

**ECTO-PARASITE INFESTATION IN LIVESTOCK: AN
EXPLORATORY STUDY IN HASSAN, KARNATAKA**
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Abstract: Present study was conducted in Halekoppalu, an adopted village of Veterinary College, Hassan, Karnataka. Focused group discussions with the villagers revealed that ecto-parasite infestation was one of the major problems in livestock rearing. Hence, an exploratory study was conducted with an objective to identify ecto-parasite infestation in livestock and recommend suitable strategies for its control. A sample of 48 livestock keeping farmers was selected randomly for the study. Results revealed that majority of the farmers were keeping Holstein Friesian and Jersey crossbred cows along with indigenous cattle. Sixty percent of the respondent revealed that ticks were the main ecto-parasites of cattle followed by flies (43.83%). Deltamethrin and herbal preparations were commonly used in tick control. More than half of the respondents had consulted veterinary experts for control of ecto-parasites and hand spraying of commercial preparation was most commonly practiced method. Lack of knowledge on ectoparasite control, annoyance and distress caused by external parasites, *etc* were considered as major problems. The laboratory examination of the collected ticks identified as *Rhipicephalus (Boophilus) annulatus* and *Rhipicephalus haemophysalides*. The annoyance causing flies were found to be *Haematobia irritans*. The villagers need to be made aware of ecto-parasites control measures, scientific housing management, composting and proper disposal of farm waste.

Keywords: Ectoparasites, Flies, Ticks, Control, Babesiosis.

Introduction

Livestock are integral component of the rural livelihood system. Most of the small, marginal farmers and landless labours, keep one or other type of livestock (Ahuja and Redmond, 2001), mainly to utilize the agricultural by-products, generate employment, as a source of food and supplement family income. The productivity of Indian livestock with respect to milk, meat and wool is less than world average (GOI, 2012). The lower productivity is attributed to factors like low productivity of non-descriptive animals, scarcity of feed and fodder, ignorance about scientific animal husbandry practices, poor veterinary services,

parasitic infection and outbreak of disease etc. Parasitic infections are considered as one of the main factors for lower production.

Ecto-parasite infestation in livestock will lead to economic losses to the livestock keeping resource poor farmers due to loss of productivity, mortality and skin diseases. The common ecto-parasites found in tropical climate are tick, flies, mosquitoes, lice, fleas and mites. Ecto-parasites cause different health problems such as mechanical tissue damage, irritation, inflammation, hypersensitivity, abscesses, weight loss, lameness, anaemia and in severe cases death of infested animals with the consequent socio-economic implications on livestock keepers (Nyangiwe and Horak, 2007). Cattle and buffaloes are frequently and heavily infested with multi-species of ticks in India, which apart from transmitting diseases such as Theileriosis, Babesiosis and Anaplasmosis, also cause extensive damage to the livestock through health and production losses (Ghosh and Nagar, 2014). In India, tick and tick borne diseases cause an estimated loss of US \$498.7 million (more than 2000 crores) per annum (Ghosh et al., 2006 and 2007). Hence, present study was conducted with the aim to explore ecto-parasite infestation status of livestock in the above mentioned village for educating the farmers in control of parasitic infestation.

Materials and methods

As a part of extension mandate, Veterinary College, Hassan has adopted Halekoppalu village to cater the extension needs of the livestock farmers. Hence, present study was purposively conducted in the adapted village, employing exploratory research design. A sample of 48 livestock rearing farmers was selected randomly from the village. Pre-tested, semi-structured interview schedule with personal interview method was used in data collection process. The collected data was analyzed and expressed in frequency and percentages. In addition to data, samples of ecto-parasites like ticks and flies were collected from the study village for laboratory examination.

Results and discussion

Common external parasites of the livestock in Halekoppalu village

About 60 per cent of the respondents opined ticks were the most common ecto-parasites infesting the cattle followed by flies (45.83%) and lice (Table 1). Ecto-parasites infestation varied with cattle breed type. Crossbred Holstein Friesian (HF) cattle showed higher incidence of tick infestation followed by Jersey crossbred (12.5%) cattle and indigenous cattle. About 30 per cent of the respondents revealed flies as important ecto-parasites in HF crossbred cattle followed by indigenous cattle (16.67%). In the support of present finding

Chhillar et al (2014) also reported higher incidence of tick infestation in cattle than buffalo in the state of Haryana. The variation in prevalence of ticks in a particular area depends on weather conditions favorable for survival of larval ticks in the environment and also adapted management practices in livestock rearing (Estrada-Peria, 2008).

Table 1: Different types of external parasites of in various households of Halekoppalu village (N=48)

Sl No	Particulars	Indigenous cattle	HF Cross	Jersey Cross	Total*
1	Ticks	5 (10.42)	18(37.50)	6 (12.5)	29(60.42)
2	Lice	2(4.17)	1(2.08)	-	3(6.25)
3	Lice eggs	-	1(2.08)	-	1(2.08)
4	Flies	8(16.67)	14(29.17)	-	22 (45.83)

Figures in parenthesis indicates percentages, *The totals do not add up to n=48

Distribution of external parasites on animal body

Farmers response and field observations revealed that lice were mainly concentrated at tail switch followed by abdomen region (Table 2). Whereas, ticks were commonly found at abdominal region followed by inner side of ear flap and sometimes distributed throughout the body. Majority of the farmers opined that flies were the major annoyance causing ecto-parasites and generally distributed throughout the body. In all, ecto-parasites were mainly distributed throughout the body of animal followed by abdominal region, inside the ear flap and at tail switch. Likewise, few parasites were found on udder tail, poll region, around the eyes and between the toes. Present results are supported by the Ravikumar et al (2015) who found that the predilection site for ticks in cattle were dewlap, umbilicus, udder and ear pinna.

Table 2: Distribution of external parasite on different location of animal body (N=48)

Sl No	Particulars	Distribution of ecto-parasite on animal body*									Total
		Under tail	Tail switch	Inside ear	Between toes	Throughout the body	Abdomen area	Poll	Around eyes	Other parts	
1	Lice	1(2.08)	3(6.25)	1(2.08)	-	-	2(4.16)	-	-	-	7(14.58)
2	Ticks	2(4.16)	3(6.25)	11(22.91)	4(8.33)	9(18.75)	12(25.00)	1(2.08)	2(4.16)	3(6.25)	47(97.91)
3	Fleas	0(00)	1(2.08)	-	-	1(2.08)	1(2.08)	-	-	-	3(6.25)
4	Flies	1(2.08)	3(6.25)	1(2.08)	1(2.08)	16(33.33)	3(6.25)	5(10.41)	5(10.41)	1(2.08)	36(75.00)
Total		4(8.33)	10(20.83)	13(27.08)	5(10.41)	26(54.16)	18(37.5)	6(12.5)	7(14.58)	4(8.33)	93

Figures in parenthesis indicates percentages, *The totals do not add up to n=48

The investigation report of Chhillar et al (2014) found that ticks were the major external parasites in Haryana and belonged to genus of Rhipicephalus, Hyalomma and Dermacentor.

Use of ecto-parasitocidal drugs

In control of ectoparasites, various methods of application of acaricides includes dipping, spraying and pour-on preparations. Majority (64.58%) of the respondents used different commercial and herbal preparations available in the market against the ecto-parasites (Table 3). Most of the livestock keepers used drugs, mainly to control ticks followed by flies and fleas. Irrespective of the ecto-parasite infestation, respondents used commercially available preparation of deltamethrin in control of ecto-parasites. The informal discussions with the respondents revealed that farmers were using ecto-parasitocidal drugs on livestock mainly by consulting fellow farmers and were little aware of dosage and correct schedule of using these drugs. Iqbal et al (2006) reported that chemical control method in tick control was considered as one of the best methods and common chemicals used were arsenic, chlorinated hydrocarbons, organophosphorous compounds and carbamates. Similarly, majority of the livestock farmers in the study are using chemical preparation in control of ecto-parasites on consultation with veterinarians and para-vets.

Table 3: Ecto-parasitocidal drugs used in Halekoppalu village* (N=48)

SI No	Lice	Ticks	Flea	Fly	Maggot
Deltamethrin	2 (4.17)	10 (20.83)	2(4.17)	5(10.42)	2(4.17)
Herbal commercial preparation		5 (10.42)	1(2.08)	4 (8.33)	
Fenvalerate				1(2.08)	
DDT		1(2.08)			
Flumethrin		3(6.25)			
Amitraz		1(2.08)			
Ivermectin		3(6.25)			
Cypermethrin		4 (8.33)			
Propoxur powder		1(2.08)	1(2.08)		
Dimethoate		-		1(2.08)	
Total	2 (4.17)	28(58.33)	4(8.33)	11(22.92)	2(4.17)

Figures in parenthesis indicates percentages, *The totals do not add up to n=48

Consultation and source of information in control of ecto-parasitic infestation

More than half of the respondents sought consultation from the local veterinarian in control of ecto-parasites (Table 4). Respondents were using information from multiple sources like past acquired experience, information from neighbours and druggist for purchase and

utilization of drugs against the ecto-parasites. With respect to application of ecto-parasiticidal drug, hand spraying was the commonly used method followed by the dipping. It was also found that more than half of the respondents were regularly changing drugs against the parasites. For small ruminants like sheep and goat dipping was commonly used method whereas in case of large ruminants like cattle and buffalo, hand spraying of ecto-parasiticidal drug was commonly used. Present findings are not in concurrence with the findings reported by Meena et al (2015) wherein majority of the livestock keeping households in Rajasthan using self-medication in treating the animals.

Table 4: Consultation and treatment for ecto-parasite infestation in livestock (N=48)

#	Particulars	Frequency	Percentage
1	Consultation with a veterinarian		
	Consultation sought	25	52.08
	No consultation is made	23	47.92
2	Source of information on ecto-parasite control		
	Previous experience	14	29.17
	Neighbours	9	18.75
	Druggist	8	16.67
	Others	17	35.42
3	Method of using the drug		
	Hand spraying	39	81.25
	Dipping	9	18.75
4	Use of ecto-parasiticides		
	Same drug is used always	21	43.75
	Changed frequently	27	56.25

Application of ecto-parasiticidal drugs

Majority of the respondents were not following standard protocols while application of ecto-parasiticidal drugs (Table 5). Only about five per cent of the respondents provided drinking water to animal before application of medicine to prevent accidental consumption of drugs. Only about 5% of the respondents applied medicines against ecto-parasites during sunny weather and rest of the respondents used ecto-parasiticidal drugs on their convenience irrespective of weather conditions. About 30% of the respondents washed their animals after dipping/spraying of the medicine against the external parasites. Few of the respondents had noticed itching, hair loss and poisoning symptoms sometimes in livestock after application of ecto-parasiticidal drugs on animal body.

Table 5: Details of application of ecto-parasitocidal drugs in livestock (N=39)

SI No	Particulars	Frequency	Percentage
1	Water given to animal for drinking before application of medication	5	12.8
2	Ecto-parasitocidal medication applied on animal body only in sunny weather	5	12.8
3	Ecto-parasitocidal medication applied at anytime irrespective of weather	8	20.5
4	Animals are washed after application of ecto-parasitocidal medicine	11	28.2
5	Poisoning symptoms are noticed after medication	1	2.6
6	Hair loss from the body coat of the animal is seen after medication	4	10.3
7	Itching symptoms are noticed in animals after medication	5	12.8

Feeding practices followed in livestock rearing at Halekopalalu village

Semi-intensive method of rearing livestock was the most commonly practiced method in livestock rearing (Table 6). Nearly 67 per cent of the respondents practiced combination of free grazing and stall feeding, based on the season, agricultural operations and availability of fodder for grazing etc. Nearly one third of the respondents were completely dependent on free grazing of the livestock whereas small percentage of respondents practiced only stall feeding. As most of the respondents practiced grazing in the open field, it may be one of the reasons that livestock pick up ecto-parasite infestation because of free living stages of parasites.

Table 6: Grazing practice in Halekoppalu (N=48)

SI No	Grazing practice	Frequency	Percentage
1	Free grazing	13	27.08
2	Partial free grazing + stall feeding	32	66.67
3	Stall feeding	3	6.25

General management practices followed in livestock rearing at Halekopalalu village

With respect to animal shed, majority (45.83%) of the respondents had concrete floor in their animal shed followed by mud flooring. The other flooring methods used were flooring with the use of small stone and large stone slabs. It is quite noticeable that mud flooring and flooring with small stone having crevices by nearly half of the respondents is matter of concern because this is ideal place for breeding of ticks. Likewise, with respect to cleaning of animal shed, majority of the respondents cleaned/washed animal on daily basis followed by

once in week (35.42%) and once in two days (14.58%). More than 50 per cent of the respondents housed livestock in the open premises and hence livestock getting infected with the ecto-parasites is high. The cracks and crevices present in the animal sheds are also the breeding sites for the external parasites. Urquhart et al. (2003) reported that ticks have ability to protect themselves against adverse climatic conditions and uses the cracks and crevices in the walls and floor as breeding site.

Table 7: Details of flooring of the cattle shed and sanitation measures followed (N=48)

Particulars	Frequency	Percentage
Floor type		
Mud	17	35.42
Laid with small stones with crevices	5	10.42
Neatly laid large stone slab flooring	4	8.33
Concrete floor	22	45.83
Washing/cleaning of the floor		
Daily	21	43.75
Once in two days	7	14.58
Weekly	17	35.42
Fortnightly	3	6.25
Housing premises for livestock		
Housed in open premises	25	52.08
Not housed in open premises	23	47.92

Conclusion

It can be concluded from the study that major annoyance causing ecto-parasites of livestock in the adopted village (Halekoppalu) of Veterinary college, Hassan were ticks and flies. The laboratory identification revealed that *Rhipicephalus (Boophilus) annulatus* and *Rhipicephalus haemophysalides* are the common species. The annoyance causing flies was found to be *Haematobia irritans*. These flies breed in fresh dung, hence livestock owners were advised to remove the dung from animal shed on regular interval with adaption of proper manure disposal method.

Commercial Deltamethrin compounds and herbal preparations were the commonly used drugs by livestock farmers mainly against the ticks and flies. More than half of the respondents consulted local veterinarians for treatment of ecto-parasite infestation. Respondents changing the drugs regularly against the ecto-parasites and consulting multiple source of information on ecto-parasite control. Semi-intensive method of feeding with combination of seasonal grazing cum stall feeding was most widely practiced in livestock

rearing. Almost less than half had mud flooring in the sheds. Ecto-parasitic infestation was the major problem in the selected village.

Ecto-parasites of livestock are causing direct and indirect economic losses to the livestock farmers by transmitting the diseases, reducing the milk production, causing the annoyance, and incurring extra treatment costs. Most of the ecto-parasitic infestations can be preventable with good management practices. Hence, extension education activities are to be designed to educate the livestock farmers in control and prevention of ecto-parasitic infestation.

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