

Ethnoveterinary Practices and Potential Herbal Materials for the Treatment of Ticks in North Gondar

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Abstract: Ticks are obligate blood feeding ectoparasites of vertebrates and induce huge production loss in livestock industry and creating serious public health problems in the world. This study was conducted to explore ethnoveterinary practices that are performed by livestock owners to control tick infestation in some districts of North Gondar, Ethiopia and to identify potential herbal materials used to control tick infestation in livestock. Three districts of the zone were selected from each agroecological zone. The data were collected using semi-structured questionnaire and field observation. Sixty randomly selected livestock owners were used as the source of information. Tick infestation is prevalent in all districts. Loss of body condition, disease transmission and damage of skin were the most commonly mentioned effects of tick infestation on the animals. The most commonly used tick control methods were use of acaricides and manual removal, however, use of herbs, washing with soap and cutting with sharp materials were also mentioned by respondents. Nine potential medicinal plants were identified that could be used to kill or repel ticks. In conclusion, tick infestation is the problem in the districts. Livestock owners use different techniques to remove tick from the animals and their effectiveness has to be evaluated.

Key words: Ethnoveterinary Practices • Ticks • Herbal Plants • North Gondar

INTRODUCTION

Tick and tick born diseases (TBD) are widely distributed throughout the world particularly in tropical and subtropical countries, which cause tremendous economic losses in livestock production [1]. The economic losses caused by tick and TBD in cattle alone are estimated at 13.9 - 18.7 billion United States dollar annually worldwide [2]. The problem is severe in developing countries. In Ethiopia, ticks infestation is one of the most important causes of huge economic loss when infest livestock [3-5].

Ticks are obligate ectoparasites of most types of terrestrial vertebrates virtually wherever these animals are found. They are large mites and thus are arachnids, members of the subclass Acari. Tick bites, in addition to causing irritation have been implicated in the transmission of viral, rickettsial, bacterial and protozoal diseases affecting wild, domestic animals and humans. By creating different grade of lesions on the skin, ticks down grade

the quality of hides and skins up to 20–30%. They also predispose animals to secondary attacks from other parasites such as screw worm flies and infection by pathogens like *Dermatophilus congolensis* and other bacterial diseases [6-8].

Ticks are controlled by application of acaricides specially organophosphates, amidines and synthetic pyrethroids, chlorinated hydrocarbons and arsenicals [9]. The cost of acaricides together with loss of enzootic stability, residues in food, undesirable effects on the environment and development of resistance by tick are some of the problems related to utilization of acaricides [2] which necessitate the searching of different alternatives. Livestock owners use different techniques to control tick infestation. Some of them are very efficient but others are less. Ethnoveterinary practices may provide very good alternatives since they are cheap and easily accessible. It can replace modern practices especially for those folks living in remote rural areas where modern veterinary service is scant.

Several plants have been shown to possess anti-tick, insecticidal, growth inhibiting, antimoulting and repellent activities [10, 11]. Preliminary results obtained by Ghosh *et al.* [7] using alcoholic extracts of *Annona squamosa* and neem (*Azadirachta indica*) against different life stages of *Hyalomma* and *Boophilus* were highly promising. However, there is no information available about the potential herbal materials that can be used to control tick in North Gondar. Therefore, the objectives of this study were to explore ethnoveterinary practices that are performed in some districts of North Gondar and to identify potential herbal materials used to control tick infestation in livestock.

MATERIALS AND METHODS

The Study Area: The study was conducted from November 2011 to June 2012 in North Gondar Zone of the Amhara regional state. Many of the dwellers either rural or urban are involved in animal production and the zone has an estimated sheep population of 524,087, goats 682,264 and cattle 1,936,543. Many other non-food producing animals are also available in the zone [12].

Data Collection Methods: Three districts of the zone were selected from each agro-ecological zone (Debank form highland, Dembia relatively low altitude, Gondar Ketema from midland) (Fig. 1). The data were collected by the use

of semi-structured questionnaire and field observation. Sixty randomly selected livestock owners were used as the source of information. Listed plants were collected and biologically identified by taxonomists.

Data Analysis: The data were recorded in excel spreadsheet. Descriptive statistics (mean, percentage and graphs) were used to express the results.

RESULTS

Respondents Demographic Characteristics:

The total numbers of respondents were 60 livestock owners, 20 from each district. Forty nine of the respondents were male, the rest were female. The respondents' age ranges from 30 to 55 with an average of 43.1. All respondents have at least five domestic animals.

Tick Infestation and Tick Born Diseases: Tick infestation is prevalent in all districts where the data were collected (Fig. 1). Loss of body condition, disease transmission and damage on the skin and hide were the most common findings in tick infested animals (Table 1). Extensive survey was not made to confirm the presence of different tick born diseases in the study districts. However, Babesiosis locally called "Demashenae" was mentioned by respondents.

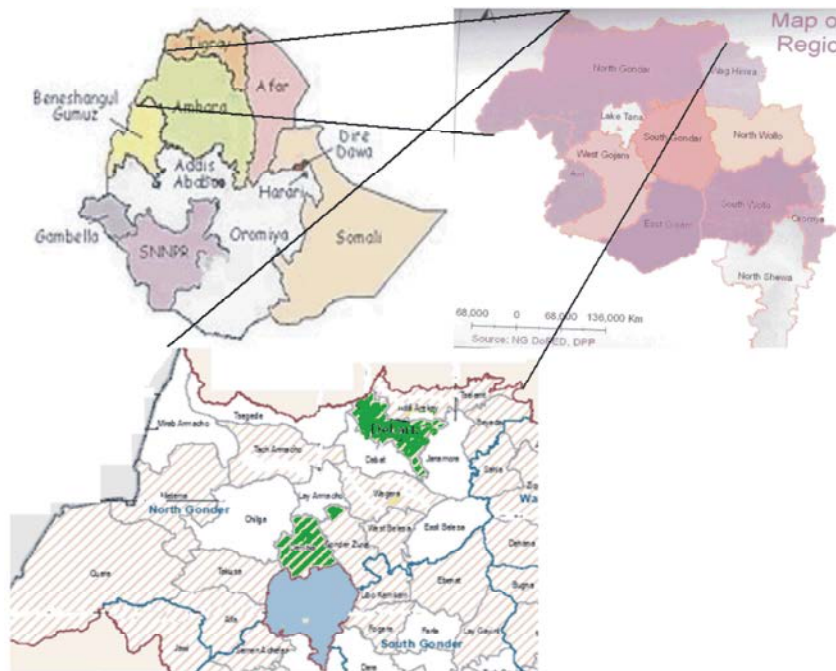


Fig. 1: Map of the study area (Debank on the top, Gondar Ketema at the middle), Dembia at the lower) (stained green)

Table 1: Effects of tick infestation

S/n	Effects mentioned	Local Expression	Respondents	
			Number	Percent (%)
1	Wound	Makusel	9	15.00
2	Loss of body condition	makesat	27	45.00
3	Mastitis and teat damage	Tute mgudate	8	13.33
4	Lameness	masnekes	4	6.67
5	skin damage	Qoda megudat	10	16.67
6	Transmit diseases	Besheta masetlalfe	6	10.00
7	Itching	masakek	3	5.00
8	Blood loss	demmentet	7	11.67
9	Alopecia	Ytsegur melat	1	1.67

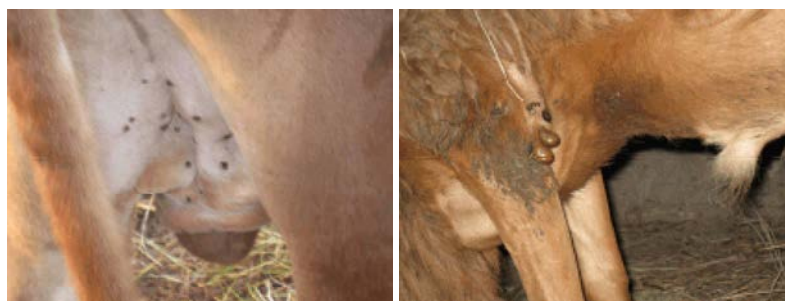


Fig. 2: Tick infested animals (ox and sheep) in the district

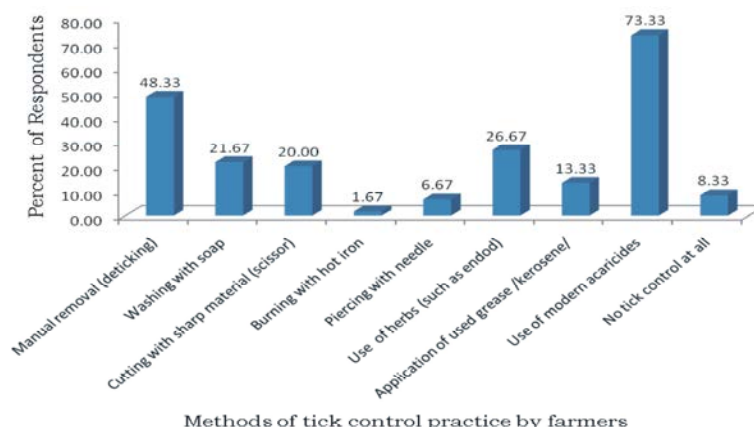


Fig. 3: Methods of tick control practiced by farmers



Fig. 4: Most commonly used acaricides (amitraz and diazinon) by livestock owners

Tick Control Methods: Respondents mentioned that the most commonly used tick control methods were use of acaricides and manual removal but use of herbs, washing with soap and cutting with sharp materials were also

mentioned by respondents (Fig. 3). It was also possible to observe that amitraz and diazinon are most commonly used acaricides in the district (Fig. 4) and hand spray was commonly utilized method of application.

Potential Herbal Materials Used to Treat Ticks Infestation: Most respondents (60.00%) didn't know any herbal material that is used for tick control. However, some mentioned even more than one type of plant that can be used to treat tick infestation. Nine potential medicinal plants were mentioned by respondents that could be used to kill or repel ticks. A plant locally called Zikita was most commonly mentioned followed by Birbira (Table 2 and Fig. 5).

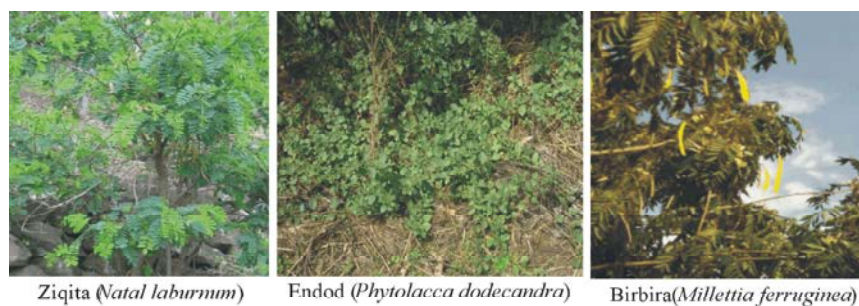


Fig. 5: Plants having effect on the tick

Table 2: List of plants having killing or repelling effects

s/n	Local name	Common name	Scientific name	Part used	Respondents	
					N ^o	%
1	Endod	Gopo Berry, or African soapberry	<i>Phytolacca dodecandra</i>	Seed/leaf	8	13.33
2	Zikita/digtha/	Natal Laburnum	<i>Calpurnia aurea</i>	leaf	15	25.00
3	Thophiya (Tobia)	apple of Sodom	<i>Calotropis procera</i>	Sap, leaf	8	13.33
4	Birbira		<i>Milletia ferruginea</i>	Seed, leaf	12	20.00
5	Lenquata		<i>Grewia ferruginea</i>	barck	8	13.33
6	Wegert		<i>Silene macroserene</i>	leaf	4	6.67
7	Yemder-inbway	Cucumis	<i>Cucumis prophetarum</i>	Fruit	3	5.00
9	Kulkual	cactus	<i>Euphorbia abyssinica</i>	sap	2	3.33
Total	60					

DISCUSSION

The respondents indicated that tick infestation is prevalent in all districts and inducing losses by making the animal to loss its conditions transmit diseases and damage on the skin. The presence of different tick species in the districts were reported by Miruts, [13]. The four more common genera of tick according to his report were *Boophilus*, *Rhipicephalus*, *Amblyomma* and *Hyalomma*. These ticks were known for inflicting problems mentioned by respondents.

Babesiosis was the only tick born disease mentioned by respondents but other tick borne diseases may be available in the area since livestock owners may not fully aware of the roles of ticks in disease transmission and identify diseases based on their source. Mekonnen [9] indicated that tick borne diseases of cattle such as anaplasmosis, babesiosis, cowdriosis and theileriosis (*T. mutans*) are present in Ethiopia. There may not be exceptions for these districts so that these diseases may be available inducing mortality and morbidity in livestock.

Respondents were able to mention different effects of tick infestation on the animal. They are aware of the effects and to make the animal healthy, it has to be free from infestation. To remove ticks from the animal respondents use different techniques. Manual removal and use of commercial acaricides were more commonly mentioned. Some of the tick control methods used by the

respondents may not be as such effective. Especially, manual removal method may leave wound which further damages the skin and predispose the animal for secondary bacterial infections. It is also very difficult to implement it in large herd size. The effectiveness of tick control by the application of used grease /kerosene/ and washing with soap has to be studied well. Greese and kerosene may deprive the tick in getting oxygen that may have a killing effect on ticks.

Even though not too many, different herbal materials were mentioned by respondents employed for treatment of tick infestations. Plants are the potential source of many drugs so this has to be investigated well so potentially very efficient and potent chemical can be extracted from these plants.

In Ethiopia; *Milletia ferruginea* pulverized seeds is used for fish poisoning so that the fish can be caught easily [14]. This indicates the presence chemicals in the plant that could also have killing effect on ticks. Karunamoorthi [15] reported that the root of *S. macroserene* has potent repellent efficiency on mosquito that transmits malaria.

In conclusion, tick infestation is the problem in the districts of North Gondar. Livestock owners use different techniques to remove tick from the animals. The effectivity of these methods has to be evaluated. Some of them may be more important to the modern acaricides since they are cheap and easily accessible.

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