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Research Article

ANTI-PYRETIC AND ANTI-NOCICEPTIVE EFFECT OF ALCOHOLIC EXTRACTS OF *PSEUDARTHRIA VISCIDA* (L) WEIGHT & ARN.

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ABSTRACT

In this study, antipyretic and analgesic effects of ethanolic extract of *Pseudarthria viscida* leaves belonging to family Fabaceae were studied in. Preliminary phytochemical screening revealed the presence of various vital components. The extract was found to be nontoxic upto the dose of 2000mg/kg. *P.viscida* (200 and 400 mg/kg , p.o) produced significant reduction in the elevated body temperature , extended latency period in Eddys hot plate and decreased the number of writhing induced by acetic acid in a dose dependent manner.

Key words: Pseudarthia viscida, analgesic, antipyretic, flavonoids, tannins

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, diabetes, hyperthermia, and general debility [1]. The plant has shown to possess antifungal[2] and antioxidant[3]effects. Since no information is available on the antipyretic and anti-inflammatory properties of the plant the present study was undertaken to investigate the antipyretic and anti-nociceptive effect of the ethanolic extract of P.viscida (EEPV).

MATERIAL AND METHODS

Preparation of extracts

Pseudarthria viscida was collected from karipatti, salem district, tamilnadu, India. The aerial parts of the plant was dried under shade and extracted with 90% ethanol and water by hot soxhlet method.

Experimental animals

Albino mice weighing 20–25 g and young adult Wistar rats of both sexes weighing 150–200 g were used. The animals were kept and maintained under laboratory conditions of temperature, humidityand light; and were allowed free access to food (standard pellet diet) and water ad libitum. The animals were divided into plant extract- and drug-treated 'test', and distilled water-treated 'control' groups of eight animals per group. All the animals were fasted for 16 h, but still allowed free access to water, before the commencement of the experiments. The mice were used for assessment of acute toxicity testing and analgesic activity, while the rats were used for the antipyretic evaluations of extracts.

Acute toxicity studies

Albino mice weighing 22–25 g (three female animals) were used in the study. Acute oral toxicity was performed as per the OECD-423 guidelines[4].The animals were fasted overnight, provided with water after which EEPV was administered orally. The animals were observed for toxic symptoms such as behavioral changes, locomotion, convulsions and mortality.

Preliminary phytochemical screening

Preliminary phytochemical screening was performed on the extracts of *Pseudarthria viscida* by standard methods.[5, 6]

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 paracetamol (PAL) standard drug, Group III: Received EEPV (200 mg/kg), and Group IV: Received EEVP (400 mg/kg).

Antipyretic activity

Antipyretic activity was carried out according to the previously reported methods[7]. Briefly, pyrexia was induced in rats by injecting 20% (w/v) aqueous suspension of Brewer's yeast intramuscularly. After 18 h, the animals developed 0.5^0C or more rise in the rectal temperature. Paracetamol (33 mg/kg) was used as standard. At different time intervals, rectal temperature was noted. Percentage reduction in rectal temperature was calculated by considering the total fall in temperature to normal level as 100%.

Acetic acid test method

Analgesic activity was evaluated in mice using the writhing test[8]. Mice were given an intraperitoneal injection of 0.7% (v/v) aceticacid solution (volume of injection was 0.1 ml/10 g body weight). Paracetamol at a dose of 45mg/kg was used as standard. The number of writhes produced in these animals was counted for 20 min.

Hot-plate test method

Analgesic effect was further evaluated using hot plate method described by Eddy [9]. The hot plate was maintained at 55±0.50C. The animals which showed pain response to the hot plate were selected. The standing time on the plate was limited to 10sec to avoid damage to the paws of the animals. The number of jumping and paw licking was assessed.

Statistical analysis

The data represent mean ± 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

Acute toxicity studies

The EEPV did not produce any toxic symptom or mortality up to a dose level of 600mg/kg body weight orally in mice, and hence the drugs were considered safe for further pharmacological screening. According to OECD-423

guidelines for acute oral toxicity, a LD50 dose of 2000 mg/kg and above is categorized as unclassified.

Preliminary phytochemical screening

Table 1 shows the phytochemical screening of ethanolic extract of *Pseudarthria viscida*. Presence of

Antipyretic activity

Table 2 shows the effect of EEPV on brewers yeast induced pyrexia. Significant increase in rectal temperature of control group was observed. Treatment with PAL showed significant (P<0.001) reduction in temperature when compared with control. EEMP 200 and 400 mg/kg also showed significant (P<0.05) reduction in rectal temperature when compared with control.

Acetic acid test method

Table 3 shows the effect of EEPV on acetic acid induced writhing. Treatment with PAL showed significant (P<0.001) reduction in number of writhes when compared with control. EEMP 200 and 400 mg/kg also showed significant (P<0.05) percentage inhibition of writhes when compared with control.

Hot-plate test method

Table 4 shows the effect of EEPV on Eddy's hot plate. Treatment with PAL showed significant (P<0.001) protection and increased the mean reaction time when compared with control. EEMP 200 and 400 mg/kg also showed significant (P<0.05) percentage protection when compared with control.

Table 1: Preliminary phytochemical screening for ethanolic leaf extracts of *Pseudarthria viscida*

Constituents	Leaf
Alkaloids	+ve
Carbohydrates	+ve
Tannins	+ve
Steroids	-ve
Flavonoids	+ve
Phenols	+ve
Saponins	+ve
Gums and mucilage	-ve
Glucosides	-ve

+ve=denotes presence of constituent -ve= denotes absence of constituents

Table 2: Anti-pyretic activity of ethanolic extracts of *Pseudarthria viscida*

Treatment	Dose mg/kg	Normal rectal temperature M±SEM	Rectal temp after yeast administration	Rectal temp in °c after administration M±SEM		
				1 hr	2 hr	3hr
Control	Saline	34.33±0.20	37.5±0.22	37.8±0.23	37.8±0.23	37.8±0.23
Paracetamol (33mg/kg)	100	34.7±0.24	39.5±0.17	37.2±0.45	36.4±0.28	34.9±0.19**
EEPV (200mg/kg)	200	34.33±0.21	37.3±0.33	36.1±0.30	35.5*±0.22	34.6*±0.21
EEPV (400mg/kg)	400	34.16±0.31	37.1±0.30	36.3±0.21	35.7*±0.22	34.8±0.34

Each value represents mean ±SEM of 6 observations. *p < 0.05, **p<0.001 vs control. Data was analyzed by student's t test. One-way ANOVA followed by Dunnett's test

Table 3: Anti-nociceptive activity of ethanolic extracts of *Pseudarthria viscida*: Acetic acid test method

Treatment	Number of writhings in 20 mins	Inhibition %
Control	41.36 ± 4.40	0.00
Paracetamol (100mg/kg)	2.60 ± 1.10**	93.86**
EEPV (200mg/kg)	22.44 ± 4.39*	51.75*
EEPV (400mg/kg)	12.89 ± 3.45*	74.29*

Each value represents mean ±SEM of 6 observations. *p < 0.05, **p<0.001 vs control. Data was analyzed by student's t test. One-way ANOVA followed by Dunnett's test

Table 4: Anti-nociceptive activity of ethanolic extracts of *Pseudarthria viscida* :Hot-plate test method

Treatment	Mean reaction time	Protection %
Control	10.31 ± 1.41	0.00
Paracetamol (100mg/kg)	20.28 ± 1.43**	92.95**
EEPV (200mg/kg)	14.50 ± 1.43*	41.95*
EEPV (400mg/kg)	16.01 ± 1.40*	65.10*

Each value represents mean ±SEM of 6 observations. *p < 0.05, **p<0.001 vs control. Data was analyzed by student's t test. One-way ANOVA followed by Dunnett's test

DISCUSSION

In acute toxicity study, oral administration of *P.Viscida* did not produce any mortality in mice upta dose level of 2 g/kg. This may be due to the broad non-toxic range of the plant

The extracts produced significant antipyretic effect in a dose dependent manner. The phytochemical analysis of the dry residue showed the presence of flavonoids, alkaloids, tannins and steroids. The antipyretic activity observed can be attributed to the presence of flavonoids. In many previous studies, flavonoids have been reported to exhibit antipyretic effect [10, 11]. A previously published study proposed that, the increase in the body temperature intensified the lipid peroxidation process, which indicates that pyrexia is associated with increased oxidative stress. The antioxidant supplementation decreased the lipid peroxidation processes[12]. *P.Viscida* has shown to possess antioxidant property [3] which may contribute to the decrease in body temperature.

The results of the present study revealed the anti pyretic and analgesic effect of *Pseudarthria Viscida* leaves. Acetic acid induced writhing and eddys hot plate test to thermal stimulation are models of pain that mainly involve peripheral[13] and central[14] mechanisms respectively. Analgesic effect observed in both these experiments with EEPV indicates the involvementof both peripheral and central mechanisms. Tannins and flavonoids[15] have shown to possess analgesic effect. *P.Viscida* was found to have tannins and flavonoids which may futher contribute to the analgesic effect of *P.Viscida*. As EEPV showed a dose dependent response on analgesic activity *P.Viscida* may also play a significant role in anti-inflammatory activity.

The present study demonstrates the potential antipyretic and anti-nociceptive effects of *P.Viscida*, which supports the folklore claims as an antipyretic and analgesic remedy.

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