



AkiNik

International Journal of Herbal Medicine

Available online at www.florajournal.com

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International
Journal
of
Herbal
Medicine

ISSN 2321-2187

IJHM 2013; 1 (3): 61-63

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Received: 22-08-2013

Accepted: 8-9-2013

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In-vivo screening of Antinociception Activity in Methanolic Extract of *Corbichonia decumbens* (Forsk.)

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ABSTRACT

The term analgesic derived from the Greek word *algosia*- means pain, is an ill defined unpleasant sensation, usually evoked by an external or internal noxious stimulus. The aim of the present study is to investigate the analgesic activity of leaf and root parts of the plant *Corbichonia decumbens* forsk. (molluginaceae) on albino mice by Eddy's hot plate, Tail flick method respectively. The analgesic activity was found out by eddy's hot plate and Tail flick method by using standard pentazocine. The analgesic activity in the *C.decumbens* treated animals was found to be significantly higher in all the models compared to vehicle control animals. Pentazocine (30 mg/kg) produced a significant analgesic activity when compared with the control group. The analgesic activity of *C.decumbens* was however, less than that of pentazocine. Our results suggest that *C.decumbens* possesses significant analgesic property.

Key words Analgesic, *Corbichonia decumbens*, Eddy's hot plate, Tail flick.

1. Introduction

Pain is a common complaint in most patients suffering from disease conditions. Analgesics and anti-inflammatory drugs go hand in hand for most of the pain management nowadays. Inflammation is a host defense mechanism to combat or overcome the invading pathogen or the foreign particles. Non-steroidal anti-inflammatory (NSAIDs) drugs make up one of the largest groups of drugs used for pain and inflammation^[1].

Drugs which are used currently for pain management & inflammatory conditions are either narcotic analgesics or NSAID'S and steroids. All the above said drugs possess adverse & toxic effects such as addiction, constipation and respiratory depression in case of narcotic analgesics peptic ulcers and kidney problems in NSAID'S. So to avoid adverse effects from these medicines, potent and safe medicine from plant origin has been used since long time. It is essential that efforts should be made to introduce new medicinal plants to develop cheaper drugs^[2]. Medicinal plants will continue to provide a source of generating novel drug compounds and as phyto-medicine for the treatment of disease^[3]. There are over 400 different tribal and other ethnic groups in India. Each tribal group has its own tradition, folk language, beliefs and knowledge about use of natural resources as medicines.

Molluginaceae family comprises about 100 species, and was previously included in the larger family Aizoaceae. The taxonomic placement of genera of Molluginaceae has been problematic, and they have been considered members of the Aizoaceae, Nyctaginaceae, or Phytolaccaceae^[2]. Mulloginaceae are commonly known as stone plants or carpet weeds. *Corbichonia decumbens* (Family: Mulloginaceae) Procumbent or prostrate annual or short-lived perennial herb. Young plants often erect Stems up to 50 cm, somewhat succulent. Leaves fleshy, alternate, obovate-spathulate or oblanceolate, glaucous; petiole winged. Flowers in terminal or pseudo-lateral inflorescences, pink, mauve or magenta. The staminodes are longer than the actual perianth, appearing as a large number of petals. Fruit shiny, yellow-green. Woodland, cultivated and disturbed ground and on stony and alluvial soils. Widespread in tropical and southern Africa and tropical Asia; introduced to tropical America.

2. Experimental Design

2.1 Plant Material

Plant material of *Corbichonia decumbens*. Was collected from Vijayamangalam, Erode district, Tamilnadu, during the month of December 2012. The plant specimens was identified with Gambles Flora of the Presidency of Madras and the identity is confirmed with the herbarium specimen deposited in Kongunadu Arts and Science college herbarium, Coimbatore

2.2 Preparation of Extract:

The leaf and root of *Corbichonia decumbens*. Were dried under shade and then powdered with a mechanical grinder. The powder was passed through sieve no. 30 and stored in an airtight container for further use.

2.3 Extraction Procedure:

The dried powders of leaf and root of *C.decumbens* were defatted with methanol (60-80 °C) in a Soxhlet Apparatus by continuous hot- percolation. The solvent was removed by distillation under low pressure and evaporation. The resulting semisolid mass was vacuum dried by using rotary flash evaporator. The resultant dried extracts were used for further study.

3. Procurement of Experimental

3.1 Animals:

Swiss albino mice (20-25 g) of either sex and of approximate same age are used in the present studies were procured from listed suppliers of animal breeding center veterinary college trissur, kerala India. The animals were fed with standard pellet diet and water ad libitum. All the animals were housed in polypropylene cages. The animals were kept under alternate cycle of 12 hours of darkness and light. The animals were acclimatized to the laboratory condition for 1 week before starting the experiment. The animals were fasted for at least 12 hours before the onset of each activity. The experimental protocols were approved by **Institutional Animal Ethics Committee (659/02/a/CPCSEA)** after scrutinization. The animals received the drug treatments by oral gavage tube.

3.2 Acute Oral Toxicity Study:-

The LD50 was determined using the graphical method in mice. Briefly, geometric doses of the extract (100–200mg/kg) were administered i.p. to 4 groups of mice each consisting of six animals. Control group received normal saline (5 mL/kg i.p.). Signs of toxicity and mortality within 24-72 h were noted. Confirmatory test was carried out and the LD50 was calculated from the graph of percent mortality against profit log dose of the extract. The lethal dose (LD 50) of the methanolic extract of dried leaf and roo of *C.decumbens* were determine by OECD guideline (423 guideline). The LD50 of methanolic extract was found to be 200 mg/kg therefore the LD50 value is 200mg/kg.

3.3 Screening Method for Analgesic Activity

3.3.1 Eddy's Hot Plate Method (Thermal Stimulation)

The mice of either sex were weighed and divided into four groups (n = 6 in each groups). Group I served as control. Group II (pentazocine 46.8 mg / kg body weight) served as standards and group III and IV were treated with extracts at leaf and root a dose of 200 mg/kg body weight, respectively. Reaction time of animals was noted down in hot plate at 30, 60, 90, 120 and 150 minutes after the treatment. The basal reaction time taken by observing hind paw licking or jump response (whichever appear first) in animals while placed on hot plate, which was maintained at constant temperature $55^{0}\pm 2^{0}C$. A cut off period of 10 seconds was observed to avoid damage to the paws. The percentage increase or decrease in reaction time (as index of analgesia) at each time was calculated.

3.3.2 Tail Flick Method:

For this the method of Gray et al. [4] was used. The tail flick was evoked by a source of radiant heat, which was focus on the dorsal surface of the tail. Adult healthy rats were examined for latency to withdraw their tails from a noxious thermal stimulus using a tail-flick meter (Instrument model no. Ugo Basile 7140, Italy). Each rat was tested twice before the administration of MTC and the reaction times were averaged to obtain a baseline. The intensity of heat stimulus was adjusted to achieve a mean tail-flick latency of 3-4 s in control animals. The selected animals were divided into four groups, each group consisting of six rats. First group for the control, second (positive control group) for reference drugs viz pentazocine and the remaining two groups for leaf and root extract (doses of 200 mg/kg). Each rat was then tested 30, 60, 90, 120, and 150 min after the administration of 200 /kg i.p. Control rats received 0.9% w/v of saline solution. pentazocine (46.8 mg / kg body weight) was administered as a positive control. Treatments were terminated if the animal did not respond within 15 sec in order to avoid tissue damage.

4. Statistical Analysis

The values were represented as mean \pm SEM. and the data obtained from this study was subjected to one-way analysis of variance (ANOVA) followed dunnet's test. The values of $***p<0.001$, $*p<0.01$, $**p<0.05$ were considered to indicate the significant levels.

5. Result and Discussion:

The hot-plate method is known as a test for detecting of opioids as well as the other CNS depressants which can respond to thermal stimuli. It is suggested that the extracts which have exhibited anti nociception effect in this method, might act through central mechanisms [5]. The antinociception effect has occurred in different experimental times for each of the plants that would be due to the various analgesic metabolites of the plants which reached to maximum in different times [6].

Table 1: Anti nociceptive effect of *C.decumbens* (Leaf and Root) Methanolic extract in Hot- Plate Method

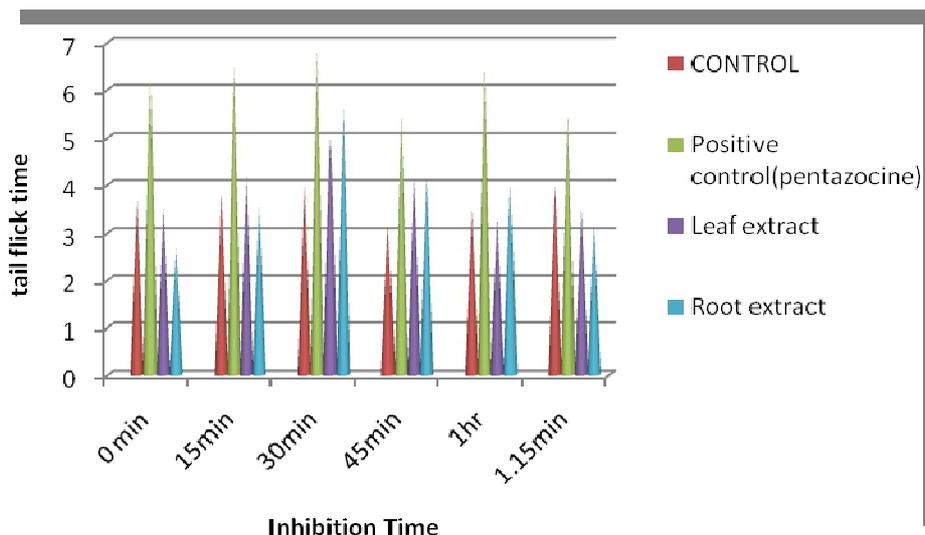
Parameters		Hot plate method in minutes							
Treatment	Dose mg/kg	0 min	30min	60min	90min	1.20hr	1.50min	1.80min	2.10min
Control	-	3.5±0.76	3.5±0.76	2.5±0.42	2.0±0.26	3.5±0.42	5.5±0.42	5.0±0.36	4.5±0.42
Positive control(pentazocine)	5	5.66±0.42	5.83±0.47	5.0±0.57	4.5±0.42	5.5±0.61	6.3±0.49	6.33±0.42	5.56±0.66
Leaf extract	200	*3.33±0.49	*3.66±0.55	*2.5±0.42	*2.5±0.42	**3.16±0.39	**3.3±0.42	*3.5±0.42	4.33±0.49
Root extract	200	***2.0±0.36	**2.83±0.47	**2.33±0.42	2.83±0.47	***2.66±0.33	**3.83±0.30	**3.83±0.30	*3.16 ±0.47

Values are expressed as mean ± SEM, (n=6), *p<0.05, **p<0.01, ***p<0.001 as Compared normal Control vs. hot plate. Control rats and drug treated mice

Pain and inflammation are induced in various clinical disorders like arthritis, cancer and vascular disease which disaster the patient. Some of medicinal plants have been traditionally used either for pain relief or as anti-inflammatory agents. Our results of

the antinociception in hot-plate and tail flick test show that among the tested plants, the highest efficacy was exhibited by the methanol extracts of *C.decumbens* leaf (200mg/kg) and *C.decumbens* root (200 mg/kg) which significantly raised the pain threshold in comparison to control.

Fig 1: Anti-Nociceptive Effect of *C.decumbens* (Leaf and Root) Methanolic extract in Tail Flick method



In tail flick method the methanolic extract of *C.decumbens* (200mg/kg) induced a significant analgesic activity in a dose-dependent manner. Based on the observation that the methanolic extract of *C.decumbens*-dependently increased the pain threshold in hot-plate and tail-flick model [Table-1, figure-1] .It is concluded that that the test drug inhibits the central mechanism of analgesic activity^[7].

6. Conclusion

The present study shows that methanolic extract of *C.decumbens* in the doses of 200 mg/kg are able to produce a consistent reduction in algisia and inflammation. Further the extracts have also shown presence of active constituents responsible for various biological activities. Though they didn't produce effect as their respective standard but they can be chosen as primary analgesic and anti-inflammatory supplement.

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