MYCOTIC FLORA IN THE LOWER DIGESTIVE TRACT OF FERAL PIGEONS (*Columba livia*) IN THE EL PASO, TEXAS AREA

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Abstract: Fourteen species of fungus were isolated from the lower digestive tract of 69 of 80 pigeons. Sixteen pigeons had concurrent isolations while two harbored three species. Fungi isolated were *Allescheria boydii*, *Aspergillus* spp., *Candida krusei*, *Chrysosporium* spp., *Geotrichum candidum*, *Mucor* spp., *Paeciliomyces* spp., *Penicillium* spp., *Rhizopus* spp., *Rhodotorula* spp., *Scopulariopsis* spp., *Streptomyces* spp., and *Trichosporon cutaneum*. There was no apparent evidence that these fungi were associated with clinical disease in any of the pigeons.

INTRODUCTION

The pigeon frequently has been associated with pathogenic and saprophytic fungi.[6,12] Kocan and Hasenclever,[12] during studies of the normal yeast flora of the upper digestive tract isolated *Candida* spp. and *Geotrichum candidum*. McDiarmid[14] has shown that free-living wild birds become infected with *Aspergillus fumigatus* and other *Aspergillus* spp. which produce aspergillosis. Cooper[5] in his observations of aspergillosis in birds reported that some birds have a silent infection with the etiologic agents of this disease.

Pigeon excrement in the soil has been shown to enhance the growth and survival of *Cryptococcus neoformans*[9,13] and chicken excrement has provided enrichment for the growth of *Histoplasma capsulatum*.[1,7,21] However, efforts to isolate these fungi from the lower digestive tract of pigeons and chickens have been unsuccessful.

Specimens from the ileo-cecal-colic junction of 80 feral pigeons (*Columba livia*) trapped in the El Paso, Texas area were cultured to determine the significance of the pigeon as a possible reservoir of fungal infection to man and animals.

MATERIALS AND METHODS

Swabs were taken from the lower digestive tract of 80 feral pigeons trapped in and around El Paso, Texas.

The pigeons were killed and soaked in a 1.0% Mikro-Bac[1] solution for 2-5 minutes. Feathers and skin over the abdomen were separated and removed from the torso. The abdominal wall was opened to expose the gastrointestinal tract. Suture material was used to ligate the ileum approximately 2.5 cm anterior to the cecum, and the colon approximately 2.5 cm posterior to the cecum. The ligated ileo-cecal-colic portion was dissected free

[1] Economica Lab., St. Paul, Minn.

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with sterile scissors. The intestinal serosal surface was cauterized using a heated spatula. A small incision was made through the cauterized area using a sterile scalpal. Samples of the intestinal lumen contents at the ileo-cecal-colic junctions were collected using a sterile swab. The culture swab was placed in a glass tube (16 x 125 mm) containing 5 ml of sterile physiological saline. The tube contents was mechanically mixed to obtain a homogenous mixture for inoculation of nutrient media to isolate fungi.

Portions of the sample mixture were inoculated onto the surface of a Sabouraud Dextrose agar plate (SDA), three SDA slants (one slant without antibiotics, one slant with .05g/1 Chloramphenicol, and one slant with 0.4g/1 Cycloheximide and .05g/1 Chloramphenicol), a Brain Heart Infusion agar plate, and two Brain Heart Infusion agar slants (one with 0.4g/1 Cycloheximide and .05g/1 Chloramphenicol and one without). Two sets of the above culture media were inoculated with each sample. One set was incubated at 25 C and the other at 37 C. All primary cultures were incubated for 4 weeks before being reported as negative.

Teased mount preparations and slide cultures mounted in lactophenol cotton blue were examined microscopically and identified on the basis of vegetative and reproductive structures. Yeasts were identified on the basis of colonial morphology on SDA slants, capsule production, urea hydrolysis, nitrate and carbohydrate assimilation and carbohydrate fermentation.[4,6,10,15,20]

RESULTS

A total of 14 fungal species were isolated. Fifty-one of the 80 feral pigeons examined were positive for at least one fungus (Table 1). Two different fungi were isolated from 16 pigeons and three or more fungi were isolated from only two pigeons.

DISCUSSION

All of the fungi isolated are known soil saprophytes. Several isolates (*Allescheria boydii, Aspergillus* spp., *Candida albicans* and *Trichosporon cutaneum*) are recognized as opportunistic fungi occasionally producing infections of variable severity in man and animals.[2,3,4,6,12,14,16,17,18,19,20]

TABLE 1. Frequency of isolation and percentage (in parenthesis) of mycotic organisms cultured from ileo-cecal-colic junction of feral pigeons.

Organism	Frequency of Isolation	
Allescheria boydii	4/80	(5)
Aspergillus spp.	11/80	(13.75)
Candida albicans	1/80	(1.25)
Candida krusei	3/80	(3.75)
Chrysosporium spp.	3/80	(3.75)
Geotrichum candidum	4/80	(5)
Mucor spp.	8/80	(10)
Paeciliomyces spp.	15/80	(18.75)
Penicillium spp.	1/80	(1.25)
Rhizopus spp.	1/80	(1.25)
Rhodotorula spp.	15/80	(18.75)
Scopulariopsis spp.	1/80	(1.25)
Streptomyces spp.	1/80	(1.25)
Trichosporon cutaneum	1/80	(1.25)

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