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Experimental evaluation of *Chathusama Vati* for its Anti-Diarrheal Activity

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ABSTRACT

Background: Diarrhea is the condition of having three or more loose or liquid bowel movements per day. The loss of fluids through diarrhea can cause dehydration and electrolyte disturbances such as potassium deficiency or other salt imbalance. According to the World Health Organization, diarrhea affects 3-5 billion people per year worldwide and cause 5 million death per year. It is an important health problem in all age groups and is a major cause of death in socio-economical backward class of people. **Aim and Objective:** An experimental evaluation of *Chathusama Vati* for its anti-diarrheal activity. **Methods:** The experimental study was a three-group experimental study, conducted on 6 different rats on each group. Total 18 healthy albino rats weighing between 150 gm to 200gm will be taken and divided randomly into three groups; Rats were induced diarrhea with castor oil orally. Rats of group 1 will be administered with distilled water served as control group. Group 2 will be administered with Loperamide 5 mg/kg. Group 3 will be administered with *Chathusama Vati* (Humandose×0.018). **Results:** In the experimental study the result was showed as the *Chathusama Vati* has significant action in Diarrhea. **Conclusion:** From the experimental study the result it was found that *Chathusama Vati* showed mild ant- diarrheal activity.

Key words: *Atisara, Diarrhea, Chathusama Vati, Anti-diarrheal activity.*

INTRODUCTION

Ayurveda is considered as *Upaveda* of *Atharva Veda* and *Upanga* of *Rigveda*,[1] *Brahma Vivartha Purana* considers *Ayurveda* as fifth *Veda. Ayurveda* is also known as *Anadiandananta*. The aim of *Ayurveda* is prevention and cure of disease from its root.[2]

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Ayurveda is a branch of science which deals with the measurement of life and describes the *Hita, Ahita, Sukha* and *Dukha* of *Ayu*.[3]

The origin of '*Rasashastra*' has its roots in the 'Indian alchemy.' Alchemy, according to Indian tradition, is not an end in itself. It is only a means. The actual intention of processing mercury is to administer it for the preservation and promotion of positive rites unhindered for a sufficiently long period to achieve *Jivan Mukti* i.e., salvation from the bondage of the world while remaining alive. To ascertain the suitability of mercury for administration to an individual, it is tested over raw (unprocessed) Mercury and other base metals. If it is capable of transmission of ordinary mercury into gold then its considered to be suitable for administration to the individual.

'Rasashastra' is the science specially deals with mercury, other minerals and poisonous drugs. These

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drugs are pharmaceutically processed and rendered it for internal administrations.

Diarrhea is the condition of having three or more loose or liquid bowel movements per day.[4] The loss of fluids through diarrhea can cause dehydration and electrolyte disturbances such as potassium deficiency or other salt imbalance.

According to the World Health Organization, diarrhea affects 3-5 billion people per year worldwide and cause 5 million death per year.[5] It is an important health problem in all age groups and is a major cause of death in socio-economical backward class of people.

In *Ayurvedic* classics Diarrhea is correlated with *Atisara. Atisara* is a condition where watery stools are passed in excess, several times a day, through *Guda*.[6] Most important factor in the pathogenesis of *Atisara* is *mandagni. Dalhana* commentator of *Sushrurha Samhitha* mentioned that passing of watery stools in increased quantity is the cardinal feature of *Atisara*. *Ama dosh* due to *Agni Dushti* caused by *Mithya Aahara Vihara,* ultimately manifesting as *Atisara*.[7] Drugs which are mainly of *Deepana, Pachana* and *Langhana* should be adopted in the *Amavastha* of *Atisara* and drugs which have *Sthambhana* properties are selected in *Niramavastha*.[8] *Ayurvedic* literature records it found as both a symptom and an independent disease.

In modern science, Loperamide and bismuth subsalicylate are used to treat diarrhea. They may cause side effects like Dizziness, Tinnitus, Blackened stools, Constipation, Fatigue, Abdominal pain, Hives, and Wheezing.[9] Number of *Atisaragna* drugs has been mentioned in our *Ayurvedic* classical texts. *Chathusama Vati* is one such simple formulation explained in the *Atisara Adhikara Chikitsasara Sangraha* of *Vangasana Samhita*.[10] This is typical combination of drugs to combat the disease *Atisara*. The combination of *Abhaya, Mustha, Nagara, Guda* are capable to overcome the disease *Atisara.*

In this formulation *Abhaya* and *Nagara* acts as *Agni Deepaka. Mustha* and *Nagara* acts as *Deepana* and *Pachana Karma*, *Mustha* helps in *Stambhana*, and is also *Grahi*.

In the view to contribute a safe and effective anti-diarrheal formulation, the present study "Experimental evaluation of *Chathusama Vati* for its Anti-Diarrheal Activity" Is taken.

Materials and Methods

The raw drug was purchased from Thrissur, Kerala. Herbal drugs authentication was done in Department of *Dravyaguna*, Ramakrishna Ayurvedic medical College, Yelahanka, Bangalore. The test drug was prepared from Department of *Rasa Shastra & Bhaishajya* Kalpana, Ramakrishna Ayurvedic Medical College, Yelahanka, Bengaluru. All the Chemical reagents and other requirements of experimental study used from stock of Invivo Biosciences, Bengaluru.

Total 18 healthy Sprague-Dawley rats weighing between 150-200gms will be taken and divided randomly into three groups, each containing six rats, maintained under a constant 12hr light and dark cycle at 22-24 and at 45%-55% relative humidity. Animals were fed with Pellet rodent from VRK nutrition solutions. Deep bore well water passed through charcoal filters and exposed to UV rays and water in polypropylene water bottles were provided to the animals. The Animal Ethical committee has approved for experiment on animals (Approval number Invivo/109).

Table 1: Group Allocation

Group No	Treatment group	Dose	No. of animals	Animal numbers	
1	Control	-	6	1	6
2	Standard (Loperamide)	5 mg/kg	6	7	12
3	*Chathusamavati*	(Human dose × 0.018)	6	13	18

All healthy Albino rats which will be selected for the experiments and kept under fasting for 18 hours, Group-I will be given normal saline (2ml/kg) which served as control group. Group II will be given

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Loperamide (5mg/kg) as standard group, Group III will be administered with *Chathusamavati*. All doses will be administered orally. After 1 hour, all groups received 1 ml of castor oil orally, and then animals were placed in the cages lined with absorbent papers and observed for 4 hour for the presence of diarrhea defined as watery (wet), unformed stool. The control group result considered as 100%. The activity of each group will be expressed as percent inhibition (%) of diarrhea. The percent inhibition of defecation will be measured by using following formula.

Percentage inhibition of defecation = [(A-B)/A] X 100

A - Mean number of defecation time caused by castor oil

B - Mean number of defecation time caused by drug.

Average of all the data was compiled and SEM was calculated. All the data was analyzed using one-way ANOVA followed by Dunnett's multiple comparison test

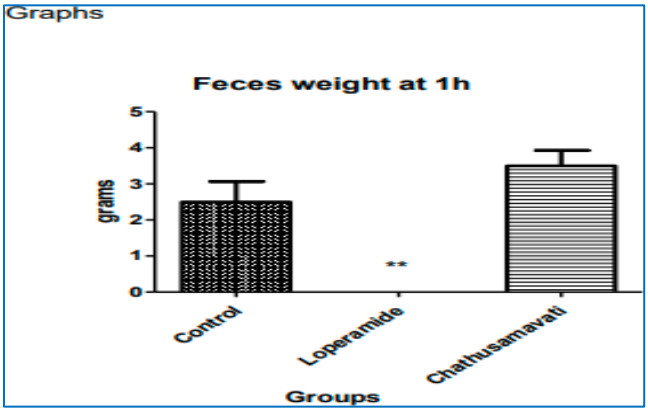
Observations and Results

Here the fasces weight was recorded and observed at one hour

Table 1: Showing mean values of faecal weight at 0-1 hour.

Group	Mean faces weight (in gm)	SEM
Control	2.5	0.6
Loperamide	0.0	0.0
Chathusamavati	3.5	0.4

Graph 1: Graph showing Faeces weight at 1 hour

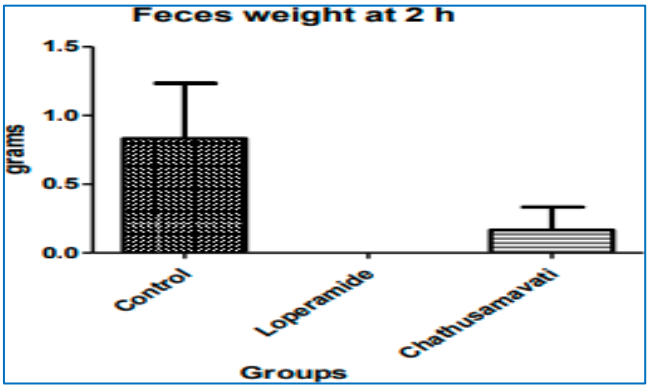


Here the fasces weight was recorded and observed at 2 hour.

Table 2: Showing mean values of faecal weight at 2 hour.

Group	Mean faces weight (in gm)	SEM
Control	0.8	0.4
Loperamide	0.0	0.0
Chathusamavati	0.2	0.2

Graph 2: Graph showing faeces weight at 2 hour

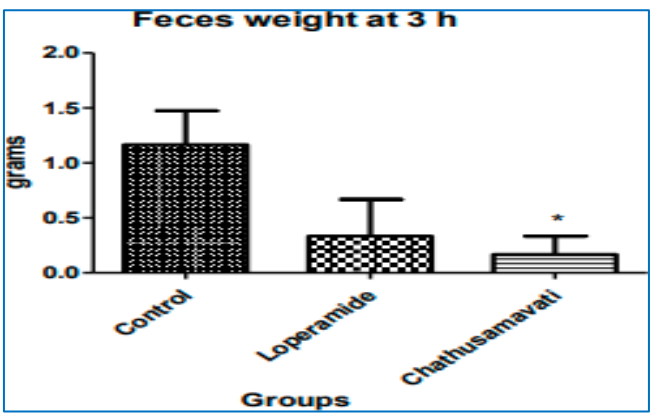


Here the fasces weight was recorded and observed at 3 hour.

Table 3: Showing mean values of faecal weight at 3 hour.

Group	Mean faces weight (in gm)	SEM
Control	1.2	0.3
Loperamide	0.3	0.3
Chathusamavati	0.2	0.2

Graph 3: Graph showing faeces weight at 3 hour.



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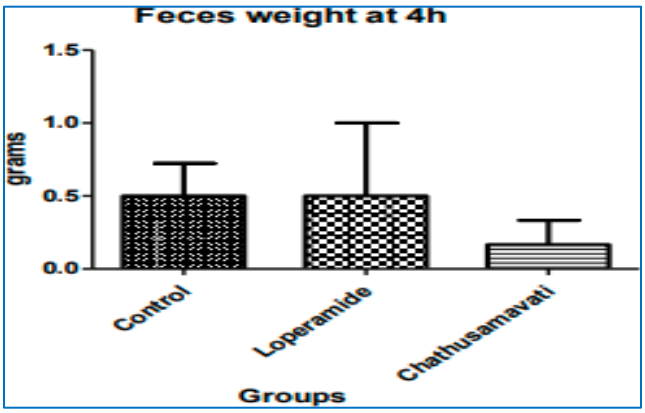
Here the fasces weight was recorded and observed at 4 hour.

Table 4: Showing mean values of faecal weight at 4 hour.

Group	Mean faces weight (in gm)	SEM
Control	0.5	0.2
Loperamide	0.5	0.5
Chathusamavati	0.2	0.2

Graph 4: Graph showing faeces weight at 4 hour.



Discussion

The main aim of the present study was to evaluate the Anti-diarrheal activity of *Chathusamavati*. The objective is to assess whether the preparation possess anti-diarrheal activity. In this study one in-vivo models are used i.e., Castor oil-induced diarrhea. The induction of diarrhea with castor oil results from the action of ricinoleic acid formed by hydrolysis of the oil. Ricinoleic acid produces changes in the transport of water and an electrolyte resulting in a hyper secretory response in addition to hyper secretion, ricinoleic acid sensitizes the intramural neurons of the gut.

Castor oil is a practical inducer that had been used in experimental models of screening anti-diarrheal agents. Following the administration of castor oil, it is hydrolyzed by lipase in the upper part of the small intestine to ricinoliec acid (the active form) which causes local irritation, inflammation of the gut, release of prostaglandin leading to intestinal hyperactivity, and fluid hyper-secretion. This will prevent water and electrolytes absorption, reduction in activity of sodium potassium - ATP ase in the intestine, and finally, diarrhea manifestation.

Agents that can inhibit electrolytes permeability and secretion can prevent castor oil-induced diarrhea. The acute toxicity study was conducted in rats as per OECD guidelines 420 and it was found that 18mg/kg body weight dose is safe as the toxicity study shows the test substance was not show any toxic clinical signs even at the dose of 2000 mg/kg body weight. In this study it was found that test substance at the dose of 18 mg/kg body weight showed anti-diarrheal activity. The faecal matter weights were measure periodically at1 h, 2 h, 3 hand 4 h time. The average reduction in the faecal matter weight was observed at 4 h. The percentage inhibition of the diarrheal is 43.54%. The anti-diarrheal activity of the test substance may be due to reduction of gastrointestinal motility or otherwise.

Conclusion

On the basis of experimental observations made in this study, *Chathusama Vati* proves to be beneficial in treatment of *Atisara.*

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