

**ANTHELMINTIC ACTIVITY STUDY OF *SARACA INDICA* LEAVES
EXTRACTS**

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ABSTRACT: To know the anthelmintic activity of the leaves of *Saraca indica*, present study was conducted. For this work, we extracted the leaves with methanol and ethanol by following the maceration and the soxhlet methods of extraction. In case of the ethanolic extract obtained from the maceration method, it was found that its anthelmintic activity was more than the methanolic extract. On the other hand, the methanolic extract, obtained from the soxhlet method of extraction, indicated that it had better anthelmintic activity than the ethanolic extract. Overall the anthelmintic activity revealed the concentration-dependent nature of the extracts. In cases of both the methods of extraction, it was observed that both the extracts had more potent anthelmintic activity than Piperazine citrate (positive control).

Key words: *Saraca indica*, methanolic extract, ethanolic extract, anthelmintic activity.

INTRODUCTION

Natural drugs are obtained from the plant, animal or mineral kingdoms. The plant kingdom is the store house of the organic compounds (Shah, et al., 1989-90). *Saraca indica* (Roxb) de wild (Family-Caesalpinaceae) is commonly known as Asoka, Sita Asoka and Haempushpam. It is an evergreen tree which is 9 m in height. The flowers are orange yellow in colour and arranged in dense corymbs. It occurs throughout India up to an altitude of 750m in central and eastern Himalayas (Prajapati, et al., 2003). Useful parts of the plant are barks, leaves, flowers and seed. The plant is also effective in dyspepsia, fever, burning sensation, colic, ulcer, menorrhagia, leucorrhoea, pimples, etc. The bark, used for the pharmaceutical preparations, is bitter, astringent, sweet, refrigerant, anthelmintic, stypic, stomachic, constipating, febrifuge and demulcent. Even the juice of the leaves, mixed with cumin seeds, is used for the treatment of stomachalgia (Indian Medicinal Plants, 1996). The Asoka tree is considered sacred throughout India. This tree has many folklorical, religious and literary associations in the religions. Due to its high value and handsome appearance, this tree is found close to the temples throughout India (Wikipedia.org).

It has already been mentioned that bark of the plant possesses anthelmintic activity (Indian Medicinal Plants, 1996). Moreover, traditional system of medicine reports the efficacy of several natural products eliminating helminths. Considering its importance, the present communication deals with the evaluation of anthelmintic activity of leaf extracts of *Saraca indica*.

MATERIALS AND METHODS

Plant material- The leaves of the plant *Saraca indica* were collected from Chhend, Rourkela, during November 2010. The sample was authenticated by Dr.S.K.Padhi, Botanist Rourkela Autonomous College, Rourkela. The shade dried leaves were powdered and stored in a desiccator until evaporation.

Preparation of extract- The powdered leaves were passed through a sieve (No.40) and stored in a desiccator. The powdered leaves were extracted by both Maceration and Soxhlet methods.

- 1) **Maceration method:** The powdered leaves (10gm) of *Saraca indica* were extracted using the maceration method. The powdered leaves were macerated in 60ml of 95% ethanol for 3 days at room temperature. The resulting extract was filtered through filter paper (Whatman No.1). The residue was further extracted using the same procedure. The filtrates obtained were combined and then evaporated to dryness. We also followed the above-mentioned method of extraction using methanol instead of ethanol (thiascience.info).
- 2) **Soxhlet method :** The powdered leaves (51gm) of *Saraca indica* were successively extracted using solvents in order of increasing polarity, viz. ethanol and methanol. After extraction, each time the marc was dried and later extracted with the next solvent. Both the extracts were dried by distilling the solvents in a rotary vacuum evaporator (Verma, et al., 2010). The yield of ethanolic extract was 4.6 gm and that of methanolic extract was 3gm. Both the extracts were dissolved in dimethylsulfoxide (DMSO) (Sing et al., 2011).

Anthelmintic activity: The suspension of both the extracts, obtained from the maceration and the soxhlet methods, was prepared in DMSO to obtain 1, 2.5 and 5% concentrations. Solutions of similar concentrations of the standard anthelmintic drug like Piperazine citrate (as positive control) were also prepared in distilled water. For our study DMSO and distilled water were used as negative controls.

Two millilitre of each concentration of both methanolic and ethanolic fractions and Piperazine citrate were diluted to 10ml separately with normal saline and poured into Petridishes. Nine groups of approximately equal size of earthworms, consisting of six in number in each group, were released into each Petridish. The anthelmintic activity was evaluated by adopting the standard method (Manjunath et al., 2006). Adult Indian earthworms *Pheritima posthuma* were selected for the study because of their anatomical and physiological resemblance with the intestinal round worm parasite of human being (Vidyarthi et al., 1997).

RESULTS AND DISCUSSION

In case of the maceration method, the ethanolic extract showed more potent anthelmintic activity than the methanolic extract (Table -1). On the other hand, the methanolic extract, obtained from the soxhlet method of extraction, indicated that it had better anthelmintic activity than the ethanolic extract (Table -2). Overall the anthelmintic activity revealed the concentration- dependent nature of the extracts. In cases of both the methods of extraction, we had found that the methanolic as well as the ethanolic extracts were more potent than the positive control as far as the anthelmintic property was concerned. We did not find any anthelmintic activity of DMSO and distilled water against earthworms.

Although the bark of the plant has got anthelmintic activity (Indian Medicinal Plants, 1996), we found that even the leaves of *Saraca indica* possessed very potent anthelmintic activity. From this study it may be concluded that, in addition to leaves, other parts of plant should be explored thoroughly (using several extracts) to know its exact anthelmintic activity.

Table-1: Anthelmintic activity of methanolic and ethanolic extracts (by Maceration method) of *Saraca indica* leaves.

Treatment group	Concentrations (%)	Time taken (seconds)	
		Paralysis	Death
Methanolic extract	1.0	105	180
	2.5	100	155
	5.0	80	150
Ethanolic extract	1.0	130	170
	2.5	75	135
	5.0	60	95
Piperazine citrate	1.0	1920	3000
	2.5	1680	2450
	5.0	780	2220

Table-2: Anthelmintic activity of methanolic and ethanolic extracts (by Soxhlet method) of *Saraca indica* leaves

Treatment group	Concentrations(%)	Time taken (seconds)	
		Paralysis	Death
Methanolic extract	1.0	370	690
	2.5	310	620
	5.0	190	435
Ethanolic extract	1.0	630	945
	2.5	510	770
	5.0	480	650
Piperazine citrate	1.0	1920	3000
	2.5	1680	2450
	5.0	780	2220

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