

OCCURRENCE OF PROSTHOGONIMIASIS AND HISTOPATHOLOGICAL OBSERVATION OF BURSA FABRICII IN A NATIVE CHICKEN (*Gallus gallus domesticus*)

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ABSTRACT

Prosthogonimiasis is one of the most pathogenic neglected fluke infections affecting bursa Fabricii, oviduct and cloaca of poultry, reared in free ranging systems especially low intensity farming in rural areas. A farmer from Orathanadu brought a dead, ten months old hen with enlarged bursa Fabricii. A yellowish caseous mass of about 5 gm weight was present in the bursa Fabricii on the cut section. Microscopical examination of impression smears from caseous mass revealed a large number of ova of Prosthogonimus spp. Histopathologically, bursa Fabricii revealed proliferation of interfollicular fibrous tissue. Few follicles had turned into cyst like structures that contained irregular blue calcified material. Lymphoid depletion was seen in most of the follicles. This is the first report of Prosthogonimiasis in native chicken from Tamil Nadu.

Key words: Bursa Fabricii, Native chicken, Prosthogonimiasis, Tamil Nadu

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Prosthogonimiasis is one of the most pathogenic fluke infection seen in bursa Fabricii, oviduct, cloaca and egg of birds

and is caused by many species of genus *Prosthogonimus* all over the world (Soulsby, 1982). This fluke infection is reported to be occur in domestic chicken, pigeon, duck, geese and a wide variety of wild birds in India as well as elsewhere (Balasundaram and Raja, 1988; Saeed *et al.*, 2019). Birds get the infection by ingesting intermediate host dragon fly or their larval stages naiads. Domestic chickens especially desi birds reared under free range system are mostly prone to *Prosthogonimus* infection due to the easy accessibility of dragonflies (Leok *et al.*, 2002).

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Poultry infected with *Prosthogonimus* fluke tends to sit with a milky lime discharge from the cloaca and lay soft shelled or shell less egg due to salpingitis. This fluke also causes inflammation of bursa Fabricii, peritonitis and death therefore, is considered an economic important fluke infection in poultry reared on low intensity farming in rural areas (Heneberg *et al.*, 2015). Sporadic occurrence of *Prosthogonimus* in chicken has been reported worldwide (Leok *et al.*, 2002). Limited reports exist on the occurrence and pathology of *Prosthogonimus* infection in domestic chickens from India (Muraleedharan and Pande, 1968; Padhi *et al.*, 1986). The present communication deals with the occurrence of *Prosthogonimus* infection and histopathological changes of bursa Fabricii in a native chicken from the Cauvery delta region of Tamil Nadu.

A farmer from Orathanadu situated in the Cauvery delta region of Tamil Nadu, India, having a flock of 14 desi birds comprising 6 hens, one cock and 7 chicks reared under free range system brought a dead, ten months old hen to the Department of Veterinary Pathology for necropsy. Postmortem examination of chicken revealed acute multifocal hepatitis with few 1-2 mm size whitish foci on the surface of the liver, enlargement and mottling of liver, diffuse moderate sub-acute enteritis, mild serosal and mucosal congestion in duodenum, enlargement and mottling of spleen multifocal severe tubular necrosis in kidney and epicardial congestion in the heart. The bursa Fabricii was pale and enlarged (Fig. 1a). The bursa Fabricii was dissected out and found yellowish caseous mass of about 5 gm weight on cut section (Fig. 1b). Impression smears

were taken from the caseous mass and sent to the Department of Veterinary Parasitology for screening of parasitic infection. The tissue from bursa Fabricii was fixed in 10% buffered formalin for histopathological study. Tissues were processed and stained with Haematoxylin and Eosin (H&E). The slides were examined for any histopathological changes in bursa Fabricii under a light microscope.

As per the postmortem examination, the chicken appeared to have died due to hepatitis. Examination of the caseous mass of bursa Fabricii revealed large number of helminthic ova and identified as eggs of *Prosthogonimus* based on the location and morphological keys (Soulsby, 1982). The eggs were operculate, dark-brown in colour with a small spine at the pole opposite to the operculum (Fig. 1c). The length and width of the egg ranged from 25-35 μm and 9-17 μm respectively. However adult flukes were not seen in the bursa Fabricii due to calcification. Examination of the oviduct and cloaca did not reveal any flukes. Reports about the occurrence of *Prosthogonimus* infection of chicken in India are scanty (Padhi *et al.*, 1986). Balasundaram and Raja (1988) reported *Prosthogonimus* infection in ducks from Tamil Nadu. However, the present report of Prosthogonimiasis in native chicken is the first of its kind from Tamil Nadu. Histopathological examinations of bursa Fabricii revealed extensive proliferation of inter follicular fibrous tissue and glandular transformation (Fig. 2b). Most of the follicles showed lymphoid depletion (Fig. 2a). Extensive erosion of superficial epithelium and some lymphoid follicles showed dysplastic reaction and transformed glandular epithelium (Fig. 2c). A few follicles

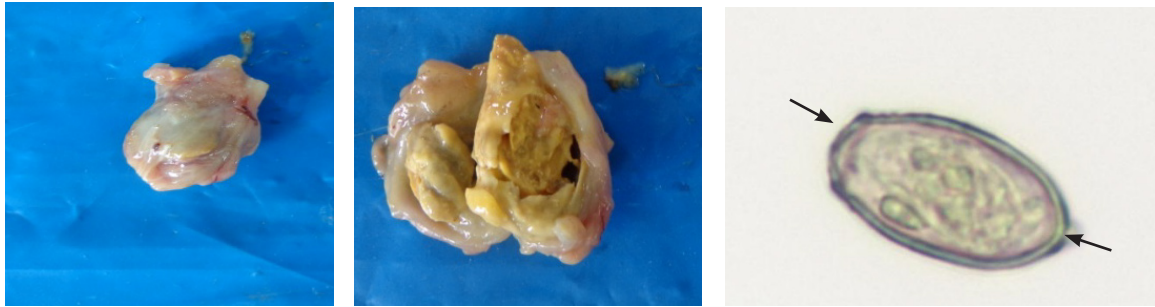


Fig. 1. Showing a). Pale and enlarged bursa Fabricii, b). Yellowish caseous mass of about 5 gm weight on cut section of bursa Fabricii, c). Prosthogonimus egg is showing operculum (→), dark-brown colour with small spine (←) at the pole opposite to the operculum (400x)

turned into cyst like structures which contain irregular blue calcified material (Fig. 2d). Normally *Prosthogonimus* infection results in inflammation and rupture of the oviduct and peritonitis (Soulsby, 1982). However, our examination showed no oviductal and cloacal lesions in the chicken. Only a few studies have been made on the infection of bursa Fabricii with this fluke. Muraleedharan and Pande (1968) observed congestion in the epithelium around the flukes that attached themselves to the areas between mucosal folds of the bursa Fabricii and blood cells in the intestine of flukes in experimentally induced *Prosthogonimus ovatus* infection in chicks. Similarly degeneration and desquamation of the mucosal lining and edema of the submucosa of bursa Fabricii were also reported (Singh and Pande, 1971; Padhi *et al.*, 1986). However, we found a yellowish caseous mass of about 5 gm weight on the cut section of bursa Fabricii without any adult fluke due to calcification. In another study, polypous elevations, epithelial

exfoliation and stratification, interstitial cell infiltration and cyst like structures between lymphoid follicles due to the attachment of flukes were observed (Leok *et al.*, 2002). A similar type of findings was also observed in our study except polypous elevation. This may be due to calcification of fluke with caseous mass inside the bursa Fabricii. However, we found the transformation of glandular structures in many lymphoid follicles, severe extensive proliferation of inter follicular fibrous tissue and irregular blue coloured calcified material inside the cyst like structures in few follicles. Lymphoid depletion in most of the follicles, extensive erosion of superficial epithelium and dysplastic reaction in the transformed glandular epithelium of isolated follicles were also identified in the present study. Further studies are required to carry out the surveillance of *Prosthogonimus* and their intermediate host in surrounding places for preventing this infection in native chickens reared under free ranging system in rural areas of Tamil Nadu.

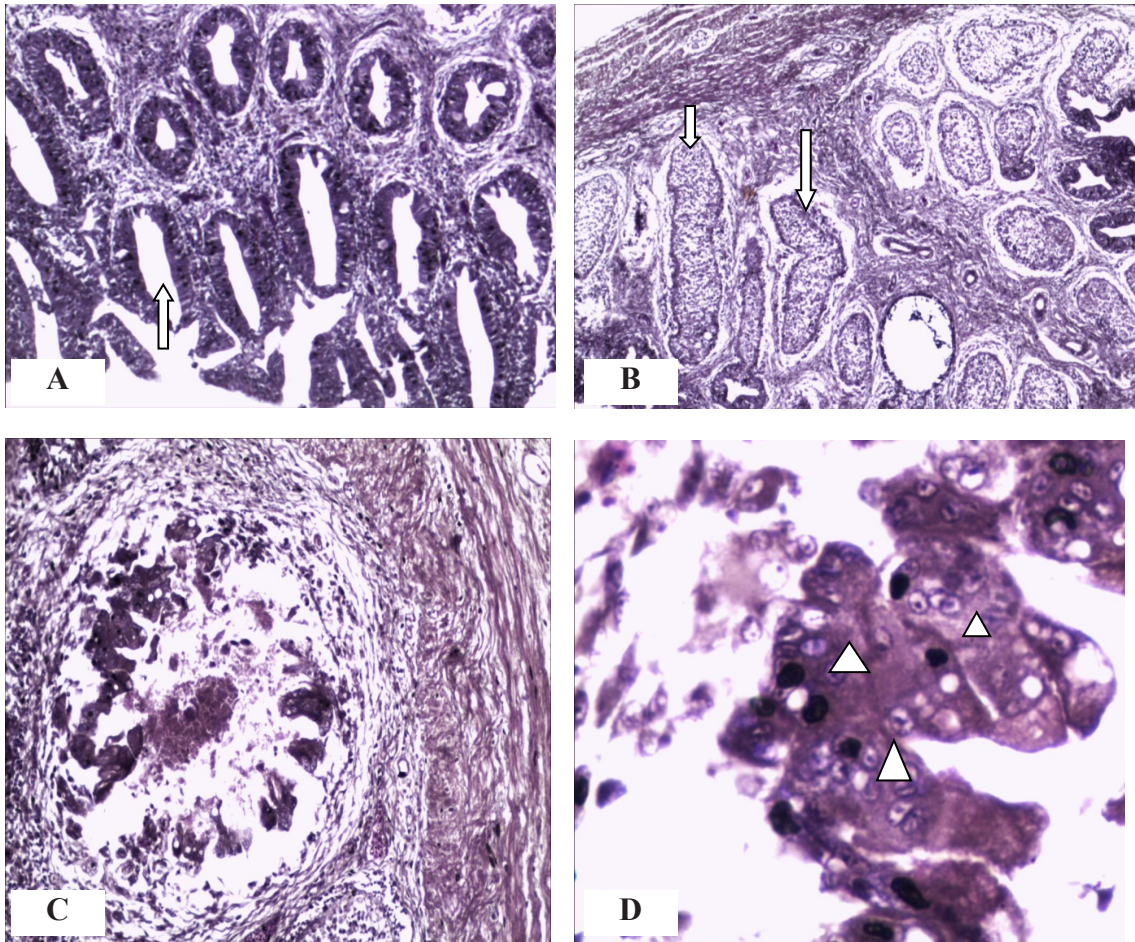


Fig. 2. Histopathological changes in bursa Fabricii due to *Prosthogonimus* in chicken. a) Lymphoid depletion in medulla of follicles (arrow) 40 x b) Glandular transformation of lymphoid follicles and proliferation of interfollicular fibrous tissue (arrow) 40x c) Extensive erosion of superficial epithelium and dysplastic reaction in the transformed glandular epithelium of follicles 100x; d) Irregular blue calcified material inside the cyst like structures in follicles (Δ) 400x

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