

Pulmonary Zygomycosis in Chicks due to *Absidia corymbifera*

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Summary

Pulmonary zygomycosis was diagnosed in 2 of the 45 broiler chicks both by culture as well as direct microscopy. *Absidia corymbifera* was isolated from the diseased lungs on Sabouraud medium at 37°C. The squash preparations of the lungs in direct microscopy revealed the presence of broad non-septate, branched zygomycetes type hyphae, Similar fungal elements were detected in the PAS stained tissue imprints of the infected lungs. The recovery of *A. corymbifera* in high concentration from the litter and soil of chick pen suggested that environment probably acted as the source of infection to these broilers. It is advised that zygomycosis may be considered in the differential diagnosis of avian respiratory diseases.

Introduction

Zygomycoses (Mucormycosis, Phycomycosis) a granulomatous fungal disease of man and animals, has been reported from many regions of the world.^{2,4,6,12,13} The disease is caused by many species of opportunistic fungi which grow as saprobes in soil, decaying vegetation and animal matter etc.^{5,13} The environment serves as the source of infection both for man and animals. Though cases of zygomycoses have been reported from India^{4,7}, there is hardly any information on zygomycosis in birds due to *A. corymbifera*.⁹ The present study describes the causative role of *A. corymbifera* with pulmonary mycosis of broiler chicks.

Materials and Methods

Forty-five pneumonic lungs collected aseptically in sterilized glass petri plate from the same number of moribund or dead broiler chicks autopsied at the Department of Pathology, College of Veterinary Science, Anand were thoroughly investigated for mycotic infection. Each lung was decontaminated by applying a disposable cotton swab containing 70% alcohol; and 30 seconds later, lung tissues were cut into small pieces with sterile surgical blade. A part of the lung was inoculated directly on to the plates and slants of nutrient agar, blood agar and Sabouraud glucose agar with chloramphenicol (0.5mg/ml) and incubated at 37°C for microbial growth. The morphology of the isolate was studied in a recently discovered staining solution named 'PHOL'.¹⁰ The stain contained 0.3ml of 3% aqueous solution of methylene blue, 5ml of 4% aqueous solution of 35% formaldehyde

and 3ml of glycerol.

Smears were prepared from the infected lungs and examined by Giemsa, Ziehl Neelsen and Periodic acid-Schiff (PAS) techniques. Squash preparations of lung tissues were also subjected for direct microscopy to detect fungal elements, if any.

In order to know the source of infection, an attempt was made to screen 10 environmental samples (5 poultry litter and 5 soil) by dilution technique.¹⁰ Each specimen was plated on duplicate Petri dish of Sabouraud's medium.

Results

Of 45 broiler chicks examined, 2 were found positive for *A. corymbifera*. Both the chicks exhibited depression, listlessness, collapse and death. *A. corymbifera* was isolated in pure and luxuriant culture from the infected lungs of both the birds on Sabouraud medium after 5 days of incubation at 37°C. No growth of bacteria, yeast, dimorphic fungi or actinomycetes could be observed on nutrient media.

Tissue imprints failed to reveal acid fast bacilli, *Nocardia*, chlamydial inclusion bodies but showed the presence of broad, non-septate, branched hyphae morphologically indistinguishable from zygomycetes. Similar morphology was observed in squash (squeeze, fresh) mounts of infected lungs.

A. corymbifera was recovered in heavy growth from 2 samples of litter and 3 of soil.

Discussion

Zygomycosis, a disease of multiple fungal etiology, is responsible for considerable mortality and morbidity in humans and animals including birds. The demonstration of *A. corymbifera* in the infected lungs of chicks indicated that this zygomycetes may be one of important causes of pulmonary disease in avians. However, further studies should confirm the role of *A. corymbifera* as a respiratory pathogen in birds as well as other animals.

Source of infection in zygomycoses is usually exogenous as the causative organisms saprophytically in nature particularly on decaying plant, animal excreta and soil.⁶ There appears to be no report on its direct transmission from animal to animal or from animal to man. The high concentration of *A. corymbifera* in the saprobic materials of poultry farm suggested that chicks would have acquired the infection from their immediate surroundings. Surprisingly, there was no clinical evidence of any pulmonary or systemic disease in poultry handlers.

There are ample evidences that zygomycetes produce infection of lymph nodes, nose, sinuses, brain, gastrointestinal tract, bone, lung, placenta etc. Since clinical symptoms and post-mortem findings are not conclusive to establish the diagnosis, attempts should be directed towards the isolation of the etiological agent and its demonstration in clinical material to confirm an unequivocal diagnosis of zygomycosis.

The present investigation however, adopted the same criteria of diagnosis. It is advised that zygomycosis should be considered in the differential diagnosis of avian diseases.

Natural infection due to *A. corymbifera* has been recorded in man, buffalo, cattle, horses, pig, dogs, mink, guinea-pig, mouse, flamingo and chick etc.¹⁻⁸. The present study suggests that zygomycosis due to *A. corymbifera* may be more prevalent in Indian sub-continent than indicated by great paucity of reports in the literature.

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닭에 있어서 *Absidia corymbifera* 에 의한 폐렴

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요 약

45두의 브로일러 중 2두에서 배양과 직접 현미경 검사에 의해 폐 접합균증이 진단되었다. 폐의 병변 부를 Sabouraud 배지에 접종하고 37℃에서 배양하여 *Absidia corymbifera* 가 분리되었다. 폐조직으로 squash표본을 만들어 직접 현미경 검사를 한 결과 폭이 넓고, 격벽이 없으며, 분지를 나타내는 접합균형 균사를 나타내었다. 감염된 폐조직의 PAS 염색 날인표본에서도 이와 비슷한 균요소가 발견되었다. 닭장의 흙과 닭똥으로부터 고농도의 *A. corymbifera* 가 증명되었는데 이것은 이 브로일러군에서 환경이 감염원이었던 것을 제시하는 것으로 판단된다. 닭의 폐렴 감별진단에 있어서 접합균류도 고려할 것이 강력히 주장되었다.