

Prevalence of phthirapteran ectoparasitic insects on domestic hens of Rampur (U.P.)

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As many as 60.9% of the fowls (510) examined in twelve localities of district Rampur (during July 2000 to August 2002) were found infested with one or other kind of Phthiraptera. The order of prevalence of seven species has been found to be *Menopon gallinae* (51.3%) > *Goniocotes gallinae* (25.4%) > *Lipeurus lawrensis tropicalis* (15.8%) > *Lipeurus caponis* (11.5%) > *Menacanthus cornutus* (8.1%) > *Goniodes dissimilis* (7.9%) > *Lipeurus heterographus* (6.9%). Significant positive correlation existed between mean monthly prevalence rate and mean monthly temperature as well as photoperiod. The prevalence rate was significantly higher on birds having poor health and poor plumage.

Keywords: Ectoparasite, Mallophaga, Phthiraptera, Poultry lice.

The prevalence and infestation intensity of different phthirapteran ectoparasites on certain avian hosts viz. sparrows (Hoyle, 1938; Woodman and Dicke, 1954), starlings (Boyd, 1951), blackbirds (Baum, 1968), auks (Eveleigh and Threlfall, 1976), procellariiform birds (Fowler *et al.*, 1984), wood ducks (Thul, 1985), reed bunting (Fowler and Williams, 1985), Wilson's petrels and storm petrels (Fowler and Price, 1987), leach's petrels (Fowler and Hodson, 1988), manx shearwaters (Fowler and Shaw, 1989), five shorebird species (Hunter and Colwell, 1994), house martins (Clark *et al.*, 1994), swifts (Lee and Clayton, 1995), flycatchers (Potti and Merino, 1995), peacocks (Stewart *et al.*, 1996), spanis raptors (Perez *et al.*, 1996), bee eaters (Kristofik *et al.*, 1996; Hoi *et al.*, 1998; Darolova *et al.*, 2001) have been noted by selected workers. Only a few workers have examined birds belonging to different orders from this point of view (Ash, 1960; Klockenhoff *et al.*, 1973). Rekasi *et al.*, 1997 and Rozsa, 1997 have discussed the pattern in abundance of avian lice.

The prevalence rate of phthirapteran ectoparasites on

Indian birds is not well documented. (Chandra *et al.*, 1990; Singh, 1999). Trivedi *et al.* (1992) recorded the prevalence and intensity of Phthiraptera on poultry birds of Dehradun. Prevalence of poultry shaft louse, *Menopon gallinae* on poultry birds of Garhwal was noted by Saxena *et al.*, (1995). Present studies deal with the prevalence and intensity of infestation of seven phthirapteran species (*Menacanthus cornutus*, *Menopon gallinae*, *Lipeurus caponis*, *L. lawrensis tropicalis*, *L. heterographus*, *Goniocotes gallinae* and *Goniodes dissimilis*) on the poultry birds of Rampur district during July 2000 to August 2002.

Several methods have been described for delousing the infested birds (Clayton and Drown, 2001) but during the present studies, the prevalence and infestation rate was recorded by timed visual counts as the birds belonged to the private owners / poultry keepers. The surveyor had to record the prevalence and intensity without causing any harm to the bird. Hence, the bird's legs were tied with rubber band / thread and both the wings were held by the assistant (in upright position). Bird's feathers were deflected manually and the presence of lice was observed with the help of magnifying torch. Lice were taken out and placed in vials containing 70% alcohol. Each infested bird was

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again subjected to 5 minutes observation (for each species) to record the number of lice by coding system (1-25 lice VL, 26-50 lice L, 51-75 lice- M, 76-100 lice H, and >100 lice - VH).

Out of 12 species reported to occur, only seven could be recovered from the poultry birds of Rampur. The chicken body louse, *M. stramineus* (which is otherwise very common poultry lice) was not detected on the poultry birds of Rampur. Another louse species (*G. gigas*) reported from poultry birds of Dehradun (Trivedi *et al.*, 1992) was also not recorded. Out of 510 poultry birds examined from 12 different localities during July 2000 to August 2002, 60.9% were found infested with one or the other kind of poultry louse. Species-wise prevalence and infestation intensity has been shown in Table.

Analysis of the data indicates that 54.4% of male birds carried infestation of one or the other phthirapteran species. Prevalence on female bird was 63.6%. Sex related difference in the prevalence was not significant at 0.05 level of significance. The colour of host birds was also recorded. The prevalence rate on the four types of birds (white, black, brown and mixed colour) remained 36.6%, 60.8%, 72.3% and 73.1%, respectively. The colour related differences were not found significant at 0.05 levels.

Out of the 60.9% infested birds, 17.9% carried single species infestation. Maximum percentage of bird (23.9%) showed two species infestation. Prevalence

of birds carrying three species infestation was 16.9%. Only a small percentage (2.4%) carried four species infestation. Infestation by *M. gallinae* and *G. gallinae* was the most favoured combination on birds carrying two species. Likewise, the popular combination of birds having three species was *M. gallinae*, *G. gallinae*, and *L. lawrensis tropicalis*. Infestation by more than four species was not observed on the poultry birds of Rampur.

An attempt has also been made to find the degree of correlation between mean monthly lice prevalence of the period July 2000 to June 2001 and the mean monthly temperature, photoperiod and RH of the corresponding period. Mean monthly prevalence was 76.5% in July. It decreased to the level of 65.3% in August and remained nearly constant in succeeding four months (60.0, 55.6, 58.8 and 56.5% from September to December, respectively). Prevalence showed a sharp decrease in January (48.4%) and reached the lowest level in February (47.0%). Thereafter, it rose gradually in succeeding four months till it reached the highest level in June 2001 (53.3, 75.0, 80.0 and 90.0% from March to June, respectively). Significant positive correlation existed between mean monthly prevalence and mean, monthly temperature as well as photoperiod ($r = 0.79$ and 0.76 respectively). However, correlation with mean monthly relative humidity ($r = -0.50$) was not found significant, at 0.05 level of significance.

Table : Intensity of infestation of seven phthirapteran species on poultry of Rampur, during July 2000 to August 2002.

Species	Prevalence	Intensity of infestation				
		VL	L	M	H	VH
<i>M. gallinae</i>	51.3	5.5	13.9	8.4	9.6	13.9
<i>G. gallinae</i>	25.4	3.3	10.8	3.3	4.5	3.5
<i>L. l. tropicalis</i>	15.8	1.4	6.5	1.8	3.7	2.4
<i>L. caponis</i>	11.5	1.6	5.7	1.2	1.4	1.6
<i>M. cornutus</i>	8.1	2.4	4.3	0.8	0.4	0.2
<i>G. dissimilis</i>	7.9	2.2	5.7	-	-	-
<i>L. heterographus</i>	6.9	0.2	6.5	0.2	-	-

The degree of harmfulness of different species of poultry lice (in terms of loss of weight, vitality and productivity of host birds) is quite variable. *M. stramineus* was not found upon poultry birds of the district Rampur, but prevalence of the other dreaded poultry louse (*M. gallinae*) was highest on the birds of this area. Nearly, half of the examined hosts carried this louse species (51.3%). Prevalence of this louse on poultry birds of Dehradun and Garhwal were noted as 44.7% and 69.3% respectively (Trivedi *et al.*, 1992; Saxena *et al.*, 1995). However, the prevalence of another haematophagous poultry louse, *M. cornutus* (whose degree of harmfulness and disease transmission capabilities have yet not been investigated) remained comparatively lower (8.1%). The order of prevalence of phthirapteran species recorded by Trivedi *et al.* (1992) was *M. gallinae*—44.7% > *M. cornutus*—40.4% > *M. stramineus*—26.2% > *G. gallinae*—19.2% > *G. dissimilis*—14.3% > *L. caponis*—13.8% > *L. lawrensis tropicalis*—9.2% and > *G. gigas*—4.8%. Thus, the prevalence of *M. cornutus* was quite high on poultry birds of Dehradun. The prevalence of *G. gallinae* and *L. lawrensis tropicalis* have been found comparatively higher on the poultry birds of Rampur while that of *L. caponis* and *G. dissimilis* remained comparatively lower. Lastly, Trivedi *et al.* (1992) did not find *L. heterographus* on the poultry birds of Dehradun.

Selected workers have noted the impact of host sex on prevalence of avian lice. There are conflicting reports on the subject. It has been stated that lice are more prevalent on male birds in case of sparrows (Woodman and Dicke, 1954), black birds (Baum, 1968) and 45 species of variety of birds (Ash, 1960). However, no difference in louse prevalence with respect to host sex has been noted in case of alcids (Eveleigh and Threlfall, 1976), domestic hens (in case of *M. gallinae*) (Saxena *et al.*, 1995) and European bee-eaters (Hoi *et al.*, 1998). During the present studies, sex related differences in the prevalence rate were not found to be significant. Thus, it may be stated that some host factors may occasionally cause variation in louse prevalence in some cases, but generally there is no significant difference in prevalence with respect to host sex.

Present studies further indicate that host colour related

difference in prevalence were not significant. Most of the workers did not find any correlation with feather colour of host bird and the louse prevalence / intensity. Studies relating to prevalence rate of lice (*M. gallinae*) on domestic fowls of Garhwal (Saxena *et al.*, 1995) also indicate similar results.

Present studies further indicate that most of the heavily and very heavily infested birds encountered during the present investigation carried *M. gallinae*, *G. gallinae* and also *L. lawrensis tropicalis*. Birds heavily infested with *M. cornutus* and *L. caponis* were rarely found. On the other hand, any bird carrying heavy or very heavy infestation of *G. dissimilis* and *L. heterographus* were not observed during the survey work.

ACKNOWLEDGEMENTS

The authors are thankful to the Principal, Govt. Raza P.G. College, Rampur for providing laboratory facilities.

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