



Prevalence of *Ascaridia galli* in some Poultry Farms of District Mardan

LAL ZADA^{1*}, TAHIR REHMAN¹, SADAF NIAZ¹, MUHAMMAD AURANG ZEB², BIBI RUQIA¹, SALMA¹, MIR ALAM KHAN¹, ABDULLAH KHAN¹

¹Department of Zoology; ²Department of Biochemistry, Abdul Wali Khan University Mardan, Pakistan.

Abstract | This study was conducted from September 2013 to March 2014 to find out the prevalence of *A. galli* in some poultry farms of district Mardan. During this period total of about 751 chicken intestines were collected and examined for the presence of *A. galli*. In these 751 about 161 were infected and the overall prevalence rate of *A. galli* was about 21.44%. In this study total 360 local chicken were examined in which 90(25%) were infected. 221 layer chicken were examined in which 41(18.55%) were infected and about 170 broiler of which 30(17.64%) were infected. The overall study shows that *A. galli* is the most common and highly prevalent nematode in the chicken of district Mardan. The study also shows that *A. galli* is a common health problem in both free ranging and poultry chicken so suggest the need of proper poultry management.

Keywords | Prevalence, Poultry farm, Chicken, *Ascaridia galli*, Mardan

Editor | Muhammad Imran Rashid, Department of Parasitology, University of Veterinary and Animal Sciences, Lahore, Pakistan.

Received | November 03, 2015; **Revised** | December 06, 2015; **Accepted** | December 07, 2015; **Published** | December 19, 2015

***Correspondence** | Lal Zada, Abdul Wali Khan University Mardan, Pakistan; **Email:** lalzada.awkum@gmail.com

Citation | Zada L, Rehman T, Niaz S, Zeb MA, Ruqia B, Salma, Khan MA, Khan A (2015). Prevalence of *Ascaridia galli* in some poultry farms of district Mardan. J. Adv. Parasitol. 2(4): 75-79.

DOI | <http://dx.doi.org/10.14737/journal.jap/2015/2.4.75.79>

ISSN | 2311-4096

Copyright © 2015 Zada et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The poultry area is one of the most organized and well growing sectors of the agriculture industry of Pakistan. The employment and income for about 1.5 million people is generated directly and indirectly by this area. The contribution of poultry in agriculture and livestock is 6.4% and 11.5%, respectively. Nowadays the income of Pakistan poultry industry is about Rs. 564 billion (Memon, 2012). So the production of poultry plays an important role in the economy as a source of income for both large and small farm holders (Ogbaje et al., 2012). In the entire poultry population above 98% are the domestic chicken (MALDM, 2000).

The infection of local chicken by endoparasites is more common due to their free-ranging mode of life (Ondwassy et al., 2000). Ewen in 1980 estimated that the most important challenge, which hinders against poultry farming are parasitic diseases. These parasitic diseases cause reduced growth, effect egg production, emaciation and anemia also cause death (Whitmarsh, 1997; Kaufman et al., 2007). The most common disease caused by helminthes parasite

in poultry is Ascariidiosis (Fatihu et al., 1991). Ascariidiosis a disease mainly caused by *Ascaridia galli*, which is a nematode parasite and worldwide problem in all poultry systems mostly free is ranging forms (Ruff, 1991; Permin et al., 1998). *A. galli* specially restricted to small intestine of bird (Yamaguti, 1961) such as chicken, turkey, geese, guinea, fowl and wild bird in most part of the world (Ackert, 1931; Kates and Colglazier, 1970; Soulsby, 1982; Anderson, 1992). The principle host being the chicken (Ackert, 1931; Kates and Colglazier, 1970). *A. galli* infection cause loss of weight, anorexia, hemorrhages in the intestinal mucosa, obstruction of the intestinal lumen (Ackert, 1931; Ikeme, 1971) reduction in growth retardation, reduced feed production rate, loss of appetite, blood lose anemia, diarrhea and secondary infection due to damage of intestinal mucosa (Ackert and Herrick, 1928; Ramadan and Abou Znada, 1991). Drooping wings, decrease egg production (Ackert and Herrick, 1928). These symptoms are more common in those chickens when their age is about 3 months (Kaufmann et al., 2011). The worm can be directly identified by post mortem diagnosis method (Soulsby, 1982) or by the examination of faecal samples or by cutting of intestine "post mortem" (Taylor et al., 2007). The aim of

this survey is to find out the prevalence rate of *A. galli* in poultry farms of district mardan.

14.28%. In winter it was about 20.84% and in spring the prevalence was reached to 30.00% (Figure 2).

MATERIAL AND METHODS

STUDY AREA

The survey covered some parts of District Mardan like Pakistan Chowk, Shankar and Shergarh.

OBSERVATION PERIOD

The study was conducted from September 2013 to March 2014. During this period total of about 751 chickens were observed including Broiler, local and layer chicken of different age, sex, area and season for the presence of adult helminthes parasite (*A. galli*). By common method the age and sex of chickens were find out by asking from workers and attendants in farms and slaughter houses. Whereas sex of chickens was determined by Jett method (2011) while the chicken were categorized into four groups on the basis of method proposed by Magwisha et al. (2002).

SAMPLES COLLECTION AND PROCEDURE OF EXAMINATION

The chicken were slaughtered and carefully observed. The gastrointestinal tract was taken out from the body carefully and removes the junction between the intestines. Double ligature were applied to prevent the mixing of contents between different parts. Removed the external membrane which help in the folding of intestine, then opened it with the help of scissor through a longitudinal cut and observed its contents for the adult parasite by washed, decanted and sediment it (Eisa et al., 1976).

Parasite Identification: Adult worms were identified according to the method given by Dunn (1978) and Soulsby (1982).

Preservation: The adult parasite were separated, collected with forceps and preserved in 10% formalin.

RESULTS

OVERALL PREVALENCE

Total 751 birds (chicken) were examined of which 161 chicken were infected with *A. galli*. The overall prevalence rate was about 21.44% with a range of 5-30%.

HOST WISE PREVALENCE

360 gastrointestinal tracts of local chicken were examined of which 90 were infected so the prevalence rate was 25%. 221 layer chickens were observed for the presence of *A. galli* of which 41 were infected having the prevalence rate as 18.55% and 170 Broiler of which 30 were infected with the prevalence rate of 17.64% (Figure 1).

SEASON WISE PREVALENCE

In relation to seasons the prevalence rate in fall season was

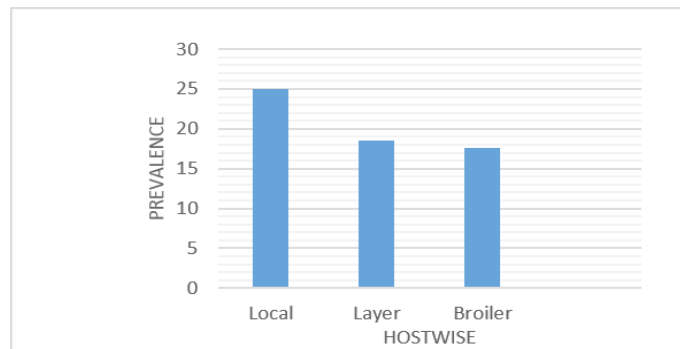


Figure 1: Host wise prevalence of *A. galli*

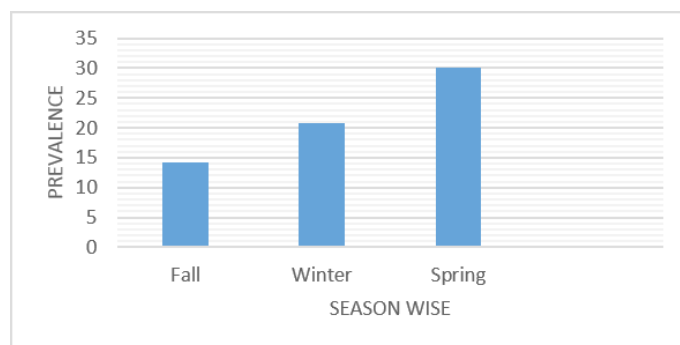


Figure 2: Season wise prevalence of *A. galli*

MONTH WISE PREVALENCE

The prevalence rate from September to March (2013-2014) was 14.28%, 5.88%, 17.91%, 16.44%, 23.64%, 24.20%, 29.20% respectively (Figure 3).

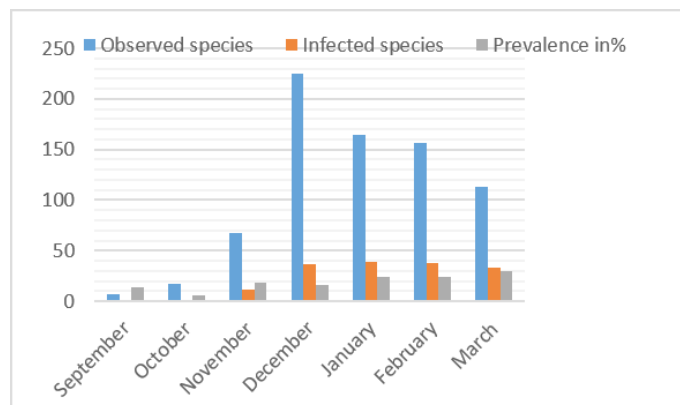


Figure 3: Month wise prevalence of *A. galli*

GENDER WISE PREVALENCE

Three hundred thirty out of 751 were male and 421 were female observed. Prevalence rate in female were 24.26% while in male 16.66% (Figure 4).

AREA WISE PREVALENCE

Data was collected from the Pakistan Chowk, Shankar and Shergarh of District Mardan .each place having different prevalence rate such as (23.61, 16.95, 18.27) percentage re-

spectively (Figure 5).

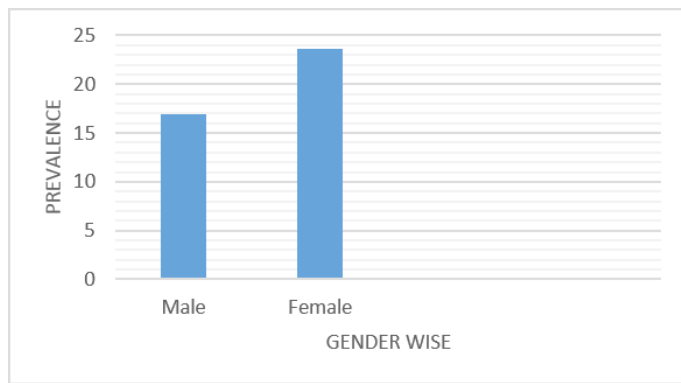


Figure 4: Gender wise prevalence *A. galli*

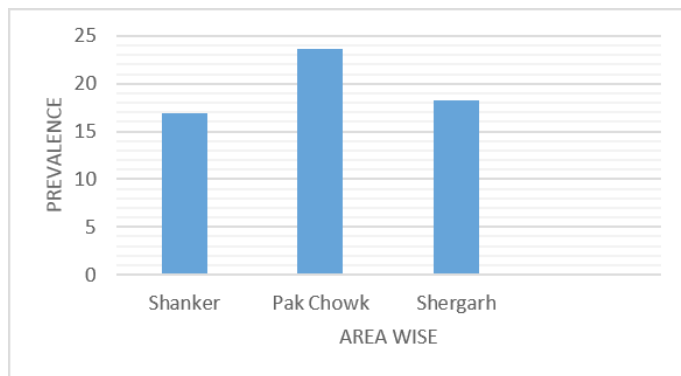


Figure 5: Area wise prevalence of *A. galli*

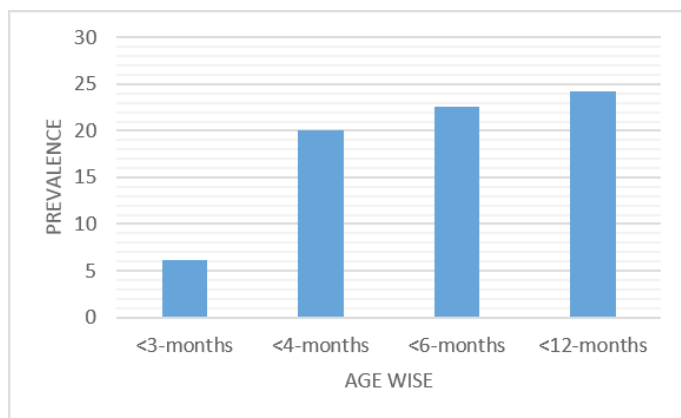


Figure 6: Age wise prevalence of *A. galli*

AGE WISE PREVALENCE

Prevalence rate in different age of chicken were <3 months (6.12), <4 months (20), <6 months (22.55) and <12 months (24.18) in percent (Figure 6).

DISCUSSION

The data that has been derived from 161 infected chickens out of 751 showed that the overall prevalence rate of 21.44 %, which is nearly equivalents to 20% in Switzerland reported by (Permin, 1997) less than 25.63% in Kenya by (Kaingu et al., 2010) 25.7% in Pakistan by (Sayyed et al., 2000) and 32.89% in Khartoun State, Sudan by (Hanan et

al., 2005). But greater than 10.03% in Kenya by (Kimani et al., 1999) 7% in Germany, 3% in Bavaria according to (Permin, 1997). The variation in overall prevalence rate are due to the climatic condition contributes in developing of infective stage, difference in chickens immunity of various locations that resist against establishment of *A. galli*, and the use of anthelmintics such as piperazine, hygromycin B and Fenbendazole drug that kills the parasites. The prevalence rate is quite different among various areas due to the wide range variations in locality and environmental factors. The infestation rate in local chickens was 25% which is greater than 17.64% in India by Channa et al. (2004) and less than 32.38% in Iran by Naem and Skandari (2004). Local chickens are more prevalent to infestation because of their free-ranging mode of life, scavenging behaviour, less veterinary care and poor sanitary conditions. As they seek food from superficial layers of soil, so there is great chances of ingestion parasitic eggs and faecal contaminated food, water, litter or by eating paratenic hosts such as grasshopper and earthworm. The prevalence in broiler and layer is 18.25% and 17.64% respectively. This is lower than 35.7% in broiler and greater than 5% in layer by Ogbaji et al. (2012). The infestation rate in broiler is low might be the regular use of anthelmintic on the farm and also short lifespan. The infestation rate in fall, winter and spring is 14.28%,20.84% and 30% respectively because humid and cool environment is good for survival of parasitic stage and helps in transmission (Kenndy, 1975; Audu et al., 2004) while moderate climatic conditions is ideal for but heat, desiccation or direct sunlight may kill the larvae of *A. galli*.

The research survey demonstrate the prevalence rate in female and male 23.58% and 16.96% respectively which is against the infestation rate given by Ekpo et al. (2010). From the study of local and exotic chickens in Nigeria, Matur et al. (2010) concluded that females are more susceptible to infestation than male by helminthes parasites due to voracious feeding nature of female while male is selective in feeding habits.

The age wise prevalence obtained from result is < 3 ,4,6 and 12 months with prevalence rate of 6.12%,20%,22.5% and 24.18% respectively. The increase in infestation rate as age of host increases might be due to their long introduction and exposure to environmental conditions facilitate the chances of ingestion by contaminated food or polluted drinks.

CONCLUSION

This study show that the infection of *A. galli* is more common in local, layer and broiler chickens in district Mardan. The *A. galli* is more prevalent parasite in poultry. It mainly affects the health of chickens and cause great economic loss. This study suggested that to improve the poultry

management and sanitary conditions in poultry houses or farms.

ACKNOWLEDGEMENT

We are thankful to Department of Zoology, Abdul Wali Khan University Mardan for providing Facilities to conduct research.

COMPETING INTEREST

We declare that we don't have any competing interest.

AUTHORS' CONTRIBUTION

Lal Zada, Tahir Rehman, Bibi Ruqia, Salma, Mir Alam Khan and Abdullah Khan carried out the experimental work and analysed the data. Sadaf Niaz provide technical support and guidance. Muhammad Aurang Zeb wrote the manuscript, gave the constructive feedback and suggestion, also help in data analysis.

REFERENCES

- Ackert JE (1931). The morphology and life history of the fowl nematode *Ascaridia lineata* (Schneider). *Parasitology*. 23: 360-379. <http://dx.doi.org/10.1017/S0031182000013731>
- Ackert JE, Herrick CA (1928). Effects of the nematode *Ascaridia lineata* (Schneider) on growing chickens. *Parasitology*. 15: 1-15. <http://dx.doi.org/10.2307/3271596>
- Anderson RC (1992). Nematode parasites of the vertebrates, first ed. CAB International, Wallingford, Oxon, UK.
- Audu PA, Oniye SJ, Okechukwu PU (2004). Helminthes parasites of domesticated pigeons (*Columbalivia domestica*) in Zaria. *Nig. J. Pest Dis. Vector Mgt*. 5: 356-360.
- Dunn AM (1978). *Veterinary Helminthology*. 2nd ed. William Heinemann Medical books Ltd., London, UK. Pp. 62-63.
- Channa D, Agnihotri RK, Katoch R (2004). Incidence of *Ascaridia galli* in palm valley of Himachal Pradesh. *J. Anim. Sci*. 74(10):1032-1034.
- Eisa AM, El bedawi ES, Saad MBA (1976). *Sudan J. Vet. Sci. Anim. Husb*. 17(2):68-76.
- Ekpo UF, Ogbooye AA, Oluwole AS, Takeet M (2010). A preliminary survey on the parasites of free range chicken in Abeokuta, Ogun State, Nigeria. *Int. J. Agri. Sci. Environ. Tech*. 9: 2.
- Fatihu MY, Ogbogu VC, Njoku CO, Saror DI (1991). Comparative studies of gastrointestinal helminthes of poultry in Zaria, Nigeria. *Revue D'Eleveage et de Medecin Veterinaire des pays Troicaux*. 44: 175-177.
- Food and Agriculture Organization (FAO) of the United Nations (1995). *FAQ Yearbook. Production*. 49 *FAQ Rome*.
- Hanan AMK, Abdalla HS, Elowni EE (2005). Prevalence rate of *Ascaridia galli* in some poultry farms in Khartoum State, Sudan. *Sudan J. Vet. Res*. 20: 55-60.
- Ikeme MM (1971). Observations on the pathogenicity and pathology of *Ascaridia galli*. *Parasitology*. 63: 169-179. <http://dx.doi.org/10.1017/S003118200007949X>
- Kaufman PE, Koehler PG, Butler JF (2007). External parasites

of poultry, University of Florida institute of Food And Agricultural Sciences, Gainesville, Fla, USA.

- Kaufmann F, Das G, Sohnrey B, Gauly M (2011). Helminth infections in laying hens kept in organic free range systems in Germany. *Livest. Sci*. 141(2-3):182-187. <http://dx.doi.org/10.1016/j.livsci.2011.05.015>
- Kates KC, Colglazier ML (1970). Differential morphology of adult *Ascaridia galli* (Schrank 1788) and *Ascaridiadissimilis* (Perez Viguera 1931). *Proc. Helminthol. Soc. Washington*. 37: 80-84.
- Kaingu F, Kibor B, Shivairo AC, Kutima R, Okeno H, Waihenya TO, Kahi AK (2010). Prevalence of gastrointestinal helminthes and coccidia in indigenous chicken from different agroclimatic zones in Kenya. *African J. Agri. Res*. 5(6): 458-462.
- Kennedy CR (1975). *Ecological Animal Parasitology*. Blackwell Scientific Publications, Oxford, London, Edinburgh, Melbourne.
- Kimani RN, Irungu LW, Kisia SM (1999). Intestinal parasites of chickens in Kenya. *Kenyan J. Agri. Sci*. 13:67-74.
- Magwisha H, Kassuku A, Kyvsgaard N, Permin A (2002). A comparison of the prevalence and burdens of helminth infections in growers and adult free range chickens. *Trop. Anim. Health Prod*. 34(3): 205-214. <http://dx.doi.org/10.1023/A:1015278524559>
- MALDM (Ministry of Agriculture, Livestock Development and Marketing), 2000. Annual Report, Animal Production Division, Nairobi, Kenya.
- Matur B, Dawam N, Malann Y (2010). Gastrointestinal helminth parasites of local and exotic chickens slaughtered in Gwagwalada, Abuja (FCT), Nigeria. *NY Sci. J*. 3(5): 96-99.
- Memon NA (2012). Poultry: Country's second-largest industry. <http://www.foodjournal.pk/Nov-Dec-2012/Nov-Dec-2012-PDF/Exclusive-article-Dr-Noor.pdf>.
- Naem SA, Skandari S (2002). Prevalence of intestinal helminthes of native chickens in Urmia, Iran. *J. Iranian. Vet. Res*. 3(2): 200-203.
- Ogbaje CI, Agbo EO, Ajanusi OJ (2012). Prevalence of *Ascaridia galli*, *Heterakis gallinarum* and tapeworm infections in birds slaughtered in Makurdi Township. *Int. J. Poult. Sci*. 11(2): 103-107. <http://dx.doi.org/10.3923/ijps.2012.103.107>
- Ondwassy HO, Okitoi LO, Obali MP, Simwa S, Wakhusama S W (2000). Epidemiology of helminth in indigenous poultry in Western Kenya in de Jong and Mukisira (Editors), *Testing of livestock technologies on smallholder mixed farms in Kenya. Research-extension-farmer experiences in the National Dairy Cattle and Poultry Research Programme 1995-1999*. Pp. 179-190.
- Permin A, Magwisha H, Kassuku AA, Nansen P, Bisgaard M, Frandsen F, Gibb L (1997). A cross-sectional study of helminth in rural scavenging poultry in Tanzania its relation to season and climate. *J. Helminth*. 71: 233-240. <http://dx.doi.org/10.1017/S0022149X00015972>
- Permin A, Nansen P, Bisgaard M, Frandsen F (1998). *Ascaridia galli* infections in free-range layers fed on diets with different protein contents. *Br. Poult. Sci*. 39: 441-445. <http://dx.doi.org/10.1080/00071669889033>
- Ramadan HH, Znada NYA (1992). Morphology and life history of *Ascaridiagalli* in the domestic fowl that are raised in Jeddah. *KAU. Sci. J*. 4: 87-99.
- Ruff MD (1991). Nematodes and acanthocephalans. In: Calnek, B.W., Barnes, H.J., Beard, C.W., Reid, W.M., Yoder, Jr. (Eds.), *Diseases of Poultry*. Iowa State University, Ames. Pp.

731-763.

- Sayyed R, Phulan M, Bhatti W, Pardehi M, Ali S (2000). Incidence of nematode parasites in commercial layers in swat. Pak. Vet. J. 20(2): 107-108.
- Soulsby EJ, Helminthes (1982). Arthropods and Protozoa of Domesticated Animals (7th edn), Bailliere Tindall, East Sussex.
- Taylor MA, Coop RL, Wall RL (2007). Parasites of poultry and gamebirds in: Veterinary Parasitology (third edition). Pp. 467-468.
- Whitmarsh (1997). Parasitic Diseases (Internal). Poultry Science, Mississippi State University, Starkville, Miss, USA.
- Yamaguti S (1961). Systema Helminthum. The nematodes of vertebrates. Interscience Publishers, New York and London. Pp. 1261.