



Analgesic activity of Chloroform extract of *Caesalpinia pulcherrima*

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ABSTRACT

The chloroform extract of *Caesalpinia pulcherrima* (CPCE) has been subjected for its analgesic activity in mice of either sex. In the acetic acid-induced writhing model, the extract at doses of 50, 75 and 100 mg/kg significantly ($P < 0.05$) showed a good analgesic effect characterized by reduction in the number of writhes when compared to the control and standard drug Diclofenac Sodium (5 mg/kg). The analgesic activity was also assessed by increasing the pain threshold level in tail immersion test in mice at dose of 50 mg/kg compared with standard drug Aspirin (25 mg/kg). The results suggest that the extract acts peripherally to produce significant analgesic action.

Keywords: Analgesic activity; *Caesalpinia pulcherrima*; Chloroform extract

INTRODUCTION

Caesalpinia pulcherrima Swartz (Leguminosae) commonly known as red bird of paradise is a medicinal herb used in the treatment of various diseases [1]. The different parts of this herb have been used in common remedies for treatment of a number of disorders including pyrexia, menoxenia, wheezing, bronchitis, antiviral, emmenagogue [2] and malarial infection. Decoction of the plant is used to treat various infections [3]. The plant is rich in many pharmaceutical active ingredients like flavonoids, carotinoids, glycosides, phenols and steroids. Earlier works reported the isolation of diterpenoids [4, 6], peltogynoids and flavonoids in this plant [7, 8]. Although large number of plants/their parts have been screened for their antimicrobial/antifungal activities, this plant is regularly being used in household medicines and therefore, it was thought worthwhile to explore the plant for its potent biological activity.

MATERIALS AND METHODS

Plant Material: *Caesalpinia pulcherrima* leaves were collected from the wild forest of Satpuda region, Maharashtra, India. The plant was identified and authenticated by Dr. D.A. Patil, Maharashtra. A voucher specimen was deposited in the Department of Pharmacognosy, SPTM, Shirpur campus. The leaves were blended with the help of blending machine and were sieved through sieve No 100 and the powdered leaves were kept separately in airtight container until the time of use.

Preparation of chloroform *Caesalpinia pulcherrima* leaf extract (CPCE): The cleaned shade dried, powdered leaf (500 g) was extracted in soxhlet apparatus with chloroform at a temperature of 55° for 36 h. The resultant extract was filtered. The filtrate was treated with 5% lead acetate solution to remove the tracts of tannins present in the extract. It was filtered and the filtrate was concentrated to dryness in a rotary evaporator under reduced pressure at a constant temperature of 40°C. The dried mass was stored in a refrigerator and considered as extract. The yield of the extract was (150g w/w in terms of dried material) [9].

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Preliminary Phytochemical screening: The extract was subjected to preliminary phytochemical qualitative screening for the presence or absence of various primary or secondary metabolites following standard procedures [10].

Animals: Adult albino mice, weighing 20-25 g were used to study the analgesic activity. The animals (six per cage) were maintained under standard laboratory conditions (light period of 12h/day and a temperature 25±2°C) with access to standard commercial diet and water *ad libitum*. The experiment was carried out according to the Committee for the purpose of Control and Supervision of Experiments on Animals (CPCSEA) guidelines and the Institutional Animal Ethics Committee had approved all the procedures. Experiment studies were undertaken according to their rules and regularities.

Analgesic Activity

Chloroform extract of leaves of *Caesalpinia pulcherrima* was evaluated for analgesic activity by two different models in mice

Acetic Acid Induced Writhing effect:

Swiss albino mice (15-20 g) were selected and were divided in to five groups of six animals each. All these animals were fasted 18 h prior to commencement of experiment but water was provided *ad libitum*. Animals of group I, II received saline solution and Diclofenac (5 mg/kg i.p.) respectively through oral route. Animals of group III, IV and V received chloroform extract at a dose of 50, 75, 100 mg/kg in a similar manner.

Mice were made to writhe by intraperitoneal injection of 0.6% v/v aqueous acetic acid (10 ml/kg). Test substances were administered 60 minutes before the injection of acetic acid. Animals were kept under observation immediately after acetic acid injection and the numbers of writhes were counted from 5-15 minutes period. The results are tabulated in Table 1.

Tail immersion Test: Prior to analgesic experiments, the animals were screened for sensitivity by immersing tip of tail gently in hot water (50-55°C). The animals which lifted the tail from hot water within 3 seconds were selected for the study. Mice were divided in the groups of three, 6 each, were held in position in a suitable restrainer with the tail extending out. 3-4 cm area of the tail was marked and immersed in the water bath thermo-statistically maintained at 51°C. The withdrawal

Table 1. Analgesic effect of Chloroform extract of *C. pulcherrima* in acetic acid induced method.

Groups	Dose	No. of writhes ± SEM (n=6)	% Inhibition
Control	10 ml/kg	76 ± 7.61	—
Diclofenac Sodium	5 mg/kg	40.83 ± 1.57	46.27 %
CPCE-50	50 mg/kg	50.4 ± 2.18**	33.68 %
CPCE-75	75 mg/kg	41.16 ± 2.40**	45.83 %
CPCE-100	100 mg/kg	28.66 ± 1.97**	62.28 %

One way ANOVA, P value 0.01, F 21.041, df 29

Data analysed by One way ANOVA followed by Dunnette's test** P < 0.01, * P < 0.05

Table 2. Analgesic effect of Chloroform extract of *C. pulcherrima* in mouse tail immersion method.

Groups	Dose	Time (Sec.) ± SEM			% Inhibition	
		0 min	30 min.	60 min.	30 min	60 min.
Control	10 ml/kg	2.37 ± 0.32	2.28 ± 0.31	2.485 ± 0.25	-	-
CPCE-50	50 mg/kg	4.53 ± 0.44*	5.72 ± 0.40**	7.16 ± 0.83**	27.99	57.11
Aspirin	25 mg/kg	2.55 ± 0.38	3.92 ± 0.51	4.83 ± 0.73	55.87	88.53

One way ANOVA, P value 0.01, F 9.369, df 35

Data analysed by One way ANOVA followed by Dunnette's test Significant relative to control reading: ** P < 0.01, * P < 0.05

time of the tail from hot water (in seconds) was noted as the reaction time or tail flick latency. 0.2 ml of saline solution was administered to control animals; plant extracts in dose of 50 mg/kg were given orally by intubation. The initial reading was taken immediately before ad-

ministration of test and standard drugs and then 30 and 60 minutes after the administration. The results are recorded in Table 2.

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