### ANTI-DIARRHEAL ACTIVITY OF WHOLE PLANT

### OF ANNONA SQUMOSA

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**ABSTRACT**

The plant *Annona squamosa* belong to Annonaceae family was taken for the study. The methanolic extact of the whole plant extract was extracted and by continous 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 LD50 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.

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

**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 polarity of solvents. The final extract or the marc will contains 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 tribal people from different parts of the world has medicinal values 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 electrolytes like Na+ and water and shows increase in the motility of the gastrointestinal tract along with increased secretions, also decrease in the absorption of the fluid. 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.

**MATERIALS AND METHODS:**

**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.



**Fig.No.1: Plant of *Annona squamosa***

The various chemical agents that are present are flavonoids and phenolic compounds. Even Terpenes are used as insecticides and their pharmacological properties include antibacterial, antifungal, anthelmintic, antimalarial and molluscicidal [6]. Several pharmacological properties have been reported in the seed and leaves extract of *Annona squamosa* and the properties highlighted are anti-bacterial, anti-fungal and anti-inflammatory properties [7].

**Preparation of Plant Extract:** The plant *Annona squamosa* 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].

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

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

**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. The Rats were divided into three 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 all the 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 Whatman filter papers which help us to collect faces separately. The parameters measured at the time of the study are latency time, frequency of defecation, total surface of impregnation and fresh total stools 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 dry in an oven to remove the water content.

**RESULTS AND DISCUSSION**

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Treatment**  | **Dose (mg/kg)**  | **Latencytime (min)**  | **Frequency of defecation (stools/8h)**  | **Inhibition of defecation (%)**  | **Total surface of impregnation (cm2)**  | **Totalweight expense of deposit (g)**  |
| Water  | 10ml/kg  | 70.62 ± 5.63  | 4.00 ± 0.50  | 0.00  | 98.11 ± 25.39  | 6.12 ± 0.68  |
| Loperamide  | 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  |

Each value represents the mean ± SEM of 10 animals; ap < 0.05, bp < 0.01,cp < 0.001, significantly different compared to negative control group (distilled water); Loperamide.

**DISCUSSION**

Castor oil releases ricinoleic acid, a metabolite that causes diarrhea, upon metabolism in the gut. Ricinoleic acid initiates diarrhea through irritation of GI mucosa, which 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.

**CONCLUSION:** The plant extract contains active component which shows an Antidiarrheal properties. This Antidiarrheal activity probably results from 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 Antidiarrheal agent.

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