Original Article

ISOLATION OF FUNGI FROM HOUSEFLY *(MUSCA DOMESTICA)* IN AHWAZ, IRAN

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ABSTRACT

Objectives: The objective of this study was isolation of fungi on external surface of houseflies collected from Ahwaz, Iran.

Methodology: The fungal spores of the external surface of 275 house-flies *(Musca domestica)* were collected from Ahwaz, Iran. The flies were captured and rinsed in a solution of 1% sodium hypochlorite for three minutes and twice in sterile distilled water for 1min. The group of ten flies was transferred to a 0.85% saline solution. 0.1ml of this solution was transferred to Sabouraud's dextrose agar (SDA). The plates were kept at room temperature to allow appearance of the fungal colonies.

Results: In this study 1295 fungal colonies were identified. The main fungi isolated were species of *Aspergillus, Penicillium,* Yeasts, *Cladosporium* and *Fusarium*. Also, 2 dermatophytes were recovered including *Microsporum gypseum* and *Trichophyton mentagrophytes*.

Conclusion: Our study demonstrated that house-fly is a carrier for fungal spores.

KEY WORDS: Fungi, House fly, Isolation.

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INTRODUCTION

The housefly, *Musca domestica,* acts as a mechanical vector for various microorganisms. The housefly has the potential for dissemination of microorganisms in the environment that are associated with animal feces and manure. These insects have been shown to feed on secretions and other human wastes, making them ideal carriers for transmitting several pathogenic microorganisms. A variety of bacterial diseases are disseminated by housefly which include typhoid fever,[1] cholera,[2] staphylococcal food poisoning (caused by *Staphylococcus aureus*)[3] and Shigellosis.[4]

Vectors like rodents and insects, especially house flies, have been reported as carriers of yeast and filamentous fungi. The association of insects and fungi has been confirmed by several reports.[5-10] Abattoirs are important sources of contamination of the house-flies surface with fungi. Dirt, soil, body discharges and excreta from animals in holding pens are the main sources of fungal contamination of house-flies. The main goal of this study was to isolate and identify fungal species from external surface of *M. domestica*. Information on the carriage of pathogenic microorganism by houseflies in Iran

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is scanty. In this study, we evaluated the presence of filamentous fungi and yeast of medical importance on external surface of houseflies collected from Ahwaz, Iran.

METHODOLOGY

House flies: Adults house flies were collected from abattoir in Ahwaz. The insects were captured with nylon net and a wooden cage covered on the sides by nylon netting. After capture, the flies were stored in the fridge for 15 min to anesthetize the flies. The flies were divided in groups of 10 specimens. The culture media and instruments were previously autoclaved and sterilized.

Isolation of fungi: The insects were rinsed in a solution of 1% sodium hypochlorite for 3 min and twice in sterile distilled water for 1 min. The group of ten flies was transferred to a 0.85% saline solution for maceration. 0.1ml of this solution was transferred to SDA containing chloramphenicol to inhibit bacterial growth. Six dishes were inoculated in each stage.

Recognition of fungi: The plates were kept at room temperature for fungal growth. The fungi were identified using a light microscope. The samples were stained with lactophenol and aniline blue for mounting between the slides and covers. If it was necessary, the slide culture was used for confirmation the species. For identification of the isolated dermatophytes some physiological methods such as hair penetration, corn meal agar medium containing 2% dextrose, and urea medium were used.

RESULTS

A total of 275 flies were studied in this work. Approximately 1295 fungi were isolated from the external surface of the flies (Table-I). *Aspergillus sp.* (30%), *Penicillium sp.* (25%), Yeasts (15%), *Cladosporium sp.* (9%) and *Fusarium sp.* (7.9%) were most commonly isolated. The other detected fungi were: Mucorales (3.5%), *Mycelia sterilia* (3.5%), *Alternaria sp.* (2.3%), *Baeuveria sp.* (1.6%) *Drecselera sp.* (1.3%) and *Geotrichum sp.* (0.9%).

Table-I: Fungi isolated on the external surface of houseflies in Ahwaz, Iran.

Fungi	*n*	%
Aspergillus sp.	393	30
Penicillium sp.	316	25
Yeasts.	195	15
Cladosporium sp.	117	9
Fusarium sp.	102	7.9
Mucorals	45	3.5
Mycelia sterilia	45	3.5
Alternaria sp.	30	2.3
Beauveria sp.	21	1.6
Drechslera sp.	17	1.3
Geotrichum.	12	0.9
Microsporum gypseum.	1	0.07
Trichophyton mentagrophytes	1	0.07
Total	1295	100

Among the filamentous fungi, 2 species of dermatophytes were identified; these were *Trichophyton* mentagrophytes and *Microsporum gypseum.*

DISCUSSION

The aim of this study was to isolate and identify the fungi that can be found of body surface of the houseflies as a source of contamination. The other purpose was to determinate whether these fungi are pathogens or saprophytes. Abattoirs are one source of contamination of the body surface of houseflies with microorganisms. It is therefore required for determination the type of microorganisms that can be found in abattoirs.

It was observed that fungi isolates recovered were mostly saprophytes. However, we isolated two pathogenic fungi which were dermatophytes. In this study, we detected 12 genera of fungi in houseflies. Aspergillus sp., an important medical species isolated in our study, has been reported in nosocomial infections. Interestingly, we isolated two dermatophytes, which cause cutaneous infections in humans.

We also detected a prevalence of the genus Aspergillus, followed by the genus Penicillium. Various studies have reported the isolation of fungi from insects. Burnside isolated Aspergillus sp. and Penicillium sp. from bees.[11] Costa and Oliveira isolated various species of Penicilliun from mosquito vectors of tropical diseases.[8] Norberg et al. verified the predominance of the genus Penicillium in adult Muscidae dipterons, captured in hospitals, bars and outdoor markets in the back-bay lowlands surrounding Rio de Janeiro.[10] These authors also reported the isolation of the other species, such as Aspergillus sp. Alternaria and C. albicans, among the most frequent.

In another work on isolation and identification of fungi in Muscidae dipterons, Kaaya and Okech (1990) reported various species isolated pupae and adults on Glossina pallidipes, among which A. flavus, A. niger, Penicillium sp. and Fusarium.[12] Our study demonstrated that house-fly is a carrier for fungal spores.

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