



Short communication

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EFFICACY OF *JASMINUM ABYSSINICUM* TREATMENT AGAINST *HEMONCHUS CONTORTUS* IN SHEEP

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Abstract

Jasminum abyssinicum DC., belongs to the plant family Oleaceae. The plant is used by indigenous farmers in Kenya against internal parasites affecting livestock. The anthelmintic effects of water extract of the leaves obtained from one geographic region was tested on naturally infected adult sheep and lambs with the nematode *Haemonchus contortus*. Sheep faecal samples were collected at day 7 for *Haemonchus contortus* faecal egg counts by the Mc Master slide technique. Results showed that ground leaves of *Jasminum abyssinicum* was efficacious with significant faecal egg count reductions of 69% at day 7 post treatment.

Key words: Anthelmintic; *Haemonchus contortus*; sheep; *Jasminum abyssinicum*

Introduction

Livestock producers have generally derived substantial benefits from the use of anthelmintics in controlling livestock parasitosis. In Africa however, declining funding for veterinary services and the rising costs (occasioned by depreciating value of local currencies) of these services has made it difficult for resource poor farmers to have access to such services. This has led to increasing use of ethno veterinary medicine by African smallholder livestock producers and pastoralists (Abdu *et al.*, 2000; Uza *et al.*, 1996). For example, cattle production in the Northwest Province of Cameroon which is carried out by Fulani herders, who have evolved from a nomadic or transhumant cattle production system, cope with cattle disease situations by adapting strategies often designed to protect animal health. These herders are deeply involved in ethno veterinary practises that were introduced in Cameroon at the end of the last century by nomadic Fulani pastoralists, from

neighbouring Nigeria and Chad, in search of new pastures (Nfi et al., 1999). According to Brandt *et al.* (1995), traditional veterinary practises are used in most developing countries, and being an integral part of the people's culture, their use is not likely to change to a significant degree in years to come.

In recent times, there has been an increasing interest in ethno medical and ethno veterinary practices across the world especially as it relates to the use of medicinal plants in treating various ailments. In the developed world, this move is in response to the production of animals free from industrial chemical inputs (Gasbarre *et al.*, 2001) and the need to discover new therapeutic substances of natural origin with possibly low toxicity to man and animals (Guarrera, 1999). *Jasminum abyssinicum*- DC (Oleaceae family) is a plant that is commonly found within Uasin Gishu District and other districts in Kenya. It is common amongst the Kamba, Kikuyu, Luhya, Maasai, Kipsigis, Keiyo and Nandi communities of Kenya. Although the Keiyo and Kipsigis communities strongly believe *J. abyssinicum* to be efficacious as a livestock anthelmintic, there is no scientific evidence to confirm this allegation.

This work was therefore conducted to determine the anthelmintic property of *Jasminum abyssinicum*. The efficacy of the plant preparation was compared to that of a commonly used oral anthelmintic: Multidose®, Ultravetis- East Africa Ltd (levamisole and rafoxanide combination).

Materials and Method

Study Area

The work was done at a farm bordering the Moi University, Chepkoilel Campus in Uasin Gishu District, Kenya . The location is to the North Western part of Eldoret town. Uasin Gishu District is one of the 18 districts of the Rift Valley province. It lies between longitudes 34 degrees 50' and latitudes 0' 03' and 0 degrees 55' north. The district receives between 900mm-1200mm rainfall occurring between months of March and September with two distinct peaks in May and August (Uasin Gishu District Development Plan, 2002-2008). The district has three agro ecological zones: Upper highlands (UH) in the East, the lower highlands (LH) zones of the north and South – West and the Upper Midlands (UM) on the West (Jaetzold, *et al.*, 1983).

Plant material

The plant material consisted of fresh leaves of *Jasminum abyssinicum* collected at Kuinet, Uasin Gishu district situated about 25km Northwest from Eldoret. The plant was identified by a botanist at the Moi University, Chepkoilel Campus, Eldoret. A voucher specimen was deposited under number KNT 001.

Preparation of experimental extract

Two handfuls of freshly harvested and washed leaves of *Jasminum abyssinicum* were macerated and soaked in 2 lt of cool water. This infusion was then filtered through a sieve. Adult sheep were given 0.3 lt., while lambs were given 0.15 lt.

Multidose®. This drug produced by Ultravetis, East Africa was administered orally at a dose of 1 ml/20 kg (7.5 mg/per kg) live weight. All sheep under treatment were weighed on the day of treatment and deprived of water for half a day after treatment, to avoid further dilution of the drug.

Experimental animals

Anthelmintic studies were carried out on 30 adult sheep and 15 lambs of indigenous mixed breeds, which are reared by several smallholder farmers. The sheep were separated into 3 groups of 16, 14 and 15 for the Multidose® treatment, *Jasminum abyssinicum* treatment and control tests, respectively. At the onset of the experiment they had not been dewormed for over three months. They were all screened initially for faecal eggs by the Modified Mc Master slide technique (Biarden, 1980). After the first screening those with worm egg counts above 100 were selected for the test and positive control experiments. Each of the selected sheep was identified using an ear tag. At day 1 the sheep were weighed using the heart girth method, the first faecal samples collected and then the sheep treated. After treatment, the faecal samples were collected at day 7. The faecal samples collected in the field were carried in small portable coolers in individually labelled plastic bags for each sheep. Faecal egg counts were performed according to the McMaster slide technique. The eggs per gram (epg) counts were used to calculate the percent efficacy of each treatment, based on the faecal *H. contortus* egg count reduction percentage (FECR %). This was corrected for changes that occur in the control group, by the equation below (Presidente, 1985).

$$\text{FECR}\% = 100(1 - (\text{XT}_2/\text{XT}_1) (\text{XC}_2/\text{XC}_1))$$

Statistical analysis.

Statistical comparisons between groups was performed using one- way ANOVA. The percentage in faecal helminth (*H. contortus*) egg reduction count was calculated using the formula below, at the seventh day, to assess the anthelmintic efficacy of the plant, *J. abyssinicum*.

$$\text{FECR}\% = 100(1 - (\text{XT}_2/\text{XT}_1) (\text{XC}_2/\text{XC}_1))$$

Where XT and XC are mean faecal egg count for the treated and control groups, respectively, while 1 and 2 refer to mean faecal egg counts before and after treatment, respectively (Kettle et al., 1982, Riffkin et al., 1984).

Results and Discussion

J. abyssinicum reduced egg count significantly by 69% while Multidose®, the positive control treatment reduced by 70%. At the seventh day *J. abyssinicum* demonstrated anthelmintic efficacy in both adults and lambs (Table 1). Although the percentage is low, there may be a possibility of inaccurate dosage for the plant anthelmintic, as this has not been confirmed. Thus there is need for further tests to confirm the optimum dosage required. Using the recommended dose and administration method, Multidose® showed almost similar efficacy to the plant *J. abyssinicum*. There was no significant difference between *J. abyssinicum* and Multidose® at $p=0.05$.

Table 1. *Haemonchus contortus* faecal mean egg counts, range of the *H. contortus* egg counts for groups of sheep treated with, *Jasminum abyssinicum*, levamisole and rafoxanide combination and the untreated control group and faecal egg count reduction percentage (FECR %) for the two test groups.

Treatment	No	Day 1		Day 7		FECR %
		Mean	Range	Mean	Range	
<i>J. abyssinicum</i> Adult Lambs	14	2550.00	0-2000	857.00	0-2000	69
		2681.82	200-5800	890.91	0-2000	69
		2066.67	1400-3200	733.33	200-1400	67
Multidose®	16	987.50	200-7600	325.00	0-3000	70
Control	15	941.0	0-2000	867.0	0-3000	-

In the present study, *Jasminum abyssinicum* was tested for its efficacy against *Haemonchus contortus*, in sheep. It can be suggested that the plant could serve as a reliable therapeutic agent against helminthosis in traditional veterinary practise. There is need to research into the activity spectrum of the plant on various species of worms. This work was meant to be a screening trial thus to confirm these preliminary results another test with necropsy procedures must be carried out.

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