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COMPARATIVE ANTHELMINTIC ACTIVITY OF SARACA ASOCA (ROXB.) WILD BARK AND CARICA PAPAYA LINN LEAVES

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ABSTRACT

The aim of the present study was to evaluate comparative anthelmintic activity of alcoholic & aqueous extracts of bark of Saraca Asoca (Roxb.) wild and alcoholic & aqueous extracts of Carica papaya Linn leaves on Indian earthworm (Pheretima posthuma) at concentration. Results were expressed in terms of time for paralysis and time for death of worms. Albendazole was used as a standard and Distill water as a control group. The result revealed that both bark of Saraca Asoca (Roxb.) wild & Carica papaya Linn leaves possesses anthelmintic activity. But leaves extracts of Carica papaya Linn has better activity than bark of Saraca Asoca (Roxb.) wild extracts. The presence of alkaloids, glycosides, saponins, flavanoids, terpenoids, tannins seems to be the responsible phytoconstituents for demonstrating anthelmintic activity.

KEYWORDS: Anthelmintic, Pheretima posthuma, Saraca Asoca**,** Carica Papaya, alcoholic, Albendazole.

INTRODUCTION

The demand for herbal products increases all over the world and major pharmaceutical companies are currently conducting research on medicinal plants on large scale for their potential medicinal value. Plant medicine has been used for the treatment of various ailments throughout the world before the advent of modern synthetic drugs.[1] Anthelmintics are drugs that are used to treat infections with parasitic worms. Helminthes infection is the most common infection in man which effects the large proportion of world's population. Albendazole, mebendazole, triclabendazole, thiabendazole, ivermectin, niclosamide,

rafoxanide and other popular synthetic anthelmintic drugs were used in helminthiasis.[2] However, resistance has been developing very fast. Utilization of traditional medicine should be considered in this scenario to kill these parasitic worms and it will help to find out newer molecular entities.[3] Keeping this in view, the present study deals with the evaluation of the Anthelmintic activity of Saraca Asoca (Roxb.) wild *bark* and Carica papaya Linn leaves.

Saraca Asoca is a rain-forest tree. It is found all over India, especially in Himalaya, Kerala, and Bengal and whole south region. Asoka is one of the most famous and sacred trees of India. Asoka tree, universally known by its binomial Latin name *Saraca asoca* (Roxb.), De. wild or *Saraca indica* belonging to family Caesalpiniaceae. It is an ever green tree. It is also known as Kankeli (Sanskrit), Ashoka (Assamese), Ashoka (Bengali), Ashoka (Gujarati), Ashoka (Hindi), Ashokadamara (Kannada)Ashok (Kashmiri), Asokam (Malayalam), Ashok (Marathi), Ashoka (Oriya), Ashok (Punjabi), Asogam (Tamil), Ashokapatta (Telugu).[4] Saraca asoca has many uses mainly in the medicine to treat the women gynecological disorders, uterine pain, urinary calculus, dysurea, etc. Stem bark of Saraca asoca dried bark is reported to contain glycosides, flavonoids, tannins and saponins. It has been used for menorrhagia in India. It is given as a tonic to ladies to treat Uterine disorders. It also used in case of all disorder associated with the menstrual cycle. It is used in all skin diseases, cancer, diarrhea, dysentery, edema, heart disease, hepatitis, herpes, jaundice, antibacterial, anthelmintic, joint pain, kidney and gall stones, paralysis, skin problems, rheumatoid arthritis, obstructions in urinary passages.[4,5]

The papaya is a short-lived, fast-growing, woody, large herb to 10 or 12 feet in height. It generally branches only when injured. All parts contain latex. The hollow green or deep purple trunk is straight and cylindrical with prominent leaf scars. Its diameter may be from 2 or 3 inches to over a foot at the base. Papaya is a powerhouse of nutrients and is available throughout the year. It is a rich source of threes powerful antioxidant vitamin C, vitamin A and vitamin E; the minerals, magnesium and potassium; the B vitamin pantothenic acid and folate and fiber. Papaya contains many biologically active compounds. Two important compounds are chymopapain and papain, which are supposed to aid in digestion.[6,7]

MATERIALS AND METHODS

Collection and Authentication of Plant material

Saraca Asoca (Roxb.) wild bark and Carica papaya Linn leaves: Fresh bark of Saraca Asoca (Roxb.) wild & Carica papaya Linn leaves were collected from local area of Sangli

and authenticated by Dr. Mrs. Manisha V. Kale (Associate Professor, Dept of botany), Jaysingpur College, Jaysingpur, Shirol, Kolhapur. After authentication, fresh bark of Saraca Asoca (Roxb.) wild & leaves of Carica papaya Linn were collected in bulk, washed under running tap water, dried under shade for a period of 7 days and then pulverized in mechanical grinder to obtain coarse powder. The dried powder was stored in airtight bottles.

Extraction methodology

Aqueous Extract of Saraca Asoca (Roxb.) Wild Bark: The coarse powdered material (50 gm) was macerated in distilled water for 48 hours. After maceration, the solutions were filtered and the concentrate was evaporated on water bath until syrupy consistency is left and then evaporated to dryness. The dried extracts recovered were placed in sterilized screw-capped bottles and stored at refrigeration temperature.[8]

Ethanolic Extract of Saraca Asoca (Roxb.) Wild Bark

Plant powder (20 g) was successively extracted with 200 ml of 95% ethanol in a Soxhlet apparatus for 04 to 05 hrs. Extracts were filtered & concentrated by keeping in water bath at 40°C until dry mass is obtained.[9]

Aqueous Extract of Carica papaya Linn leaves

The coarse powdered material (20 gm) was macerated in distilled water for 48 hours. After maceration, the solutions were filtered and the concentrate was evaporated on water bath until syrupy consistency is left and then evaporated to dryness. The dried extracts recovered were placed in sterilized screw-capped bottles and stored at refrigeration temperature.[10]

Ethanolic Extract of Carica papaya Linn leaves

Plant powder (20 g) was successively extracted with 200 ml of 95% ethanol in a Soxhlet apparatus for 04 to 05 hrs. Extracts were filtered & concentrated by keeping in water bath at 40°C until dry mass is obtained. [11,12]

Experimental worms

Indian earthworm *Pheretima posthuma* were used to study Anthelmintic activity. The earthworms were collected from the moist soil from the near region of Jaysingpur, Kolhapur, Maharashtra and washed with normal saline to remove all faecal matter. The earthworms in 6-8 cm in length were used for experimental protocol due to their anatomical and physiological resemblance with the intestinal roundworms parasites of human beings.

Anthelmintic screening

For the Anthelmintic activity, Indian adult earthworms (*Pheretima posthuma*) in 6-8 cm in length were used. The earthworms were divided in Twenty Two groups of six earthworms in each group. The ethanol, aqueous extracts (10, 20, 30, 40 & 50 mg/ml conc.) of both Saraca Asoca (Roxb.) wild bark and Carica papaya Linn leaves were dissolved in sterile distilled water and final volume was adjusted to 50 ml. The extract and standard drug Albendazole (20 mg/ml) were freshly prepared before starting the experiments. The extract of different concentration and standard solution were poured in different Petri dishes. All the earthworms were washed into normal saline solution before they are released in to Petri dishes. Observation were made for time taken to paralyze (paralysis was said to occur when earthworms didn't revive in normal saline) and death (death was concluded when earthworms lost their motility and followed with their body colors fading away). All the results were expressed as a mean ± SEM of six earthworms in each group.

RESULTS AND DISCUSSION

Figure. 1: Aqueous Extract of Carica papaya Linn leaves.

Figure. 2: Alcoholic Extract of Carica papaya Linn leaves.

OBSERVATION TABLE

Table 1: Anthelmintic Activity of Aqueous & Ethanol extracts of Saraca Asoca (Roxb.) Wild Bark against Earthworm.

Treatment	Time taken by earthworms for	
	Paralysis (min) mean ± SEM	Death (min) mean ± SEM
Distilled Water (Control)	Absent	Absent
Standard Albendazole (20 mg/ml)	07 ± 0.3605	14 ± 0.2516
Aqueous Extract		
10 mg/ml	15 ± 0.2309	27 ± 0.3055
20 mg/ml	13 ± 0.1154	20 ± 0.1527
30 mg/ml	09 ± 0.1	15 ± 0.2645
40 mg/ml	07 ± 0.4358	12 ± 0.9165
50 mg/ml	05 ± 0.2645	10 ± 0.0577
Ethanolic Extract		
10 mg/ml	11 ± 0.2081	17 ± 0.1
20 mg/ml	09 ± 0.0577	14 ± 0.1527
30 mg/ml	06 ± 0.2516	11 ± 0.1527
40 mg/ml	04 ± 0.0577	09 ± 0.3214
50 mg/ml	03 ± 0.1527	06 ± 0.2309

Table 2: Anthelmintic Activity of Aqueous & Ethanol extracts of Carica papaya Linn leaves against Earthworm.

Treatment	Time taken by earthworms for	
	Paralysis (min) mean ± SEM	Death (min) mean ± SEM
Distilled Water (Control)	Absent	Absent
Standard Albendazole (20 mg/ml)	07 ± 0.3605	14 ± 0.2516
Aqueous Extract		
10 mg/ml	10 ± 0.1	17 ± 0.2
20 mg/ml	08 ± 0.2645	14 ± 0.3055
30 mg/ml	07 ± 0.2	12 ± 0.1527
40 mg/ml	03 ± 0.2886	08 ± 0.3605
50 mg/ml	02 ± 0.1154	05 ± 0.2081
Ethanolic Extract		
10 mg/ml	09 ± 0.2886	15 ± 0.6305
20 mg/ml	05 ± 0.1	12 ± 0.3605
30 mg/ml	04 ± 0.2	09 ± 0.1154
40 mg/ml	02 ± 0.1	06 ± 0.6305
50 mg/ml	01 ± 0.2081	03 ± 0.1154

Table 3: Phytochemical Evaluation of Saraca Asoca (Roxb.) Wild Bark *(*Alcoholic and Aqueous extract).[13,14]

Chemical tests	Result	Chemical tests	Result
Test for Saponins Foam test	Positive	**Test For Tannins** A. 5% Ferric chloride B. Acetic acid test C. Dil. KMnO4 Test	 Positive Positive Positive
Test For Steroids Salkowaski test	Positive	**Test For Flavonoids** A. Lead acetate test B. NaOH + Dil.acid	 Positive Positive
Test For Alkaloids Dragendroff's test Wagner's test Mayer's test	 Positive Positive Positive	**Test for Glycosides** Borntrager's test	 Positive

Table. 4: Phytochemical Evaluation of Carica papaya Linn leaves *(*Alcoholic and Aqueous extract).[15,16,17]

Chemical tests	Result	Chemical tests	Result
Test For Carbohydrates A. Benedicts Test B. Fehling's Test C.Molisch's Test	 Positive Positive Positive	**Test For Tannins** A.5% Ferric chloride B. Acetic acid test C. Dil. KMnO4 Test	 Positive Positive Positive
Test For Steroids Salkowaski test	Positive	**Test For Flavonoids** A. Lead acetate test B. NaOH + Dil.acid	 Positive Positive
Test For Alkaloids Dragendroff's test Wagner's test Mayer's test	 Positive Positive Positive	**Test for Glycosides** Borntrager's test	Positive

The perusal of the data reveals that as the concentration increases paralysis and death time decreases. In Table 1 of Anthelmintic Activity of Aqueous & Ethanol extracts of Saraca Asoca (Roxb.) Wild Bark, ethanolic extract at the concentration of 50 mg/ml showed both paralysis and death in 03 min and 06 minutes respectively as compared to aqueous extract, Paralysis & death time is 05 & 10 minutes respectively. While In Table 2 of Carica papaya Linn leaves, ethanolic extract at the concentration of 50 mg/ml showed both paralysis and death in 01 minutes and 03 minutes respectively as compared to aqueous extract, Paralysis & death time is 02 & 05 minutes respectively. The extract of both the plant show cidal action as shown by standard Albendazole on earthworms. Ethanolic extracts required least time to cause paralysis and death of the earthworms followed by aqueous extracts of both plants.

CONCLUSION

From the above results, it is concluded that the Ethanolic extract of Saraca Asoca (Roxb.) Wild Bark and Carica papaya Linn leaves shows potent Anthelmintic activity as shown by standard Anthelmintic drug. Some of these phytoconstituents may be responsible to show a potent Anthelmintic activity. It is also confirmed that these drugs triggers natural immune system to fight against various parasites and helminthes. This comparative study reveals that Carica papaya Linn leaves shows potent Anthelmintic activity as compared to Saraca Asoca (Roxb.) Wild Bark.

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