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Research Article

ANTIDIARRHOEAL ACTIVITY OF *PSEUDARTHRIA VISCIDA* ROOTS

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ABSTRACT

Aim of study: To evaluate the root extract of *Pseudarthria viscida* Linn, for antidiarrhoeal activity using standard model.

Material and methods: The roots of *Pseudarthria viscida* Linn were collected from Kolli Hills, dried and extracted with ethanol (95%). Wistar albino rats were used for studies. Castor oil was used to induce diarrhoea and 200, 400 mg/kg of ethanol extract of *Pseudarthria viscida* (EEPV) was used to test antidiarrhoeal activity. Results were calculated by student “t” test, to assess statistical significance.

Results and Discussion: The extract showed dose dependant inhibition of frequency of defecation as well as reduction in number of wet feces. The percentage inhibitions of faecal with 200 and 400 mg/kg doses of ethanol extract were 48.14 and 62.96 respectively. The plant roots extract contains tannins and flavonoids, which could have contribution to the antidiarrhoeal activity.

Conclusion: Ethanol extract of *Pseudarthria viscida* (EEPV) Linn possesses significant antidiarrhoeal activity.

Key words: *Pseudarthria viscida*, Tannins, Castor oil induced diarrhoea, Antidiarrhoeal.

1. INTRODUCTION

Diarrhoea, an important health problem worldwide, especially in developing countries, accounts for more than 5-8 millions death in infants and children under 5 years, each year (1). In recent years, there has been a great interest in herbal remedies for the treatment of number of ailments. Indigenous plants such as *Andrographis paniculata*, *Asparagus racemosus*, *Butea monosperma*, *Cassia auriculata* and others are widely used for the treatment of diarrhoea (2).

Pseudarthria viscida Linn (Fabaceae) grows throughout south India up to 900 m in the hills and also in Gujrat. Roots of this plant have been traditionally used for various medicinal properties such as anti-inflammatory, diuretic, cardiotonic, diabetes, diarrhoea, fever, asthma, worms and urinary diseases (3-5). The roots of this plant have been investigated for its antihypertensive and antifungal activity (6, 7). Earlier work on the plant roots reported the presence of polyphenolic compounds, flavonoids and tannins (6). In the present study, plant roots were investigated for antidiarrhoeal activity using animal model.

2. MATERIALS AND METHODS

2.1 Preparation of extract

The roots of *Pseudarthria viscida* Linn were collected from Kolli Hills, Nammakal Dist, Tamilnadu, India and authenticated by the Botanical Survey of India, Southern Circle, TNAU campus, Coimbtore. Further the roots were dried under shade and then powdered with mechanical grinder, defatted with petroleum ether in a Soxhlet apparatus and subsequently extracted with ethanol. After exhaustive extraction, the ethanol extract was made solvent free by distillation under reduced pressure and the resulting semisolid mass was vacuum dried to yield a solid ethanol extract (8).Yield was 18.2%.

2.2 Animals

Wistar albino rats weighing between 150-200g were maintained under standard laboratory conditions on 12-day/night cycle with free access to food and water being *adlibitum*. The animals were acclimatized to laboratory conditions prior to experimentation. The activity was carried out in between 09.00 hr to 17.00 hr at ambient temperature. The animals were drawn at random for the study. All the experiments were performed according to current guidelines for the care of the laboratory animals and the ethical guidelines.

In acute toxicity study, EEPV did not show any mortality up to the dose of 2000 mg/kg in rats, also there was no change in general behavior and morphological profile.

2.3 Screening of antidiarrhoeal activity (9)

Before the experimental study, the animals were fasted overnight with free access to water. The experimental animals were grouped into four, each group containing six Wistar albino rats.

Group I received vehicle (1%CMC), orally and served as control.

Group II received ethanol extract (200 mg/kg).

Group III received ethanol extract (400 mg/kg).

Group IV received Loperamide (2 mg/kg) and served as Standard.

All test preparations and standard drug were administered 1hr prior to Castor oil challenged (10 ml/Kg). Each rat was then housed separately in the cages and observed for diarrhoeal episode, for a period of 4hr. During that period, number and weight of diarrhoeal faeces were taken after every half an hour. Using mean diarrhoeal episodes, percentage diarrhoea and percentage protections were calculated.

2.4 Statistical analysis

Results were calculated by student “t” test, to assess statistical significance and data summarized as mean \pm SEM

Table 1. Data showing antidiarrhoeal activity of ethanol extract of roots of *Pseudarthritis viscida* Linn.

S No.	Treatment	Dose	Mean no. of fecal matter	% Protection	Mean weight of stools
1	Control	10 ml/kg	5.40 ± 0.37	0	5.10 ± 0.31
2	EEPV	200 mg/kg	2.80 ± 0.58	48.14	3.51 ± 0.23
3	EEPV	400 mg/kg	2.0 ± 0.67	62.96	2.58 ± 0.17
4	Loperamide	2 mg/kg	1.40 ± 0.54	74.01	1.81 ± 0.12

Values are expressed as mean±SEM(N= 6 animals in each group)

3. RESULTS AND DISCUSSION

The extract showed dose dependant inhibition of frequency of defecation as well as reduction in number of wet feces. However, this value was significant at 400 mg/kg dose. The Loperamide has shown significant reduction in frequency of defecation and wet faeces. The percentage inhibitions of faecal with 200 and 400 mg/kg doses of ethanol extract were 48.14 and 62.96 respectively.

In the present study antidiarrhoeal activity of *Pseudarthritis viscida* Linn was evaluated in terms of percent protection using model of castor oil induced diarrhoea in rats. It is well known that ricinoleic acid, an active component of castor oil, induces changes in mucosal permeability, electrolyte transport and intestinal peristalsis, leading to hypersecretory of the intestinal mucosa, leading to prostaglandin's release, which causes an increase in net secretion of water and electrolytes into the small intestine (11). Inhibitors of prostaglandin response and diarrhea(10). Ricinoleic acid causes irritation and inflammation biosynthesis delay castor oil induced diarrhoea. It has been shown that E

type of prostaglandins causes diarrhoea in experimental animals as well as in human beings. The mechanism has been associated with dual effects on gastrointestinal motility as well as on water and electrolyte transport (12). PGE₂ also inhibits the absorption of glucose, a major stimulus to the intestinal absorption of water and electrolytes (13).

Earlier work on the plant roots revealed the presence of flavonoids and tannins. These compounds are reported for their antidiarrhoeal activity (14, 15). Tannins can evoke an antidiarrhoeal effect and these substances may precipitate proteins of the electrolytes, reduce peristaltic movement and intestinal secretion (15). The antidiarrhoeal activity of flavonoids has been ascribed to their ability to inhibit intestinal motility and hydroelectrolytic secretion (16), which is known to be altered in intestinal condition. *In vitro* and *in vivo* experiments have shown that flavonoids are able to inhibit the intestinal secretary response induced by prostaglandin E₂ (17). In addition, flavonoids possess antioxidant properties, which are presumed to be responsible for the inhibitory effects exerted upon several enzymes, including those involved in the arachidonic acid metabolism (18).

4. CONCLUSION

The root extract of *Pseudarthria viscida* contains tannins and flavonoids, which could have contribution to the antidiarrhoeal activity.

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