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Evaluation of Anthelmintic Potential of *Cucurbita maxima*Linn. (*Cucurbitaceae*) Leaf

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ABSTRACT:Background: The living plant may be considered as a biosynthetic laboratory. The history of herbal medicine is as old as human civilization. India has an ancient heritage of traditional medicine**.** Ethnomedicine is an area of research dealing with medicine derived from plant, animal and minerals including indigenous beliefs, concepts, knowledge and practice among ethnic group. Ethnomedicinal documentation provides information on use of plant, screening of plant using ethnomedicinal knowledge provide wide scope of discovering therapeutically active constituents. **Aim:**The present study was aimed to evaluate the anthelmintic potential of crude extract of the leaf of the plant *Cucurbita maxima* Linn. (*Cucurbitaceae*). **Method:**The leaves of *C. maxima* were extracted by Soxhlation method using ethyl-acetate as solvent. The leaf extract in different concentration was used for the bioassay for Anthelmintic activity by using adult Indian earthworm *Pheretimaposthuma*. Albendazole was included as standard reference and distilled water as control. The paralysis and death of the worms was significantly determined.**Results:**The results indicated that the ethyl acetate extract of the leaf exhibited significant anthelmintic activity in a dose dependent manner with respect to standard drug Albendazole. **Conclusion:** It could be concluded that the leaves of *C. maxima* significantly exhibited Anthelmintic activity which proves its Folklore Medicine as evident from its Ethnobotanical survey.

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INTRODUCTIONS:

Nature always acts as a golden mark to exemplify the outstanding phenomenon of symbiosis [1]. The *Cucurbita maxima* Linn (Belonging to family *Cucurbita*ceae) leaf possesses 5 lobed, palmitate leaves with long petioles (Fig 1). The leaves are arranged in alternate manner around the stem. The stems are angular containing hardened and sharptrichomes. The stem also contain spring like tendril. The stems in some species are angular [2]. There are male and female

flowers on a single plant, and these grow singly, appearing from the leaf axils. Flowers have five fused yellow to orange petals (the corolla) and a green bell-shaped calyx. Male flowers have five stamens. Female flowers have thick pedicels, and an inferior ovary with 3 to 5 stigmas that each have two lobes [3].

Screening of plant using ethno medicinal knowledge provides wide scope of discovering therapeutically active constituents. The selected plant was reported to have wide ethno medicinal use. As per folk remedies*Cucurbita* have been used to treat intestinal worms and urinary ailments. This plant is used as an anthelmintic for the expulsion of worms [4]. It is also used to treat irritable bladder and benign prostatic hyperplasia. Traditionally it is belief that it reduces blood sugar levels [5] and used for schistosomiasis [6]. On the basis of the literature review the plant *C. maxima* leaf was selected for anthelmintic activity.

Fig 1. The *Cucurbita maxima* Linn leaf.

MATERIALS AND METHODS:

Collection and Identification of Plant:

The leaves of *Cucurbita maxima* were collected from Jamadarpali, Sason, are the places in the Sambalpur district of Odisha in May-June. It was identified and authenticated at Central National Herbarium, Botanical Garden, Howrah.

Preparation of Extracts:

The leaves were dried in shade and powdered to get a coarse powder. About 1 kg of dry coarse powder was extracted with ethyl-acetate extract (40 to 60^0C) by continuous hot percolation using Soxhlet apparatus. The extraction was continued for 72h. Then ethyl acetate extract was dried in rotary drum evaporator. The extract was kept in air tight container in dark and cool place for further study.

Evaluation of Anthelmintic activity:

***Animals*:**

Indian adult earthworms (*Pheretimaposthuma*) were used to study anthelmintic activity. The earthworm were collected from moist soil and washed with normal saline to remove all the fecal matter. The earthworm of 3 to 5cm in length and 0.1 to 0.2cm in width were used for all experimental protocol. The earthworm resembles both anatomically and physiologically to the intestinal roundworm parasites of human beings, hence can be used to study the anthelmintic activity[7].

Anthelmintic activity:

The ethyl-acetate extract of *Cucurbita maxima* Linnleaf was dissolved in minimum amount of Dimethyl Formamide and the volume was adjusted to 50 ml with saline water. All drugs and extract solution were freshly prepared before starting the experiment. About 50 ml formulations containing three different concentrations (10, 25 and 50 mg/ml in saline water), each of crude ethyl acetate extract was prepared. The earthworms were divided into five groups containing six earthworms in each group. Different concentrations of extract were poured in different petridishes. All the earthworms were washed in normal saline solution before they were released into petridishes. Time for paralysis was noted when no movement of any sort could be observed except the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that the worms neither moved when shaken vigorously nor when dipped in warm water at 50 ^{o}C[8]. Albendazole (10 mg/ml) was used as reference standard while normal saline water was used as the control. The experiment was statistically analyzed.

Table 1. Anthelminitic activity of *Cucurbita maxima* Linn. (*Cucurbitaceae*) leaf.

Groups	Drug	Dose (mg/ml)	PT (min) (X±SEM)	DT (min) (X±SEM)
I	NSW	2 ml/mg	-	-
II	ABZ	10	04.36±0.58	06.20±0.27
III	EAE	10	12.47±0.42	15.65±0.27
IV	EAE	25	09.14±0.54	11.60±0.84
V	EAE	50	06.76±0.67*	07.78±0.92*

NSW – Control, NSW – Normal saline water, ABZ – Albendazole, EAE - Ethyl acetate extract, PT – Paralysis time and DT – Death time. Values are expressed as Mean ± Standard Error of Mean (n=6, *p<0.05).

RESULTS AND DISCUSSION:

The anthelmintic activity data of *C. maxima*leaf ethyl acetate extract is given in Table 1. Ethyl-acetate extract of *C. maxima*exhibited anthelmintic activity in dose-dependent manner giving shortest time of paralysis and death with 50 mg/ml concentration.

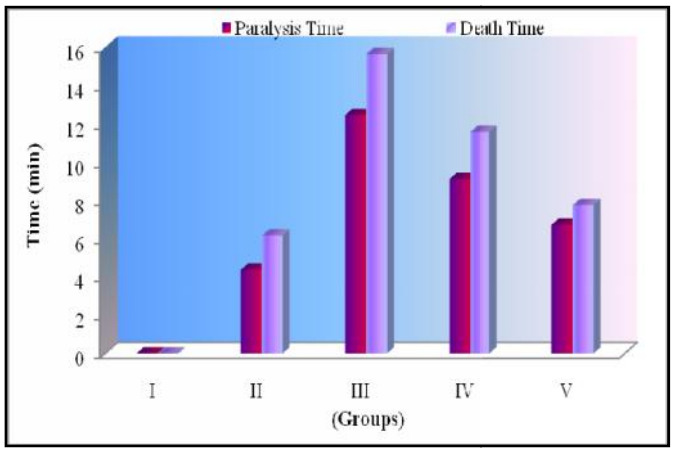

Fig 2. *In vitro* anthelmintic activity study of *C. maxima* leaf extract.

Group I- Normal saline water (2 ml/mg), Group II – Standard drug (Albendazole – 10 mg/ml), Group III to V – Ethyl acetate extract at 10, 25 and 30 mg/ml respectively.

The standard drug Albendazole at 10 mg/ml concentration showed the same anthelmintic activity that is the paralysis and death time were at 4.36 and 6.20 min, respectively. It was found that ethyl-acetate extract showed best anthelmintic activity. As the dose of the ethyl acetate extract of *C. maxima*leaf was increased, the anthelmintic activity was found to be increased. The anthelmintic activity of *C. maxima*was well comparable with the standard drug Albendazole as evident from Fig 2.The paralysis and death of the worms was significantly determined statistically as the value of $p<0.05$.

CONCLUSION:

It is concluded that ethyl-acetate extract of *Cucurbita maxima* leaf have potent anthelmintic activity at the dose of 50mg/ml concentration when compared with conventionally used drug and is equipotent to standard anthelmintic drug. Further study has to be done to isolate and identify the chemical constituent responsible for exhibiting Anthelmintic activity.

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