

Isolation and Identification of Fungi That Cause Hair Loss (Alopecia)

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Abstract

Due to the crowded number of female students in a very narrow place, the fact that the college is for females only, and the fact that some of the female students live in the internal sections of the student residence, as well as the crowded number there, and as a result of the presence of the head covering or what is known as the Islamic veil on the head, which covers the hair of the head, which provides a suitable hot humid atmosphere 100% of fungal growth in the scalp of female students. Therefore, it is necessary to know the widespread fungal species that contaminate the scalp. In other research, we learn about the antifungals that should be used to reduce fungal infections in college employees. The study was carried out to identify the presence and spread of fungi that cause hair loss. The study was conducted on some students of the College of Education for Girls/University of Shatra for the period from 1/11/2021 to 1/12/2021, where 100 hundred hair samples were collected from (the scalp) from different ages in different educational stages, as random samples were taken after asking the student whether she suffers from hair loss or not, and studying the presence and spread of fungi in terms of density and type, after transferring them to the microbiology laboratory-College of Education for Girls using sterile sample collection bags. The current results showed that the fungal species *E. flocculosum* is the most common among them, followed by the fungal species *C. carrionii*, then the rest of the genera are as follows: *E. flocculosum*, *Basisidioplus*, *Aspergillus terreus* Hormderndrum *Rhotorula*, *Bipolaris*, *Aspergillus*, *Phoma*, *Rhizopus*, *Blastomyces*, *Microsporum*, *Sporothrix*, *Exophiala jeanselmei*, *Neoscytalidium Aereomonium* *Cladophialophora carrionii*, *Paecilomyces*, *Exophiala dermatitidis*, *Geotrichum*, *Volvariella*, *Rhizomucor*, *Saksmaea vassiformis*, *Candida albicans*, *Chrysosporium*, *Dimiatum*.

Keywords

Fungi, Hair Loss, Female Students, Shatra

1. Introduction

The presence of huge numbers of students in Iraqi schools, universities and institutes in places that are almost confined in space, and for this reason skin infections, including fungal ones, abound, especially in the head and scalp area, since females are more numerous compared to males. Fungal infections abound in the scalp of female students, and for this reason the study came to know the most important fungal species that infect the scalp.

Dermatophyte is a group of fungi that have the ability to attack the keratinous tissues of humans and animals such as hair, skin and nails, causing what is known as Dermatophytosis. These fungi include three genera: (*Trichophyton*, *Microsporum* (*Epidermophyton*) [1]. Skin fungi are classified according to the environment in which they exist into three types: anthropophilic skin fungi, where humans are the natural host, and they can be transmitted from person to person, but they are rarely transmitted to animals. Examples of them are fungi: The second type is zoophilic dermatophytes, where animals are the main host, but they have the ability to infect humans, such as: *M. canis*, *T. mentagrophytes*. Animals play an important role in the spread and transmission of the fungus that causes tinea capitis. Alteras [2] stated that the appearance of tinea capitis in children between the ages of two and eleven months is caused by cats. As for tinea corporis, it is characterized by a slightly raised red edge. It has a sharp edge and may contain blisters. This type includes all cutaneous fungal infections of smooth skin except for the palm of the hand. The causative fungus is *T. rubrum*.

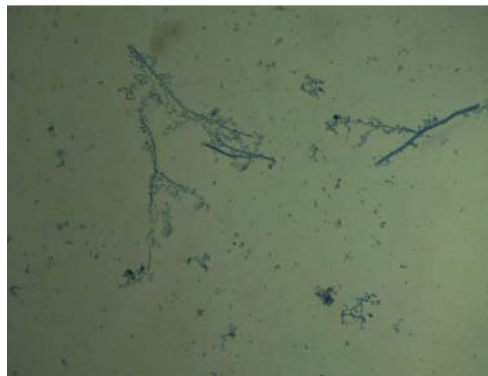
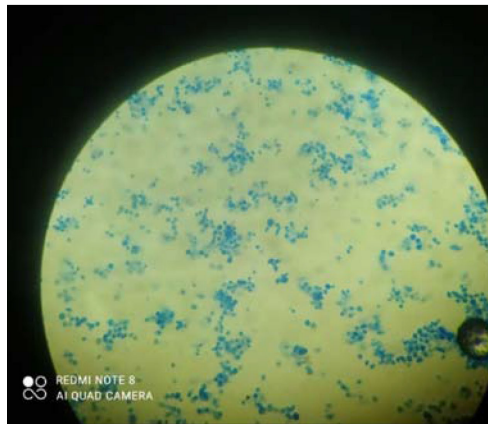
2. Materials and Methods

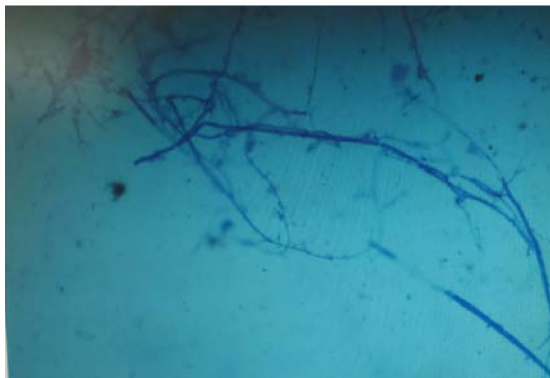
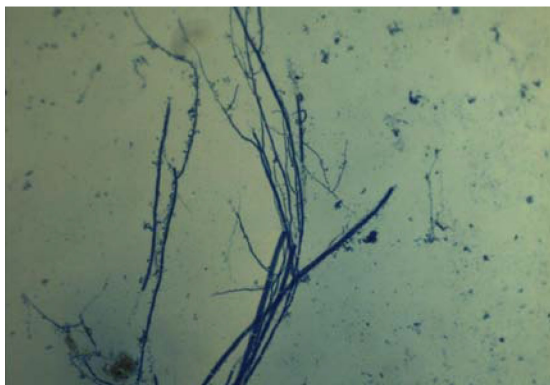
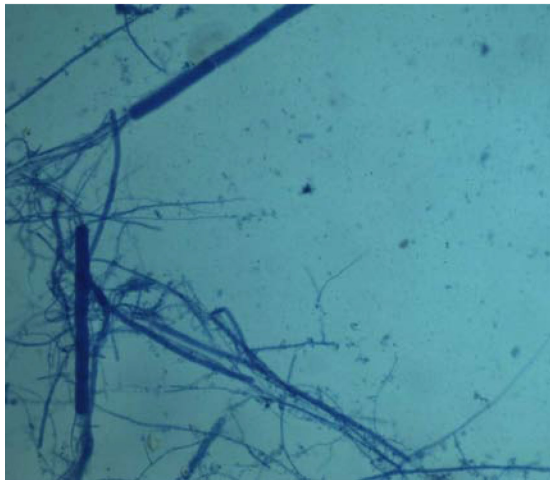
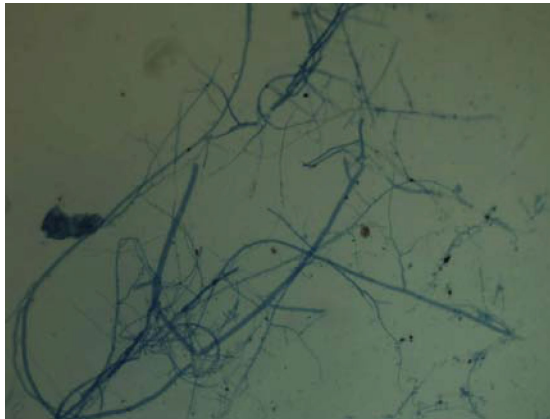
(100) hair samples were collected from the female students. Oral approvals were taken from the participants in the study, and all their information was recorded. The samples were collected by special nylon bags for collecting dry and sterile samples. After that, the samples were transferred to the microbiology laboratory- College of Education for Girls.

3. Results

The results of the detection of fungi isolated from the scalp in this study, which included (100) hundred samples (hair) and then taken from students in the College of Education for Girls/Shatra, showed the emergence of twenty-five species that were diagnosed based on medical fungal atlases, where these isolates varied In the fungal product in its shapes and colors, it appeared in white, gray and black. As a result of the microscopic examination, the pres-

ence of the structures represented, as in **Figure 1**, showed spores. The large conidia and the small conidia that appear as rods. Or spherical, scaly spores in single or paired clusters, as shown in **Table 1**, where the study showed that the fungal species *E. flocculosum* is the most frequent, followed by *C. carrionii*, and then the rest of the species.





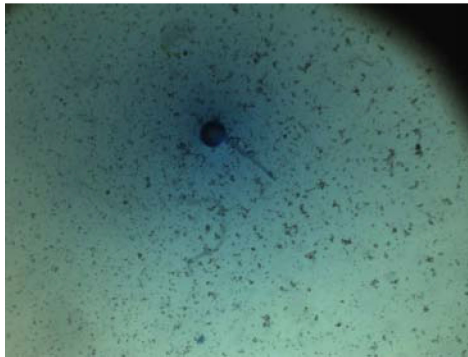




Figure 1. The genus and type of fungi isolated from alopecia.

Table 1. Explain the genus and type of fungi isolated from alopecia.

No.	Genus	Species
1	<i>Epidermophyton flocculosum</i>	<i>E. flocculosum</i> spp.
2	<i>Basidioplus.</i>	<i>Basidioplus</i> spp.
3	<i>Aspergillus terreus.</i>	<i>A. terreus</i> spp.
4	<i>Hormodendrum</i>	<i>Hormodendrum</i> spp.
5	<i>Rhodotorula</i>	<i>Rhodotorula</i> spp
6	<i>Bipolaris</i>	<i>Biopolaris</i> spp.
7	<i>Aspergillus</i>	<i>Aspergillus niger</i>
8	<i>Phoma</i>	<i>Phoma</i> spp.
9	<i>Rhizopus</i>	<i>Rhizopus</i> spp.
10	<i>Blastomyces</i>	<i>Blastomyces dermatitidis</i>
11	<i>Miosporum</i>	<i>Miosorum distortum.</i>
12	<i>Sporothrix</i>	<i>S. schenckii</i>
13	<i>Exooniala jeanselmei</i>	<i>E. jeanselmei</i> spp
14	<i>Nesocytolidium.</i>	<i>N. dimidiatum</i> spp.
15	<i>Aeremonium.</i>	<i>Aermonium</i> spp.
16	<i>Cladophialophora. carrionii</i>	<i>C. carrionii</i> spp.
17	<i>Pecilomyces.</i>	<i>P. lilacinus</i> spp.
18	<i>Exophiala dermatitidis</i>	<i>E. dermatitidis</i> spp.
19	<i>Geotrichum.</i>	<i>Geotrichum</i> spp.
20	<i>Volvariella.</i>	<i>Volvariella</i> spp.
21	<i>Rhizmucor</i>	<i>Rhizmucor</i> spp.
22	<i>Saksrnaea vassiformis</i>	<i>S. vassiformis</i> spp.
23	<i>Candida albicans</i>	<i>C. albicans</i> spp.
24	<i>Chrysosporium</i>	<i>Chrysosporium</i> spp.
25	<i>Dimiatum</i>	<i>Dimidiatum</i> spp.

4. Discussion

The current study, which included 100 samples of female students in the College of Education for Girls/Al-Shatra, showed fungal and bacterial infections, as the results showed the presence of twenty-five fungi belonging to twenty-five genera. The results reached by many researchers in different regions when watching the fungi under the microscope that the isolation of zoophilic dermatophyte species in this study represented by the fungus *T. verrucosum*. *T. mentagrophytes* and *M. canis* explains that, as for the type *P. lilacinus*, it occupied the third place in appearance [3]. This type colonizes keratinized materials. Because of the high pathogenicity of these fungi, they are capable of infecting different types of ringworm (tinea), especially tinea capitis, tinea cruris, beard tinea and nail tinea [4]. The results of the current study showed that the skin is the most affected area of

the body, and that male children are more affected than females, and rarely adults with this disease. It is derived from (sebum), and the low standard of living and culture and lack of interest in personal hygiene are all factors that helped increase the incidence of infection [5] samples Female hair gave a positive result on the culture medium. This result is consistent with several studies that indicate that males are more susceptible to infection with fungus on the scalp [6]. Researchers showed that the fungus rubrum. T is the most common type of dermatophyte since the 1960s, as it constituted 80% - 90% of all isolated species, followed by. (*T. mentagrophytes* [7] [8] [9]). Some scientists indicated that this is due to the fact that the symptoms caused by the fungus present in the scalp vary according to the type of pathogenic fungus and the area it targets. Skin peeling, hair loss. Where these fungi are very contagious and very widespread among young boys and school students. Ringworm infection is produced by a type of fungus called dermatophytes. Dermatophytes attack the outer layer of the skin and the hairline. In certain cases, the fungus causes an inflammatory reaction in the scalp called Kerion, and in this case yellow cysts appear from which a purulent fluid is secreted. It causes the production of a yellowish rash on the surface of the scalp. Excessive hair loss occurs in the area of inflammation, or the hair on the head is easily pulled out, and this situation appears due to an exaggerated inflammatory reaction, which can lead to the appearance of a scar on the scalp and permanent baldness. These signs can appear in other diseases, so an accurate diagnosis is necessary, and confirmation of the presence of ringworm of the scalp.

5. Conclusion

The study was conducted on female students who suffer from hair loss due to a fungal infection as proven by the specialist doctor, as we recorded many cases. Therefore, this study concludes that the percentage of scalp fungus infection, especially the types proven in the above study, among the female student community is very high.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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