ENTOMON 41(4) : 351-354 (2016)
Shrot Communicationt. 41413

Population increase of poultry wing louse, *Lipeurus caponis in vivo* condition

Surendra Kumar[1] and Vijay Kumar[2*]

[1] Government Raza P.G. College, Rampur, U.P., India; [2] Government P. G. College, Bilaspur, Rampur, U.P., India. E-mail: entomology3@yahoo.com

ABSTRACT: Studies regarding the rate of population increase of poultry wing louse *Lipeurus caponis in vivo* condition revealed that initial inoculums of 10 *L. caponis* could produce an average of 318 lice after 90 days in summer (indicating the doubling time to be 18 days) and during winter months it produced 336 lice (the doubling time 22 days). Thus, studies clearly indicated that ischnoceran lice (e.g. *L. caponis*) multiplied population at moderate rate. Summer months are more favorable for population build up of lice.

KEY WORDS: Phthiraptera, poultry lice, *Lipeurus caponis,* population build up

Information regarding the rate of population increase of parasitic insects attracts the attention of parasitologist /biologist and also the veterinarians. Only few workers have made attempts to furnish information on the rate of population increase (*in vivo* condition) of phthirapterans infesting avian hosts. Some clues on the aspects can be derived from the contributions of Glees and Raun (1959), Stockdale and Raun (1960), Brown (1970), Gupta *et al.*, (2007) and Saxena *et al.*, (2007). Information on the rate of population increase of two mammalian ischnocerans has been noted by Murray and Gordon (1969) and Rust (1974). Keeping in view the lacuna prevailing in the field, it was found worthwhile to study the rate of expansion of ischnoceran poultry lice. The present report deals with the rate of population increase of poultry wing louse, *Lipeurus caponis*.

Ten adults of *Lipeurus caponis* were released on the wings of each of the twelve louse free fowls of age 6 months. The aforesaid lice were transferred from lice infested chicken with the help of camel hair brush. The artificially infested fowls were individually housed in wire meshed cages (prevented to come in contact) and provided with poultry feed and water (during April 2013). Two of the artificially infested fowls were subjected to delousing fortnightly by fumigation method. The fowls were placed in large polythene bag containing a wad of cotton wool, soaked in chloroform in such a way that head protruded to allow breathing. The bird was taken out after 15 minutes and feathers manually ruffled over white plastic sheet to recover the lice load. The fowls were further searched to recover the remaining lice load with the help of hand lens fitted with circular light tube. The lice loads so obtained were stored in 70% alcohol and separated stage wise. Lice were identified with the help of information given by Ansari (1943), Same experiment was repeated in November 2013.

As indicated in methodology two fowls were subjected to delousing fortnightly in the months of summer (April 2013 to June 2013). First two fowls deloused after 15 days yielded a total of 32 *L.*

* Author for correspondence

caponis (4 adults, 28 nymphs). Two fowls deloused after 30 days yielded 50 lice (28 adult, 22 nymphs). Likewise, the number of lice obtained from fowls deloused after 45, 60 and 75 days remained 120 (76 adults, 44 nymphs), 174 (92 adults, 82 nymphs) and 344 lice (120 adults, 224 nymphs). Finally, last two fowls deloused after 90 days yielded 636 lice (280 adults and 356 nymphs). Thus, initial inoculums of 10 *L. caponis* produced on an average of 318 lice after 90 days (Fig.1). Thus, by applying the back roll method the doubling time of the population of *L. caponis* appeared to be 18 days, during summer months.

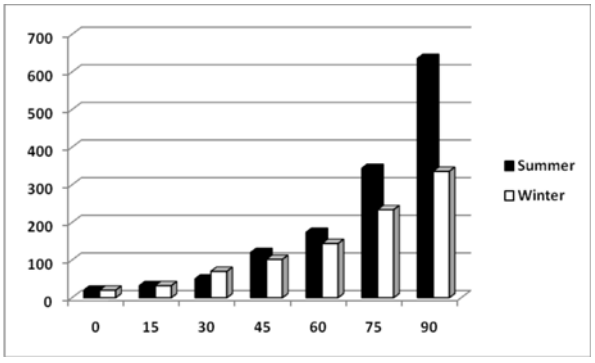

Figure 1. Showing the total number of *Lipeurus caponis* recovered from two fowls (Each inoculated with 10 lice) deloused fortnightly, during 2013

Same experiment was repeated during winter months (November 2013 to January 2014). Two fowls deloused after 15 days were found infested with 32 lice (06 adults, 26 nymphs). The number of lice recovered from fowls deloused after 30, 45, 60 and 75 days yielded 70 (32 adults, 38 nymphs), 102 (54 adults, 48 nymphs), 144 (68 adults, 76 nymphs) and 234 lice (94 adults, 140 nymphs). The last two fowls deloused after 90 days yielded 336 lice (124 adults, 212 nymphs) (Fig.1). Thus, initial inoculums of 10 lice could produced178 lice indicating it's doubling time to be 22 days during winter months. The data obtained from delousing of chickens during summer and winter was tested with the help of χ^2 and the difference was found significant (χ^2=38.9; df =5; p =.05)

There are only few studies relating to rate of population expansion of phthirapteran parasitizing avian host's *in vivo* condition. While recording the economic effects of parasitism of chicken body louse, *Menacanthus stramineus*, Glees and Raun (loc cit.) released 10 lice on each of domestic hens and observed that their numbers increased to 23,063 during a span of 14 weeks. Likewise, while performing similar studies on same louse, Stockdale and Raun (loc cit.) found that 3 adult female could increase up to 12,305 in 16 weeks. However, Brown (loc cit.) released an initial population of 50 chicken body louse (*Menacanthus stramineus*) and found that numbers increased to 1584 in 31 days on debeaked chickens while 50 lice released on beaked (normal) birds could not increase beyond 56 lice. Saxena *et al.* (loc cit.) released an initial population of 14 ischnoceran louse, *Goniocotes gallinae* / bird and found that their population became 1267 in 14 weeks (doubling time 14 days). Likewise, in case of red amandava louse, *Brueelia amandavae* the initial inoculums of 5 lice could build up an average of 60 lice per bird during a span of 75 days. Thus the doubling time of aforesaid louse was computed by (Gupta *et al.* (loc cit.) as 21.5 days. During present studies the doubling time of poultry wing louse, *Lipeurus caponis* appeared to be 18 days (in summers) under *in vivo* conditions in contrast 22 days in winters, indicating that environment plays important role in determining the rate of population expansion of avian lice.

ACKNOWLEDGEMENT

Authors acknowledge the principal of Government Raza Post Graduate College, Rampur, UP, India for providing lab and other facilities required to perform theexperiment.

REFERENCES

Ansari M.A.R.(1943) Mallophaga found on domestic fowl, *Gallus domesticus* Linn. Indian Journal of Entomology, 5: 129-142.

Brown N.S.(1970) Distribution of *Menacanthus stramineus* in relation to chicken's surface temperature. Journal of Parasitology, 56: 1205.

Gless E. and Raun E. S. (1959) Effects of chicken body louse on egg production. Journal of Economic Entomology, 52: 358-359.

Gupta N., Kumar S. and Saxena A. K. (2007) Intrinsic

rate of natural increase of B*rueelia amandavae* (Ischnocera, Phthiraptera) infesting Indian red avadavat. Biologia, 62: 458-461.

Murray M. D. and Gordon G. (1969) Ecology of lice on sheep. VII: Population dynamics of *Damalinia ovis* (Schrank). Australian Journal of Zoology, 16: 179-186.

Rust R.W. (1974) The population dynamics and host utilization of *Geomydoecus oregonus*, a parasite of *Thomomys bottae*. Oecologia, 15: 287-304.

Saxena A. K., Kumar S., Gupta N. and Singh R. (2007) Population expansion of poultry fluff louse *Goniocotes gallinae* (De Geer. 1778) (Isochnocera, Phthiraptera, Insecta). Zoological Science, 24: 327-330.

Stockdale H. J. and Raun E.S. (1960) Economic importance of chicken body louse. Journal of Economic Entomology, 53: 421-423.

(Received. 8 July 2016; accepted 17 November 2016.; published 31 December 2016)