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## DETERMINATION OF ANTI-DIARRHOEAL ACTIVITY OF VETIVER

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### ABSTRACT

Diarrhea is the most common disease of bowel movement which is originated from contaminated food and water in developing countries. It is also caused by bacteria, viral infections and parasitic organism. The antibiotic resistance used for bacteria clostridium difficile shows higher incidence of diarrhea. The astringent activity, anti inflammatory components and bulk forming agents are involved in the plants used in the diarrheal treatment. The seeds are potential to important substantial medicines. Herbal medications plays an important role in india. The present study was conducted with various folklore claims in the plant *Vetiver zizinaloides* to isolate saponins and ethanol is extracted from the fruits. The ethanolic extract of *Vetiver zizinaloides* may be useful in a wide range of diarrhoeal states, due to both disorders of transit e.g. functional diarrhoeas, radiation diarrhoea or due to abnormal secretory mechanisms like in cholera or E.coli enterotoxin induced diarrhoea. Further studies are needed to completely understand the mechanism of anti-diarrhoeal action of *Vetiver zizinaloides*.

**KEY WORDS:** *Vetiver zizinaloides*, Diarrhea, Castor oil, dose dependency.

### INTRODUCTION

Diarrhea is the most common disease of bowel movement which is originated from contaminated food and water in developing countries. It is also caused by bacteria, viral infections and parasitic organism. The 70% acute diarrhea occurs when the condition lasts from one to two days due to food borne disease. The microscopic colitis and IBD causes chronic diarrhoea. The antibiotic resistance used for bacteria clostridium difficile shows higher incidence of diarrhea. The astringent activity, anti inflammatory components and bulk forming agents are involved in the plants used in the diarrheal treatment. The seeds are potential to important substantial medicines. Herbal medications plays an important role in india. The present study was conducted with various folklore claims in the plant *Vetiver zizinaloides* to isolate saponins and ethanol is extracted from the fruits. Therefore, this plant is used as herbal drug to maintain nerve disorders, aphrodisiac and infertility in males. The investigations are performed in the present study on the herbal plant to produce antidiarrheal activity.

### MATERIALS & METHODS

#### Preparation of extracts

The fruits are dried in shade, separated and made to dry powder. It was then passed through the 40 mesh sieve. A weighed quantity (50gm) of the powder was subjected to continuous hot extraction in Soxhlet Apparatus. The extract was evaporated under reduced pressure using rotary evaporator until all the solvent has been removed to give an extract sample. Percentage yield of ethanolic extract of *Vetiver Zizinaloides* (EEVZ) was found to be 18.5 % w/w. The phytochemical examination of ethanolic (90%) extract of fruits of *Vetiver Zizinaloides* was performed by the standard methods [7].

#### Animals used

Albino wistar rats (150-230g) of either sex were obtained. The animals were maintained in a well-ventilated room with 12:12 hour light/dark cycle in polypropylene cages. The animals were fed with standard pellet feed (Hindustan Lever Limited., Bangalore) and water was given *ad libitum*. Ethical committee clearance was obtained from IAEC (Institutional Animal Ethics Committee) of CPCSEA.

### Castor oil-induced diarrhoea

Rats were divided into four groups of six animals each, diarrhea was induced by administering 1 ml of castor oil orally to rats. Group I treated as control (2 ml/kg, i.p. saline), group II received atropine (3mg/kg, i.p.) served as standard and group III and IV received EEVZ (100 and 200 mg/kg, i.p.) 1 h before castor oil administration. The number of both wet and dry diarrheal droppings were counted every hour for a period of 4 h mean of the stools passed by the treated groups were compared with that of the positive control group consisted of animals given an intraperitoneal injection of saline (2ml/kg, i.p) [8].

### Statistical analysis

The data were expressed as mean  $\pm$  standard error mean (S.E.M). The Significance of differences among the groups was assessed using one way and multiple way analysis of variance (ANOVA). The test followed by Dunnet's test *P* values less than 0.05 were considered as significance.

**Table 1: Effect of EEVZ on castor oil-induced rats**

Group	Treatment	Mean Defecation in 4hr	% Inhibition of Defecation
I	Castor oil (1ml p.o) + saline (2ml/kg i.p)	26.47 $\pm$ 3.52	---
II	Castor oil (1ml p.o) + atropine (3mg/kg i.p)	9.78 $\pm$ 0.43**	70.92
III	Castor oil (1ml p.o) + EEVZ (200mg/kg i.p)	18.23 $\pm$ 2.6*	44.64
IV	Castor oil (1ml p.o) + EEVZ (400mg/kg i.p)	11.56 $\pm$ 1.04**	65.37

### CONCLUSION

In conclusion, the EEVZ showed marked reduction in the number of diarrhoea stools and the reduction in the weight and volume of the intestinal contents, as well as a modest reduction in intestinal transit. This study did not go further, to demonstration as to whether the extract altered the activity of Na/K ATPase or activation of chloride channels. Whatever, may be the mechanism of action, the ethanolic extract of *Vetiver zizinaloides* may be useful in a wide range of diarrhoeal states, due to both disorders of transit e.g. functional diarrhoeas, radiation diarrhoea or due to abnormal secretory mechanisms like in cholera or E.coli enterotoxin

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### RESULTS & DISCUSSION

The results of preliminary phytochemical screening of the ethanolic extract of inner bark of *Vetiver zizinaloides* revealed that presence of alkaloids, flavonoids, triterpenoids, carbohydrates, tannins, phenols, gums and mucilage and absence of saponins and steroids.

### Castor oil-induced diarrhoea

30 min after administration of castor oil the diarrhoea was clinically apparent in all the animals of control group, for the next 4 h. This was markedly reduced by the intraperitoneal injection of atropine, 3 mg/kg (70.92%). A similar marked reduction in the number of defecations over four hours was achieved with *Vetiver zizinaloides* at the doses of 200 or 400 mg/kg i.p. EEVZ 100 and 200 significantly inhibited the defecation.(44.64% and 65.37%) EEVZ 200 and 400 mg/kg, i.p. dose of extract delayed the onset of diarrhoea and only 30% of animals showed diarrhoea at first hour ( $P < 0.001$ ) (Table 1).

induced diarrhoea. Further studies are needed to completely understand the mechanism of anti-diarrhoeal action of *Vetiver zizinaloides*.

### CONFLICT OF INTEREST

Authors declare no conflict of interest.

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