

Anti Diarrheal Activity of the Chloroform Extract of Cayratia Pedata Lam in Albino Wistar Rats.

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Summary

To evaluate the Anti diarrheal activity of chloroform extract of Cayratia Pedata lam in albino wistar rats. The chloroform extract of Cayratia pedata (CECP) was investigated for its anti diarrheal activity against Castor Oil-Induced Diarrhea and Magnesium Sulphate-Induced Diarrhea in rats. Loperamide (3mg/kg p.o) were used as standard drugs. The dose 200 mg/kg ($p < 0.05$), 400 mg/kg ($p < 0.01$) significant in anti diarrhea. The remarkable Antidiarrheal effect of Cayratia pedata extract against castor oil and magnesium sulphate induced diarrhea model.

Keywords: *Cayratia pedata* (Lam), Castor Oil Induced Diarrhea, Magnesium Sulphate Induced Diarrhea,

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Introduction

Diarrhea results from an imbalance between the absorptive and secretory mechanisms in the intestinal tract, accompanied by intestinal hurry, resulting in an excess loss of fluid in the faeces^[1]. In some diarrhoea the secretory component predominates. While other diarrhoea are characterised by hypermotility. Combinations of antidiarrhoeal drugs, with different mechanisms of action, are often used for synergistic action. The value of these combination have not been studied experimentally and hence the present study was aimed at studying the antidiarrhoeal activity of some drugs singly and in combination in models of hypermotility and hypersecretion of intestinal tract in experimental animals^[2].

Cayratia Pedata lam (Family –Vitaceae) endemic to south Western Ghats in Kerala and Tamil Nadu ^[3,4]. In folklore claim, it is used for treating ulcer, diarrhoea, burns, refrigerants, uterine, flukes, astringents ^[3,5] low diuretic activity and has been a reputed remedy for cough, bronchitis, asthma, joint pain and to check uterine reflexes^[5,6]. From the sources of the literature documentation and relevant traditional approaches on plants drugs ^[7,8].

Materials and Method

Collection and authentication of plant materials

The leaves of Cayratia pedata lam were collected from the Palakadu forest in kerala on the month of September. The plant material was identified and authenticated by Mr. Chelladurai, Research Officers- Botany, C.C.R.A.S Govt of India Tirunelveli.

Preparation of Plant Extract

The freshly collected leaves of Cayratia Pedatata Lam were dried to get a coarse powder. A weight quantity of the powder was passed through sieve number 40 and extracted using soxhlet apparatus with chloroform extract as a solvent at a temperature range of 60° c. the extract was concentrated by distilling off the chloroform and the evaporating to dryness on a water bath. Before and after every extraction the powder bed was completely dried and weighted. The percentage yield of chloroform extract was 18.4% W/W. the chloroform extract was administered to the animals by suspending each time in 1 % CMC.

Experimental animals

Adult Wistar rats of the either sex weighing 150-250 gms were used in pharmacology and toxicological studies. The inbred animals were taken from the animal's house in C.L.Baid Metha College of Pharmacy. Thoripakkam, Chennai-97. The animals were maintained in a well ventilated room with at 12:12 hr light, dark cycle in polypropylene cages and maintained at 22±1°C with humidity at 55±5%. They were fed balanced rodents pellet diet from poultry research station, Nandanam, Chennai-35 and tap water *ad libitum* throughout the experiment period. The experiment protocol was approved by the Institutional Animals Ethics Committee (IAEC) of CPCSEA (Committee for the Purpose of the Control and Supervision of the Experiments Animals). Regd.No.930/a/06/CPCEA.Dt.30-06-2006).

Acute toxicity study

The acute toxicity of chloroform extract of *Cayratia Pedatata* leaves was determined as per the OECD guidelines No.423 (acute toxic class method). It was observed that the test extract was not lethal to the rats even at 2000mg/kg dose. Hence 1/10th (200mg/kg) and 1/5th (400mg/kg) of this dose were selected for further study^[9].

Anti diarrheal activity study by castor oil-induced diarrhea^[10]

Twenty Albino rats were randomly divided into four equal groups (n=5) divided into control group, positive control and test groups. The control group received vehicle (2 ml water/ rat). The positive control group received Loperamide at the dose of 3 mg/kg orally^[11]. The test group received chloroform extract of *Cayratia Pedatata* Lam 200 and 400 mg/kg orally. Each animal was placed in an individual cage the floor of which was lined with blotting paper. The floor lining was cleaned for every hour. Diarrhea was induced by oral administration of 1.0 ml castor oil to each rat. 1 hour after the above treatment during an observation period of 6 hours, the total number of feces and the number of diarrheic feces excreted by the animals were recorded. A numeric score based on the stool consistency was assigned as follows: normal stool = 1, semisolid stool = 2 and watery stool = 3.

**Antidiarrheal Activity Study by Magnesium Sulphate-Induced Diarrhea
castor oil-induced diarrhea**

A similar protocol as for castor oil-induced diarrhea was followed. Diarrhea was induced by oral administration of magnesium sulphate at the dose of 2gm/kg to the animals 1 hour after of vehicle (2ml /rats) to the control group, Loperamide (3mg/kg) to the positive group and chloroform extract of *Cayratia Pedatata* to the treatment group. All the administrations were carried out through the oral route^[12].

Statistical Evaluation

The groups were compared using one-way analysis of the variance (ANOVA) followed by Dennett's test. The minimum level of significance was set at (P<0.05).

Results**Effect on Castor Oil-Induced Diarrhea**

In the rats with castor oil-induced, the chloroform extract of the leaves of *Cayratia Pedatata* at the dose of 200 mg/kg and 400 mg/kg, reduced the total number of feces as well as of diarrheic feces in a dose dependent manner and the results were statistically significant (p<0.05) and p (<0.01) respectively. Loperamide reduced the total number of feces as well as of diarrheic feces in

dose dependent manner and the results were statistically significant $p(<0.01)$ The results were shown in Table 1.

Effect on Magnesium Sulphate – Induced Diarrhea

In the magnesium sulphate – induced diarrheal model , castor oil-induced the chloroform extract of the leaves of Cayratia Pedatata at the dose of 200 and 400 mg/kg, reduce the severity of diarrhea in test animals and the results were statistically significant $p (<0.05)$ and $p (<0.01)$ respectively. Loperamide reduced the total number of feces as well as of diarrheic feces in dose dependent manner and the results were statistically significant $p(<0.01)$ Table 2.

Discussion

Castor oil induced diarrhea is a secretory diarrhea since ricinolic acid, the active ingredient of castor oil, induces diarrhea by a hypersecretory response [13,14]. Since the chloroform extract of Cayratia pedata successfully inhibited the castor oil-induced diarrhea, it can be assumed that the Antidiarrheal action was mediate by an antisecretory mechanism. This was also evident from the reduction of total number of wet feces in the test group in the experiment.

Magnesium sulphate has been reported to induce diarrhea by increasing the volume of intestinal content through prevention of reabsorbtion of the water. It has also been demonstrated that it promotes the release of chloeccystokinin from the duodenal mucosa, which increases the secretion and motility of the small intestine and thereby prevents the reabsorption of sodium chloride and water^[15] . The chloroform extract of Cayratia pedata increased absorption of water and electrolyte from the gastrointestinal tract

Table 1. Effect of Chloroform Extract of Cayratia Pedatata lam Leaves on Castor Oil-induced Diarrhea in Rats (1 ml to each rat at 0 hrs)

Treatment	Dose (mg/kg, p.o)	Total number of feces in 6 hrs	Total number of wet feces in 6 hrs
Control (2 ml water/rats)	-	18.40 ± 0.6782	14.20± 1.428
CECP	200	13.40 ± 0.9274*	10.00 ± 0.7746*
CECP	400	11.00 ± 0.7071**	7.400± 0.8124**
Loperamide	3	5.200 ± 0.8602**	2.800± 0.3742**

Value are Mean ±SEM (n=05). Statistical significant test for comparison was done by ANOVA followed by dunnet’s ‘t’ test. Symbols statistical significant: * p<0.05, ** p<0.01

Table 2 . Effect of Chloroform Extract of Cayratia Pedata Lam Leaves on Magnesium Sulphate Induced Diarrhea in Rats (2 g/kg at 0 hrs)

Treatment	Dose(mg/kg, p.o)	Total number of feces in 6 hrs	Total number of wet feces in 6 hrs
Control (2 ml water/rats)	-	14.40±1.288	11.20±1.114
CECP	200	11.00±0.7071*	8.600±0.5099*
CECP	400	6.800±0.7348**	4.800±0.5831**
Loperamide	3	3.000±0.4472**	2.200±0.3742**

Value are Mean±SEM (n=05). Statistical significant test for comparison was done by ANOVA followed by dunnet’s ‘t’ test. Symbols statistical significant: *p<0.05 **p<0.01

Conclusion

Since the chloroform extract of *Cayratia pedata* exhibited Antidiarrheal activity in an number of models of diarrheic condition in test rats along with antimicrobial activity the extract could be useful as a nonspecific treatment for diarrhea. it is also reasonable to suppose that the chloroform extract might be effective in secretory diarrhea and inflammatory diarrhea. On the basis of these findings, it is can be assumed that the *Cayratia pedata* leaves could be potential source for an antidiarrhea drug in combination with other drugs.

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