

MYCOTIC INFECTIONS OCCURRING DURING AN EIGHT YEAR  
PERIOD AT THE CHICAGO ZOOLOGICAL PARK,  
BROOKFIELD, ILLINOIS

by

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We present below listings of mycotic infections occurring in vertebrates at the Chicago Zoological Park from September, 1954 to December, 1962. Most of the identifications were made by Dr. Tilden and Mrs. Getty from cultures of the fungi involved. Except for a few cases noted among the mammals, the findings were made from necropsy material.

It is interesting to note the wide variety and numbers of birds with mycotic infections in contrast to the few findings in mammals and reptiles. Our interest in mycotic infections during this period led to the publication of the eight articles listed at the end of this paper, and the reader is referred to these for additional information on some of the cases. These

studies have included research on the endotoxins of *Aspergillus flavus* and *fumigatus*, the description of a new species of *Microsporium*, and case reports of mycoses in animals that were previously unrecorded.

It is hoped that this listing will help to provide some clue to the epidemiology of the disease and that correlations of animal feeding habits, etc., with disease occurrence may eventually lead to a satisfactory means of control of mycotic infections, especially those of *Aspergillus*.

We wish to thank Dr. George Rabb, Chicago Zoological Park, and Mrs. Ann C. Uzzell for assistance in the preparation of this paper.

MYCOSES IN BIRDS

Bird	Scientific Name	Tissue Examined	Remarks
1 King penguin	<i>Aptenodytes patagonica</i>	Air sacs	<i>Aspergillus</i> sp.*
1 King penguin	<i>Aptenodytes patagonica</i>	Air sacs	<i>A. fumigatus</i>
5 Emperor penguins	<i>Aptenodytes forsteri</i>	Air sacs	<i>A. flavus</i>
1 Fairy penguin	<i>Eudyptula minor</i>	Air sacs	<i>A. fumigatus</i>
9 Humboldt penguins	<i>Spheniscus humboldti</i>	Air sacs	<i>A. fumigatus</i>
1 Humboldt penguin	<i>Spheniscus humboldti</i>	Air sacs	<i>A. fumigatus</i>
9 Humboldt penguins	<i>Spheniscus humboldti</i>	Air sacs	<i>A. flavus</i>
1 Humboldt penguin	<i>Spheniscus humboldti</i>	Air sacs	<i>A. flavus</i>
			<i>A. terreus</i>
1 Ostrich	<i>Struthio camelus spatzi</i>	Air sacs	<i>A. fumigatus</i>
		Nodule (foot)	<i>A. flavus</i>
1 Crested tinamou	<i>Eudromia elegans</i>	Lung	<i>Aspergillus</i> sp.*
1 Rufous-crowned tinamou	<i>Rhynchotus rufescens pallescens</i>	Air sac	<i>A. fumigatus</i>
1 Loon	<i>Gavia immer immer</i>	Air sac	<i>A. fumigatus</i>
1 American bittern	<i>Botaurus lentiginosus</i>	Air sacs	<i>A. fumigatus</i>
1 Tiger bittern	<i>Tigrionis leucolopha</i>	Air sac	<i>A. fumigatus</i>
1 Whistling swan	<i>Olor columbianus</i>	Air sac	<i>A. flavus</i>
1 Black swan	<i>Chenopsis atrata</i>	Lungs & air sac	<i>A. fumigatus</i>
1 Brant goose	<i>Branta bernicla hrota</i>	Air sacs	<i>A. fumigatus</i>
2 Andean geese	<i>Chloephaga melanoptera</i>	Air sacs	<i>A. fumigatus</i>
1 Chilean pintail duck	<i>Anas georgica niceforo</i>	Air sacs & lungs	<i>Aspergillus</i> sp.*

## MYCOSES IN BIRDS

Bird	Scientific Name	Tissue Examined	Remarks
1 Gadwall	<i>Anas strepera</i>	Lung	Aspergillus sp.*
2 Chloie widgeons	<i>Mareca sibilatrix</i>	Air sacs	Aspergillus sp.*
1 Mandarin duck	<i>Dendronessa galericulata</i>	Air sac	A. fumigatus
1 Mandarin duck	<i>Dendronessa galericulata</i>	Lung	Aspergillus sp.*
1 Greater Scaup	<i>Aythya marila</i>	Exudate, esophagus	C. albicans
1 Common Eider	<i>Somateria mollissima borealis</i>	Lung	Aspergillus sp.*
1 Monkey-eating eagle	<i>Pithecopaga jefferyi</i>	Air sacs	A. fumigatus
1 Spur-winged lapwing	<i>Belonopterus chilensis</i>	Kidney	Aspergillus sp.*
1 Cockatiel	<i>Nymphicus hollandicus</i>	Lung	Aspergillus sp.*
1 Eclectus parrot	<i>Lorius rostratus</i>	Lung	Aspergillus sp.*
1 King parrot	<i>Alisterus scapularis</i>	Lung	Aspergillus sp.*
1 Pileated parakeet	<i>Purpureicephalus spurius</i>	Lung	Aspergillus sp.*
1 Quetzal	<i>Pharomachrus mocinno costaricensis</i>	Lung	Aspergillus sp.*
1 Quetzal	<i>Pharomachrus mocinno costaricensis</i>	Lung	A. fumigatus
1 Cuban woodpecker	<i>Centurus superciliaris</i>	Lung	Aspergillus sp.*
1 Bare-throated bell bird	<i>Procnias nudicollis</i>	Lung	A. fumigatus
1 Rieffer's fruiteater	<i>Pipreola riefferii</i>	Lung	A. fumigatus
1 Peruvian green jay	<i>Cyanocorax yncas yncas</i>	Lung	A. fumigatus
1 Common Crow	<i>Corvus brachyrhynchos</i>	Air sacs	A. fumigatus
1 European blackbird	<i>Turdus merula</i>	Lung	Aspergillus sp.*
1 Cuban solitaire	<i>Myadestes elisabeth</i>	Lung	Aspergillus sp.*
1 Rufous-bellied niltava	<i>Muscicapa sundara</i>	Lung	A. fumigatus
1 Tricolor superb starling	<i>Spreo superbus</i>	Lung	A. fumigatus
1 Magnolia warbler	<i>Dendroica magnolia</i>	Lung	Aspergillus sp.*
1 Magnolia warbler	<i>Dendroica magnolia</i>	Lung	A. fumigatus
1 Silver-beaked tanager	<i>Ranphocelus carbo</i>	Air sacs	A. fumigatus
1 Silver-beaked tanager	<i>Ranphocelus carbo</i>	Lung	Aspergillus sp.*
1 Superb Tanager	<i>Calospiza fastuosa</i>	Lung	Aspergillus sp.*
1 Jackson's whydah bird	<i>Drepanoplectes jacksoni</i>	Lung	Aspergillus sp.*

Aspergillus sp.\* — Identified from microscopic examination of fresh tissue (not cultured).

## MYCOSES IN MAMMALS

Mammal	Scientific Name	Tissue Examined	Remarks
1 Kangaroo	<i>Macropus melanops</i>	Stool	(Living) Candida sp.
1 Owl monkey	<i>Aotus trivirgatus</i>	Lung	Candida parapsilosis
2 Chimpanzee	<i>Pan satyrus</i>	Skin scrapings	(Living) Trichophyton mentagrophytes
1 Malabar squirrel	<i>Ratufa indica</i>	Skin scrapings	(Living) Microsporium vanbreuseghemii
1 Fisher	<i>Martes pennanti</i>	cerebro spinal fluid	A. fumigatus
1 Fisher	<i>Martes pennanti</i>	cerebro spinal fluid, urine	Penicillium sp.
1 Fisher	<i>Martes pennanti</i>	Kidney	C. albicans
1 Northern sea lion	<i>Eumetopias jubata</i>	Lung	Blastomyces dermatitidis
1 Blesbok	<i>Damaliscus albifrons</i>	Lung	A. fumigatus
1 Sitatunga	<i>Tragelaphus spekei</i>	Lung	Aspergillus sp.*

Aspergillus sp.\* — Identified from microscopic examination of fresh tissue (not cultured).

## MYCOSES IN REPTILES

Reptile	Scientific Name	Tissue Examined	Remarks
1 Alligator 1 Galapagos tortoise	<i>Alligator mississippiensis</i> <i>Testudo elephantopus nigrita</i>	Lung Leg tumor Lung	Penicillium sp. A. amstelodami A. amstelodami & Geotrichum candidum
1 Galapagos tortoise	<i>Testudo elephantopus nigrita</i>	Lung	Beauvaria bassiana
1 Aldabra tortoise	<i>Testudo gigantea</i>	Lung	Paecilomyces fumoso-roseus
1 Aldabra tortoise	<i>Testudo gigantea</i>	Lung	Beauvaria bassiana

## TOTALS OF MYCOSES

Aspergillus fumigatus	34
Cases diagnosed as aspergillosis at necropsy (not cultured)	22
Aspergillus flavus	18
Candida	4
Penicillium	2
Trichophyton mentagrophytes	2
Beauvaria bassiana	2
Aspergillus terreus	1
Aspergillus amstelodami	1
Geotrichum candidum	1
Paecilomyces fumoso-roseus	1
Microsporium vanbreuseghemii	1
Blastomyces dermatitidis	1

## PUBLISHED PAPERS

- 1959 The parasitic nature of the soil fungus *Keratinomyces ajelloi*. L. K. GEORG, W. KAPLAN, L. AJELLO, W. WILLIAMSON, and E. TILDEN. J. Invest. Dermatol., vol. 32, No. 4, pp. 539-544.
- 1959 North American blastomycosis in a northern sea lion. WEAVER M. WILLIAMSON, LOUISE S. LOMBARD, and RUTH E. GETTY. J. Am. Vet. Med. Assn., vol. 135, No. 10, pp. 513-515.
- 1961 Preparation and properties of the endotoxins of *Aspergillus fumigatus* and *Aspergillus flavus*. E. B. TILDEN, E. H. HATTON, S. FREEMAN, W. WILLIAMSON, V. KOENIG. Mycopathologica et Mycologia Applicata, vol. 14: 325-346.
- 1961 Partial purification and characterization of the endotoxin from *Aspergillus fumigatus*. Mycopathologica et Mycologia Applicata, vol. 14: 347-358. E. M. RAU, V. L. KOENIG, and E. B. TILDEN.
- 1962 A new species of *Microsporium* pathogenic to man and animals. Sabouraudia, 1 (4): 189-96. L. K. GEORG, L. AJELLO, L. FRIEDMAN, and S. A. BRINKMEN.
- 1962 Mycotic pulmonary disease of captive giant tortoises due to *Beauvaria bassiana* and *Paecilomyces fumoso-roseus*. Sabouraudia, vol. 2 (2): 80-86. L. K. GEORG, W. M. WILLIAMSON, E. B. TILDEN, and R. E. GETTY.
- 1963 Further studies of the *Aspergillus* endotoxins. E. B. TILDEN, S. FREEMAN, and L. LOMBARD. Mycopathologica et Mycologia Applicata, 20: 253-271.
- 1963 Chromatographic fractionation of *Aspergillus* endotoxins. L. K. WYNSTON and E. B. TILDEN. Mycopathologica et Mycologia Applicata, 20: 272-283.