A Comprehensive Review on the Bioactive Component and Pharmacological Properties of *Mimusops Elengi Linn* (Bullet-Wood Tree)

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Abstract:

Mimusops elengi Linn, also referred to as "Bakul," is a significant medicinal plant that may be found all over the world. The goal of this review is to give a thorough analysis of *M. elengi's* bioactive components and pharmacological characteristics. A wide variety of bioactive substances, including alkaloids, flavonoids, terpenoids, phenolic compounds, and essential oils, have been found in *M. elengi*, according to extensive research. These elements have been linked to the plant's diverse pharmacological properties and aid in its medicinal potential. *M. elengi* has a wide spectrum of actions, including anti-inflammatory, antioxidant, antibacterial, antidiabetic, hepatoprotective, anticancer and neuroprotective properties according to pharmacological research. In conclusion, The bioactive components of *Mimusops elengi* Linn are abundant and exhibit a broad spectrum of pharmacological activity. The goal of this review is to advance knowledge of *Mimusops elengi's* enormous potential for pharmaceutical relevance.

Keywords : Mimusops Elengi, Bakul, Medicinal plant, Pharmacological properties, Neuroprotective

Introduction:

The medicinal plant *Mimusops elengi*, also referred to as the Indian Medlar or Bakul, has been widely utilized in traditional medical systems for its therapeutic benefits. It is indigenous to the Indian subcontinent and a member of the Sapotaceae family.[1] Because *Mimusops elengi* has the potential to be used in the creation of new medicinal treatments, there has been an increase in interest in studying its biological assessment and pharmacological characteristics in recent years. The tropical flowering tree *Mimusops elengi*, also called the Spanish cherry or bullet wood, may be found all over the world.[2] It has been employed in traditional medicine for many years to cure a variety of diseases. The biological and pharmacological characteristics of *Mimusops elengi* have been the subject of contemporary scientific study, with encouraging results. A tree species called *Mimusops elengi L.* is indigenous to tropical and subtropical areas of Africa and Asia. It is an evergreen tree with a maximum height of 30 feet, fissured bark that has a grayish brown color, rectangular berry fruit, fragrant and creamy flowers.[2] Traditional uses of the plant include the treatment of microbiological illnesses such as diarrhoea, gum disease, sore mouth, stomachaches, ulcers, wounds, and inflammation.[3] This review study aims to provide an overview of the present level of knowledge about the biological evaluation and

pharmacological properties of *Mimusops elengi*, including its chemical components, therapeutic applications, and potential for drug development. This review's main objective is to offer up-to-date knowledge on *Mimusops elengi*, which may be an important plant due to its priceless pharmacological properties. By providing this information, students and researchers will get a comprehensive understanding of the plant's published phytochemical and pharmacological properties for their future research.

Table 1 : Names of *Mimusops elengi Linn* in various languages[1]

Language	**Names**
English	Spanish cherry, Medlar and Bullet wood
Sanskrit	Bakula, Bramarananda, Stri-Mukhamadhu, Anankantha and Madhuparijara
Hindi	Maulseri, Molchari, Maulsiri, and Bakula
Bengali	Bakul
Gujarathi	Bolsari, Barsoli
Malayalam	Elengi, Ilanni, and Ilenji
Marathi	Bakula, Barsoli, and Avalli
Tamil	Alagu, Kesaram, Magilam, Mogadam, Nakum, Magizham, and Magizhamboo
Telugu	Kesari, Pogada, Vagula, and Magadam
Urdu	Molsari, Kirakuli

Table 2: Taxonomic rank of *Mimusopselengi*[4]

Domain	**Eukarya**
Kingdom	Plantae
Division	Spermatophyta
Class	Magnoliopsida
Order	Sapindales
Family	Sapotaceae
Genus	*Mimusops*
Species	*M. elengi*

Botanical Description:

The Spanish cherry, also known as *Mimusops elengi*, is an evergreen tree with a height of 15 meters. The tree has a short, rugged, black trunk, and its big, spherical head is made up of wide-spreading branches. Sections of the dark-gray bark measure 15–25 cm in length and 10–15 cm wide.[4] The rough surface of the bark is caused by longitudinal fissures, cracks, and vertical lenticels. The 2.5 cm long, spherical berries have a sweet and tart flavor and become yellow when ripe. When fully ripe, the fruits have one or two seeds and are present throughout the wet season.[6]

Mimusops elengi has 3.2–5 cm broad and 6.3–10 cm long, glossy and dark green leaves.[6] The morphologies of leaves vary widely; they might be elliptic or oblong, with short or long acuminate margins, undulate edges, and weak yet close veining. New leaves usually start to show in February, when they are often a vibrant, bright green color. The petioles are between 1.2 and 2.5 cm long.[4] *Mimusops elengi* is an attractive and distinctive species of tree that may be identified by its rough bark, globular berries, and glossy, dark-green foliage.[6]

Phytochemical Constituents :

The majority of the extracts of *M. elengi* contained flavonoids, glycosides, steroids, terpenoids, quinone, saponin and phenol. Along with the roots and seeds, the aerial sections also contain taraxerone, lupeol, and taraxerol. According to a qualitative study, ash contains calcium, aluminum, potassium, chlorides, and sulphates.[6]

Leaves and bark :

According to certain research, the ethanolic extract of leaves contain quercetin (1.7%), hentriacontane (1.7%), D-mannitol (2.7%), alpha-sitosterol (2.7%), and β-D-glucoside (2.7%). *M. elengi* has also found to contain tannins, alkaloids, saponins, cardiac glycosides, steroids, flavonoids, triterpenoids and reducing sugar. Stem bark includes pentacyclic triterpene.[6] Ursolic acid, dihydroquercetin, and quercitol are all found in *Mimusops elengi* seeds. Quercetin, hentriacontane, Beta-carotene, D-mannitol, Beta-sitosterol, and Beta-sitosterol--D glucoside are present in the leaves.[1]

Fruit and Seed :

The bakula fruit and seed contained quercitol, ursolic acid, dihydroquercetine, quercetine, beta-d glycosides of β-sitosterol, and α-spinasterol. With the novel migrated oleanane skeleton, mimusopane, along with mimusopgenone and mimugenone, pentacyclic triterpenes have been isolated.[4] The unsaponifiable substance from the seed fat was composed of β and α-sitosterol. The mesocarp, testa, and kernel contain glucose.[6]

Flowers :

Volatile oil, querictol, teraxerol, and lupeol are all present in the *Mimusops elengi* flower. Phenylethanol, hexadecanoic acid, long-chain carboxylic acid and 9-octadecanoic acid are the most prevalent volatile elements of the flowers.[1]

Four phenolic compounds, two peptide derivatives, and a new dipeptide, N2 methylaurantiamide acetate were all produced by the methanolic extract of *M. elengi* flowers.[6]

Preliminary Phytochemical Investigation :

Qualitative testing was conducted as part of a preliminary phytochemical investigation of leaf extracts from *Mimusops elengi L*. to determine the presence of several primary and secondary metabolites. The results are as follows[5]

- **Alkaloids :** Formation of white precipitate with Mayer's reagent indicates presence of alkaloids.
- **Flavonoids :** When neutral ferric chloride was added to the extract, appearance of brown color, indicating the presence of flavonoids.
- **Terpenoids :** When concentrated sulfuric acid and chloroform were added to the extract, a reddish-brown tint resulted, indicating the presence of terpenoids.
- **Steroids :** When chloroform, acetic anhydride, and strong sulfuric acid were added to a solution, a dark red or dark pink tint resulted, indicating the presence of steroids.
- **Tannins :** A yellow precipitate showed up when 1% lead acetate was added to the extract, suggesting the presence of tannins.
- **Saponins :** When the extract was stirred with distilled water, a 1 cm layer of foam formed, indicating the presence of saponins.
- **Phenolic compounds** : A brown precipitate showed up when lead acetate solution was added to the extract, suggesting the presence of phenolic chemicals.
- **Carbohydrates :** When Molisch reagent and strong sulfuric acid were added to the extract, a violet ring formed at the junction of liquids, indicating the presence of carbohydrates.
- **Proteins :** When Ninhydrin solution in acetone was added to the extract, formation of purple colour, indicating the presence of proteins.
- **Fixed oil and fat :** When Sudan III solution was added to the extract, a bright orange color appeared, indicating the presence of fixed oil and fat.

Analyzing plant compounds with disease-preventive qualities but no nutritional value is known as preliminary phytochemical screening. These substances, also referred to as phytochemicals, provide defense against infections and can function as antioxidants to shield cells from oxidative damage. Additionally, they can activate specific enzymes, lowering the chance of illnesses like breast cancer. Ex. Terpenes [5]

A preliminary phytochemical investigation of the well-known plant species *Mimusops elengi L.* was carried out using leaf extracts in petroleum ether, chloroform, and water. Numerous active ingredients were found, like carbohydrates, amino acids, saponins, alkaloids, flavonoids, terpenoids, steroids, tannins, phenols, as well as fixed oil and fat.[5]

Table 3. Preliminary phytochemical analysis of leaf extracts of *Mimusops elengi L.*[6]

Phytoconstituents	**Extracts**			
	Petroleum ether	**chloroform**	**Methanol**	**Aqueous**
Carbohydrates	-	+	+	+
Proteins	-	-	-	-
Amino acids	-	-	+	+
Steroids	+	+	+	+
Glycosides	+	-	+	+
Alkaloids	-	-	+	+
Flavonoids	-	+	+	+
Tannins	-	+	+	+
Triterpenoids	-	-	-	+
Saponins	-	-	+	+
Fixed oil and fat	-	+	-	+

(a) *MimusopsElengi* Tree

(b) Bark

(c) Fruits

(d) Flowers

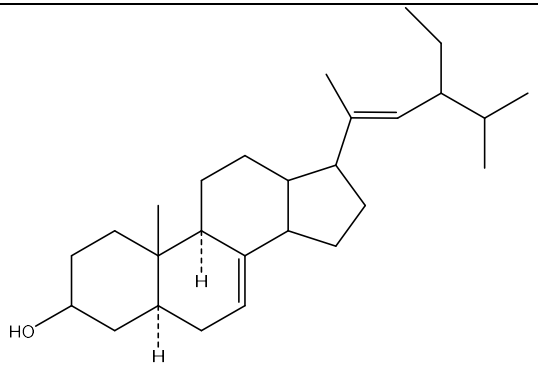
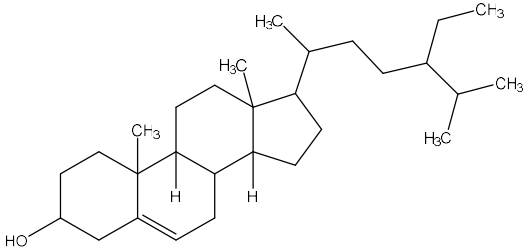
Fig. No.1 - Various Parts of *Mimusops Elengi* Plant

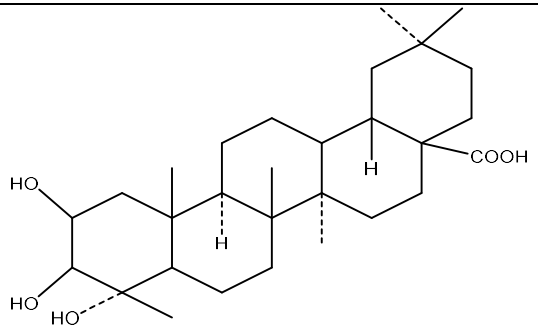
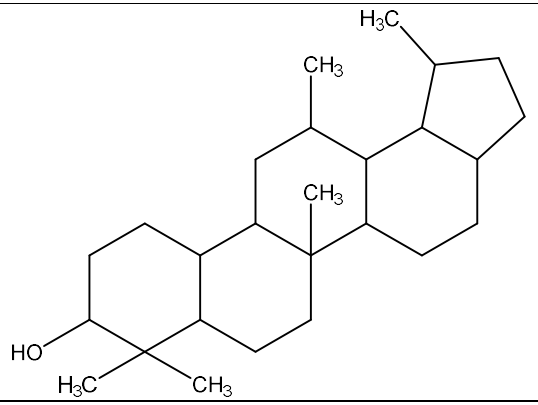
Assessment

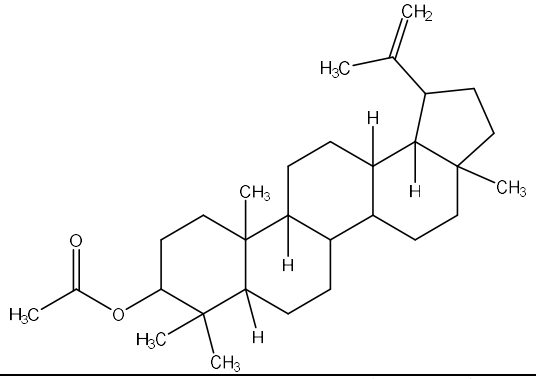
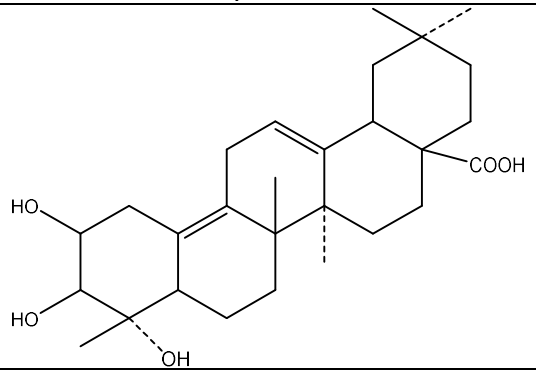
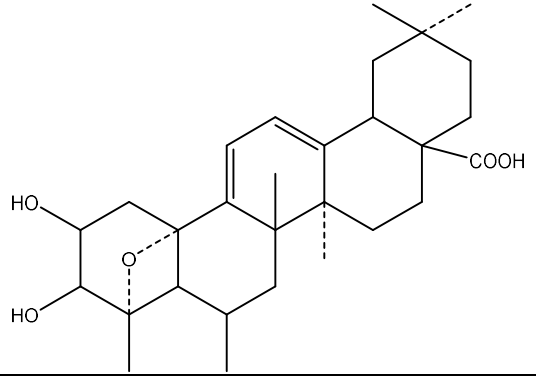
- The GC-MS method was used to examine the phytochemical composition of the methanolic leaf extract of *Mimusops elengi*. According to the data, nine bioactive phytochemical components were found in the extract, with stearic acid, 3-(octadecyloxy) propyl ester, pregnane-3,11,12,14,20-phenol,3,12,20-triacetate, hexadecanoic acid methyl ester, 10-octadecenoic acid methyl ester, and squalene being the primary constituents. It was found that these substances had antihelminthic, antibacterial, antifungal, and anticancer properties.[7]

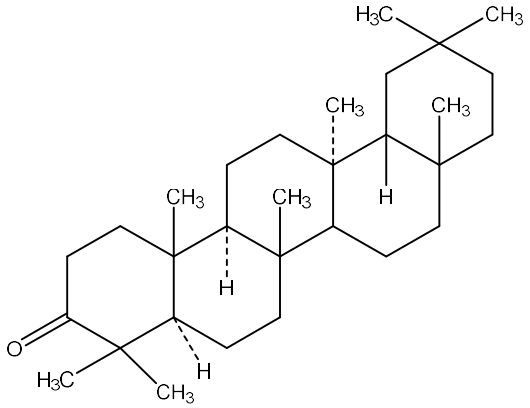
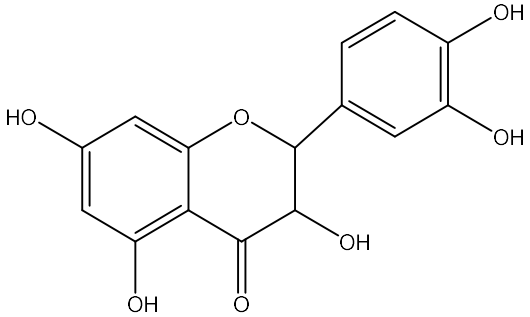
- The steam volatile material from the crucially essential plant *Mimusops elengi* is studied by using GC-MS, to characterize the components of the volatile organic matter found in the plant's bark. The volatile organic material was extracted using the steam distillation technique, and the chemical components contained were identified by GC-MS analysis. α-cadinol, tau muurolol, hexadecanoic acid, diisobutyl phthalate and octadecadienoic acid were the principal components found.[8]
- The investigation of the volatile substances in the Southeast Asian tree species *Mimusops elengi* L. is carried out by using gas chromatography-mass spectrometry. Researchers examined both the fresh and dried pikul blossoms of this tree to determine the primary components of the volatile oils. They discovered that the primary constituents of fresh flowers were 2-phenylethanol, 4-hydroxybenzenemethanol and cinnamyl alcohol but the major constituents of dried flowers were long chain carboxylic acid ester and (Z)-9-octadecenoic acid. Additionally, the researchers created an analytical technique to ascertain the levels of methyl paraben, 2-phenylethanol, and benzyl alcohol in dried flowers. According to the study, there were differences in these components' contents between the dried flower samples.[9]
- The volatile components of *Mimusops elengi* L. flowers are discussed in this article. Using capillary GC and GUMS to investigate the flowers, a total of 74 chemicals were discovered. Aromatic alcohols and esters make up the majority of chemical classes. The most prevalent substances, according to the headspace analysis, were 2-phenylethanol, methyl benzoate, p-methylanisole, and 2-phenylethyl acetate. 2-phenylethanol, (E)-cinnamyl alcohol, and 3-hydroxy-4-phenyl-2-butanone dominated the solvent extract.[10]

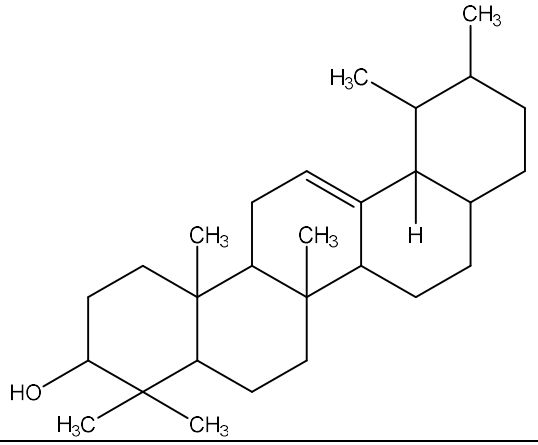
Table 4: Details about Phytoconstituents present in *Mimusops Elengi*.

Sr. No.	Name of Phytoconstituent	Groups	Chemical Name	Chemical Formula	Molecular Weight	Structure	Ref
1	Alpha-Sitosterol	Phytosterol (Plant Sterol)	(5S,9R)-17-(E)-4-ethyl-5-methylhex-1-en-2-yl)-10-methyl-2,3,4,5,6,7,9,10,11,12,13,14,15,16,17-tetradecahydro-1H-cyclopenta[α]phenanthren-3-ol	$C_{27}H_{44}O$	384.34		4
2	Beta-Sitosterol	Phytosterol (Plant Sterol)	17-(5-ethyl-6-methylheptan-2-yl)-10,13-dimethyl-2,3,4,7,8,9,10,11,12,13,14,15,16,17-tetradecahydro-1H-cyclopenta[α]phenanthren-3-ol	$C_{29}H_{50}O$	414.72		2

3	Bassic Acid	Terpenoid	(6aR,9S,12bR)-9,10,11-trihydroxy-2,2,6a,6b,9,12a-hexamethylicosahydropicene-4a(2H)-carboxylic acid	$C_{29}H_{48}O_5$	476.70		4
4	Betulinic Acid	Pentacyclic Triterpenoid	1,5b,8,8,13-pentamethylicosahydro-1H-cyclopenta[α]chrysene-9-ol	$C_{26}H_{44}O$	372.64		2

5	Lupeol	Pentacyclic Triterpenoid	3a,8,8,11a-tetramethyl-1-(prop-1-en-2-yl)icosahydro-1H-cyclopenta[α]chrysene-9-yl acetate	$C_{30}H_{48}O_2$	440.71		2
6	Mimusopic Acid	Pentacyclic Triterpenoid	(6aR,9S)-9,10,11-trihydroxy-2,2,6a,6b,9-pentamethyl-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,13,14b-hexadecahydropicene-4a(2H)-carboxylic acid	$C_{28}H_{42}O_5$	458.30		4
7	Mimusopsic Acid	Oleanane Triterpenoid	(4S,6bS)-2,3-dihydroxy-4,5,6a,6b,11,11-hexamethyl-2,3,4,4a,5,6,6a,7,8,9,10,11,12,12a-tetradecahydro-1H-4,14b-epoxypicene-8a(6bH)-carboxylic acid	$C_{29}H_{42}O_5$	470.30		4

8	Tarexerone	Pentacyclo -Triterpenoids	(4aR,12bS,14aS)-4,4,6a,8a,11,11,12b,14b-octamethylicosahydropicen-3(2H)-one	$C_{30}H_{50}O$	426.73		4
9	Taxifolin	Flavanonols	2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxychroman-4-one	$C_{15}H_{12}O_7$	304.25		4

10	Ursolic Acid	Pentacyclic Triterpenoid	4,4,6a,11,12,14b-hexamethyl-1,2,3,4,4a,5,6,6a,6b,7,8,8a,9,10,11, 12,12a,14,14a,14b-icosahydropicen-3-ol	$C_{28}H_{46}O$	398.68		2

Pharmacological Activities

Table 5: Pharmacological activities of *Mimusops Elengi*

Sr. No.	Animal	Dose (mg/kg)	Part of plant	Extract	Activity	Induction	Standard	Ref
01	Albino Rat	2-16 mg/kg	Shade-Dried Plant Material	Methanolic extract	Hypotensive Activity	***	Nifedipine (0.9mg/kg) and Verapamil (3.9mg/kg)	11
02	Wistar Albino Rats	100 mg/kg	Bark	50% alcoholic extract	Gastric Ulcers	Ethanol-induced, pylorus-ligated and water-immersion plus stress induced gastric ulcer	Ranitidine HCl (80mg/kg) and Pantoprazole (20mg/kg)	12
03	Male Albino Rats	200 mg/kg	Bark	Petroleum ether, chloroform and alcohol extract	Diuretic activity	***	Furosemide (20mg/kg)	13
04	Male Albino Wistar Rats	200 mg/kg	Bark	Petroleum ether, chloroform, and alcohol extracts	Antiurolithiatic and antioxidant activity	Ethylene glycol (0.75%) in drinking water	Cystone (750mg/kg)	14
05	Rats	200 mg/kg	Bark	70% ethanol extract	Anti-inflammatory,	Carrageenan-inducedpaw edema and cotton pellet-induced granuloma	Diclofenac sodium (10mg/kg)	15
					Analgesic,	Acetic acid-induced writhing and Eddy's hot plate	Pentazocine (10mg/kg)	
					Anti-pyretic	Brewer's yeast-induced pyrexia	Paracetamol (150mg/kg)	
06	Male albino rats	100 mg/kg	Leaves	Ethanolic leaf extract	Lipid Peroxidation And Antioxidant Enzymes In	Streptozotocin (STZ) (40mg/kg)	Glibenclamide(0.6 mg/kg)	16

					Experimental Diabetic Rats			
07	Wistar rats and Swiss albino mice	50, 100, 200 mg/kg	Bark	Methanolic, aqueous, and n-butanolic extract of bark	Anticonvulsant activity	Maximal electroshock test (MES) in rats and Isoniazid(INH) for mice	Diazepam (2mg/kg)	17
08	Swiss-albino mice	250mg/kg and 500 mg/kg	Leaves	Methanolic extract	Antioxidant, Analgesic And Cytotoxic Activities	Acetic acid induced writhing and hot plate test	Diclofenac sodium (25mg/kg)	18
09	Albino mice	5% w/w ointment	Stem Bark	Methanolic extract	Wound Healing Activity	Excision, the Incision and Dead space wound	Betadine ointment	19
10	Male albino Wistar rats	100 mg/kg	Leaf	Ethanolic leaf extract	Hypoglycemic Activity	Streptozotocin (STZ) (40mg/kg)	Glibenclamide(0.6 mg/kg)	20
11	Wister albino rats	200, 400mg/kg	Bark	Ethanolic extract	Anti-inflammatory activity	Carrageenan-induced paw edema and cotton pellet-induced granuloma	Indomethacin (10mg/kg)	21
12	Male Albino rats	100, 500mg/kg	Areal parts of the plant	Methanolic extract	Anti diabetic activity	Streptozotocin (STZ) (50mg/kg)	Glimeperide (0.1mg/kg)	22
					CNS activity	***	Diazepam (4mg/kg)	
					Antioxident Activity	***	***	
13	***	1000 µg/mL	Leaves	Alcoholic extract	Antioxidant and in vitro anti-inflammatory	***	***	23
14	Swiss albino male mice	200 and 300 mg/kg	Leaves	Methanol extract	Antitumor Activity	Ehrlich ascites carcinoma (EAC) cell line	5-Fluro Uracil (20mg/kg)	24
15	Male Wistar rats	100 and 200 mg/kg	Flowers	Hydroalcoholic extract	Protective effect of middle cerebral artery occlusion induced brain injury in rats	Middle cerebral artery occlusion (MCAO) method	***	25

16	Wistar rats	200mg/kg	Leaf	Methanolic leaf extract	Antioxidant Anti-inflammatory	*** Carrageenan induced rat paw edema method	Ascorbic acid Indomethacin (10mg/kg)	26
17	Male albino rats	2gm/ kg body weight	Seeds	Aqueous powder	Antifertility activity	***	***	27
18	Wistar Albino mice	5% w/w	Leaves	Methanolic extract	Wound Healing Activity	Excision, the Incision and Dead space wound	Betadine 5% w/w in ointment I.P	28
19	Parkes strain male mice	200, 400 and 600 mg/kg	Fruit	Aqueous Fruit Extract	Reversible suppression of spermatogenesis and fertility in male mice	***	***	29
20	Male Wistar rats	100 and 200mg/kg	Flowers	Hydroalcoholic extract of flowers	Cognitive and Anti Oxidant Property of Alzhiemer's Disease	Colchicine (20mg)	Donepezil	30
21	Male Albino Wistar rats	2.5% - 20%	Flowers	Ethanolic extract	Wound Healing	Excision wounds	JatyadiTailaand Betadine	31
22	***	***	Bark and fruits	Chloroform, acetone methanol and aqueous extracts of bakul bark and fruits	Antioxidant and free radical scavenging activity	***	***	32
23	Experimental mice	0.05, 0.1, 0.2 ml	Leaf	Extract in the water	Anti-cholesterol	***	Atorvastatin (2.6mg/kg)	33
24	***	***	Fruit and bark	Thiocyanate and agar diffusion method	Antioxidant activity	***	***	34
25	Swiss mice	100 and 200mg/kg	Leaves	Methanolic extract	Antiamnesic and Neuroprotective Effects	Elevated plus maze and Morris water maze	Scopolamine (0.4mg/kg) diazepam (1mg/kg)	35
26	Albino rats	100, 200, 300, 400 mg/kg	Leaves	Ethanolic extract	Immunomodulator	***	***	36

27	Wistar strain rats	2 mg/kg	Bark	70 % ethanol extract, watery extract	Hyperglycemia	Adrenaline tartrate (0.2mg/kg)	***	37
28	Parkes strain male mice	200, 400, 600mg/kg	Fruit	Aqueous fruit extract	Sperm morphology, antioxidant values and apoptotic germ cells	***	***	38
29	Wistar-Albino rats	200-400mg/kg	Root	Hydro-alcohol extract	Hepatoprotective Effect	Isoniazid (50mg/kg), rifampicin (100mg/kg), and pyrazinamide (350mg/kg)	Silymarin	39
30	Albino mice	200 mg/kg	Bark and flowers	Methanol Extract	Neurocognitive and neuroprotective in scopolamine-induced amnesia	Scopolamine (3mg/kg)	Donepezil (4mg/kg)	40

*** Not Provided

Pharmacological Action:

1. **Hypotensive activity :** *M. Elengi's* hypotensive impact might be partially brought about by a disruption of calcium mobilization through Ca^{2+} channels. It has been suggested that the non-specific spasmolytic effect attributed to the presence of saponins and triterpenoids in Sapotaceae family members is the reason for this vascular influence.[11]
2. **Anti-urolithiatic and Antioxidant activity :** Phenolic components found in *M. elengi* may protect against renal damage brought on by lipid peroxidation and calcium oxalate crystal deposition. Therefore, *M. elengi* can inhibit the attachment of calcium oxalate crystals as well as the development of stones. Treatment with *M. elengi* shows noticeable reduction in MDA and an increase in GSH, SOD, and CATS These findings show that *M. elengi's* AlE is protective against the oxidative alterations brought on by ethylene glycol. Triterpenes, lupeol, and polyphenolic substances like quercetin found in *M. elengi* have been linked to these qualities. The outcomes show that *M. elengi's* AlE has powerful antiurolithiatic and antioxidant properties comparable to pomegranate juice.[1]

3. **Anticonvulsant activity :** The probable mechanism of action of methanolic extract of *M. Elengi*, aqueous extract of *M. Elengi*, n-butanolic extract of *M. Elengi* depending upon the presence of taraxerol, taraxerone, ursolic acid, betulinic acid, alpha-spinosterol, beta-sitosterol glycoside, quercitol, lupeol, alkaloid isoretronecyltiglate and mixture of triterpenoid saponins in the bark of *Mimusops Elengi*. It contains significant amounts of ursolic acid, glycoside, alkaloids, tannin, and saponin. We discovered that the action of *Mimusops Elengi* depends on dose in the current experiment. Whereas *M. Elengi's* methanolic and aqueous extracts provided the greatest protection against convulsions throughout all stages, *M. Elengi*'s n-butanolic extract merely prolonged the onset of stupor and clonus. Therefore, the protection provided by *M. Elengi's* methanolic, aqueous, and n-butanolic extracts by lengthening latency and survival times may indicate the existence of substances that enhance GABAergic action.[17]
4. **Wound Healing activity :** The study discovered that applying an ointment containing a methanolic extract of *Mimusops elengi* to wounds successfully stimulated wound contraction and increased the tensile strength of dead space and incision wounds.[19]
5. **Anti-inflammatory activity :** This study established that the anti-inflammatory activity of the bark of *Mimusops elengi* is related to its ethanolic extract and separated triterpenoids fraction, and the effects seen are attributable to the presence of amyrincaprylate in the plant.[21]
6. **Anti-tumor activity :** The results of the current investigation demonstrated that *M. elengi* extract dramatically decreased tumor volume, most likely by reducing the volume of ascitic nutritive fluid. Additionally, compared to the control group, the treated animals had considerably decreased packed cell volume and viable tumor cell counts in the peritoneum. These findings might point to a direct cytotoxic effect on tumor cells or a local indirect effect that would include macrophage activation and a reduction in vascular permeability.[24]
7. **Anti-fertility activity :** The weight of the testes, epididymis, seminal vesicle and coagulating gland, vasa deferens, and ventral prostrate decreased in the rats utilized in the current investigation after receiving *Mimusops elengi* seed extract, which may have been attributed to a low testosterone level in the plasma. The atrophy of glandular tissue and the reduction in secretary cells, which is reflected in the drop in testosterone, are shown by the accessory sex organs weight loss. Histopathological results and the decline in sperm count both support a partial stoppage of

spermatogenesis as the cause. Reduced sperm reserve could be a plausible explanation for the weight of the epididymis.[27]

8. **Anti-amnesic activity :** In this work, scopolamine and diazepam were given to mice with aging-related amnesia; acquisition and retention were enhanced by the methanolic extract of *Mimusops elengi* leaves. This proved that M. elengi extract has a lot of potential for use as an aged patient's memory-restoring drug.[35]
9. **Hepatoprotective activity :** In addition to its anti-inflammatory characteristics, the hydro-alcohol extract of *Mimusopselengi* may lessen the oxidative stress caused by isoniazid, rifampin, and pyrazinamide, reducing liver damage. As a result, the mechanism of hepatoprotection of *Mimusops elengi* may be due to its inherent antioxidant property present in these phytochemicals, which reduces the induced oxidative stress that occurred due to the administration of anti-tubercular drugs in addition to other properties like anti-inflammatory and curative properties that may prevent hepatic damage.[39]

Conclusion

Mimusops elengi Linn is a herbaceous plant that has been used historically to treat a variety of ailments. This review aimed to assemble and summarize the available information on the bioactive compounds and pharmacological activities of *M. elengi*. The medicinal benefits of the plant are attributed to a variety of bioactive components, including phenolic compounds, flavonoids, terpenoids, and alkaloids. Pharmacological studies have shown that *M. elengi* possesses a variety of activities such as anti-inflammatory, anti-oxidant, anti-microbial, anti-diabetic, hepatoprotective, anti-tumor, and neuroprotective effects. The findings from this review highlight the potential of *M. elengi* as a valuable source of natural compounds for the development of novel therapeutic agents. However, further research is warranted to fully elucidate its mechanisms of action and explore its therapeutic potential in humans. In conclusion, *Mimusops elengi* Linn is a promising medicinal plant with significant pharmacological potential. The available evidence suggests that it can be used as a natural alternative or supplement to conventional medicines for various ailments. Further research is needed to explore its full therapeutic potential and optimize its use in clinical settings.

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