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EVALUATION OF ANTHELMINTIC ACTIVITY OF CARICA PAPAYA LATEX USING PHERITIMA POSTHUMA

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ABSTRACT

The aim of present study is to evaluate Anthelmintic potential of latex of *Carica papaya* using Pheretima posthuma as test worms. Various concentrations (100%, 50%, and 20%) of *Carica papaya* latex were tested in the assay, which involved determination of time of paralysis (P) and time of death (D) of the worms. It show shortest time of paralysis (P=24.5 min) and death (D=56min) in 100% concentration, while the time of paralysis and death will increase in 50% concentration (P=28min&D=64min) and in 20% concentration (P=34min&D=74min) respectively as compare to Piperazine citrate (10mg/ml) used as standard reference (P= 24 min& D= 54) and distilled water as control. The results of present study indicated that the latex of *Carica papaya* showed significantly demonstrated paralysis, and also caused death of worms especially at higher concentration as compared to standard reference Piperazine citrate and control.From the result it is conclude that the latex of *Carica papaya* showed significant Anthelmintic activity.

Key words : Pheretima posthuma, Anthelmintic, Carica papaya latex, Piperazine citrate.

1. INTRODUCTION

Helminthiasis is a disease in which a part of the body is infested with worms such as pinworm, roundworm or tape worm. Typically, the worms reside in the gastrointestinal tract but may also burrow into the liver and other organs (Jaya Raju N and Ali Elias Yesuf, 2010). They produce harmful effect on host by depriving him of food, causing blood loss and by secreting toxins (Tripathi KD, 2003), (Mahadik K R,1998). The parasitic worms are categorized into three groups: cestodes, or tapeworms; nematodes, or roundworms; and trematodes, or flukes (Tripathi K D, 2003), (Sharma V N, 2007) Anthelmintic are drugs that act locally to expel parasitic worm from gastrointestinal tract or systemically to remove adult helminthes or development froms that invade organs and tissue. They can either killing (vermin-cides) or, expel them (Tripathi KD, 2003), (Kokate C K et al .2005).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 contains many biologically active compounds. Two important compounds are chymopapain and papain, which are supposed to aid in digestion (Bouanga-Kalou. G. et al, 2011)

2. MATERIALS AND METHODS

2.1 Worms Collection:

Indian earthworm P. posthuma were collected from the water logged area of soil, Kakinada (East

Godavari Dist), Andhra Pradesh. Indian adult earthworms (Pheretima posthuma) were used to study anthelmintic activity. The earthworms were collected from the water logged area of soil, Kakinada (Andhra Pradesh), washed with normal saline to remove all fecal matter. The earthworms of 5-8 cm in length and 0.2-0.3 cm in width were used for all experimental protocol.

2.2 Latex Collection

The latex of Carica papaya of family Caricaceae was collected from the area around Kakinada (East Godavari Dist., Andhra Pradesh) in April 2011.

2.3 Preparation Of Latex Sample

Fresh latex was collected from locally grown Carica papaya. Initially, four to six longitudinal incisions were made on the unripe fruit using a stainless steel knife[7]. The exuded latex was allowed running down the fruit and dripping into collecting devices attached around the trunk. Following collection, the latex was transferred to a plastic bottle. The prepared latex was diluted with the help of distilled water in varying concentration as follows, 100 % concentration, 50 % concentration, 20 % concentration.

2.4 Anthelmintic Activity

The Anthelmintic assay was carried as per the method of Mali (R.G.et al, 2007) (Aswar Manoj et al., 2008,) with minor modifications (Manoj A et al, 2009)' (Mali R.G, 2007) Indian adult earthworms (Pheretima posthuma*)* of 5-8 cm in length and 0.2-0.3 cm in width were used. The animals were divided into five groups containing six earthworms in each group. 50 ml Preparation ,containing three different concentrations (100%, 50% and 20% in distilled water) were prepared and the standard drug solution were poured in different petridishes. All the earthworms were washed in normal saline solution before they were used. Six worms (same type) in each were placed in it. Time for paralysis was noted when no movement observed except when 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 (50°C). Piperazine citrate (10mg/ml) was used as reference standard while distilled water as control.

RESULTS AND DISCUSSION

Anthelmintic activity of Carica papaya Latex is confirmed by examining the time taken for paralysis (P) and death (D) for Pheretima posthuma worms were reported in Table 1.

Papaya contains many biologically active compounds. Fruit, leaves, latex and stem are used to treat indigestion, diarrhoea, swelling of the lungs, stoppage of urination, blindness, tachycardia, ringworm and alopecia. The seeds are used as anthelmintics. Recent years, papaya latex and its commercial products have been widely applied in baking and beverage industries, pharmacy and new chemicals synthesis. There are four major components including papain, chymopapain, caricain, glycyl endopeptidase and papaya lipase.The assay was performed on adult Indian earthworm, Pheretima posthuma due to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings. Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds in vitro (Sollmann. T, 1918) (Shivkar Y.M and Kumar V. L, 2003) Piperazine citrate by increasing chloride ion conductance of worm muscle membrane produces hyperpolarisation and reduced excitability that leads to muscle relaxation and flaccid paralysis(Martin R.J, 1985), As shown in **Table 1** concentrated latex of Carica papaya exhibited Anthelmintic activity in dose dependent manner taking shortest time for paralysis (P) and death (D) with 100 % concentration. Hence latex of Carica papaya in its different conc. exhibited Anthelmintic activity. It shows shortest time of paralysis (P=24.5 min) and death (D=56min) in 100% concentration, while the time of paralysis and death will increase in 50% concentration (P=28min&D=64min) and in 20% concentration (P=34min&D=74min) respectively as compare to Piperazine citrate (10mg/ml) used as standard reference (P= 24 min& D= 54) and distilled water as control. The predominant effect of Piperazine citrate on worm is to cause a flaccid paralysis those results in expulsion of the worm by peristalsis. Thus latex of *Carica papaya* showed significant Anthelmintic activity as compare to standard reference and control.

Table 1: ***In vitro evaluation of anthelmintic activity Carica papaya Latex.***

Test samples	*Concentration*	*Time for paralysis (min)*	*Time for Death (min)*
Piperazine citrate	(10mg/ml)	24 ± 0.68	54 ± 0. 93
Carica papaya latex	100%	24.5 ± 0.31a***	56 ± 0. 77 a ***
Carica papaya latex	50 %	28 ±0.53 a,b,d**	64 ± 0.96 a,b,d **
Carica papaya latex	20 %	34 ±0.59 a,b,c **	74 ± 0.77 a,b,c**

The result was expressd as Mean ± SEM. Statistical analysis was carried out using one way ANOVA followed by the student-t test. P<0.05 was considered statistically significant.
(n=6). * = p<0.01, ** = p<0.001.where a =comparison with normal control, b = comparison with 100% conc. of latex , c = comparison with 50% conc. latex, d = comparison with 20% conc. latex

CONCLUSION

From the result, it is conclude that the latex of *Carica papaya* showed significant anthelmintic activity when compared with the standard anthelmintic drug .The drug may be further explored for its phytochemical profile to identify the active constituent responsible for anthelmintic activity.

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