ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 9| Issue: 12| December 2023|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2023: 8.224 || ISI Value: 1.188

PHARMACOLOGICAL EVALUATION OF MORINGA OLEIFERA LEAF EXTRACT FOR ANTIDEPRESSANT ACTIVITY: A REVIEW

Jagdish Abadar[1], Vaishnavi Adkine[2], Nikita Ambhore[3], Shinde Punam*

**Assistant Professor, Department of Pharmacology,*
Saraswati Institute of Pharmacy Kurtadi Hingoli-431701.Maharashtra, India.
[1,2,3]B. Pharmacy Final Year Student, Saraswati Institute of Pharmacy Kurtadi Hingoli-431701.Maharashtra, India.

Corresponding Author: *Ms.Punam Kailash Shinde*

ABSTRACT

The prevalence of mental depression has increased in recent years, and has become a serious health problem in most countries of the world, including India. Due to the high cost of antidepressant synthetic drugs and their accompanying side effects, the discovery of safer antidepressant herbal remedies is on the rise .This work was carried out to antidepressant effect of n-hexane fraction of Moringa oleifera. Depression is a neurological disorder characterized by apathy, loss of energy, decreased mood, feeling of guilt, loss of interest, retardation of thinking and activity as well as profound feelings of gloominess, despair and suicidal ideation. About 21% of the world population is largely affected by depression. Many people in the world advocate the use of Moringa oleifera to treatvariety of central nervous system illnesses. Moringa oleifera (MO) (drumstick) has been used in traditional old medicine, and in Ayurveda, it is considered as a valuable remedy for treating nervous system disorders as well as memory enhancing agent. The present study was undertaken to investigate the effect of ethanolic extract of moringa oleifera in mice. In the present study, the antidepressant effect of moringa oleifera was examined using two behavioural models, the forced swimming test (FST) and tail suspension test (TST). Depression is a wide spread psychiatric disorder. According to WHO, 450 million people suffer from a mental or behavioural disorder. this amount to 12.3% of global burden of disease and predicted to rise upto 15% by 2020. In traditional system of medicine, many plants and formulation have been used to treat depression for thousands of years. moringa oleifera is known miracle tree its every part having medicinal use for human. The present study reports physicochemical characterization, antidepressant activity of extracts from Moringa Oleifera leaves collected from local region of Nanded, Maharashtra, and India. The In-Vivo antidepressant activity of Moringa Oleifera leaf was evaluated by forced swim test model in mice using imipramine as a standard.

KEYWORDS: ***Moringa Oleifera, Antidepressant activity, Forced swim test ,Locomotor activity.***

INTRODUCTION

Depression is a serious mood disorder characterized by apathy, anhedonia feeling of helplessness and worthlessness leading to suicidal attempt.[1] It is an illness characterized by persistent sadness, loss of interest and ability to perform daily activities for a period of over two weeks; at worst leading to suicides which is the second cause of death to people aged 15- 29 years globally.[1] Several million individuals in the world do experience depression in their lifetime and this translates to about 21% of the world population.[2] Depression occurs due to the default in receptor-neurotransmitter relationships leading to functional deficit in these neurotransmitters (Noradrenalin, 5-Hydroxytryptamine or Dopamine) in the limbic system as well as prefrontal cortex, hippocampus and amygdale areas of the brain [3'4] The burden of depression is 50% higher for females than males.[5]

Moringa oleifera a member of Moringaceae family has been used in traditional folk medicine for treating numerous central nervous system disorders including convulsion and hysteria.[6'7] Moringa oleifera is a small, fast-growing and evergreen tree that usually grows as high as 9 m, with a soft and white wood and the bark is gummy. Moringa oleifera is commonly known as drumstick.[8] The present studies were designed to assess the antidepressant activity of Moringa oleifera (MO) in the mouse model. In India, it is used as food and for medicinal purposes. It is widely grown in different parts of the world. Moringa oleifera contains Vitamins A, B, C, flavonoids, oleic, palmitic and stearic acid, saponins, glycoside, gum, protein, calcium, magnesium, potassium, and iron.[9'10] The leaves have shown to possess strong antioxidant and anti-inflammatory properties, and thus could be used in the treatment of depression caused by OS or inflammation.[10]

INTRODUCTION OF PLANT

Moringa Oleifera

Moringa Oleifera Lam. *(*M. Oleifera) is a cruciferous plant that belongs to the Moringaceae family. M. Oleifera is commonly called horseradish tree or drumstick tree by locals and is a popular staple in different parts of the world. M. Oleifera is consumed not only for its nutritional values but also its medical benefits.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 9| Issue: 12| December 2023|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2023: 8.224 || ISI Value: 1.188

Figure.1:- Leaf

Figure.2 :- Powder

Table :- 1
Scientific Classification

Kingdom	Plantae
Order	Brassicales
Family	Moringaceae
Species	M.Oleifera
Genus	Moringa

VARIOUS ANTIDEPRESSANT ACTIVITY TEST ON MORINGA OLEIFERA

1.Tail Suspension Test (TST) :[11]

The method described by Steru., *et al.* was adopted. Thirty mice were divided into five groups of six mice each. The first group was pre-treated with normal saline 10 ml/kg i.p; the second, third and fourth groups were pre-treated with 100, 200 and 400 mg/ kg of the n hexane fraction of Moringa oleifera, i.p while the fifth group was pre-treated with the standard antidepressant drug (imipramine) 10 mg/kg body weight i.p. Thirty (30) minutes after the pre-treatment, animals were individually suspended 50 cm above the floor by means of an adhesive tape placed approximately 1 cm from the tip of the tail. Duration of immobility was measured for the entire testing period of 6 minutes. Each mouse was considered inactive when hung passively motionless.

2.Locomotor activity test :[12

Locomotor activity test (LAT) was performed to assess CNS inhibitory or stimulatory activity of the extract.

3.Forced Swim Test (FST) :[13]

Porsolt and Bertin *et. al.* are given the information about antidepressant activity. Thirty mice were divided into five groups of six mice each. The first group was pre-treated with normal saline 10 ml/kg i.p; the second, third and fourth groups were pre-treated with 100, 200 and 400 mg/kg of the n-hexane fraction, i.p while the fifth group was pre-treated with 10 mg/kg body weight imipramine i.p. Thirty minutes (30minutes) after the pretreatment, depression was produced by forcing the animal to swim individually in a transparent and open glass container of 30 cm height and 20 cm wide containing fresh water of 15 cm height and maintained at 21 ± 0.5oC. Each animal assumed a typical immobile posture after struggling to escape. The immobility time on each mice was recorded using digital camera for the entire six minutes period. Each mouse was considered immobile when given up struggling to escape. Immobility timereduction was taken as antidepressant like action.

DISCUSSION

In this study, alkaloids, cardiac glycosides, flavonoids,tannins and saponins were detected from n-hexane fraction of Moringa oleifera leaf extract, whereas steroids were absent.[14]

Forced swim test (FST) and Tail suspension Test (TST) remainthe most applicable animals models for antidepressant screening growing to their ease of operation are require little resources. These protocols are quite specific to almost all classical antidepressants in clinical use.[14]

Tail suspension and Forced swim tests showcasea state of behavioral despair in rodents which reflects depression in humans.[15]

Clinically used antidepressants decrease the immobility time significantly in both FST and TST.[16] The present study was designed to investigate the antidepressant activity of ethanolic MOE in mice using well-tried-out and standardized behavioral tests of depression. MO is often used as antidiabetic, anti-inflammatory, antimicrobial, and antiulcer remedy.[17]

The polyphenolic compounds are purported to exert neuroprotective and anti-inflammatory effects in the CNS.[18] This phenomenon also suggested the involvement of noradrenergic and serotonergic pathways in the induction of antidepressant activity.[19]

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 9| Issue: 12| December 2023|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2023: 8.224 || ISI Value: 1.188

In order to assess the occurrence of false positive results exhibited in the TST and FST due to CNS stimulant action of MOE, mice were subjected to open field tests.[20]

CONCLUSION

The results of our study suggests that ethanol leaf extract of Moringa oleifera possess antidepressant activity in both FST and TST in mice the potential use of Moringa oleifera in the treatment of depression .

The two extract were tested for in vivo antidepressant activity. The different extracts of Moringa oleifera leaf showed significant antidepressant activity as per suggested by the various references.

REFERENCES

1. *World Health Organization (2017) Depression: let's talk. World Health Day.*
2. *Gu X, Zhou Y, Wu X, Wang F, Zhang CY (2014) Antidepressant-like effects of auraptenol in mice. Sci Rep 4: 4433.*
3. *Richard HH (1998) Theories of Depression. Int J Pharm Sci 195: 520-524.*
4. *Loiuse BA, Barry EB, Face (2016) Depression and suicide.*
5. *World Health Organization (2008) The Global Burden of Disease 2004.*
6. *Bakre AG, Aderigbe AO, Ademowo OG (2013) Studies on neuropharmacological profile of ethanol extract of Moringa oleifera leaves in mice. J Ethnopharmacol 149: 783-789.*
7. *Kaur G, Invally M, Sanzagiri R, Buttar HS (2015) Evaluation of antidepressant activity of Moringa oleifera alone and in combination with fluoxetine. J Ayurveda Integr Med 6: 273-279.*
8. *Bhattacharya A, Naik MR, Agrawal D, Sahu PK, Kumar S, et al. (2014) CNS depressant and muscle relaxant effect of ethanolic leaf extract of Moringa oleifera on Albino Rats. Int J Pharm Tech Res 6: 1441-1449.*
9. *Leelavinothan P, Magdalena K. Antioxidant activity of thecrude extracts of Moringa oleifera and Scoparia dulcis L.leaves. Pol J Food Nutr Sci 2007;57:203-8.*
10. *Bhoomika R, Babita G, Goyal R. Phyto-pharmacology of Moringa Oleifera Lam anoverview. Nat Prod Radiance 2007;6:347-53.*
11. *Steru L., et al. "The tail suspension test: A new method for screening antidepressants in mice". Psychopharmacology 85.3 (1985): 367-370.*
12. *Bhattacharya SK, Bhattacharya A, Sairam K, Ghosal S. Anxiolytic-antidepressant activity of Withania somnifera glycowithanolides: An experimental study. Phytomedicine 2000;7:463-9.*
13. *Porsolt RD and Bertin A. "Behaviour despair in mice A primary screening test for antidepressants". Archives Internationalesde Pharmacodynamie et de Therapie 229.2 (1977): 327-361.*
14. *Mishra G., et al. "Traditional uses, phytochemistry and pharmacological properties of Moringa oleifera plant: Anoverview". Der Pharmacia Lettre 3.2 (2011): 141-164.*
15. *Sharma V., et al. "Anti-Depressant Activity of Zizyphus xylopyrus". International Journal of Phytomedicine 1.1 (2009): 12-17.*
16. *Yunusa S and Musa A. "Evaluation of Antidepressant Effect of Ethanol Extract and Chloroform Fraction of Moringa oleifera Lam. (Moringaceae) Leaf in Mice". Journal of Drug Research and Development 4.1 (2018).*
17. *Mann JJ. The medical management of depression. N Engl J Med 2005;353:1819-34.*
18. *Pemminati S, Gopalakrishna H, Shenoy A, Sahu S, Mishra S, Meti V, et al . Antidepressant activity of aqueous extract of fruits emblica offcinalis in mice. Int J Appl Biol Pharm Technol 2012;1:449-54.*
19. *Huang QJ, Jiang H, Hao XL, Minor TR. Brain IL-1 beta was involved in reserpine-induced behavioral depression in rats. Acta Pharmacol Sin. 2004;25:293–6.*
20. *Parekar RR, Jadhav KS, Marathe PA, Rege NN. Effect of Saraswatarishta in animal models of behavior despair. J Ayurveda Integr Med. 2014;5:141–7.*
21. *The world health report, mental health; new understanding new hope. WHO, Geneva, 2001.*
22. *Siddhuraju P, Becker K. Antioxidant properties of various solvent extract of total phenolic constituents from three different agroclimatic origins of drumstick tree (Moringa oleifera Lam.) leaves. J Agric Food Chem., 2003; 51: 2144-55.*
23. *L. J. Fuglie, The Miracle Tree: Moringa oleifera: Natural Nutrition for the Tropics, Church World Service, Dakar, Senegal, 1999.*
24. *J. W. Fahey, "Moringa oleifera: a Review of the medical evidence for its nutritional, therapeutic, and prophylactic properties. Part 1," Trees for Life Journal, vol. 1, aticle 5, 2005.*
25. *S. Y. Dangi, C. I. Jolly, and S. Narayanan, "Antihypertensive activity of the total alkaloids from the leaves of Moringa oleifera," Pharmaceutical Biology, vol. 40, no. 2, pp. 144–148, 2002.*
26. *Jawai T, Gupta R, Siddiquie Z. A review on herbal plants showing antidepressant activity. Int J Pharm Sci Res. 2011;2:3051–60.*
27. *World Health Organization (2012) World suicide prevention day.*