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RESEARCH ARTICLE

MYCOLOGICAL ISOLATION AND IDENTIFICATION IN THE CAFETERIA OF HAWLER CITY KURDISTAN REGION, IRAQ

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ABSTRACT

In order to forecast the effects of the fungi on humans, this study was conducted to isolate and identify the fungi in three distinct samples in the college of science cafeteria. In order to obtain well-isolated colonies, the power plate method with Potato Dextrose Agar (PDA) was used to isolate and identify various fungal species. The results show the identity and the total colony forming units (CFU) for fungi. The most frequently isolated fungi were Cladosporium, Rhizopus sp., Aspergillus Sp, Alternaria, Yeast, Penicillium, . While the less frequently detected fungi species were Trichocladium, Drecheslera sp.and Botrytis sp. According to the fungi the higher numbers of fungi were isolated on menu and containers.

KEYWORDS

Cafeteria, Fungi, Aspergellus nigar, tables, containers

1. INTRODUCTION

Due to daily handling, cafeteria and restaurant items (menus, tables, chairs, and containers) may pose a risk of cross-contamination between patrons' hands and food and, if not cleaned and disinfected, may serve as a vector for certain food-borne illnesses. (Martin et al., 2016)

The kingdom Myceteae includes fungi. This group's unique traits include being eukaryotic, not photosynthetic, lacking tissue differentiation, having a chitin or other polysaccharide-based cell wall, and spreading through spores (either sexual or asexual) (Benson, 2002). The most prevalent fungal infections in humans are opportunistic fungal infections that occur in individuals with immune system disorders. (Kavanagh, 2007). The majority of bacteria in humans and the majority of other animals are found in the gut and on the skin. Though many are helpful, especially in the gut flora, the immune system's defenses render the great majority of bacteria in the body harmless. On the other hand, a number of bacterial species are harmful and can result in infectious illnesses such as leprosy, cholera, syphilis, anthrax, and bubonic plague. Respiratory infections are the most common and deadly bacterial diseases. (Sears, 2005). In many infectious diseases, microorganisms are the pathogens that cause the illness. The organisms involved include fungi that cause diseases like candidiasis, ringworm, or histoplasmosis, as well as pathogenic bacteria that cause illnesses like anthrax, TB, and plague (Lepp et al., 2004). The aim of the research is to identify and separate the bacteria and fungi found in restaurants, as well as to ascertain their existence and potential health impacts on people

2. MATERIALS AND METHODS

2.1 Sampling

Sample swapping was done in the cafeteria at various locations (chairs, tables, and containers). The samples were then brought to the lab the same day of the sample collection to be cultured on the growth medium for identification and isolation.

2.2 Identification Of The Fungal Genera

Transferring the fungal isolates to sterile plates allowed for their identification and purification. grown using the power plate technique on PDA medium and incubated for three to five days at 25°C. Media utilized in the identification and isolation of fungi Potato Dextrose Agar (PDA) (Onuorah, 1982).

After the fungi were grown, they were put on a slide, stained with lactophenol-cotton blue to look for fungal structures, covered with a cover slip, looked at under a microscope, and identified using atlas books and the morphology of their colonies and spores (Ronhede et al., 2005 and Rajankar et al., 2007).

Chemical compound Quantity of PDA

Dextrose 20 g.

Potato... .200 g.

Nutrient Agar.....500g.

Distill water (D.W.).....1 L

3. RESULT AND DISCUSSION

The total colony forming units (CFU) of the fungi in sample 1 on PDA medium are displayed in the results table (table 1) in each of the three locations where samples were collected (table, chair, and container). Tables held the highest quantity of isolated fungi, with 62 CFU, followed by chairs with 47 CFU. In this sample, Aspergillus Niger, Penecillium sp., Vorticella sp., and Cladosporium sp. were the most often isolated fungi.

The total colony forming units (CFU) of the fungi in sample 2 on PDA medium and SDA medium are displayed in table 2 along with the three locations where samples were collected (table, chair, and container). There were 308 CFU more isolated fungi on the chair than there were on

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the tables (96 CFU). In this sample, Penecillium sp., Aspergillus sp., and Cladosporium sp. were the most often isolated fungi.

The findings displayed in Table 3 demonstrate the total colony forming units (CFU) of fungi in Sample 3 on PDA and SDA medium in the three locations where samples were collected (the table, chair, and container). With 148 CFU on a container and 96 CFU on chairs, respectively, the higher concentrations of isolated fungi were found. In this sample, Alternaria sp., Penecillium sp., Cladosporium sp., and Mycelia Sterilia were the most often isolated fungi.

Figure (1) and Table (4) display the proportion of fungal genera in the initial sample. Aspergillus niger had a higher percentage of isolated fungi (77%), compared to 30% for Penecillium sp. Scopula and Alternaria sp., with a combined 0.8% of the total, have the lowest percentage of isolated fungi. Figure (2) and Table (5) display the proportion of fungal genera in the second sample. Aspergillus niger had a higher percentage of isolated fungi (71%), compared to 14% for Cladosporium sp. Candida, on the other hand, made up only 0.2% of the isolated fungi.

The third sample's percentage of fungal genera is displayed in Table (6) and Figure (3). Aspergillus niger accounted for 45% of the isolated fungal percentages. Cladosporium sp., on the other hand, had a lower percentage of isolated fungi—2%. The results across all samples show that there were more microorganisms on the chairs and containers (sugar, salt, pepper, etc.) figure (4,5,6), which may be related to the infrequent cleaning and disinfection of these areas. Aerobic bacteria might be proliferating in your essential salt and pepper shakers. It is well known that these thrive in environments with oxygen. E. coli and certain Coliform bacteria, which are found in the gut and in feces, are among the bacteria that could be there (Barbara et al 2000; Joanne and others, 2008). Menus are a breeding ground for contamination, just like almost anything that is passed around and touched regularly. Bacteria such as E. Coli and Staph were detected in one study. When exposed to rhizopus, most healthy individuals are not at risk for serious health issues. The illness known as mucormycosis is an uncommon but dangerous risk. When this mold gets into the air and gets into the sinuses or lungs, it can cause illness (Bjorklund et al 2005). Open wounds are another way for it to get into the bloodstream. Because their skin is so susceptible to infection, people who have burns are more likely to get this illness. Fever, cough, eye swelling, and black discharge from the nose are a few of the symptoms of mucormycosis (Bjorklund et al 2005; Kirk et al 2008). Numerous molds, particularly those belonging to the Cladosporium and Aspergillus genera, can grow indoors where they can enter through dust particles that are attached to spores or active fungi (Ainsworth, 2009). The Aspergillus and Penicillium species are typically found isolated in indoor settings, typically originating from indoor sources. In spite of the fact that Hindy and Awad noted that Cladosporium species typically originate in outdoor environments, we were able to identify them in indoor air during our study. Because Aspergillus niger is a common species of the genus Aspergillus, it is a fungus and the most commonly isolated type of Aspergillus. It contaminates food frequently and causes a disease known as "black mold" on some fruits and vegetables, including grapes, apricots, onions, and peanuts. It grows widely in soil and is frequently observed in indoor environments, where its black colonies are mistaken for Stachybotrys colonies (a species also known as "black mold")(Kirk et al., 2008).

Table 1: Variation Of Fungi Count (CFU.m^{-1}) in first sample.

chairs (Fungi)	CFU	Table (Fungi)	CFU	Containers(fungi)	CFU
Penicillium sp.	30	*Cladosporium sp.*	3	*Vorticella sp.*	4
Cladosporium sp.	7	*Rhizopus sp*	2	*Alternaria sp.*	1
Aspergillus niger	100	*Drechslera sp.*	1	*Aspergillus niger*	30
Yeast.	3	*Yeast.*	1	*Cladosporium sp.*	1
Trichoderma sp.	1	*Aspergillus niger*	55	*Torula sp.*	2
Drechslera sp.	1			*Humicola sp.*	3
Torula sp.	2			*Trichocladium*	1
Penicillium sp.	2			*Mycelia sterilia*	1
Alternaria sp	1				
Total	47		62		43

Table 2: Variation Of Fungi Count (CFU.m^{-1}) in second sample.

chairs (fungi)	CFU	Table (Fungi)	CFU	Containers(fungi)	CFU
Cladosporium sp.	60	*Cladosporium sp.*	11	*Aspergillus sp.*	30
Altrenaria sp.	0	*Altrenaria sp.*	30	*Cladosporium sp.*	2
Aspergillus sp.	300	*Aspergillus sp.*	54		
		Candida sp.	1	*Penicillium sp.*	40
Total	360		96		72

Table 3: Variation Of Fungi Count (CFU.m^{-1}) in Third sample.

chairs (fungi)	CFU	Table (Fungi)	CFU	Containers(fungi)	CFU
Yeast	5	*Yeast*	10	*Yeast*	12
Mycelia Sterilia	2	*Alternaria sp.*	0	*Cladosporium sp.*	4
Penicillium sp.	20	*Penicillium sp.*	6	*Aspergella niger*	91
Alternaria sp.	40	*Cladosporium sp.*	2	*Alternaria sp.*	1
Aspergellus nigar	29	*Mycelia sterilia*	1	*Penicillium sp.*	40
Total	96		19		148

Table 4: Total fungi count (CFU.ml-1) in first sample

Fungi	Count	*Percentage%*
Penicillium sp.	30	*12*
Cladosporium sp.	11	*4*
Aspergillus niger	185	77
Yeast	4	1.6

Table 4: Total fungi count (CFU.ml-1) in first sample		
Trichoderma sp.	2	0.8
Alternaria sp.	2	0.8
Rhizopus sp.	2	0.8
Vorticella sp.	4	1.6
Total	240	100

Table 5: Total Fungi Count (CFU.Ml-1) In Second Sample		
Fungi	Count	Percentage %
Cladosporium spp.	73	14
Alternaria	30	6
Aspergillus sp.	354	71
Candida sp.	1	0.2
Penicillium spp.	40	8
Total	498	100
Table 6: Total fungi count (CFU.ml-1) in third sample		
Fungi	Count	Percentage%
Yeast	27	10
Penicillium sp.	66	25
Alternaria sp.	41	15
Cladosporium sp.	6	2
Aspergella Niger	120	45
Total	260	100

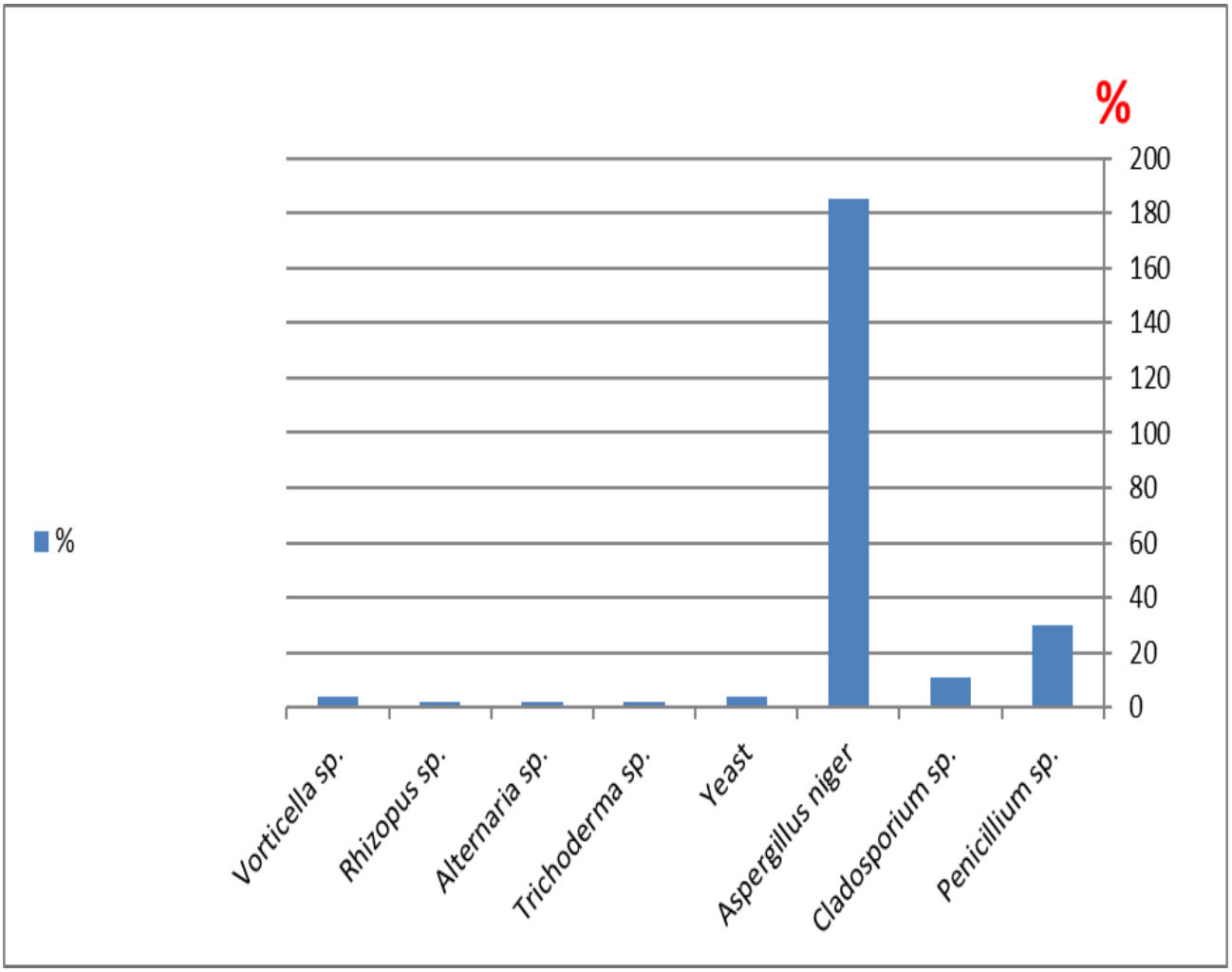


Figure 1: Shows fungi percentage in first sample

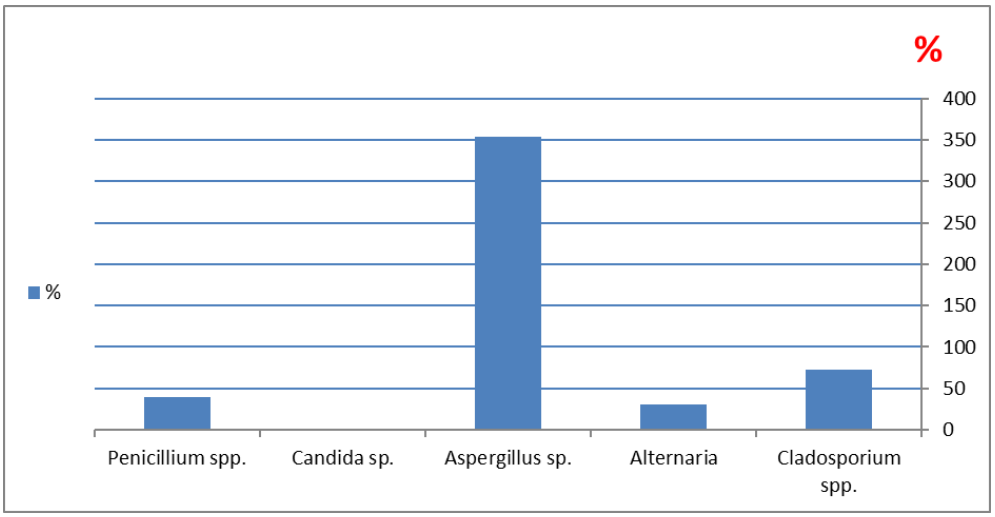


Figure 2: Shows fungi percentage in second sample

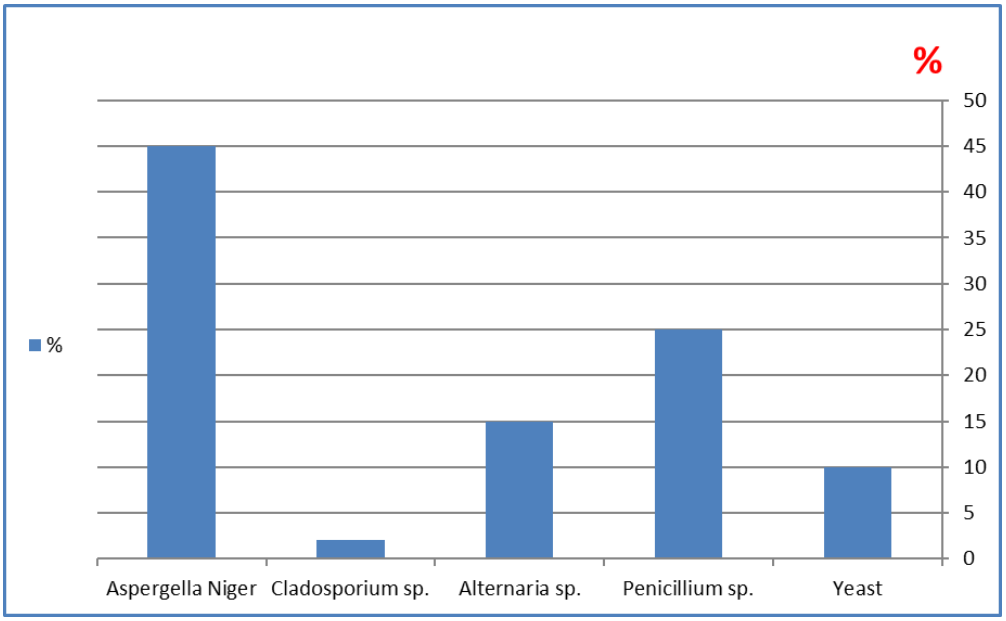
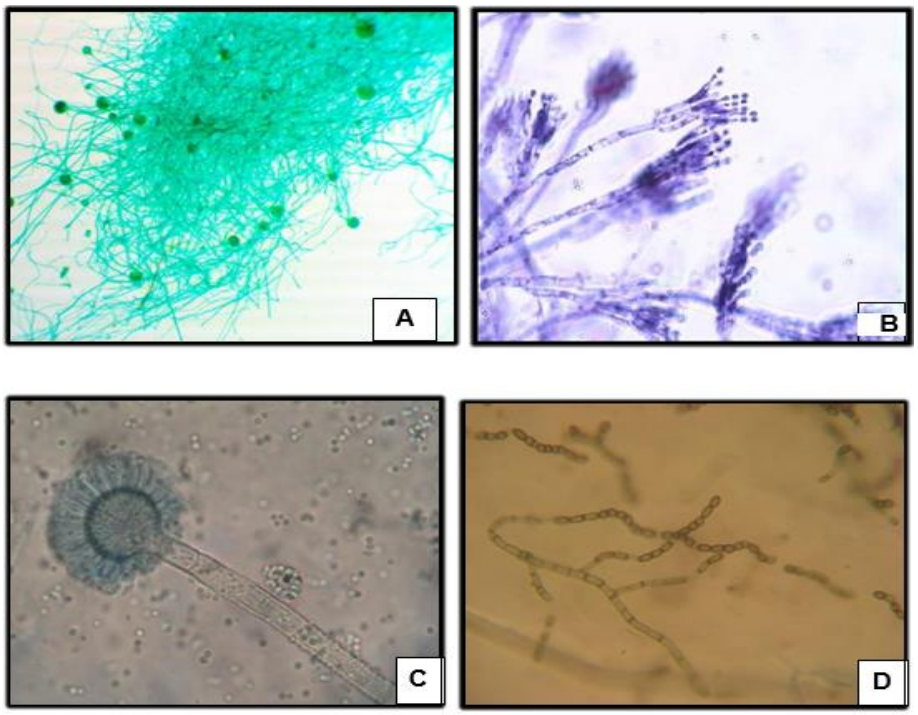


Figure 3: Shows Fungi Percentage In Third Sample



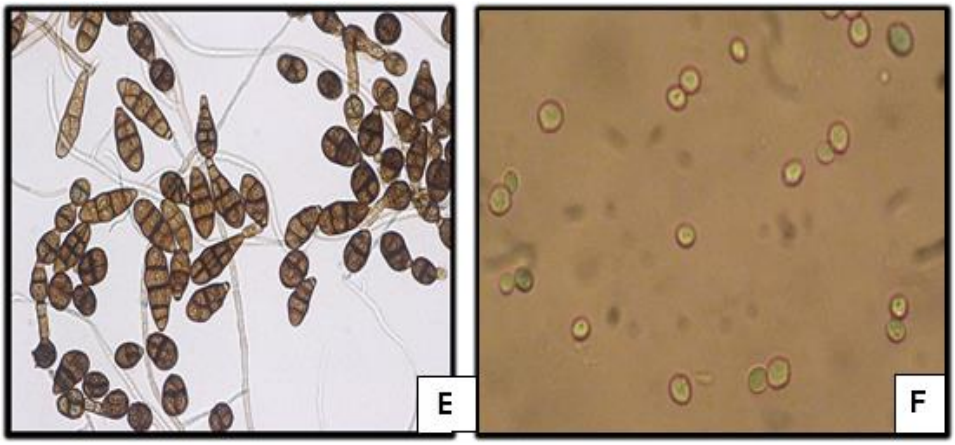


Figure 4: Shows Some Genera of Fungi Isolated On PDA Medium

A- *Rhizopus sp.* B- *Penicillium sp*. C- *Aspergillus* sp.

D- *Cladosporium sp.* *E- yeasts* *F- Alternaria sp.*

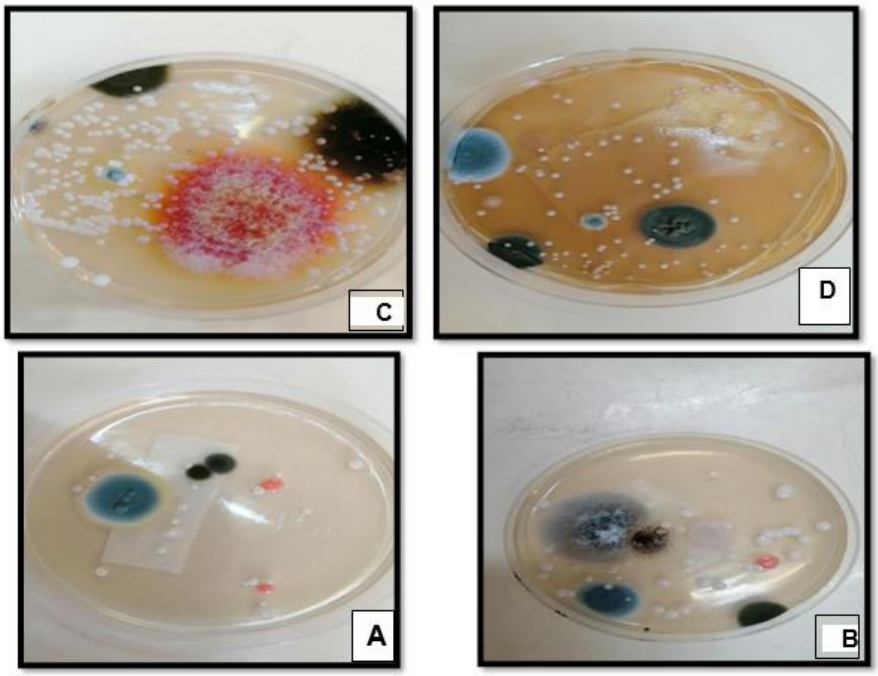


Figure 5 : Show different fungal colonies growth on PDA

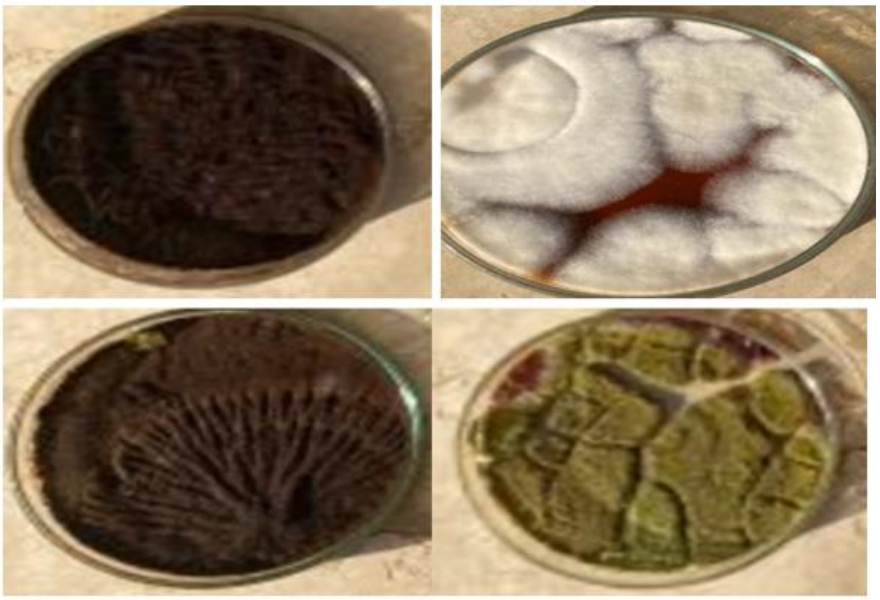


Figure 6: Show different fungal colonies (pure culture) growth on PDA

4. Conclusion

Several kinds of fungi were isolated from Salahaddin University's College of Science cafeteria. Penicillium, Cladosporium, Alternaria, and Aspergillus Sp were the most often isolated fungi. Trichocladium, Drecheslera sp., and Botrytis sp. were the less commonly found fungal species. Of all the Aspergillus species, Aspergillus Niger was the most prevalent.The fungi indicated that larger concentrations of fungi were isolated on chairs and containers.

References

Ainsworth, M., 2009. Food Pathogens .Fish and Seafood Pathogens. USA.207-2018.

Barbara, L, Baird-Parker, Anthony, C., and Grahame, W., 2000. Microbiological Safety and Quality of Food, 2000.

Benson, H.J., 2002. Microbiological Applications, Laboratory Manual in general microbiology. 8th ed. McGraw Hill. Pp. 477.

Bjorklund, R., 2005. What is A Food-Borne Illness. Food- Borne Illnesses. New York: Marshall Cavendish Corporation.1th ed. Pp. 10-26.

Blackburn, W., Clive de, W., 2006. Introduction and Microbial Spoilage,Food Spoilage Microorganisms. Pp. 1-11.

Eugene, W., Denise, G. C., Evans Roberts, Nancy, N., Martha, T., 2004. Common Spoilage Fungi, Microbiology.4th ed. Pp. 811.

Gámez, M. N., Mengual Lombar, M., Carcedo, I., Lopez, M.A., Álava J.I., 2016 Pathogen Persistence in Restaurant Menus: Comparison between Materials. J Food Microbiol Saf Hyg, 1: Pp. 1

Hindy, K.T., Awad, A.H.A., 2000. An initial control of indoor air biocontamination. Environ Management Health 11:Pp. 133–138.

Joanne, M., Linda, M., and Christopher, J., 2008. Microbial Growth and Food Spoilage, Microbiology, New York.7th ed. 1026.

Kavanagh, K., 2007. New Insights in Medical Mycology. Published by Springer, Dordrecht. The Netherlands; page1.

Kirk, P.M., Cannon, P.F., Minter, D.W., Stalpers, J.A., 2008. Dictionary of the Fungi (10th ed.). Wallingford, UK: CABI. Pp. 599. ISBN 978-0-85199-826-8

Lepp, P., Brinig, M., Ouverney, C., Palm, K., Armitage, G., Relman, D., 2004. Methanogenic Archaea and human periodontal disease. Proc Natl Acad Sci USA. 101 (16): Pp. 6176–81.

Sears, C.L., 2005. A dynamic partnership: celebrating our gut flora. Anaerobe. 11 (5): Pp. 247–51.

Sperber, W., 2009. Microbiological Food Spoilage Mechanisms, compendium of the Microbiological Spoilage of Foods and Beverages, New York.10.