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ANTI-PARASITIC ACTIVITY OF CERTAIN INDIGEOUS PLANTS

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ABSTRACT: *The antiparasitic activity of certain indigenous plant extracts was tested against the model bovine filarial parasite Setaria digitata. Among the plants tested, the extracts of Strebulus asper was found to be most effective. The chloroform and other phase of the organic solvents showed most activity indicating that the active compound may be a non polar substance having low molecular weight.*

INTRODUCTION

Lymphatic filariasis is a major public health problem in India with over 300 million people being exposed to risk of infection[1]. The life cycle of the filarial parasite involves three stages, the adult parasite, microfilariae (mf) and the mf becoming the infective larvae. The adult parasites are found in the lymph nodes or lymph vessels of man. Plant drugs have been used for centuries for the treatment of many diseases. DEC is the single most effective drug available today in the treatment of bancroftian filariasis. Suresh *et.al*[2] reported the antifilarial activity of *Anacardium occidentale.* Kumaraswami *et.al*[3] reported the use of lvermectin for the treatment of *W. bancrofti* filariasis. Present study was carried out with an attempt to screen the antiparasitic activity of some indigenous plants.

MATERIALS AND METHODS

Setaria digitata, a bovine filarial parasite similar to the human filarial parasite was used as the test parasite to study the antiparasitic activity. In studying a plant used in traditional medicine, it is necessary to investigate aqueous extracts *(Kashayams)* thoroughly because water is commonly used by medicine men as the extracting solvent. Aqueous extracts of bark, leaves, seed and stem were prepared.

Preparation of plant extracts

All the indigenous plants *(Andrographis, paniculata, Alstonia spectabilis, Cassia alata, Caesalpinia bonduc, Picrorhiza kurrooa, Azadiracta indica, Leucas aspera* and *Strebulus asper)* were cut into small pieces and added to 400 ml distilled water 2 sets (a) 200 mgm and (b) 500 mgm boiled gently till the volume was reduced to $1/4^{th}$ (100ml). It was filtered and used for the experiment.

For testing polarity, aliquots of an aqueous solution of the most active plant extract (*Strebulus asper)* were extracted with ether, chloroform, n-butanol, alcoholic and acetone. In the case of ether and chloroform, after the removal of the organic solvent, the organic extract and the corresponding aqueous phase were tested for

antiparasitic activity. The aqueous solution of the extract was mixed with10 volumes of alcohol and acetone and the resultant precipitate collected by centrifugation. Following the removal of alcohol and acetone from supernatant, both fractions were tested for antiparasitic activity.

2 ml of the aqueous extract was dialysed against 50 ml distilled water for 20 hrs and tested for antiparasitic activity of both the dialysate and outer aqueous phase.

RESULTS AND DISCUSSION

Antiparasitic activity of the plant extracts against *S.digitata* are shown in Table I. The antiparasitic activity of organic solvent extracts of *S. asper* are shown in Table II.

In 200 mgm% and 500 mgm% concentration both *S. asper* and *Caesalpinia bonduc* showed antiparasitic activity. In low concentration *S. asper* showed more activity that *C. bondu* extract ie in *Strebulus* the worms died within 5^{th} hour and in *Caesalpinia* extract the worms died within 6^{th} hour. At higher concentration except *Alstonia spectabilis* and *Andrographis paniculata*, the other plant extracts showed antiparasitic activity. Further extraction and antiparasitic study of the most active plant extract, *S. asper*, showed that the activity was present in the chloroform and ether phase when partitioned with the organic solvents indicating that the active compound may be a non-polar compound. The result of dialysis also shows that the activity may be present in the small solute particles present in the extract because the worms died within 6hr in the outer aqueous phase while in the dialysate the worms was still active. It is reported that the bovine filarial parasite *S. digitata* is similar to the human parasite4. As *S. asper* showed antiparasitic activity when tested with *S. digitata* it may also posses antifilarial activity. Further work is in progress to isolate, characterize and study the antiparasitic and antifilarial activity of *S. asper.*

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TABLE I

Antiparasitic activity of certain indigenous plant extracts against *Setaria digitata*

Plants	Parts used	Activity	
		200 mgm % (a)	500 mgm% (b)
Andrographis paniculata	Leaves	-	-
Alstonia spectabilis	Bark	-	-
Cassia alata	Leaves	-	++
Caesalpinia bonduc	Seed	++	+++
Picrorhiza kurrooa	Stem	-	+

Azadiracta indica	Leaves	-	+
Leucas aspera	Leaves	-	++
Strebulus aper	Bark	+++	++++

(a) +++ = 100% mortality in 5 hr., ++ = 100% mortality in 6 hr.

(b) ++++ = 100% mortality in 2 hr., +++ = 100% mortality in 3 hr., ++ = 100% mortality in 4 hr., + = 100% mortality in 5 hr.

TABLE II

Antiparasitic activity of different fractions of organic solvent extracts of *Strebulus asper*

Organic solvents	Organic solvent layer	Aqueous layer	Precipitate	Filtrate
Chloroform	+	-		
Ether	+	-		
n-butanol			+	+
Alcohol			+	+
Acetone			+	+

Values corresponds to 200 mgm of the drug

+ = activity, - = no activity

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