

Determination of Fungi That May Cause Diseases to Athletes Which Spread in the Combat Sports Halls

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Abstract:

This study aims at determining the fungi that cause disease to athletes, which spread in the combat sports halls. Approach: scanning approach from descriptive researches. Sample: Selected purposively from air and playing field of combat sports halls, (wrestling, fencing, boxing and self-defense). Time and place: 17/03-20/05/2009, faculty of physical education for men Alexandria University, Egypt. Materials and method: Modified Sabouraud Dextrose agar medium was used. Opened plates method and the cotton swab technique were applied for fungal isolation. Results: Nineteen fungal isolates from air and playing field of combat sports halls. They cause diseases to athletes. Conclusion: (Acremonium kiliense, Alternaria alternata, Aspergillus flavus, Aspergillus fumigatus, Aspergillus niger, Aspergillus ochraceus, Cladosporium sphaerospermum, Curvularia hawaiiensis, Epicoccum nigrum, Fusarium chlamydosporum, Geotrichum candidum, Microsporum canis, Monilia sitophila, Nigrospora oryzae, Penicillium aurantiogriseum, Rhizopus arrhizus, Scopulariopsis brevicaulis, Trichophyton mentagrophytes, Trichophyton rubrum) Isolated from the combat sports halls and cause onychomycosis, keratitis, endophthalmitis, endocarditis, meningitis, peritonitis, osteomyelitis, phaeohyphomycosis, hypersensitivity, pneumonitis, otitis, sinusitis and invasive disease, aspergillosis, pulmonary disease, skin lesions, tinea capitis, tinea corporis, respiratory allergy, penicilliosis, otomycosis, necrotizing esophagitis, urinary tract infections, zygomycosis and dermatophytosis. Fungal isolates spreading in wrestling and self-defense halls more than in boxing and fencing halls.

Introduction and Research Problem:

A combat sport, also known as a Fighting Sport, is a competitive contact sport where two combatants fight against each other to gain enough points or a condition to declare a single winner by means of using certain rules of direct engagement. These engagements rules and conditions are significantly different from the rules in simulated contact or combat meant for technical based challenges, practice, or demonstration in martial arts, typically with the aim of simulating parts of real hand to hand

combat through kata and self-defense training. Boxing, kickboxing, amateur wrestling, judo, mixed martial arts; Muay Thai and Swordsmanship are examples of combat sports (Annesley, 2008).

Microbial infections are a fairly common disease entity in contact sports. Combat sports in particular provide a competitive environment in which viruses, bacteria and fungi thrive; that infections could hinder athlete's ability to perform their full potential, combat sports activities includes movements that may cause the skin to develop its heat and friction against athletic equipments. Compounded by perspiration, this friction commonly results in blisters that can be quite painful and diminishes the athlete's ability to compete, infections can be particularly upsetting to athletes because they are often unsightly and the athlete may not even

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have a pre-existing that diseases conditions to develop it (Basler, 2000).

The presence of microbial contamination in indoor environment has been confirmed by many studies around the world (Kanaani, 2009).

Since Feinberg's studies (1955), it has been well established that fungal spores play a major role in allergic diseases such as asthma, hay fever and hypersensitivity pneumonitis and that they may cause serious systemic infections in some areas. In most cases there is no exposure to true or opportunistically pathogenic fungi, but there are species that can act as allergens or cause other non-allergic symptoms [4]. Moulds readily enter indoor environments by circulating through doorways, windows, ventilation systems, and air conditioning systems.

Spores in the air also deposit on people and animals, bags, and pets common carriers of mold into indoor environments. The most common sports halls moulds are *Cladosporium*, *Penicillium*, *Aspergillus*, and *Alternaria* (Bush, 1989 & Hoppe, 1995).

The quality of air and the number of pathogens depend on the condition and cleanliness of the building, appropriate humidity and temperature and good ventilation, access to light, oxygen and water (Bartzokas, 1975; Apter et al., 1994; Verhoeff, 1994; Bachmann & Myers, 1995).

The pathogenic process depends on the quality and the condition of the building as well as on the time of exposure to fungi spores present in the air (Bush, 1989 & Hoppe, 1995).

One strategy would be to determine the initial source of the organisms that cause infections. In doing so, we would be better equipped to understand the transmission and construct methods to prevent the transmission of the fungi and molds. It is most likely that the mode of transmission of these infections is person to person. Combat sports require close body contact and often results in skin abrasions that provide a perfect opportunity for person-to-person transmission. However, fungi have been isolated from several inanimate objects as mats and floors (Kemna & Elewski, 1996), may be responsible for prolonged transmission of fungal infections (Amow et al., 1991).

To raise the level of the athlete's performance and to protect them from diseases that can be deadly and painful, and then save time, effort, and money.

From all of the above the researchers urge to study the determination of fungi that cause diseases to athletes which spread in the combat sports halls.

Aim of the Research:

To determine the fungi that causes disease to athletes which spread in the combat sports halls.

Aim Achieved:

The aim is to be achieved through

- Isolation of fungi, which spread in the combat sports halls including air, and playing field.
- Identification of isolated fungi.
- Determination of isolated fungi that causes diseases to athletes.

Hypotheses of Research:

- Presence of Variety of fungi in the combat sports halls air.
- Presence of Variety of fungi in the combat sports halls playing field.
- Some of the fungal isolates cause diseases to athletes.

Research Procedures:

Research Approach:

The researcher used the scanning approach from descriptive researches as it suits the research nature.

Research Sample:

The research sample selected purposively from air and playing field of the following combat sports halls, freestyle and greco-roman wrestling, fencing, boxing and self-defense.

The sample was taken as following five areas from each hall, one from the center and four from the corners, except the fencing hall the sample was taken from five areas distributed

along the fencing playing field, in equal distances, these procedures repeated three times with interval one week between the different isolations for both air and playing field, with total count 120 Petri-dishes.

Research Domains:

Research Time:

Isolation: 17/03-06/04/2001

Incubation and Purification: 17/03-27/04/2011

Identification: 28/04-20/05/2011

Research Place:

Sampling was performed at faculty of physical education for men Alexandria University from air and playing field of combat sports halls; freestyle and greco-roman wrestling, fencing and self-defense. Mycological researches conducted in faculty of science Alexandria University. Pure culture fungal slants were identified in the mycological center, Assiut University, Egypt.

Materials:

Media used:

The modified Sabouraud Dextrose agar medium was used, this medium is specific for routine isolation, growth, and cultivation of fungi, and it is composed of (g/l): Glucose, 20; Peptone, 10; Agar, 15. Chloramphenicol 500 mg in 10 ml of 95% ethanol (antibiotic) for inhibition of bacteria was added to molten medium and stir, autoclave (Mackenzie et al., 1986).

Chemicals and solutions:

Chemicals

Glucose, peptone, HCl, NaOH, and agar. All are obtained from laboratory fine chemicals, El Naser Pharmaceutical chemicals Co.

Chloramphenicol, Sedico pharmaceuticals Co., 6th of October city - Giza - Egypt.

Methods:

Media preparation:

Dissolve agar in 500 ml distilled water, dissolve glucose and peptone in 500 ml distilled water and warm to 50°C, combine. Chloramphenicol 500 mg in 10 ml of 95% ethanol was add to molten medium and stir, distribute in flasks, autoclave at 115°C for 15 minutes. The pH of unadjusted glucose peptone agar is about 5.6 (Mackenzie et al., 1986).

Isolation techniques of microorganisms:

Two techniques were used for isolation of fungi.

1. Opened plate's method

Air fungal isolation applied by opened plates method. Immediately after practice the windows were closed for at least 1 h prior to sampling, and then used 60 Petri-dishes, filled with modified Sabourauds Dextrose agar medium, opened in different combat sport halls for 1 h. (Martino & Luzi, 2008).

2. Cotton swab technique

The cotton swab technique was applied. In this technique, the fungal species were isolated immediately after practice before any playing field cleansing was done, to improve the chance of finding organisms. Using sterile moist cotton buds swabbed over the surface, cotton swabs were then used to distribute fungi on the media in Petri-dishes, and the isolation medium was modified Sabourauds Dextrose agar. This technique was applied on 60 plates (Booth, 1971; Chaisrisook et al., 1995; Mousa, 1999; Kohl et al., 2000). The playing field cleaning habits of the college and the hygiene of the individuals were not controlled or altered in any way.

Isolated fungi incubation:

The dishes of isolated fungi were incubated at 25 °C, examined the agar plates daily for 14 days for growth. For purification and identification of fungi, the growing fungi were purified in pure cultures on slants of modified Sabourauds Dextrose agar medium (Kohl et al., 2000).

Results:

Table (1)
The type and number of airborne fungal isolates identified in combat sports halls

Fungi	Combat sports halls air sample n=60 plate				Total
	Number of airborne fungal isolates				
	Wrestling hall	Fencing hall	Boxing hall	Self-defense hall	
<i>Acremonium kiliense</i>	5		1	6	12
<i>Alternaria alternate</i>	219	60	97	164	540
<i>Aspergillus flavus</i>	125	31	50	98	304
<i>Aspergillus fumigatus</i>	8	2	5	4	19
<i>Aspergillus niger</i>	310	78	131	233	752
<i>Aspergillus ochraceous</i>	11	3	4	5	23
<i>Cladosporium sphaerospermum</i>	616	154	299	415	1484
<i>Curvularia hawaiiensis</i>	5			3	8
<i>Epicoccum nigrum</i>	8	2	4	8	22
<i>Fusarium chlamydosporum</i>	21	5	8	18	52
<i>Geotrichum candidum</i>	8	2	3	4	17
<i>Monilia sitophila</i>	8		2	9	19
<i>Nigrospora oryzaa</i>	11	3	1	7	22
<i>Penicillium aurantiogriseum</i>	422	99	211	295	1027
<i>Rhizopus arrhizus</i>	27	5	8	11	51
<i>Scopulariopsis brevicaulis</i>	8			9	17
Total	1812	444	824	1289	4369

Table 1 Shows the results of sixteen airborne fungal isolates from wrestling, self-defense, boxing and fencing halls, in descending order with total count 4369.

Table 2

The type, number and percentage of airborne fungal isolates identified in wrestling hall air

Fungi	No. of isolates	%
<i>Cladosporium sphaerospermum</i>	616	34.00
<i>Penicillium aurantiogriseum</i>	422	23.29
<i>Aspergillus niger</i>	310	17.11
<i>Alternaria alternate</i>	219	12.09
<i>Aspergillus flavus</i>	125	6.90
<i>Rhizopus arrhizus</i>	27	1.49
<i>Fusarium chlamydosporum</i>	21	1.16
<i>Aspergillus ochraceous</i>	11	0.61
<i>Nigrospora oryzaa</i>	11	0.61
<i>Aspergillus fumigatus</i>	8	0.44
<i>Epicoccum nigrum</i>	8	0.44
<i>Geotrichum candidum</i>	8	0.44
<i>Monilia sitophila</i>	8	0.44
<i>Scopulariopsis brevicaulis</i>	8	0.44
<i>Acremonium kiliense</i>	5	0.28
<i>Curvularia hawaiiensis</i>	5	0.28
Total isolates	1812	100

Table 3

The type, number and percentage of airborne fungal isolates identified in fencing hall air

Fungi	No. of isolates	%
<i>Cladosporium sphaerospermum</i>	154	34.66
<i>Penicillium aurantiogriseum</i>	99	22.3
<i>Aspergillus niger</i>	78	17.56
<i>Alternaria alternate</i>	60	13.51
<i>Aspergillus flavus</i>	31	6.97
<i>Fusarium chlamydosporum</i>	5	1.13
<i>Rhizopus arrhizus</i>	5	1.13
<i>Aspergillus ochraceous</i>	3	0.67
<i>Nigrospora oryzaa</i>	3	0.67
<i>Aspergillus fumigatus</i>	2	0.45
<i>Epicoccum nigrum</i>	2	0.5
<i>Geotrichum candidum</i>	2	0.45
<i>Acremonium kiliense</i>		
<i>Curvularia hawaiiensis</i>		
<i>Monilia sitophila</i>		
<i>Scopulariopsis brevicaulis</i>		
Total isolates	444	100

Table 4

The type, number and percentage of airborne fungal isolates identified in boxing hall air

Fungi	No. of isolates	%
<i>Cladosporium sphaerospermum</i>	299	36.28
<i>Penicillium aurantiogriseum</i>	211	25.61
<i>Aspergillus niger</i>	131	15.90
<i>Alternaria alternate</i>	97	11.77
<i>Aspergillus flavus</i>	50	6.07
<i>Fusarium chlamydosporum</i>	8	0.97
<i>Rhizopus arrhizus</i>	8	0.97
<i>Aspergillus fumigatus</i>	5	0.61
<i>Aspergillus ochraceous</i>	4	0.49
<i>Epicoccum nigrum</i>	4	0.49
<i>Geotrichum candidum</i>	3	0.36
<i>Monilia sitophila</i>	2	0.24
<i>Acremonium kiliense</i>	1	0.12
<i>Nigrospora oryzaa</i>	1	0.12
<i>Curvularia hawaiiensis</i>		
<i>Scopulariopsis brevicaulis</i>		
Total isolates	824	100

Tables 2 – 5 Shows the results of airborne fungal isolates appearance percentage in the different combat sports halls, the most common culturable airborne fungi were *Cladosporium*, *Penicillium* and *Aspergillus* while *Acremonium*

Table 5

The type, number and percentage of airborne fungal isolates identified in Self-defense hall air

Fungi	No. of isolates	%
<i>Cladosporium sphaerospermum</i>	415	32.20
<i>Penicillium aurantiogriseum</i>	295	22.89
<i>Aspergillus niger</i>	233	18.08
<i>Alternaria alternate</i>	164	12.72
<i>Aspergillus flavus</i>	98	7.60
<i>Fusarium chlamydosporum</i>	18	1.40
<i>Rhizopus arrhizus</i>	11	0.85
<i>Monilia sitophila</i>	9	0.70
<i>Scopulariopsis brevicaulis</i>	9	0.70
<i>Epicoccum nigrum</i>	8	0.62
<i>Nigrospora oryzaa</i>	7	0.54
<i>Acremonium kiliense</i>	6	0.47
<i>Aspergillus ochraceous</i>	5	0.39
<i>Aspergillus fumigatus</i>	4	0.31
<i>Geotrichum candidum</i>	4	0.31
<i>Curvularia hawaiiensis</i>	3	0.23
Total isolates	1289	100

kiliense, *Curvularia hawaiiensis*, *Monilia sitophila* and *Scopulariopsis brevicaulis* didn't appeared in fencing hall air also *Curvularia hawaiiensis* and *Scopulariopsis brevicaulis* didn't appeared in boxing hall air.

Table 6
The type and number of playing field fungal isolates identified in combat sports halls

Fungi	Combat sports halls air sample n=60 plate				Total
	Number of fungal isolates				
	Wrestling mat	Fencing floor	Boxing floor ring	Self-defense mat	
<i>Alternaria alternate</i>	116	15	27	47	205
<i>Aspergillus flavus</i>	96	11	14	29	150
<i>Aspergillus niger</i>	130	7	26	46	209
<i>Cladosporium sphaerospermum</i>	421	55	51	97	624
<i>Curvularia hawaiiensis</i>	7	1	1	2	11
<i>Epicoccum nigrum</i>	5	1		2	8
<i>Fusarium chlamydosporum</i>	12		2	5	19
<i>Microsporum canis</i>	35	5	4	8	52
<i>Monilia sitophila</i>	3				3
<i>Nigrospora oryzaa</i>	9	1	1	2	13
<i>Penicillium aurantiogriseum</i>	170	8	34	60	272
<i>Rhizopus arrhizus</i>	19	3	2	6	30
<i>Trichophyton mentagrophytes</i>	47	5	7	11	70
<i>Trichophyton rubrum</i>	23	1	5	6	35
Total	1093	113	174	321	1701

Table 6. Shows the results of fourteen playing field fungal isolates from wrestling, self-defense, boxing and fencing halls, in descending order with total count 1701.

Table 7**The type, number and percentage of playing field fungal isolates identified in wrestling hall**

Fungi	No. of isolates	%
<i>Cladosporium sphaerospermum</i>	421	38.52
<i>Penicillium aurantiogriseum</i>	170	15.55
<i>Aspergillus niger</i>	130	11.89
<i>Alternaria alternata</i>	116	10.61
<i>Aspergillus flavus</i>	96	8.78
<i>Trichophyton mentagrophytes</i>	47	4.30
<i>Microsporum canis</i>	35	3.20
<i>Trichophyton rubrum</i>	23	2.10
<i>Rhizopus arrhizus</i>	19	1.74
<i>Fusarium chlamydosporum</i>	12	1.10
<i>Nigrospora oryzae</i>	9	0.82
<i>Curvularia hawaiiensis</i>	7	0.64
<i>Epicoccum nigrum</i>	5	0.46
<i>Monilia sitophila</i>	3	0.27
Total isolates	1093	100

Table 9**The type, number and percentage of playing field fungal isolates identified in boxing hall**

Fungi	No. of isolates	%
<i>Cladosporium sphaerospermum</i>	51	29.31
<i>Penicillium aurantiogriseum</i>	34	19.54
<i>Alternaria alternata</i>	27	15.52
<i>Aspergillus niger</i>	26	14.94
<i>Aspergillus flavus</i>	14	8.05
<i>Trichophyton mentagrophytes</i>	7	4.02
<i>Trichophyton rubrum</i>	5	2.87
<i>Microsporum canis</i>	4	2.30
<i>Fusarium chlamydosporum</i>	2	1.15
<i>Rhizopus arrhizus</i>	2	1.15
<i>Curvularia hawaiiensis</i>	1	0.57
<i>Nigrospora oryzae</i>	1	0.57
<i>Epicoccum nigrum</i>		
<i>Monilia sitophila</i>		
Total isolates	174	100

Table 8**The type, number and percentage of playing field fungal isolates identified in fencing hall**

Fungi	No. of isolates	%
<i>Cladosporium sphaerospermum</i>	55	48.67
<i>Alternaria alternata</i>	15	13.27
<i>Aspergillus flavus</i>	11	9.73
<i>Penicillium aurantiogriseum</i>	8	7.08
<i>Aspergillus niger</i>	7	6.19
<i>Microsporum canis</i>	5	4.42
<i>Trichophyton mentagrophytes</i>	5	4.42
<i>Rhizopus arrhizus</i>	3	2.65
<i>Curvularia hawaiiensis</i>	1	0.88
<i>Epicoccum nigrum</i>	1	0.88
<i>Nigrospora oryzae</i>	1	0.88
<i>Trichophyton rubrum</i>	1	0.88
<i>Fusarium chlamydosporum</i>		
<i>Monilia sitophila</i>		
Total isolates	113	100

Table 10**The type, number and percentage of playing field fungal isolates identified in self-defense hall**

Fungi	No. of isolates	%
<i>Cladosporium sphaerospermum</i>	97	30.22
<i>Penicillium aurantiogriseum</i>	60	18.69
<i>Alternaria alternata</i>	47	14.64
<i>Aspergillus niger</i>	46	14.33
<i>Aspergillus flavus</i>	29	9.03
<i>Trichophyton mentagrophytes</i>	11	3.43
<i>Microsporum canis</i>	8	2.49
<i>Rhizopus arrhizus</i>	6	1.87
<i>Trichophyton rubrum</i>	6	1.87
<i>Fusarium chlamydosporum</i>	5	1.56
<i>Curvularia hawaiiensis</i>	2	0.62
<i>Epicoccum nigrum</i>	2	0.62
<i>Nigrospora oryzae</i>	2	0.62
<i>Monilia sitophila</i>		
Total isolates	321	100

Table 11
Type, isolation source and pathogenicity of air and playing filed fungal isolates identified in combat sports halls

Fungi	source		Pathogenicity
	Air	filed	
<i>Acremonium kiliense</i>	√		Onychomycosis, osteomyelitis, endophthalmitis, endocarditis, meningitis, peritonitis, keratitis (Gupta & Summerbell, 1999).
<i>Alternaria alternata</i>	√	√	Phaeohyphomycosis. Cases of onychomycosis, sinusitis, ulcerated cutaneous infections, and keratitis (Schell, 2000).
<i>Aspergillus flavus</i>	√	√	Hypersensitivity pneumonitis, Otitis, sinusitis and invasive disease (Hoog <i>et al.</i> , 2000).
<i>Aspergillus fumigatus</i>	√		Most common agent of aspergillosis (Klich, & Pitt, 1988).
<i>Aspergillus niger</i>	√	√	Otitis and pulmonary disease (Steinbach & Stevens, 2003).
<i>Aspergillus ochraceous</i>	√		Carcinogen, mutagen, teratogen, hepatotoxin, nephrotoxin, immunosuppressant, and hemorrhage of intestinal tract and kidneys (Zalar <i>et al.</i> , 2008).
<i>Cladosporium sphaerospermum</i>	√	√	Skin lesions, keratitis, onychomycosis, sinusitis and pulmonary infections (Balows <i>et al.</i> , 1998).
<i>Curvularia hawaiiensis</i>	√	√	Phaeohyphomycosis (Walsh <i>et al.</i> , 1995).
<i>Epicoccum nigrum</i>	√	√	No documented infection in humans (Pritchard & Muir, 1987).
<i>Fusarium chlamydosporum</i>	√	√	Etiologic agent in an invasive infection in a patient with aplastic anemia (Segal <i>et al.</i> , 1998).
<i>Geotrichum candidum</i>	√		Colonizer of the intestinal tract and geotrichosis via ingestion or inhalation (Farina <i>et al.</i> , 1999).
<i>Microsporum canis</i>		√	Causes tinea capitis and tinea corporis (Frieden, 1999).
<i>Monilia sitophila</i>	√	√	Respiratory allergy (Singh & Kumar, 2002).
<i>Nigrospora oryzae</i>	√	√	Cutaneous lesions (Talwar & Sehgal, 1978).
<i>Penicillium aurantiogriseum</i>	√	√	Penicilliosis, endophthalmitis, otomycosis, necrotizing esophagitis, pneumonia, endocarditis, peritonitis, and urinary tract infections (Deshpande & Koppikar, 1999).
<i>Rhizopus arrhizus</i>	√	√	Zygomycosis includes mucocutaneous, rhinocerebral, genitourinary, gastrointestinal, pulmonary, and disseminated infections (Chakrabarti <i>et al.</i> , 2001).
<i>Scopulariopsis brevicaulis</i>	√		Onychomycosis, skin lesions, mycetoma, invasive sinusitis, keratitis, endophthalmitis, pulmonary infections, endocarditis, brain abscess and disseminated infections (Baddley <i>et al.</i> , 2000).
<i>Trichophyton mentagrophytes</i>		√	Dermatophytosis and infect the hair, skin, and nails (Kaufman <i>et al.</i> , 2007).
<i>Trichophyton rubrum</i>		√	Dermatophytosis (Zaugg <i>et al.</i> , 2009).

Tables 7–10 Shows the results of playing filed culturable playing filed fungi were fungal isolates appearance percentage in the Cladosporium, Penicillium and Aspergillus different combat sports halls, the most common while Monilia sitophila didn't appeared in

fencing, boxing, and self-defense halls, *Fusarium chlamydosporum* didn't appeared in fencing hall, *Epicoccum nigrum* didn't appeared in boxing hall finally *Nigrospora oryzae* didn't appeared in self-defense hall.

Table 11 Showing that there is a presence of nineteen fungal isolates in air and on playing field, from wrestling, self-defense, boxing and fencing halls and the fungal human health effect except *Epicoccum nigrum* no documented infection in humans.

Discussion:

The combat sports halls that work as fungi reservoirs (Viegas et al., 2009), is also favoured by the organic matter accumulation, construction complexity, material selection, high temperatures and inadequate maintenance (Brandi et al., 2007), Some studies have shown high levels of humidity in sport environment, making it difficult to separate the high humidity effect from the fungi presence (Goyer et al., 2001). Other environmental variable such as velocity of air and flow of fresh air indoors are influenced by ventilation system, which are an aspect to consider when analyzing fungal contamination (Wu et al., 2005).

The playing fields can harbor organisms that responsible for diseases at the times and in the areas that we sampled. The playing field cleaning habits of the college and the hygiene of the individuals were not controlled or altered in any way. We studied the playing fields in the state in which the college kept them. We diagnosed infections in all sample cultures. So the playing fields were the source of the infections, and may also the exposure to the dermatophytes responsible for the infections when the infected players were practicing. Because the playing fields were not cleaned on a regular basis and also we increase our chance by sampling immediately after practice times.

The count and identification data showed variations in both fungal genera and species, this finding was reported by several workers (Neely et al., 2001; Montegut et al., 1991; Zyska, 1997). The identified genera suggest a mix contamination, originated from playing field and air (Macura, & Gniadek, 2000), the most common culturable combat sports halls

airborne fungi were *Cladosporium*, *Penicillium* and *Aspergillus*. Elevated concentrations of *Aspergillus* and *Penicillium* soil fungi were associated with the dirt floor and crawl-space type of basement (Miller et al., 2000).

Exposure to some fungi can induce diseases, while other species can cause primary infectious diseases. The inhalation of spores containing mycotoxins has been shown to cause many of the symptoms typically associated with the "sick building syndrome" as the spores of *Aspergillus* can cause hypersensitivity pneumonitis. (Bush, 1989; Su et al., 1992)

Athletes' fungal diseases are usually spread from person to person through direct skin contact or contact with shared items or surfaces that have touched a person's infection or by contaminated air. Fungi might spread more easily among athletes because during participation athletes have repeated skin-to-skin contact, get breaks in the skin such as cuts and abrasions that if left uncovered allow fungal spore to enter and cause infection, share items and surfaces that come into direct skin contact, and have difficulty staying clean (Anderson, & Porter, 2007).

As a result of sports nature fungal isolates have been reported mostly in high physical contact sports halls such as wrestling and self-defense. However isolates have been reported less frequent among halls in other sports such as boxing and fencing with little physical contact during participation.

Conclusion:

From the aim of the research, isolated fungi, obtained results, and finally analysis of this data the researchers can deduct that this study showing the presence of nineteen different fungal species, (*Acremonium kiliense*, *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus fumigatus*, *Aspergillus niger*, *Aspergillus ochraceus*, *Cladosporium sphaerospermum*, *Curvularia hawaiiensis*, *Epicoccum nigrum*, *Fusarium chlamydosporum*, *Geotrichum candidum*, *Microsporum canis*, *Monilia sitophila*, *Nigrospora oryzae*, *Penicillium aurantiogriseum*, *Rhizopus arrhizus*, *Scopulariopsis brevicaulis*, *Trichophyton mentagrophytes*, *Trichophyton*

rubrum), which they are isolated from the combat sports halls air and playing field. The fungal isolates have been reported mostly in high physical contact sports (wrestling and self-defense halls). However isolates have been reported less frequent among (boxing and fencing halls) with little physical contact during participation and they cause the following diseases: onychomycosis, keratitis, endophthalmitis, endocarditis, meningitis, peritonitis, osteomyelitis, phaeohyphomycosis, hypersensitivity, pneumonitis, otitis, sinusitis and invasive disease, aspergillosis, pulmonary disease, skin lesions, tinea capitis, tinea corporis, respiratory allergy, penicilliosis, otomycosis, necrotizing esophagitis, urinary tract infections, zygomycosis and dermatophytosis.

Recommendations:

For the college management

1. The application of standards in the construction of sports halls in terms of location, size, and quality of ventilation and easy cleaning.
2. Keep the indoor sport environment dry moisture and good Ventilation.
3. Select equipments and materials with easily cleaned surface.
4. Perform of routinely medical examination for the athletes and the professionals working in indoor sport environment.
5. Development of health education for the athletes of fungal diseases spread in the sports environment and the prevention methods.

Recommendations for the athletes

1. Avoiding the contact with infected person and do not use the others clothing.
2. Share shower after sport practice with antifungal soap to avoid fungal infection.
3. Keep skin dry as possible to reduce the fungal infection.
4. Must take off their cloth after the performed of the sport activity and washing it as soon as possible.

Recommendations for the researchers

Investigate more researches on other sports and other micro-organisms.

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