Acta Chimica and Pharmaceutica Indica

Research | Vol 7 Issue 3

Investigation of Analgesic Activity of Leaves and Seed extracts of *Abelmoschus moschatus* Medik

Abhishek Dwivedi[1*], Girendra Gautam[1] and Ameeta Argal[2]

[1]Institute of Pharmaceutical Sciences and Research, Bhagwant University, Ajmer, Rajasthan, India

[2]TIT Pharmacy, Bhopal, Madhya Pradesh, India

[*]**Corresponding author:** Abhishek Dwivedi, Institute of Pharmaceutical Sciences and Research, Bhagwant University, Ajmer, Rajasthan, India, E-Mail: abhiherbal@gmail.com

Abstract

Abelmoschus moschatus Medik commonly known as Musk mallow (E) and Kasturi bhendi (Hindi) is an aromatic and medicinal plant belongs to Malvaceae family. The plant has numerous medicinal values as claimed by traditional and folk lore. The PEE, CE, EE and AE of Abelmoschus moschatus leaves and seed were evaluated for analgesic activity in animal models and the results obtained indicates that the extract found to have significant (P < 0.01) analgesic activity in rats. The PEE, CE, EE and AE of Abelmoschus moschatus leaves at the test doses 200 and 400 mg/kg b.w. produced prodound analgesic activity 5 h is more more potent, when compared with the PEE, CE, EE and AE of Abelmoschus moschatus seeds at the test doses 200 and 400 mg/kg b.w. when compared to standard drug and control group

Keywords: ***Abelmoschus moschatus; Analgesic activity; Leaves and seed extract***

Received: August 12, 2017; **Accepted:** September 18, 2017; **Published:** September 25, 2017

Introduction

Abelmoschus moschatus Medik is an aromatic and medicinal plant in the Malvaceae family, which is native to India. The plant is used in the treatment of various diseases as described in traditional and folk remedies. Every part of this medicinal plant is used in one or the other way [1,2]. Seeds are effective aphrodisiac and antispasmodic, and used in tonics. Also useful in treating intestinal disorders, urinary discharge, nervous disorders, hysteria, skin diseases etc. In India, roots, leaves (rarely), and seeds of ambrette are considered valuable traditional medicines. The bitter, sweet, acrid, aromatic seeds are used as a tonic and are considered cooling, aphrodisiac, opthalmic, cardiotonic, digestive, stomachic, constipating, carminative, pectoral, diuretic, stimulant, antispasmodic, deodorant, and effective against kapha and vata, intestinal complaints, stomatitis; and diseases of the heart [3-5]. The plant has wide therapeutic efficacy but so far, no any systematic studies has been carried out to reveal the anthelmintic activity. Therefore, the present work was conceived to determine the anthelmintic activity of PEE, CE, EE and AE of leaves and seed extract of *Abelmoschus moschatus* Medik.

Material and Methods

Selection and collection of plant material

Abelmoschus moschatus Medik. (Kasturi bhendi) belongs to family Malvaceae is oil yielding and medicinally important plant, commonly found wild in some parts of our country, till yet no any systematic studies has been carried out in evaluating

Citation: Dwivedi A, Gautam G, Ameeta A. Investigation of Analgesic Activity of Leaves and Seed extracts of *Abelmoschus moschatus* Medik. Acta Chim Pharm Indica. 7(3):113

the species as concerned to development of standardization parameters and pharmacological screening, therefore, the plant was selected for present investigation.

Authentication of plant/plant material

The seeds of the selected plant were collected in the months of July 2015 from the Jawahar Lal Nehru Krishi Vishwavidhalay (JNKVV) Agriculture University, Jabalpur, M.P. and identified & authenticated by Dr. Santosh Agnihotri, Professor, Department of Botany, Govt. Model Science College, A.P.S. University, Rewa, M.P. and was deposited in our Laboratory, Voucher specimen No. PCog/AM/175. The seeds was then sown in soil, irrigated regularly and after 3-4 months various part of the plants i.e., root, stem, leaves, flowers, fruits and seeds were collected, dried under shade, powdered and stored in an air-tight container for further use [6-12].

Analgesic Activity

Animals

Female Wistar rats of (200-250 gm) were procured from Veterinary College, Mhow, Indore, (M.P.) maintained under ideal feeding and management practices in the laboratory. The animals were fed with standard pellet diet (Hindustan lever Ltd. Bangalore) 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 experimental protocols were approved by Institutional Animal Ethics Committee after scrutinization.

Study Design

Hot plate

Animals were divided into different groups, each group containing six animals each. Group I served as the positive control with no protection. Group II animals received the standard drug of Indomethacine 5 mg/kg body weight, whereas group other groups were orally administered the various plant extracts viz., Pet. Ether, Chloroform, ethanolic and aqueous extract of *Abelmoschus moschatus* Medik at the dose of 200 and 400 mg/kg body weight respectively. The temperature of the hot plate was maintained 55 ± 1ºC, mice were placed on the hot plate and time in seconds for paw licking or jumping was recorded as basal reaction time. Cut off time in the absence of response was 15sec to prevent the animals being burnt. The reaction time in seconds (latency period) was observed on hot plate, the time taken for mouse to react to the thermal pain by licking its paw or attempting to jump out. Observations were made before and after administration of respective drugs at an interval of 60 min.

Tail flick method

The animals were tested for tail flick by Analgesiometer (Techno Electronics, Lucknow, India) as it was described earlier. The basal time was noted at first for each animal. Current through the naked nichrome wire was set at 5 Amp over which 1-2 cms from the tip of the tail was exposed to check out the response. The cut off time was set at 10 sec to prevent any tissue damage. The time (in second) required for the animal to withdraw (flick) its tail from the heat source was measured. The reaction time was noted in minutes after the animals were treated orally with various doses of extract and with Indomethacine (5 mg/kg). Normal saline (0.1ml/10gm) served as control group.

Statistical analysis

All the values ware statistically analyzed by one-way analysis of variance (ANOVA) followed Bonferroni's post hoc test. Comparison between control and drug treated groups were considered to be significant (*P<0.01). All values are expressed as mean ± SEM.

Results and Conclusion

An analgesic or painkiller is any member of the group of drugs used to achieve analgesia, relief from pain. Analgesic drugs act in various ways on the peripheral and central nervous systems. They are distinct from anesthetics, which temporarily affect, and in some instances completely eliminate, sensation. Analgesics include paracetamol (known in North America as acetaminophen or simply APAP), the non-steroidal anti-inflammatory drugs (NSAIDs) such as the salicylates, and opioid drugs such as morphine and oxycodone. In choosing analgesics, the severity and response to other medication determines the choice of agent; the World Health Organization (WHO) pain ladder specifies mild analgesics as its first step. Analgesic choice is also determined by the type of pain: For neuropathic pain, traditional analgesics are less effective, and there is often benefit from classes of drugs that are not normally considered analgesics, such as tricyclic antidepressants and anticonvulsants.

The PEE, CE, EE and AE of *Abelmoschus moschatus* leaves and seed were evaluated for analgesic activity in animal models and the results are summarized in TABLE 1 and 2. The result obtained indicates that the extract found to have significant (P < 0.01) anti-inflammatory activity in rats. The PEE, CE, EE and AE of *Abelmoschus moschatus* leaves at the test doses 200 and 400 mg/kg b.w. produced prodound analgesic activity 5 h (GRAPH 1) is more more potent, when compared with the PEE, CE, EE and AE of *Abelmoschus moschatus* seeds (GRAPH 2) at the test doses 200 and 400 mg/kg b.w. when compared to standard drug and control group.

TABLE 1. **Analgesic effect of leaves extract of *Abelmoschus moschatus* Medik.**

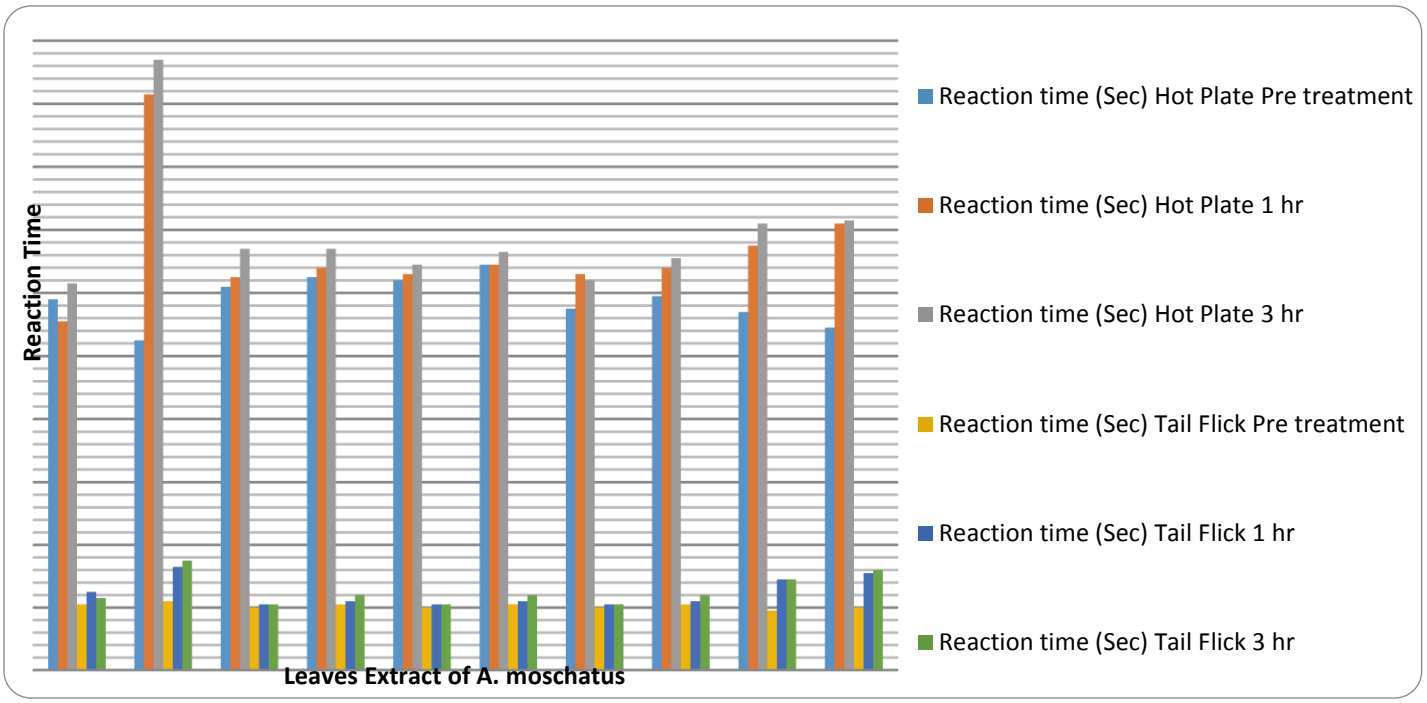
Group	**Reaction time (Sec)**					
	Hot Plate			**Tail Flick**		
	Pre treatment	**1 hr.**	**3 hr.**	**Pre treatment**	**1 hr.**	**3 hr.**
Control	11.8 ± 0.8	11.1 ± 0.7	12.3 ± 0.9	2.1 ± 0.2	2.5 ± 0.2	2.3 ± 0.1
Standard	10.5 ± 1.2	18.3 ± 1.7***	19.4 ± 1.4***	2.2 ± 0.1	3.3 ± 0.1***	3.5 ± 0.1***
5mg/kg						
PEEAML	12.2 ± 0.4	12.5 ± 0.7	13.4 ± 0.7	2.0 ± 0.3	2.1 ± 0.1	2.1 ± 0.5
200 mg/kg						
PEEAML	12.5 ± 0.7	12.8± 0.5	13.4 ± 0.3	2.1 ± 0.4	2.2 ± 0.5	2.4 ± 0.2
400 mg/kg						
CEAML	12.4 ± 0.5	12.6 ± 0.7	12.9 ± 0.8	2.0 ± 0.3	2.1 ± 0.1	2.1 ± 0.5
200 mg/kg						
CEAML						
400 mg/kg	12.9 ± 0.7	12.9 ± 0.5	13.3 ± 0.2	2.1 ± 0.4	2.2 ± 0.5	2.4 ± 0.2

EEAML						
200 mg/kg	11.5 ± 0.3	12.6 ± 0.7	12.4 ± 0.5	2.0 ± 0.3	2.1 ± 0.1	2.1 ± 0.5
EEAML						
400 mg/kg	11.9 ± 0.7	12.8 ± 0.5	13.1 ± 0.2	2.1 ± 0.4	2.2 ± 0.5	2.4 ± 0.2
AEAML						
200 mg/kg	11.4 ± 0.2	13.5 ± 0.8	14.2 ± 0.6	1.9 ± 0.6	2.9 ± 0.7	2.9 ± 0.2
AEAML						
400 mg/kg	10.9 ± 1.2	14.2 ± 0.6	14.3 ± 0.9	2.0 ± 0.1	3.1 ± 0.6	3.2 ± 0.6
All values are expressed as mean ± S.E.M (n=6),						
***P<0.001 as compared control, **P<0.01 as compared control, One-way ANOVA followed by Bonferroni multiple comparison test						

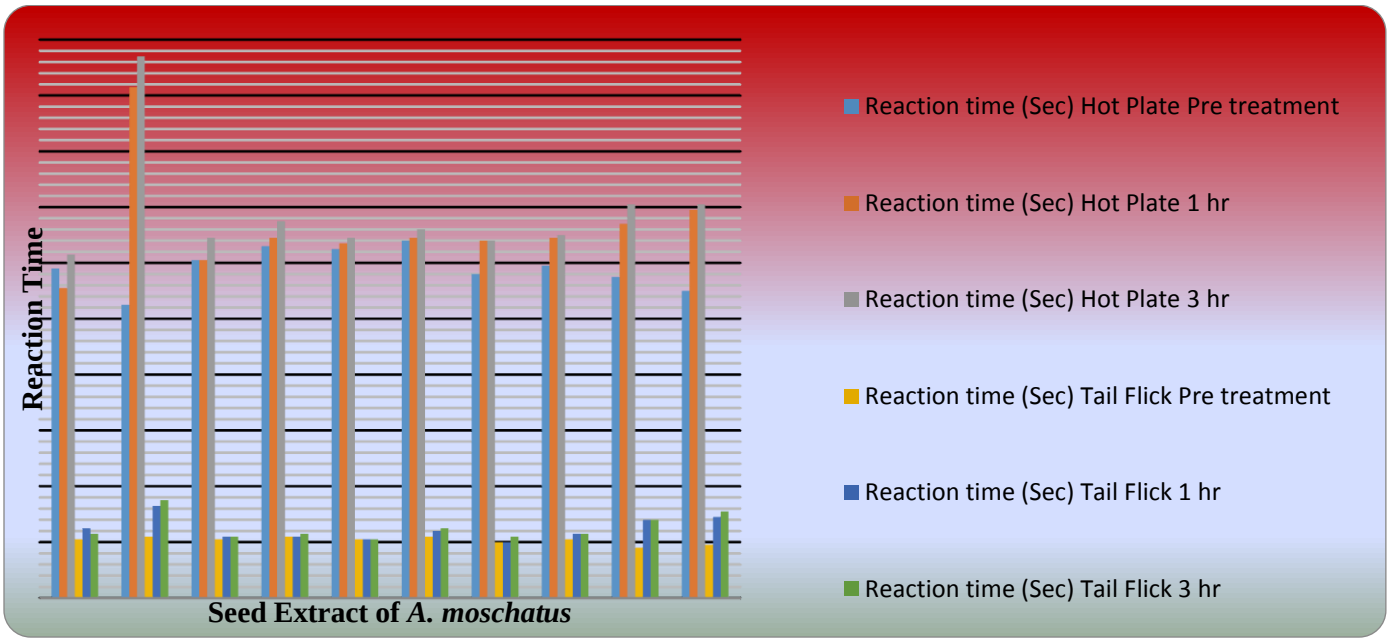
TABLE 2. **Analgesic effect of Seed extract of *Abelmoschus moschatus* Medik.**

Group	**Reaction time (Sec)**					
	Hot Plate			**Tail Flick**		
	Pre treatment	**1 hr**	**3 hr**	**Pre treatment**	**1 hr**	**3 hr**
Control	11.8 ± 0.8	11.1 ± 0.7	12.3 ± 0.9	2.1 ± 0.2	2.5 ± 0.2	2.3 ± 0.1
Standard 5mg/kg	10.5 ± 1.2	18.3 ± 1.7***	19.4 ± 1.4***	2.2 ± 0.1	3.3 ± 0.1***	3.5 ± 0.1***
PEEAML 200 mg/kg	12.1 ± 0.4	12.1 ± 0.7	12.9 ± 0.7	2.1 ± 0.1	2.2 ± 0.1	2.2 ± 0.5
PEEAML 400 mg/kg	12.6 ± 0.7	12.9± 0.5	13.5 ± 0.2	2.2 ± 0.4	2.2 ± 0.5	2.3 ± 0.1
CEAML 200 mg/kg	12.5 ± 0.4	12.7 ± 0.7	12.9 ± 0.6	2.1 ± 0.3	2.1 ± 0.2	2.1 ± 0.4
CEAML 400 mg/kg	12.8 ± 0.7	12.9 ± 0.5	13.2 ± 0.1	2.2 ± 0.4	2.4 ± 0.5	2.5 ± 0.4
EEAML 200 mg/kg	11.6 ± 0.1	12.8 ± 0.7	12.8 ± 0.5	2.0 ± 0.3	2.0 ± 0.1	2.2 ± 0.5
EEAML 400 mg/kg	11.9 ± 0.7	12.9 ± 0.5	13.0 ± 0.1	2.1 ± 0.4	2.3 ± 0.5	2.3 ± 0.2
AEAML 200 mg/kg	11.5 ± 0.2	13.4 ± 0.8	14.1 ± 0.3	1.8 ± 0.6	2.8 ± 0.7	2.8 ± 0.1
AEAML 400 mg/kg	11.0 ± 1.2	13.9 ± 0.6	14.1 ± 0.7	1.9 ± 0.3	2.9 ± 0.4	3.1 ± 0.4
All values are expressed as mean ± S.E.M (n=6), ***P<0.001 as compared control, **P<0.01 as compared control, One-way ANOVA followed by Bonferroni multiple comparison test						

GRAPH 1. **Analgesic effect of leaves extract of *Abelmoschus moschatus* Medik.**



GRAPH 2. **Analgesic effect of Seeds extract of Abelmoschus moschatus Medik**.



REFERENCES

1. Sumeet D. Status survey of medicinal plants wealth of Malwa region of Madhya Pradesh with special reference to conservation of vulnerable and endangered species, J EconTaxon Bot, 2009;33:443-452.

2. NISCOM. A dictionary of Indian Raw materials and Industrial products, National Institute of science communication (NISCOM) Council of Scientific and Industrial Research (CSIR), New Delhi, India.
3. Jain S. K. (1991). Dictionary of Indian folk medicine and ethnobotany, Deep publications, New Delh.
4. Nadkarni KM. Indian Materia Medica, Bombay Popular Prakashan, India.
5. Purohit SS, Vyas SP. Medicinal plant cultivation: A scientific approach, Agrobios India.
6. Whittle BA. The use of changes in capillary permeability in mice to distinguish between narcotic and non-narcotic analgesics. Br J Pharmacol Chemotherp,1964;22:246-253.
7. D'Amour FE, Smith DL. A method for determining loss of pain sensation. J Pharmacol Exp Ther 1941;72:74-79.
8. Collier HO, Kinneen LC, Johnson CA, et al.. The abdominal constriction response and its suppression by analgesic drugs in the mouse. Br J Pharmacol, 1968;32:295-310.
9. Santos ARS, Vedana EMA, Freitas GAG. Antinociceptive effect of meloxicam, in neurogenic and inflammatory nociceptive models in mice. Inflammation Res, 1998;47:302-307.
10. Reichert JA, Daughters RS, Rivard R, et al. Peripheral and preemptive opioid antinociception in a mouse visceral pain model. Pain, 2001;89:221-227.
11. Ronaldo AR, Mariana LV, Sara MT, et al. Involvement of resident macrophages and mast cells in the writhing nociceptive response induced by zymosan and acetic acid in mice. Eur J Pharmacol, 2000;387:111-118.
12. Vogel HG, Vogel WH. Drug Discovery and Evaluation: Pharmacological Assays. Springer Verlag, Germany.