

ASCARIDIA GALLI INFECTION IN BACKYARD CHICKENS. SOUJANYA*, M. LAKSHMAN and D. MADHURI¹

Department of Veterinary Pathology, College of Veterinary Science, Rajendranagar

¹Department of Veterinary Pathology, College of Veterinary Science, Korutla
PVNRTVU, Hyderabad- 500030, India

Received: 12.01.2022; Accepted: 14.02.2022

SUMMARY

Twelve adult backyard chickens of nine weeks age were presented for postmortem examination to Department of Veterinary Pathology, College of Veterinary Science, Rajendranagar, Hyderabad, Telangana. It was diagnosed as *Ascaridia galli* infection in all birds based on clinical signs, gross, histopathological lesions and morphological examination of the parasites. All the birds showed clinical signs like anaemia, diarrhoea, depression, unthriftiness, decreased growth rate, weight loss and emaciation. Grossly, the carcasses showed pale musculature. In all the birds large, thick, rounded and creamy white colored Ascarid worms were noticed in gizzard, proventriculus, small intestine and duodenum. In one bird, haemorrhages and ulcers were observed on mucosa of proventriculus and its wall was thickened. Histopathological examination of intestine revealed haemorrhages, necrosis of epithelial cells and mononuclear cell infiltration. Morphological examination of the parasites revealed presence of three well developed lips and long club shaped esophagus without any posterior bulb at the anterior end of the worm. At the posterior end of the parasite, straight tail and ventrally placed anal aperture were noticed in females whereas curved, pointed tail with well-developed spicules were noticed in males.

Keywords: *Ascaridia galli*, Backyard chicken, Duodenum, Gizzard, Intestine

How to cite: Soujanya, S., Lakshman, M. and Madhuri, D. (2022). *Ascaridia galli* infection in backyard chicken. *Haryana Vet.* 61(2): 288-290.

Ascaridia galli (*A. galli*) is the largest and most common roundworm in poultry and is distributed throughout the globe (Katakam *et al.*, 2010). The occurrence of Ascariidiosis infection in poultry is highest during summer than the rainy season and it is minimum during spring and winter season (Yousaf *et al.*, 2019). The highest rate of infection was reported in 2 to 4 months of age group chicken. Various predisposing factors for occurrence of ascariidiosis include young age, coccidiosis and deficiency of vitamin A and protein (Gordon *et al.*, 1982). The adult ascarid worms live in lumen of the small intestine in domestic fowl and other birds. *A. galli* has a direct life cycle and is transmitted by the faeco-oral route. Among the gastrointestinal helminths of chicken, the highest prevalence (41.56%) was reported for *A. galli* infection (Alam *et al.*, 2014). *Ascaridia galli* infection in poultry is having economic importance because high worm load will result in reduction of meat and egg production and also mortality due to intestinal blood loss and anaemia (Norton and Ruff, 2003). Behavioral changes like ground pecking, feather pecking and social rank disruption were reported in laying hens due to ascarid infection (Gauly *et al.*, 2009). In the present report *A. galli* infection in backyard chicken is reported.

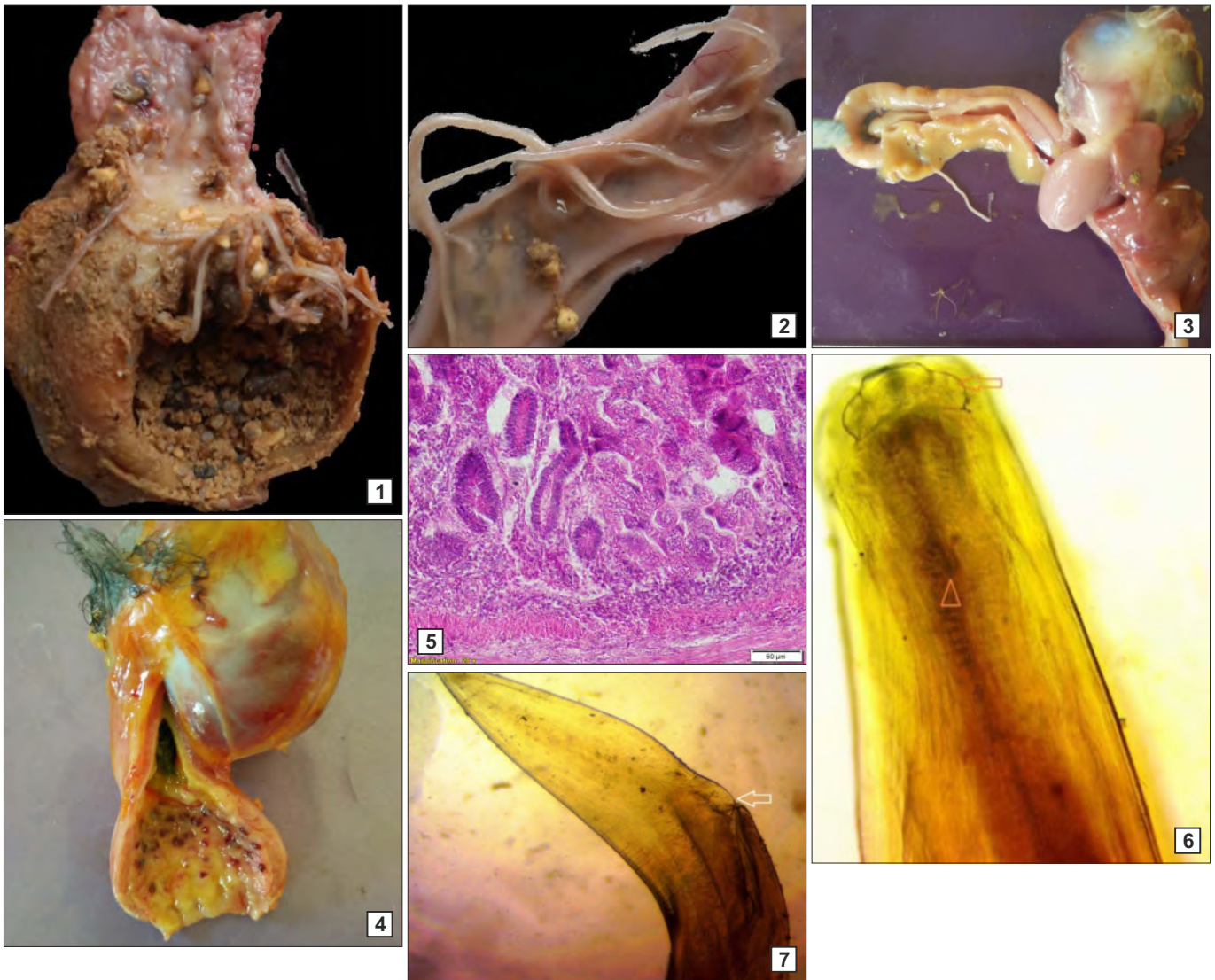
Nine weeks old twelve adult backyard chickens were brought for necropsy to Department of Veterinary Pathology, College of Veterinary Science, Rajendranagar, Hyderabad, Telangana, India. Diagnosis was done based on the clinical signs, gross, histopathological lesions and

characteristic morphology of the parasites. A thorough postmortem examination was done and lesions were recorded. For histopathological examination, intestine pieces were collected in 10% neutral buffered formalin (NBF) and allowed to fix for 24 hours. Then tissue was washed for overnight under running tap water, dehydration was done in ascending grades of alcohol and clearing was done in xylene. Then tissue was embedded in liquid paraffin and blocks were made. Then sections of 5 µm were cut using microtome and stained with Haematoxylin and Eosin as per the standard protocol (Luna, 1968). The parasites were collected in a petridish containing normal saline solution, processed in ascending grades of alcohol and cleared in lactophenol. Then, parasites were taken on to a clean glass slide, examined under microscope and identified based on morphology (Soulsby, 1986).

Clinical signs: In the affected chickens, anaemia, diarrhoea, soiling of the feathers with faeces, depression, unthriftiness, decreased growth rate, weight loss and emaciation were observed. Similar clinical signs were reported by earlier researchers (Adang *et al.*, 2010, Abhra *et al.*, 2014). Penetration of the parasite into the small intestine mucosa might have caused haemorrhagic enteritis that resulted in anemia and diarrhoea (Balqis *et al.*, 2013).

Gross lesions: At postmortem examination of the birds, pale musculature was noticed. In all the birds, elongated, thick, round and creamy white colored worms were noticed in lumen of gizzard (Fig. 1), small intestine (Fig. 2)

*Corresponding author: sonurv36@gmail.com



Figs. 1 to 7. (1) *A. galli* worms in lumen of gizzard; (2) *A. galli* worms in jejunum of chicken; (3) *A. galli* worms and pasty mucin in lumen of duodenum; (4) Minute petechial haemorrhages, ulcers and thickening of wall of the proventriculus due to nematode infection; (5) Section of intestine showing haemorrhage, necrosis of intestinal epithelial cells and mononuclear cell infiltration (H&E, 20X); (6) Anterior end of the *A. galli* worm showing three well developed lips and long club shaped esophagus without any posterior bulb; (7) Posterior end of female *A. galli* worm showing straight tail and ventrally placed anal aperture.

and duodenum (Fig. 3). In one bird, the mucosa of proventriculus revealed pin point haemorrhages and ulcers. Thickening of wall of the proventriculus was also observed (Fig. 4). The lumen of duodenum was filled with thick white pasty mucus. Intestinal mucosa revealed haemorrhagic spots and necrotic patches throughout the intestine. Similar findings in intestine were reported by Milan *et al.* (2019). Similarly intestinal haemorrhages due to *A. galli* were reported by Torres *et al.* (2019).

Histopathological lesions: The sections of intestine revealed haemorrhages, necrosis of epithelial cells and mononuclear cell infiltration (Fig. 5). These lesions earlier reported by Milan *et al.* (2019).

Morphological examination: Light microscopic examination of the anterior end of the parasites revealed

three well developed lips and long club shaped esophagus without any posterior bulb (Fig. 6). Male and female worms were identified based on the characteristic features at the posterior part of the worm. Straight tail and ventrally placed anal opening were noticed in females (Fig. 7) whereas curved, pointed tail with well-developed spicules were noticed in males. Similar observations were reported by Torres *et al.* (2019). These parasites were differentiated from *Heterakis gallinarum* and *Capillaria* species by morphological features. *Heterakis gallinarum* worms are small, round, white and their anterior extremity is slightly bent and the esophagus is provided with posterior bulb. *Capillaria* worms known as hair worms because of their extreme thinness in size and they have long esophagus as long as body.

CONCLUSION

The *A. galli* infection was diagnosed in backyard chickens based on the above findings. These parasites caused anaemia and diarrhoea that resulted in death of the birds. The ascarid infection can spread easily in deep litter system. It can be reduced by rearing chicken in battery cages because the chicken were separated from the faeces and therefore from the source of infection. In one of the experimental study, the pineapple leaves extract treatment effectively reduced the Ascarid worm load in chicken.

ACKNOWLEDGEMENTS

The Authors are thankful to the College of Veterinary Science, PVRTVU, Rajendranagar, Hyderabad for providing the facilities to carry out the present research work.

REFERENCES

- Abrha, B., Tesfay, T. and Tekle, Y. (2014). Clinical, gross and histopathological study on common local chicken diseases in Enderta District, South East Tigray. *Eur. J. Biol. Sci.* **6**: 95-103.
- Adang, K.L., Abdu, P.A., Ajanusi, J.O., Oniye, S.J. and Ezealor, A.U. (2010). Histopathology of *Ascaridia galli* infection on the liver, lungs, intestines, heart and kidneys of experimentally infected domestic pigeons (*C.l. domestica*) in Zaria, Nigeria. *Pac. J. Sci. Technol.* **11**: 511-515.
- Alam, M.N., Mostofa, M., Khan, M.A.H.N.A., Alim, M.A., Rahman, A.K.M.A. and Trisha, A.A. (2014). Prevalence of gastrointestinal helminth infections in indigenous chickens of selected areas of Barisal district, Bangladesh. *Bangl. J. Vet. Med.* **12**(2): 135-139.
- Balqis, U., Hambal, M., Darmawi and Utami, C.S. (2013). Histopathological changes in intestine of chicken (*Gallus domesticus*) infected naturally by *Ascaridia galli*. Proceedings of the 3rd Annual International Conference, Syiah Kuala University (AIC Unsyiah), pp. 343-348.
- Gauly, M., Duss, C. and Erhardt, G. (2009). Influence of *Ascaridia galli* infections and anthelmintic treatments on the behaviour and social ranks of laying hens (*Gallus gallus domesticus*). *Vet. Parasitol.* **146**(3-4): 271-280.
- Gordon, R.F. and Jordan, F.T.W. (1982). Poultry Diseases. (2nd Edn.), Bailliere Tindall, London.
- Katakam, K., Nejsun, P., Kyvsgaard, N., Jorgensen, C. and Thamsborg, S.M. (2010). Molecular and parasitological tools for the study of *Ascaridia galli* population dynamics in chickens. *Avian Pathol.* **39**: 81-85.
- Luna, G.L.H.T. (1968). Manual of Histological and Special Staining Techniques, (2nd Edn.). The Blakistone Division McGraw-Hill Book Company, Inc. New York, Toronto, London. pp. 1-5 and 9-34.
- Milan, R., Ivana, V., Milos, V., Milan, D., Claude, C.L., Radmila, R. and Sasa, T.M. (2019). *Ascaridia galli* infection in laying hens and the results of *in vitro* efficacy of levamisole, piperazine and *carvacrol*, whether is necessary to change the deworming protocols. *Acta Vet. Beograd.* **69**(4): 414-425.
- Norton, R.A. and Ruff, M.D. (2003). Nematodes and acantocephalans. In: Diseases of poultry. (11th Edn.), Saif, Y.M. Iowa State Press Ames, IOWA. pp. 937-938.
- Soulsby, E.J.L. (1986). Helminths, arthropods and protozoa of domestic animals, (7th Edn.), Balliere Tindall, London. pp. 163-164.
- Torres, A.C.D., Costa, C.S., Pinto, P.N., Santos, H.A., Ferreira, A., Gomez, S.Y.M., Resende, M. and Martins, N.R.S. (2019). An outbreak of intestinal obstruction by *Ascaridia galli* in broilers in Minas Gerais. *Braz. J. Poult. Sci.* **21**(4): 1-6.
- Yousaf, A., Tabasam, M.S., Memon, A., Rajput, N., Shahnawaz, R., Rajpar, S., Jamil, T. and Mushtaq, M. (2019). Prevalence of *Ascaridia galli* in different broiler poultry farms of potohar region of Rawalpindi, Pakistan. *J. Dairy Vet. Anim. Res.* **8**(1): 71-73.

THE HARYANA VETERINARIAN

Editors/Editorial Board Members are highly thankful to all the distinguished referees who helped us in the evaluation of articles. We request them to continue to extend their co-operation and be prompt in future to give their valuable comments on the articles for timely publication of the journal.