Nat. Volatiles & Essent. Oils, 2021; 8(5): 255 – 261

NVEO
Natural Volatiles & Essential Oils

Prayer beads-*Eleocarpus ganitrus* (Ruthracham)and Its Medicinal Importance-A Review

P.L. Balasubraanian[1], D. Amirtharaj[1], Govindarajan Sumathy*

[1] Assistant Professor, Department of Siddha Medicine, Tamil University, Thanjavur.

[1]Professor, Department of Varmam pura Maruthuvam and Sirapumarthuvam, Sri Sairam Siddha Medical College and Research Centre, Chennai.

**Professor & Head, Department of Anatomy, Sree Balaji Dental College & Hospital, BIHER, Chennai.*

Abstract

Eleocarpus ganitrus is one of the most dominant medicinal plants known as Ruthracham. This highly spiritual bead is a treasure trove of many health benefits.It is frequently cited as "Prayer beads" and it is contemplated as the most sacred bead.It is habitually accessible and cultivated in the Himalayan regions.It is renowned for its salubrious usage. In the Siddha system of medicine, which is the oldest system of medicine, "Ruthracham" is extensively used for numerous ailments together with stress, depression, anxiety, epilepsy, migraine, bronchial asthma, hypertension, arthritis, nerve pain, palpitations, ADHD (attention deficit hyperactive disorder) and liver diseases. It is generally acknowledged for its anti-inflammatory, immune stimulatory, anti-hypertensive, anti-asthmatic, anti-microbial, anxiolytic, anti-diabetic, nephroprotective, and anti-oxidant activities. This article allocates all the imperative information concerning its long established literature and research upgrades on ethnopharmacology, phytoconstituents, traditional properties, and pharmacological importance.

Keywords: Eleocarpus ganitrus (Ruthracham), Ethnopharmacology, Traditional Properties, Phytoconstituents, pharmacological importance.

INTRODUCTION

Although medicinal plants are unequivocally the preeminent source of drugs in human history, the inadequacy of authentic literature to brace the pharmacological potential of the plants has outstandingly reduced their acceptability among people. *E. ganitrus* (Synonyms: E. sphaericus) is a large, eternal tree, universally cited as the Rudraksha tree in India. It is a sacred tree and is relished with exceptional acclaim and devotion in the Hindu community. In Hindi it is known as "Rudraki" and in Sanskrit it is known as "Rudraksha". The word "Rudraksha" literally means "Tears of Shiva". In our ancient Siddha system of medicine, it is extensively used in treating stress, anxiety, depression, palpitation, nerve pain, epilepsy, migraines, lack of concentration, asthma, hypertension, arthritis, and liver diseases. In consonance with our Siddha medicinal system, wearing Rudraksha beads generates positivity and soothes numerous ailments, but most vitally, it has age-defying effects. Besides the fact that Rudraksha beads are traditionally utilized in India, they are used widely in other Asian countries too. This species' name is synonymous with E. sphaericus, whose fruits or seeds are used in Siddha for psycho-somatic diseases [5] [6]. The main focus of this article is to encapsulate the morphology, distribution, phytochemistry, and medicinal properties of *E. ganitrus* for nurturing the scientific investigation into the evolution of effective therapeutic compounds [1].

Taxonomy

Kingdom: Plantae
Division:Magnoliophyta
Class: Magnoliopsida
Order: Oxalidales

Family: Elaeocarpaceae,
Genus: Elaeocarpus
Species: *E. ganitrus* Roxb.

MORPHOLOGY

*E. ganitrusis*a huge eternal tree with large leaves. Its growth ranges from 50-200 feet in height. On the sun-facing side, the leaves are large and shining and are dull and leathery on the dorsal side. Flowers will start appearing in the month of April to May and are yellow or white in colour with fringed petals. Fruits will start appearing in the month of June and will ripen in the month of October. The ripe fruit is so fleshy and has a seed with a blue shell. The inner part of the bead lying in the seed is known as "Rudraksha".

Geographical distribution

E. ganitrus is contemporarily grown on plantations and hillock's for its mercantile and pious values in Nepal, India, Bangladesh, Bhutan, Maldives, Pakistan, Indonesia, New Guinea, Australia, Guam, Hawaii, and Sri Lanka. Capitalistically, there are three varieties of "Rudraksha" that are up for grabs: Nepalese, Indonesian, and Indian. In India, *E. ganitrus* is dispersed in the Eastern Himalayas in Arunachal Pradesh, Bihar, Madhya Pradesh, and the Konkan Ghats. In Asia, the genus Eleocarpus consists of 120 species, out of which 25 have been delineated from India.

Ethnopharmacology

E. ganitrus is a crucial medicinal plant with several medicinal uses in the traditional medicine system. It is used to cure many health problems in several parts of the world. Leaves and seeds are known for their various medicinal properties and are customarily used to heal stress, anxiety, depression, palpitation, nerve pain, epilepsy, migraines, lack of concentration, asthma, hypertension, arthritis, and liver diseases [3] [4].

ETYMOLOGICAL & MACROSCOPICALDESCRIPTION

The leaves are shorn, ovate, mucronate, lobed, and sporadically serrated, cuspated, or aciculated. The flowers are in opaque racemes, yellow or white in colour and mainly from stipules of leaves which have fallen. They come into sight from April to May. The tiny fruits are blue or violet in colour, circular or ovoid in shape, and they taste acidulous. The stone pit is solid, sphere-shaped, and it is reddish brown in colour.

COMPOSITION OF "RUDRAKSHA"

The rudraksha beads encompass oxygen, hydrogen, carbon, nitrogen and other micro elements in integrated form. The gaseous elements in Rudraksha beads and their configuration in percentage are specified underneath.

Oxygen - 30.53%
Hydrogen - 17.897%
Nitrogen - 0.95%
Carbon - 50.031%

LEAF EXAMINATION – MACROSCOPICAL

APEX	**BASE**	**COLOUR**	**MARGIN**	**SHAPE**	**SIZE**
Stiff	**uniform**	**Gleaming green**	**ripple**	**ovoid**	**2 inch breath** **5-6 inch length**

Chemical Constitutions of *Elaeocarpus ganitrus*

Dynamic constituents in Rudraksha are elaeocarpidine, elaeocarpine, rudrakine, flavonoids, and quercetin (Johns SR., et al., 1971; Ray AB., et al., 1979; Chand L., et al., 1977). Excerpts exhibit the presence of phytosterols, fat, alkaloids, flavonoids, carbohydrates, ethanol, proteins and tannins, acid and ellagic acid. It holds 50.03% C, 0.95% N, 17.89% H, and 30.53% O2. Phytonutrient inspection with different extractions displays distinct chemicals. Extraction with petroleum ether shows the existence of fatty oil fats and phytosterols. Extraction with ethanol ether appearance displays the existence of alkaloids, flavonoids, carbohydrates, proteins, tannins. Extraction with water displays the existence of carbohydrates, proteins, and tannins. Elaeocarpus sphaericus capitulates mainly indolizidine alkaloids, including isoelaeocarpine, epiisoelaeocarpiline, epielaeocarpiline, alloelaeocarpiline, and pseudoepiisoelaeocarpilline.

Traditional Properties

The conventional use of the unripe and ripped fruit of *Elaeocarpus sphaericus* manifests as follows:

- *Elaeocarpus sphaericus* is revered as the sacred bead that bestows constructive sequels on trepidation, stress, inadequacy of concentration, epilepsy, and other ailments.Those who are enduring stress are cited as saying that holding a larger size of five muki
- *Elaeocarpus sphaericus* in their right palm tightly for ten minutes would bring tranquilly to their mind. It also assists in regaining self-possession and solidity in individuals.
- *Elaeocarpus sphaericus* is an excellent pregnancy bead. Wearing Garbh Gauri Elaeocarpus sphaericus helps women who are vulnerable to miscarriages and aids in natural conception.
- *Elaeocarpus sphaericus* is beneficial for both delirium and somnolence in women.

- *Elaeocarpus sphaericus* is additionally potent for children who experience frequent fevers. Those children should put up three-faced Elaeocarpus sphaericus.
- To treat small pox, pulverise an equal amount of black pepper and *Elaeocarpus sphaericus* and take it with water.
- *Elaeocarpus sphaericus* is even more effective in psychiatric disorders. Milk boiled with four-faced Rudraksha seeds is a sweet medicine for cognitive illness. This also helps in intensifying memory.
- *Elaeocarpus sphaericus* also has anti-aging properties [5].

Pharmacological Activities

Antioxidant properties

Ethanolic extract of leaves of *Elaeocarpus ganitrus* was scrutinized for their total antioxidant capacity, reducing power, hydroxyl radical scavenging activities. The extract at 500 µg/ml manifested utmost Iron chelating activity (76.70%). Nevertheless, the extract exhibited only modest hydroxyl radical scavenging activity (13.43%). Total antioxidant capacity was 24.18 mg ascorbic acid equivalents at 500?g/ml extract concentration. There was a positive correlation between the total phenolic content and antioxidant capacity, R^2 = 0.8547, whereas the correlation between the total flavonoids and antioxidant capacity was determined to be R^2=0.8413. The results suggest that phenolics and flavonoids in the leaves provide substantial antioxidant activity. [15]

Antihypertensive activity

It is experimentally proven that extracts of *E. ganitrus* Roxb can be utilized in stress-induced hypertension. Whereas the ethanolic extract of E.garcinia failed to bring down nicotine, it persuaded hypertension. An aqueous extract of *E. ganitrus* seeds evinced antihypertensive activity in renal artery-clogged hypertensive rats. Treatment of animals with aqueous extract of *E. ganitrus* for 6 weeks outstandingly depleted the upraised blood pressure of the animals [9].

Antimicrobial activity

It is cited that certain solvents should be used to extract active phytochemicals from the epicarp and endocarp of *E. ganitrus*, which could be a prospective source of dynamic phyto-constituents such as alkaloids, phenols, flavonoids, tannin, glycosides, and coumarins. It is long established that *E. ganitrus* seeds have antimicrobic activities and would play a vital part in the pharmaceutical industry. Numerous extracts of E. sphaericus were assessed for their antimicrobic activity in opposition to 28 gram-positive and gram-negative bacteria. Petroleum ether, benzene, chloroform, acetone and ethanol extract formulated from dried fruits of E. sphaericus showed broad spectrum antimicrobial activity with regard to the spread of microorganisms. Amidst all the extracts, the aqueous extract revealed astounding antimicrobial activity greater than that of other extracts [10]. Petroleum ether, chloroform, ethanol and aqueous extracts formulated from E. ganitrus seeds demonstrated potential broad spectrum antifungal activity against Asperagillus niger, Candidum geotrichum, Candida albicans, C. glabrata and C. tropicalis [11].

Immunostimulatory activity

E.*Ganitrus*seeds appear to evince remarkable immunostimulatory activity and it impacts both non-specific and specific arms of the immune system. Alkaloidal fragments of *E. ganitrus* seeds

have been shown in vitro and in vivo to brace immune mediators from peritoneal exudates cells and intensify immune cells in in vitro and in vivo models [12].

Anti-inflammatory activity

Copious solvent excerpts (Petroleum ether, benzene, chloroform, acetone and ethanol extracts) from E. sphaericus fruits evinced noteworthy anti-inflammatory action in opposition to both acute and sub-acute models in mice. Over and above, all excerpts secured guinea-pigs against bronchospasm, persuaded by histamine and acetylcholine aerosols [13]. Petroleum ether, chloroform, methanol, and aqueous excerpts of E. sphaericus leaves displayed outstanding analgesic and anti-inflammatory potential in carrageenan-induced paw oedema (inflammation) in rats and tail flick tests in mice. Methanol and aqueous extracts displayed remarkable dose-dependent anti-inflammatory activity in the course of the experiment [14].

Antioxidant activity

E.ganitrus leaf excerpts were delineated to evince noteworthy antioxidant activity in numerous in vitro methods. Ethanolic excerpt of *E. ganitrus* leaves against the spread of free radicals exhibited remarkable total antioxidant activity, reducing power potential, metal chelating activity, and ABTS scavenging activity. Furthermore, a positive correlation between total phenolic content and antioxidant capacity, as well as total flavonoid content and antioxidant activity, was declared.[15] Formalized paraphrase

Antiasthmatic activity

E.sphaericusfruits were found to manifest antiasthmatic activity *in vivo.* Numeroussolvent extracts (petroleum ether, benzene, chloroform, acetone and ethanol extracts) of *E.*
E. sphaericus fruits evidenced mast-cell sustaining activity, validating the potency of *E. sphaericus* against bronchial asthma [16].

Anxiolytic activity

E. sphaericus fruits were found to have anxiolytic activity in a Swiss albino mouse model. Methanolic extract of E. sphaericus fruits (200 mg/kg bw) expressed exceptional anxiolytic effects in a mouse model. It has been affirmed that the anxiolytic activity of the extract may be due to its high flavonoid content [17].

Antidiabetic activity

Aqueous excerpts of *E. ganitrus* seeds exhibited an appreciable hypoglycemic sequel after 2 hours of treatment in streptozotocin-persuaded diabetic rats. Extract treatment remarkably decreased the blood glucose level in a dose-dependent manner during the 30 days of treatment [18]. Chitosan-based extract and aqueous extract prepared from *E. ganitrus* leaves were assessed for their antidiabetic potential in Arrayed Albino rats. Amidst both extracts, the chitosan-based extract of *E. ganitrus* leaves exemplified more consequential antidiabetic activity than that of the aqueous extract [19].

Nephroprotective activity

Ethanolic excerpts of *E. ganitrus* seeds were established to exhibit a striking nephroprotective effect. In male Wistar rats, GM induces nephrotoxicity. The extract treatment of

diseased mice exceptionally minimised the upraised levels of serum creatinine, blood urea nitrogen, uric acid, and albuminuria with a substantial increase in serum albumin and urine creatinine [20].

Toxicology

The majority of the plants are predominantly contemplated as nontoxic, but it's vital to substantiate their level of toxicity before therapeutic use. Aqueous extract of *E. ganitrus* seed was established to be nontoxic up to a dose of 5.0 g/kg weight (highest dose checked) in the Swiss albino mouse model [21]. Literature corroboration is not available to report the future exposure of the extract. Another study, aqueous extract of *E. ganitrus* leaves did not display any hemolytic activity against human erythrocytes up to 1000 µg/ml concentration; henceforth it might potentially be scrutinized secure with regard to human erythrocytes [22].

AN ANTIDEPRESSANT ACTIVITY

Ethanol and petroleum ether excerpts of Elaeocarpus spharicus's fruit lessened the swim stress stolidity in mice, designating some scale of antidepressant activity. Pharmacological investigations with the 90% ethanolic extract of the fruits of *E. ganitrus* revealed the phenomenon of a serious central nervous system depressant effect, signaled by quintessential behavioral actions, morphine analgesia, anticonvulsant, potentiating of hexobarbitone hypnosis, and anti-amphetamine effects. In this study, the extract emphasised a cardio stimulant and a depressor, part of these being arbitrated by way of beta adreno receptor stimulation and in part through direct musculotropic effects. The present unearthings prop up the implementation of *Elaeocarpus ganitrus* as an antidepressant endorsed in the conventional system of medicine and open an avenue to develop a proxy antidepressant agent from distinguished herbal remedies [23].

ANTI-ANXIETY ACTIVITY

Ethanolic fruit excerpts of Euganitrus procure antidepressant effects. *E. ganitrus* was appraised for antianxiety activity in mice utilizing an elevated plus maze model. The chloroform and ethanol extracts were found to be effective against anxiety in low doses, but a dose of 200 mg/kg of ethanol extractive was equal to diazepam, as evidenced by statistical equivalence between the results of this dose and those of diazepam.Chloroform extractives are also effective in the lowest doses, but best at a dose of 400 mg/kg. Anxiolytic effect of *Elaeocarpus sphaericus* fruit extract (methanolic) in Swiss albino mice

Conclusion:

In the wake of its remarkable medicinal perquisites, rudraksha has made a nook in medicine and religion. Good luck. It ushers in added exuberance to our system, contributing to health and harmony by eliminating negativity. Ethno medical and scientific reports about the medicinal properties of *E. ganitrus* describe it as a treasured plant and initiate it as a candidate for enduring drug development.

References:

1) Gaurav Kumar, A Review on Medicinal Properties of *Elaeocarpus ganitrus*Roxb.ex G. Don. (Elaeocarpaceae), Research J. Pharm. and Tech. 7(10): October 2014.
2) Swami G et al. *Elaeocarpus sphaericus*: Medical and scientific facts. Der Pharmacia Lettre. 2(1); 2010: 297-306.

3) Dasgupta A et al. Anticonvulsant activity of the mixed fatty acids of the *Elaeocarpus ganitrus* Roxb. Indian Journal of Physiology and Pharmacology. 28(3); 1984: 245-246.
4) Gaurav Kumar, A Review on Medicinal Properties of *Elaeocarpus ganitrus* Roxb.ex G. Don. (Elaeocarpaceae), Research J. Pharm. And Tech. 7(10): Oct. 2014 Page 1184-1186.
5) Mooligai
6) Dennis TJ, Rudraksha - Not Just a Spiritual Symbol but Also a Medicinal Remedy, SachitraAyurved, 46(2), 1993.
7) Kumar ST, et al., 2008 Evaluation of Antioxidant Properties of Elaeocarpus ganitrus Roxb. Leaves. Iranian journal of Pharmaceutical Research, 7(3): 211-215.
8) Gaurav Ajay Dubey, Effect of extract of Rudraksha (elaeocarpus ganitrus) on parkinson's disease and depression, World Journal of Pharmaceutical Research, Vol 7, Issue 12, 2018.
9) Sakat SS et al. Antihypertensive effect of aqueous extract of Elaeocarpus ganitrus Roxb. Seeds in renal artery occluded hypertensive rats. International Journal of PharmTech Research. 1(3); 2009: 779-782.
10) Singh RK and Nath G. Antimicrobial activity of Elaeocarpus sphaericus, Phytotherapy Research. 3(5); 1999: 448-450.
11) Singh B et al. Pharmacognostic and antifungal investigations of Elaeocarpus ganitrus (Rudrakasha). Indian Journal of Pharmaceutical Sciences. 72(2); 2010: 261-265.
12) Hule AK and Juvekar AR. Effect of alkaloidalfraction of Elaeocarpus ganitrus Roxb. Seeds on murine in vitro immune parameters. Journal of Pharmacy Research. 2(8); 2009: 1261-1265.
13) Singh RK et al. Pharmacological activity of Elaeocarpus sphaericus. Phytotherapy Research. 14(1); 2000: 36-39
14) Nain J et al. Analgesic and anti-inflammatory activity of Elaeocarpus sphaericus leaf extract. International Journal of Pharmacy and Pharmaceutical Sciences. 4(1); 2012: 379-381.
15) Kumar TS et al. Evaluation of antioxidant properties of Elaeocarpus ganitrus Roxb. Leaves. Iranian Journal of Pharmaceutical Research. 7(3); 2008: 211-215.
16) Singh RK et al. Studies on extracts of Elaeocarpus sphaericus fruits on in vitro rat mast cells. Phytomedicine. 7(3); 2000: 205-207.
17) Shah G et al. Anxiolytic effects of Elaeocarpus sphaericus fruits on the elevated plus-maze model of anxiety in mice. International Journal of PharmTech Research. 2(3); 2010: 1781-1786.
18) Hule AK et al. An evaluation of the antidiabetic effects of Elaeocarpus ganitrus in experimental animals. Indian Journal of Pharmacology. 43(1); 2011: 56-59.
19) Rao KS et al. Hypoglycemic and antidiabetic potential of chitosan aqueous extract of Elaeocarpus ganitrus. International Journal of Research in Pharmacy and Chemistry. 2(2); 2012: 428-441.
20) Kakalij RM et al. Ameliorative effect of Elaeocarpus ganitrus on gentamicin-induced nephrotoxicity in rats. Indian Journalof Pharmacology. 46; 2014: 298-302.
21) Dadhich A., Antidepressant effects of fruit extract of Elaeocarpus ganitrus in force swim test. Int J Pharm Sci Res 2014; 5(7): 2807-12.doi: 10.13040/IJPSR.0975-8232.5 (7).2807-12
22) Bhattacharya SK, Debnath PK, Pandey VB, Sanyal AK, Pharmacological investigations on Elaeocarpus ganitrus, PlantaMedica, 28, 1975, 174-177
23) Shah G, Shri R, Mann A, Rahar S, Panchal V, Anxiolytic effects of *Elaeocarpussphaericus* fruits on the elevated plus-maze model of anxiety in mice, International Journal of Pharm Tech Research, 2(3), 2010, 1781-1786.