

Scientific Research on *Elaeocarpus Ganitrus* (Rudraksha) for its Medicinal Importance

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Abstract: *Rudraksha (Elaeocarpus ganitrus)* owes an important status both in Ayurveda as well as in Hindu mythology for its curative and spiritual Benefits, respectively. Hindu mythology believes that, anyone who wears Rudraksha beads get the mental and physical prowess to get spiritual illumination. In traditional system of medicine, different parts of rudraksha such as beads, bark, leaves and outer shell of beads are taken for the alleviation of various health problems such as mental Disorders, headache, fever, skin diseases, and for healing the wounds. Rudraksha Beads have been traditionally used in India and other Asian countries As stated by Ayurveda system of medicine, Wearing Rudraksha beads relieves strain, anxiety, lack of concentration, insomnia, depression, hypertension, Palpitation, infertility, rheumatism, and asthma. Present investigation as a review has been attempting to make the Collections of the details like botanical, ethnomedicinal, pharmacological information and therapeutic potential of *Elaeocarpus ganitrus* on the basis of recent scientific research.

Keywords: *Rudraksha*

I. INTRODUCTION

Elaeocarpus commonly called Rudraksha, a genus of the family *Elaeocarpaceae*, is a large evergreen, drought-tolerant, perennial, Broad-leaved tree with a large spreading crown and attains a Height of about 15.0-20.0 m. The Hindu mythology considers Rudraksha as symbol of link between earth and heaven. It is believed that it contains the secrets of evolution of entire cosmos within itself. A categorization of rudraksha fruits as Thermogenic, sedative, cough alleviator is mentioned in some ayurvedic texts and are useful for the treatment of Bronchitis, neuralgia, cephalgia, anorexia, migraine, manic conditions and other brain disorders.

Rudraksha- factually means "Shiva's tears" which is believed as the seed of *Elaeocarpus* species. The word *Elaeocarpus* is derived from the Greek word *Elaeo* = olive and *carpus* = fruit (referring to olive-like fruits produced by the genus). Rudraksha seeds are covered with a blue outer husk when fully ripe and are also known as blueberry beads. The blue color is not derived from pigment but is structural. According to the Hindu mythological story in Puranas, the seed of *Elaeocarpus* was created from the tears of the lord Shiva which were fallen from his eyes after a prolonged fight with a demon called Asur. Pharmacologically, Rudraksha beads have been reported for their therapeutic potential against several disorders Like stress, anxiety, depression, palpitation, nerve pain, Epilepsy, migraine, lack of concentration, asthma, Hypertension, diabetes, arthritis and liver diseases. Pharmacologically, Rudraksha beads have been reported for their therapeutic potential against several disorders like stress, anxiety, depression, palpitation, nerve pain, epilepsy, migraine, lack of concentration, asthma, hypertension, diabetes, arthritis and liver diseases .

Rudraksha beads Might have exhibited multiple pharmacological activities. In the Last few decades, the phytochemical composition of *Elaeocarpus* Has also been studied extensively (Miller et al., 2006). Various Extracts from the different *Elaeocarpus* parts have revealed The presence of alkaloids, phenolics, tannins, flavonoids, and Fatty acids .Rudraksha is the King of herbal medicine working Effectively and positively, are measured to be sacred and Have many spiritual and medicinal values both as Defensive and remedial. It is further believed that the Rudraksha tree also possesses dielectric and magnetic Properties, which may impart positive changes in the human body .Present review has been attempting to make to collect the botanical, Ethnomedicinal, pharmacological information and therapeutic utility of *Elaeocarpus ganitrus* on the basis of current science.



II. BOTANICAL DESCRIPTION

It is a large evergreen tree having large leaves. Its height Ranges from 50–200 feet. Leaves are large and shining green On the sun facing side and dull stringy on earth facing side. Flowers become visible in the month of April- May and are White or yellow in colour. Origin and distribution Rudraksha botanically Called Elaeocarpus ganitrus raise in tropical and Subtropical regions at the eminence ranging from Seacoast to 2,000 meters above the sea level.

III. SCIENTIFIC CLASSIFICATION

Kingdom :Plantae
 Sub kingdom :Viridiplantae
 Super division :Embryophyta
 Division :Tracheophyta
 Sub division :Spermatophytina
 Class :Magnoliopsida
 Order :Oxalidales
 Family :Elaeocarpaceae
 Genus :Elaeocarpus
 Species :Ganitrus



IV. ACTIVE CONSTITUENTS

The Elaeocarpus ganitrus fruit have many phytoconstituents Such as alkaloids, flavonoids, tannins, carbohydrates, Steroids, triterpenoids and cardiac glycosides. Also contains A significant amount of phytocomponents such as Isoelaecarpicine, elaeocarpine, isoelaecarpine and Quercetin, gallic, ellagic acids and rudrakine. Rudraksha

beads contains carbon, hydrogen, oxygen, Nitrogen and trace elements in combined form. Percentage Composition of gaseous elements in rudraksha beads are 50.031%, 17.897%, 30.53%, 0.95% respectively.

Rudraksha contains indolizidine type of Alkaloids. The indolizidine alkaloids display a wide Range of biological activities and have been the Subject of numerous synthetic studies It also contains minerals, vitamins, steroids, Flavanoids. Aqueous extract of leaves contains Glycosides also. Ethanollic extract of leaves contains Gallic acid, ellagic acid and quercetin. Rudraksha Contains indolizidine type of Alkaloids. Indolizidines Are widely distributed in nature-in plants as well as in Many animals.

Table 1: Provisioning services of Rudraksha species with their functions.

Particulars	Species	Roles or functions	References
Food and Timber	E. floribundus Blume E. lanceifolius Roxb. E. munroii Mast. E. serratus L. E. sphaericus K. Schum. E. griffithii A. Gray E. reticulatus Sm	Fuel and energy (e.g., fuelwood, organic matter), fodder, and fertiliser (e.g., krill, leaves, litter)	Vuong et al., 2018
Genetic resources	E. griffithii A. Gray E. serratus L. E. glandulosus Wall. E. dolichostylus Schltr	Drugs and pharmaceuticals	Pezzuto et al., 1984; http://naturalheritage.intach.org
Biochemicals and secondary metabolite production	E. reticulatus Sm. E. eumundi F.M. Bailey E. sylvestris Lour. E. lanceifolius Roxb. E. dolichostylus Schltr. E. tonkinensis A. DC	---	Singh et al., 2018; Dao et al., 2019
Medicinal resources	E. venustus Bedd. E. tuberculatus Roxb. E. sphaericus K. Schum. E. lanceifolius Roxb.	Resources for fashion, handicraft, jewellery, pets, worship, decoration	http://naturalheritage.intach.org

Traditional Properties

Elaeocarpus sphaericus is also useful in mental Diseases. Milk boiled with four faced Rudraksha seed Is good medicine for mental diseases. This also helps In increasing memory.

Elaeocarpus sphaericus is also useful for women Suffering from hysteria and coma.

It cools down the body temperature and brings calm To mind. Those who suffer from anxiety should keep Big size five mukhi Elaeocarpus sphaericus with Themselves and whenever they feel nervous; they Should hold them tight in their right palm for ten Minutes. It will help them to regain their confidence And their body would become stable.

Elaeocarpus sphaericus also possess anti ageing Property.

Elaeocarpus sphaericus imposes positive effect on Stress, Anxiety, Depression, Palpitations and Lack of Concentration To cure smallpox equal quantity of black pepper and Elaeocarpus sphaericus should be powdered and Taken with water.

Ayurvedic Properties of Rudraksha

Ayurveda refers to this wonderful bead and Gives details of rudraksha for strengthening body Constitutions.

The beads of rudraksha, its bark and Leaves all are used to cure various ailments like Mental disorders, headache, fever, skin diseases etc.

The beads, bark and leave Of Rudraksha all are used to cure various ailments like Mental disorders, headache, fever, skin diseases etc. Rudraksha may be worn either on arm, wrist or other Parts of the body.

Rudraksha can be used for treating all brain diseases like Brain fever etc.
 Rudraksha can be used for improving memory power When taken with milk.
 Rudraksha can be used in cosmetics to bring skin glow, Also brings in a charming face.
 As a blood purifier: Rudraksha Shall be used for treating the blood impurities and Strengthens the body substance.
 For curing liver related problems, jaundice, and Stomach ach Rudraksha can be used for treating stomach pain and Liver problems.
 Rudraksha can be Used in cosmetics to bring skin glow, also brings in a Charming face. For improving memory powers.
 For blood pressur Rudraksha can be used to treat high blood pressure, heart Diseases etc.
 For curing liver related problems, jaundice, and Stomach ach Rudraksha can be used for treating stomach pain and Liver problems.
 Rudraksha can
 Be used for treating stomach pain and liver problems. Modern science has shown that the electromagnetic Nature of rudraksha beads affect our neurophysiology In a specific manner that allows control of heart beat, Blood pressure, stress levels, hypertension and at the Same time relieves anxiety, depression and neurotic Condition.

V. SCIENTIFIC GAPS IN RUDRAKSHA RESEARCH

Several reports related to biochemical constituents in Rudraksha bead are available in literature. These revealed presence of glycosides, alkaloids, Minerals, vitamins, steroids, flavanoid, gallic acid, Ellagic acid and quercetin in Rudraksha. Reported the electromagnetic characteristics of Rudraksha on dracaena plant. Authors divided each plant into two zones, i.e., Positive region (stem) and Negative Region (plant leaf). The study reported that The electromagnetic properties of Rudraksha beads activate body's energy wheel, which in turn influences the bioelectrical properties of human body and heals various chronic diseases like blood pressure, heart rate, **diabetes, gynaecological** Problem, neurological disorders, mental problem, Insomnia and rheumatism.

IN VITRO ANALYSIS

The antimicrobial, antioxidant, anti-cancerous, and Immunomodulatory activities of different solvent Mediated Rudraksha extracts have been studied. Chemically the extracts showed the presence of Phytosterols, fats, alkaloids, flavonoids, carbohydrates, Proteins and tannins. The tree is well known for its medicinal and religious value in India. In Ayurveda, the seed is used for the treatment of hypertension, insomnia, psychoneurosis and mental diseases. The aqueous extract of fruit is hypotensive, sedative, spasmolytic, anticonvulsant, choleric, bronchodilatory and cardiostimulant and the stem bark is hypoglycaemic.



Fig :- Different stages of micropropagation of Rudraksha (*Elaeocarpus sphaericus*): Bud breaking in nodal explants (a), Multiple shoots formation with casein hydrolysate (b), Multiplication and growth in MS medium containing 2 µM BA (c), Rooting of microshoots in MS medium (d), Rooting of microshoots in MS media containing 5 µM NAA (e), Micropropagated plantlets transferred for hardening under greenhouse conditions (f), Well acclimatized and grown plants in earthen pots placed under shade net nursery condition (g), 2 years old micropropagated plants before transfer to plantation site at HAPPRC premises (h) and well grown 3 years old plants in HAPPRC premises at Srinagar-Garhwal (i)

In vitro (tissue culture) techniques have become a useful alternative to conventional methods of propagation providing a faster and better means for conservation of such plants

The microbial load such as total bacterial count And fungal count (Enterobacteria, Escherichia coli, Salmonella species, Staphylococcus aureus and Pseudomonas aeruginosa) and antibacterial activity were Measured using serial dilution method and Kirby bauer Method, respectively, for selective pathogens. The study Results demonstrated potent antibacterial activity of all E. Ganitrus extract against gram-positive and gramnegative bacteria.

IN VIVO ANALYSIS

Examined antihypertensive effect Of E. ganitrus on male Wistar rats. To perform the Analysis, powdered seeds were extracted by Maceration using water in copper (E1) and glass Vessel (E2) and analyzed for antihypertensive Activity in cadmium chloride (1 mg/kg Intraperitoneally; for a period of 15 days) induced Rats.

In mainly biological studies, E. ganitrus exhibited the Broad range of pharmacological actions and identified as Active beside specific biological targets during large scale Screening of multiple plant extracts. On the basis of a Variety of in vitro, investigational and scientific Researches, the following pharmacological activities of E. Ganitrus have been reported. Literature information are Available on a mixture of pharmacological effects which Include analgesic, CNS activities, typical behavioral Actions, sedative, tranquilizing, hypnosis potentiation, Anti-inflammatory, antiasthmatic, antidepressant, Antidiabetic, cardio stimulation, hydrocholeretic, Anticonvulsant and antihypertensive,

Evaluated antidepressant Effects of Rudraksha Bead extract (75% ethanol) in Albino mice. Study was carried out on Group I (Untreated Control received vehicle (Distilled Water)), Group II (Control (Fluoxetine) 20 mg/kg Body weight) and Group III (Control (Imipramine) 15 mg/kg) administrated orally with distilled water. Group IV, V, VI and VII were administered orally With different doses (20, 40, 60 and 80 mg/kg body Weight) of E. ganitrus fruit extract (EGFE). Antidepressant effect of EGFE was assessed by Forced swim test. EGFE (20 and 40mg/kg) Significantly decreased the immobility time and Increased climbing and swimming time significantly. Duration of immobility of mice increased at high Dose (80mg/kg) as compared to vehicle. It is Concluded that while EGFE exhibited antidepressant Effect at low dose, at high dose it was sedative.

The extract of E. Ganitrus seed Significantly ($P < 0.05$) reduced blood glucose level in Alloxan induced diabetic rats after twelve hours of Administration. Results supported traditional uses of E. ganitrus seed for the management of diabetic sores. Tripathy et al. (2016-c) also examined antihyperglycemic Effect of methanolic seed extracts of E. ganitrus roxb. Instreptozotocin induced diabetes. The methanolic seed Extract exhibited potent antidiabetic activity comparable To the standard drug glybenclamide.

Anti-parkinsonian Effect of E. ganitrus in rota rod and catalepsy bar Tests. Assessment of oxidative stress was done by Measuring the malondialdehyde (MDA) and reduced Glutathione (GSH) levels in the striatal region of the Brain. E. ganitrus (200 and 400 mg/kg, p.o.) showed Significant anti-oxidative effect by causing a Decrease in brain MDA levels ($p < 0.001$) and a Significant increase in GSH levels ($p < 0.001$) that Further plays a vital role in the pathophysiology of PD. Overall this study conclusively shows E. ganitrus has anti-oxidant and neuroprotective Activity in haloperidol experimental model of PD.

VI. CONCLUSION

The world wide investigations are exposed that *Elaeocarpus ganitrus* (Roxb) having valuable Essential phytochemicals like triterpenes, tannins like Geraniin and 3, 4, 5-trimethoxy geraniin, Indolizidine alkaloids grandisines, rudrakine and Flavonoids quercetin. Different bioactive extracts Prepared from *Elaeocarpus ganitrus roxb*. It shown Numerous healthpromoting effects in vitro and in Vivo, such as antioxidant, anti-inflammatory, Analgesic, antifungal, antimicrobial, antidiabetic, Antioxidative, antihypertensive, antianxiety, Antiasthmatic, hepatoprotective and antidepressant activities. The mode of action of Rudraksha covers the basic principles Of Ayurveda and also fulfils the ideas of gentle, harmless and Quick restoration of health basing on comprehensive Principles.

Rudraksha being purely herbal and most Tolerable by human body, can be taken by persons of any age, Sex and profession with least side effect. There is a strong need to conduct in-depth research studies in order to prove its Efficacy as cost-effective, user friendly, easily Accessible, safe and holistic therapeutic approach to Ameliorate adverse effects of chronic diseases.

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