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(RESEARCH ARTICLE)

A comparative Study of ecto and endo parasites of free range and captive Fowl in Sangli District, Maharashtra

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Abstract

Among the agricultural practices poultry is one of the main financial sources in western Maharashtra. In the present research we concentrated on one of the main source economic loss of the poultry farmers, the parasitic infestation. We selected free range birds and captive birds of both male and female. In the present study we observed that females are more resistant to parasitic infestation than male. The captive birds are more prone to parasitic infestation than free range one, indicating the improper caring of the birds in the study localities. Concerned with ectoparasite lice is outnumbered flowed by fleas and mite. Concerned with Endoparasites Ascaridiae is greater cause of infection than Heterakis, Subulura and *Raillietina tetragona*. This research work will enable the poultry farmers to assess their fowls regarding the various ecto and endo parasite infections and how to manipulate their day to day care of the birds to minimize the parasitic infections and their by increase the productivity, because parasitic infection directly correlates with egg production and meat quality.

Keywords: Poultry; Ectoparasite; Endoparasites; Lice; flea; Mite; Ascaridiae

1. Introduction

The poultry industry is one of the agricultural practice and major financial source in south Maharashtra, including Sangli district. It is one of the major sources of protein supplement in these areas. It is estimated that chicken conception per capita has registered a 3.1 kg per year in India (Bangalore Mirror Bureau, AM IST, Surge in demand for Swarnadhara breed of poultry http://bangaloremirror.indiatimes.com/news/state/surge-in-demand-for-swarnadhara-breed-of-poultry/articleshow/56901126.cms, Updated: Feb 1, 2017, 04.00), which is low compared to world average of 17 kg per year. This low count is because majority of Indian peoples are vegetarian and even non-vegetarian generally eat meat products one or twice in a week. This surge in need for poultry is not in pace with production of poultry meat due to various reasons. The consumption rate shows that in United States people consuming about 21 billion kg of meat from 8.2 billion broiler chickens that cost about 21 billion US dollars [1]. Poultry industry is suffering from various diseases which outbreak and cause mass death of birds, poor nutrition supplements, poor management and absence of biosecurity. The heavy density of birds in poultry farm also causes diseases in human [2]. In household production system birds are exposed to various threats like parasitic infection which range from mites, lice, ticks and helminthes to conidia. The helminthes worm of cestoda, trematoda and nematode is the major cause poultry death in India. Raillietina and Hymenolepis is main cestoda worm found in poultry. Ascaridiae, Heterakis and Capillaria are significant among nematods [3]. The prevalence of helminthes and its negative effect on poultry is mainly depending on unpredictable climate change [4]. High temperature and high humidity is better conditions for many vectors which

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spreading the helminthes diseases. The ticks and mites prefer high humidity and temperature. Global warming indirectly causes ideal condition of many poultry ticks and worms and mass death of the birds. The captive birds are less prone to many diseases as most of the poultries are well maintained technologically. Desi birds are prone to many infections they are in fore front of many disease causing organisms [5]. It is also observed that many disease causing agents are immunosuppressive due to extensive use of vaccine [6-8]. Ascaridiae have high resistant power due to its anatomy and physiology and is one of the major culprits in the poultry infection [9]. It is also observed that older Fowls are the good reservoir of disease causing parasites without showing any symptoms [10], hence culling the birds on time is very essential to control the spreading of the disease.

2. Material and methods

The study includes villages of Sangli, randomly selected for Desi birds. Captive birds are obtained from butchers' house as poultry birds. In the present study total 100 desi (average weight 1.5 kg, 50 male and 50 female) and 100 broiler birds (average weight 1.5 kg, 50 male and 50 female) (without correlating age of the birds) are used. Ten birds of broiler and ten birds of desi are used for at a time. Desi birds are examined for external parasites in the early morning and sacrificed immediately (In the butcher house by the licensed butcher) and its intestine was stored in physiological saline pH 5.5 (at 20 °C) and further process was done in our laboratory. The dissected intestine (lengthwise opened) were again put in the physiological saline and kept aside for further survey at average temperature 20 °C. The average number of parasites was counted in the slot. Finally average of the ten slots was calculated to obtained percentage prevalence of infection of each parasite [11].

$$\text{Percentage prevalence (P)} = \frac{\text{Number of infected chicken}}{\text{Total number of observed chicken}} \times 100$$

The parasite was preserved in absolute alcohol for further reference (at 20 °C). The data of feeds collected from the owner of the poultry farm and villagers to correlate any effect of nutritional supplement and parasitic infection (Date is not included).

3. Results and discussion

Broiler birds in captive is more protected from parasitic infection as compared to free range desi birds (Table 1 and 2). Lice are dominating in both broiler and free range birds in prevalence percentage in both population and parasite. The lice are followed by flea and mite in increasing prevalence percentage. The trend of occurrence of lice, flea and mite is similar in captive and free range birds. When comparing the intensity of infection female is more resistant than male in both broiler and desi birds (Table 2). This study indicate that ectoparasite infestation of arthropods like lice, mite and fleas are very common in village birds and captive one , but captive birds show comparatively more infestation than free range one. This may be due to the fact that captive hygienic condition is poor and may be due to the high resistance attained by free range birds against these arthropods [12-16]. The relative abundance of lice, flea and mite is not static [12] and reported fleas are more predominant ectoparasite on Fowl, but in another study by the same author [12] reported fleas are least occurrence as ectoparasite on Fowl. Some study showed that no ectoparasite on the Fowl had studied. This variation in the observation may correlate with study time, season, environmental conditions like moisture contents, temperature, light intensity etc. Further study of correlation between Fowl productivity and ectoparasite infestation is needed to validate the commercial importance of the study.

Table 1 Prevalence of ectoparasite in the population

Ectoparasite	Broiler (Captive)				Desi (Free)			
	Male		Female		Male		Female	
	Number	Prevalence (%)	Number	Prevalence (%)	Number	Prevalence (%)	Number	Prevalence (%)
Lice	56	51.9	48	52.7	48	55.8	39	56.5
Flea	38	35.2	32	35.2	26	30.2	22	31.9
Mite	16	14.8	11	12.1	12	14	8	11.6
Total	110	-	91	-	86	-	69	-

In the case of Endoparasites Ascaridiae is dominating over other Endoparasites observed. It is followed by Heterakis and Subulura. The intensity of infection is more in male birds than females in both free range and captive birds (Table 2) Ectoparasite infection is more than Endoparasites in both free range and captive birds in both male and female. The prevalence of more Endoparasites in captive birds may correlate the unhygienic practice of poultry farm, lack of resistance, poor vaccination etc. casual investigation with farmers shows that those birds infest more is less in egg laying capacity and poor quality eggs as comparing to more active and less parasite infested one [17-18]. In our study Ascaridiae is more occurred as compared to helminthes. This observation is in contrast to the study carried out in other regions [19-22]

Table 2 The prevalence of various Endoparasites species in the sample population

Endoparasite	Broiler (Captive)				Desi (Free)			
	Male		Female		Male		Female	
	Number	Prevalence (%)	Number	Prevalence (%)	Number	Prevalence (%)	Number	Prevalence (%)
Ascaridiae	12	46.2	10	50	16	42.1	14	51.9
Heterakis	9		6	30	11	28.9	10	37.0
Subulura	5	34.6	4	20	7	18.4	3	11.1
Raillietina tetragona	-	--	-	-	4	10.5	3	11.1
Total	26		20		38		27	

Free range birds are more resistant to parasitic infestations compared to captive one in both ecto and endo parasite infection. It is advised that while practicing poultry farm in enclosed condition a natural atmosphere of free exchange of air and light must be ensured for maximum reap from the farm. Immunization should be practiced to common ecto and Endoparasites on regular basis. A further study to correlate parasitic infection and poultry product maximization should be done.

4. Conclusion

Our study will help the poultry farmers to maintain the fowl in healthy condition by reducing the incidence of parasitic infection of both ecto and endo parasites of various kinds and thereby increasing the productivity in quantity (Egg) and quality (Egg and meat). We propose here that a further study correlating the parasitic infestation and quality of egg and meat should be performed to assists the farmers in a big way.

Compliance with ethical standards

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Disclosure of conflict of interest

There is no conflict of interest among the authors

Statement of ethical approval

The birds are sacrificed by the licensed butcher in the local butcher house; we collected only the intestine for the purpose of the study.

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