



**MALKANGNI (*CELASTRUS PANICULATUS* WILLD.):
NEUROPHARMACOLOGICAL PROPERTIES IN PERSPECTIVE OF
UNANI MEDICINE AND PHARMACOLOGICAL STUDIES-A REVIEW**

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ABSTRACT

Malkangni (*Celastrus paniculatus* Willd.) which belongs to the family Celastraceae is a climber, a widely used medicinal herb in Unani Medicare System. The seeds and its oil play an important role in a wide range of substances of natural origin and used for the treatment of facial paralysis, amnesia, hemiplegia, gout, leprosy, leucoderma, ascites, anaemia etc. It is an endangered medicinal plant distributed throughout India, mostly in tropical forest and the subtropical Himalayas ascending up to 1400 m. increased interest in products of natural origin has been noticed within recent years. In this view, the main aim of this study is to document the knowledge of ethnomedicinal uses and create awareness about the uses of the plant in Unani System of Medicine to cure various disorders.

KEYWORDS: Endangered, Malkangni, *Celastrus paniculatus* Willd., Climber.

INTRODUCTION

Malkangni (*C. paniculatus* Willd.) is the most widely used tradition herb in Unani System of Medicine. The seeds and its oil have been used as common neurotonic, memory tonic, from the time immemorial. It has been shown to possess aphrodisiac, eye tonic, digestive tonic, liver tonic, expectorant, mild laxative, anti-inflammatory, analgesic, diuretic and emmenagogue, laxative, diuretic, diaphoretic, thermogenic, appetizer, digestive properties also. The plant contains celastrine, paniculatine, celapanin, celapanigin and celapagin alkaloids. In Unani system of medicine the plant is said to have hot and dry temperament in

3rd degree, so mainly used for the treatment of the diseases produced due to the cold and related to the nerve and brain such as facial paralysis, hemiplegia, gout, sciatica, pneumonia, pleurisy, amnesia, leucoderma, asthma etc. and also used to treat various disorders such as leprosy, ascites, anemia, loss of appetite, flatulence, sexual weakness and amenorrhea etc. In the present scenario, increasing health issues, hazardous effects of synthetic drugs and thus the preference of natural products over synthetic one is questioning the survival of many valuable medicinal plant species. So it is necessary to increase the production of such type of drugs which have higher medicinal value. In this paper, the information regarding its pharmacological and phytochemical studies and medicinal value in perspective of Unani Medicine is described.

Vernacular Names

Arabic: Qaifur, Tilan; *Bengali:* Lataphatki; *Burma:* Myinkongnayoung; *Deccan:* Malkanguni; *English:* Intellect tree, Black oil tree, Staff tree; *Garhwal:* Malkauni; *Gujrati:* Makngana, Malkangani; *Hindi:* Jyotishmati, malkakni; *Kannada:* Kariganne; *Kumaon:* Makagni, malakoni; *Marathi:* Kanguni; *Malyalam:* Palulavam; *Panjabi:* Samphu, sankhu; *Tamil:* Atiparichcham, valuluwai; *Telgu:* Malaerikata, malkangni; *Urdu:* Malkangani, *Sanskrit:* Amruta, Jyotishmati, Jyotishka, swarnlata, pita tel, mati priya, vanhiruchi, katumbhi, maghsudhi, medhya; *Sinhalese:* Duhudu.^[1,2,3,4]

Threat Status

C. paniculatus Willd. is a rare and endangered medicinal plant distributed throughout India mostly in tropical forests and subtropical Himalayas (5). It is recorded as a threatened plant in forests of Rajasthan and critically endangered in Uttrakhand and Uttar Pradesh.^[6,7]

Distribution

The genus is distributed in the sub-Himalayan tract from the Jhelum eastward, up to 6000 ft., the species is extensively distributed in Andhra Pradesh, Bombay, Bihar, Orissa, Madhya Pradesh, Gujarat, Western Ghats, Uttar Pradesh, Kerala, Tamil Nadu, Karnataka, Jammu Kashmir and Himachal Pradesh.^[4,8]

Botanical Description

Celastrus paniculatus Willd. is a large liana (woody climber), height up to 18m with stem diameter up to 23cm.^[9] Stem woody, bark brown and thin. Branchlets hairless, with many distinct minute white dots called lenticels; leaves simple, alternate, ovate to oblong-elliptic,

about 5-15x2-8 cm; apex acute, acuminate or obtuse; base round, shortly acuminate, margin toothed with rounded teeth, hairless; lateral nerves 5-8 pairs, slender; leaf stalks about 3 cm long; flowers unisexual in terminal pyramidal panicles, about 6mm across, yellowish or greenish white, collected in terminal paniculate cymes; panicles 5-30cm long, pendulous. Capsules sub-globose, 1.0–1.5 cm in diameter, smooth, yellow when mature, transversely wrinkled, dehiscing by three valves; seeds 3-6, ellipsoid or avoid, about 6x3 mm, yellowish brown enclosed in crimson-red aril; flowering is from November to February and fruiting is from March onward.^[10,11]

Scientific classification

Kingdome	plantae
Class	angiospermae
Order	celastrales
Family	celastraceae
Genus	celastrus
Species	paniculatus

Description in Unani Literatures

In Unani System of Medicine, the plant is described by Hakim Azam Khan, Hakim Sharif Khan and Hakim Najmul Ghani and many more physicians in their books. According to them, it is a seed obtained from an Indian climber known as Malkangni (*Celastrus paniculata* Willd.). It attains a height of *Qad-i-Adam* (height of a man). It has one or two stems with many branches; leaves resemble with *Morus* leaves but more rounded and serrated; fruits appear in clusters, divides into three parts after drying; seeds are rough, triangular in shape, blackish red and yellowish white inside, enclosed in a capsule (fruit) which ripen in late summer season. The seeds of this plant constitute the drug which is bitter and possess unpleasant odour and bitter taste.^[1,2] *Roghan Malkangni* is obtained by cold expelling process from *Malkangni* seeds.^[12] The second method of oil collection is that the coarsely powdered seeds are placed on a cloth, which covers the head of a Deg, half filled with water. After putting the seeds, the head is covered by a *Sarposh* (head cover). Now the deg is put on the fire to boil. The vapors rise up and cross the cloth and warmth the seeds, after touching the roof of the *Sarposh* (head cover) they return and drop back, taking the oil with them from the seeds. After sometimes oil is collected in the water and then separated.^[1]

Parts used (*Ajza-i-musta'mla*)

In Unani System of Medicine mainly the seeds and its oil are used medicinally and leaves are also used for some diseases^[2]

Temperament (*mizaj*)

According to Unani physicians the temperament of the seeds is hot and dry in 3rd degree^[1,2]

Action and uses

It has been described in the classical literature of Unani medicine to be as *muqawi-i-bāh* (aphrodisiac), *muqawwi-i-dimāgh* (brain tonic), *muqawwi-i-ḥāfīza* (memory tonic), *muqawwi-i-chashm* (eye tonic), *muqawwi-i-ḥaḍm* (digestive tonic), *muqawwi-i-jigar* (liver tonic), *munaffith-i-balgham* (expectorant), *mushil khafīf* (mild laxative), *muḥallil-i-awrām* (anti-inflammatory), *musakkin-i-alam* (analgesic), *mudirr-i-bawl* (diuretic), *muddirr-i-ḥayḍ* (emmenagogue), *mu'arriq* (diaphoretic), *muwallid-i-ḥarārat* (thermogenic), *muḥarrik-i-ishtiha* (appetizer), *hāḍim ta'ām* (digestive), *kāsir-i-riyāḥ* (carminative), *muqi* (emetic), *mumsik* (retentive), *tiryāq sumūm-i-afiyūn* (antidote of opium poisoning) etc. Seeds and its oil are used locally as well as internally to stimulate intellect and appetite, to sharpen memory and to reduce a headache and joint pain (especially in the patients of arthritis). Especially it is used to cure disorders which are caused by cold humours and nerve or brain origin like *Laqwa* (facial paralysis), *Falij* (hemiplegia), *Dard-i-Zanu* (thigh pain), *Dard-i-Sar* (headache), *Waja' al-Ṣadr* (chest pain), *Niqris* (gout), *Irq al-Nisa* (sciatica), *Tashannuj* (spasm), *Waja' al-Warik* (hip pain), *Zat al-riya* (pneumonia), *Zat al-janb* (pleurisy), *Duḥf' ḥafīda* (amnesia), *Baras* (leucoderma), *Ḍiq al-naḥas* (asthma) etc. It is also used to treat various disorders such as *Juzām* (leprosy), *Istisqa* (ascites), *Su al-Qinia* (anemia) etc.^[1,2] In various disorders its uses are as follows:

Memory weakness (*dufi' hafiza*): One drop of its oil is used daily to increase memory.^[2]

Loss in eye vision (*du'fi chashm*): Its seed is taken one daily then gradually increasing it one every day for eight days and after that taken continuously 8 seeds daily, strengthen the eyesight. Its oil is also applied to the soul of hand and feet to increase eyesight^[1,2]

Spasm (*tashannuj*): If spasm occurs in any organ due to cold or collection of gas, takmid (thermotherapy) after application of *Roghan Malkangni* is very useful.^[1]

Sexual weakness (*du'fi bah*): Its fried seeds with *roghan zard* (ghee) are taken in quantity of one cuff (24 gm) to increase sexual power and the oil of its seeds in quantity of 10 drops is taken daily with betel leaves to treat impotence.^[2]

Premature greying of hairs (*shayyeb-i-sha'r*): A Ghee obtained from the milk boiled with its seeds is used orally in quantity of 24 ½ gm -28gm with *Khira* (a diet made with rice and milk) to treat premature greying of hair.^[1,2]

Leprosy (*juzam*): Its oil is applied locally and also taken orally to cure leprosy.^[1,2]

Stomach disorders (*amraz-i-me'da*): For diseases of stomach it is taken orally which strengthen the stomach, increase appetite and digestion.^[2]

Litharge (*litharghas*): A snuff is taken to cure lethargic condition.^[2]

Cold diseases (*amraz-i-barida*): In cases of cold diseases like *fali*j (hemiplegia), *laqwa* (facial palsy) and *tashannuj* (spasm), local application of its oil are useful.^[2]

Retention of urine (*Ihtibas-i-bawl*): The oil causes diuresis, so it is used with lassi to cure retention of urine.

Fistula (*nasur*): Its oil is applied in the fistula, which heals it easily.^[2]

Dose (*miqdar khurak*): Seeds 500mg-1gm; leaves juice 20-40ml and oil is used in the quantity of 10-15 drops.^[2]

Adverse effect (*mazarrat*): It is harmful in a younger age person in the hot season, hot places, having a hot temperament. It also induces abortion so contraindicated in pregnancy; it also causes a headache.^[1,2]

Correctives (*musleh*): Due to the 3rd degree of its temperament, it produces some toxicity and adverse effects, so cold materials like cow milk and cold regimens are used to correct its toxic or adverse effects.^[1,2]

Substitute (*badal*): Sometimes in absence or unavailability of one drug another drug is used as a substitute in Unani Medicine, so *Roghan Qarnful* (clove oil) is used as a good substitute of the *Roghan Malkangni*.^[2]

Compound Formulations: Various compound formulation are prepared in which Malkangni is used as an important ingredient such as ‘Asbi, Habb-i-Sar’ Khas, Halwa-i-Malkangni, Halwa-i-Ghikwar, Dawa-i-Takor, Majun Nishat Angaiz, *Roghan Malkangni*, *Roghan Shifa*, *Tila-i-Ajib*, *Tila-i-Khas al-Khas*, *Tila-i-Benazir*, *Tila-i-Iksir*, *Tila-i-Nishatangaiz*, *Zimad Kharatin Shangarfi*, *Zimad Muqawwi* (The detail is given in **table 01**) etc.

Bioactive compounds

Two alkaloids, namely, celastrine and paniculatine, isolated from seed are considered to be the active constituents.^[3] Three important alkaloids, namely, celapanin, celapanigin and celapagin, have also been isolated from the plant.^[13] Seeds contain brownish-yellow oil, a bitter resinous principle, tannin and ash. It is rich in acetic and benzoic acids along with other fatty acids and a crystalline substance tetracasanol and sterol is the main content of medicinal use.^[14,15] Other ingredients from the oil are also reported such as protein, carbohydrate, fats, Vit. C, sodium, potassium, ash, calcium, iron etc.^[11] The sesquiterpene alkaloids are derived from a new sesquiterpene tetra-ol (celapanol) which is alternately esterified with acetic, benzoic, nicotinic and β -furoic acids.^[16] The plant was found to possess a number of mineral elements such as sodium, magnesium, aluminium, potassium, calcium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc and molybdenum.^[17] Besides these, oil of the plant also comprises of proteins, carbohydrates, fats (saturated fats, polyunsaturated and monounsaturated fats) and vitamin C. The hydroalcoholic extract of areal part of the plant was found to contain 3.52 % of tannins.^[18]

Pharmacological Studies

Aqueous extract of the plant at a daily dose of 100, 200 and 300 mg/kg for a period of 21 days was investigated for its cognitive-enhancing and antioxidant property in an experimental model of Alzheimer’s disease in albino rats. The seeds oil given in the form of emulsion showed the tranquillizing effect in mice subjected to the excitement with the administration of adrenaline and amphetamine.^[19] The seed extract has been studied by a number of researchers for its neuropharmacological effects, and a number of preclinical reports are available to confirm the nootropic action possessed by it.^[20] Due to its remarkable brain-stimulating and antioxidant properties as described in kinds of literature, its effect was studied against immobilization-induced stress in albino mice. The crude *C. paniculatus* seed oil administered orally, intramuscularly and intraperitoneally in a dose of 1 g/kg, which produced a sedative effect in rats and demonstrated a significant reduction of movement in

mice.^[19] Aqueous seed extract at a dose of 200 mg/kg body weight of rat, administered for 14 days, has been observed to have an improvement in learning and memory. It has also exhibited antioxidant properties by decreasing lipid peroxidation and increasing endogenous antioxidant enzymes in the brain. It was found to be effective in forestalling the cognitive deficits as well as the oxidative stress caused by the administration of streptozotocin in rats.^[21] The anticonvulsant activity of seed oil was examined against leptazole, picrotoxin and strychnine-induced convulsions in rats. It increased strychnine convulsions and reduced leptazole toxicity. It produced a calming effect in injected rats, potentiated pentobarbitone sedation and exerted antispasmodic activity with respect to acetylcholine but did not significantly affect the amphetamine toxicity.^[22] Apart from its efficacy in diseases of Nervous System it is also studied for various pharmacological properties and found to possess analgesic, anti-inflammatory^[23], hypolipidaemic^[24], anti-arthritic^[25], anti-fungal^[26], antibacterial^[27,28], anti-fertility^[29] properties in various studies.

Table 01 showing compound formulation of Malkangni, their dosage and indications.

S.N.	Compound formulations	Dosage	Indication
01.	'Asbi ^[30]	2 tablet twice a day	Arthritis, Neuritis, Nerve weakness
02.	Habb-i-Sar' Khas ^[30]	1 Pills twice a day	Epilepsy, Infantile convulsion
03.	Halwa-i-Malkangni ^[31]	2 tablet twice a day	Arthritis, Neuritis, Sexual weakness
04.	Dawa-i-Takor ^[32]	Local application	Erectile dysfunction
05.	Majun Nishat Angaiz ^[30]	6gm with milk or water	Sexual weakness, weakness of vital organs
06.	<i>Roghan Malkangni</i> ^[12]	Local application and per orally	Paralysis, arthritis, gout, nerve weakness, numbness etc.
08.	<i>Tila-i-Ajib</i> ^[32]	Local application	Weakness male sexual organ
09.	<i>Tila-i-Khas al-Khas</i> ^[30]	Local application	Weakness male sexual organ
10.	<i>Tila-i-Benazir</i> ^[30]	Local application	Weakness male sexual organ
11.	<i>Tila-i-Iksir</i> ^[30]	Local application	Weakness male sexual organ
12.	<i>Tila-i-Nishatangaiz</i> ^[30]	Local application	Male sexual weakness
13.	<i>Zimad Kharatin Shangarfi</i> ^[30]	Local application	Male sexual weakness
14.	<i>Zimad Muqawwi</i> ^[30]	Local application	Weakness of male sexual organ



Fig. 01: Showing Illustrated diagram of the plant (a); leaves and fruits (b & c); fruits (d); seeds (e).

CONCLUSION

Malkangni (*Celastrus paniculatus* Wild.) is one of the important Unani herbal drug which is used locally as well as orally to treat various disorders related to digestive system, sexual and eye diseases and especially in disorders of brain and nerves. The seed extract and its oil have been extensively investigated in several research institutes and laboratories and a number of reports are available confirming their neuropharmacological effects such as nootropic action, tranquilizing, anticonvulsant, anti-stress effects etc.

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Conflict of interest – None declared.

REFERENCES

1. Khan Azam. *Muhit-i-Azam*, vol 4. (Urdu translation by Central Council for Research in Unani Medicine), Ministry of AYUSH, Family Welfare and Health, Govt of India, New Delhi, 2018; 512-15.
2. Ghani Najmul. *Idara Kitab al-Shifa*, New Delhi, 2011; 1211: 1212.
3. Khare CP. *Indian medicinal plants: an illustrated dictionary*. Springer, Berlin/Heidelberg, 2007; 1–775
4. Kirtikara KR and Basu BD. *Indian Medicinal Plants*, Periodical Experts Book Egancy, Delhi. 2012; 1: 575-577.
5. Warriar PK, Nambiar V P K and Ramankutty C. *Indian Medicinal Plants*, Vol.1-5. Orient Longman Ltd., Madras, 1993-1995.
6. Anonymous. *The Wealth of India, a Dictionary of Indian Raw Materials & Industrial Products*, Vol. I: A-Ci. National Institute of Science Communication and Information Resources, CSIR, New Delhi, 2007; 238: 239.
7. Prakash Anand and Singh KK. Observation on some threatened plants and their conservation in Rajaji National Park, Uttaranchal, India. *J.Econ.Tax, Bot*, 2001; 25(2): 363-366.
8. Anonymous. *The Wealth of India, a Dictionary of Indian Raw Materials & Industrial Products*, Vol. 3: Ca-Ci. National Institute of Science Communication and Information Resources, CSIR, New Delhi, 1992; 412,413.
9. Nadkarni AK. *Indian Materia Medica* (edn. 3), Popular Prakashan, Bombay, 1976; I: 296.
10. Afaq SH. *Ethano Medico Botany of Western Uttar Pradesh*. Publication Division AMU, Aligarh, 2011.
11. Neha Arora and Shashi Pandey Rai. *Celastrus Paniculatus*, an Endangered Indian Medicinal Plant with miraculous cognitive and other therapeutic properties: An Overview *Int J Pharm Bio Sci.*, 2012; 3(3): 290–303.
12. Anonymous. *National Formulary of Unani Medicine*, Central Council for Research in Unani Medicine, Ministry of AYUSH, Family Welfare and Health, Govt of India, New Delhi, 2006; 197.
13. Anonymous. *The Wealth of India (Raw materials)*, Publication and Information Directorate, CSIR, New Delhi, 1992; VI: 439–444.

14. Yoganarasimhan SN. Medicinal Plants of India, Tamil Nadu, Regional Research Institute, Bangalore, 2000; 2: 441.
15. Gamlath CB, Gunatilaka AAL, Tezuka Y, Kikuchi T, Balasubramaniam S. Quinone-methide, phenolic and related triterpenoids of plants of Celastraceae: further evidence for the structure of celastranhydride. *Phytochemistry*, 1990; 29: 3189–3192.
16. Wagner H, Heckel E. Struktur und stereochemie eines sesquiterpenesters und dreier sesquiterpen-alkaloide von *Celastrus paniculatus* Willd. *Tetrahedron*, 1975; 31: 1949–1956.
17. Saily A, Sahu R, Gupta B, Sondhi SM. Analysis for mineral elements of medicinal plants used for the treatment of asthma, syphilis, diarrhoea, skin diseases and rheumatism. *Hamdard Med.*, 1994; 37: 18–22.
18. Atal CK, Srivastava JB, Wali BK, Chakravarty RB, Dhawan BN, Rastogi RP. Screening of Indian plants for biological activity: part VIII. *Indian J Exp Biol.*, 1978; 16: 330–349.
19. Gatinode BB, Raiker KP, Shroff FN, Patel JR. Pharmacological studies with malkanguni, an indigenous tranquilizing drug (preliminary report). *Curr Pract*, 1957; 1: 619–621.
20. Bhanumathy M, Harish MS, Shivaprasad HN, Sushma G. Nootropic activity of *Celastrus paniculatus* seed. *Pharm Bio.*, 2010; 148: 324–327.
21. Kumar MHV and Gupta YK. Antioxidant property of *Celastrus paniculatus* willd: a possible mechanism in enhancing cognition. *Phytomedicine*, 2002; 9: 302–311.
22. Shroff FN, Gaitonde BB, Patel JR. Tranquillizers (An experimental study). *J Group Hosp*, 1959; 4: 160-173.
23. Ahmad F, Khan RA, Rasheed S. Preliminary screening of methanolic extracts of *Celastrus paniculatus* and *Tecomella undulata* for analgesic and anti-inflammatory activities. *J Ethnopharm*, 1994; 42(3): 193-198.
24. Mathur NT, Varma M, Dixit VP. Hypolipidaemic and antiatherosclerotic effect of *Celastrus paniculatus* seed extract in cholesterol fed rabbits. *Indian Drugs*, 1993; 30: 76-82.
25. Patil KS, Suryavanshi J. Effect of *Celastrus paniculatus* Willd: Seed on adjuvant induced arthritis in rats. *Phcog Mag*, 2007; 3(11): 177-181.
26. Vonshak A, Barazani O, Sathiyamoorthy P, Shalev R, Vardy D, Golan-Goldhirsh A. Screening South Indian medicinal plants for antifungal activity against cutaneous pathogens. *Phytother Res.*, 2003; 17(9): 1123-1125.
27. Patel RP, Trivedi BM. The in vitro antibacterial activity of some medicinal oils. *Indian J Med Res.*, 1962; 50: 218-222.

28. Pandya KK, Patel RB, Chakravarthy BK. Antibacterial activity of some Indian Medicinal Plants. *Indian Drugs*, 1990; 27: 415-417.
29. Wangoo D, Bidwai PP. Anti-spermatogenic effect of *Celastrus paniculatus* seed extract on the testis of albino rats. *Fitoterapia*, 1988; 59: 377-382.
30. Anonymous. National Formulary of Unani Medicine, Central Council for Research in Unani Medicine, Ministry of AYUSH, Family Welfare and Health, Govt. of India, New Delhi, part-VI. 2011; 21,26, 64,78, 79,90,92,93.
31. Anonymous. National Formulary of Unani Medicine, vol. 1, part-2. Central Council for Research in Unani Medicine, Ministry of AYUSH, Family Welfare and Health, Govt of India, New Delhi, 2007; 44.
32. Anonymous. National Formulary of Unani Medicine, Part-V. Central Council for Research in Unani Medicine, Ministry of AYUSH, Family Welfare and Health, Govt of India, New Delhi, 2008; 84, 128, 151.