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Prevalence of Gastrointestinal Parasites in domestic Chickens (*Gallus domesticus* Linnaeus, 1758) in sangli City

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Abstract:

Especially in traditional reared free ranging chickens helminthosis is very important disease. Poultry farming provides 53 % of animal protein from chickens. The traditionally reared poultry farming system exposes chickens to many types of parasites.

The aim of present study is to investigate various aspects of helminth infections and protozoans.

In the present investigation 50 desi (domestic) birds were screened for the presence of gastrointestinal parasites. Among 50 desi birds screened 48 were found positive for gastrointestinal infections. Gut Samples of chicken were considered for necropsy examinations to see both adults and egg of helminth parasites respectively.

Therefore mixed infection and higher prevalence of parasitism observed in study area requires an urgent intervention with regular deworming scheme and strict attention should be given towards health related activities and hygienic measures.

Key words – Gastro-intestinal Parasites, Sangli, Chickens, Prevalence.

Introduction –

In India, backyard poultry farming system is as old as its civilization (Randhawa, 1946). Both poultry eggs and meat are affordable sources of protein. Chickens provide 53 % of animal protein production. *Gallus domesticus* is type of local domestic chicken that has been cultivated and can be found in India.

Traditional free range poultry farming is a low or no input and is characterized by indigenous night shelter made of locally available material, a free range scavenging system during day time with occasional supplementary feeding and natural hatching of chicks. (Zoungrana and Slenders, 1992; Saha, 2003). Due to hardy nature of domestic fowl, free ranging poultry farming is possible (Goi, 1976). Traditional free ranging poultry farming contributes to 30 % of Indian egg production (Singh et al.2009).

The free range poultry farming system exposes chickens to many types of parasites. The traditionally reared free ranging chickens are infected by helminthosis. It is very important disease affecting the poultry industry. In addition to helminthiasis other infectious diseases such as coccidiosis, salmonellosis and some other protozoa are considered to be a causes of mortality while predators are an additional source of loss.

Helminthiasis and Coccidiosis of domestic poultry can causes nutritional deficiencies, predispose to secondary infections, interfere with post vaccination immune development and lead to death (Guerra et al., 2015; Silva et al., 2016). The digestive tract of chickens is infected by endoparasites that includes protozoa, viruses, bacteria, trematodes, cestodes and nematodes (Hadi and Soviana, 2000).

Backyard free ranging system face high mortality due to cross diseases infection transmission, predators poor management and nutrition (Conroy et al., 2005).

The aim of present investigation is to study the prevalence of gastrointestinal helminths in domestic chickens with the objective of collecting base line data. In Sangli city prevalence of gastrointestinal parasites in traditional reared free ranging chickens was evaluated to access the impact of agro ecosystems on the prevalence of helminths.

Material and Methods –

The study was carried out from October 2023 to January 2024, in Sangli City (M. S.) were selected to conduct a cross sectional study on gastrointestinal helminths of domestic chickens.

Total 50 chickens gut from Sangli City were used for this study. They were brought from slaughter house, all of them are domestic reared according to traditional system. The alimentary canal, from oesophagus down was separated into crop, gizzard, proventriculus, small intestine and large intestine containing caeca. Each region was cut and opened by dissection. The flotation and intestinal scrapping methods were used to collect the parasites.

All worms were visible to the naked eyes were removed using forceps and identify directly under the stereomicroscope using the key characteristics described by Soulsby (1965). During observations photographs were taken with the help of Xiaomi 12 Pro 50 MP camera. In the present investigation prevalence was estimated by Thrusfield (1995) equation.

$$P = 100 \times \frac{Number\ of infected\ chicken}{Total\ number\ of\ observed\ chicken}$$

Result and Discussion

Many research reports from different parts of the world regarding endoparasites in backyard poultry are available. (Raote et al., 1991; Tasawar et al., 1999; Mungube et al., 2008; mukaratirwa and Hove., 2009; Orunc and Bicek, 2009; Hussen et al. 2012).

However, very few reports are available regarding prevalence of endoparasites from different geographical regions of India (Bali and Kalra, 1975; Matta and Ahluwalia, 1981; katoch et al., 2012.

Furthermore there is no any research report available regarding the prevalence of endoparasites in backyard poultry based on necropsy of gut from Sangli.

The most frequently reported helminth parasites are from superfamily. Heterakoidea consist of the general Ascaridia spp and Heterakis spp which belong to phylum Nematoda (Taylor et al., 2016). The pathogenicity of these parasites is higher in high level of infection (Thapa et al., 2015; Silva et al., 2018).

Prevalence of Endoparasites based on gut Necropsy A total of 50 gut specimens of backyard poultry in Sangli City were examined, among which 48 (96 %) were found infected with different types of helminths and protozoans. The same prevalence is found in Sudan (Saad et al., 1989), in Ethiopia (Ashenafi and Eshetu. 2004) and in Kenya (Irungu et al., 2004) with 86.3, 94.7, 90.8 and 77.3 % respectively.

On gut examination, the most common Nematodes found were *Ascaridia galli, Heterakis gallinarum, Capillaria species, Trichiuris trichiura*. The principle cestode species encountered *were Raillietina echinobothrida, Davainea proglottina, Raillietina tetragona, Hymenolepis carioca.(Table No.1 and Table No.2).*

TABLE NO.1

HELMINTH PARASITES

SPECIES	NUMBER OF INFECTED CHICKENS	PREVALANCE
CESTODES		
1. Raillietina echinobothria	30	62.50%
2. Davainea proglottina	27	56.25%
3. Raillietina tetragona	25	52.08%
4. Hymenolepis carioca	19	39.60%
NEMATODES		
5. Ascardia galli	38	79.16%
6. Heterakis gallinarium	31	64.58%
7. Capillaria species	23	47.92%
8. Trichiuris trichiura	21	43.75%

Some pathological protozoa included are *Eimeria (Coccidia), Cryptosporidium (Cryptosporidia), Histomonas meleagridis (Histomonad)*.

TABLE NO. 2

PROTOZOAN PARASITES

SPECIES	NUMBER OF INFECTED CHICKENS	PREVALANCE
1. *Eimeria*	22	45.83%
2.*Cryptosporidium*	18	37.50%
3. *Histomonas*	11	22.92%

PLATE -I (FIGURE A TO E) CESTODES

A. GASTROINTESTINAL SAMPLE OF CHICKEN

B. Raillietina echinobothria

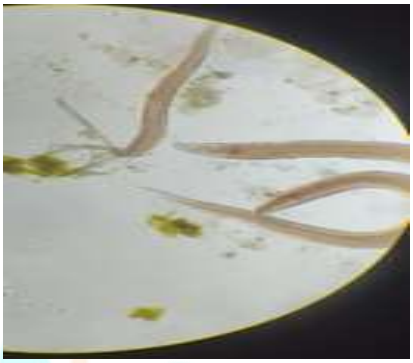
C. Davainea proglottina

D. Raillietina tetragona

E. Hymenolepis carioca

PLATE -I (FIGURE F TO I) NEMATODES

F. Ascardia galli



G. Heterakis gallinarium

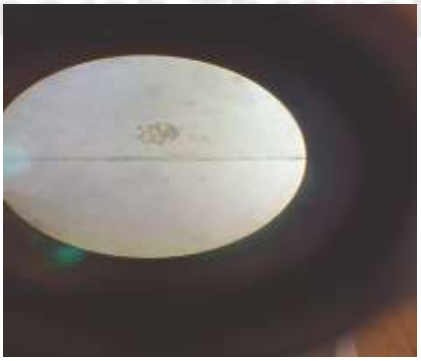
H. Capillaria species

I.Trichiuris trichiura

PLATE -II (FIGURE J TO L) PROTOZOANS

J. Eimeria

K. Cryptosporidium



L. Histomonas

The most common Cestodes found were Raillietina echinobothria (62.50%), Davainea proglottina (56.25%), Raillietina tetragona (52.08%), Hymenolepis carioca (39.60%) while Nematodes as Ascardia galli (79.16%), Heterakis gallinarium (64.58%), 7. Capillaria species (47.92%), 8. Trichiuris trichiura (43.75%) and some Protozoans were found Eimeria (45.83%), Cryptosporidium (37.50%) and Histomonas (22.92%) based on gut examination and these findings were similar to Mukaratirwa and Hove (2009).

In this study, prevalence of endoparasites based on gut examination, revealed an overall prevalence of 96% indicating high prevalence of various endoparasites in the free ranging poultry birds. These results were in agreement with findings of other workers (Nadakal et al.,1972; Hedge et al.,1973).

Conclusion

The present investigation provides valuable information regarding prevalence of endoparasites and will essentially be helpful for both researchers and local veterinarians to develop strategies for control and treatment of endoparasites of poultry.

References

1) Ashenafi H, Eshetu Y. Study on gastrointestinal helminths of local chickens in Central Ethiopia. Rev. Med. Vet.2004; 155(10):504-507. [Google Scholar]
2) Bali, H. S. and I. S. Kalra, 1975. Studies on the incidence of helminths in domestic and wild birds in the Punjab State, Part 1: Nematoda (India). J. Res. Punjab Agric. Univ., 12: 313-316.
3) Conroy, C., N. Sparks, D. Chandrasekaran, A. Sharma and D. Shindey et al., 2005. The significance of predation as a constraint in scavenging poultry systems : Some findings from India. Livestock Res. Rural Dev., Vol. 17.
4) Goi, 1976. Report of national commission on agriculture, part VII : Animal husbandry. Government of India, ministry of Agriculture and Irrigation, New Delhi, India.
5) Guerra RMSNC, Chaves EP, Passos TMG, Santos ACG Especies, Sitios de localizacao dinamica e estrutura de populacoes de malofagos em galinhas caipiras (Gallus gallus L.) criadas na ilha de Sao Luis, MA. Neotrop Entomol. 2015; 37(3): 259-264. doi: 10. 1590/ S 1519-566x2008000300004.
6) Haddi, U.K., and Soviana, S. (2000). Ektoparasit: pengenalan, diagnosis dan pengendaliannya. Laboratorium Entomologi, Bagain Parasitology dan Patologi, Fakultas Kedokteran Hewan, Institut Pertanian Bogor.
7) Hedge, K. S., S. Abdul Rahman, G. R. Rajasekariah, M. Ananth and J. Bhagiratha, 1973. Comparative studies on the incidence of intestinal heliminths in desi birds reared on free range system & farm birds under hygienic conditions, Mysore.
8) Hussen, H., H. Chaka, Y. Deneke and M. Bitwe, 2012. Gastrointestinal helminths are highly prevalent in scavenging chickens of selected districts of eastern Shewa zone, Ethiopia. Pak. J. Biol. Sci., 15 : 284-289.
9) Irungu LW, Kimani RN, Kisia SM. Helminth parasites in the intestinal tract of indigenous poultry in parts of Kenya. J.S. Afr. Vet. Assoc. 2004; 75(1): 58-59.
10) Katoch, R., A. Yadav, R. Godara, J. K. Khajuria, S. Borkataki and S. S. Sodhi, 2012. Prevalence and impact of gastrointestinal helminths on body weight gain in backyard chickens in subtropical and humid zone of Jammu, India. J. Parasitic Dis., 36: 49-52.
11) Matta, S. C. and S. S. Ahlywalia, 1981. Note on the survey of gastrointestinal helminths of domestic fowls Uttar Pradesh. Indian J. Anim. Sci., 51 : 1013-1015.
12) Mukaratirw, S. and T. Hove, 2009. A survey of ectoparasites, cestodes and management of free range indigenous chickens in rural Zimbabwe. J. S. Afr. Vet. Assoc., 80 : 188-191.

13) Mungube, E. O., S. M. Bauni, B. A. Tenhagen, L. W. Wamae, S. M. Nzioka, L. Muhammed and J. M. Nginyi, 2008. Prevalence of parasites of the local scavenging chickens in a selected semi-arid Zone of Estern Kenya. Trop. Anim. Health Prod., 40 : 101-109.
14) Nadakal, A. M., K. O. John and A. Mohandas, 1972. A quantitative analysis og gastrointestinal helminths of domestic fowls in southern Kerla. Indian J. Anim. Health, 11: 5-9.
15) Orunc, O. and K. Bicek, 2009. Determination of parasite fauna of chicken in the vanregion. Turkiye Parazitolojii Dergisi, 33: 162-164, (In Turkish).
16) Randhwa, M. S., 1946. Role of domesticated animals in Indian history. Sci. Culture, 12: 5-14.
17) Raote, Y. V., M. V. Joshi, A. G. Bhandarkar and S. S. Bhagwat, 1991. Incidence of helminth parasites in desi fowls. Indian J. Poult. Sci., 26 : 188-188.
18) Saad MB,El Sadig AA, Shammat AM. Helminth parasites of the local breed of poultry in Kordofan region studanese. J. Vet. Anim. Husb.1989;28(2):54-55.[Google Scholar]
19) Saha, D., 2003. Status of rural poultry production in North 24 Paraganas district of West Bengal. M.V.Sc. Thesis, Division of Extension Education, IVRI, Izatnagar.
20) Silva G S, Romera DM, Fonseca LEC, Meireles MV. Helminthic parasites of Chickens (Gallus domesticus) in different regions of Sao Paulo State, Brazil. Rev Bras Cienc Avic. 2016; 18(1) : 163-168. doi: 10. 1590/18069061-2015-0122.
21) Silva GS, Romera DM, Conhalato GS, Soares VS, Meireles MV. Helminth infections in Chickens (Gallus domesticus) raised in different production systems in Brazil. Vet Parasitol Reg Stud Rep. 2018; 12: 55-60. doi: 10.1016/j. vprsr. 2018.02.003.
22) Singh, A., A. Yadav, U. K. Khajuria, S. Borkataki, N. Pande, D. Konwar and R. Katoch, 2009. Comparative evaluation of different of back yard poultry under field condition. Vet. Practitioner, 10 : 181-182.
Singh, M., Kaur, P., Singla, L., Kashyap, N., Bal M. S, 2021. Assessment of risk factors associated with prevalence of gastrointestinal parasites in poultry of central plain zone of Panjab, India. Vet word; 14 (4) : 972-977.
23) Soulsby EJL. Textbook of veterinary clinical parasitology, vol 1: helminths. Oxford: Blackwell; 1965. [Google Scholar]
24) Taylor MA, Coop RL, Wall RL. *Parasitologia veterinaria* Rio de Janeiro : Guanabara Koogan; 2016.
25) Thapa S, Hinrichsen LK, Brenninkmeyer C, Gunnarsson S, Heerkens JL, Verwer C, et al. Prevalence and magnitude of helminth infections in organic laying hens (Gallus gallus domesticus) across Europe. *Vet Parasitol.* 2015; 214 (1-2): 118-124. doi : 10. 1016/ j. vetpar. 2015.10.009.
26) Tasawar, Z., F. Aziz and M. Akther, 1999. Prevalence of cestode parasites of domestic fowl (*Gallus gallus domesticus*). Pak. Vet. J., 19: 14-144.
27) Thrusfield M. Veterinary epidemiology.2. Oxford: Blackwell;1995. [Google Scholar]
28) Zoungrana, B and G. Slenders, 1992. Burkina Faso : Poultry in the backyard. ILEIA Newsle., 8: 17-17.