

## Aspergillosis in turkey poults

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### ABSTRACT

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*Aspergillus fumigatus* infection was recorded in turkey farm of 120 brooding poults. Grossly, air sacs were slightly opaque with few scattered miliary white foci. Lungs were moderately firm and had pin point to pin head sized yellowish white caseous nodular growth throughout the lung parenchyma. Histopathologically, lung granuloma showed necrotic cellular debris, heterophils and long septated fungal hyphae in the center surrounded by macrophages, multinucleated giant cells and aggregates of lymphocytes. Gomori's Methanamine Silver Nitrate staining revealed black coloured fungal hyphae.

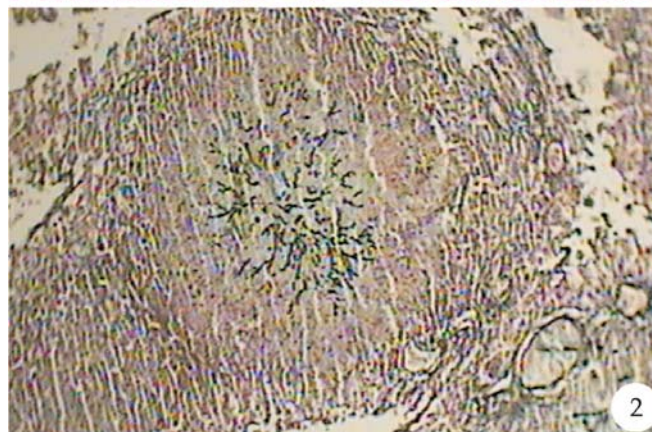
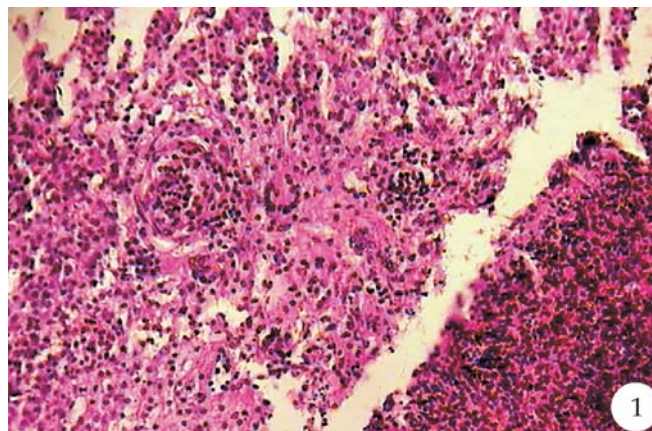
**Keywords:** *Aspergillus fumigatus*, aspergillosis, fungal hyphae, turkey

Aspergillosis is a fungal disease caused by infection with the genus *Aspergillus*, which is composed of approximately 600 species<sup>9</sup>. Aspergillosis in birds is usually confined to the lower pulmonary system with granulomatous lesions in airsacs and lung. *Aspergillus fumigatus* is a ubiquitous saprophyte and opportunistic fungal pathogen which causes more mortality than that of *Aspergillus flavus* in aerosol exposed poults<sup>7</sup>. It remains viable under extreme harsh condition with production of spores (conidia). Mortality of one third flocks of turkey poults was recorded in *Aspergillus* contaminated litter<sup>2</sup>. Outbreaks are apparently more common in winter when indoor gas and dust levels tend to be highest. Lesions in avian species are commonly confined to the lungs and airsacs, although infection of oral mucosa, trachea, brain, eye, skin, bone, liver, kidneys and nasal passages have also been recorded<sup>6,8</sup>. Typical lesions are characterized by granulomatous inflammation with necrosis, hemorrhage and fungal elements that are locally invasive<sup>3,8</sup>.

*Aspergillus fumigatus* infection was recorded in turkey farm of 120 brooding poults at ACVM. Mortality in the poults were reported at the age of 3 days. In all 85 poults exhibited signs of aspergillosis including ruffled feather, gasping, nasal discharge and trembling out of these sixty five birds died. The dead birds were brought to the Department of Veterinary Pathology for postmortem examination. Organs showing frank lesions were collected in 10 % formal saline and fixed tissues were processed for histopathological study by routine paraffin embedding technique and sections of 4-5 micron thickness were made and stained by routine Haematoxylin and Eosin stain as described earlier<sup>4</sup>. Duplicate sections were stained by Gomori's Methanamine Silver Nitrate stain for fungus<sup>4</sup>. Lungs of Turkey poults and feed samples were inoculated on

Sabouraud Dextrose Agar (SDA) and was incubated aerobically at 37° C for five days. Microscopic examination of the fungi was done after Lacto-phenol cotton blue staining<sup>10</sup>.

Grossly, air sacs were slightly opaque with few



**Fig.1.** Photomicrograph of fungal granuloma in lung showing macrophages, multinucleated giant cells and lymphocytes in surrounding area. HE x400. **Fig.2.** Photomicrograph of fungal granuloma in lung showing long septate black fungal hyphae in the center. Grocott's x100

scattered miliary white foci. Lungs were moderately firm and had pin point to pin head sized yellowish white caseous nodular growth throughout the lung parenchyma. Similar lesions were described by earlier workers<sup>5,7</sup> Brain and liver showed severe congestion and in some cases yellowish discoloration in liver was also recorded. Earlier studies also reported granulomatous lesions in poultry brain<sup>1</sup>.but these lesions were not found in present study.

Histopathologically, lung granuloma showed necrotic cellular debris, heterophils and long septated fungal hyphae in the center surrounded by macrophages, multinucleated giant cells and aggregates of lymphocytes (Fig, 1). Lumen and interstitial spaces of some alveoli were completely filled with red blood cells and had mono nuclear cells in interstitial area of alveoli. Gomori's Methanamine Silver Nitrate staining revealed black coloured fungal hyphae in the Granulomatous area which is suggestive of *Aspergillus* species (Fig, 2). These findings are in corroboration with observations by earlier workers<sup>1,8</sup>. Liver showed focal accumulation of heterophils and mononuclear cells with severe congestion at sinusoidal areas with degenerative and fatty changes in the hepatocytes. Brain showed severe congestion with mononuclear cells infiltration in meninges.

Microbiological study revealed velvety bluish green colony of *Aspergillus* on SDA after five days of incubation. Further, upon microscopic examination using Lactophenol Cotton blue staining, large number of fruiting heads of *Aspergillus fumigatus* having chains of pigmented conidia were observed<sup>10</sup>. The disease was confirmed on the basis of clinical examination, gross and histopathological lesions and microscopical culture examination.

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## REFERENCES

1. Chauhan HVS and Roy S (2007). *Poultry Diseases. Diagnosis and Treatment*, 3<sup>rd</sup> ed, New Age International Publishers. pp 127-129.
2. Dyar PM, Fletcher OJ and Page RK (1984). Aspergillosis in turkeys associated with use of contaminated litter. *Avian Dis.*, **28**: 250-255.
3. Kunkle RA and Rimler RB (1996). Pathology of acute aspergillosis in turkeys. *Avian Dis.*, **40**: 875-886.
4. Luna LG (1968). *Manual of Histologic Staining Methods of the Armed Forces*. Institute of Pathology, 3<sup>rd</sup> Edn. Mc Graw Hill Book Co. New York and London.
5. Okoye JO, Gugnani HC, Okeke CN (1989). Pulmonary infections due to *Aspergillus flavus* in turkey poults and goslings. *Mycoses.*, **32**: 336-339.
6. Peden MW and Rhoades KR (1992). Pathogenicity differences of multiple isolates of *Aspergillus fumigatus* in turkeys. *Avian Dis.*, **36**: 537-542.
7. Richard JL, Thurston JR, Peden WM and Pinello C (1984). Recent studies on *Aspergillus* in turkey poults. *Mycopathol.*, **87**: 3- 11.
8. Saif YM (2003). *Diseases of poultry*, 11<sup>th</sup> ed. Iowa state press, a Blackwell Publishing Company. 883 - 893.
9. Santos RMDB, Firmino AAP, De sa CM and Felix CR (1996). Keratinolytic activity of *Aspergillus fumigatus fresenius*. *Curr. Microbiol.*, **33**: 364 - 370.
10. Quinn PJ, Markey BK, Carter ME, Donnelly WJ and Leonard FC (2002). *Veterinary Microbiology Microbial Diseases*. Blackwell Science Ltd., UK.