

**ANTI-INFLAMMATORY AND DIURETIC EFFECT OF PLANT EXTRACTS OF
PSEUDARTHRIA VISCIDA (L) WEIGHT & ARN.**

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ABSTRACT

The ethanolic extracts prepared from aerial parts of *Pseudarthria viscida* was studied for anti-inflammatory and diuretic activities in albino rats. The results obtained were compared with that of standard drug indomethacin and frusemide for their anti-inflammatory and diuretic activities respectively. The present study demonstrated the diuretic effect of *P.viscida* by increasing the excretion of Na⁺, K⁺ and Cl⁻ ions in the urine. The extract also showed significant anti-inflammatory effect by reducing the paw edema caused by carrageenan and reduced the weight of granular tissues formed in cotton granuloma technique.

KEYWORDS: *Pseudarthria viscida*, anti-inflammatory, diuretic, flavonoids, tannins

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INTRODUCTION

Pseudarthria viscida (family: Fabaceae) is useful in vitiated conditions of pitta and vata, cough, bronchitis, asthma, tuberculosis, helminthiasis, dyspepsia, diarrhea, neurasthenia, inflammations, strangury, cardiopathy, emaciation, haemorrhoids, gout, diabetes³, hyperthermia, and general debility^{1,2}. The plant has shown to possess antifungal⁴ and antioxidant⁵ effects. Our previous study demonstrated that *p.viscida* possessed significant analgesic and anti-pyretic effects⁶. Since no information is available on the diuretic and anti-inflammatory properties of the plant the present study was undertaken to investigate the diuretic and anti-inflammatory effect of the ethanolic extract of *P.viscida* (EEPV).

MATERIAL AND METHODS

Grouping of animals

Each group was allotted six animals each. Group I: Received 3% aqueous suspension of gum acacia (1ml/200g) as vehicle, Group II: Received standard drugs, Group III: Received EEPV (200 mg/kg), and Group IV: Received EEVP (400 mg/kg).

Carrageenan induced rat paw oedema

The initial right hind paw volume of the rats were measured using a plethysmometer and then 0.1 ml of 1% (w/v) carrageenan was subcutaneously injected into the subplantar region of the right hind paw. The volume of right hind paw was measured at 1, 2, 3, and 4 h after carrageenan injection, and the edema volume was determined. The data were expressed as paw volume (ml), compared with the initial hind paw volume of each rat. Co solvent, alcoholic extracts (200 & 400 mg/kg) of *P.viscida*, as suspension in distilled water and indomethacin (10 mg/kg) was orally administered 30 min before carrageenan injection. Each group comprised of 6 rats. The group received co solvent was treated as control⁷ (**Table 1**).

Cotton pellet granuloma

Cotton pellet granuloma was induced according to the method of D' Arcy *et al*⁸. Sterilised cotton pellets each weighing 10mg were implanted in both axilla and groin of each rat under light ether anaesthesia. Twenty four rats were divided into four groups as shown in for various treatments for five days. Subsequently, on 6th day all pellets were dissected out under ether anaesthesia and dried at 70°C for 6 hours and weight of each granuloma was determined (**Table 2**).

Diuretic test

The diuretic activity in rats was studied by the method as described by Lipschitz *et al*⁹. Male Wistar rats weighing 100-200 g were used. Three animals per group were placed in metabolic cages provided with a wire mesh bottom and a funnel to collect the urine. Stainless-steel sieves were placed in the funnel to retain feces and to allow the urine to pass. The rats were fed with standard diet (pellets) and water *ad libitum*. Fifteen hours prior to the experiment food and water were withdrawn. Three animals were placed in one metabolic cage. For screening procedures two groups of six animals were used for one dose of the test compound. The EEPV was given orally at a dose of 200 mg/kg and 400 mg/kg in 5.0 ml water/kg body weight. One group received the standard drug frusemide (20 mg/kg) and served as positive control. Additionally, 5 ml of 0.9% NaCl solution per 100 g body weight was given by gavage. The urine volume for 24 h was measured and urine electrolyte estimation was carried out for Na⁺, K⁺ using flame photometer¹⁰ and Cl⁻ was estimated by titration¹¹. Urine volume excreted per 100 g body weight was calculated and showed in **Table 3**.

Statistical analysis

The data represent mean \pm SEM. The results were analyzed statistically using one-way ANOVA followed by Dunnett's test. The minimum level of significance was set at $p < 0.05$. All assays were conducted in triplicate and statistical analysis was done, using Graph pad Prism (version 5) software.

RESULTS & DISCUSSION

Table 1 shows the effect of EEPV on Carrageenan induced paw edema. Significant decrease in paw edema was observed in EEPV 200 ($P<0.01$) and 400 mg/kg ($P<0.001$) when compared with the control group. The observed effect was in a dose dependent manner.

This anti-inflammatory activity was dose-dependent and found to be statistically significant at the higher concentration, 400 mg/kg, (Table 2) when compared with indomethacin, a standard reference drug. A dose dependent reduction in granular tissue formation was observed in EEPV 200 and 400 mg/kg treated rats (Table 2). The results were found to be statistically significant ($P<0.001$).

Table 3 shows the diuretic effect of ethanolic extracts of *Pseudarthria viscida*. The ethanolic extract was found to produce significant ($P<0.001$) increase in excretion of sodium, potassium and chloride ions at the higher dose level (400 mg/kg p.o.).

The present study revealed that, ethanolic extract of *Pseudarthria viscida* significantly increased the urinary output as well as urinary electrolyte concentration in a dose dependent manner. Carrageenan-induced paw edema model was used to evaluate the anti-inflammatory activity of the compounds which involves several chemical mediators such as prostaglandins, serotonin, histamine and bradykinin¹². It is possible that the active constituents present in *P.viscida* may be involved in the inhibition of some of these inflammatory mediators. Presence of phytoconstituents like terpenoids, saponins, flavonoids have been previously found to be responsible for diuretic and anti-inflammatory activity in plants¹³⁻¹⁶. Our previously published study showed the presence of these constituents in *P.viscida* which could have been responsible for the observed diuretic and anti-inflammatory effect.

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Table 1: Effect of *Pseudarthria viscida* extracts on Carrageenan induced rat paw oedema in albino rats

Treatment	Dose mg/kg	Percentage of inflammation at time (h)			
		1	2	3	4
Control	5ml/kg	37.51 ±4.65	85.66±3.11	106.65±6.14	126.81±6.10
Indomethacin	10	18.15±3.32*	21.08±3.60***	25.67±3.46***	31.50±3.45***
EEPV	200	32.65±5.50	63.28±4.08**	90.48±3.56	101.87±5.92**
EEPV	400	17.35±3.45**	52.50±4.74***	82.42±5.18**	90.27±4.94***

Each value represents mean±SEM of 6 observations. *p<0.05, **p<0.01, ***p<0.001 vs control, n=6
Data was analyzed using One-way ANOVA followed by Dunnett's test.

Table 2: Effect of *Pseudarthria viscida* extracts on cotton pellet induced granuloma in albino rats

Treatment	Weight of granuloma (mg)	Pair wise mean difference
Control	34.43 ± 2.39	
EEPV (200mg/kg)	23.36*** ± 0.58	10.16 ± 2.27
EEPV (400mg/kg)	20.76*** ± 1.08	11.66 ± 2.27
Indomethacin (5mg/kg)	18.26*** ± 1.62	14.26 ± 2.27

Each value represents mean±SEM of 6 observations. *p<0.05, **p<0.01, *** p<0.001 vs control
Data was analyzed using One-way ANOVA followed by Dunnett's test.

Table 3: Diuretic effect of *Pseudarthria viscida* extract in albino rats

Treatment	Dose mg/kg	Urine volume (ml)	Electrolyte Excretion			
			Na ⁺ μmole/kg	K ⁺ μmole/kg	Cl ⁻ μMoles/kg	Na ⁺ /K ⁺
Control		2.80±0.12	50.12±2.84	140.70±2.64	84.85±3.85	0.36
EEPV	200	3.97±0.24	52.16±4.23	137.50±3.55	92.86±5.22	0.38
EEPV	400	5.56±0.44	62.75±2.30*	149.55±2.59***	109.85±1.55***	0.42
Furosemide	20	10.56±0.23	106.10±4.12***	185.50±1.23	128.55±4.24***	0.57

Each value represents mean±SEM of 6 observations. *p<0.05, **p<0.01, ***p<0.001 vs control
Data was analyzed using One-way ANOVA followed by Dunnett's test.

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