

COMPARATIVE INVITRO ANTICESTODAL ACTIVITY OF SOME MEDICINAL PLANTS FROM WESTERN INDIA

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Summary

Herbal extract of three medicinal plants were tested for anticestodal efficacy, employing *Raillietina echinobothrida*, a tapeworm of poultry, as a model test parasite. The study revealed that out of different plant extracts tested, *Asparagus racemosus* rhizome extract and *Bambusa arudinacea* leaves extract possess a profound anticestodal efficacy as evident by the mean mortality time of parasites which ranged from 1.53 hrs to 2.30 hrs. respectively in 20mg/ml. Moderate activity was recorded for the leaves of *Aloe vera*.

Keywords : Herbal extract, *Raillietina echinobothrida*, Anticestodal efficacy, *Asparagus racemosus*,

Introduction

Parasitic diseases are among the major public health problems of tropical countries including India. They infect man and also severally invade domestic animals like poultry and dairy animal . The emergence of resistance to anthelmintic drugs, which is now a worldwide phenomenon (Jackson and Coop, 2000) and awareness of consumers about drug residue that potentially enter the food chain (Kaemmerer and Butenkotter 1973) have stimulated investigation into alternative available anthelmintic, such as medicinal plants. Several plants or plant derived preparations are used to cure helminthic infections (Akerele 1990, Satyavati 1990). A number of medicinal plants have been used to treat parasitic infections in man and animals (Nadkarni, 1954, Roy and Tandon, 1999, Githiori et.al. 2002).

This paper describes the anticestodal efficacy of *Asparagus racemosus*, *Bambusa arudinacea* and *Aloe vera*. These plants are selected because they are used in the indigenous system of medicine by some tribal peoples near Sangamner, as an anthelmintic.

Materials and Methods

Preparation of Plant Extracts : The plants used were collected and identified by the plant taxonomist, Dept. of Botany, Sangamner College, Sangamner. The roots of *Asparagus racemosus* commonly called as Shatavari and the leaves of *Bambusa arudinacea* and *Aloe vera*, were collected air dried under shade and ground using grinder

and extracted with methanol using Soxhlet extractor (Gafner et.al. 1985). The methanol extract of plants were obtained by the complete removal of solvent through rota evaporator and the residues were stored at - 4 °c until use.

Testing of the plant extracts : Live specimen of adult *Raillietina echinobothrida* were collected in 0.9% phosphate buffered saline (PBS, pH 7.4) from intestine of freshly necropsied domestic fowl *Gallus gallus domesticus*. The test parasites were maintained in Hank's solution at 37 ± 2 °c inside a incubator. The plant extracts were dissolved in a few drops of 1% Dimethyl sulphoxide (DMSO). Concentration of 5, 10, 20, 40 mg/ ml were prepared and in each case six parasites were released and tested for their mortality. In each case, a set of worms maintained without plant extract but having a few drops of 1% DMSO in Hank's solution served as a normal control. Similarly the six set of worms were also released in drug Albendazole to study comparatively. The anticestodal efficacy of plant extracts was adjudged in terms of the motility and mortality of the test parasites and was monitored at regular time intervals. The mortality of parasites was confirmed by removing the plant-extract treated / control parasites from Hank's solution and dipping them in slightly warm water. The mortality of parasites was assumed to have occurred when all signs of movements had ceased.

Results and Discussion

Table 1: Anticestodal efficacy of plant extracts against *R. echinobothrida* in vitro.

Results are expressed as Mean±SD. *Data represent mean values± SD of mortality (h) for 3 experiments

Plant / Plant Parts	Mean Mortality time in hrs of <i>R. echinobothrida</i> at different concentrations of plant extract			
	5 mg/ ml	10 mg/ml	20 mg/ml	40 mg/ml
<i>Asparagus racemosus</i> (rhizome)	2.30 ± 0.29	2.09 ± 0.05	1.53 ± 0.16	1.35 ± 0.17
<i>Bambusa arudinacea</i> (leaves)	3.05 ± 0.26	2.85 ± 0.45	2.30 ± 0.46	1.73 ± 0.18
<i>Aloe vera</i> (leaf extract)	66.16 ± 1.36	51.55 ± 0.21	42.01 ± 0.42	37.06 ± 0.72
Albendazole	1.60 ± 0.03	1.22 ± 0.12	0.74 ± 0.17	0.43 ± 0.05
Control *	67.49 ± 2.0			

The given Table no. 1 summarizes the effect of plant extracts and Albendazole on mortality time of test parasite *Raillietina echinobothrida*. The worms in the normal control medium showed physical activity for about 67.49 ± 2.0 hrs. Out of different plants extracts tested, *Asparagus racemosus* rhizome extract showed best anticestodal activity, followed by *Bambusa arudinacea* whereas *Aloe vera* showed least activity as revealed by the mean mortality time of parasites as compared to standard drug Albendazole.

The function of the anthelmintic drugs like Albendazole is to cause paralysis of worms so that they are expelled in the feaces of man and animals. The extracts not only demonstrated this property, they also caused death of the worm, especially at 20 mg/ml as compared with the Albendazole. In conclusion *Asparagus* and *Bambusa* have been confirmed to display anthelminthic activities.



fig 1

Dissected Intestine of *Gallus gallus Domesticus*



fig 2

Cestode parasites collected and maintained in Hanks solution

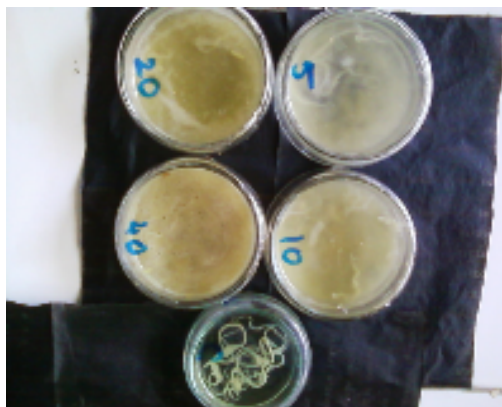


fig 3

Treated with *A. racemosus* in 5, 10, 20, 40 mg/ml



fig. 4

Anthelminthic effect observed and compared with control

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References

1. Athanasiadou S., Githiori J. and Kyriazakis I. (2007) : Medicinal plants for helminth parasite control : facts and fiction. *The Animal Consortium* 1:9, pp 1392-1400.
2. Daniel M. 2006 : Medicinal plants, Chemistry and Properties, Oxford and IBH Publishing Co. Pvt. Ltd.
3. Nirmal S.A., et.al (2008) : Anthelmintic activity of some existing Polyherbal Ayurvedic formulations. *Pharmacology online* 3 : 76-79.
4. Rashtra Vardhana 2008 : Encyclopaedic Dictionary of Medicinal and Economic Plants Vol. I and II.
5. Roy, B. and Tandon, V. (1999) : Flukicidal activity of *Alpinia nigra* (Zingerberaceae) against the trematode, *Fasciolopsis buski*, in humans. *Biomed. Letters* 60 : 23-29
6. Srivastava, B.K. and Srivastava A.K. 1988 : Observation of new cestode parasite, *Raillietina taburensis* n.sp. During ecological study of fowl, *Gallus gallus domesticus* (L.) in Jhansi (India). *U.P.J. Zool.* 8(1) : 40-42.
7. Tangpu V. and Yadav, A.K. (2004) : Anticestodal activity of *Trifolium repens* extract. *Pharmaceutical Biol.* 42 : 1-3
8. Temjenmongla and Yadav, A.K. (2003) : Filaricidal efficacy of some folklore medicinal plants against *Setaria cervi* (Nematoda : Filarioida). *Proc. Zool. Soc. Calcutta.* 56 :57-61.
9. Temjenmongla and Yadav, A.K. (2005) :Anticestodal efficacy of Folklore medicinal plants of Naga Tribes in North – East India. *130 Afr. J. Trad. CAM* 2(2) : 129-133.
10. Yadav, A.K., Tandon, V. and Rao, H.S.P. (1992). In vitro anthelmintic efficacy of fresh tuber extract of *Flemingia vestita* against *Ascaris suum*. *Fitoterapia* 63 : 395 – 398.