



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2018; 6(4): 131-134

© 2018 IJCS

Received: 15-05-2018

Accepted: 20-06-2018

Borah N

Master Research, Fellow Dept. of Parasitology College of Veterinary Science, AAU, Khanapara, Guwahati, Assam, India

Phukan SC

Professor, Dept. of Parasitology College of Veterinary Science, AAU, Khanapara, Guwahati, Assam, India

Islam S

Professor, Dept. of Parasitology College of Veterinary Science, AAU, Khanapara, Guwahati, Assam, India

Tamuli S

Assistant Professor, Dept of Vety. Biochemistry College of Veterinary Science, AAU, Khanapara, Guwahati, Assam, India

Tamuli SM

Professor, Dept of Vety. Pathology College of Veterinary Science, AAU, Khanapara, Guwahati, Assam, India

Dr. Pradip Rajbongshi

Farm Manager, Dept. of LFC, Lakhimpur College of Veterinary Science, AAU, Joyhing, North Lakhimpur, Assam, India

Correspondence**Dr. Pradip Rajbongshi**

Farm Manager, Dept. of LFC, Lakhimpur College of Veterinary Science, AAU, Joyhing, North Lakhimpur, Assam, India

Prevalence of helminth parasites of domestic ducks in Upper Assam (India)

Borah N, Phukan SC, Islam S, Tamuli S, Tamuli SM and Rajbongshi P

Abstract

A survey was conducted in seven districts of upper Assam for a period of one year from June, 2016 to May, 2017 to study the prevalence of helminths parasites of domestic ducks in upper Assam. Examination of 724 faecal samples collected from different localities of upper Assam revealed 333 samples to be positive for helminths with overall prevalence of 45.99 per cent. Out of the positive samples, total 2 faecal samples were found positive for cestodes, 171 for trematodes and 160 for nematodes with incidence of 0.60 per cent, 51.35 per cent and 48.05 per cent. Post mortem examination of 774 carcasses of ducks from different localities of different districts in upper Assam revealed 518 carcasses to be positive for helminthic infections. The overall prevalence of helminths was recorded as 66.93 per cent. 232 carcasses were found positive for cestodes (44.79%), 241 for trematodes (46.52%) and 45 for nematodes (8.69%). On the basis of morphological studies, 7 different species of cestodes and 1 larval stage of cestode, 8 different species of trematodes and 5 different species of nematodes were identified and recorded. Highest incidence of cestodes was recorded with *Hymenolepis collaris* (35.78%) followed by *Hymenolepis carioca* (35.34%), *Fimbriaria fasciolaris* (22.41%), *Hymenolepis lanceolata* (1.74%), *Raillietina tetragona* (1.29%), *Raillietina echinobothrida* (1.29%) and *Raillietina cesticillus* (1.29%) and lowest with plerocercoid (0.86%). Highest incidence of trematodes was recorded with *Echinostoma revolutum* (24.07%), *Hypoderaeum* sp. (18.67%), *Psiloritis* sp. (18.67%), *Echinostoma paraulum* (16.60%), *Paramphistomum* sp. (10.79%), *Prosthogonimus* sp. (8.30%), *Tracheophilus cymbius* (2.07%) and *Psilochasmus* sp. (0.83%). Highest incidence of nematodes was recorded with *Tetrameres* sp. (57.78%), *Heterakis gallinarum* (17.78%), *Heterakis dispar* (17.78%), *Strongyloides avium* (4.44%) and *Porrocaecum* sp. (2.22%). *Hymenolepis carioca*, *Hymenolepis lanceolata*, *Raillietina tetragona*, *Hypoderaeum* sp., *Echinostoma paraulum*, *Prosthogonimus* sp., *Psilochasmus* sp. and *Heterakis dispar* were first time reported from Assam in duck.

Keywords: Helminths, prevalence, morphological studies, faecal sample, infection, incidence, carcass, postmortem

Introduction

In Assam ducks fulfill a great proportion of animal protein like any other developing countries of the world in the form of meat and eggs. They are aquatic in nature and can thrive best in areas where there is plenty of water. Although ducks are reared all over the country, they are mostly found in Eastern, North-Eastern and Southern states of India. As per the Livestock census 2012, the total poultry population in Assam is 27.21 million numbers. Out of the total poultry population, duck contributes 7.31 million numbers in Assam. Duck farming is traditionally very popular in Assam because of the religious point of views, social structure, abundance of surface water, marshy and water logged areas throughout the state, which provides a congenial environment. Assam possess a number of popular breeds of ducks namely Pati (Desi), Nageswari, Muscovy, Chara-Chemballi and Khaki Campbell. Depending on the economic status during recent years, many organized duck farms have been established as a source of earning, particularly by the unemployed youths. Open range, semi-intensive and intensive type of rearing is practiced by farmers. But still the duck industry could not meet the increasing demands of consumers in respect of eggs and meat in the state. One of the major factors responsible for this is the various parasitic infections which cause heavy economic loss to the farmers due to poor growth rate, poor feed conversion rate, reduced egg and meat production leading to death (Souls by, 1982) [13]. The Agro-climatic condition of Assam with adequate rainfall, temperature, humidity and varied topography of land also provides a suitable microclimate for growth and propagation of parasites.

All free-ranged birds are in constant contact with soil, water and vegetation, which serves as an important source for transmission of eggs and larval stages of helminths and insects. Moreover, ducks feed on various aquatic organisms like snails, fishes, earthworms, water cyclops etc. which act as an intermediate host and gets infected with parasitic disease. Migration of exotic ducks to Assam in different seasons may also carry some of the parasites which are unknown and may spread to local ducks. Although information is available about the prevalence of parasitic fauna along with its epidemiological picture and pathological significance in different livestock of Assam, such information on ducks is scanty, except a few investigatory study in parasites of Brahmini duck (Gogoi *et al.* 1982)^[7], cestodes of duck (Barua *et al.* 1987)^[3] and parasites of duck in Assam (Roy, 2005)^[11]. Therefore, considering all factors which are the major obstacles in raising healthy economically viable flock of ducks, the present investigation was undertaken with the following objective to study the prevalence of helminth parasites of domestic ducks in upper Assam.

Materials and Methods

A survey was undertaken for a period of one year from June, 2016 to May, 2017 to study the prevalence of parasites of domestic ducks in upper Assam. During the study period regular visits were made to some selected areas of Golaghat, Jorhat, Sibsagar, Dibrugarh, Tinsukia, Dhemaji and Lakhimpur districts of Assam for collection of materials for parasitological study.

Collection and examination of faecal samples

A total of 724 fresh faecal samples were collected randomly from ducks of different localities of different districts of upper Assam irrespective of age, breed and sex. Each sample of about 5-10g quantity was collected separately in properly labelled leak proof polythene bags. The samples were brought to the laboratory and kept in a refrigerator at 4 °C for further examination. Samples were first examined macroscopically for the presence of nematodes and segments of cestodes. Subsequently the samples were examined by the routine floatation method using saturated salt solution and by sedimentation method using tap water for detection of helminth ova (Souls by, 1982)^[13].

Collection of helminths at postmortem examination

A total of 774 duck carcasses that comprised of 25 from natural death due to unknown causes, 35 live ducks obtained from various localities sacrificed in the laboratory and 714 intestines and other organs such as liver obtained from duck sacrificed from duck meat selling booths were examined for the presence of end parasites.

After opening each carcass, all organs were carefully removed and kept on an enamel tray containing normal saline solution (NSS). Individual portions of digestive system, respiratory system, urogenital system and other visceral organs were separated in petridishes containing normal saline solution. For convenience of handling the digestive tract, ligatures were applied between the gizzard and duodenum and also between the small and large intestine. Each portion of the intestine was cut into several pieces and made open with the help of scissors. The open parts were then washed by agitating in saline to separate out the helminths from the contents. The parasites were later transferred to another petridish containing normal saline solution and washed thoroughly to remove the dirt and mucus from them. The tapeworm scolices, which did not detach from the mucosa, were detached by keeping the

portion of the intestine overnight in a refrigerator at 4 °C and also by dissecting them out under Stereoscopic microscope.

The mucosa of the intestine, proventriculus, oesophagus and crop were scrapped with a scalpel by grasping the end of the tissue with forceps and the materials were then transferred to normal saline solution and were thoroughly examined under a Stereoscopic microscope for the presence of parasites. The cornified layer of gizzard was removed and the muscular portion of the gizzard was examined for the presence of parasites. The liver and the other organs were cut into pieces and minced in saline. The suspension was later examined under Stereoscopic binocular microscope for parasite recovery.

Identification of cestodes and trematodes

Cestodes and trematodes thus recovered from ducks at postmortem were washed in normal saline solution and fixed for 48 hours in 10% formalin after flattening them by placing a coverslip and a glass slide or between two glass slides tied with a rubber band at both the ends. The formalin fixed flattened specimens were taken out of glass slides and preserved separately in properly labelled glass vials containing 10% formalin.

For identification, the fixed specimens were at first washed overnight under slow running tap water, dehydrated in ascending grades of alcohol (50%, 60%, 70%, 80%, 90% and absolute) for 30 mins to 1 hr, stained thereafter with alcoholic Borax carmine and destained in 1% Acid alcohol. Subsequently dehydration in ascending grades of alcohol for 30mins to 1 hr followed by clearing in clove oil or xylene for 1-2mins and mounting in DPX was done as per the method described by Cable (1963). Study of the morphological characters including micrometry was carried out in all the stained specimens for their identification at least up to generic level as per keys and descriptions provided by Souls by (1982)^[13].

Identification of Nematodes

The nematodes recovered during post mortem examination were washed several times in normal saline solution and put into hot 70% alcohol to fix them in an extended condition and preserved thereafter separately in properly labeled vials containing 70% alcohol. The parasites were cleared in Lactophenol (Glycerine 2 parts, Distilled water 2 parts, Phenol 1 part and Lactic acid 1 part) and their morphological features were studied under microscope for identification at least up to generic level as per the keys and descriptions provided by Souls by (1982)^[13].

Results and Discussion

Prevalence of helminths can be studied on the basis of faecal examination and post-mortem examination as follows-

Prevalence of helminths in duck on the basis of faecal examination

A total 724 numbers of faecal samples were examined, out of which 333 samples were found positive for helminths and the overall prevalence of helminths was 45.99 per cent. Out of these, 314 samples were positive for single and 19 for mixed infection with incidence of 94.29 per cent and 5.71 per cent. A total of 2 faecal samples were found positive for cestodes, 171 for trematode and 160 for nematodes with incidence of 0.60 per cent, 51.35 per cent and 48.05 per cent. Similar findings were reported by several other workers, Roy (2005)^[11] reported 47.60 per cent helminthic infection with

incidence of 3.36 per cent for cestodes, 43.70 per cent for trematodes and 68.91 per cent for nematodes in 250 faecal samples examination of ducks in Assam; Adejinmi and Oke (2011) reported 95.4% prevalence of gastro intestinal parasites of domestic duck (*Anas platyrhynchos*) in Ibadan and environs and Adang *et al.* (2014)^[1] reported 4.70 per cent the prevalence of gastro-intestinal helminths in faecal samples of ducks slaughtered at the Gombe main market, Gombe State, Nigeria.

From the present investigation it was revealed that the incidence of trematodes and nematodes were higher than cestodes. This might be due to the fact that trematodes and nematodes are prolific breeders and large number of eggs comes out along with the faeces. But in case of cestodes, eggs retain in gravid segments with minimum chance of mixture with the faeces.

Prevalence of helminths on the basis of post mortem examination

In the present study, a total of 774 carcasses of ducks from different localities of different districts in upper Assam were examined, out of which 518 were found positive for helminths. The overall prevalence of helminths was recorded as 66.99 per cent. 232 carcasses were found positive for cestodes (44.79%), 241 for trematodes (46.52%) and 45 for nematodes (8.69%). Prevalence of helminths in duck ranging from 36.00-97.00 percent was reported by several workers: 97 per cent by Islam *et al.* 1988^[8] from Bangladesh; 63.88 per cent by Roy, 2005^[11] from Assam; 52 per cent by Muhairwa *et al.* 2007^[10] from Tanzania; 96.66 per cent by Farjana *et al.* 2008^[6] from Bangladesh.

On the basis of morphological studies, 7 different species of cestodes and 1 larval stage of cestode, 8 different species of trematodes and 5 different species of nematodes were identified and recorded. Highest incidence of cestodes was recorded with *Hymenolepis collaris* (35.78%) followed by *Hymenolepis carioca* (35.34%), *Fimbriaria fasciolaris* (22.41%), *Hymenolepis lanceolata* (1.74%), *Raillietina tetragona* (1.29%), *Raillietina echinobothrida* (1.29%) and

Raillietina cesticillus (1.29%) and lowest with plerocercoid (0.86%). The present findings are almost similar with the findings of Barua *et al.* (1987)^[3] from Assam; Islam *et al.* (1988)^[8] from Bangladesh; Roy (2005)^[11] from Assam; Adang *et al.* (2014)^[1] from Nigeria and Shemshadi *et al.* (2017)^[12] from Iran. Besides the findings similar to the present investigation, they have also recorded different species of cestodes that could not found from this part of the state. *Hymenolepis carioca*, *Hymenolepis lanceolata*, *Raillietina tetragona* and the plerocercoid might be the first reports from this part of the state in duck.

Highest incidence of trematodes was recorded with *Echinostoma revolutum* (24.07%), *Hypoderaeum* sp. (18.67%), *Psilorbitis* sp. (18.67%), *Echinostoma paraulum* (16.60%), *Paramphistomum* sp. (10.79%), *Prosthogonimus* sp. (8.30%), *Tracheophilus cymbius* (2.07%) and *Psilochasmus* sp. (0.83%). The present findings are almost similar with the findings of Yousuf *et al.* (2009)^[15] from Bangladesh; Yoshino *et al.* (2011)^[14] from Japan and Kakati *et al.* (2015)^[9] from Assam. *Echinostoma paraulum*, *Hypoderaeum* sp., *Psilochasmus* sp. and *Prosthogonimus* sp. might be the first report from Assam in duck.

Highest incidence of nematodes was recorded with *Tetrameres* sp. (57.78%), *Heterakis gallinarum* (17.78%), *Heterakis dispar* (17.78%), *Strongyloides avium* (4.44%) and *Porrocaecum* sp. (2.22%). The present findings are almost similar with the findings of Bhattacharjee and Doss (1967)^[4] from Assam; Islam *et al.* (1988)^[8] from Bangladesh; Chowbay *et al.* (2012)^[5] from Assam and Shemshadi *et al.* (2017)^[12] from Iran. Besides the findings similar to the present investigation, they have also recorded different species of nematodes that could not found from this part of the state. *Heterakis dispar* from duck might be the first report from Assam.

The wide variation in the incidence of cestodes, trematodes and nematodes in ducks in upper Assam might be due the influence of environmental conditions like temperature, humidity, rainfall and topography of land, availability of intermediate host and fecundity of parasites.

Table 1: Comparison between the Results of Faecal Examination and Post Mortem Examination

Type of Examiznation	No. of Samples		No. of Samples Positive (Incidence)		
	Examined	Positive	Cestodes	Trematodes	Nematodes
Faecal examination	724	333 (45.99)	2 (0.60)	171 (51.35)	160 (48.05)
Post mortem examination	774	518 (66.93)	232 (44.79)	241 (46.52)	45 (8.69)

Results of the present investigation revealed that post mortem examination showed higher prevalence for helminthic infection (66.93%) against lower prevalence in faecal examination (45.66%). Comparison between the two methods revealed post mortem examination to be more reliable and accurate for survey (Table 1).

Summary and Conclusion

Examination of 724 faecal samples collected from different localities of upper Assam revealed 333 samples to be positive for helminths with overall prevalence of 45.99 per cent. Post mortem examination of 774 carcasses of ducks from different localities of different districts in upper Assam revealed 518 carcasses to be positive for helminthic infections. The overall prevalence of helminths was recorded as 66.93 per cent. 232 carcasses were found positive for cestodes (44.79%), 241 for trematodes (46.52%) and 45 for nematodes (8.69%). On the basis of morphological studies, 7 different species of cestodes and 1 larval stage of cestode, 8 different species of trematodes

and 5 different species of nematodes were identified and recorded. The systematic study conducted in upper Assam led to a significant conclusion that parasitic infections in duck are highly enzootic. Favourable climatic condition and presence of intermediate host and vectors are the contributing factors towards prevalence of parasites in duck. It can be convincingly remarked that conventional microscopy provide aid in routine diagnosis of clinical and sub-clinical cases of parasitic disease, but at the same time expertise with well-equipped laboratory for a better diagnosis is also needed. This study has also set a strong message on creating awareness among duck farm owners/breeder about the importance of various parasitic diseases of ducks and their pathogenic potential.

Transmissibility pattern of helminths of duck including vector involvement study are necessary for making a comprehensive epidemiological mapping of parasitic infection in near future.

References

1. Adang KL, Asher R, Abba R. Gastro-intestinal helminths of domestic chickens *Gallus gallus domestica* and ducks *Anas platyrhynchos* slaughtered at Gombe Main Market, Gombe State, Nigeria. *Asian Journal of Poultry Science*. 2014; 8:32-40.
2. Adejinmi JO, Oke M. Gastro- intestinal parasites of domestic ducks (*Anas platyrhynchos*) in Ibadan Southwestern Nigeria. *Asian Journal of Poultry Science*. 2011; 5(1):46-50.
3. Barua N, Gogoi AR, Pathak DC, Dutta BM. Occurrence of cestodes in ducks in Assam. *Indian J Poult. Sci.* 1987; 22(2):141-144.
4. Bhattacharjee ML, Doss DD. Tetrameriasis in ducks in Assam. *Indian Vet. J.* 1967; 44:81-82.
5. Chowbay D, Das G, Pathak P, Thangjam CD, Islam S. A note on the prevalence of *Tetrameres mohtedai* (Bhalerao and Rao, 1944) in the proventriculus of *Gallus gallus domesticus* in Assam. *Journal of Veterinary Parasitology*. 2012; 26(2):176-177
6. Farjana T, Islam KR, Mondal MMH. Population density of helminths in ducks: effects of host age, sex, breed and season. *Bangl. J Vet. Med.* 2008; 6(1):45-51.
7. Gogoi AR, Mukit A, Chakravarty A. *Opisthorchis brahminii* n. sp. from Brahmini duck, Tadorna ferruginea. *Indian J Parasitol.* 1982; 6(1):71-72.
8. Islam MR, Shaikh H, Baki MA. Prevalence and pathology of helminth parasites in domestic ducks of Bangladesh. *Vet. Parasitol.* 1988; 29(1):73-77.
9. Kakati P, Sarmah PC, Bhattacharjee K. Occurrence of digenetic trematode *Tracheophilus cymbius* (Diesing, 1850), Skrjabin, 1913, in domestic duck (*Anas boschas domesticus*) from India. *International Journal of Advanced Research*. 2015; 3(7):143-145.
10. Muhairwa AP, Msoffe PL, Ramadhani S, Mollel EL, Mtambo MMA, Kassuku AA. Prevalence of gastro-intestinal helminths in free-range ducks in Morogoro Municipality, Tanzania. *Livestock Research for Rural Development*. 2007; 19(4):2007.
11. Roy K. Studies on parasites of Duck (*Anas boschas domesticus*) in Assam. M.V. Sc. Thesis, Assam Agricultural University, Khanapara, Guwahati, 2005, 22.
12. Shemshadi B, Ranjbar-bahadori S, Delfan-abazari M. Prevalence and intensity of parasitic infection in domestic ducks (*Anas platyrhynchas*) in Gilan Province, Northern Iran. *Comp Clin Pathol*. 2017; 26:165. Doi: 10.1007/s00580-016-2361-7.
13. Souls by E.J.L. Helminths, Arthropods and Protozoa of Domesticated Animals. Seventh Edition, the English Language Book Society and Baillier Tindal and Cassel Ltd. London, 1982.
14. Yoshino T, Endoh D, Onuma M, Osa Y, Saito M, Kuwana T *et al.* Prevalence of gastrointestinal helminths of Aigamo ducks in Hakkaido, Japan. *Journal of Veterinary Epidemiology*. 2011; 15(2):106-109.
15. Yousuf MA, Das Anisuzzaman PM, Banowary B. Gastro-intestinal helminths of ducks: Some epidemiologic and pathologic aspects. *J Bangladesh Agril. Univ.* 2009; 7(1):91-97.