WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 14, Issue 8, 161-175. Review Article ISSN 2277–7105

PHYTOCHEMICAL STUDY AND PHARMACOLOGICAL ACTIVITY OF MIMUSOPS ELENGI LINN

Madhuri Kawade*, Dr. Soniya Singh, Omprakash Katkar, Riya Salve, Kanchan Virkar, Saurabh Rakshe

Alard College of Pharmacy Marunji, Hinjawadi, Pune, (Department of Pharmacognosy).

Article Received on
22 February 2025,

Revised on 12 March 2025,
Accepted on 02 April 2025

DOI: 10.20959/wjpr20258-36158

***Corresponding Author**
Madhuri Kawade
Alard College of Pharmacy
Marunji, Hinjawadi, Pune,
(Department of
Pharmacognosy).

ABSTRACT

This article seeks to emphasize the significance of the plant species Mimusops elengi Linn., commonly referred to as 'Bakul.' This species, which is part of the Sapotaceae family, is indigenous to India. Ayurveda and traditional medicine employ the stem, bark, leaves, and fruits of this plant to treat a variety of health issues. Numerous phytochemicals have been isolated from different extracts derived from various parts of the plant. Tannins, alkaloids, saponins, cardiac glycosides, steroids, flavonoids, reducing sugars, and other similar compounds are among the various phytochemicals that can be extracted from plants. Mimusops elengi L. exhibits a wide range of pharmacological properties. Among the reported activities are antibacterial, antifungal, anti-helminthic, antidiuretic, larvicidal, wound healing, anti-HIV, analgesic, antipyretic, anticancer, anti-inflammatory, anti-hyperlipidemic, cognitive enhancement, antioxidant, anti-anxiety, anti-spermatic, and anti-diabetic effects. This article also emphasizes the potential commercial applications of Mimusops elengi L.[1] In recent years, there has been a swift rise in the standardization of certain medicinal plants that hold potential therapeutic value. The identification of plant-based drugs through pharmacognostic studies remains more dependable, even with the advent of modern techniques Mimusops elengi, commonly referred to as Spanish cherry, is a tree that is part of the Sapotaceae family and is indigenous to the Western Ghats of peninsular India. Given the extensive traditional use of the plant Mimusops elengi Linn, this study was conducted to establish pharmacopoeial standards for this species. This study focuses on the pharmacognostic characteristics of the bark of Mimusops elengi, which primarily includes an

examination of macromorphological and microscopical features, as well as the assessment of physicochemical properties and phytochemical analysis. This information will be valuable for the subsequent pharmacological and therapeutic assessment of the species and will aid in the standardization of quality, purity, and sample identification.[1]

- **KEYWORDS:** Mimusops Elengi Linn leaves, Maceration, Formulation and Evaluation.

INTRODUCTION

Elengi Mimusops Linn. (M. elengi) is a big, glabrous, evergreen tree that grows 12 to 15 meters tall. It has a short, upright trunk and a compact, leafy head. Its bark is gray, scaly, and smooth. Petioles 1.3-2.5 cm long, elliptic, briefly acuminate, glabrous, base acute or rounded, 6.3-10 by 3.2-5 cm leaves, white, fragrant, solitary, nearly 2.5 cm broad, ovoid, acute buds, and pedicels 6.20 mm long. In contrast to the inner circle of lobes, the calyx is 1 cm long and has 8 stamens. The fruit berry is about 2.5 cm long, ovoid, compressed, brown, and shiny, and the ovary is appressedly silky-pubescent. The seeds are solitary and ovoid.[3]

Traditional medical practice is founded on hundreds of years of observations, analysis, and belief that have aided in the creation of contemporary medicine. Herbal medications are really popular right now. The main reason for this interest is the perception that herbal remedies are less harmful, safer, and less expensive. Mimusops elengi Linn., also referred to as the "Indian meddler tree" or the "Bakul tree," is one such significant medicinal plant (Bhattarcharjee, 2004). Hindus view Mimusops elengi as a sacred plant, and it has a significant role in both In religious texts and ancient Sanskrit literature, particularly in the Puranas, its blossoms are honored and even esteemed among the flowers of the Hindu paradise. It is believed that the milkmaids of Brindavan on the banks were captivated by Krishna.[4]

- Taxonomy and nomenclature (common names) is as following

1) Kingdom: Plantae,
2) Order: Ericales,
3) Family: Sapotaceae,
4) Genus: Mimusops,
5) Species: M. elengi L.,
6) Binomial name: Mimusops elengi (L).
7) Scientific Name- Mimusops Elengi Linn.

- Origine and Distribution

The western peninsula is home to the Mimusops elengi Linn tree. In South India, the tree grows in dry evergreen forests from the Krishna southward, as well as in 20-meter-deep hillside ravines along the western coast and lower ghats in moist evergreen forests. Andaman, Martaban, Tennasserim, Burma, and the Western Ghats are among its distributions; in the Eastern Ghats, it is found in arid regions, frequently on laterite, and is quite modest in size. The Northwestern Himalayas, the Eastern and Western Ghats, the Central Deccan Plateau, the East and West Coasts, the Indo-Gangetic Plain, and the Outlying Islands are its primary habitats.[4]

Figure 1: A] Mimusops Elengi Plant, B] Flower, C] Leaves, D] Fruit.

English: bullet wood, spanish cherry; Hindi:
mulsari, sinha kasaraka Sanskrit: bakula, kesara,
madhugandha Udumbara; assamese: Gokui;

marathi: ovalli; bengali: Bakul; Telugu: bogada, bogada-manu; Singhali: minn-mal, muhulla, muhuna; Tamil: vagulam, magadam, muhunain; Oriya: kira kauli, baula

English: bullet wood, spanish cherry; Hindi: mulsari, sinha kasaraka Sanskrit: bakula, kesara, madhugandha Udumbara; assamese: Gokui;

marathi: ovalli; bengali: Bakul; Telugu: bogada, bogada-manu; Singhali: minn-mal, muhulla, muhuna; Tamil: vagulam, magadam, muhunain; Oriya: kira kauli, baula

English: bullet wood, spanish cherry; Hindi: mulsari, sinha kasaraka Sanskrit: bakula, kesara, madhugandha Udumbara; assamese: Gokui;

marathi: ovalli; bengali: Bakul; Telugu: bogada, bogada-manu; Singhali: minn-mal, muhulla, muhuna; Tamil: vagulam, magadam, muhunain; Oriya: kira kauli, baula

- Vernacular names

The plant is also known as varieties of name as mention bellow:

1.	Sanskrit	Anangaka, Bakula, Chirapushpa, Dhanvi, Gudhpushpa, Kantha, Karuka, Kesha
2.	Gujarati	Babhuli, Bolsari, Varsoli, Vovoli
3.	Hindi	Bakul, Bolsari, Maulsarau, Maulser, Maulsari
4.	Marathi	Bakhor, Bakula, Barsoli, Ovalli, Owli, Vavoli, Wovali, Wowli
5.	Malayalam	Bakulam, Elengi, Ilanni, Iranni, Makuram
6.	Tamil	Alagu, Ilangi, Kesaram, Kosaram, Magil, Magilam, Vagulam
7.	Punjabi	Maulsari, Maulsiri
8.	Bengali	Bakal, Bakul, Bohl, Bukal
9.	English	Bullet wood, Indian Medlar
10.	Nepalese	Bakulapuspa
11.	Sinhalese	Munemal
12.	German	Affengesict

Uses

Bark: Alkaloids, starch, tannin, and saponins are among the key components of bark. It also contains caoutchouc, wax, coloring matter, and ash, which creates inorganic salts. The bark's ethanolic extract was used to separate saponin, which hydrolyzed to produce bassic acid and

β-amyrin. The alcoholic extract's hexane soluble fraction produced betulinic acid, sodium ursolate, α-spinasterol, taraxerol, and taraxerone, whereas the hexane insoluble fraction produced β-D-glucoside of βsitosterol and quercitol in the aqueous extract.

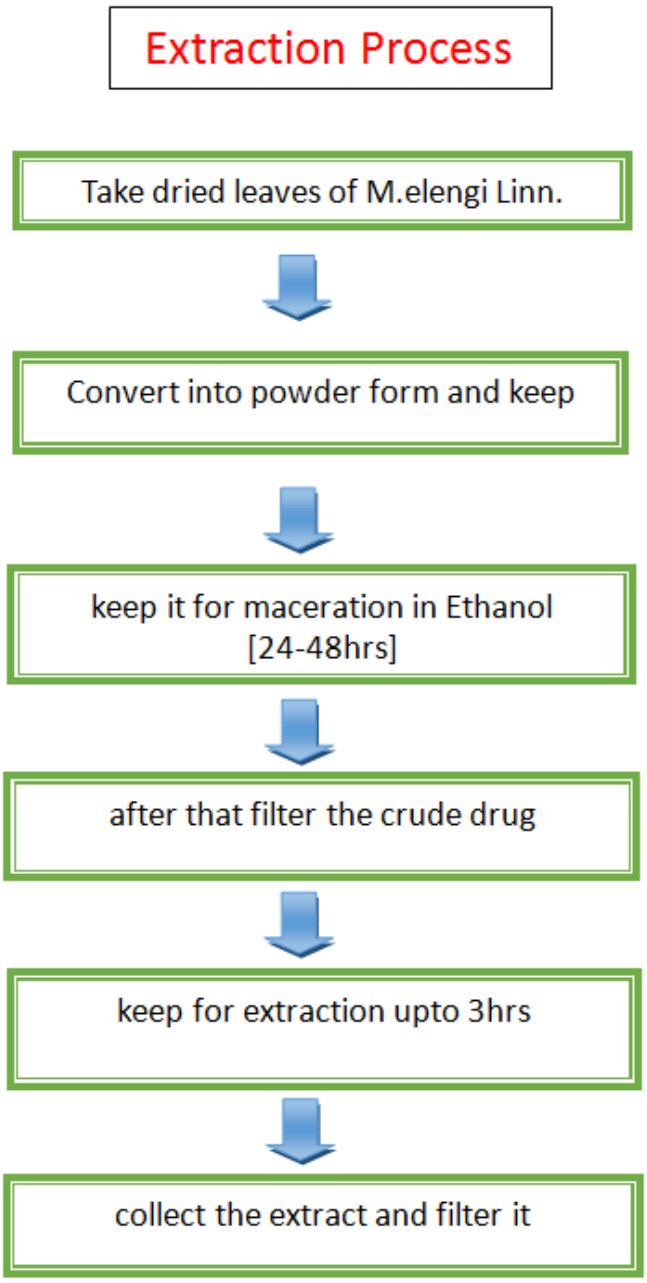
Ursolic acid, taraxerol, and lupeol. Bark was also used to isolate α-spinasterol's fatty acid ester. α-spinasterol and taraxerol were obtained from the petroleum ether preparations of stem bark. The amount of volatile organic materials in the bark sample was 0.18% after steam distillation. Linalol, Copaene, Isosafrol, β-caryophyllin, Safrol, δcadinene, Phenol, 2, 5-bis (1-methylethyl)-(Thymol), and γcadinene are the volatile oil elements of the bark. Tryptophan, lysine, methionine, proline, glysine, and alanine are among the amino acids found in bark. The bark's lipid content ranged between 13.5 and 16.8 mg/gm. Pentacyclic triterpene acids, mimusopic acid, and mimusopsic acid are found in seeds. The ethanolic extract of M. elengi seeds produced β-D-glucoside of β-sitosterol, α-spinasterol, dihydroquercetin, and querciyol. The fatty seed oil included capric, Lauric, myristic, palmitic, stearic, arachidic, oleic, and linoleic acids; β- and γ-sitosterol made up the unsaponifiable portion of the seed fat. Steroid saponin 5α-stigmast-9(11) en-3-O-β-D-glucopyranosyl (→5)-O-β-D-xy-lofuranoside is found in the root. Upon ethanol extraction, the roots yielded α-spinasterol, taraxerol, lupeol acetate, and β-D-glucoside of β-sitosterol. Flower: When fresh M. elengi flowers were extracted with acetone, D-mannitol was produced; however, when ethanol was extracted, β-sitosterol-β-D-glucoside was obtained. The flowers' ethanolic extract produced ursolic acid, quercitol, and a triterpene alcohol that was subsequently determined to be lupeol. Sterols, which reduce sugars and tannins, are found in leaves. Quercitol, hentriacontane, β-carotene, and glucose were obtained from the ethanol extract of M. elengi leaves. Fruit: A significant amount of sugar and saponin are present in the fruit pulp.[6]

MATERIAL AND METHODS

Chemical Constituent:-Phytochemical compounds present in Mimusops Elengi Linn.[6]

Fruit and seed of the plant containing following categories of phytochemical

1] Flavonoids	Quercitol, dihydro quercetine
2] Phytosterols	Alphaspinasterol, Oleanane,alpha-spinasterol glucoside, Miglycoside 1
3]Pentacyclic triterpenoids	ursolic acid, mimusopic acid, mimusopsic acid, 6beta,19alpha,23-tetrahydroxy-urs-12-ene,1beta-hydroxy-3beta-hexanoyllup-20(29)-ene-23, 28-dioicacid,
4]Protein (1.29 %)	
5]Sugars (6.3 %)	
6]Minerals (0.32 %)	



Extraction:-

The percentage yield of six extracts from C. carandas fruits was measured for the following phases: fresh fruit in the unripe stage, fresh fruit in the ripe stage, fresh fruit in the fully ripe stage, dried fruit in the unripe stage, dried fruit in the ripe stage, and dried fruit in the fully ripe stage. These yields were 5.33, 4.70, 5.28, 32.40, 38.59, and 38.30, respectively. The dried fruit extracts produced notably greater yields. This may be due to the drying process, which removes excess water and enzyme activity from the cells. Because it offers free bonding and lower viscosity, the dried fruit is consequently better suited for the extraction procedure. Using solvents such as ethanol or ethyl acetate, maceration is.[8]

Pharmacological activity

Anti-ulcer activity

Fresh fruit in the unripe stage, fresh fruit in the ripe stage, fresh fruit in the fully ripe stage, dried fruit in the unripe stage, dried fruit in the ripe stage, and dried fruit in the fully ripe stage were the phases for which the percentage yield of six extracts from C. carandas fruits was measured. The corresponding yields were 5.33, 4.70, 5.28, 32.40, 38.59, and 38.30. The yields from the dried fruit extracts were noticeably higher. The drying process, which eliminates extra water and enzyme activity from the cells, could be the cause of this. The dried fruit is therefore more appropriate for the extraction process since it provides free bonding and reduced viscosity. Maceration is the process of using solvents like ethanol or ethyl acetate to

Anti-fungal activity

Zehavi et al. (1986) assessed the antifungal activity of Mimusops elengi using a poisoned food approach. They examined the antifungal properties of all solvent extracts, as well as the aqueous extract at several concentrations (10%, 20%, 30%, 40%, and 50%) and the separated components (Fraction I to IV) from Mimusops elengi. To get the necessary concentrations for the antifungal activity test, these extracts were mixed to Czepak Dox Agar (CDA) medium. Following autoclaving, the mixture was cooled by being moved onto 20 mL Petri plates. After the medium had set, five millimeter discs from seven-day-old cultures of the fungi under investigation were put onto the plates. Four replicates were maintained for each concentration. The control plates had CDA medium without the extract. Incubation of the plates took place at 26±1 °C for seven days. The fungitoxicity of the extracts was determined by calculating the percentage inhibition of mycelial growth. To produce comparable evaluations, synthetic fungicides, including Blitox, Captan, Dithane M-45, and Thiram, were also tested for antifungal activity using the poisoned food technique at their recommended dosage of 2000 ppm. The portion III's alkaloids exhibited potent antifungal activity. The nature of the active principle was demonstrated by the fact that fractions I, II, and IV exhibited no antifungal activity.

The fungi under investigation, D. halodes was the most susceptible to the alkaloid fractions, while F. oxysporum showed the least. Out of the four fungicides.[9]

Antioxidant activity

The bark chloroform extract was assessed using DPPH (1, 1-diphenyl-2-picrylhydrazyl) radical, nitric oxide, ABTS radical, and hydroxyl radical, in that order. The results of the study clearly demonstrate that M. elengi has a lot of potential for use as a natural antioxidant agent. The leaf's crude methanolic extract showed statistically significant antioxidant activity in the DPPH free radical scavenging and nitric oxide scavenging assays. The preventive impact of leaf extract on lipid peroxidation and both enzymatic and non-enzymatic processes The levels of antioxidants in plasma and tissues were examined. Plasma and tissue lipid peroxidative markers, as well as enzymatic and non-enzymatic antioxidants, were used to measure oxidative stress. It showed promising antioxidant properties by dramatically reducing the level of lipid peroxidation and strengthening the antioxidant defense system in pancreatic tissues. The in-vivo antioxidant activity of bark extracts in petroleum ether, chloroform, and alcohol was examined using lipid peroxidation (MDA), glutathione (GSH), catalase (CAT), and superoxide dismutase (SOD). The results showed significantly greater levels of GSH, SOD, and CAT and much lower levels of MDA. The alcohol extract has higher antioxidant activity than petroleum ether and chloroform extract. DPPH, reducing power, and hydroxyl radical scavenging assays were employed to evaluate the in vitro antioxidant activities of the methanolic extract. It demonstrated significant in vitro reducing power capacity and radical scavenging activity. The antioxidant capacity of the phenolic components that were separated from the orange, mature green, and immature green of Mimusops elengi. The crude extract from immature fruit has a greater antioxidant capacity than either the mature or the ripe fruit.

Diuretic activity

The diuretic and electrolyte excretion effects of alcoholic extract were evaluated. Five hours after the extracts and standards were dosed, urine was collected, and the volume was recorded. The most effective diuretic was the alcoholic extract. The water extract, ethanol, and ethyl acetate were evaluated for their diuretic properties. As part of a diuretic study, rodent urine volume was assessed at 1, 2, 4, 6, and 24 hours. The aqueous extracts exhibited a significant diuretic impact in comparison to other extracts.

Ant diabetic activity

The polar and nonpolar solvent extracts of leaves were tested for antidiabetic effects in rats that had both acute and chronic hypoglycemia brought on by alloxan. Alcoholic and aqueous

extracts shown significant antidiabetic benefits in both short-term and long-term therapy trials. The antihyperglycemic activity of methanolic stem bark extract was evaluated in diabetic and non-diabetic mice using an oral glucose tolerance test. Furthermore, the extract showed a significant reduction in increased glucose levels in non-diabetic rats that were administered glucose. The antidiabetic effects of the aqueous bark extract were tested in rats that were given alloxan to induce hypoglycemia. Blood glucose, serum insulin, glycosylated hemoglobin and liver glycogen, glucokinase, glucose-6-phosphatase, and glucose-6-phosphate dehydrogenase were measured after 45 days of treatment.[10]

Antihypertensive activity

Mice with alloxan-induced diabetes were used to test the in vivo antihyperglycemic effects of a methanolic extract of M. elengi bark; the extract showed a significant antihyperglycemic effect in both diabetic and non-diabetic mice given glucose.42 Methanolic extracts of Mimusops elengi flowers and foliage were tested for their hypoglycemic effect in rats with normoglycemia and diabetes brought on by alloxan. Mimusops elengi oral doses were administered to both normal and alloxan-induced diabetic rats. The oral glucose tolerance test, fasting blood glucose, and alloxan-induced diabetic rats were used to evaluate the hypoglycemic effects, which were then contrasted with those of the standard drug tolbutamide. Both extracts dramatically reduced blood glucose levels within two weeks in rats with normotension.

The antihyperglycemic effects of M. elengi bark methanolic extract were examined in vivo in patients with alloxan-induced diabetes.

Anti-microbial Activity

Extracts of Mimusops elengi bark, fruit, and seed were used to test the antibacterial activity of gram-positive and gram-negative strains, such as Nocardia asteroids NRRL-174, Micrococcus luteus ATCC-10240, Bacillus subtilis PCSIRB-248, Bacillus licheniformis NCL-2024, Proteus mirabilis ATCC-29425, and Salmonella typhimurium ATCC-14028. Seed extracts were found to be ineffective, whereas fruit and stem bark extracts shown antibacterial action against all test organisms. The ethyl acetate extract showed the biggest zone of inhibition against B. subtilis, while the aqueous methanol extract also showed notable results against N. asteroids.

At doses of 10, 20, 30, 40, and 50 µl, the antibacterial activity of the aqueous and solvent extracts of Mimusops elengi (petroleum ether, toluene, chloroform, methanol, and ethanol) was evaluated in vitro against five harmful bacteria: Pseudomonas, Salmonella typhi, and Escherichia coli. At a 50µl concentration, Streptococcus pneumonia and E. coli showed the strongest inhibition among the five pathogens evaluated when compared to the common drugs Streptomycin, Tetracycline, and Gentamicin. With doses ranging from 10 to 50 µl, methanol and ethanol extract demonstrated the largest zone of inhibition against Streptococcus pneumonia and E. coli in solvent extract.27 Ethanolic extracts of Mimusops elengi bark were tested for their antibacterial properties against one clinical strain of Candida spp., coliforms, Pseudomonas aeruginosa (NCTC 10662), E. coli (NCTC 10418), and Staphylococcus aureus (NCTC 6571).

Anti-inflammatory, analgesic and antipyretic activities

Karmakar et al. (2011) investigated the analgesic effects of an ethanol extract of Mimusops elengi leaves using the hot plate test and acetic acid-induced writhing of white albino mice. In the hot plate test, the extract considerably increased the delay time response to the heat stimuli. Animals were used to test the bark's ethanol extract's anti-inflammatory, analgesic, and antipyretic qualities. At third and fourth weight, the carrageenan-induced paw oedema was considerably reduced by the bark ethanol extract. The ethano extract also lowers the rectal temperature in Brewer's yeast-induced pyrexia and the writhing caused by acetic acid in analgesic models. The hot plate test did not, however, show an increase in latency time.

Cytotoxic activity

Mahavorasirikul et al. (2010) examined the antineoplastic properties of a 95% ethanolic extract prepared from Mimusops elengi flowers. In vitro investigations were conducted using human cholangiocarcinoma cell line CL6, human laryngeal carcinoma cell line Hep-2, human hepatocarcinoma cell line HepG2, and normal human epithelial cells (HRE). 5-fluorouracil served as the positive control, while cytotoxicity was employed as the endpoint measurement. For a duration of 24 hours, cells in the logarithmic growth phase were subjected to different concentrations of either 5-fluorouracil or the extract (ranging from 1.95 to 250 µg/mL). The MTT assay was used to evaluate the cytotoxic effects. The study's findings demonstrated a cytotoxic impact that was concentration-dependent, with estimated IC50 values of 48.84, 109.99, and 54.44 µg/mL.

Anti-hyperlipidemic activity

The antineoplastic qualities of a 95% ethanolic extract made from Mimusops elengi flowers were investigated by Mahavorasirikul et al. (2010). Human cholangiocarcinoma cell line CL6, human laryngeal carcinoma cell line Hep-2, human hepatocarcinoma cell line HepG2, and normal human epithelial cells (HRE) were used in in vitro studies. Cytotoxicity was used as the endpoint measurement, and 5-fluorouracil was used as the positive control. Cells in the logarithmic growth phase were exposed to varying doses of 5-fluorouracil or the extract (range from 1.95 to 250 µg/mL) for a whole day. The cytotoxic effects were assessed using the MTT test. The results of the investigation showed a concentration-dependent cytotoxic effect, with estimated IC50 values of 48.84, 109.99, and 54.44 µg/mL.[11]

CNS depressant activity

Nasrin et al. (2011) examined the potential analgesic and neuropharmacological effects of Mimusops elengi's methanolic bark extract in rats using dosages of 100 mg/kg, 200 mg/kg, and 400 mg/kg of body weight. Analgesic activity was assessed using studies using tail immersion and writhing caused by acetic acid. The extract's effects on the central nervous system (CNS) were examined using open field and hole cross tests. In the tail immersion test, the extract considerably lengthened the time it took the mice to flick their tails in comparison to the control group. This effect depended on the dosage ($p < 0.05$-0.001). The extract significantly suppressed the acetic acid-induced writhing test by 65.48 percent at 400 mg/kg.

Immunostimulatory effect

Shivatare et al. (2014) looked into how the immune system of mice was stimulated by a methanolic extract from the bark of Mimusops elengi (MEMEL). Depending on their body weight, the mice received oral dosages of 10, 20, and 40 mg/kg/day of MEMEL. The study assessed both specific and non-specific immune responses using the carbon clearance test (CCT), the haemagglutination antibody (HA) assay, and delayed-type hypersensitivity using sheep red blood cells (SRBC) as the antigen. Vitamin E at 150 mg/kg served as the standard reference, and distilled water was used as a control in all investigations. The results demonstrated a dose-dependent increase in the immunostimulatory response upon oral administration of MEMEL. The phagocytic index rose dramatically in the CCT.

Antibacterial activity

Using the Agar cup diffusion method, the effects of aqueous petroleum ether, toluene, methanol, ethanol, and chloroform extract of leaves on five harmful bacteria—Salmonella

typhi, Pseudomonas aeruginosa, Streptococcus pneumonia, Vibrio cholera, and Escherichia coli—were examined. Strong antibacterial activity was demonstrated by the aqueous extract. Methanol and ethanol extract showed the highest and most significant action. The paper disc diffusion method was used to assess and compare the bark extracts' antibacterial activity against salivary microorganisms in aqueous and acetone solvents. There were no discernible zones of inhibition in the acetone or aqueous extracts.

Wound healing activity

Using the Agar cup diffusion method, the effects of aqueous petroleum ether, toluene, methanol, ethanol, and chloroform extract of leaves on five harmful bacteria—Salmonella typhi, Pseudomonas aeruginosa, Streptococcus pneumonia, Vibrio cholera, and Escherichia coli—were examined. Strong antibacterial activity was demonstrated by the aqueous extract. Methanol and ethanol extract showed the highest and most significant action. The paper disc diffusion method was used to assess and compare the bark extracts' antibacterial activity against salivary microorganisms in aqueous and acetone solvents. There were no discernible zones of inhibition in the acetone or aqueous extracts.

Cognitive-enhancing activity

Using the raised plus maza and passive avoidance task method with mentat as a standard, the effect of the flower's alcoholic extract on congestive enhancing activity was assessed using the step-down and transfer-latency parameters. The alcoholic extract demonstrates the noteworthy impact.Using thin-layer chromatography (TLC), the presence of terpenoids in Mimusops elengi Linn was further confirmed. Terpenoids were then separated by preparative TLC and examined by UV, FTIR, and HPTLC methods. The elevated plus maze and passive avoidance task methodologies were used to assess the alcoholic extract's cognitive-enhancing effects for the pharmacological screening, with Mentat serving as the standard reference. These analyses relied on metrics like transfer delay and step-down latency. MES and scopolamine were administered as part of the induction procedure. In order to assess the activity of the acetylcholinesterase enzyme, the researchers separated the brain on the seventh day. The study's findings demonstrated that, in comparison to the control group, the alcoholic extracts, which were given at a dose of 200 mg/kg body weight, had notable effects. This was demonstrated by a significant drop in acetylcholinesterase enzyme activity, a decrease in transfer latency, and an increase in step-down latency. It should be mentioned, nevertheless, that the effects were not as strong as those of the regular medication. In conclusion, it was

discovered that the triterpenoids present in Mimusops elengi Linn flowers are responsible for their notable cognitive-enhancing qualities.

Anticonvulsant activity

The Ganu et al. (2011) assessed the bark of Mimusops elengi, a plant that has traditionally been used as a febrifuge, tonic, and to treat odontopathy and inflammation. The blossoms of this plant are known for their brain-tonic properties and are used as snuff to ease cephalalgia. The bark of Mimusops elengi was shown to be a valuable natural antioxidant source due to its high concentration of tannin, saponin, alkaloids, and glycosides. The conventional treatments for anxiety and seizures have several shortcomings, particularly with regard to side effects. Natural remedies have become more and more popular due to their numerous processes and little adverse effects. Mimusops elengi bark extracts in methanolic, aqueous, and n-butanolic forms were tested for their anticonvulsant qualities at dosages of 50.[12]

CONCLUSION

Since ancient times, Bakul (Mimusops elengi) has been used for its medicinal properties to treat antimicrobial, antioxidant, diabetic diseases, wound healing, antibacterial, and anti-ulcer conditions.

The present experiment demonstrated that it is possible to develop and evaluate an ointment containing Mimusops elengi with quercetin extract for ulcer treatment.

Future Scope

- Clinical Trials & Validation: To verify the safety, effectiveness, and ideal dosage of Mimusops elengi ointment for the treatment of ulcers in people, more clinical research is required.
- Formulation Improvement: To improve absorption and therapeutic benefits, research can concentrate on enhancing the formulation by adding cutting-edge drug delivery technologies such hydrogels or nanoemulsions.
- Comparative Studies: To determine Mimusops elengi ointment's superiority or supplementary advantages, its efficacy can be compared to that of currently available commercial ulcer therapies.
- Broad-Spectrum Applications: Because of its antibacterial and wound-healing qualities, the formulation may be investigated for the treatment of skin disorders other than ulcers, such as burns, wounds, and infections.

- Mechanism of Action Studies: Comprehensive investigations can be carried out to comprehend the molecular mechanisms by which quercetin and Mimusops elengi produce their anti-ulcer actions.
- Commercialization & Patent Filing: Should the ointment be shown to be successful, it may be patented and produced on a big scale, which would benefit the herbal medicine and pharmaceutical sectors.
- Sustainability & Cultivation: Promoting Mimusops elengi cultivation for therapeutic uses can help maintain natural biodiversity and promote sustainable herbal medicine development.

ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my teacher Mrs. Madhuri Kawade as well as our principal. Dr. sonia Singh Who gave me a golden opportunity to do this wonderful project on the topic Mimusops Elengi Linn, which also helped me in doing a lot of research and I came to know about so many new things.

THANKS AGAIN TO ALL

REFERENCES

1. Musops elengi: Phytochemical research, ethnobotanical knowledge, pharmacological aspects, and possibilities for the future* Department of Life Sciences, University of Mumbai, Vidya Nagari, Kalina, Mumbai, India; Dalvi, T. S.; Karande, A. V.; Jaiswal, R. S.; Pandey, K. K.; Shah, N. J.
2. Physiochemical, phytochemical, and pharmacognostic analyses of the stem bark of Mimusops Elengi Linn (Sapotaceae) Manohar J. Patil Marathwada, Kavita N. Yadav, Rakesh S. Shivatare, Ramesh S. Deoda, and Prasad V. Kadam * The College of Pharmacy of Mitra Mandal, Thergaon (Kalewadi), Pune.
3. Review of Mimusops elengi Linn. ethnobotanical, phytochemical, and pharmacological aspects Bharat Gami1*, Smita Pathak2, and Minoo Parabia2
4. PHYTOMEDICINAL IMPORTANCE OF MIMUSOPS ELENGI: A NEW PRESENT AND EXCITING FUTURE Department of Botany, Kanoria PG Mahila Mahavidyalaya, JLN Marg Jaipur 302004 Reema Srivastava*, Gauri Shukla, and Sakshi. Sharma.

5. A Review of Pharmacognostic Standards for Mimusops elengi Linn Manohar J. Patil, Hanumant U. Bhusnar, Prasad V. Kadam, Rakesh S. Shivatare, Ramesh S. Deoda, and Nupura S. Narappanawar.
6. A review of the phytochemistry and pharmacology of Mimusops elengi linn. Nikunja Kishor Mishra, Biswa Mohan Sahoo, Jnyanaranjan Panda, Sujata Mahapatra, and Milimita Padh.
7. Mimusops elengi: A thorough analysis Author links cause the overlay panel to open. Muhammad Arif, Aysha Javed, Anas Khan, Sristi Srivastava, and Mohd Aftab Siddiqui
8. Mimusops elengi: A thorough analysis Author links cause the overlay panel to open. Muhammad Arif, Aysha Javed, Anas Khan, Sristi Srivastava, and Mohd Aftab Siddiqui.
9. Primary, adaptive, and acquired resistance to cancer immunotherapy Cell, P. Sharma et al. (2017)
10. Journal of Pharmacognosy and Phytochemistry, Volume 1, Issue 3, 2012 [www.phytojournal.com] Page | 64 An overview of the ethnobotany, phytochemistry, and pharmacological profile of Mimusops elengi Manohar J. Patil1, Ramesh S. Deoda1, Rakesh S. Shivatare1, Kavita N. Yadav1, Prasad V. Kadam 1*
11. A review of the pharmacological and phytochemical properties of Mimusops elengi linn. Jnyanaranjan Panda*1, Biswa Mohan Sahoo1, Nikunja Kishor Mishra1, Milimita Padhi2, Sujata Mahapatra2, 1. Roland Institute of Pharmaceutical Sciences, Odisha, India, Berhampur, 760010 2. Khallikote (Auto) College, Berhampur, Odisha, Department of Botany and Biotechnology.
12. A REVIEW OF MIMUSOPS ELENGI'S PHYTOCHEMICAL AND BIOLOGICAL ACTIVITIES Department of Pharmacognosy, Khaled Rashed, National Research Center, 33 El Bohouth St.-Dokki, Giza, P.O. 12622, Egypt.