- Short communication

Antinociceptive Activity of Whole Plant Extracts of *Paederia foetida*

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Paederia foetida (Bengali name- Gondhabadali, Gondhal; English name- King's Tonic) is a climbing twining shrub belonging to the family Rubiaceae. The plant grows all over Bangladesh.[1] Leaf juice of the plant is astringent and is given to children in diarrhea. Decoction of the leaves acts as diuretic and the roots and barks are used as emetic and in the treatment of piles, inflammation of spleen and pain in the chest and liver. Fruit is specific against toothache.[1] Previous phytochemical investigation showed that the leaves contain methyl mercaptan and arial parts contain a crystalline keto alcohol, paederolone, a keto compound, paederone and beta-sitosterol.[1] Though the plant is traditionally used in many parts of Bangladesh, no scientific report is available to justify the folkloric use. As a part of our continuing studies on the medicinal plants of Bangladesh,[2-5] we investigated the analgesic activity of the whole plant extracts of *P. foetida.*

The whole plant part of *P. foetida* was collected from Savar, Dhaka, Bangladesh in April 2004 and was taxonomically identified at the Department of Botany, University of Dhaka. Collected plant parts, after cutting into small pieces, were dried and pulverized into a coarse powder, and stored into an air-tight container.

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The pulverized coarse powder of the plant *P. foetida* (325 gm) was extracted with hexane, ethyl acetate and methanol (1L × 3) successively for 7 days. All the extracts were then filtered off and evaporated to dryness *in vacuum* by a rotary evaporator. The hexane extract was designated as PFH (0.7 g), ethyl acetate extract as PFE (0.95 g) and methanol extract as PFM (1.14 g). Finally the extracts were defatted at 4° C temperature.[6]

Swiss albino mice (20-25 g) of either sex were obtained from the animal house of International Center for Diarrhoeal Disease and Research, Bangladesh (ICDDR, B). The animals were given standard feed developed by ICDDR,B and water *ad libitum* and kept in the laboratory environment (12 h dark/12 h light cycle) for seven days for acclimatization. Animals were kept under fasting for overnight and weighed before the experiment Aminopyrine (Sigma-Aldrich), acetic acid (Merck, Germany) were used as drugs.

75 and 37.5 mg of the extract was separately triturated by the addition of small amount of Tween-80. After proper mixing of the extract and tween-80, saline water was slowly added and the final volume of the suspension of each extract was adjusted to 2.5 ml. For the preparation of standard, 12.5 mg of aminopyrine was taken and suspension of 2.5 ml was made with Tween-80 and saline water. Each 10 g of experimental animal received 0.1 ml of the crude extract and the standard drug.

The antinociceptive activity of different extracts of *P. foetida* was determined by the acetic acid induced writhing inhibition method.[7] The pre-screened *Swiss albino* mice were divided into groups depending on the number of samples and doses to be applied as shown in table1. The inhibition of writhing in mice by the plant extract was compared against inhibition of writhing by a standard analgesic agent, aminopyrine given *p.o.* at a dose of 50 mg/kg. Acetic acid (0.7%) at a dose of 0.1 ml/10g was administered intraperitoneally to create pain sensation. The number of writhing was calculated for 10 minutes after the acetic acid injection. The percentage of pain protection was calculated. The results were analyzed for statistical significance using one-way ANOVA followed by Dunnet's test. A *P* value <0.05 was considered significant.

The hexane and methanol extracts of *P. foetida* at a dose of 300 mg/kg body weight showed significant antinociceptive activity (Table 1) with 37.42% and 25.18% inhibition in the number of writhing, respectively. The results were found to be statistically significant (P < 0.01). At a dose of 150 mg/kg body weight both extracts produced 21.10% and 19.74% inhibition of writhing response, respectively. The antinociceptive activity of the ethyl acetate extract was not significant in both doses.

Table 1. Effects of crude extract[a] on acetic acid induced writhing response in mice.

Treatment	Dose (mg/kg, p.o.)	Average Writhing	% Writhing	% Inhibition	SD	SE	One way ANOVA
Control (vehicle, 10ml/kg)	-	12.3	100	-	1.48	0.60	-
PFH	150	9.67	78.9	21.10	1.08	0.44	p<0.01
	300	7.67	62.58	37.42	1.08	0.44	P<0.01
PFE	150	11.1	9.46	9.54	0.97	0.40	p>0.05
	300	10.8	87.74	12.26	1.17	0.48	p>0.05
PFM	150	9.83	80.26	19.74	1.57	0.64	p<0.01
	300	9.20	74.82	25.18	1.29	0.53	p<0.01
Aminopyrine	50	4.50	36.73	63.27	0.89	0.37	p<0.01

[a]1hr after treatment, mice were injected i.p. with 0.7%(v/v) acetic acid (0.1ml/10g); immediately after the injection, the number writhing was counted for 10 min. PFH = Hexane extract, PFE = Ethyl acetate extract, PFM = Methanol extract. (n = 6); One-way ANOVA F= 23.4, df = 7, 40.

The acetic acid induced writhing response is a sensitive procedure to evaluate peripherally acting analgesics. The response is thought to be mediated by peritoneal mast cells [8], acid sensing ion channels [9] and the prostaglandin pathways.[10] The significant antinociceptive activity of hexane and methanol extract of the whole plant of *P. foetida* might be due to the presence of analgesic principles acting with the prostaglandin pathways. Although the extracts of *P. foetida* exhibited significant analgesic activity, further study is required to isolate active constituents of this plant.

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