Research Article **ISSN: 0976-7126**
CODEN (USA): IJPLCP **Nannore & Daniel, 14(3):1-5, 2023**

International Journal of Pharmacy & Life Sciences
Open Access to Researcher

Evaluation of Analgesic activity of various extract of *Michelia champaca* Linn.

Pooja Nannore* and Kratika Daniel

Faculty of Pharmacy, Oriental University, Indore, (M.P.) - India

Article info

Received: 10/01/2023

Revised: 26/02/2023

Accepted: 11/02/2023

© IJPLS

www.ijplsjournal.com

Abstract

The present investigation reveals that the ethanolic extract (EEMCSB) of *M. champaca* exhibit its maximum analgesic activity of 74.79%, by hot plate method at the given dose of 500mg/kg, followed by 71.28% EEMCSB at the dose 250 mg/kg, and it was significant when compared with control and standard group.The aqueous extract showed a moderate analgesic activity of AEMCSB 35.48 % at the dose 500 mg/kg and AEMCSB 32.13 % at the dose 250 mg/kg when compared with control and standard group. Study reveals that the ethanolic extract of *M. champaca* exhibit its maximum analgesic activity of by tail flick method at the given dose of 500mg/kg, and it was significant when compared with control and standard group.The aqueous extract showed a moderate analgesic activity when compared with control and standard group. Hence, from the present work it was concluded that the selected medicinal plants *M. chmapaca Linn*. of Indian origin possess optimum analgesic activity which will claims their folk-lore uses as mentioned in traditional system of medicine.

Key Words: *M. champaca*, Extract, Herbal drug

Introduction

Medicinal plants have always been the principle source of medicine in India since ancient past and presently they are becoming popular throughout the developed countries. Besides, they also play an important role in the lives of tribal and rural people, particularly in remote part of developing countries. Obviously, these plants help in alleviating human suffering. These plants are being integrated to the field of foods as additives, beverage and cosmetics. There has been a rapid extension of allopathic system of medical treatment in our country during the past century. However, these drugs have adverse effect on human health and people are going back to nature with hope of safety and security. One the other hand, the drug obtained from the medicinal plants are safe, cheaper, easily available and with no fear of any side effects. Moreover, these are more compatible the human body constitution and suits to the local and cultural need of the people. The indigenous method of preparation maintains the purity of the drug. Furthermore, traditional folk healers treat with kindness, grace, patience and tolerence, which play a vital role in healing process today. [1-4]

Michelia champaca L. (Magnoliaceae) commonly known as Champa wild in the eastern sub-Himalayan tract and lower hills up to 3,000 ft. and found in Assam, Burma, South India. The plant is a handsome, evergreen shrub. Leaves 15- 25 by 5-9 cm., lanceolate, acute, entire, glabrous; petioles 18-25mm long.

***Corresponding Author**

Flowers about 5-6.2 cm. diameter, very fragrant, greyish yellow pubescent. Sepals and petals 15 or more deep yellow or orange. Grey or brownish bark. Seeds 1-12, brown, polished, variously angled, rounded on the. Its flowers and stem bark are useful in diabetes, quick wound healing, cardiac disorders, gout, dysuria and more. [5-7]

From the literature review it was also observed that so far no any systematic pharmacological screening of the extract of part of the plant have been carried, therefore attempt can be made in evaluating the species for various pharmacological approaches to prove the efficacy of the plant.

Material and Methods

Selection, collection and authentication of plant/plant material

The stem bark of plant *Michelia champaca* Linn. parts was collected in the months of Jan-Feb 2022 from the Malwa regione, M.P. and identified & authenticated by Dr. S. N. Dwivedi, Prof. and Head, Department of Botany, Janata PG College, A.P.S. University, Rewa, M.P. and was deposited in our Laboratory, Voucher specimen No. PCog/MC/29.

Successive Extraction of Plant Material

Sample were shattered and screened with 40 mesh. The shade dried coarsely powdered stem bark of *Michelia champaca* (250gms) were loaded in Soxhlet apparatus and was extracted with petroleum ether (60-62°C), Chloroform, ethanol and water until the extraction was completed. After completion of extraction, the solvent was removed by distillation. The extracts were dried using rotator evaporator. The residue was then stored in dessicator. [8]

Acute Toxicity Studies of Extracts

Procurement of experimental animals

The mice were used for acute toxicity study as per OECD guidelines 423. 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. [9]

Evaluation of analgesic activity [10-11]

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.

Hot plate

Animals were divided into V 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 III to V animals were orally administered the various plant extracts viz., ethanolic and aqueous extracts at the dose of 250 and 500 mg/kg body weight respectively. The temperature of the hot plate was maintained 55±1 ºC, 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 (Miranda et al, 2003)21 . 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 Discussion

The aqueous and ethanolic extracts of stem bark of *M. champaca* were screened for acute toxicity study by OECD guideline no. 423 for determination of $LD_{50.}$ The results showed that the aqueous and ethanolic extracts i.e., AEMCSB and EEMCSB were belonging to category-5(unclassified). Hence, LD_{50} was 5000 mg/kg, therefore, ED_{50} was 500 mg/kg. Therefore, two doses of 200 and 400 mg were selected for present investigation. The results were presented in table 1.

Table 1: Determination of LD_{50} and ED_{50} of aqueous and ethanolic extract of *M. champaca* Stem bark

S/No.	No. of Animals	Extract Dose (mg/kg)	No. of death of animals	
			AEMCSB	EEMCSB
1.	3	5	0	0
2.	3	50	0	0
3.	3	300	0	0
4.	3	2000	0	0
5.	3	5000	0	0

The present investigation reveals that the ethanolic extract (EEMCSB) of *M. champaca* exhibit its maximum analgesic activity of 74.79%, by hot plate method at the given dose of 500mg/kg, followed by 71.28% EEMCSB at the dose 250 mg/kg, and it was significant when compared with control and standard group.

The aqueous extract showed a moderate analgesic activity of AEMCSB 35.48 % at the dose 500 mg/kg and AEMCSB 32.13 % at the dose 250 mg/kg when compared with control and standard group. The results were presented in table 2.

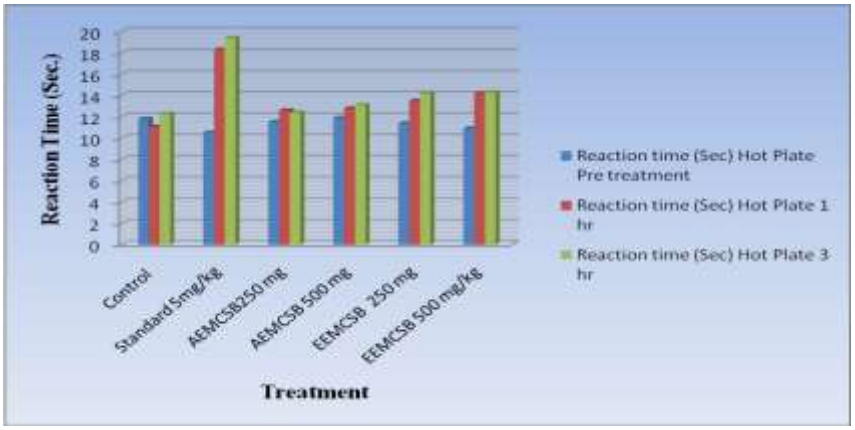
The present investigation reveals that the ethanolic extract of *M. champaca* exhibit its maximum analgesic activity of by tail flick method at the given dose of 500mg/kg, and it was significant when compared with control and standard group.

The aqueous extract showed a moderate analgesic activity when compared with control and standard group. The results were presented in table 6.

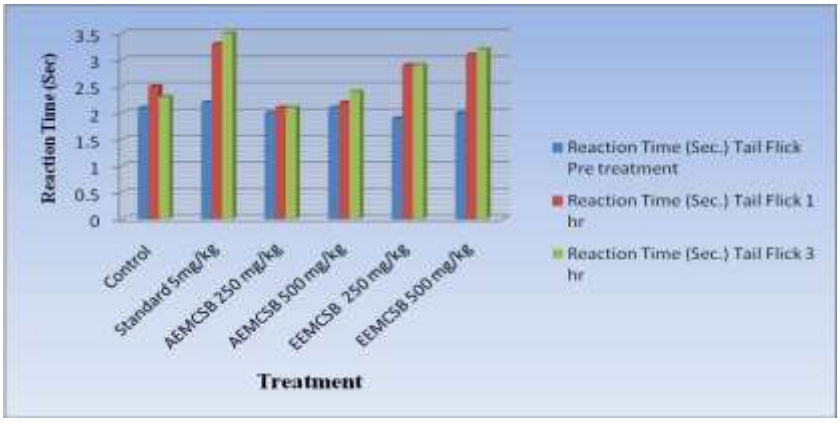
Table 2: Analgesic effect of aqueous and ethanolic extract of *M. champaca* Stem bark

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***
AEMCSB 250 mg	11.5 ± 0.3	12.6 ± 0.7	12.4 ± 0.5	2.0 ± 0.3	2.1 ± 0.1	2.1 ± 0.5
AEMCSB 500 mg	11.9 ± 0.7	12.8 ± 0.5	13.1 ± 0.2	2.1 ± 0.4	2.2 ± 0.5	2.4 ± 0.2
EEMCSB 250 mg	11.4 ± 0.2	13.5 ± 0.8	14.2 ± 0.6	1.9 ± 0.6	2.9 ± 0.7	2.9 ± 0.2
EEMCSB 500 mg	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



Graph 1: Analgesic effect of aqueous and ethanolic extract of *M. champaca* Stem bark by Hot plate method



Grapg 2: Analgesic effect of aqueous and ethanolic extract of *M. champaca* Stem bark by Tail flick method

Conclusion

The aqueous extract showed a moderate analgesic activity when compared with control and standard group. Hence, from the present work it was concluded that the selected medicinal plants *M. chmapaca Linn*. of Indian origin possess optimum analgesic activity which will claims their folk-lore uses as mentioned in traditional system of medicine.

References

1. Baker, J. T.; Borris, R. P. and Carte, B. (1995). Natural product drug discovery and development: New perspective on international collaboration. J Nat Prod, 58: 1325-1357.
2. Chopra, R. N., Nayar, S. L. and Chopra, I. C. (2005). Glossary of Indian Medicinal Plants, National Institute of Science Communication (NISCOM) Council of Scientific and Industrial Research (CSIR), New Delhi.
3. Dwivedi, Sumeet, Dwivedi, Abhishek and Dwivedi, S. N. (2008). Folklore uses of some plants by the tribals of Madhya Pradesh with special reference to their conservation. Ethno. Leaflets, 12:763-771.
4. Dwivedi, Sumeet (2009). Status survey of medicinal plants wealth of Malwa region of Madhya Pradesh with special reference to conservation of vulnerable and endangered species. J. Econ. Taxon. Bot., 33(2): 443-452.
5. Stuffness, M. and Douros, J. (1982). Current status of the NCI plant and animal product program. J Nat Prod, 45: 1-14.
6. The Ayurvedic Pharmacopoeia of India (2001). First ed., Volume First, The

controller publication Govt. of India, New Delhi.
7. Vimala R, Nagarajan S. and Joy S. 1997, Anti-inflammatory and antipyretic activities of Michelia champaca Linn., Ind. Jou. Exp. Biol., 35(12), 1310-1314.
8. Kokate C.K. (1997). *Practical Pharmacognosy*, Vallabh Prakashan, Delhi., 4th Edition, 107 - 111.
9. OECD. Guidelines for the testing of chemicals revised draft guideline 423: Acute oral toxicity. France: Organization for Economic Cooperation and Development; 2000.
10. D'Amour FE, Smith DL. A method for determining loss of pain sensation. J. Pharmacol. Exp. Ther. 1941; 72: 74-79.
11. Vogel HG, Vogel WH. Drug Discovery and Evaluation: Pharmacological Assays. Germany, Spr

Cite this article as:
Nannore P. and Daniel K. (2023). Evaluation of Analgesic activity of various extract of *Michelia champaca* Linn. *Int. J. of Pharm. & Life Sci.*, 14(3): 1-5.

Source of Support: Nil
Conflict of Interest: Not declared
For reprints contact: ijplsjournal@gmail.com