

## PREVALENCE OF ECTOPARASITES INFESTING SHEEPS OF GARHWAL REGION

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### ABSTRACT

An attempt was made to estimate the prevalence of ectoparasites on sheeps of Garhwal, India. Extensive survey work was performed during August 1999 to July 2000. Sheep of Garhwal was found to be infested by three species of lice (i.e. *Linognathus ovillus*, *L. pedalis*, *Bovicola ovis*), two species of ticks (i.e. *Boophilus microplus*, *Hyalomma brevipunctata*) and one species of sheep ked (*Melophagus ovinus*). The prevalence of sheep face louse, *L. ovillus* was highest (64.2%) followed by sheep foot louse, *L. pedalis* (63.1%) and sheep biting louse, *B. ovis* (52.5%). The prevalence of sheep ked and ticks were found 38.3, 35% respectively. The effect of host sex, coat colour, and host age and host health on prevalence rate were also discussed. The intensity of infestation of these ectoparasites was recorded by the coding system. The heavy and very heavy infestation was recorded during the winter months.

**Key words:** Phthiraptera, Sheep lice, Prevalence, ectoparasite

### INTRODUCTION

Arthropod ectoparasites are one of the problems for wool growers in the world. They reduce the quality and quantity of fleece and hide (Kettle & Lukies, 1982a & b, Kettle, 1984). McLeod (1995) estimated that \$ AU169 million per annum is the cost of louse infestation in Queensland sheep flocks and most of the cost spent over pesticidal control measures. The pesticide also causes consequences of environmental pollution.

Few workers like Williams (1986), Wooten-Saadi *et al.* (1987), Rawat *et al.* (1991) and Kumar *et al.* (1994a & b) have provided valuable information on the incidence and intensity of Phthiraptera infesting other domestic mammals such as pigs, buffaloes, cattles, and goats. In Australia, Murray (1960a, b, 1962), Morcombe *et al.* (1994) and Ward & Armstrong (1999) have record the incidence rate of lice on sheep flocks.

A thorough study of literature reveals that studies on the prevalence of Phthirapteran

on Indian sheep escaped the attention of workers. Present studies have made records of three species of lice (*Linognathus ovillus*, *L. pedalis*, *Bovicola ovis*), ticks (*Boophilus microplus*, *Hyalomma brevipunctata*) and sheep keds (*Melophagous ovinus*).

## MATERIALS AND METHODS

Extensive survey work was performed in 15 localities of Garhwal (covering most of the area) during August 2001 to July 2002. In each sheep flocks, 5-10 sheep were randomly selected for examination. As many as 360 sheep were examined. Most of the examined sheeps were of 'Rampur bushire' and cross breed of marino. Each sheep was critically examined by hair parting method (Lewis *et al.* 1967). Ectoparasites were sampled by brushing cum searching, dusting and combing and also by shaving the hair/wool from heavily infested parts of host body. The ectoparasites of each host were preserved in 70% alcohol in separate vial for for identification. Each vial was recorded the information regarding host number, host sex, host health, coat colour, and host age etc. The intensity of infestation was recorded by placing the infested host under five categories- VL (very light infestation), L (light infestation), M (moderate infestation), H (heavy infestation) and VH (very heavy infestation). Finally the data were analysed in the laboratory.

**Abbreviation used:** BO-*Bovicola ovis*, LO-*Linognathus ovillus*, LP-*Linognathus pedalis*, K-Sheep ked, T-Ticks, F-Flea.

## RESULTS

360 sheep were examined during August 1999 to July 2000 for the records of prevalence and intensity of phthirapteran as well as other ectoparasitic insects. As many as 64.17% sheep were infested with *L ovillus* followed by *L pedalis* (63.61%) and *B. ovis* (52.5%). The sheep ked (*M ovinus*) and ticks were found infested on 38.33% and 35% sheep respectively (Table-1, Fig.1). Fleas were recorded accidentally.

Out of 360 sheep, 341 (94.72%) were found infested by the ectoparasites. Only 5.28% were recorded uninfested or negative host. Infested hosts were divided into three categories: mono-, bi- and multi-infestation. Minimum number of sheeps (13.61%) carried mono-infestation (BO-1.94%, LO-4.72%, LP-3.61%, K-1.67%, T-1.67%). Bi-infestation was quite common carried by 31.11% sheep (BO+LO-5.83%, BO+LP-3.89%, BO+K-1.39%, BO+T-0.83%, LO+LP-7.22%, LO+K-3.06%, LO+T-1.67%, LP+K-4.17%,

ectoparasites. Host age does not seem to influence the prevalence rate in all cases except keds. Keds has showed higher prevalence rate on young sheep.

Studies on intensity of infestation revealed that maximum numbers of moderate, heavy and very heavy infestation have been recorded during winter months (Table-1, Fig. 3). On the other hand most of sheep examined during rainy months carried very light or light infestation. Lastly, it has been concluded that in Australia, McLeod (1995) estimated \$169 million per annum loss caused by the lice problem while the incidence rate of *B. ovis* has recorded nearly 40%. The Indian sheep has showed higher prevalence rate comparatively. Australian wool growers have fair knowledge about the economic harmfulness of ectoparasites and they often eradicate them properly. But Indian shepherd do not have knowledge about economic harmfulness of ectoparasites and eradication measures. It has enable us the loss caused by five parasites will be much more. Hence, more study and effective control measure will be needed on Indian sheep.

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## REFERENCES

- Johnson, P.W., Boray, J.C., Plant, J.W. and Blunt S.C. 1993. Prevalence of the cause of fleece derangement among sheep flocks in New South Wales. *Aust. Vet. J.* 70, 220-224.
- Kettle, P. R. and Lukies, J.M. 1982a. Effect of sheep lice (*Damalinia ovis*) on wool colour. *N. Z. Jour. Exp. Agric.*, 10: 15-17.
- Kettle P.R. and Lukies, J.M. 1982b. Long term effect of sheep body lice (*Damalinia ovis*) on body weight and wool production. *N.Z. Jour. Exp. Agric.*, 25: 531-534.
- Kettle, P. 1984. Sheep lice, biology significance and control. *Farm Production & Practice*, 4/3000/5/84: 340.
- Kumar, A., Rawat, B.S., Saxena. A.K. and Agarwal, G.P., 1994a. Prevalence of ectoparasites on goats in Dehradun (India). *AppliedParasitology*. 35: 227-236.
- Kumar, A., Rawat, B.S. and Saxena A.K. 1994b. Distribution of two phthirapteran species (Insecta) on the goats *Capra aegagrus* forma *hircus* of India. *Rudolstadter naturhistorische Schriften*. 6: 79-82.
- Lewis, L.F., Christenson, D.M. and Eddy,G.W.,1967. Rearing of long nosed cattle louse and cattle biting louse on host animals in Oregon. *Jour. Econ. Entomol.*, 60: 755-757.
- McLeod, R.S. 1995. Costs of major parasites to the Australian livestock industries. *Int. J. Parasites*, 25: 1363- 1367.

- Morcombe, P. W. 1992. The sheep lice detection test. *J. Agric West. Aust.*, 33, 100- 102.
- Morcombe, P.W. Thomson and Buckman, P.O. 1994. The prevalence of lice (*Bovicola ovis*) infested flocks in Western Australia (1987- 1993). *Aust. Vet. J.*, 71, 71-74.
- Murray, M.D. 1955. Infestation of sheep with face louse *Linognathus ovillus*. *Aust. Vet. J.*, 31: 22-26.
- Murray, M.D. 1957a. The distribution of eggs of mammalian lice on their hosts. I. Description of oviposition behaviour. *Aust. J. Zool.*, 5: 13-18.
- Murray, M.D. 1957b. The distribution of eggs of mammalian lice on their hosts. II: Analysis of the oviposition behaviour of *Damalinia ovis* (L.). *Aust. J. Zool.*, 5: 19-29.
- Murray, M.D. 1957c. The distribution of eggs of mammalian lice on their hosts. III: The distribution of eggs of *Damalinia ovis* (L.) on the sheep. *Aust. J. Zool.*, 5 (2): 173-182.
- Murray, M.D. 1960a. The ecology of lice on sheep. I: The influence of skin temperature on populations of *L. pedalis* (Osborn). *Aust. J. Zool.*, 8: 349-356.
- Murray, M.D. 1960b. The ecology of lice on sheep. II: The lice on sheep. II: The influence of temperature and humidity on the development and hatching of the eggs of *Damalinia ovis* (L.). *Aust. J. Zool.*, 8 (3): 357-362.
- Murray, M.D. 1962. Efficiency of insecticides against the sheep body louse (*Damalinia ovis*). *Aust. Vet. J.*, 38(5): 308
- Pearse, B.H.G. and Baldock, C. 1994. Attitude of Queensland sheep grazers to sheep lice (*Bovicola ovis*) control practices. *Wool. Tech. Sheep. Breed.* 42: 120-128.
- Pearse, B.H.G., Gardner, L.A. and Baldock, C. 1994. Probability of correctly identifying a lice affected flock of sheep using visual inspection (fleece parting). *Wool. Tech. Sheep. Breed.* 42, 144-149.
- Rawat, B.S., Kumar, A. and Saxena, A.K. 1991. Prevalence of *Haematopinus suis* Linne. (Phthiraptera: Haematopinidae). On swine belonging to an Indian locality. *Rivista di Parasitologia*, 8 (2): 93-97.
- Ward, M.P. and Armstrong, R.T.F. 1999. Prevalence and clustering of louse infestation in Queensland sheep flocks. *Vet. Parasitol.* 82: 243-250.
- Williams, R.E. 1986. Epidemiology and control of ectoparasites of swine. *Food Animal practice*, 2(2): 469-481.
- Wooten-Saadi, E.I., Vail, C.A.T., Williams, R.E. and Gaafar, S.M. 1987. Incidence of *Sarcoptes scabiei* (Acari : sarcoptidae and *Haematopinus suis*) (Anoplura : Haematopinidae) on swine in Indiana. *J. Econ. Entomol.*, 80 (5) : 1031-1034.