A REVIEW ON PHARMACOLOGICAL EVALUATION OF MORINGA OLEIFERA LEAF EXTRACT FOR ANALGESIC ACTIVITY BY USING MICE

Shinde Punam[*], Bagal Shital[1], Bamne Akansksha[2], Belkhede Akshay[3], Amilkar Sachin[4].

[1]Assistant Professor, Department of Pharmacology, Saraswati Institute of Pharmacy Kurtadi, Maharashtra, India-431701
E-Mail:punamshinde7887@gmail.com

[1,2,3,4]B. Pharm final Year, of Saraswati Institute of Pharmacy, Kurtadi, Hingoli, Maharashtra, India-431701

ABSTRACT

Moringa oleifera is highly valued plant available in many countries of the tropic and subtropics. Moringa oleifera leaf are a potential source of phytochemical ingredients claimed to have analgesic property including Anti- inflammatory and Anti-oxidant properties. Pain is an disagreeable, nasty, obnoxious sensation, which in many cases represents the only symptom for the diagnosis of several diseases and Disorders. The present study is undertaken toevaluate the analgesic activity of Moringa oleifera using acetic acid induced writhing test and Eddy's hot plate test and the Tail flick method. In this study of Analgesic activity detection includes the three tests :1] Acetic Acid Induced Writhing Test , 2] Eddy's Hot Plate Test , 3] Tail Flick Method. The ethanolic leaf extract of Moringa oleifera exhibited analgesic activity in both models showing its both central and peripheral analgesic actions. Studies are needed to isolate the active constituents responsible for the observed effect and to reveal the possible mechanism ofaction responsible for its anti- nociceptive activity.

KEYWORDS: *Acetic Acid Induced Writhing Test, Analgesic, Eddy's Hot Plate Method, Ethanolic Extract of Moringa Oleifera.*

INTRODUCTION:

Pain is an unpleasant sensation but a protective mechanism of our body. Analgesics are defined as substances, which decrease pain sensation by increasing pain threshold to external stimuli without altering consciousness. Therefore, analgesic drugs lacking the side effect as alternative to nonsteroidal anti- inflammatory drugs (NSAIDs) and opiates are in demand for the society.[1]Different parts of this plant containa profile of important minerals, and good source of proteins, vitamins, beta-carotene, amino acids and variousphenolics. Other than having a high concentration of vitamin A, vitamin C, potassium and calcium. The drumstick tree was used as food and medicine since centuries. Varieties of phytoconstituents such as alkaloids (moringine and moringinine), phenolics, several procinidin were reported in the plant.[2]*Moringa oleifera* is the most widely cultivated species of the monogeneric family Moringaceae (order Brassicales), which includes 13 species of trees and shrubs distributed in sub-Himalayan ranges of India, Sri Lanka, North-eastern and Southwestern Africa, Madagascar and Arabia.[3]The genus is well known for its multiple uses. The seeds are used for purifying water, the leaves as nutrition supplements, the oil as a biofuel, the trunks as gum, the flowers as honey and all of the plant parts can also be used for medicinal purposes. *Moringa oleifera* which isalso known as the "Miracle Tree" and "Mother"s Best Friend" has been named the most nutrient-rich plant. Various research has been conducted on this genus to study its biological properties, especially on *Moringa oleifera* that has been under study since the 1970s. Currently, it is well known that the plant has anti-

inflammatory, antioxidant, anticancer and antidiabetic activities. Recently, more research has been conducted on other species such as *M. concanensis*, *M. stenopetala* and *M. peregrine*. However, no profound research on other species has been found.[2] Pain is a very uncomfortable feeling, one may feel being conscious. There has been a great progress made in recent years in the development of pain therapy, still there is needed for effective, safe and potent analgesic, particularly which can be used for chronic pain. The analgesics used to alleviate chronic pain are related to various serious complications, such as liver dysfunction, kidney damage etc which necessitate the finding of safe option from nature as many plants derived compounds present potential analgesic effects. For this reason, they can be used as promising mother molecules for the development of new drugs, specifically designated to be designed for the treatment or control of chronic inflammatory andpainful states.[5]

INTRODUCTION OF PLANT:

Moringa oleifera (Moringaceae) is a highly valued plant, distributed in many countries of the tropics and subtropics. It is well known as the "Drumstick" or "horseradish" tree. The Moringa genus comprises 13 species distributed through southwest Asia, southwest Africa, northeast Africa and Madagascar. Among the 13 species, current research is limited to *Moringa oleifera*, *Moringa stenopetala*, *Moringa Concanensis* and *Moringa peregrina*. As the other species are endemic to Madagascar and Northeast Africa, they are being evaluated less as there is less exploration for naturally occurring bioactive substances in these locations. In contrast, *Moringa oleifera* which is native to india, is being studied widely.[2]

Figure 2. Moringa oleifera leaves extract

Scientific Classification	
kingdom	Plantae
Order	Brassicales
Family	Moringaceae
Genus	Moringa
Species	Moringa oleifera

The Moringa plant is a perennial, evergreen tree that grows up to 20 ft (6.1) tall, with a straight trunk with corky, whitish bark. The tree has tuberous taproot and brittle stem with corky bark. The leaves are pale green,compound, tripinnate, 30-60cm (11.8 to 23.6 in) in length, with many small leaflets.[6]

Various analgesic Activity Test on Moringa oleifera:

Method

It is a randomized control study. The animals were randomly divided into 6 groups with 6 mice each; Group I: Control (normal saline given orally at 2ml/kg body weight); Group II: Standard (diclofenac 10 mg/kg IP / morphine1 1 mg/kg IP); Group III, IV, V, VI (EMO 50, 100, 200,400 mg/kg, respectively). The total numberof mice used in each experiment was 36, so a total of 72 mice were

used in this study.

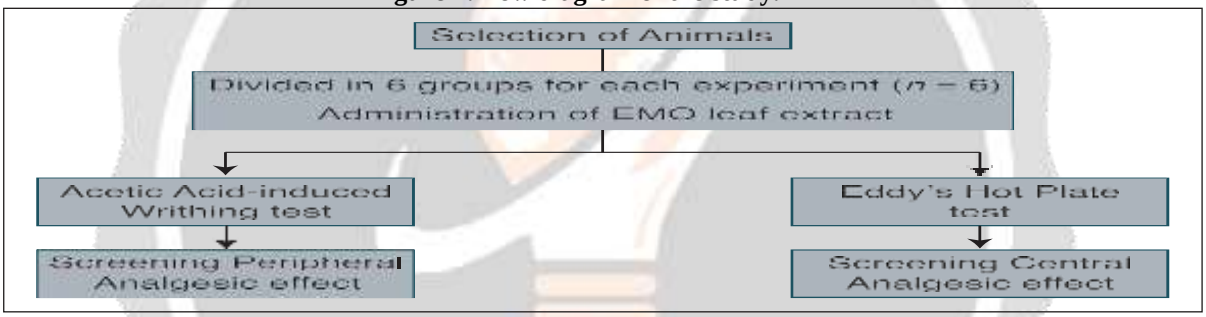
1. **Acetic acid-induced writhing test:**

Koster et al.,1959; Singh and Majumdar et al., 1995. Initially test drug EMO was given orally 1 hr before, and the standard drug diclofenac (10 mg/kg) was given intraperitooneally half-an-hour before the administration of acetic acid.[7,8]Next acetic acid 1%, 10 ml/kg was injected intraperitoneally in albino mice and the writhing movements were recorded after 5 min for a total of 10 min. For scoring purposes a writhe ischaracterized by stretching of the abdomen with simultaneous stretching of at least one hind limb [9]The resultwere permitted to express the percentage of protection of writhes compared with the control.

2. **Eddy's hot plate test :**

Eddy and Leimbach et al., 1953. Albino mice were placed on heated plates and the time taken for either paw licking or jumping was taken as the reaction time or latency time.[10]Albino mice were immediately removed from the hot plate on paw licking or jumping to prevent damage to their paws. The test drug (EMO) was given orally 1 hour before and the standard drug morphine (1 mg/kg) was given intraperitoneally half-an-hour priorto the experiment. The temperature of the hot plate was set at 55 ± 1oC. The cutoff period was taken at 15 seconds. The latency is recorded before and after 15, 30, 45, 60, 90, 120, 180 min of administration of standard and test drugs and the results were compared with the control.

Figure 2:Flow diagram of the study.



3. **Tail flick test[11]:**

D'Amour and Smith et al., 1941. Tail-flick latency was assessed by the Algesimeter. The strength of the current passing through the naked nichrome wire was kept constant at 5 ampere. The distance between heat source and the tail was 1.5 cm and the application site of the heat on the tail was maintained within 2 cm, measured from the root of the tail. To avoid any tissue injury during the process the cutoff reaction time wastaken as 10 sec. The time taken by Rat to withdraw (flick) the tail was taken as the reaction time. The animalswere subjected to the same test procedure at 0 before and 30, 60, and 120 min after administration of treatmentas described in the grouping and dosing section.

Table 1. Groups classification for the Tail Flick Method Study[11]

Group	Description	Drug / Extract dose
1	Control	Normal saline 10 ml orally
2	Standard	Aspirin 20 mg/kg orally
3	Ethanolic extract Moringa oleifera	100 mg/kg orally
4	Ethanolic extract Moringa oleifera	200 mg/kg orally

5	Ethanolic extract Moringa oleifera	400 mg/kg orally

DISSCUSSION:

Moringa oleifera is a valuable medicinal plant which has also been demonstrated to be pharmacologically very potent. Different parts of the plant contain a profile of important phytochemical constituents that are mostly responsible for its biological action. Different parts of Moriga oleifera (leaf, seed, flower, bark, pod and root)are shows pharmacological properties [3].

The result revealed that aqueous and ethanol extract of most of parts contain alkaloids, tannins, flavonoid, anthraquinone, cardiac glycoside, carbohydrate and saponin which were tested in this study. For the aqueousextract, flower contain all the 7 phytochemicals that were evaluated; while the rest did not contain flavonoid.For the ethanol extract, the leaf, seed and flower obtained 7 phytochemicals, the bark was positive for all except alkaloid, whereas the root did not contain alkaloid, tannin and cardiac glycoside. The seven phytochemicals' compounds were present only in the flower (aqueous and ethanol), leaf (ethanol), and bark (ethanol) extract. Ethanol is a better solvent capable of extracting organic and inorganic materials from the plant. Overall, the ranking of phytoconstituents in the plant parts was flower>seed>leaf>root>bark. This did not correspond exactly to the ranking of the percentage yields- Flower>bark>seed>root or leaf.[3]

CONCLUSION:

In this study, the analgesic effect of EMO is exhibited in a dose-dependent manner and thus scientifically validating the folklore claims about the plant. However, further studies are needed to isolate the active constituents responsible for the observed effect and to reveal the possible mechanism of action responsible for its anti- nociceptive activity as per suggested by the various References.

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