

RESEARCH ARTICLE

PHARMACOGNOSY

EVALUATION OF ANALGESIC ACTIVITY OF *CLERODENDRUM VISCOSUM* LINN. (VERBENACEAE) LEAVES ON EXPERIMENTAL ANIMAL MODEL.

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ABSTRACT

The main objective of the present investigation is to evaluate the analgesic activity of ethanolic extract of leaves of *Clerodendrum viscosum* (EELCV) on rats. Analgesic activity of EELCV at a dose of 100, 300 and 1000mg/kg and 500mg/kg & 2.5 mg/kg of pethidine was evaluated against the standard drug pethidine at a dose of 5mg/kg. Adult Swiss albino rats of either sex of six numbers in each group was undertaken for study and evaluated by tail flick method (for central action). The analgesic activity profile of ethanolic extract at different doses of 100, 300, 1000mg/kg and combination of 500mg/kg extract and 2.5 mg/kg of pethidine showed significant ($p < 0.05$ & $p < 0.01$) analgesic activity when compared with control and pethidine treated animals. Thus, ethanolic extract of leaves of *Clerodendrum viscosum* exhibited marked central analgesic effect in dose dependent manner

KEYWORDS

Clerodendrum viscosum leaves, Ethanolic extract, Analgesic activity, Tail flick method, Pethidine.

INTRODUCTION

Medicinal plants are believed to be an important source of new chemical substances with potential therapeutic effects. Herbalism is a traditional medicinal or folk medicine practice based on the use of plants and plant extracts (Acharya *et al.*, 2008). Pain is an unpleasant sensation localized to a part of the body. It is both sensation and emotion. Pain usually occurs when peripheral nociceptors are stimulated in response to tissue injury, visceral distension, or other factors. In such situation, pain perception is a normal physiologic response mediated by healthy nervous system (Fields and Martin, 2008). *Clerodendrum viscosum* is a shrub of 0.9 to 2.4 meter height. It is found abundantly in India, Ceylon, Burma, Pakistan, and Malaysia. Leaves and roots are commonly used in traditional medicines. Leaves of the plant are used as bitter tonic and antiperiodic, vermifuge, pain killer, laxative and cholagogue. The leaves and roots are externally used for tumors and in certain other skin diseases as paste. Use of fresh leave juice as injection into rectum has also reported for treating ascarids. The tribal of Chotanagpur region uses the leaves of the plant in preparing traditional expectorant pills (Kritikar and Basu, 1999). The leaves are also used in snake bite and scorpion sting in ayurveda (Kritikar and Basu, 1999) but contradictory reports have been published about the anti venom property of the leaves (Kritikar and Basu, 1999; Richard Lobo *et al.*, 2006). An extensive search of the literature reveals that the analgesic property of this plant has not been scientifically evaluated so far. Hence, present investigation was planned to find out the therapeutic level of ethanolic extract of leaves of *Clerodendrum viscosum* in analgesic activity.

MATERIAL AND METHODS

Plant material: The plant for the experimental purpose has been collected from Jalpaiguri district of West Bengal, India . Proper care was taken to choose healthy plants with normal organs. The plant was authenticated taxonomically by Prof. A. P. Das, Taxonomy and Environmental Biology Laboratory, Department of Botany, University of North Bengal. A voucher specimen (A/N-9480 dated. 19.12.2007) is submitted to Taxonomy and Environmental Biology Laboratory of University of North Bengal for future reference.

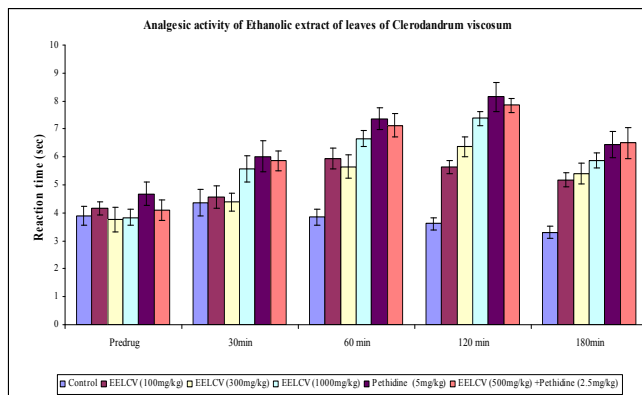
Extraction Procedure: The leaves of the plant were air dried in shade. 500gm of leaves were then powdered and ethanol extract (EELCV) was prepared by exhaustively extracted with ethanol in a soxhlet extractor, filtered and was concentrated at reduced pressure using a rotary vacuum evaporator. The yield was 5.9% with respect to dry starting material.

Tail flick response

The central analgesic activity was tested by tail flick method in Wistar strain of Albino rats (D'Armour and smith, 1941). Healthy rats of either sex weighing between 100 – 200 g were selected and divided into 6 groups of 6 animals each. The tail flick latencies (reaction time) of the animals were assessed by an analgesio-meter (Radiant heat) [Labotech, India], which was fixed at 5 amps. Basal reaction time of radiant heat was taken by placing the tip (last 2cm) of the tail on the radiant heat source. The time taken by the animal to withdraw (flick) its tail from the radiant heat was taken as the reaction time. Ethanolic extract of leaves of

Clerodendrum viscosum were given at the doses of 100, 300 and 1000mg/kg to the second to fourth group orally. Pethidine at the dose of 5mg / kg (Sheth *et al* 1972) was given intraperitoneally to the fifth group which served as standard group. Sixth group received pethidine at the dose of 2.5mg / kg intraperitoneally and EELCV at 500mg/kg orally. Normal saline solution

served as control was given to the first group. Analgesic activity was measured at after the administration of test and standard drugs. The cut-off reaction time was fixed at 10 sec to avoid tissue damage(Sheth *et al* 1972). The tail flick latencies were recorded at pre-drug, 30, 60, 120 and 180 minutes.



RESULT

For determination of analgesic activity, we used tail flick method. The analgesic activity profile of ethanolic extract at different doses (100, 300, 1000mg/kg and combination of 500mg/kg extract and 2.5 mg/kg of pethidine) showed significant ($p < 0.01$) analgesic activity when compared with

control and pethidine treated animals. Thus, ethanolic extract of leaves of *Clerodendrum viscosum* exhibited marked central analgesic effect in dose dependent manner as evidence (Table –I) by significant increase in reaction time when compared with control and standard. The reaction time was recorded in second (sec).

Table I

Assessment of central analgesic activity of ethanolic extract of *Clerodendrum viscosum* leaves by tail flick method

Group	Drug	Pre-drug reaction time (sec)	Time (Sec)			
			30	60	120	180
Group I	Control	3.89 ± 0.33	4.36 ± 0.48	3.85 ± 0.28	3.61 ± 0.21	3.30 ± 0.21
Group II	EELCV(100mg/kg)	4.15 ± 0.24	4.56 ± 0.39	5.95 ± 0.37*	5.64 ± 0.24*	5.18 ± 0.26**
Group III	EELCV(300mg/kg)	3.76 ± 0.45	4.38 ± 0.32*	5.65 ± 0.43*	6.36 ± 0.34**	5.40 ± 0.38**
Group IV	EELCV(1000mg/kg)	3.84 ± 0.28	5.57 ± 0.46*	6.65 ± 0.29**	7.38 ± 0.25**	5.86 ± 0.27**
Group V	Pethidine (5mg/kg)	4.68 ± 0.42	6.02 ± 0.56*	7.36 ± 0.39**	8.14 ± 0.51**	6.45 ± 0.47**
Group VI	EELCV(500mg/kg) + Pethidine (2.5mg/kg)	4.10 ± 0.36	5.86 ± 0.34*	7.12 ± 0.42**	7.85 ± 0.27**	6.50 ± 0.56**

Data are mean ±SEM. Analysis for significance by using ANOVA followed by Dunnet's t- test (Post-hoc test). (n = 6) * $p < 0.05$ ** $p < 0.01$

DISCUSSION

Peripherally acting analgesics act by blocking the generation of impulses at chemoreceptor site of pain, while centrally acting analgesics not only raise the threshold for pain, but also alter the physiological response to pain and suppress the patient's anxiety and apprehension (Shreedhara *et al* 2009). It has been reported that a number of flavonoids possess analgesic activity (Hossinzadeh *et al* 2002). Flavonoids are known to inhibit the enzyme prostaglandin synthetase, more specifically the endoperoxidase (Ramaswamy *et al* 1985). From the preliminary phytochemical study, it observed that EELCV contains flavonoids (Das *et al* 2010). Pethidine is a centrally acting analgesic and showed significant increase in reaction time. When 50% of highest drug concentration and 50% dose of pethidine was administered, it showed the more or less similar increase in reaction (increase threshold potential of pain).

CONCLUSION

From the above investigation, it is quite apparent that ethanolic extract of *Clerodendrum viscosum* leaves possesses potent central analgesic effect

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against stimuli. This is evidenced by significant increase in the reaction time (increase threshold potential of pain) by stimuli in a dose dependent manner. In addition, 50% of the extract and 50% dose of total dose of used pethidine showed the almost similar increase in reaction (increase threshold potential of pain). This result clearly indicates that the ethanolic extract of *Clerodendrum viscosum* leaves might contain pethidine like compound that possesses potent central analgesic effect against stimuli.

STATISTICAL ANALYSIS: The data of all groups were statistically analyzed. The values were expressed as mean \pm SEM. The data were analyzed for significance by using ANOVA followed by Dunnet's t- test.

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