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Exploring The Therapeutic Potential Of *Celastrus Paniculatus*: An Inclusive Review

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Abstract: *Celastrus paniculatus*, a botanically significant and therapeutically versatile medicinal plant, has been extensively utilized in traditional and modern systems of medicine. Its pharmacological applications span centuries, with both crude extracts and purified phytoconstituents being employed in the treatment of diverse pathological conditions. The species exhibits a wide spectrum of biological activities, including but not limited to cognition-enhancing, neuroprotective, antipsychotic, antidepressant, antibacterial, anti-arthritic, anti-malarial, analgesic, anti-inflammatory, antifertility, cardioprotective, anxiolytic, wound healing, antispasmodic, hypolipidemic, anticancer, antioxidant, and iron-chelating effects. These multifaceted properties are attributed to its rich phytochemical profile comprising monoterpenes, sesquiterpene esters, diterpenoids, triterpenoids, alkaloids, fatty acids, steroids, flavonoids, polyols, epoxides, polysaccharides, and ascorbic acid (vitamin C). Rather than the continuous pursuit of novel phytocompounds from unexplored botanical sources, a more pragmatic and cost-effective strategy lies in the rational repurposing of activity-enriched scaffolds from well-established multipotent medicinal plants such as *C. paniculatus*. This approach not only leverages the intrinsic chemical diversity and established bioavailability of known constituents but also has the potential to significantly reduce time and financial expenditure in drug development. From the standpoint of Ayurvedic medicine, *Celastrus paniculatus* holds a prominent place in classical compendia. In the Charaka Samhita, it is classified under the category of Śirovirechana Dravyas, indicating its utility in cleansing therapies for disorders of the head and central nervous system. The Sushruta Samhita enumerates it as an Adhobhagahara Dravya, highlighting its purgative action directed toward the lower gastrointestinal tract. Furthermore, traditional Nighaṇṭus include this plant under multiple pharmacological clusters, such as Arkādi Gaṇa, Gudūcyādi Varga, and Harītakyādi Varga, underscoring its therapeutic breadth and integrative applications in polyherbal formulations. A comprehensive body of literature spanning from 1990 to 2025 has detailed the ethnopharmacological, phytochemical, and pharmacodynamic profiles of *C. paniculatus*, affirming its relevance as a model species for translational research and integrative therapeutic development.

Index Terms - Celastrus paniculatous, nootropic activity, celasteraceae, neuroprotective, antipsychotic, antidepressant.

Introduction

Celastrus paniculatus (CP) Willd. family: Celastraceae, is a woody climbing shrub that typically reaches a height of 11 to 19 meters (Table 1.).[1] Although classified as endangered, it remains widely distributed across India, including the Middle and South Andaman Islands, and is found at altitudes up to 3000 ft.[2] In Ayurvedic medicine, CP has long been utilized for its wide-ranging therapeutic properties, particularly for enhancing cognitive function and managing various health conditions. Traditionally, the seeds of CP have been prized for their memory-boosting, anxiolytic, and neuroprotective effects. They also demonstrate notable antibacterial, antifungal, anti-inflammatory, and wound-healing activities. The plant's strong antioxidant capacity is attributed to its ability to neutralize free radicals. In classical Ayurvedic literature, CP is recognized as a powerful brain tonic that promotes intellectual clarity and memory. Moreover, the bark is reputed for its abortifacient and detoxifying properties.[3] Modern scientific research supports these traditional claims, indicating that seed extracts of CP enhance cognitive abilities—likely due to increased acetylcholine levels in the brain and reduced oxidative damage.[4] Phytochemical investigations have revealed that CP seeds (Fig. 1) contain a complex mixture of bioactive constituents, including fatty acids (stearic, palmitic, oleic, linoleic, and linolenic acids), sesquiterpene alkaloids (such as celapanigin, celapanin, and celapagin), and plant sterols (like campesterol, stigmasterol, and β-sitosterol).[5] Due to this rich chemical profile, CP is considered as a natural resource for the development of targeting neurodegenerative disorders, especially Alzheimer's disease.[6]

I. METHODOLOGY

This study reviewed 120 relevant articles selected from databases such as Scopus, PubMed, Google Scholar, and ScienceDirect using keywords related to *Celastrus paniculatus*, memory-boosting, anxiolytic, and neuroprotective effects, antibacterial, antifungal, anti-inflammatory, and wound-healing activities, etc. Articles included were in English and comprised both original research and reviews.

II. TAXONOMICAL CLASSIFICATION [7]

3.1 Botanical Aspects [8]

Botanical Name: *Celastrus paniculatus* Willd.
Family: Celastraceae
Synonym: Jyotishmati, Paravatpadi, Kakandki , Kangunika , Peettaila , Katveeka , Vega.
Vernacular Names:
Hindi: Malkangani
English: Staff tree
Kannada: Kariganne
Tamil: Valuluvai
Telugu: Malkangani

3.2 Botanical Description:

Celastrus paniculatus Willd. is a climbing or scrambling shrub characterized by (cylindrical) branches. The young shoots and branches are typically pendulous in nature.[9]
Leaves: The leaves are glabrous (smooth and hairless), broadly ovate or obovate in shape, and possess an acuminate or acute apex.
Flowers: The plant bears unisexual, yellowish-green flowers arranged in terminal, pendulous panicles. Flowering occurs throughout the year.
Fruit: The fruit is a globose capsule, typically 3-valved and 3-celled, containing 3 to 6 seeds.
Seeds: Seeds are ovoid and brown, enclosed in a complete red arillus, giving them a distinctive appearance.[10]

3.3 *C.panniculatous* mention in ayurvedic text:

In classical Ayurvedic literature, *Celastrus paniculatus* (commonly known as *Jyotishmati* or *Malkangani*) holds significant therapeutic importance. In the Charaka Samhita, it is mentioned as a potent *Śirovirechana dravya*—used for the elimination of toxins from the head region through nasal routes—highlighting its role in the management of neurological and psychiatric disorders.[11] Additionally, the Sushruta Samhita

describes Jyotishmati as both an *Adhobhāgahara* (purgative acting on the lower part of the body) and *Śirovirechana*, indicating its dual action in detoxifying the upper and lower regions of the body.[12] These references underscore its traditional application in treating disorders related to the central nervous system, mental health, and Vata-dominant conditions. According to the Ashtanga Hridaya, Jyotishmati (*Celastrus paniculatus*) is classified under the Arkadi Gana category, indicating its placement among potent medicinal herbs. Various Ayurvedic lexicons or Nighantus have grouped this plant into different therapeutic classes based on their unique classifications.[13] For instance, the Bhavprakash Nighantu includes it under the Haritakyadi Varga, while both the Rajnighantu and Shodhal Nighantu categorize it under the Guduchyadi Varga. Similarly, the Madanpal Nighantu lists it in the Abhayadi Varga, the Dhanvantari Nighantu also places it in the Guduchyadi Varga, and the Kaiyadeva Nighantu classifies it under the broader Aushadhi Varga. These groupings highlight the plant's wide therapeutic relevance across classical Ayurvedic literature.[14]

3.4 Phenology

The flowering and fruiting phase of *Celastrus paniculatus* typically begins after 3 to 4 years of growth. Fruit maturation occurs around September to October. During this period, the plant also exhibits fruit shattering behavior, where mature fruits naturally split open to release seeds.[15]

3.5 Ayurvedic Properties [16]

The medicinal attributes of the plant, as documented in classical Ayurvedic texts such as the *Madanapāla, Bhāvaprakāśa, Ādarśa, Dhanvantari*, *Śaṅkara*, and *Kaiyadeva Nighaṇṭus*, reveal a largely consistent profile with some minor variations. As depicted in Table 2., the *rasa* (taste) is mainly described as *Tikta* (bitter), with some texts also noting *Kaṭu* (pungent) and *Kaṣāya* (astringent). The *guṇa* (qualities) are commonly noted as *Tīkṣṇa* (sharp), while a few sources also mention Snigdha (unctuous) and Sara (mobile). The plant is regarded as having a *Ūṣṇa* (hot) *vīrya* (potency) and a *Kaṭu* (pungent) *vipāka* (post-digestive effect). In terms of its impact on the bodily humors, it is known to alleviate *Vāta* and *Kapha* doṣhas. Therapeutically, it is used for its *medhya* (brain tonic), *virechanīya* (purgative), *kandughna* (anti-itching), and *vraṇaśodhana* (wound-cleansing) properties. It also acts as a *vāmaka* (emetic), *dīpana* (digestive enhancer), and is beneficial in managing conditions like *pāṇḍu* (anemia), *visarpa* (inflammatory skin diseases), and promotes wound healing (vraṇya).[16-22]

3.6 Role in Tridosha, Action, and Side Effects of *Celastrus paniculatus*

Jyotishmati (*Celastrus paniculatus*) plays a significant role in balancing the *Tridosha*. It is particularly effective in reducing Kapha dosha due to its pungent *(Katu)* and bitter (*Tikta*) taste, as well as its hot potency (*Ushna Veerya*). The herb also alleviates Vata dosha owing to its sharp (*Shighra*) quality and thermal properties. It is frequently utilized in formulations aimed at treating Kapha-related conditions.[23]

Traditionally, Jyotishmati has been employed in the management of various ailments, including neurological disorders (*Vatavyadhi*), anorexia (*Aruchi*), dysmenorrhea (*Kashtarthava*), skin diseases (*Kushta*), abdominal tumors (*Gulma*), inflammation (*Shotha*), urinary difficulties (*Mutrakrichha*), and facial palsy (*Ardita*). The seed oil is also well known for its nootropic properties, enhancing memory and supporting mental well-being. It is often included in traditional and proprietary formulations like Mentat syrup for cognitive support and mental disorders.[24]

However, caution is advised with dosage. When consumed in quantities exceeding 2 masa, Jyotishmati may induce adverse reactions such as vomiting (*Vamana*) and purgation *(Virechana).* Therefore, appropriate dosing and supervision are essential for safe use.[25]

3.7 Part used:

The part of Jyotishmati (*Celastrus paniculatus*) used for medicinal purposes is primarily the seed and the oil extracted from it. These components are valued for their therapeutic properties and are commonly utilized in traditional medicine systems for enhancing memory, cognitive function, and overall neurological health.[26]

3.8 Ethnobotany study of *C. panniculatous*. Ref.[27-50]

The ethnobotany study of *C. panniculatous* have been summarized in Fig. 2 and Table 3.

3.9 A preliminary phytochemical analysis of *Celastrus paniculatus* revealed the following:[51]

- The methanolic extracts of both leaves and seeds showed the presence of saponins, flavonoids, steroids, tannins, alkaloids, and carbohydrates, indicating a rich phytochemical profile.
- Terpenoids were detected only in the leaves, while aldehydes/ketones, phenols, and glycosides were exclusive to the seeds.
- Several compounds such as reducing sugars, anthraquinones, phlobatannins, proteins, and amino acids were absent in both extracts.

3.10 Phytochemical Constituents of *Celastrus paniculatus*[52-60]

The phytochemical constituents of *Celastrus paniculatus* are depicted in Table 4.

3.11 Macroscopy:

The leaves are simple and arranged alternately on the stem. They have an acuminate apex and a base that is either cuneate or rounded. The margins are finely crenate, and the venation is reticulate. The shape of the leaves is broadly ovate. Fresh leaves appear green, are odorless, and have a mildly acrid taste. Each leaf typically measures about 11 cm in length and 6 cm in width.[61]

3.12 Microscopy:

The leaf exhibits anomocytic stomata, measuring approximately 18–20 mm in length and 14–15 mm in width. Microscopic examination reveals the presence of three palisade cells. The powdered form of *Celastrus paniculatus* leaf shows various tissue elements, including xylem, sclerenchyma, parenchyma, collenchyma, and mesophyll.[62]

III. PHARMACOLOGICAL STUDY OF *C.PANICULATOUS.*

In Ayurvedic medicine, this plant holds significant therapeutic value due to its pharmacological properties. The biological effects of its seed oil vary depending on the route of administration (intraperitoneal, intravenous, or oral) and the dosage used in specific animal models with drug-induced toxicity.[63] Table 5-14 summarizes the pharmacological activities of CP respectively as CNS effects of seed oil, antifertility activity, analgesic & anti-inflammatory activity, hypolipidaemic activity, antioxidant & neuroprotective activity, anti-arthritic activity, wound healing activity, antimalarial activity, antibacterial activity, and antifungal activity.

4.1 Recommended Dosage (Matra) of *Celastrus paniculatus*:[95]

- Seeds: Typically administered in a range of 5 to 15 seeds per dose.
- Seed Oil: The advised amount is 5 to 15 drops.
- Seed Powder: Commonly used in doses of 1 to 2 grams.

4.2 Formulations Containing *Celastrus paniculatus*:[96]

- Jyotishmati Taila – A medicated oil preparation used for neurological and cognitive support.
- Smritisagara Rasa – A classical Ayurvedic formulation known to aid memory and mental clarity.
- Jyotishmati Churna – A fine herbal powder derived from the seeds of *Celastrus paniculatus.*
- Chandanadi Taila – An herbal oil blend in which *Celastrus paniculatus* may be used for calming and cooling effects.
- Karanjadi Yoga – A polyherbal combination where Jyotishmati is included for its therapeutic properties

4.3 Herbal Combinations and Uses of *Celastrus paniculatus* (Jyotishmati)[97]

Jyotishmati is often incorporated into multi-herb formulations for enhanced therapeutic effects.

For external use, the oil is commonly blended with apricot kernel oil and Bhringraj oil to support hair and scalp health.

As a cognitive enhancer, it is typically used in combination with cardamom, almonds, Jatamansi, and Shankhpushpi, among other traditional herbs, to promote mental clarity and memory function.

IV. CONCLUSION:

The extensive research conducted over the past few decades clearly demonstrates that *Celastrus paniculatus* is a medicinal plant of remarkable therapeutic potential. Studies have consistently confirmed its diverse pharmacological activities, attributed to its rich and varied phytochemical profile. One of the most significant findings is that the isolated constituents from this plant exhibit strong and specific bioactivity against numerous disease targets when evaluated in experimental models. What sets *C. paniculatus* apart is the absence of adverse effects such as pharmacological resistance, neurotoxicity, or unpredictable hypersensitivity reactions, even when its compounds are administered alongside standard drugs or used alone. To date, 103 distinct phytoactive molecules have been identified from various parts of the plant—including the root, bark, leaf, fruit, and flower—all of which have shown robust biological action. The plant's multifunctional therapeutic profile, documented extensively between 1990 and 2025, has captured the attention of pharmacologists and researchers worldwide. These findings strongly support the idea that *Celastrus paniculatus* is poised to achieve significant advancements in modern drug development. Its bioactive constituents have immense potential as template molecules for designing new, effective, and safer synthetic or semi-synthetic drugs, ensuring its place in the future of integrative medicine.

Figures and Tables

Figure 1. *Celastrus paniculatus* seeds

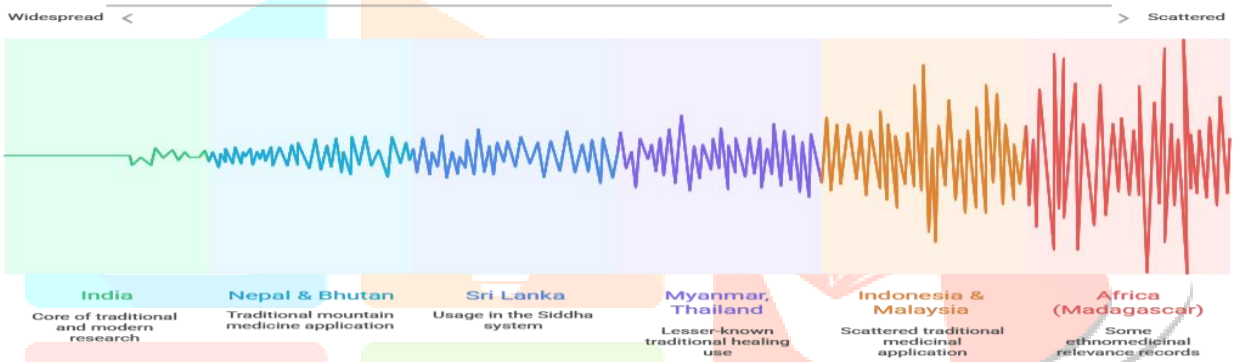

Figure 2. Usage spectrum of *Celastrus paniculatus* from widespread to scattered

Table 1. Taxanomical Classification of *Celastrus paniculatus*

Taxonomic Rank	**Classification**
Kingdom	Plantae
Sub-kingdom	Tracheobionta
Super-division	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Rosidae
Order	Celastrales
Family	Celastraceae
Genus	Celastrus
Species	*Celastrus paniculatus*

Table 2. Ayurvedic Properties of *Celastrus paniculatus*

Property	Description
Guna (Quality)	Tikshna (Sharp/Penetrating)
Rasa (Taste)	Tikta (Bitter), Katu
Virya (Potency)	Ushna (Hot)
Vipaka (post-digestive effect)	Katu (Pungent)
Dosha Effect	Pacifies Vata and Kapha doshas
Mechanism of Dosha Pacification	- Vata is pacified due to Snigdha (unctuous) and Ushna (hot) qualities. - Kapha is pacified due to Katu (pungent), Tikta (bitter), and Ushna.

Table 3. Ethnobotany study of *Celastrus paniculatus*

Plant Part Used	Place/Community	Uses
Fruit juice	Himachal Pradesh	Used as a cardio-tonic
Seeds	Himachal Pradesh	Used as appetizer
Fruit paste + mustard oil	Himachal Pradesh	Applied on the scalp
Oil (3 drops) + egg yolk	Himachal Pradesh	Given orally to patients
Powdered seeds	Himachal Pradesh	Taken orally for acidity/gas
Shade dried fruit powder	Himachal Pradesh	Taken for 4-5 days to destroy intestinal worms
Oil	Himachal Pradesh	Applied on infected areas of skin
Leaves and roots paste	Haridwar district, Uttaranchal	Applied as a poultice on forehead for headache
Crushed roots	Folk medicine	Used in pneumonia
Powdered root	Gond tribe, Uttar Pradesh	Used for treatment of cancerous tumors
Root/bark paste	Achanakman-Amarkantak Biosphere Reserve (AABR), Central India	Applied on forehead of children to cure boils
Roots + fruits of Piper longum (in boiled rice water)	AABR, Central India	Given twice daily for leucorrhoea and spermatorrhoea
Root powder & seed decoction	Chhindwara and Betul districts, Madhya Pradesh	Used to treat rheumatism
Bark powder	Baiga tribes, Rewa district, Madhya Pradesh	Taken with cow milk once a day for a month to cure leucorrhoea
Seed oil	Mayurbhanj district, Odisha	Applied for joint diseases, body warmth, pain relief, and blood circulation
Seed oil	Gujarat tribes	Used in gout; rubbed on affected part
Seed oil	Gujarat (traditional phytotherapy)	Applied to hair for hair care, makes hair silky

Mixed powder (leaves, flowers, fruits, seeds)	Ambaji forest, Banaskantha, North Gujarat	Taken with milk to cure mental disorders and increase mental power
Boiled leaves	Ambaji forest, Banaskantha, North Gujarat	Applied externally on swellings and fractures
Seed oil + hot milk	Ambaji forest, Banaskantha, North Gujarat	Taken to treat rheumatism and paralysis
Seeds (ointment)	South India (herbal vendors)	Used in ointments for wounds
Bark decoction	Valaiyans, Karandamalai, South Eastern Ghats, Tamil Nadu	Given orally for 7 days to induce abortion
Seed powder	Paliyan tribes, Sirumalai hills, Southern India	Mixed with water, taken orally for nervous disorders
Roots	Central Western Ghats, Karnataka	Used for excessive pain during menstruation and to induce fertility
Seed oil	Bhilla tribes, Dhule, Jalagaon, Nandurbar districts, Maharashtra	Applied on joints, treats rheumatism and painful joints
Seed oil (boiled seeds)	Pawaras, Bhilla, Konkani tribes, Nandurbar district, Maharashtra	Applied to paralysed parts and taken orally (2 ml) for paralysis
Seed oil	Buldhana district, Maharashtra	Applied externally on joints to cure paralysis
Seed oil	Dhangars and Gawalies, Purandhar	Used externally for joint pain

Table 4. Phytochemical constituents of *Celastrus paniculatus*

Plant Part / Extract	**Constituents Identified**	**Notes**
Seed (Fixed Oil)	Oleic, linoleic, linolenic, palmitic, stearic, crude lignoceric, benzoic acid, acetic acid	Volatile and non-volatile fatty acids
Seed (Aqueous Extract)	Tannins (traces), reducing sugars	Starch absent
Seed Husk (Petroleum Ether Extract)	Palmitic acid, stearic acid, unidentified sterol	From saponifiable and unsaponifiable fractions
Seed Oil (80% Methanolic Extract)	Malkanguniol (major), polyalcohols A–D	Sesquiterpene polyalcohols
Seed Oil (Non-saponifiable Fraction)	Paraffinic hydrocarbons, β-sitosterol, β-amyrin, paniculatadiol (olean-12-ene-3β,29-diol)	Triterpene and sterol components
Seed Lipids (Lipid Fractions)	Normal TGs (20.2%), polar TGs (44.4%), polar non-glyceridic esters (23.5%), non-polar non-glyceridic esters (11%)	Includes palmitooleopalmitin, triolein, etc.
Seed (CCl_4-soluble Methanolic Extract)	New: 1α,6β,8β-triacetoxy-9β-benzoyloxydihydro-β-agarofuran; Known: other agarofurans including angulatueoid C	Sesquiterpene esters
Arils (Petroleum Ether Extract)	Celastrol (0.15%), semi-solid fat, resinous matter	
Fruit (Petroleum Ether Extract)	Steroids/terpenoids, alkaloids	Flavonoids and saponins absent
Flowers	Dulcitol (polyalcohol)	First report in Celastrus genus
Bark (Ethanol Extract)	Saponins, tannins	Alkaloids absent

Root Bark (Petroleum Ether Extract)	Benzoic acid, n-triacontanol, pristimerin, hydrocarbon, uncharacterized quinone, yellow oil	
Root Outer Bark	Celastrol, pristimerin, zeylasterone, zeylasteral	Quinone-methide and phenolic triterpenoids
Whole Plant (50% Ethanol Extract, excl. root)	Tannins (3.52%)	
Other Compounds (Various Parts)	Malkangunin (new sesquiterpene ester), celapanin, celapanigin, celapagin, celapanol (tetra-ol)	Esterified with acetic, benzoic, nicotinic, and β-furoic acids
Minerals (Whole Plant)	Na, Mg, Al, K, Ca, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Mo, Ag	Sr and Ce absent

Table 5. Central Nervous System Effects of *Celastrus paniculatus* Seed Oil

Effect Category	Extract Type	Dose & Route	Study Type	Model/Subject	Key Observations	Ref.
Nootropic activity	Seed oil	3 g/kg (oral, i.m., i.p.); 100 mg/kg (oral emulsion)	*In vivo* (behavioral)	mice	The oil-treated group spent significantly less time in the dark compartment.	[64]
Nootropic activity	Ethanolic extract of seed	2 g/kg per body wt.orally	*In vivo* (behavioral)	Mice	↑ SOD, CAT, and GPx level indicate significant antioxidant activity	[65]
Anticonvulsant / Antispasmodic	Crude Oil	Various doses	*In vivo* (pharmacological)	Rats	↑ Strychnine convulsions, ↓ leptazole toxicity, no amphetamine effect; antispasmodic vs ACh	[66]
Active Fraction (Mal III/A)	Isolated fraction (Mal III/A)	200 mg/kg	*In vivo* (behavioral, physiological)	Rats, mice, cats, monkeys	Tranquilizing, potentiated hexobarbitone, hypothermia, ↓ activity, ↓ oxygen use	[67]
Nootropic activity	Seed	40 mg/kg (orally)	*In vivo* (behavioral, physiological)	Albino rats	Neuroprotective effect by modulating bioenergetic pathways which were altered by ketamine	[68]
Learning & Memory (Short-term)	Oil Emulsion	1 ml of 5% emulsion	*In vivo* (behavioral)	Albino rats	↑ Learning and memory, comparable to vasopressin	[69]

		(oral, 3 or 7 days)				
Spatial Memory (Morris Water Maze)	Seed Oil	50, 200, 400 mg/kg (oral, 14 days)	*In vivo* (behavioral)	Rats	Reversed scopolamine-induced impairment (chronic only)	[70]
Cognitive Function – Aqueous Extract	Aqueous extract	200 mg/kg (oral, 14 days)	*In vivo* (behavioral)	Rats	↑ Memory (shuttle-box & step-through), antioxidant activity	[71]
Alzheimer's Model (ICV-STZ)	Aqueous extract	100, 200, 300 mg/kg (oral, 21 days)	*In vivo* (behavioral + biochemical)	Rats	Prevented memory loss & oxidative stress (↓ MDA, ↑ SOD, GSH, CAT)	[72]
Antianxiety (Operant Behavior Model)	Petroleum ether extract	3.2 g/kg/day (oral, 5 days)	*In vivo* (behavioral)	Rats	↓ Punishment/reward-induced behavioral suppression	[74]
Anxiolytic Effects (Serotonergic Pathway)	Celastrus oil	1 & 1.5 g/kg (oral)	*In vivo* (behavioral)	Rats	Anxiolytic without sedation, reversed by 5-HT1A agonist	[75]

Table 6. Antifertility Activity of *Celastrus paniculatus*

Study Type	Extract/Formulation	Animal Model	Dose	Duration	Observations	Ref.
In vivo	Seed oil	Adult albino rats	0.2 ml/animal/48 h	30 days	Antispermatogenic effects, reversible liver necrosis	[76]

Table 7. Analgesic & Anti-inflammatory Activity of *Celastrus paniculatus*

Study Type	Extract/Formulation	Animal Model	Dose	Standard Drug	Activity Observed	Ref.
In vivo	Methanol extract (flower)	Mice/rats	Not specified	Aspirin	Analgesic & anti-inflammatory	[77]
In vivo	Whole plant of Tecomella undulata	Mice/rats	Not specified	Aspirin	Analgesic only	[77]
In vivo	Seed oil	Rat	5 & 10 ml/kg	Ibuprofen (100 mg/kg)	66.60% & 78.78% inhibition	[78]

Table 8. Hypolipidaemic Activity of *Celastrus paniculatus*

Study Type	Extract/Formulation	Animal Model	Dose	Duration	Observations	Ref.
In vivo	50% ethanolic seed extract	Hyperlipidaemic rabbits	500 mg/kg	120 days	↓ cholesterol/LDL, ↑ fecal excretion,plaqueregression	[79]

Table 9. Antioxidant & Neuroprotective Activity of *Celastrus paniculatus*

Study Type	Extract/Formulation	Model	Dose	Mechanism/Outcome	Ref.
In vitro	Methanolic extract of whole plant.	Human fibroblasts	Dose-dependent	Free radical scavenging, DNA protection	[80]
In vitro	Aqueous extracts of seed.	Neuronal cells	Dose-dependent	DPPH scavenging, AF most effective	[81]
In vitro	Seed oil, EE, ME	Neuronal cell culture	Various	Neuroprotection, ME most effective	[82]

Table 10. Anti-arthritic Activity of *Celastrus paniculatus*

Study Type	Extract/Formulation	Animal Model	Dose	Outcome	Ref.
In vivo	Petroleum ether & alcohol extract of seed	Wistar rats, Freund's adjuvant induced arthritis.	300 and 500 mg/kg orally	Reduced swelling, corrected body weight loss	[83]
In vivo	Petroleum ether & alcohol extract of seed	Formaldehyde induced arthritis in rat.	500 mg/kg orally	Reduced paw swelling.	[84]
In vivo	Petroleum ether & methanolic extract of seed.	Freund's adjuvant induced arthritis in rat.	100 – 400 mg/kg b. wt. orally.	Reduced swelling on dose dependent order.	[85]

Table 11. Wound Healing Activity of *Celastrus paniculatus*

Study Type	Compound	Animal Model	Dose	Model	Outcome	Ref.
In vivo	Lupeol, isolated from the petroleum ether extract of leaves.	Swiss albino rats	8 mg/ml (0.2% gel)	Multiple wound models	Faster healing, more collagenation	[86]

Table 12. Antimalarial Activity of *Celastrus paniculatus*

Study Type	Extract/Formulation	Model	Active Compound	Activity	Ref.
In vitro	Chloroform extract of root bark	Plasmodium falciparum	Pristimerin	Less active than standard drugs	[87]

Table 13. Antibacterial Activity of *Celastrus paniculatus*

Study Type	Extract/Formulation	Target Organisms	Dose	Activity	Ref.
In vitro	CP seed oil	Multiple bacteria	0.4–1% v/v	Effective against S. typhosa, M. aureus	[88]
In vitro	CP seed oil	Various bacteria & fungi	20–100%	Weak activity at 100%	[89]
In vitro	Aqueous extract	Multiple bacteria	Not specified	Potent activity; inactive vs B. subtilis, S. paratyphi B	[90]

Table 14. Antifungal Activity of *Celastrus paniculatus*

Study Type	Extract/Formulation	Target Fungi	Outcome	Ref.
In vitro	Crude extract	Various fungi	Inhibitory effect noted	[91]
In vitro	Roots and aerial part ,Hydro-alcoholic extract	A.solani,Helminthosporium sp., Bipolaris sp., Curvularia lunata, and Fusarium sp.	Inhibitory activity at 5000 µg/ mL.	[92]
In vitro	Hydro-alcoholic extract of whole plant.	Aspergillus parasiticus, C. albicans, and A. niger	Low antifungal activities	[93]
In vitro	Leaves Copper nanoparticle (CuNPs)	F. oxysporum	Maximum mycelial growth inhibition.	[94]

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