



**PHARMACOLOGICAL ACTIONS OF AN AYURVEDIC DRUG: *JYOTISMATI* (*CELASTRUS PANICULATUS* WILLD.)**

**OMPRAKASH BAIRWA<sup>1\*</sup> PRIYANKA GAUTAM<sup>2</sup>**

<sup>1\*</sup>Assistant professor, Dept. of Kaumarbhritya, SDAMC&RC, Mathura, INDIA

<sup>2</sup>Assistant professor, Dept. of Dravyaguna, SDAMC&RC, Mathura, INDIA

Corresponding Email id: [dromprakash090@gmail.com](mailto:dromprakash090@gmail.com) Access this article online: [www.jahm.co.in](http://www.jahm.co.in)

Published by Atreya Ayurveda Publications under the license CC-by-NC-SA 4.0

**ABSTRACT:**

Plants have been one of the most important sources of medicines since the beginning of human era. One of them “*Jyotismati*” is a significant medicinal herb. It is generally known as ‘*Malakangini*’ or ‘black oil plant’. Botanically it is known as “*Celastrus paniculatus* Willd.” and belongs to Family Celastraceae. It is a large climbing shrub, mostly found throughout India especially in hilly areas. In Indian system of medicine the seeds and oil of *Jyotismati* (*Celastrus paniculatus*) are extensively used to treat various neurological disorders such as cognitive dysfunction, cerebral disorders, paralysis, epilepsy, insomnia, nephropathy, Abdominal disorders, Leprosy, Pruritis, Leucoderma, Skin diseases and many other ailments. The present paper aims to search the different pharmacological actions of *Celastrus paniculatus* and its different chemical constituent and medicinal properties in different diseases. All data collected from various classical texts, Ayurvedic Pharmacopoeia of India and searched in Google Scholar, scientific databases, PubMed, Science Direct, Springer etc. In this research work, it was found that *Jyotismati* (*Celastrus paniculatus*) overcome diseases of neurological disorders and other systems. Its preparations can reasonably maintain brain health and used in various ailments.

**Keywords:** *Celastrus paniculatus*; Ayurvedic Pharmacopoeia of India, Ayurveda, *Jyotismati*.

## INTRODUCTION

*Jyotismati* has been identified as "*Celastrus paniculatus* Willd." which is a large evergreen woody climbing shrub. It is distributed almost all over India up to an altitude of 1800 meter. *Jyotismati* (*Celastrus paniculatus*) is known for its ability to memory enhancement. *Jyotismati* seeds are acrid, bitter in taste, thermogenic, emollient, stimulant, intellect promoting, digestive, laxative etc. The seed oil is bitter in taste, thermogenic and intellect promoting and is helpful in gastrointestinal disorders, beri-beri and sores [1]. Medicinal plants in ayurvedic science have been investigated for their nootropic[2] and neuroprotective effects[3] on various CNS disorders. One of them *Celastrus paniculatus*, which have immense health benefits considered that *Celastrus paniculatus* as the "Intellect plant" and use it to improve IQ of mentally retard children [4].

Thus, the purpose of this comprehensive review is to represents the immeasurable and various pharmacological properties of *Jyotismati* (*Celastrus paniculatus* Willd.) according to the Ayurvedic literature as well as contemporary sciences.

### Material and methods

The review of classical Ayurvedic scriptures and Ayurvedic classical texts, Ayurvedic Pharmacopoeia of India, and Scientific

databases such as Science Direct, PubMed, Springer and Google Scholar with *Jyotismati* and *Celastrus paniculatus* as detailed of regional name, botanical description, classical literature and pharmacological actions was done.

Some published data were reviewed and data related to the title of the manuscript and related research was selected.

### Significance of the name- *Jyotismati* and its Synonyms

The word '*Jyotismati*' means stem of its having white shining dots (Lenticels) and it improves intellect and having hot potency. Various synonyms (Classical name) of *Jyotismati* are '*jyotishka*', '*kanguni*', '*kangunika*', '*pinya*', '*lata*', '*kakandaki*', '*Aagnibha*', '*vega*', '*peetataila*' and '*medhya*'[5].

### Vernacular names (Name in different regions)

Eng.- Climbing staff plant, Hindi- *malkangani*, *malkunki*, *malkungi*, Beng.- *kondgaidh*, *malkangni*, *sankhu*, Guj. - *malkangana*, Kan.- *kariganne*, Mal.- *cerupunna*, *velulavam*, Mar.- *malkangoni*, *dhimarbel*, *pigavi*, Punj.- *sankhu*, *sankhii*, Tam.- *valuluvai*, *siruvaluluvai*, *kaligam*, Tel.- *danti cettu*, *gundumida*, *maneru*[6].

### Botanical Description

*Jyotismati* (*Celastrus paniculatus* Willd.) Stems are up to 18 m high. Twigs fairly smooth reddish brown, densely covered with small

elongate whitish lenticels. **Bark** is pale brown, rough with shallow cracks, exfoliating in small soft scales. **Blaze** is 0.75-1 cm in thickness, not fibrous, pink finely streaked with red or reddish brown. The Juice turns blue on the blade of knife. **Leaves** are 6-10 cm long, 4-8 cm wide nearly ovate, elliptic ovate, circular or obovate, abruptly short-acuminate, crenate-serrate, glabrous lateral nerves are arching. Petiole is 8-15 mm long. It has panicle inflorescence which 5-20cm long. **Fruits** are capsule form 1cm diameter, depressed globose, three lobed, bright yellow on ripening 3-6 seeds. Seeds are completely covered in orange –red aril. **Flowers** are unisexual, small, 4cm diameter and greenish –white or yellowish-green, in terminal pendulous panicles. Capsules globose, 6-12 mm across, yellow, 1-6 seeded. **Seeds** are ellipsoid or ovoid. 3-6 mm length and 2.5-3.4mm wide, seeds are yellowish or reddish brown in color, enclosed in scarlet aril<sup>[7]</sup>. Root, bark, leaf, Seed and Seed oil are the useful part of *Jyotismati* for medicinal purpose.

### Geographical Distribution

It is found throughout India, up to an attitude of 1600m, outer Himalaya from Jhelum to Assam, Eastern Bengal, Bihar, hilly parts of Eastward of Punjab, in dry deciduous forest of Aravalli, Gujarat, Konkan, South India including Karnataka<sup>[6]</sup>.

### Taxonomical classification

Classification of *Jyotismati* as *Celastrus paniculatus* in taxonomy form represents in table no. 1<sup>[7]</sup> – **Table 1 Taxonomical classification**

Kingdom	Plantae
Class	Dicotyledons
Subclass	Polypetalae
Order	Celestrales
Family	Celastraceae
Genus	Celastrus
Species	Paniculatus

### Classification of *Jyotismati* in Various *vargas* according to Ayurvedic Classical texts

*Jyotismati* (*Celastrus paniculatus*) is mentioned in different *vargas* in various ayurvedic texts due to its different properties and uses. Generally it is called as “Staff tree”<sup>[8]</sup>. According to *Acharya Charaka* it is mentioned in *Shirovirechana mahakashaya dravyas* in *Charaka Samhita*<sup>[9]</sup>. *Acharya Sushruta* also mentioned in *Shirovirechana dravyas* and consider as *Adhobhagharadravya* in *Sushruta Samhita*<sup>[10]</sup>. *Acharya Priy vrat Sharma* described *Jyotismati* in *medhyadravyas* for used as *medhya* action on brain cells<sup>[11]</sup>. *Acharya Bhavmishra* grouped *Jyotismati* in *Haritakyadivarga* of *Bhavaprakasha Nighantu*<sup>[8]</sup>.

### Ayurvedic Properties (*Rasa Panchaka*) of *Jyotismati*

Ayurvedic Properties of drugs are mentioned as per *Rasa Panchaka*, which consists of *Rasa*, *Guna*, *Virya*, *Vipaka* and *Prabhava*. After review in different texts, According to API *Rasapanchaka*<sup>[12]</sup> and *Karma* (actions) of *Jyotismati* (*Celastrus paniculatus*) are shown in table no. 2: - *Rasa Panchaka*

**Table no. 2: - *Rasa Panchaka***

<i>Rasa</i>	<i>Katu, Tikta</i>
<i>Guna</i>	<i>Sara, Ushna, Tikshna</i>
<i>Virya</i>	<i>Ushna</i>
<i>Vipaka</i>	<i>Katu</i>
<i>Prabhava</i>	<i>Medhya</i>
<i>Dosaprabhava</i>	<i>VataKaphashamaka</i>

*Other Doshaprabhava are VataKaphashamaka, helpful in different diseases like Kaphavatajavikara, Pakshaghat, Ardita, Sandhivata, Gridhrasi, Katishoola, Vatavikara, Dhvajabhaga, Gandamala, Mastishkaroga, Nadidaurbalya, Agnimandya, Gulma, Hridayamandata, Shotha, Kasa, Shwasa, Sheetadhikyajanya mootrakrichchra, Kashtartava, Klaibya, Kushta, Kandu, Charmaroga, Jwara*<sup>[6]</sup>.

***Karma***-*Vatahara, Vedanasthapana, Uttejaka, Medhya, Nadibalya, Mastishkashamaka, Deepana, Vatanulomana, Hridayottejaka, Shothahara, Shirovirechana, Kaphaghana, Vrikkottejaka, Mootrala, Artavajanana, Vajikarana, Kusthaghna, Swedajanana, Amapachana, Jvaraghna*<sup>[6]</sup>.

#### **Various Classical uses of *Jyotismati***

Acharya Sushruta mentioned internal use of *Jyotismati* seed oil with *sarja kshara, heenga* and milk help to treat *Udararoga*. Due to presence of mutral and *swedala* properties in *Jyotismati* oil it is helpful in *Udararoga*<sup>[13]</sup>.

*Jyotismati* included in *Vrana sodhanadravyas* and *Vranasodhana-ropanadravya* by Acharya Sushruta. It helps to normalize the colour of *vrana*<sup>[14]</sup>.

Acharya Chakradatta described that *Jyotismati* fried leaves *kalka* prepared with *kanji* and Japa flowers helps to withdraw menses (*Artavapravritti*). It used in *Aartavakshaya*<sup>[15]</sup>.

According to Acharya Vangasena intake of milk for 8 days with *Jyotismati* oil helps to cure *Sannipataka Udararoga*<sup>[16]</sup>.

#### **Description of *Jyotismati* in Ayurvedic Pharmacopoeia of India (API)**

*Celastrus paniculatus* (*Jyotismati*) is included as a monograph in The Ayurvedic Pharmacopoeia of India part-I & Volume II described its seed part properties along with definition, synonyms, seed description of macroscopic & microscopic, powder, identity, purity and strength, T.L.C., Constituents, properties and action, important formulations, therapeutic uses and Dose.

#### **Purity and Strength**

Foreign matter should not be more than 2%. Total ash value should not exceed more than 6% and acid-insoluble ash should not exceed more than 1.5%<sup>[12]</sup>.

**Description of *Jyotismati* in Database of Medicinal plants**

*Celastrus paniculatus* (*Jyotismati*) is described in 'Database of Medicinal Plants in Ayurveda' Volume II. *Jyotismati* mentioned with Chemical Constituents, pharmacological properties and action, important formulations, therapeutic uses and dose<sup>[6]</sup>.

**Chemical Constituents of *Jyotismati* <sup>[6]</sup>**

*Celastrus paniculatus* contains chemical compounds which present in various parts. Active constituents described according to different parts of *Celastrus paniculatus* shown in Table-3. - Chemical Constituents

**Table-3. - Chemical Constituents**

Part	Active constituents
Seed	<ul style="list-style-type: none"> <li>• Celastrine, Paniculatine, Malkanguniol.</li> <li>• Malkangunin(sesquiterpene ester), Panculatadiol, <math>\beta</math>-amyrin, <math>\beta</math>-Sitosterol, 5-Stigmasten-3<math>\beta</math>-ol</li> </ul>
Stem	<ul style="list-style-type: none"> <li>• Pristimerin</li> </ul>
Root bark	<ul style="list-style-type: none"> <li>• Pristimerin , hydrocarbon, n-triacontanol, Zeylasterol and Zeylasterone</li> </ul>
Seed oil	<ul style="list-style-type: none"> <li>• Malkanguni oil, Malkanguniol, Sesquiterpene ester-malkangunin, two Sesquiterpenoids tetra esters-celapanine and Celapanigine, Triterpene diol, Paniculatadiol, <math>\beta</math>-amyrin, <math>\beta</math>-sitosterol and fatty acids</li> </ul>
Whole plant	<ul style="list-style-type: none"> <li>• <math>\beta</math>-dishydroagarofuran Sesquiterpene polyesters</li> </ul>

**Pharmacological activities of *Celastrus paniculatus* Willd.**

*Jyotismati* (*Celastrus paniculatus* Willd.) have so many pharmacological properties which mentioned in database of medicinal plants are-Antihistaminic, Sedative, Anticonvulsant, Antiprotozoal, Antiviral, Antipyretic, Antiulcerogenic, Antiemetic, Antibacterial, Schizontocidal, Emmenagogue, Hypotensive, Stimulant, Central muscle relaxant,

Hypolipidaemic, Antiatherosclerotic, Spasmolytic, Tranquillizer, Anti –inflammatory, Antifertility(antispematogenic)<sup>[6]</sup>.

**Pharmacological actions and scientific evidence of different uses of *Jyotismati***

On a detailed review, it was found that the following biochemical & pharmacological activities has been published:

**Neuromodulating effect**

Aluminium induction caused histopathological changes in the cerebral cortex, cerebellum and hippocampus of rat brain which as reverted by the use of alcoholic seed extract of *Celastrus paniculatus* (ASECP). Finally conclude that *Celastrus paniculatus* possess neuroprotective properties by decreasing level of free radicals and increasing the activity of antioxidant enzymes, ATPases with improvement in brain architecture<sup>[17]</sup>.

### **Improving Behavioural changes**

*Celastrus paniculatus* oil used for the treatment of attention deficit hyperactivity disorder (ADHD), due to anti-oxidant, anti-inflammatory and neurotransmitter balancing properties. It also increased nerve growth factor and decreased interleukin-6, nuclear factor- $\kappa$ B, and TNF- $\alpha$ . In addition, *Celastrus paniculatus* oil improves the synaptic plasticity and provides neuroprotective effect<sup>[4]</sup>.

### **Cognitive enhancement and Neuroprotective effect**

*Celastrus paniculatus* Willd. seed oil (*Jyotismati* oil) on male Wistar rats shows Neuroprotective effect and Cognitive enhancement. On observation it was found decrease in the Acetylcholinesterase (AChE) activity assayed from hypothalamus, frontal cortex and hippocampus of the rat brain<sup>[3]</sup>. In another study, the aqueous extract of *Celastrus paniculatus* seed has dose-

dependent cholinergic activity, by this means improving memory performance<sup>[2]</sup>.

### **Antidepressant activity**

The internal use of *Celastrus paniculatus* seed oil in different doses experimented in Swiss young albino mice. In result it was found that *Celastrus paniculatus* seed oil shows antidepressant-like effect in mice possibly through interaction with dopamine D<sub>2</sub>, serotonergic, and GABA<sub>B</sub> receptors; as well as inhibition of MAO-A activity and reduce in plasma corticosterone levels<sup>[18]</sup>.

### **Antioxidant effect**

On assessment of therapeutic value of ethanol extract of *Celastrus paniculatus* seeds and its fractions used against 3-Nitropropionic acid (NP) induced behavioral alterations and oxidative damage. Among various fractions, ethanol extract of CP seeds (100 and 200 mg/kg) treated were most effective in improving behavioral alterations (better body weight, locomotor performance, balance beam walk performance and memory retention), and oxidative damage (reduced lipid peroxidation, nitrite levels, restored catalase, and increased glutathione levels in the striatum, and cortex regions of brain. It has protective action against Huntington's disease (HP) like symptoms which produce by NP<sup>[19]</sup>.

### **Anti-inflammatory activity**

Aqueous extract of *Celastrus paniculatus* showed maximum anti-inflammatory activity. The major components palmitic acid with maximum composition of 38.61%, followed by phytol (11.72%), erucic acid (6.99%), trans-beta-copaene (4.78%), and linalool (3.97%) in the essential oil, being strongly antioxidant in nature<sup>[20]</sup>. All of this favors to disclose the extreme effect of *Celastrus paniculatus* in cognition enhancement<sup>[3]</sup>.

#### Radical scavenging activity

On comparing the *Celastrus paniculatus* seed oil and extravirgin olive oil for radical scavenging activity toward the constant 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical, it was found that *Celastrus paniculatus* seed oil showed stronger RSA (Radical scavenging activity). In this seed oil the amounts of neutral lipids were highest, followed by glycolipids and phospholipids<sup>[21]</sup>

#### Relaxant effect on muscles

The methanolic extract from *Celastrus paniculatus* (CPE 0.0001–10 µg/mL) seeds produce an inhibitory effect on the motility of the isolated rat and human ileum, which is in conformity with the traditional use of the *Celastrus paniculatus* for the treatment of gastrointestinal spasms<sup>[22]</sup>.

With these all pharmacological properties Anti-fungal activity<sup>[23]</sup>, Anti-Psoriatic<sup>[24]</sup>, Anti-arthritis activity<sup>[25]</sup>, Anti-infertility

activity<sup>[26]</sup> also showed by *Jyotismati* (*Celastrus paniculatus*).

#### CONCLUSION

As stated in this review of pharmacological actions of *Jyotismati* (*Celastrus paniculatus* Willd.) it is clear that *Celastrus paniculatus* seed oil, which is also known as 'Black oil' is most important pharmacological preparation and used for various health ailments. *Jyotismati* has long been used in traditional medicine to relieve various brain health issues and wide number of disorders like Neuromodulating effect, Improving Behavioural changes, Cognitive enhancement and Neuroprotective effect, Antidepressant activity, Antioxidant, Anti-inflammatory activity, Radical scavenging activity, Relaxant effect on muscles, Anti-fungal activity, Anti-Psoriatic, Anti-arthritis activity, Anti-infertility activity etc.

#### REFERENCES

1. Bhanumathy M, Chandrasekar S. B., Chandur Uma, Somasundaram T. Phyto-pharmacology of *Celastrus paniculatus*: An Overview. International Journal of Pharmaceutical Sciences and Drug Research 2010;2(3):176-181
2. Bhanumathy M, Harish M.S, Shivaprasad H.N, and Sushma G. Nootropic activity of *Celastrus paniculatus* seed. Pharmaceutical Biology 2010; 48(3): 324–327
3. George Lekha et al. Cognitive enhancement and Neuroprotective effect of *Celastrus paniculatus* Willd. seed oil (*Jyotismati* oil) on male Wistar rats.

- Omprakash Bairwa, Priyanka Gautam. Pharmacological Actions of an Ayurvedic Drug: *Jyotismati (Celastrus paniculatus* Willd.). Jour. of Ayurveda & Holistic Medicine, Vol.-XI, Issue-V (May 2023).
- Journal of Pharmaceutical Science and Technology 2010; 2 (2):130-138
4. Khushboo G Faldu, Snehal S Patel, Jigna S Shah. *Celastrus paniculatus* oil ameliorates synaptic plasticity in a rat model of attention deficit hyperactivity disorder. Asian Pacific Journal of Tropical Biomedicine 2021; 11(3): 105-114
  5. Priya Vrit Sharma(editor). Namarupagyanama(Characterization of medicinal plants based on...),Varanasi; Chaukhambha Visvabharati, 2011:88-89
  6. P.C. Sharma. Database on Medicinal Plants used in Ayurveda, Vol 2, Janakpuri, New Delhi;Central council for research in *Ayurveda* and *Siddha*, Dept. of ISM &H, Min. of Health Family welfare, Govt. of India, 2005:281-284
  7. Dr. Prakash Hegde, L Dr. Harini (Editor). A Text book of *Dravyaguna Vigyana*, New Delhi; Chaukhambha Publications, 2022:340-345
  8. KC Chunekar (editor), *Bhavaprakasha Nighantu* of Bhavamishra, Chapter 1, Verse no. 171-172, Reprint, Varanasi; Chaukhambha Bharti Academy. 2013:86-87.
  9. Kashinath Pandey (editor). Charak Samhita of Charaka Sutrastahna, chapter 4, verse no-13, Reprint,Varanasi; Chaukhambha Bharti Academy, 2009: 86.
  10. Ambikadutta Shastri (editor). Sushruta Samhita of Sushruta Sutrasthana, chapter-39, verse no. 4 &6, Reprint, Varanasi; Chaukhambha Sanskrit Sansthan, 2023:190-191.
  11. Priya Vrit Sharma (editor). Dravyaguna Vijnana, Vol 2. Chapter 1, Reprint, Varanasi; Chaukhambha Bharati Academy, 2011: 11–14.
  12. Anonymous. The Ayurvedic Pharmacopoeia of India Part I, Volume II, 1<sup>st</sup> Ed., New Delhi;Govt. of India, Ministry of Health and Family Welfare Department of Ayush, 2008: 65-67
  13. Ambikadutta Shastri (editor). Sushruta Samhita of Sushruta Chikitsashsthana, chapter-14, verse no. 10, Reprint, Varanasi; Chaukhambha Sanskrit Sansthan, 2012:87.
  14. Ambikadutta Shastri (editor). Sushruta Samhita of Sushruta Chikitsashsthana, chapter-8, verse no. 39 &51,Reprint, Varanasi; Chaukhambha Sanskrit Sansthan, 2023:60.
  15. Gautam Priyanka et.al., A progressive step towards classical uses of Medicinal Plants in Gynecological disorders, Journal of Ayurveda and Integrated Medical Sciences, May –June 2017,Vol 2, issue 3; 225-236
  16. Bapalal G.Vaidya (Editor). Nighantu Adarsh, Part 1, Chapter 34, Reprint, Varanasi; Chaukhambha Bharti Academy; 2018:285-290.
  17. Thangarajan Sumathi et al. Oxidative stress in brains of male rats intoxicated with aluminium and neuromodulating effect of *celastrus paniculatus* alcoholic seed extract. Asian journal of pharmaceutical and Clinical research 2013;6(3):80-90
  18. V Rekha, D Dingra. Behavioral and Biochemical Evidences for Antidepressant-Like Activity of *Celastrus Paniculatus* Seed Oil in Mice. Basic and Clinical Neuroscience 2016;7(1):49-56
  19. Malik J, Karan M, Dogra R. Ameliorating effect of *Celastrus paniculatus* standardized extract and its fractions on 3-nitropropionic acid induced neuronal damage in rats: possible antioxidant mechanism. Pharmaceutical Biology 2017;55: 980-990
  20. Arora N, Pandey S. GC–MS analysis of the essential oil of *Celastrus paniculatus* Willd. seeds and antioxidant, anti-inflammatory study of its various solvent extracts. Industrial Crops and Products 2014;61:345-351

Omprakash Bairwa, Priyanka Gautam. Pharmacological Actions of an Ayurvedic Drug: *Jyotismati (Celastrus paniculatus* Willd.). *Jour. of Ayurveda & Holistic Medicine*, Vol.-XI, Issue-V (May 2023).

21. Fawzy Ramadan M. et al. Fatty acids, bioactive lipids and radical scavenging activity of *Celastrus paniculatus* Willd. Seed oil. *Scientia Horticulture* 2009;123(1):104-109
22. Borelli F et al. Potent relaxant effect of a *Celastrus paniculatus* extract in the rat and human ileum. *Journal of Ethnopharmacology* 2009;122(3):434-438.
23. Mali S.C,Dhaka A, Githala C.K, Trivedi R. Green synthesis of copper nanoparticles using *Celastrus paniculatus* Willd. leaf extract and their photocatalytic and antifungal properties. *Biotechnology Reports* 2020;27;1-9
24. Arora N, Shah K, Pandey-Rai S. Inhibition of imiquimod induced psoriasis-like dermatitis in mice by herbal extracts from some Indian medicinal plants. *Protoplasma* 2016;253:503–515.
25. Suryawanshi JS, Karande KM, Dias RJ, Patil KS. Formaldehyde induced antiarthritic activity of seeds of *Celastrus paniculatus*. *Indian Journal of Natural Product* 2008;24(2):20–23.
26. Singh M, Verma GN, Srivastava K. An assessment of antifertility efficacy of ethanol extract of *Celastrus paniculatus* seed in male albino rats. *Journal of Pharmacy and Biological Science* 2018;13(4):67–72.

#### CITE THIS ARTICLE AS

Omprakash Bairwa, Priyanka Gautam. Pharmacological Actions of an Ayurvedic Drug: *Jyotismati (Celastrus paniculatus* Willd.). *J of Ayurveda and Hol Med (JAHM)*. 2023;11(5):67-75

**Conflict of interest:** None

**Source of support:** None