

A COMPARATIVE STUDY OF REGION SPECIFICITY IN BIRD LOUSE IN ORGANIZED AND UNORGANIZED SECTOR OF MUMBAI

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Abstract: Owing to the scanty information in India about poultry lice specificity, the present investigation took place in Mumbai to add in lice literature. We took two sectors for a comparative study, for organized we chose cpdo (central poultry development organistaion), Mumbai and for unorganised we preferred different local house and slum areas. In the present investigation, prevalence of different species of lice was noted on poultry birds belonging to organized farm and backyard system. On organized farm the prevalence was 100% and on local desi birds it was 62%. Amongst all the birds screened *Lipeurus caponis* (41.30%) was found out to be the most predominant species. The other species of louse found in order of declining occurrence were *Cuclotogaster heterographus* (40.87%), *Menacanthus* spp (31.74%), *Menopon gallinae* (18.70%), *Goniodes gigas* (4.35%) and *Goniocotes gallinae* (2.61%). The lice encountered in the present study showed marked region specificity. Head, wing and body were the three regions which showed higher rate of occurrence of lice. *Cuclotogaster heterographus* and *Lipeurus caponis* were predominantly found on head and wing regions respectively. Similarly the *Menacanthus* spp and *Menopon gallinae* were predominantly encountered on the body region.

Keywords: Poultry, Lice, Prevalence, Region specificity, Mumbai.

INTRODUCTION

Like all other animals, poultry too suffer from a wide range of maladies and ectoparasitic infestation is one of them. The effects of louse parasitism on birds are often severe, including retarded growth, low egg production and susceptibility to other infections. Poultry lice are flightless, oviparous, obligate parasites that spend their whole life on their host. All poultry lice have chewing mouthparts and feed on dry skin scales, scab tissues, and feather parts. They also feed on blood when the bird's skin and feather quills are punctured. The ectoparasites causes irritation, interfere with the feed consumption and thus they are associated with emaciation, anaemia and eventually loss of production (Soulsby, 1982). Lice differ in preferred locations on the host, and these preferences have given rise to the common

names applied to various species. These include four amblyceran species—*Menacanthus cornutus*, *M. stramineus*, *M. Pallidulus* and *Menopon gallinae* and eight ischnoceran species *Cuclotogaster heterographus*, *Goniocotes gallinae*, *Goniodes dissimilis*, *Goniodes gigas*, *Lagopoecus sinensis*, *Lipeurus caponis*, *L. tropicalis*, and *Oxylipeurus dentatus*. Most of these are cosmopolitan and, apparently, highly adaptive for various geographic regions and climatic conditions (Sychra *et al.* 2008).

In India, prevalence rate of phthirapteran ectoparasites on Indian birds is not well documented (Chandra *et al.*, 1990, Singh, 1999). So there is only scarce information available on the prevalence of lice infestation and the deleterious effects caused by these ectoparasites on the health of poultry. By considering these points, the present research work was undertaken with the following broad objective in mind which are as follows:-

1. To determine the prevalence of lice infestation in poultry.
2. To identify the species of louse occurring in birds.
3. To identify the region specificity of lice in body of birds.

MATERIALS AND METHODS

Collection of the lice : Individual bird (*Gallus gallus domestica*) was carefully screened by parting the feathers and spreading its wings, with a help of a powerful hand lens for the presence of lice. The body of the bird was divided into four region viz. i. Head and neck, ii. Wing, iii. Body and iv. Fluff region to access the region specificity of birds. The lice from the respective regions were collected with help of the blunt plastic forceps in the glass vials containing 30% alcohol and labeled properly. The louse was detached carefully to avoid decapitation and bottled with a label denoting the identity of the host, centre of collection, site of infestation, intensity at that site, date of collection and sample number. The specimens were brought to the laboratory for further identification. The specimen from each bottle were processed systematically for preparation of permanent mounts as per the method described by Soulsby (1982) , i.e. dehydration, clearing and mounting .

Processing of lice for preparation of Permanent mount: The lice collected in 30% alcohol were further dehydrated using ascending grades of alcohols starting from 50%, 70%, 90% and absolute alcohol. In each grade of alcohol the specimen was kept for 20 minutes, followed by clearing with clove oil for 30 minutes. After clearing, each specimen was carefully taken on a glass slide and mounted with DPX. The slide was allowed to dry and solidify which took approximately 4 to 5 days.

Identification of lice: The lice were identified by the key given by Sen and Fletcher (1967).

Statistical analysis: Pearson's chi-square test (χ^2) was used to evaluate the association of different variables with the prevalence of ectoparasitic infestation and the data were analyzed by following IBM SPSS Statistics Microsoft version 16 for windows. P-value less than 0.05 (at 5% level of significance) were considered significant in all analysis.



White leg horn showing *Lipeurus caponis* in wings

RESULT AND DISCUSSION

A total of 230 birds from Mumbai region were included in the survey conducted from March to May 2015. Out of 230 birds screened, 130 birds were from organized farm belonging to four different breed viz. White Leghorn (WLH), Kadaknath, Aseel and Giriraj. Desi birds (100) raised in backyard farms from an unorganized sector were also screened for presence lice infestation.

Prevalence of poultry lice: Out of the total bird screened, 192/230 were found to be positive for the presence of lice. The overall prevalence of lice infestation in poultry birds from Mumbai region was found to be 83.48% (Table 1). All the birds screened from the organized flock (CPDO) were infested with poultry louse whereas only 62/100 desi birds showed lice infestation. Statistically there was a very high significant ($p \leq 0.05$) difference between the prevalence of poultry louse in organized and unorganized sector. This may be due to overcrowding and limited space constraints in flocks raised under organized farm unlike in unorganized sector, where birds are let loosed during day time and they do not come in close contact with each other. As the lice spread by close contact, the prevalence rate was higher in organized sector as compared to unorganized sector. These findings are

contradictory with the findings reported by Chaddha *et al.*, (2005) and Rani *et al.*, (2008) in Himachal Pradesh and Tamil Nadu respectively, in which backyard poultry had a higher prevalence of lice infestation than the organized farm birds. The overall prevalence of various parasites differed greatly when compared with present observation. This may be due to different geographical location, seasonal variation and period of study.

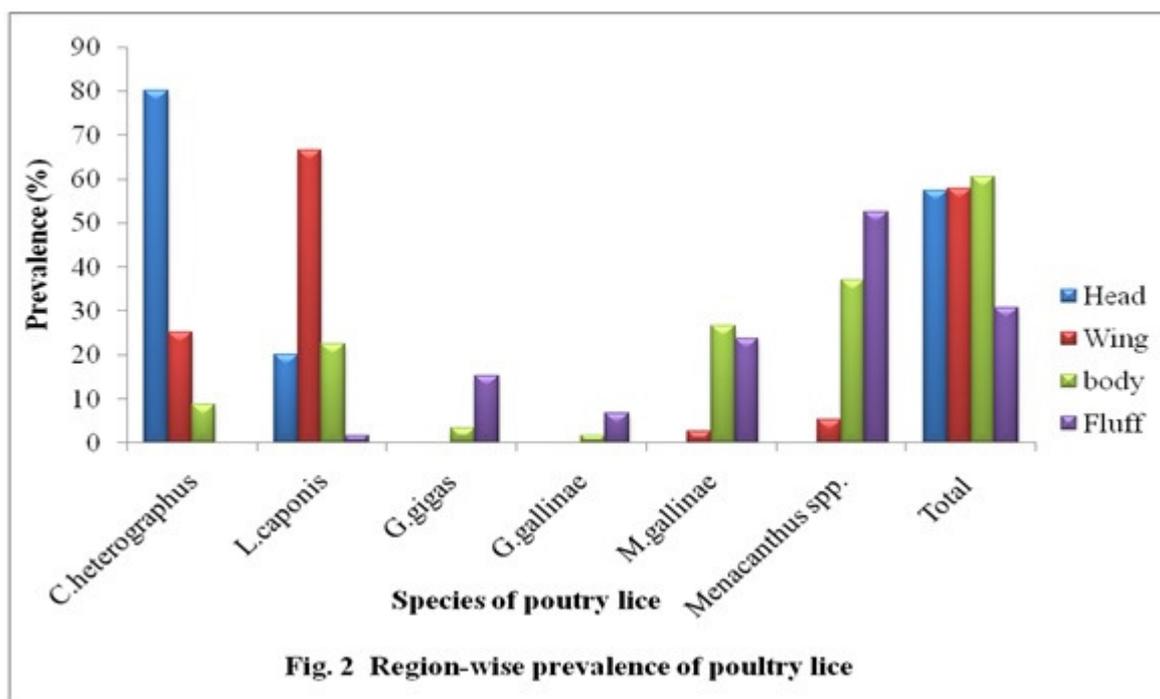
Table 1: Prevalence of poultry lice

Sector	Bird examined	Birds positive	Prevalence (%)
Organized	130	130	100
Unorganized	100	62	62
Total	230	192	83.48%

*(Values are significant $p < 0.05$)

Region wise prevalence of poultry lice: In the present study lice were collected from four different regions from the body of poultry birds which include i. Head and neck ii. Wing iii. Body and iv. Fluff region. In this study the prevalence rate of infestation with respect to individual species of louse showed wide variation which was found statistically significant ($p \leq 0.05$). It is evident that the regions which showed higher prevalence were body, wing and head and comparatively prevalence of lice on fluff region were distinctly low. This was obviously due to the species of louse encountered in the study and their inherent region preference. Amongst the different regions defined in the present study, only body region showed occurrence of all the species of lice encountered in the study. However more than 85% of the cases revealed *Menacanthus* spp, *Menopon gallinae* and *Lipeurus caponis*. As regards head region 80% of cases revealed *Cuclotogaster heterographus* and remaining were *Lipeurus caponis*. In wing region more than 90% of cases revealed *Lipeurus caponis* and *Cuclotogaster heterographus*, while *Goniodes gigas* and *Goniocotes gallinae* were not found in these regions. In wing region, more than 76% of cases of fluff infestation revealed *Menacanthus* spp and *Menopon gallinae* with absence of *Cuclotogaster heterographus*. If the data is looked with different perspective, it is evident that *Cuclotogaster heterographus* was mainly found on head and wings and did not venture fluff region. More or less similar trend was seen with *Lipeurus caponis*. Jj But it was found to be covering larger area on the body and occurred on all the body regions demarcated in the study. *Goniodes gigas* and

Goniocotes gallinae were found only in the body and fluff regions. Similar trend was also showed by *Menacanthus* spp and *Menopon gallinae* but few specimens were also found on wings. The exact reason for the region specificity could be due to minute differences in the microclimate presented by the host with respect to each body region.



CONCLUSION

The above study conducted to generate a basic data on prevalence and region specificity aspect of poultry lice from Mumbai region from organized and unorganized sector. The findings revealed that, louse prevalence varied significantly with respect to organized and unorganized sector investigated. The present study suggests that more research should be conducted on bird lice with emphasis on managerial practices by the farmers that will minimize the harmful effects of bird lice on birds.

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