ANTI-DIARRHEAL ACTIVITY OF WHOLE PLANT OF *ANNONA SQUMOSA*

Abstract

The plant *Annona squamosa* belong to Annonaceae family was taken for the study. The methanolic extract of the whole plant extract was extracted and by continuous hot percolation process and the Phytochemical test was evaluated and then the extract was taken for the Antidiarrheal study with 400mg /kg as a dose after literature study and a trial for LD_{50} and Antidiarrheal activity was carried over by using castor oil induced diarrhea model which was compared with that of the standard loperamide with 5mg/kg body weight as dose. A significant decrease in the diarrhea was monitored and the same was compared with that of the standard drug loperamide. Finally the percentage protection was calculated and the results were found that the methanolic extract of *Annona squamosa* showed Antidiarrheal effect by reducing the stool weight.

Keywords: *Annona squamosa*, Castor oil induced Diarrhea model, Methanolic extract.

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I. INTRODUCTION

Herbal plants and its active constituents from single plant or combination of two or more plants are extracted at room temperature or by applying heat after they collected shade dried and crushed and powdered and extracted with various polarities of solvents. The final extract or the marc will contain various active compounds which may produce a synergistic or antagonistic effect for particular activity when compared to that of the standard drug or marketed drug. They may have an individual compound or a multiple compounds as an active ingredient. [1]. Nature serves different medicinal values plants which can be used to treat many diseases from ancient period. So plants and its value is very useful and very important for the communities [2]. Now a day the world at the pandemic situation to practiced herbal based or natural medicine obtained from plant sources where it helps to fight against foreign invading microbes with fewer side effects [3]. WHO has documented that plants practiced by many tribal who live around the different parts of the world for medicinal values of the plant since ancient period [4]. India is very rich in medicinal plants and has a practice of using herbal plants since ancient times. The modern isolation techniques and pharmacological testing procedure helps the plant products to find its own way as medicine [5].

Diarrhea not a disease but symptoms of various diseases like cancer. It is also called loose motions and defined as frequent passage of semisolid or liquid fecal and loss of electrolytic substance like Na^+ and water which shows the increase in motility and secretions in GIT also decrease the absorption of some fluids from GIT. Over eating of wrong food in untiming and overloading of foods or sometime consumption of laxatives may cause diarrhea. The main aim of present research work was to determine Antidiarrheal property of methanolic extract of whole plant of *Annona squamosa* was carried by using castor oil induced diarrhea model.

II. MATERIALS AND METHODS

1. **Plant Materials**: *Annona squamosa* belongs to the family Annonaceae grows I different zones of the world. It has 44 species out of 40 are native of Americas 3 are to asia and 1 species grow in Africa. They have properties like soil binders, sand stabilizers. They exist in mannar regions for a long period.

Figure 1: Plant of *Annona squamosa*

The various chemical agents that are present are flavonoids and phenolic compounds. Even Terpenes posses and cidial effect against the insects and other pharmacological properties against bacteria , fungal, microbial, malarial.[6]. Several pharmacological properties have been reported in the seed and leaves extract of Annona *squamosa like* kill bacteria, fungus and also reduce the inflammation produced in the body. [7].

2. **Preparation of Plant Extract:** The plant *Annona squamosa* which was collected in the month of july and shade dried and made in to coarse powder, taken for extraction process through hot continuous extraction method by using Soxhlet apparatus. The use of commercially available Soxhlet apparatus is a convenient way to prepare crude plant extract. Further the extraction was distilled to remove the solvent and the percentage yield of was calculated 9.52%. The extract was stored in refrigerator until further studies [8].

3. **Drugs:** Loperamide, castor oil, acetic acid (ASES Chemical Works, Jodhpur), and Sodium chloride (ASES Chemical Works).

4. **Procurement of Animals:** Male Wistar rats weighing (100–150 g) were taken for the study, placed in the animal room and fed with normal pellet diet and water ad libitum[9]. All experiments were performed according to ethical guidelines in conscious animal. Research protocol was approved by the Institutional Animal Ethics Committee.

5. **Anti-diarrheal activity:** *The in vivo* anti-diarrheal activity was done by using Castor oil which was practiced by ancient times10]. 24hours fasted animals which was free access to water were taken for the study and divided into 3 groups (n=10).

   - Group 1 served as control and received distilled water (10 ml/kg),
   - Group II served as standard or reference drug, i.e loperamide at a dose 5.26 mg/kg,
   - Groups III served with MEAS at the respective doses of 400 mg/kg.

   All drugs were administered orally by using gastric gavages at a single bolus. The animals where left for one hour. After one hour, 10 ml/kg of castor oil were administered orally to the entire animal in the three groups.

   Then the animals were placed in separate metabolic cages with transparent plastic container below the cage and that was lined with what man filter papers which help us to collect faces separately.

   The parameters measured at the time of the study are frequency of defecation, latency time, total surface of impregnation and even the fresh stools total weight. All the parameters were measured for every hour and continued for a period 8 h which was compared with that of the control. Fresh stools were then dried in an oven to remove the water content.

III. RESULTS AND DISCUSSION

Table 1: Effects of the aqueous extract of *Annona squamosa* (MEAS) on castor oil-induced diarrhea:

Group treated	Dose (mg/kg)	Latency time (min)	Number of of defecation (stools/8h)	(%) inhibition in defecation	Total surface of impregnation (cm^2)	Total weight expense deposit (g)
water	10ml/kg	70.62 ± 5.63	4.00 ± 0.50	0.00	98.11 ± 25.39	6.12 ± 0.68
Loperaminde	5.26	147.62 ± 5.28	1.37 ± 0.46	65.62	27.85 ± 12.38	2.07 ± 0.49
MEAS	400	296.00 ± 21.50	1.50 ± 0.50	62.50	18.69 ± 6.89	2.48 ± 0.43

The value expressed mean ± SEM of 10 animals in each group, $P<0.05$, $P<0.01$, $P<0.001$, and compared with standard and control

IV. DISCUSSION

Castor oil contains ricinoleic acid, a metabolite which causes diarrhea, when metabolize in the gut. The active metabolite Ricinoleic acid produce diarrhea through by producing irritation of GI mucosa, this helps to release the prostaglandin which stimulates gastrointestinal motility and electrolyte secretion by reducing electrolyte absorption from the intestine and colon which leads to diarrhea.

V. CONCLUSION

The plant extract contains active component terpenes which show Antidiarrheal properties. This Antidiarrheal activity probably due to spasmolytic or may be due to antisecretory effect in intestinal smooth muscle. From the obtained data the plant extract is safe and can be used as an Antidiarr heal agent.

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