Biological Forum – An International Journal **15(5): 462-472(2023)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

A Review of the Pharmacological, Biological, Chemical and Therapeutic Value of *Elaeocarpus ganitrus Roxb.* (Rudraksha)

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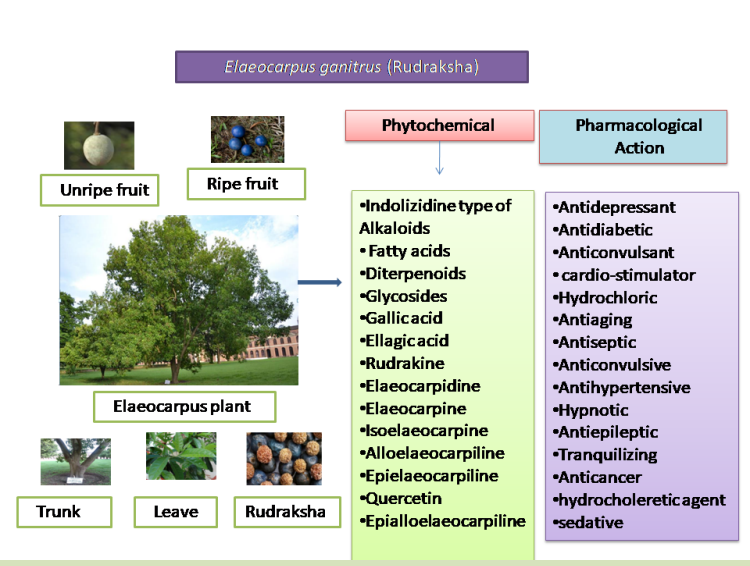
(Received: 24 February 2023; Revised: 16 April 2023; Accepted: 21 April 2023; Published: 20 May 2023)
(Published by Research Trend)

ABSTRACT: *Elaeocarpus ganitrus* plants are traditionally found in north Asian countries whose seeds (Rudraksha) are commonly used in various conventional systems of medicine for their great medicinal property. From ancient times it has been used for multiple diseases like stress, anxiety, Insomnia, improving immunity, tension, mental sicknesses, and blood pressure. As per the Ayurvedic medication system, wearing Rudraksha positively affects the heart and nerves. This review on Rudraksha endeavours to bring together the Pharmacological, Biological, chemical and therapeutic value of *Elaeocarpus ganitrus Roxb.* (Rudraksha). The inclusive and comprehensive literature on Rudraksha is prepared using different online resources, such as Google Scholar, PubMed, Science Direct, and further dependable online databases. Significant appropriate evidence from the articles analyzed and included. Rudraksha regulates our bioelectrical energy, positively impacting our body. It can be used for various common traditional medicinal diseases from mental sickness. With time, Rudraksha cures Insomnia, stress, anxiety, and similar disorders, and further scientific experiment is necessary to unleash their actual medicinal effect. This work aims to review the literature and get insight into the difficulties that new researchers and students have when studying the *Elaeocarpus ganitrus* plant. By addressing the existing problem of therapeutic usage of Rudraksha, research has contributed to a better world.

Keywords: Rudraksha, *Elaeocarpus ganitrus Roxb*, stress, anxiety, Insomnia.

Graphical Abstract:



INTRODUCTION

A set of plants employed in herbalism, or "herbal medicine," are called "medicinal plants". Herbalism includes the study of Ayurveda and such techniques and using plants for medicinal purposes (Bhattacharjee, 2000). Since the Stone Age, people have employed plants for medical purposes. Chinese literature, Egyptian papyrus, and ancient Unani texts describe herbs used for medicine (Sandeep Kumar Jain *et al.*, 2023). According to Unani, Indian Vaids and Hakims, Plants are referred to as "medicinal plants" when employed in the herbal medicine system to cure disease. Plants were used as medicine before the

prehistoric era(Sofowora, 1996). The World Health Organization (WHO) estimates that 80% of people utilize herbal remedies as a component of their primary healthcare. Rudraksha seeds are frequently made from *Elaeocarpus* plant species. These seeds are used for several medical treatments. It claims that Rudraksha seeds offer properties that fight off ageing, anxiety, dejection, diabetes, inflammation, convulsions, hypertension, and fungus. The use of Rudraksha for various forms of spiritual healing and for enhancing mental focus is strongly emphasized in ancient texts like Ayurveda (Houghton, 1995).

***Elaeocarpus ganitrus* Plant profile.** *Elaeocarpus ganitrus* plant (syn: *Elaeocarpus sphaericus*; belongs to the family Elaeocarpaceae) is a huge evergreen tree possessing large size leaf. *Elaeocarpus ganitrus* plant inhabits the zone from the Gangetic plain in the lower region of the Himalayas hills to South-East Asia Bangladesh, Burma, Indonesia, New Guinea, Nepal, and Hawaii, Bhutan, Australia. The Plant's familiar locality is Nepal, Indonesia, Bhutan, Bihar, Bengal, Assam, and Uttarakhand. *Elaeocarpus* plant was cultivated as a decorative plant in different parts of India (Soman & Surya 2018). This Rudraksha plant has perennial growth in the forest, which means it grows throughout the year. The Plant usually originates up to 2km above sea level. The plants belong to the genus *Elaeocarpus* and possess above 360 known species worldwide. The name of the word *Elaeocarpus* originated from two Greek words: Elaeo = olive and carpus = fruit, which means olive green colour fruits. The Hindu legends consider that anyone who wears a Rudraksha bead obtains the psychological and physical ability to get spiritual enlightenment. As per Ayurveda medication, Rudraksha controls diseases like hypertension, asthma, anxiety, diabetes, and gynaecological and neurological disorders (Lal, 2013). The *Elaeocarpus ganitrus* is a traditional medicinal plant with a rich record of ancestral healing in therapeutic science. Rudraksha is a conjugate word connected to Lord Shiva of Hindu mythology. The ancient Indian literature describes the significance of Rudraksha. "Rudra" is noted as "Shiva", and "Aksh" signifies "Eyes". These two words unite to form the word Rudraksha, which exactlyrepresents "the eyes of Lord Rudra". Rudraksha originates from the fruit stone of the *Elaeocarpus ganitrus* plant (Rudraksha tree). When this Plant blue coloured fruit pulp is removed,the Rudraksha bead comes outside. The Rudraksha bead is hard and bumpy in texture, alienated into the segment by ridge found from top to bottom. These ridges are called the faces of Rudraksha (Aryal, 2021). The Rudraksha seed is believed to possess some electromagnetic properties that help drive out negative energy. There are almost 300 species of *Elaeocarpus* plants found all over the world. In India, nearly 35 species of Rudraksha plant were found. Plant leaves, fruits, and seeds are used for several therapeutic and healing purposes.

Morphological Characteristics of *Elaeocarpus ganitrus* plant. The *Elaeocarpus ganitrus* **(**Rudraksha) is approximately 50-200 feet tall. This tree grows 14.70 meters to 29.50 meters in height, depending on the region and the type of weather. The diameter of the Rudraksha tree trunk ranges up to 1.23 meters in length. This Plant is cylindrical with a darkish white and uneven textured bark. In the natural habitat, the green crown of a Rudraksha gets a pyramidal shape (Krishna *et al.*, 2019).

- **Leaves**. *Elaeocarpus ganitrus* plant leaves appear almost like Indian mango plant leaves, and their length is nearly 18 cm and width varies from size 2.65 cm to 4.55 cm in length. The leaves of this huge Plant appear to shine deep green on the upper side and have a tedious leathery pattern on the dorsal side. At the early stage of the Plant, foliage is light green which turns into deep green with development. In the last step of life, the colour of leaves changes into yellowish red or grey deep brown before falling. This sequence of leaves carries on all through the year. The leaves have appeared Simple, glabrous, lanceolate in shape, irregular, acute, or acuminate in size(Mahomoodally & Sookhy, 2018).
- **Flower**. Rudraksha plants bear flowers of white colour or yellowish-white with fringed petals, which appear in April-May of the year. This flower has dense racemes; anthers are linear in shape. Flowers of the Rudraksha plant exhibit a soft sweat aroma or smell. The flowers of the Rudraksha appear in the bunch but are smaller than that of the leaf (Rai *et al.*, 2021).
- **Fruits.** Rudraksha Fruit is bulbous in shape with fatty acid in the outer part. These fruit shapes are circular, elliptical or oval, violet or blue, andthe pulp is acidic in pH. The fruit endocarp is a Stony, hard, globular, strong tubercle (Joshi *et al.*, 2012).
- **Seed.** Rudraksha dark bluish colour fruits dipped in water for a few days to remove their outer covering and get a hard stony source. Rudraksha seeds are hard and woody on the surface, with light chocolate colour juice enclosed within the pulp of the berry. Seed colour varies from dirty white-yellowish, reddish-brown to brownish-black. The seeds are typically sphere-shaped witha rough exterior with a vertical hole in the centre, leading from top to bottom. Every Rudraksha seed has an altering number of perpendicular lines that run down on its exterior, forming the 'Mukhs' or Rudraksha faces of the seed. Rudraksha seed price varies based on these faces or 'mukhs' from a few bucks to million rupees. The faces or mukhs in each Rudraksha seed can range from 1 to 24. Rudraksha seeds are also called blueberry beads due to their appearance. The Rudraksha tree matures after seven years and continues to produce fruits for a long time after seven years (Rashmi & Amrinder 2014).

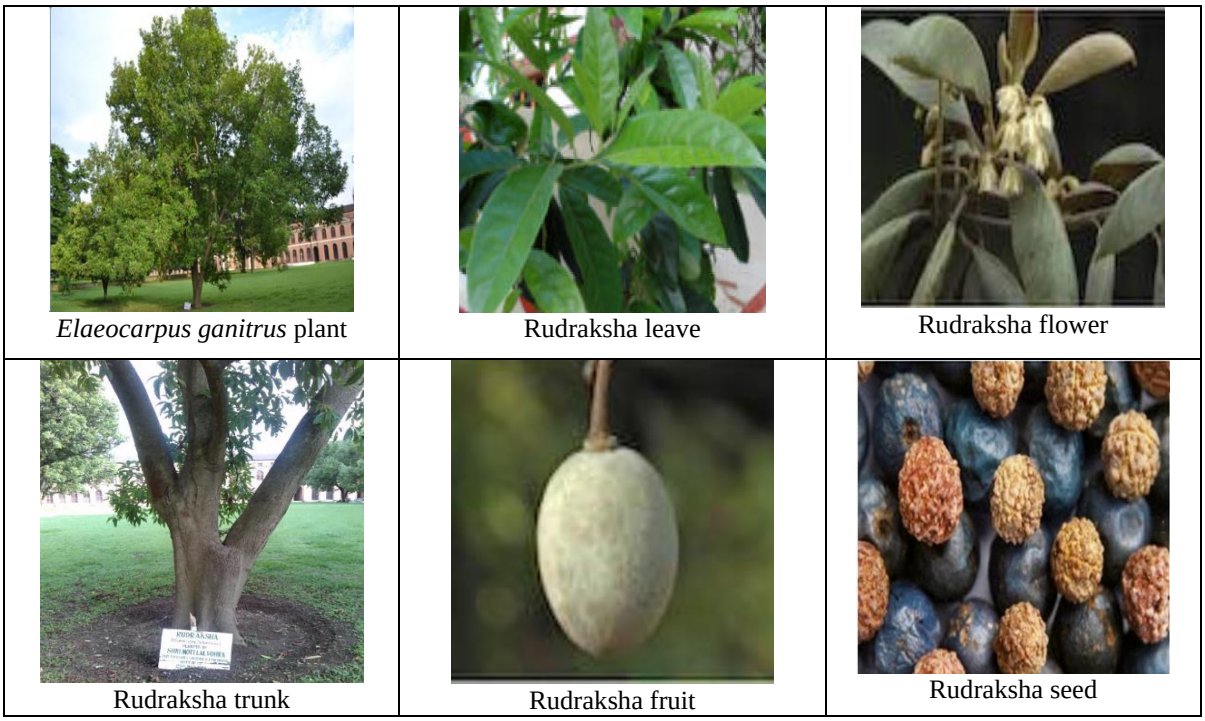


Fig. 1. Morphology of Rudraksha (Priya, 2014; Ritu *et al.*, 2016; Tripathy *et al.*, 2021).

Microscopy *Elaeocarpus ganitrus* (Rudraksha). Rudraksha seeds are oval and contain a membranous root. *Elaeocarpus ganitrus* shows parenchymatous cells, epidermis, lateral vein, vascular bundle, calcium oxalate crystals, unicellular trichomes, xylem, phloem covering, etc. Always prominent funicle found at one ending of the hard seed. Rudraksha seed is covered with thick cellular endosperm. The endosperm cells run with a parallel solid row. Rows are extended from the margin to the centre. Endosperm cells found to the margin are less significant and turn slowly larger towards the middle of the seed (Rai *et al.,* 2019). Endosperm cells in embryos have giant calcium oxalate crystals, or they contain sphaerocrystals.

Similarly, the transverse part of the leaf is disturbed into three parts: mesophyll, epidermis, and vascular bundle. Microscopically examining a transverse section of the leaf shows the presence of cuticle collenchymas, epidermis, collenchymas, vascular bundles and palisade cells. The epidermis of the Rudraksha plant is found on both higher and lower surfaces and is single-layered. Densely arranged parenchyma cells are covered outwardly with a cuticle. Leaves sometimes contain hairy trichomes. The mesophyll is present among the outer and inner sides of the epidermal layers.

Vascular bundles are collateral-type closed vascular bundles. The transverse section of the seed reveals the presence of a hard endocarp encompassed by lignin-deposited isodiametric sclereids, seeds having membranous seed coats, which enfolded a dense cellular endosperm incorporating calcium oxalate druses. Palisade cells are made up of two-layer of extended, efficiently precise chlorenchyma. When seen carefully in the microscope, the mesophyll's vascular strands and prisms of calcium oxalate cells are present. The epidermal layers of the leaf are incessant in the midrib region (Garg *et al.,* 2013). The epidermis contains 2-3 layers of collenchymas cells. The mass of the midrib part is made up of elliptical parenchyma cells. Almost 3-9 vascular bundles layer is present near the centre of the midrib region. The stomata cells found to a considerable extent in the leaf. Stomata are present in the lower part of the epidermis. Trichomes of Rudraksha leaf are elongated and have glandular outgrowth on the epidermal cell, and trichomes found are unicellular.

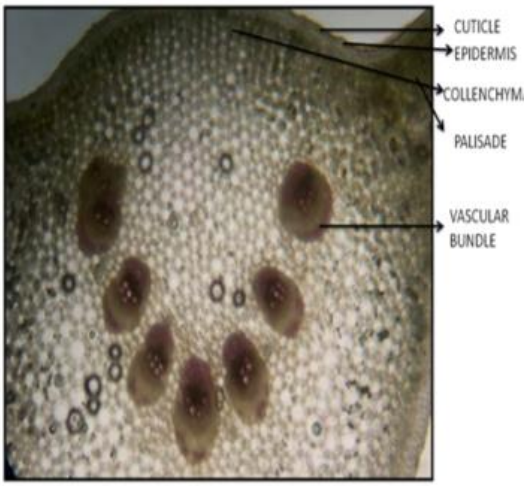


Fig. 2. Transverse section of *Elaeocarpus ganitrus* (Rudraksha) leaf (Bharti, 2018).

Cultivation and collection of *Elaeocarpus ganitrus.* Rudraksha tree germination is very slow, and cultivation is a complicated process. The rising demand and underprivileged germination always affect the *Elaeocarpus ganitrus* natural restoration in nature. The tree typically originates up to 2000 meters over the mean sea level (*Singh et al.,* 2015). The group of *Elaeocarpus* plants typically prefers a slightly warm moist climate for germination. The Rudraksha tree

considers a very sacred tree. This Plant occurs in various surroundings like moist gullies, stony ridges, and grimy coastal areas. Rudraksha trees require well-drained with moist tropical and subtropical soil for germination. Some Elaeocarpus species are recognized to live and survive in excellent or low-nutrient soils and dry soil. Some *Elaeocarpus* species cultivate in marshes and soft sweat water places (Singh *et al.*, 2015). The normal re-growth of Rudraksha is a sluggish procedure due to slow germination speed as it contains a hard seed coat. The seeds require almost two years to develop on the soil's dampness. Normal germination of *Elaeocarpus* (Rudraksha) is less than five percent in inclement conditions. The germinating seeds are also susceptible to fungal infection.

Rudraksha tree begins bearing fruits once it passes 3-4 years and continues producing fruit until its urvives (Prasannan *et al.*, 2020). Various fungi destroy the fruits, and viruses and fauna like Squirrels, Civet Cats, and insects are pollinator inhabitants. In Nepal, the manor of trees cultivated on homestead lands is both for its business esteem and for improving soil richness. On slope inclines, it forestalls soil disintegration. Rudraksha is a quickly developing plant category and has been incorporated under the social park ranger service program of Arunachal Pradesh and has been planted alongside the road. The germination of Rudraksha is poor and unpredictable. Thus, it is a troublesome undertaking to bring the seedlings up in the nursery (Vuong *et al.*, 2018). So, in the nursery, tissue culture is generally employed for germinating the Rudraksha plant.

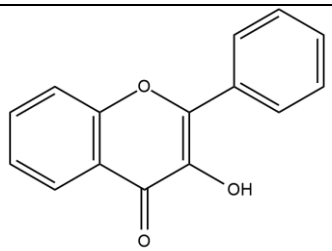
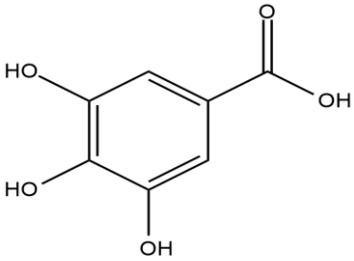
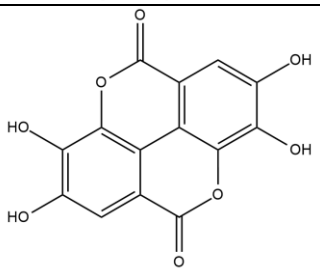
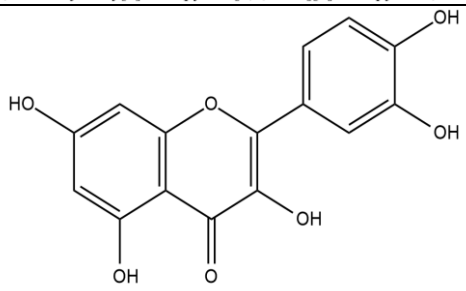
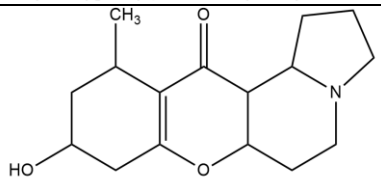
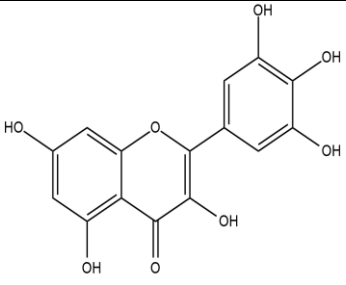
Scientific technique for testing actual *Elaeocarpus Ganitrus* seed (Rudraksha). Rudraksha seeds are considered very difficult to obtain and valuable. The most proportion of Rudraksha produce from *E. ganitrus* plant are five faces, but Rudraksha Price goes up if no look raises on the surface or more than ten or only one face grove on its surface. Due to growing demand, imitation of replica Rudraksha beads are also there in the marketplace, and this imitation of Rudraksha bead requires a routine test to recognize its originality (Naresh *et al.*, 2013).

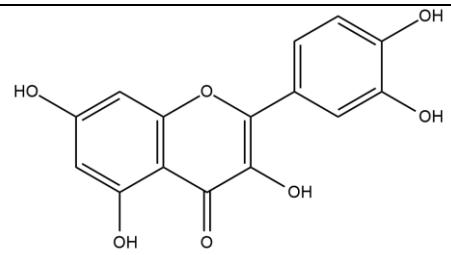
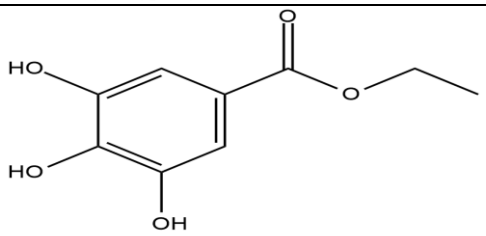
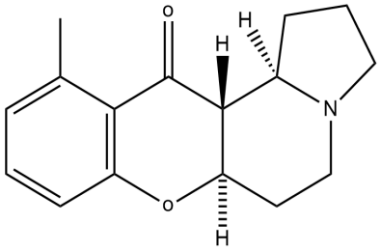
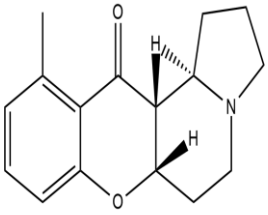
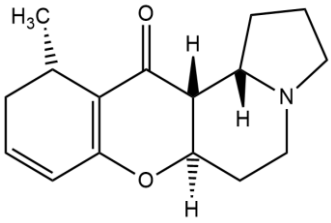
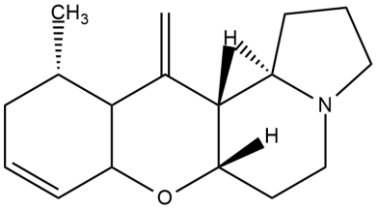
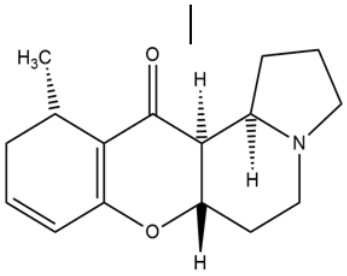
- **Properties Test:** This test is conducted to know information, whether the seeds show properties similar to capacitance, inductance, conduction of electricity, and electromagnetic resonance.
- **Cut Test:** It is considered the most reliable method, but Rudraksha seed spoils permanently with no further use in this test. When an *E. ganitrus* seed is cut in a straight line, then an equal number of sections as the number of lines appears (Prasannan *et al.*, 2020).
- **Eye test:** Overtime and again, the false or the fake *E. ganitrus* seed may seem the same as the genuine one, but these counterfeit Rudraksha seeds cannot be made as genuine as those on the real Rudraksha. This is a usual partition on Rudraksha, just like the Natural Grove. One can see these deep linings (facets) with the help of a magnifying glass (Lenses).
- **Copper Coin Test:** It is believed that when an *E. ganitrus* seed is situated in the middle of two copper coins, it will somewhat move clockwise or anticlockwise. This condition happens due to the electrical and magnetic character of the Rudraksha seeds (Prasannan *et al.*, 2020).
- **X-Ray:** In an X-ray method, one can see the internal arrangement without damaging the seeds. X-ray tests lacked difficulty for Rudraksha up to nine Mukhi, but when Rudraksha has more than 10 Mukhi, it may not give 100% precise results due to the overlap of the interior seeds line.
- **Water test:** Variousrandom rare and precious Rudraksha seeds like Gauri Shankar Rudraksha or a trijuti Rudraksha made artificially by unnaturally joining two or three Rudraksha with the glue; if it is kept inboiling water for some time, a razor-sharp band appears at the joint if it is made of synthetic artificial Rudraksha (Farnsworth, 1966).
- **CT scanning:** CT scanning method is a very complex process for recognizing Rudraksha but is more costly than X-ray. In this method, the apparent result can get for higher face Rudraksha.

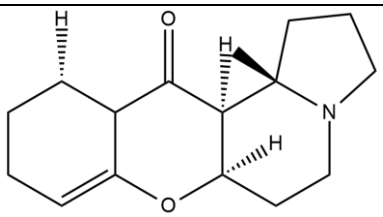
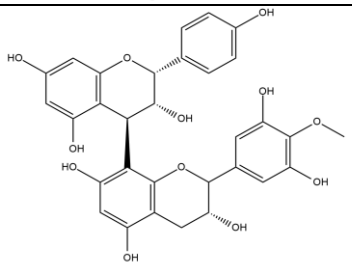
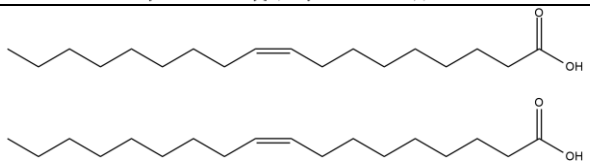
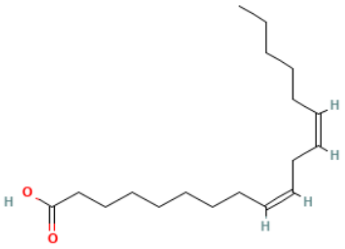
Chemical composition of *Elaeocarpus ganitrus*:

The preliminary Phytochemical studies for Ethanol extracts of *E. ganitrus* show proteins, Glycosides, Amino acid Alkaloids, Flavonoids, Fatty acids, tannins, and carbohydrates. The Rudraksha seed of the *Elaeocarpus* plant contains Carbon (C), Hydrogen (H), Oxygen (O), Nitrogen (N) and different trace phytoconstituents in a combined form. *Elaeocarpus* leaves laboratory tests proves that it has a significant source of bioactive compound like fatty acid alcohols, esters, aldehydes, hydrocarbons, alkenes, fatty acids amides, etc. In addition to fruit, an ethanolic extract from the leaves of *E. ganitrus* yielded quercetin, fatty acids and gallic acid (Prasannan *et al.*, 2020b). The quercetin chemical constituent remains in *E. ganitrus* seeds as glycoside (Arivu & Muthulingam 2017). Rudraksha contains the indolizidine type of alkaloids. (-)-isoelaeocarpilineand (+)-elaeocarpiline, which are common phytoconstituents. Elaeocarpidine, (+)-Epiisoelaeocarpiline, (+)- Isoelaeocarpin, (+)-Elaeocarpine, (+)- Pseudoepiisoelaeocarpiline, (+)-Epiialloelaeocarpiline and Rudrakine are al so most prevalent phytoconstituents in Rudraksha plants.

Table 1: Phytoconstituents of *Elaeocarpus ganitrus.*

Phytoconstituents	Structure	Solubility (solvent)
Flavonol	 3-hydroxy-2-phenylchromen-4-one	Ethanol, water, methanol, Dimethyl sulfoxide (DMSO), and Dimethyl formamide (DMF).
Gallic acid	 3,4,5-trihydroxy benzoic acid	Methanol, ethanol, water, and ethyl acetate
Ellagic acid	 2,3,7,8-Tetrahydroxy[1]benzopyrano[5,4,3-cde][1]benzopyran-5,10-dione	Dimethyl sulfoxide (DMSO), Slightly *soluble in alcohol.*
Quercetin	 2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxychromen-4-one	Ethanol, water, Organic solvents like methanol, Dimethyl sulfoxide (DMSO), and Dimethyl formamide (DMF).
Rudrakine	 9-hydroxy-11-methyl-2,3,6,6a,8,9,10,11,12a,12b-decahydro-1*H*-chromeno[2,3-*g*]indolizin-12(5*H*)-one	Water, Alcohol
Myricetin	 3,5,7-trihydroxy-2-(3,4,5-trihydroxyphenyl)-4H-1-benzopyran-4-one	Ethanol, DMSO, DMF

Kaempferol	 2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxychromen-4-one	Sparingly soluble in water, Hot ethanol, and diethyl ether
Ethyl gallate	 ethyl 3,4,5-trihydroxybenzoate	Ethanol, DMSO, DMF
Elaeocarpine		Water, Alcohol
Isoelaeocarpine	 11-Methyl-1,2,3,5,6,6a,12a,12b-octahydro-12H-[1]benzopyrano[2,3-g]indolizin-12-one	Water, Alcohol
Alloelaeocarpiline		Ethanol
Epielaeocarpiline		Ethanol
Epialloelaeocarpiline		Ethanol

Isoelaeocarpiline		Ethanol
Proanthocyanidins	 (3R)-2-(3,5-dihydroxy-4-methoxyphenyl)-8-[(2R,3R,4R)-3,5,7-trihydroxy-2-(4-hydroxyphenyl)-3,4-dihydro-2H-chromen-4-yl]-3,4-dihydro-2H-chromene-3,5,7-triol	Water
Oleic acid	 Oleic acid (Z)-octadec-9-enoic acid 18:1n-9	Amyl acetate, alcohol, CCl_4 $CHCl_3$
Palmitic acid	 hexadecanoic acid	Water
Linoleic acid		Ethanol, Benzene, Acetone, Ethyl ether

Ethnomedicinal Uses Rudraksha. Rudraksha seeds have numerous health benefits, as per Ayurveda. Rudraksha seeds cure sicknesses like anxiety, Insomnia and nervousness, lack of concentration, depression, hypertension, rheumatism, and infertility, and all possess immune modulator properties (Kumar *et al.*, 2021). Rudraksha has properties like asthma and anti-ageing effect. Wearing the Rudraksha seed affects the body and performs heal various diseases due to its electromagnetic impulse.

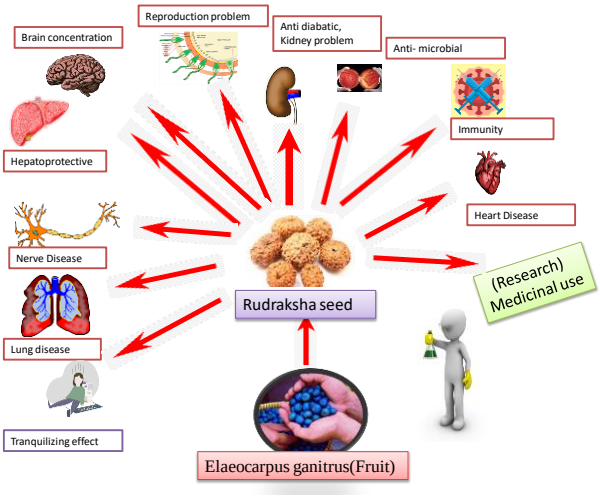


Fig. 3. Rudraksha medicinal use.

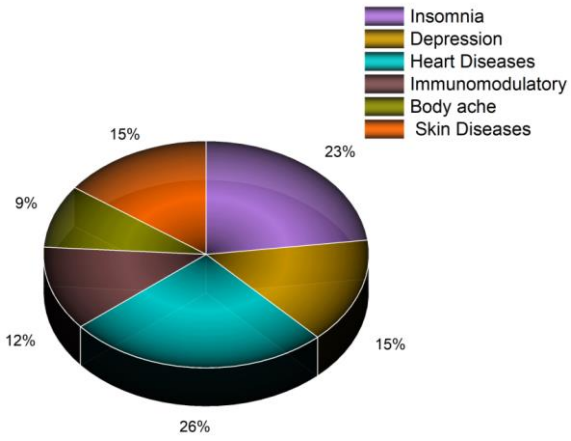


Fig. 4. Traditional use of Rudraksha.

Table 2: Pharmacological Activity study on different varieties of *Elaeocarpus* plant.

Researcher	Species of *Elaeocarpus*	Objective	Plant Extract and Method	Activity and Result
• **Antimicrobial activity**				
(Singh & Nath 1999)	*Elaeocarpus sphaericus*	Antimicrobial activity study of *E. sphaericus*	Petroleum ether, benzene, chloroform, acetone and ethanol	Antimicrobial activity conforms against ten microorganisms.
(Kumar *et al.*, 2011)	*Elaeocarpus ganitrus*	Antimicrobial activity of *E. ganitrus* studies by *In- vitro* method	Aqueous extract	Potential use of *E. ganitrus* leaves for the development of antimicrobial compounds.
(de Lima *et al.*, 2019)	*Elaeocarpus serratus*	To know the bioactive compounds and antimicrobial activity of *E. serratus* fruit extract.	Ethanolic extract of the fruit	The antimicrobial activity showed against *B. cereus, E. coli, S. cholaresuis, S. aureus* and *X. campestris*.
(Jayashree *et al.*, 2014)	*Elaeocarpus serratus*	Evaluation of antimicrobial Potential of *E. Serratus*	Acetone and methanol extracts	Broad spectrum antimicrobial perspective in the management of microbial infections obtained.
(Sakha *et al.*, 2018)	*Elaeocarpus ganitrus* with other plant species	Antimicrobial activity studied against human pathogenic bacteria	Ethanolic extracts	*E. ganitrus* leaves showed the most promising antimicrobial activity against *S. aureus*
(Manoharan *et al.*, 2019)	*Elaeocarpus tectorius*	Antioxidant and antimicrobial investigations of *E. tectorius*	Petroleum, ether, Dichloromethane, Ethyl acetate, Methanol and water	The herbal drug formulation can be used for treating UTI
(Ogundele *et al.*, 2021)	*Elaeocarpus floribundus*	To know Antimicrobial and α-Amylase Inhibitory Activity	Hydroethanolic extract	The promising positive result obtained
(Singh *et al.*, 2010)	*Elaeocarpus ganitrus*	Pharmacognostic and antifungal study of plant *E. ganitrus* extract	Ethanol	Effective antifungal activity against *C. albicans*.
• **Anticancer activity**				
(Fang *et al.*, 1984)	*Elaeocarpus dolichostylus*	To study Cytotoxicity and Anticancer activity	Ethanol	Isolated phytoconstituents in plants responsible for cytotoxicity
(Turner *et al*., 2020)	*Elaeocarpus reticulatus*	The study aimed to isolate and identify potential anti-Pancreatic cancer cell compounds in the fruit of *E. reticulatus*	50% acetone	Positive results obtained in the crude extract
(Balamurugan *et al*., 2022)	*Elaeocarpus variabilis Zmarzty*	This study focused on the determination of secondary metabolites for anticancer activity.	Ethyl acetate extract	Positive anticancer activity obtained in the crude extract

• **Antidiabetic activity**				
(Hule *et al.*, 2011)	*Elaeocarpus ganitrus*	To study Antidiabetic effects of *E. ganitrus* in experimental animals.	Water	The significant hypoglycemic activity was noticed in the extract in STZ-induced diabetic rats.
(Tripathi *et al.*, 2015)	*Elaeocarpus ganitrus*	To know the Antihyperglycemic effects of *E. ganitrus Roxb* (Rudraksha) in Streptozotocin-Induced diabetes.	Methanolic extracts	Methanolic extract of *E. ganitrus* seeds possesses potent hypoglycemic activity.
(Rao *et al*., 2012)	*Elaeocarpus ganitrus*	To know the hypoglycemic and antidiabetic potential of aqueous chitosan extract of *E. ganitrus*.	Aqueous extract	The chitosan-based extract improved the antidiabetic activity.
(Keerthana & Chitra 2020)	*Elaeocarpus tectorius*	To know antidiabetic activity of chemical constituents in *E. tectorius* fruits	Ethanolic extracts	*E. tectorius* has good potential source of antidiabetic compounds.
• **Antidepressant Effect**				
(Dadhich *et al*., 2014)	*Elaeocarpus ganitrus*	Evaluate antidepressant effects of fruit extract of *E. ganitrus*	75% ethanol extract	Exhibit antidepressant effect in tested animals in low dose but sedative at high dose.
(Singh *et al*., 2012)	*Elaeocarpus ganitrus* with *Centaurea behen* Linn.	The antianxiety activity of an *E. ganitrus* with *Centaurea behen* Linn.	Petroleum ether, chloroform, ethanol and water	A potential candidate for bioactivity-guided isolation of natural antianxiety agents.
• **Asthmatic Activity**				
(Cho *et al.*, 2013)	*Elaeocarpus petiolatus*	Inhibitory asthmatic activity on OVA-induced mouse	Ethanol	A positive result was found.
• **Ameliorative activity** .				
(Kakalij *et al*., 2014)	*Elaeocarpus ganitrus*	The study aims to evaluate the ameliorative effect	*E. ganitrus* crude drug100, 200, and 400 mg/kg body weight	*E. ganitrus* seeds have immunomodulatory and nephroprotective activity.
• **Antihypertensive effect**				
(Sakat *et al.*, 2009)	*Elaeocarpus ganitrus*	Evaluations of antihypertensive activity	Aqueous extract	Antihypertensive activity of the aqueous extract of *E. ganitrus* may be due to the action on the rennin-angiotensin system.
• **Mast-cell stabilizing activity**				
(Singh *et al.*, 2000)	*Elaeocarpus sphaericus*	Study on rat mast cell to investigate the effect of *E. sphaericus* fruits on Autacoids.	Petroleum ether, benzene, chloroform, acetone, ethanol	*E. sphaericus* fruits were found to have mast-cell stabilizing activity.
• **Parkinson's disease**				
(Singh *et al.*, 2000)	*Elaeocarpus floribundus*	The study aims to isolate flavonoids from *E. floribundus*; and evaluation of MAO inhibitory properties	flavonoids from Plant were chosen for the experiment	Myricitrin inhibited MAO in the mouse brain and elevated dopamine levels

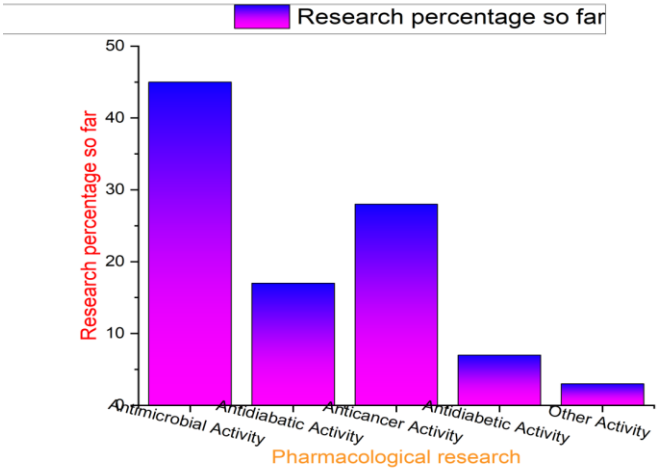


Fig. 5. Various pharmacological Research on Rudraksha.

DISCUSSION

This literature survey explores the significance of the Rudraksha medicinal properties with its Pharmacological and biological importance. Rudraksha seeds are considered a precious therapeutic gift of nature to humanity. When Rudraksha touches the human body's skin for a prolonged period, it slowly heals various diseases like blood pressure, restlessness, anxiety, nervousness, Impotence, etc. Rudraksha's therapeutic values are due to its electromagnetic property. Rudraksha seeds must apply to the human skin like the Acupressure and Magnetic Healing technique for remedial healing. The wide-reaching literature study shows that *Elaeocarpus ganitrus* is a vital herb of nature. It has tremendous pharmacological and medicinal significance, and various bioactive extracts of *Elaeocarpus ganitrus* display multiple kinds of health improvement.

CONCLUSION AND FUTURE SCOPE

These observations obtained by various literature surveys are limited and cannot be extrapolated to know Rudraksha's medicinal significance in modern times. Rudraksha's therapeutic effect is due to its impact on humans' bioelectricity. However, these findings also need to study with a different up-to-date new scientific methodology for further clarification. From an extensive literature survey, we can conclude that Rudraksha seeds have some bioelectricity-generating properties, which can be used for various medicinal healing properties. This Review highlights the potential usefulness of *Elaeocarpus ganitrus* and suggests the future Scope of the Plant.

Acknowledgement. I would like to thank my supervisor for his constant help, support and encouragement in preparing the manuscript

Conflict of Interest. None.

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How to cite this article: Subhashish Tripathy, Amit Mishra and Arun Kumar Mishra (2023). A Review of the Pharmacological, Biological, Chemical and Therapeutic Value of *Elaeocarpus ganitrus Roxb.* (Rudraksha). *Biological Forum – An International Journal, 15*(5): 462-472.