

ajava

Asian Journal of Animal and Veterinary Advances



Academic
Journals Inc.

www.academicjournals.com

A Rare Report of Ectoparasites in Backyard Poultry in Jammu Region: Prevalence Study and Economic Importance

¹Sartaj Ahmad Bhat, ²Mohd Yaqoob Wani, ¹Jatinder Kumar Khojuria, ¹Rajesh Katoch and ³Kuldeep Dhama

¹Department of Parasitology, Faculty of Veterinary Sciences and Animal Husbandry, Sher-E-Kashmir University of Agricultural Sciences and Technology, Jammu, 181102, India

²Department of Veterinary Microbiology, Khalsa College of Veterinary and Animal Sciences, Amritsar, 143001, Punjab, India

³Avian Disease Section, Division of Pathology, Indian Veterinary Research Institute, Izatnagar, Bareilly, 243122, Uttar Pradesh, India

Corresponding Author: Sartaj Ahmad Bhat, Department of Veterinary Parasitology, Khalsa College of Veterinary and Animal Sciences, Amritsar, 143001, Punjab, India

ABSTRACT

Backyard poultry farming plays an important role in rural people by providing eggs, meat and employment. The production of backyard poultry is generally affected by ecto and endo-parasites due to their free range feeding habit and housing practices. The present study was designed to study the prevalence of ectoparasites in back yard poultry in Jammu region of India during October 2010 to September 2011. The results showed that out of 710 birds examined, 373 (52.53%) were found infested with different ectoparasites. The highest prevalence was recorded for *Menopon gallinae* (16.05%) followed by *Menacanthus stramineus* (12.95%), *Goniocotes gallinae* (9.58%), *Goniodes gigas* (5.91%), *Lipeurus caponis* (2.95%), *Argas persicus* (3.38%) and *Dermanyssus gallinae* (1.69%). Seasonal prevalence indicated, *Menopon gallinae* was predominant in all seasons except in pre monsoon, highest during winter and lowest during post monsoon. While *Menacanthus stramineus* had the highest prevalence during pre monsoon, *Argas persicus* during monsoon and *Dermanyssus gallinae* had the lowest prevalence during all the seasons. The study is first in its nature from Jammu, the north Indian region and will provide valuable information on ectoparasites in back yard poultry. However, further investigation is required in this regard so as to reduce the production losses by ectoparasites.

Key words: Backyard poultry, prevalence, ectoparasites, economic importance

INTRODUCTION

In India, poultry farming under backyard system is very old (Randhawa, 1946). As India is an agricultural country, about 70% population is rural and practice mixed farming. Most rural people rear backyard poultry due of its marked physiological adaptability in different agro-climatic conditions. Backyard poultry farming have many advantages like small space requirements for night shelter, scavenging habit of feeding during day and little supplementary feeding (Raveloson, 1990; Bhat *et al.*, 2014). The rearing of poultry also provides excellent opportunity for gainful employment to idle or unemployed members of rural communities. The production of eggs and broilers is increasing at the rate of 8-10% per annum (Mehta *et al.*, 2003). In India, total population of backyard poultry is 45.73 crore and in Jammu and Kashmir, its total population is

53.25 lakhs. Backyard poultry contributes to nearly 30% of Indian egg production (Singh *et al.*, 2009). Moreover, nowadays poultry rearing is one of the fastest growing segments of agriculture in India.

However, there are many factors which significantly impact the rural poultry farming especially grown under backyard system. One of the major factors is ectoparasitic infestations due to their free ranging feeding habits and close night contacts. Moreover, there is inappropriate housing and lack of considerable pest control efforts taken for these parasites (Mungube *et al.*, 2008). Ectoparasites damage feathers, irritate and cause skin lesions, resulting in reduced performance of adult chickens and direct harm to young chicks. They transmit a number of infectious disease agents and act as transport or intermediate host for several helminthes (Arends, 2003). The fowl soft tick (*Argas persicus*) acts as a vector for *Borrelia anserina* (fowl spirochaetosis), *Aegyptianella pullorum* and *Anaplasma marginale*. Similarly, red mite of poultry (*Dermanyssus gallinae*) transmits Saint Louis Encephalitis, Eastern and Western Encephalitis. *Dermanyssus gallinae* causes skin lesions in man and hence has got zoonotic importance. Ectoparasites cause weight loss at the rate of about 711 g per bird and decrease the egg yield at the rate of about 66 eggs per bird in a year (El-Kifl *et al.*, 1973). They cause heavy morbidity by sucking blood and causing irritation to the birds which adversely affects the economical production of poultry (Phulan *et al.*, 1984). However, limited reports are available from the epidemiological point of view for the prevalence of ectoparasites in backyard poultry. Further, there is no report on prevalence of ectoparasites of backyard poultry from Jammu region. Hence, present study was conducted to determine the prevalence of ectoparasites in rural free ranging poultry.

MATERIALS AND METHODS

The study was conducted in and around Jammu. The area is located 332 m above mean sea level, between 74°50' East longitude and 30°40' North latitude. The average temperature recorded was 28.68°C in monsoon, 21.57°C in post-monsoon, 12.2°C in winter and 25.98°C in pre-monsoon seasons. The recorded rainfall was 277.87 mm in monsoon, 12.6 mm in post-monsoon, 46.63 mm in winter and 59.53 mm in pre-monsoon periods. The humidity was 76.34% in monsoon, 65.75% in post-monsoon, 76.83% in winter and 55% in pre-monsoon. The soil texture is sandy loam to clay loam in this area. The study period was divided into four seasons according to Indian Meteorological Department, Pune, viz., monsoon (July to September), post-monsoon (October to November), winter (December to February), summer/pre-monsoon (March to June). The meteorological data (temperature, relative humidity and rainfall) was collected from the Meteorological Division Chatha, Faculty of Agriculture (FOA), Sher-e-Kashmir University Agricultural Sciences and Technology, Jammu.

Sample collection: A total of 710 backyard poultry birds were screened for the presence of ectoparasites for a period of one year (October 2010 to September 2011) in 5 selective villages of Jammu district. Body coats of poultry were examined for the presence of ectoparasites. Poultry houses were also screened for the presence of ectoparasites and were identified by using standard protocols (Soulsby, 1982).

Statistical analysis: The parasitic findings were correlated with the meteorological data. The experimental data generated during the study were analyzed using descriptive statistics (SPSS 16.0 versions). A two tailed test was used to compare the means. A $p < 0.05$ was considered significant.

RESULTS

Prevalence of ectoparasites based on physical examination: A total of 710 birds were examined, of which 373 (52.53%) were found infested with different ectoparasites, like *Menopon gallinae* (16.05%), *Menacanthus stramineus* (12.95%), *Goniocotes gallinae* (9.58%), *Goniodes gigas* (5.91%), *Lipeurus caponis* (2.95%), *Argas persicus* (3.38%) and *Dermanyssus gallinae* (1.69%). Analysis of data revealed highest overall prevalence of *Menopon gallinae* (16.05%) and lowest that of *Dermanyssus gallinae* (1.69%) (Table 1).

Menopon gallinae was predominant in all seasons except in pre monsoon and had highest prevalence during winter and lowest during post monsoon. In pre monsoon *Menacanthus stramineus* had the highest prevalence. *Dermanyssus gallinae* had the lowest prevalence during all the seasons. The prevalence of *Argas persicus* was highest during monsoon and lowest during post monsoon (Table 1).

Season wise prevalence of ectoparasites: Analysis of data revealed highest seasonal prevalence in winter (60%) and lowest in post monsoon (40%). Significant differences were observed in the prevalence rates between monsoon and pre monsoon, post monsoon and pre monsoon, winter and monsoon and winter and post monsoon seasons ($p < 0.05$) (Fig. 1a). Among the month wise distribution the highest prevalence was observed in the month of January (72%) and lowest in the month of October (38.46%) (Fig. 1b).

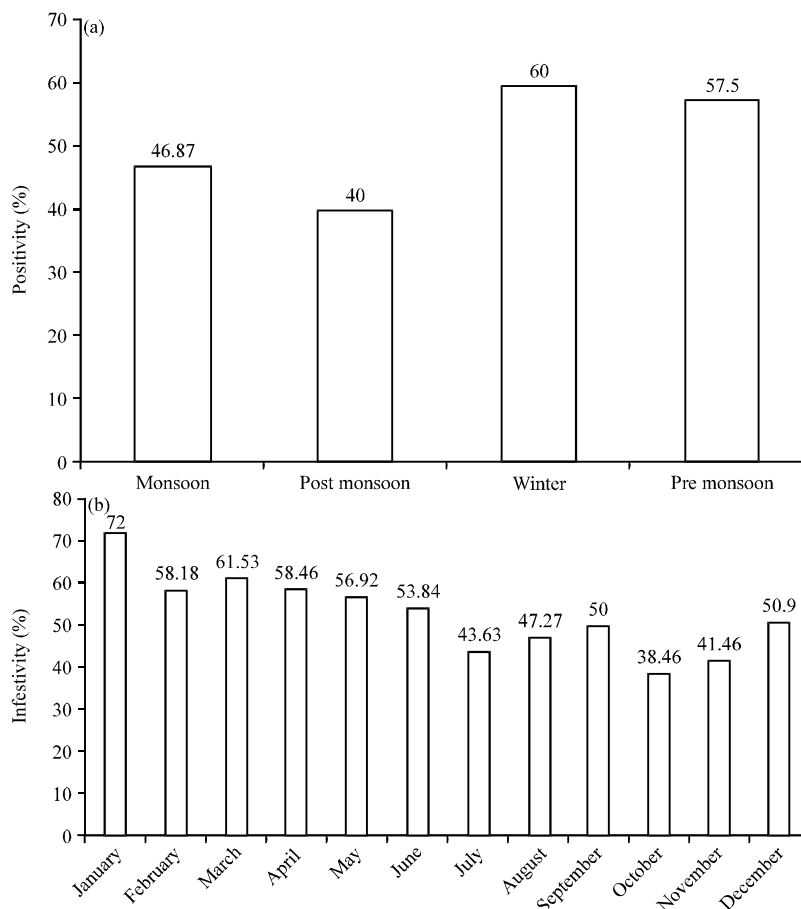


Fig. 1(a-b): (a) Season wise and (b) Month wise prevalence of ectoparasites observed during physical examination of birds

Table 1: Seasonal prevalence of ectoparasites of backyard poultry

Season	No. of birds examined (N)	Positive (%)	<i>Dermanyssus gallinae</i>	<i>Menopon gallinae</i>	<i>Menacanthus stramineus</i>	<i>Gonocotes gallinae</i>	<i>Goniodes gigas</i>	<i>Lipeurus caponis</i>	<i>Argas persicus</i>
Monsoon	160	75 (46.87)	3 (1.86)	20 (12.5)	16 (10)	14 (8.75)	8 (5)	4 (2.5)	10 (6.25)
Post-monsoon	130	52 (40)	1 (0.77)	15 (11.5)	12 (9.23)	10 (7.69)	7 (5.38)	4 (3.07)	3 (2.30)
Winter	160	96 (60)	2 (1.25)	40 (25)	16 (10)	20 (12.5)	9 (5.63)	5 (3.13)	4 (2.5)
Summer	260	150 (57.69)	6 (2.31)	39 (15)	48 (18.46)	24 (9.23)	18 (6.92)	8 (3.07)	7 (2.69)
Total	710	373 (52.53)	12 (1.69)	114 (16.05)	92 (12.95)	68 (9.58)	42 (5.91)	21 (2.95)	24 (3.38)

Values represent the number of positive cases and the values in parenthesis as percent positivity

DISCUSSION

Ectoparasitic infestations are of significant importance for poultry industry, especially backyard poultry throughout the world. Scarce reports regarding the prevalence of ectoparasites in backyard poultry from different parts of the world including India are available (Saxena *et al.*, 2004; Chaddha *et al.*, 2005; Shanta *et al.*, 2006). The study is first report pertaining to prevalence of ectoparasites of backyard poultry from Jammu region, northern part of India. In this study, prevalence of ectoparasites based on physical examination of backyard poultry was determined during October 2010 to September 2011. Examination of body coats of poultry for ectoparasites revealed an overall prevalence of 52.53%. These results were in line with the findings of different workers of the India (Saxena *et al.*, 2004; Chaddha *et al.*, 2005). The reason could be almost similar type of agro-climatic conditions. However, on the contrary, Shanta *et al.* (2006) recorded comparatively higher (86.67%) prevalence of ectoparasites.

Among the individual ectoparasites, *Menopon gallinae* (16.05%) was most common followed by *Menacanthus stramineus* (12.95%). Chaddha *et al.* (2005) also reported highest prevalence of *M. gallinae* (49.5%) followed by *M. stramineus* (26.30%). However, Shanta *et al.* (2006) recorded higher prevalence of *Menacanthus stramineus* (74%) followed by *Menopon gallinae* (63%). The reason could be different environmental conditions. Furthermore, the prevalence of other ectoparasites recorded in the present study was *Gonocotes gallinae* (9.58%), *Goniodes gigas* (5.91%), *Lipeurus caponis* (2.95%), *Argas persicus* (3.38%) and *Dermanyssus gallinae* (1.69%). Comparatively higher prevalence of these species (*Gonocotes gallinae*, 25.4% and *Lipeurus caponis*, 11.5%) was noted by Saxena *et al.* (2004). Shanta *et al.* (2006) also reported higher prevalence of these species (*Lipeurus caponis* (48%), *Goniodes gigas* (18%), *Gonocotes gallinae* (14%) and *Dermanyssus gallinae* (57%)).

Month wise analysis of data revealed highest prevalence (72%) of ectoparasites in January and lowest (38.46%) in October. The reason could be that there is huddling of birds during cold and the close contact leads to the spread of infestation. Similarly, Season wise analysis of data indicated highest prevalence of ectoparasites of backyard poultry in winter (60%), followed by pre monsoon (57.5%), monsoon (46.87%) and post monsoon (40%). However, Chaddha *et al.* (2005) recorded highest (78.80%) prevalence of ectoparasites during rainy season and the lowest (42.10%) in the winter season. The difference in results could be attributed to different managerial practices and agro climatic conditions in the study area.

The economic impact of ectoparasites is generally overlooked and limited control measures are generally followed for the ectoparasites in backyard poultry rearing. However, ectoparasites cause weight loss, irritation by sucking blood and reduce the egg yield and other production performances (El-Kifl *et al.*, 1973; Phulan *et al.*, 1984). Further, presently limited extensive epidemiological reports are available for most of the individual ectoparasites especially affecting the back yard system. In this regard, the present study will be very helpful in providing valuable information for

the researchers as well as veterinarians in this direction. However, further extensive investigations are required in this direction so as to improve the economic condition of rural people by improving the production of back yard poultry.

REFERENCES

- Arends, J.J., 2003. External Parasites and Poultry Pests. In: Diseases of Poultry, Calnek, W.B., H. John, W.C. Beard, L.R. McDougald and Y.M. Saif (Eds.). 11th Edn., Iowa State Press, Ames, Iowa, pp: 905-930.
- Bhat, S.A., J.K. Khajuria, R. Katoch, M.Y. Wani and K. Dhama, 2014. Prevalence of endoparasites in backyard poultry in North Indian region: A performance based assessment study. *Asian J. Anim. Vet. Adv.*, 9: 479-488.
- Chaddha, D., R.K. Agnihotri and R. Katoch, 2005. Incidence ectoparasites in poultry in Palam valley of Himachal Pradesh. *J. Vet. Parasitol.*, 19: 57-59.
- El-Kifl, A.H., A. Wahab, M.K. Kamel and W.A.E. Abdel, 1973. Poultry ectoparasites in Sharikia governorate. *Agric. Rev.*, 51: 113-120.
- Mehta, R., R.G. Nambiar, C.L. Delgado and S. Subramanyam, 2003. Annex II: Livestock industrialization project: Phase II-policy, technical and environmental determinants and implications of the scaling-up of broiler and egg production in India. IFPRI-FAO Project, Food and Agricultural Organization of the United Nations, Rome, Italy, July 24, 2003.
- 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 Eastern Kenya. *Trop. Anim. Health Prod.*, 40: 101-109.
- Phulan, M.S., W.M. Bhatti and S.N. Buriro, 1984. Incidence of *Argas persicus* in poultry. *Pak. Vet. J.*, 4: 174-175.
- Randhawa, M.S., 1946. Role of domesticated animals in Indian history. *Sci. Culture*, 12: 5-14.
- Raveloson, C., 1990. Situation et contraintes de l'aviculture villageoise a madagascar. Proceedings of the CTA Seminar on Smallholder Rural Poultry Production, Volume 2, October 9-13, 1990, Thessaloniki, Greece, pp: 135-138.
- Saxena, A.K., K. Sandeep, G. Nidhi and S.K. Singh, 2004. Prevalence of phthirapteran ectoparasitic insects on domestic hens of Rampur U.P. *J. Parasitic Dis.*, 28: 57-60.
- Shanta, I.S., N. Begum, A. Anisuzzaman, A.S.M. Bari and M.J. Karim, 2006. Prevalence and clinic-pathological effects of ectoparasites in backyard poultry. *Bangladesh J. Vet. Med.*, 4: 19-26.
- Singh, A., A. Yadav, U.K. Khajuria, S. Borkataki, N. Pande, D. Konwar and R. Katoch, 2009. Comparative evaluation of different breeds of back yard poultry under field conditions. *Vet. Practitioner*, 10: 181-182.
- Soulsby, E.J.L., 1982. Helminths, Arthropods and Protozoa of Domesticated Animals. 7th Edn., Bailliere Tindall, London, UK., ISBN-13: 9780702008207, pp: 162-163.