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***Tetrameres fissispina* Infection in Local Chickens in Taraba State, Nigeria, Case Report**

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Abstract: A severe and fatal outbreak of *Tetrameres fissispina* in four flocks of local chickens in Nigeria is being described. The outbreak was characterized by sudden and massive death and pathology mimicking avian influenza. Convention tests for major viral and bacterial diseases of poultry in Nigeria were all negative. *T. fissispina* was isolated from most carcasses submitted for post mortem examination. A pathogenic *T. fissispina* in local chicken is being reported

Key words: *Tetrameres fissispina*, avian influenza, sudden massive deaths

INTRODUCTION

The Nigerian poultry population is estimated at 140-160 million comprising of 72.4 million chicken, 11.8 million ducks, 4.7 million guinea fowl 15.2 million pigeon and 0.2 million turkeys (FLDPCS, 1992; FAO, 2006). The rural poultry accounts for 84% of the total chicken population. Chickens are of great importance to African village households. They constitute more than 80% of the total poultry population in Africa (Sonaiya *et al.*, 1999). In general, village producers keep small flocks of between 5 and 20 chickens per household. Women and children play a key role in their management. The chickens are generally raised in a free-range system, scavenging around the compound of households, feeding on the locally available resources e.g. earthworms, household refuse, insects, residues from the harvest etc. The rural poultry represents a significant part of the rural economy in particular and the national economy as a whole. Rural households maintain the bulk of poultry in Nigeria under low input extensive system of management (Ajala *et al.*, 1977). The rural poultry constitutes 43% and 9% of the national egg and poultry meat production respectively with an estimated annual output of 67,000 metric tonnes of meat and 82,000 metric tonnes of egg (Adegeye *et al.*, 1988). The village chickens are characterized by such survival traits as small body size, slow growth rate, late maturity and high degree of adaptability to prevailing climatic conditions (Baba *et al.*, 2004). Besides the provision of easy accessible income for small holder, rural poultry plays a significant role in the cultural life of rural people serving as gift item, sacrificial and ceremonial activities as well as starting capital for youths and the newly married (Ajala *et al.*, 2007). Members of the genus *Tetrameres*, Creplin, 1846, are remarkable for the fact that the mature female is almost spherical in shape, blood red in colour and lies embedded in the

proventricular gland of birds the male being white and filiform, with or without spines on the cuticle and tail end. (Soulsby, 1982). Four species have been reported in poultry, *T. americana* (Cram, 1927) infecting chicken turkey, ducks, grouse, pigeon and quails. *T. crami* (Swales, 1933) occurs in wild and domestic ducks in North America. *T. fissispina* (Diesing, 1861) infects chicken, turkey, duck, guinea fowl, pigeon and quails. *T. pattersoni* infects quails (Saif *et al.*, 2003). Life cycle involves the intermediate host usually orthopteran insects, water crustacean or amphipods (Soulsby, 1982). Eggs are passed in the faeces of the bird and hatch after they have been swallowed by a suitable host. Infection of the final host occurs through ingestion of the infected intermediate host and both the male and female worms migrate into the proventricular glands where they copulate. Pathogenicity varies with the species, host and load of infection. In addition to sucking blood of the host, the greatest damage is done when the young worms migrate into the wall of the proventriculus, causing marked irritation and inflammation, which may kill chicks (Soulsby, 1982). Infected chicken are emaciated and anemic in heavy infestation. There is diarrhea and death in heavily infected quails (Saif *et al.*, 2003).

MATERIALS AND METHODS

Case report: On 3/10/2007 carcasses of local chicken (Black batan and other local breeds) raised on free range were brought from Ussa and Gassol Local Government Areas of Taraba state, Nigeria. Carcasses were from four flocks of local chicken. In flock A, 60 (50%) of 120 birds died, flock B 37 (35%) of 106 birds died, Flock C, 40 (42%) of 98 birds died and flock D 30 (38%) birds died in a span of 2 weeks. Clinical signs include, sudden massive death, inappetency, whitish diarrhoea, ruffled feathers, disinclination to move, dullness, cough, oral discharges, paralysis of legs,

falling off from tree tops dead. Post mortem changes are fast with the head and neck region becoming swollen and black, petrifying rapidly with flies (*Musca domestica*) hovering around moribund birds.

Post-mortem result: Slight hemorrhages of the trachea and viscera. Serous adhesion of gizzard and proventriculus, friable liver and reddish spots massively embedded in the proventricular mucosa of several carcasses.

Diagnostic plan: Samples of intestine, liver, lung, spleen were taken to Viral and Bacterial Research Departments for isolation of pathogens. The whole proventriculi were sent to Parasitology Department for parasite identification.

Parasitological examination: The proventriculi were gently washed with sterile normal saline on a Petri dish to clear debris. It was teased using sterile blade to release the dark reddish structures, which were then placed individually on a clean grease free microscopic slides and examined under light microscope at x 4, x 10 objectives. Parasite identification and eggs were done using the helminthological keys by Soulsby (1982).

RESULTS

Avian Influenza virus-negative by PCR and virus isolation in chicken embryonated egg. Infectious Bursal Disease Virus-Agar Gel Immunodiffusion (AGID). Newcastle Disease Virus-Negative by PCR and virus isolation in chicken embryonated egg. Bacteriology-no significant colonies were seen on general purpose agar.

Parasitology result: Massive *Tetrameres fissispina* gravid females (Fig. 1). Embryonated eggs of *Tetrameres Fissispina* (Fig. 2)

Diagnosis: *Tetrameres fissispina* infection.

DISCUSSION

The high incidence of diseases is one of the principal constraints to African smallholder livestock systems. The recent outbreak of Highly Pathogenic Avian Influenza (HPAI) in Nigeria has raised serious alarm and suspicion for any condition causing massive sudden death in poultry as reported in this case where an overall mortality of 41% was recorded over a period of 14 days. However, tests for Avian Influenza, Newcastle disease and IBD, were negative and no pathogenic bacterium was isolated. In a 15-year study (October, 1976-1991) by Saidu *et al.* (1994) of indigenous chickens in Nigeria, showed that the commonest and most significant causes of mortality were Newcastle disease (40.9%), infectious bursal diseases (19.3%), fowl pox (19.1%), ectoparasitism e.g. lice and mites (26.9%) and endoparasites like *Tetrameres* sp, *Syngamus* sp. and tapeworms. However, none of these known pathogenic organisms was isolated in this case. Gravid female

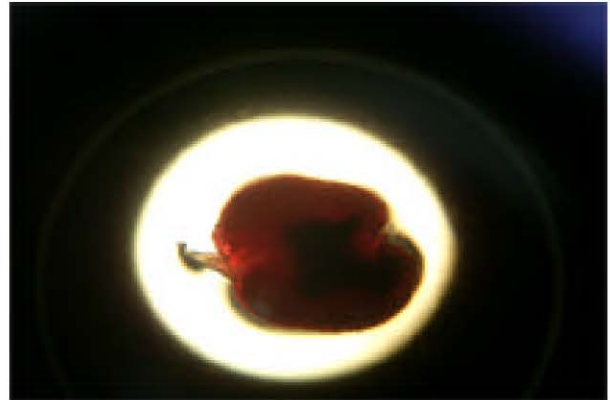


Fig. 1: Gravid female *Tetrameres fissispina* x 4 (3.4 x 2.6 mm)

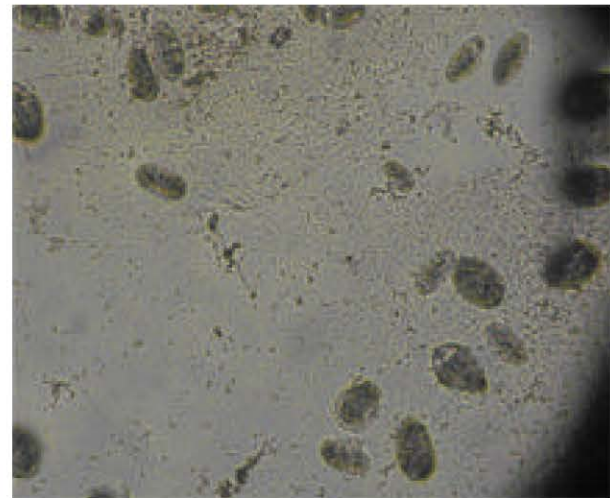


Fig. 2: Embryonated eggs of *T. fissispina* x 10

Tetrameres fissispina were identified based on size and morphology (Fig. 1). *Tetrameres grusi* was reported to infect 82% of proventriculi of Eurasian crane, (*Grus grus*.) in Central Iran, the author opined that *Tetrameres* are not very pathogenic to birds, but under stressful conditions they may cause mortalities in poultry (Mowlavi *et al.*, 2006). Hassouni and Belghyti (2006) examined intestinal tracts of chicken and reported overall prevalence of 89.9% gastrointestinal helminths parasitizing chickens in Morocco with *tetrameres* accounting for only 3.3% of the overall prevalence. In Anambra state, Nigeria, Oyeka (1989) found that 54.5% of the chickens examined harboured helminths with no apparent clinical signs. Although reports of high prevalence of *Tetrameres* in local chickens in Nigeria abound (Saidu *et al.*, 1994; Fakae and Paul-Abiade, 2003; Biu and Haddabi, 2005), there has not been a report of a serious outbreak resulting in high mortalities.

The acute and high mortalities recorded in this case resemble the clinical pictures of Newcastle disease or Avian Influenza but both tests were negative. In serious infections, the nematode produced vast structural and functional changes, causing organ dysfunction and glandular necrosis, which might have lead to the sudden massive deaths in the local chicken population. Further investigation in the Pathogenicity of *Tetrameres* species under different management conditions in Nigeria is being planned.

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