

RESEARCH ARTICLEINTERNATIONAL JOURNAL OF NOVEL TRENDS IN PHARMACEUTICAL SCIENCES
Available online at www.ijntps.com | ISSN: 2277 - 2782

Analgesic activity of dichloromethane extract of *Valeriana jatamansi* roots

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Received for publication, June 06, 2011, and in Revised form, September 09, 2011; Published online in, October 7, 2011

ABSTRACT

The present study was designed to evaluate the analgesic activity of *Valeriana jatamansi* (Fam. Valerianaceae) roots. The dichloromethane extract was subjected to analgesic activity evaluation on lacca mice using tail immersion test. The standard and test extract were administered per oral route. Dichloromethane extract of the roots exhibited significant dose dependent analgesic activity at 400 mg/kg, comparable to that of standard aspirin (100 mg/kg).

Keywords: *Valeriana jatamansi*, Analgesic, Tail immersion test.**INTRODUCTION**

Valerian is a common name given to crude drug consisting of the underground parts of *Valeriana* species (Fam. Valerianaceae). The genus *Valeriana* comprises 200 species distributed worldwide and many of them are used medicinally. Hooker in 1882 reported 13 species from Indian subcontinent and Wealth of India mentions only three species, namely *V. jatamansi*, *V. hardwickii* and *V. pyrolaefolia* from India [1,2]. Several formulations containing valerian have been patented for analgesic activity even though Indian valerian was long categorized as analgesic in Ayurvedic text [3,4]. A number of formulations containing valerian extract and NSAIDs are used to treat acute muscular aches, strains and sprains [5-7].

EXPERIMENTAL**Plant material**

The roots of *V. jatamansi* were purchased from local market of Bhunter, Kullu. Voucher specimen of *V. jatamansi* roots (accession number 1466) has been deposited in the Museum-cum-Herbarium of University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh.

Chemicals and reagents

Dichloromethane (Thermo Fisher Scientific India Pvt. Ltd., Mumbai), carboxy methyl cellulose (Merck Specialities Pvt. Ltd., Mumbai) and tween 80 (HiMedia

Laboratories Pvt. Ltd., Mumbai) were used. Aspirin (Torrent Pharmaceuticals) was used as standard analgesic.

Preparation of extracts

Coarsely powdered roots and rhizomes of *V. jatamansi* (100 g) were macerated (24 h) twice with DCM at room temperature. The extract was filtered and solvent was recovered using rotary vacuum evaporator under reduced pressure. Dried extract was preserved in vacuum desiccator containing anhydrous silica gel blue.

Experimental animals

Lacca mice (20-30g) of either sex, housed at Central Animal House, Panjab University, Chandigarh, were maintained in a 12 h light/dark cycle at a constant temperature of 25 °C. The mice were fed standard pellet diet (Ashirwad Industries, Mohali) and water *ad libitum*. The animals were fasted for 18 h before the experiment. The animals were allocated to different experimental groups each of five mice. All the studies were performed as per the guidelines of the Institutional Ethical Committee of Panjab University, Chandigarh, India (45/GO/ReBi/S/99/CPCSEA).

Preparation of doses

Tween 80 (5%) in aqueous carboxy methyl cellulose (0.5%) was used as vehicle for preparing the

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suspension of extract and standard drug. Doses of various substances were prepared by suspending appropriate quantities in vehicle so as to administer these to mice in a volume ranging from 0.20 to 0.30 mL, per oral route, using a tuberculin syringe fitted with an oral canula. The vehicle alone served as control.

Analgesic activity evaluation: Tail immersion test

Tail immersion test was used for determining the analgesic activity [8]. The tail of the animal was immersed in a thermostatically controlled water bath ($55 \pm 1^\circ\text{C}$) and withdrawal time of each animal was noted. An increase in withdrawal period with respect to control indicated significant activity. The extent of activity was reflected in the quantum of increase. A cut-off time of 10 seconds was kept to prevent any injury to the tail.

Statistical Analysis

The data have been expressed as mean \pm standard deviation of mean. Significant differences among the groups were assessed using one way analysis of variance (ANOVA). The test was followed by Tukey's multiple range test, p values less than 0.05 were considered as significant.

RESULTS

Analgesic Activity

Dichloromethane extracts of *V. jatamansi* was evaluated at three dose levels for analgesic activity. The activity was determined by recording the tail withdrawal time (reaction time) of each animal in a test group and comparing the mean reaction time of the test group with the control group. Aspirin was used as a positive control. Significant analgesic activity was observed at a dose of 400 mg/kg. The results and details are given in Tables 1.

Table 1. Analgesic activity of dichloromethane extract of *V. jatamansi* roots

Group	Dose (mg/kg)	Mean reaction time \pm SD* (sec)	Per cent increase from control
Control	-	1.62 \pm 0.12	-
Aspirin	100	3.16 \pm 0.12**	95
Dichloromethane extract	100	1.79 \pm 0.15	11
	200	2.59 \pm 0.18**	60
	400	3.33 \pm 0.24**	106

*n = 5; **significant at $p < 0.05$

DISCUSSION

The genus *Valeriana* has been used since time immemorial for treatment of various mental conditions and for pain relief. Various species have been investigated for their numerous biological effects, however, no significant reports pertaining to analgesic activity of *V. jatamansi* are available [9]. Thus, it was considered worthwhile to evaluate the analgesic potential of *V. jatamansi* roots.

DCM extract of *V. jatamansi* roots & rhizomes was prepared as valepotriates, known for their numerous biological effects are soluble in DCM. The analgesic activity was evaluated using tail immersion test. Results of the present study indicate that the dichloromethane extract of *V. jatamansi* has significant analgesic activity at a dose of 200 mg/kg. However, maximum analgesic activity was observed at a dose of 400 mg/kg which is comparable to that of standard aspirin (100 mg/kg).

CONCLUSION

Present investigation shows that dichloromethane extract of *V. jatamansi* roots exhibits analgesic activity, thus, validating their traditional use as pain reliever.

ACKNOWLEDGEMENT

The financial support for this work by University Grants Commission (UGC), New Delhi is gratefully acknowledged.

CONFLICT OF INTEREST

Nil

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