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Isolation and identification of some important mycological isolates from dropping of birds in Baghdad

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Abstract
The aim of the present study for isolation and identification of yeasts and moulds from systemic infection of dropping birds in Baghdad. One hundred samples were collected from faeces belong to three kindes of birds which included: Pigeon (70), Pet bird (25) and Chicken (5). These samples were cultured on Sabouraud Dextrose Agar (SDA) and the results revealed that the percentage of systemic mycosis in birds was (88%) which classified into (25%) yeasts and (63%)moulds through isolation of Penicillum (19%), *Cryptococcus spp*. (13%), Mucor (9%), Geotricum (8%). Rizipus (7%), *Candida spp* (6%), *Rhodotorula* (6%), *Aspergillus niger* (%6), *Aspergillus* Fumigatus (%5), *Aspergillus flavus* (4%) Cladosporium (3%) and Alternerria (2%).The present study suggests that the fungal diseases considered a serious threat to the animals life, other types of birds, Environment and human through handling with infected birds.

Keywords: Birds drooping, poultry mycosis, mould, yeast

1. Introduction
There are most common of mycotic infections in all type of birds but are less dominant when compared with bacterial and viral infections. These fungal diseases include Aspergillosis, Candidiasis, Dactylariosis, Cryptococcosis, Favus, Rhodotorulosis, Torulopsis, Mucormycoses, Histoplasmosis and Cryptococcosis [1].
It is believed that about 50% of birds are reservoirs and carriers for fungi which are potentially pathogenic to birds themselves and to human [2] While Al-Temimay and Hasan (2016) [3] pointed that the birds and their droppings can carry over 60 diseases; many of them are airborne and can be transferred to humans just by being around them. Sporadic cases of fungal infection are most commonly occur but sometimes they develop to form outbreaks [4].
On the other hand, Birds are susceptible to fungi due to their anatomy of the respiratory and nervous systems and have very poor antifungal activity in their serum [5]. But the gastrointestinal tract of birds can play a crucial role in fungal growth [6]. Also, Fungi can be transmitted by birds feathering, ectoparasites, internal organs, the respiratory and digestive tracts [7,8]. Carrier birds do not usually become ill because of their high body temperature which inhibits the growth of pathogenic fungi. and this fungi become dangerous at the body temperatures of humans or other mammals with impaired immunity [9, 10]
So, fungal infections require appropriate attention in terms of timely diagnosis and effective treatment regimens to be followed as mentioned by Dhama *et al*. [11].
Therefore, the aim of this study was to investigate the percentage of mycotic infection and evaluate the diversity of yeasts and moulds in the intestine of birds found in Baghdad.

2. Materials and methods
2.1 Sources of Birds samples
A total of (100) birds faecal sample that belong to pigeon (70), pet bird (25) and chicken (5) were collected from Abu- Ghraib, Al- Horrya city and Baghdad centre during the period of October 2015 to March 2016. The samples were collected in sterile polythene bags and directly transported to the laboratory in ice box. One gram of each sample was put it in a test tube with 9 ml of normal saline, Then all tubes were shaken by vortex mixer for 3min. and left for 15 min. Cultures were made from the supernatant part in Sabouraud dextrose Agar (BDH-england) plates and were incubated at 28±2 ºC for (3-7) days. Fungal isolates were diagnosed according to cultural characteristic, morphology of hyphae cells, spores and kind of fruiting bodies [12].

All yeast isolates were identified by direct microscopic examination using the lacto-phenol-cotton-blue stain (Fluka-Switzerlabnd), India ink stain and urease test.

Results and Discussion

The present study reported high percentage of mycotic infections in bird that reach (88%) which classified into (9) species (63%) of mould and (5) species (25%) yeast (Table 1).

Table 1: Prevalence of mycotic infection in birds.

Types of fungi	No. of spp	No. of isolates	Percentage (%)
Yeasts	5	25	25%
Moulds	9	63	63%

The present study revealed that prevalence of mycotic infection caused by moulds was more than yeasts (Table 2 and 3) those showed wide diversity of mould and yeast species.

Table 2: Types of moulds that isolated from faecal samples of birds.

Type of moulds	No. of isolates	Percentage of moulds isolates
Penicillum	19	19%
Rizopus	7	7%
Aspergillus flavus	4	4%
Aspergillus fumigatus	5	5%
Aspergillus niger	6	6%
Mucor	9	9%
Alternerria	2	2%
Cladosporium	3	3%
Geotricum	8	8%

Table 3: Types of yeasts that isolated from faecal samples of birds.

Types of yeast	No. of isolates	Percentage of yeasts isolates
Cryptococcus neoformans	13	13%
Candida spp.	6	6%
Rhodotorula	6	6 %

This study isolated some important fungi like *Cryptococcus neoformans*. Cryptococcosis is a one of the dangerous diseases to humans and the causative agent of this disease is common in the faeces of different avian species and in faeces-contaminated soil [13, 14]. On other hand, another study that conducted by Liaw *et al*., [15] could isolate eight isolates of *Cryptococcus neoformans* from pigeons faeces. In Spain, Rosario *et al*., [16] isolated *Cryptococcus neoformans* from cloak of pigeons with (6) variety of *Cryptococcus neoformans*. Also in Malaysia, Tay *et al.,* [17] found (20) isolates of *Cryptococcus neoformans* from faeces of zoo birds. Lugarini *et al.,* [18] reported isolation of *Cryptococcus neoformans* from faeces of parrots and sparrows and stated that faeces of domestic birds act as reservoir for *Cryptococcus neoformans*. While Duncan *et al*. [19] obtained *Cryptococcus gattii* from nasal culture of a gray squirrel in Vancouver Canada, and stated that wild animals of Vancouver can become a reservoir for this fungus, like domestic animals of this region.in another study, Cermeño *et al.* [20] isolated *Cryptococcus neoformans* from doves in Boliv Gorganar province of Venezuela and [15] reported isolation of *Cryptococcus neoformans* from faeces of pigeons and stated (99) percent of *Cryptococcus neoformans*. While in Qazvin, [21] found the total of (50) pigeon excrete were collected 50 pigeon excreta (2) cases (4%) *Cryptococcus neoformans* were detected. Besides the *Cryptococcus neoformans* were isolated (10) species of *Cryptococcus, Candida unigattulatus* 4 cases (5.72%), *Candida laurentii* 3 cases (4.28%), *C. albidus* 2 cases (2.86%) and *Candida humicola* 1 cases (1.43). While the study of [2] fungi were isolated from sampling yielded 272 yeast isolates: from the beak and from the cloaca, the isolates represented 23 species, among which *C. albicans, C. neoformans*, and *R. rubra* were predominant.

Another important fungus that isolated in this study was *Aspergillus* spp. Aspergillosis is a respiratory disease of chicken, turkey, humans and other mammals while it is less frequently in ducks, pigeon, geese and other wild and domestic birds [22]. The current study reported 15% of all types of *Aspergillus spp.* which isolated in this work. This result of this research showed lower percent when compare with study conducted by [3] how reported 28.24% of *Aspergillus spp.* that isolated from poultry droppings. The current study showed 4% of infection caused by *A. flavus*. This type of fungus has specific importance due to its ability to produce aflatoxin that cause serious problems in animals and human [23]. Whereas this result was differed to the investigation of Joshi *et al*., [24] how found eighteen samples of the dropping of blue rock pigeon a total of (44) fungal isolates were return to *Aspergillus spp. Rhizopus* spp. (29.55%) was the predominant one while *Penicillium* spp. (2.27%) was the least isolated one.

Soltani *et al*., [25] reported the presence of *Candida, Cryptococcus, Aspergillus, Alternaria, Rhizopus, Mucor* and *Penicillium* from pigeon droppings collected from urban areas of Isfahan. The study of [26] from the intestinal tracts of 35 out of 50 birds 58 yeast isolates belonging to 3 genus and 6 species were obtained. The occurrences of individual yeast species were *Saccharomyces* (31.03%*), Candida glabrata* (20.69%*), C. tropicalis* (15.51%*), C. albicans* (15.51%), *C. fmata* and *Creptococcus neoformans* (8.62%). While [27] found the presence of these opportunistic fungi such as *Aspergillus, Alternaria, Rhizopus, Mucor* and yeast like fungi in various domestic birds presented to veterinary clinics in Tehran. In other hand, Seo *et al*. [28] studied the identification of *Rhodotorula*, with the predominance of *R. rubra*, indicates that the birds feed on sewage waters.

4. Conclusion

The present study concluded that there is a potential role of pigeons, pet birds and chicken as reservoir for zoonotic yeasts and mould in the environment that can affect humans and animals also can cause threatening to human through handling with infected bird. So, further investigations are needed to define the health status of these birds, in order to estimate the real risks of the cohabitation of these birds with humans.

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