, (1950); culturing of hair and incubate these samples under 25 centigrade. identification of fungi depending on microscopic appearance of fungal colonies

depending on cultural and behavioral characteristics and microscopic examination by using of lactophenol cotton blue (Ellis, 1971; McGinnis, 1980; DeHoog and Guarro, 1995 and Ellis, 2002) while isolation and identification of growing bacteria by using of other selective bacterial media and different differential biochemical tests.

### Results and Discussion

Dermatophytosis consider as predominant fungal infection to human in the world (Ranganathan *et al.*, 1995). the results of this study explained predominance of genus Trichophyton compared to other genuses and this may be due to that the genus contain large number of fungal types and some of these can affect human (anthropophilic), part of this affect animals (zoophilic) and others inhabit with soil (geophilic) (Kannan *et al.*, 2006). Trichophyton consider as one of important fungi and more spreading as indicated by Morod *et al.*, (2003) that *T. rubrum* and *T. mentagrophytes* are predominant types between most common tenth isolated fungi in Europe, T. infection remain the main problem in the world (Fuller *et al.*, 2003), this genus is the main causative fungal agent to *Tinea capitis*, *Tinea pedis* and *Tinea unguinum* (Norris *et al.*, 1999), and its responsible for more than 70% of dermatophytosis (Summerbell and Weitzman, 1995) this study explain that the genus T. was more predominant and this agree with what founded by many researchers as (Summana and Singaracharya, 2004, and Kannan *et al.*, 2006). other studies proved predominance of T. in the world; one study included 165 patients found 66% from which infected with *T. rubrum*

**Table 1:** Explain types of fungi and bacteria founded in scalp.

Species	Genus	No.
<i>T. rubrum</i>	Trichophyton	1
<i>T. verrucosum</i> Bodin		
<i>T. tonsurans</i>		
<i>A. alternata</i>	Alternaria	2
Alternaria. spp.		
<i>A. fumigatus fresenius</i>	Aspergillus	3
<i>A. terreus</i>		
<i>Absidia</i> spp.	Absidia	4
<i>S. aurantiacum</i> Gilgado	Scedosporium	5
<i>R. nannfeldt</i>	Rhinocladiella	6
<i>C. carrionii</i> Terjos	Cladophialophora	7
<i>Phoma</i> spp.	Phoma	8
<i>Staphylococcus epidermidis</i>	Staphylococcus	9
<i>Moraxella</i> spp.	Moraxella	10
<i>Propionibacterium acnes</i>	Propionibacterium	11
<i>Staphylococcus aureus</i>	Staphylococcus	12
<i>Escherichia coli</i>	Escherechia	13

and small number infected with *Phaeoannellomyces wernecki*, other study conducted in (8) eight primary schools included 937 of children in Kiefeland city found that *T. tonsurans* as predominant and one case infected with *M. canis*; other many researchers found that the *Malassezia* with different types as *furfur*, *globosa* and *restrica* were predominant and chief causative agent for scalp dandruff but, in this study donot found this genus. the occur in changes in microbial populations in the scalp either due to chemical compounds used or changes in physiology of host skin are the main predisposing factors for prevalence of dermatophytosis. determination of fungal types necessary for opening the doors to fungal therapy. determination of of different scalp fungi is difficult in its understanding in previous studies by Gremmer *et al.*, 2002; McGinley *et al.*, 1995; Bark *et al.*, 2012 and Ashbee, 2006 and the reasons may be due to problems in isolation of fungi or difficulty in growth, there is no adjustment in diagnosis or miss diagnosis to the infections and skin lesions especially after discovery and typing of *Malassezia*, know, keratinophilic fungi have greatly importance, its include many types of dermatophytes have the ability to destruct different types of keratinized compounds and yet, number of opportunistic fungi became keratinophilic with strength in disease induction emerge suddenly and quickly and many scientists observed that the fungi especially that isolated from soil and plants have ability to lysis and district of keratin materials through growing of fungi by using of hair after collection by hair – baiting technique, so that, in the days human attacked by highly pathogenic fungi this consider healthy problems take large space from modern researchers and know many of non pathogenic fungi are opportunistic pathogens

and its existence in different environments capable and in case of its traveling to human causing mycosis by contamination of hospitals, house dust, shoes, live stock animals and naked legs at night which all localized at ground of hospital or house this proved by study included 46 hospitals and 47 houses in Kanapure city / india by taking of internal samples of dust from these areas, study found huge number of keratinophilic fungi about 19 types classified into 11 genres. also, in this study bacterial contaminants founded indicate to normal flora exist in the skin and scalp - hair .

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