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Comparative efficacy of some plant extracts on Rhipicephalus (Boophilus) microplus infestation on mithun (Bos frontalis) in the north-east

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Abstract

Tick infestation is a common problem encountered in mithun (Bos frontalis), resulting in reduced productivity besides transmitting infections to the host. Present study on the tick infestation on mithun was undertaken at Jharnapani and Porba mithun farms of the National Research Centre on Mithun (semi-intensive) as well as free ranging condition of Nagaland and Mizoram. Present study showed the ixodid tick of the genus Rhipicephalus (Boophilus) microplus was the most prominent tick infesting mithun in this region. A pilot study was undertaken with crude aqueous extracts of neem and tobacco to evaluate the effect of these plant extracts on the survival of the above tick species. Two synthetic acaricides viz., ivermectin and cypermethrin were also used to compare the efficacy of these acaricides against R. (B). microplus. Crude aqueous extract of the tobacco was found highly efficacious against the tick infestations at a low concentration whereas, neem was found effective at much higher concentration. Ivermectin (1m/50 kg body weight S/C) was the most effective synthetic acaricide against R. (B). microplus in this study.

Keywords: Mithun, Rhipicephalus (B) microplus, Plant extract, Acaricide.

Introduction

Mithun is a pride animal and plays an important role in the social, cultural, religious and economic life of the tribal populations of the states of Arunachal Pradesh, Nagaland, Manipur and Mizoram. Tick infestation on the animals of this region is one of the major problems faced by the livestock owners (Singh et al., 1978; Biswas et al., 1994; Rajkhowa et al., 2003). However, there is a lack of study on the evaluation of different acaricides against R. (B). microplus infestation on mithun. Therefore, a pilot study was undertaken to evaluate the efficacy of two crude aqueous plant extracts and compare their effects with two most commonly used synthetic acaricides.

Materials and Methods

External body parts of 96 and 29 mithun, reared at Jharnapani and Porba mithun farms as well as 71 numbers of animals from free ranging condition of Nagaland and Mizoram of irrespective of the age and sex of the animal were examined for occurrence of ticks. For identification purpose, the ticks were handpicked and collected in a sterilized plastic vial, labeled and brought to the laboratory. Ticks were fixed in hot water for a few min, followed by dipping in 10% formalin containing 1-2 drops of glycerin and kept for 24-48 hrs. They were washed thoroughly in running tap water for 6 hrs and processed as per the method of HMSO (1979), mounted in DPX and dried in a BOD incubator at 38°C. Thereafter, the ticks were examined under a microscope and identified using the key of HMSO (1979).

To find out the efficacy of the plant extracts, a total of 24 animals mostly affected with nymphal stages of ticks and adult ticks have been omitted during present investigation. Animals were divided into six groups with four animals in each group in a completely randomized design. Each group was treated separately with crude neem (Azadirachta indica) (500 g/lit. and 1 kg/lit.), crude tobacco (Nicotina tobacum) (100 g/lit.) and cypermethrin (1ml/lit.) as body spray, whereas ivermectin (1ml/50 kg body weight) was used subcutaneously. The four tick infested animals were maintained without treatment as a control group. The plant leaves which were used as crude extracts were initially collected as fresh leaves, sun dried and homogenized to powder by grinding. The powder was solubilized in distilled water for 72 hr.

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