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Studies on efficacy of anthelmintic in treatment of sucking lice and tick infestation in organised farm of tellicherry goats

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Abstract

The present study was conducted to determine the prevalence and type of sucking lice and tick infestation associated with ectoparasites reported in an organized Tellicherry goat farm at Dindigul district of Tamilnadu during 2011-12. Clinical examination and laboratory analysis were carried out in 200 goats. The collected raw data were analyzed using χ^2 -test. A total of 6 species of ectoparasites were identified, of them 3 were ticks namely *Haemaphysalis bispinosa* (34.4%), *Boophilus microplus* (27.2%), *Rhipicephalus sanguineus* (7.2%), and one was mite, *Psoroptes cuniculi* (5.6%) and 2 were lice such as *Damalinea caprae* (20.8%) and *Linognathus stenopsis* (18.4%). Relatively low parasitic burden was found in case of *R. sanguineus* (1.33±0.516) infestation. The study showed that significant (P<0.05) high proportion of ticks in young kids and goats less than a year with poor bodily condition. The prevalence of sucking lice in the present study was high in an organized Tellicherry goat farm which affected the productivity and health status of goats and a plethora of control measures was advocated along with the regional Veterinary Assistant Surgeons against these deadly suckling lice and their economic loss in goat farms.

Keywords: Tellicherry goat farm -suckling lice and ticks- Ectoparasite infestation-control

Introduction

Small ruminants are reared mostly by the poor and marginalized farmers, an important livestock species in India and other developing countries^[1]. Goats play an important role in the rural economy and internal trades of Tamilnadu. About 97.90% of goats are distributed in rural areas and 2.10% in urban areas. Goat constitutes an important species of livestock in India and contributes greatly to food, rural employment, and the gross domestic product (GDP). Presently owing to its value on meat, organized goat farms are sprouting up in Tamilnadu^[2-4]. Infestation by ectoparasites could lead to economic losses and loss of productivity, mortality and at times there is rejection of preslaughter skin defects owing to the infestations on skin. Zoonotic aspects have gained more importance as they transmit several types of pathogens between animals and to humans due to their blood sucking habits.

But goat rearing is hindered by various problems and among them parasitism is an important limiting factor in Southern Tamilnadu as the climatic condition favors the development and survival of various parasites. Of the parasitic problems, ectoparasitic infestations are commonly seen in goats^[2].

Common ectoparasites of animals are ticks, lice and mites^[5]. They are annoying pests because of their movement over the skin. Both biting and sucking lice are ectoparasites that adversely affect low productivity in goats^[6]. The damage done by the ectoparasites cause considerable amount of blood loss, irritation and annoyance which leads to retarded growth, loss of weight and reduced milk and meat production. The infested goats bite and rub the affected area so that myiasis and other infections may occur which might lead to death of the animals^[7]. Ectoparasitic infestations reduce the quality and market value and has emerged as a major constraint on extensive goat farming in recent years. This research paper aims to study the population of ticks infested along with suckling lice in an organized Tellicherry goat farm reared under intensive system and to find out the efficacy of anthelmintic against the various ectoparasites and its effective control in field conditions.

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2. Materials and Methods

A disease investigation was conducted in an organized Tellicherry goat farm of 200 nos in Devinaickenpatti, Dindigul District which was reported to have ectoparasitic clinical manifestations continuously and this study period is from Feb 2011- March 2012. The skin had abnormal pigmentation, desquamation, ulceration and alopecia and the goats were thoroughly investigated by close inspection, digital palpation and parting the hairs. Ectoparasites were counted in per square inch of area.

2.1 Collection and identification of ectoparasites

Ticks and lice were collected from different parts of the body of the goats by hand picking and by using tools. The point of attachment was smeared with ethanol. Adequate precautions were taken to preserve the mouth parts and appendages of the ectoparasites during collection. To collect mites, skin scrapings from the affected areas were collected and the skin scrapings were examined by adding 10% potassium hydroxide [8]. Ticks and lice were preserved in 70% alcohol in clean, well-stopper glass vials.

The direct physical inspection of each 10.16-cm² region of neck and loin per goat was performed to screen ectoparasites. This technique was previously applied [9]. The goats affected were evaluated for ectoparasites at least 10 eggs per count (EPC) for ticks and at least 50 EPC for lice) were considered. Ectoparasites were identified according to the keys and descriptions [7, 10].

2.2 Methodology of Treatment

The goat was administered Neomec SX Injection *(Ivermectin) subcutaneously @0.2mg/kg body weight and repeated after two week interval.

*A Brand of Intas Pharmaceuticals, Ahemedabad.

2.3 Statistical analysis

The collected data were performed on data by Statistical Package for Social Sciences (SPSS) 13.0 software by using χ^2 -test and statistical differences ($p < 0.01$ and $p < 0.05$) between groups were calculated. To determine the susceptibility of different groups of goats to ectoparasitic infestation, odds ratio was calculated [11].

3. Results and Discussion

Among 200 goats examined, nearly 72.8% were infested with one or more species of ectoparasites. A total of 6 species of ectoparasites were identified, of them 3 were ticks namely *Haemaphysalis bispinosa* (34.4%), *Boophilus microplus* (27.2%), *Rhipicephalus sanguineus* (7.2%) and one was mite, *Psoroptes cuniculi* (5.6%) and 2 were lice such as *Damalinia caprae* (20.8%) and *Linognathus stenopsis* (18.4%). Mean parasitic burden was almost equal in case of *L. stenopsis* (3.93 ± 2.219) and *D. caprae* (3.00 ± 2.424). Relatively low parasitic burden was found in case of *R. sanguineus* (1.33 ± 0.516) infestation.

Our study finding is similar to that of previous work done in India by in Kerala (74.73%) [12] and in Tamilnadu (72.73%) [13]. In this study area, the identified 6 species of ectoparasites, is similar to the previous report who documented that goat as alternative hosts of cattle ticks [14].

Prevalence of ectoparasites was lower (51.61%) in young animals (>6 months to 1 year) than that of kids (≤ 6 months), (82%) and older animals (> 1 year), (79.55%). Calculated odds ratio implied that kids were 4.27 times more susceptible to ectoparasitic infestation than young goats which are similar

to the findings [15]. But the older animals were 3.65 times more susceptible than young animals.



Fig 1: Showing *Lignonathus stenopsis* under 10x objective optical Microscope, Italy (Head end, cervical, dorsal and caudal end).

Table 1: The prevalence of ectoparasite infestation in goat.

Species of Ectoparasite	No. (%) goats positive
<i>Sarcoptes scabiei</i> var <i>caprae</i>	178(53.29)
<i>Lignonathus stenopsis</i>	33(9.88)
<i>Damalina capre</i>	7(2.08)

In this study, prevalence of ectoparasites was slightly higher in females, (77.63%) than males, (65.31%) which resulted in 1.84 times more susceptibility of female to ectoparasitic infestations than males. In male goats, prevalence was higher in case of *D. caprae* (30.61%), followed by *L. stenopsis* (24.49%). In female goats, prevalence was higher in case of *Sarcoptes scabiei* var *caprae* (42.11%) followed by *L. stenopsis* (34.21%) which is in accordance with earlier findings also [16]. This variation is due to relate to the management system where animals are permitted to graze together in communal fields in the mixed farming system of the study area. Fig. 1 shows the microscopic view of the lice infection and Fig. 2 shows the externally infected lice infestation.



Fig 2: Goat affected with ectoparasitic infestation.



Fig 3: Recovered goat after treatment.

The efficacy of Ivermectin against ecto parasites in the present study corresponded to the findings of earlier studies [17]. A 100% reduction of EPC was recorded in from day 7 through day 28. Fig 2 shows the recovered goat after Ivermectin treatment. This study also revealed that, the goat sucking louse; *L. stenopsis*, is the second most prevalent ectoparasite in goats examined in the farm. The sucking louse *L. stenopsis* (9.88%) is found to be more prevalent than the biting louse *Damanalia caprae* (2.08) in goats and is comparable with earlier study [18] as observed in goat skins. Hence ectoparasite incidence of Lice in goat skins indicated one of the most a relatively higher level of sucking lice on the skin of goats.

The previous study of *L. stenopsis* (68%), *B. microplus* (60%) and *R. haemaphysaloides* (52%) in goats [19] were slightly different from our study due to variation in the geographical locations, climatic conditions of the experimental area and methods of study and breed of goats.

In the present study the distribution of ticks in ears were more (71.3%) followed by other parts which is in accordance with the findings of previous study where the ticks were found located mostly on the ears (69.76%) followed by ear and other parts viz., eye, axis, anus, tail and vulva (30.21%) and next to the ear, the ticks were more in ear and anus (7.29%) and ear and vulva (5.21.) [13] This might be attributed to the fact that the attachment of tick is dependent on the temperature and the thickness of the skin of the animal [20-21].

The present findings are in accordance with earlier studies regarding the efficacy of Ivermectin against both ecto and endoparasites without any adverse effect [22]. Those studies reported 89.5%-100% efficacy against endo and ectoparasitic infection in goats or other small ruminants reared in a backyard system in Bangladesh. A slight variation of the efficacy of Ivermectin in the previous study might be due to the degree of ectoparasitic infection, the sample size used for different experiments, dose and preparation, and the route used for administering the drugs.

4. Conclusion

The present study results revealed that tick infestation in goats was of very high intensity in organized farm in Dindigul district of Tamilnadu (India). The study showed high proportion of ticks in young kids and goats less than a year with poor bodily condition and anthelmintic effect of Ivermectin was recorded as 89.5% - 100% efficacy against ectoparasitic infection in goats reared in an organised farm in Tamilnadu. The farm owner was advised suitably for acaricide application periodically and follow target specific dipping as these may lead to igh morbidity, various disease transmission, decrease in skin/hide quality and finally significant economic loss. Therefore adoption of package of health practices in tick control will improve the economy of the farm in turn the farmer as capital investments in construction and maintenance of organized farms are much more than that of conventional goat rearing.

5. Acknowledgement

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