

Review on *Elaeocarpus ganitrus* (Rudraksha)

Devendra J. Sonawane^{1,*}, Bhushan G. Rajput¹, Kunal B. Patil¹, Ghansham P. Mahajan¹,
Karan S. Shivade¹

Abstract

The seed of *Elaeocarpus ganitrus*, also known as Rudraksha, is renowned for its electromagnetic characteristics. Recent scientific research has demonstrated that this seed possesses natural electromagnetic properties which can effectively treat various chronic diseases. The present study was focused on the phytochemical screening and thin layer chromatographic analysis of the extract obtained from *Elaeocarpus ganitrus* seeds, which belong to the *Elaeocarpaceae* family. It is commonly grown as an ornamental tree in different regions of India. In Hindu mythology, it is believed that wearing Rudraksha beads can provide individuals with mental and physical strength for spiritual enlightenment. Ayurvedic medicine utilizes Rudraksha for managing conditions such as blood pressure, asthma, mental disorders, diabetes, gynecological issues, and neurological disorders. Rudraksha, a plant highly regarded in Ayurveda, offers significant medicinal and astrological benefits in human life. It is thought to have come from Lord Shiva's tears. In addition to its scientific properties, Rudraksha holds great spiritual importance in the daily lives of individuals. It possesses unique qualities that can even cure incurable diseases. By conducting biochemical analysis, electromagnetic analysis, and studying its chemical composition, one can gather comprehensive information about Rudraksha. The accurate understanding of its scientific properties highlights its effectiveness in medical science. Moreover, Rudraksha holds traditional, mythological and astrological significance, with various types available, ranging from 1 to 14 faces (Mukhi), each carrying its own value. Furthermore, Rudraksha is rich in medicinal and pharmacological activities, such as analgesic, antioxidant, antifungal, and antidepressant properties, which are recognized and utilized by modern medical science. This substance exhibits anti-inflammatory, hypoglycemic, and antiulcerogenic properties due to the presence of alkaloids, flavonoids, elaeocarpine, isoelaeocarpine, quercetin, and gallic acid.

Keywords: anti-inflammatory, hypoglycemic, antiulcerogenic alkaloids, flavonoids, elaeocarpine, isoelaeocarpine, quercetin, gallic acid

INTRODUCTION

Rudraksha beads, also known as *Elaeocarpus ganitrus* (L.) fruit in scientific terms, hold significant spiritual and medicinal value in traditional medicine. Numerous research studies have highlighted the therapeutic advantages of wearing Rudraksha beads in treating neurological and cardiovascular

*Author for Correspondence

Devendra J. Sonawane

E-mail: devendrasonawane001@gmail.com

¹Student, Department of Pharmacology, Ahinsa Institute of Pharmacy, Dondaicha, Dhule, Maharashtra, India

Received Date: March 13, 2024

Accepted Date: May 10, 2024

Published Date: May 27, 2024

Citation: Devendra J. Sonawane, Bhushan G. Rajput, Kunal B. Patil, Ghansham P. Mahajan, Karan S. Shivade. Review on *Elaeocarpus ganitrus* (Rudraksha). Research & Reviews: A Journal of Pharmacognosy. 2024; 11(2): 8–15p.

ailments, as well as rheumatism. The Ayurvedic system of medicine is known for its effectiveness in treating infertility and various other diseases. It is interesting to note that Rudraksha beads, which hold great significance in Ayurveda, exhibit different pharmacological properties depending on their grooves or Mukhi (Figure 1). These beads contain a rich cellular endosperm filled with calcium oxalate druses. Fruits adorned with Rudraksha beads have been cherished throughout history for their mythological, aesthetic, and medicinal attributes [1]. Alkaloids, tannins, flavonoids, steroids, glycosides, and phenols are components of plants that have



Figure 1. Type of *Elaeocarpus ganitrus* (Rudraksha).

biological and therapeutic properties and are used to treat a variety of illnesses, including fever, headaches, skin conditions, and mental disorders. Narratives have indicated many pharmacological effects, including but not limited to antihypertensive, antioxidant, hypoglycemic, anti-inflammatory, and anti-atherosclerotic properties [2, 3].

Botanical Classification

- Kingdom Plantae
- Division Magnoliophyta
- Class Magnoliopsida
- Order Oxilidales
- Family Elaeocarpaceae
- Genus *Elaeocarpus*
- Species *sphaericus/ ganitrus* [4]

Because of its inherent electromagnetic nature, it possesses the ability to heal various chronic illnesses. According to the principles of *Ayurvedic* medicine, the utilization of Rudraksha beads can alleviate a multitude of ailments such as strain, insomnia, anxiety, lack of focus, depression, palpitations, hypertension, rheumatism, infertility, and asthma. Additionally, it is known to possess anti-aging properties [5, 6]. Rudraksha acts as a natural sedative, providing relief from stress, insomnia, anxiety, depression, and lack of concentration (Figure 2). Furthermore, it aids in calming the mind and reducing body temperature [7, 8]. In traditional medicine, Rudraksha is frequently used to treat a variety of conditions, including anxiety, depression, stress, palpitations, nerve pain, epilepsy, migraines, loss of focus, asthma, hypertension, arthritis, and liver illnesses. Rudraksha beads are believed by adherents of *Ayurvedic* medicine to have possible health benefits for the heart and neurological system [9–11].

TRADITIONAL USES OF RUDRAKSHA

The fruits of *Elaeocarpus sphaericus*, when unripe and torn, have various traditional uses (Figure 3).

- It is beneficial for reducing stress, anxiety, sadness, palpitations, and difficulty focusing.
- It helps in lowering body temperature and bringing peace to the mind. Individuals experiencing anxiety are advised to carry a large five-faced *E. sphaericus* with them. They should keep it firmly in their right hand for ten minutes if they are feeling anxious. This practice can help restore confidence and stabilize the body.



Figure 2. Drinking a Rudraksha water



Figure 3. Rudraksha tree.

- *E. sphaericus* also possesses anti-aging properties.
- It is beneficial in treating mental illnesses. Boiling milk with a four-faced Rudraksha seed is considered a good remedy for mental disorders and can also aid in improving memory.
- It is advised for female hysterics and coma patients.
- It is also beneficial for children experiencing frequent fevers.
- It can help alleviate prolonged cough. A paste made from ten-faced Rudraksha with milk can provide relief from prolonged cough when taken three times a day. It can also be used to treat skin ailments such as burns, boils, pimples, ringworms, and sores.
- *E. sphaericus* powder and equal portions of black pepper should be taken with water to treat smallpox [1].

TYPE OF RUDRAKSHA AND MAJOR BENEFITS

- *1 Mukhi*: Enlightens the super consciousness, enhances focus, and modifies the structure of the mind.
- *2 Mukhi*: Gives the bearer “UNITY” blessings. It might have to do with friends, parents and kids, or *Guru* and *Shisha*.
- *3 Mukhi*: The wearer returns to purity and is freed from all sins and wrongdoings from his life. Perfect for people who experience depression and guilt.
- *4 Mukhi*: When blessed, the wearer gains the ability to be creative and has increased intelligence and memory.

- 5 Mukhi: Wearer improves memory and experiences tranquility and wellness.
- 6 Mukhi: Protects against the emotional damage caused by heavy losses and bestows knowledge, insight, and learning.
- 7 Mukhi: People who are struggling with their finances and mental health should wear it.
- 8 Mukhi: Removes all obstacles and brings success in all undertakings.
- 9 Mukhi: Wearer is endowed with a great deal of vitality, strength, dynamism, and fearlessness, all of which are helpful for leading a successful life.
- 10 Mukhi: It works like a shield on one's body and drives evils away.
- 11 Mukhi: Bestows success, courage, knowledge, and sound judgment on the bearer.
- 12 Mukhi: The wearer acquires the ability of the Sun to govern and move constantly with dazzling splendor and vigor, eliminates anxiety and dread, improves motivation and self-image.
- 13 Mukhi: It is beneficial for meditation and bestows dignity and satisfies every desire on Earth.
- 14 Mukhi: It awakens the sixth sense organ by which the wearer foresees the future happenings [12].

PHARMACOLOGICAL BENEFITS OF ELAEOCARPUS

CNS Activity Effects via a δ -Opioid Receptor (DOR) Affinity

Elaeocarpus is a type of drug that targets delta-opioid receptor (DOR) and is crucial in the treatment of different central nervous system (CNS) or DOR-related illnesses. The alkaloids found in *Elaeocarpus* are promising candidates for the treatment of DOR-related diseases. Additionally, extracts from *Elaeocarpus* have proven to be beneficial in the treatment of convulsive disorders, anxiety, asthma, stress, depression, nerve pain, epilepsy, and migraines. These diseases are associated with the DOR in the brain, hence the term "DOR-related diseases". Opioid receptors play a role in various physiological activities, and their dysfunction can lead to CNS diseases such as cardiovascular disease, epileptic seizures, Parkinson's disease, depression, hypertension, malignancies, diabetic cutaneous wounds, and immune diseases [13].

Antimicrobial, Antimalarial, and Antibabesial Effects

E. ganitrus, commonly known as Rudraksha, is recognized for its antioxidant characteristics. Silver nanoparticles were synthesized using aqueous and metabolic solvent extracts. Additionally, the antibacterial, antifungal, and antiproliferative activities were assessed, revealing positive qualitative results at the nanoscale. Furthermore, the nano conjugates were examined for their anticancer properties [14].

Antivirus

Elaeocarpus sylvestris demonstrates antiviral and immunomodulatory properties. The aqueous ethanol extract (ESE) of this plant exhibits in vitro antiviral effects against influenza A virus (IAV). The primary components of ESE are 1, 2, 3, 4, 6-penta-O-galloyl- β -D-glucose (PGG), and geranium. Importantly, the oral administration of ESE can inhibit IAV replication and reduce the expression of inflammatory cytokines. Both ESE and its key constituents (PGG and geranium) display potent antiviral activity against IAV at various stages of infection, including in silicon, in vivo, and in vitro [15].

Anticancer Effect

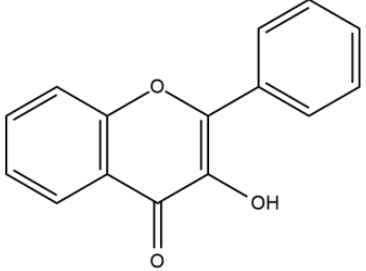
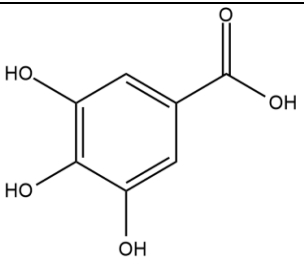
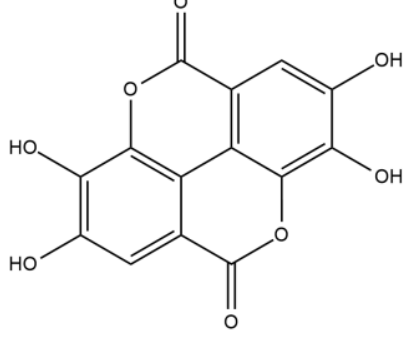
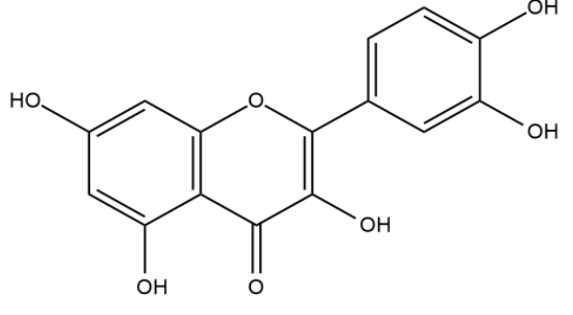
The ability of six *Elaeocarpus* species is linked to their phenolic and flavonoid compounds, as well as cucurbitaceous. These species are recognized for their antioxidant properties and noteworthy biomedical potential. Notably, extracts from the leaves and bark of *E. floribundas* contain triterpenoids, friedelin, epifriedelanol, and β -sitosterol, which exhibit substantial anticancer activity [16].

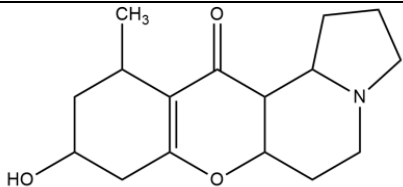
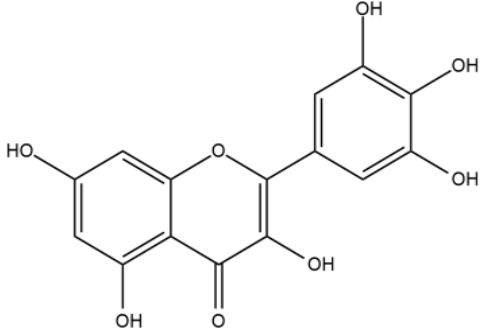
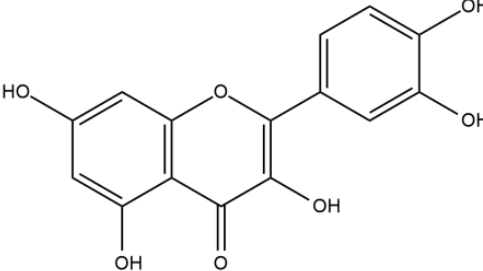
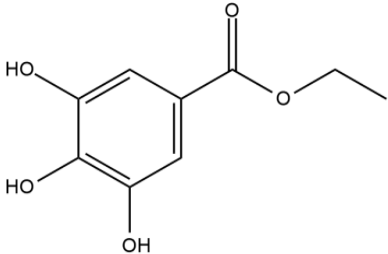
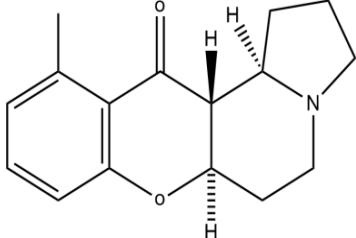
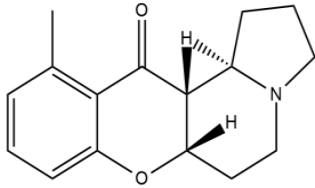
CHEMICAL COMPOSITION OF ELAEOCARPUS GANITRUS

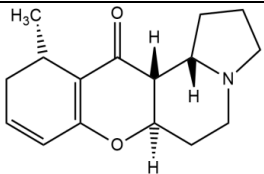
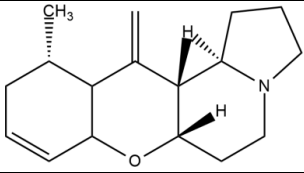
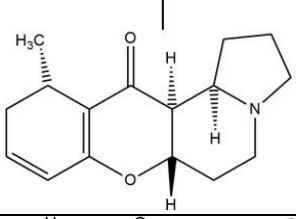
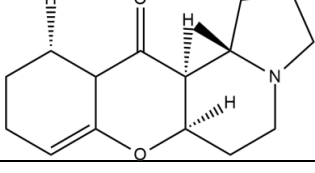
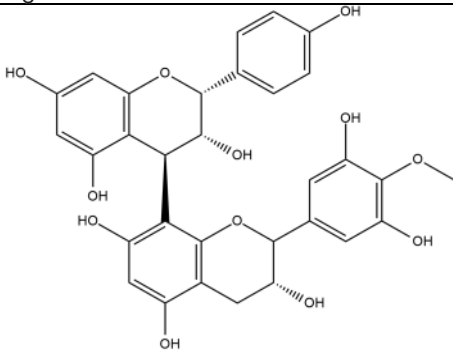
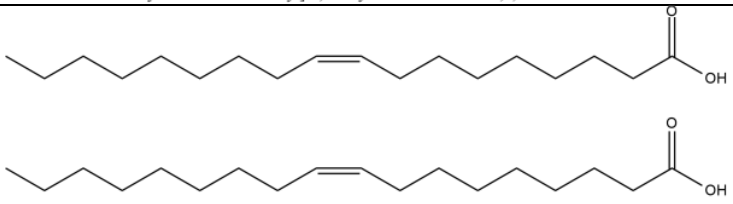
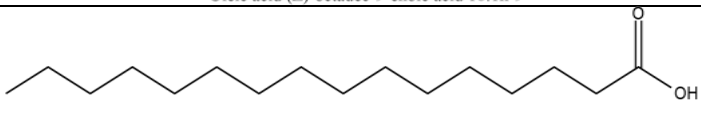
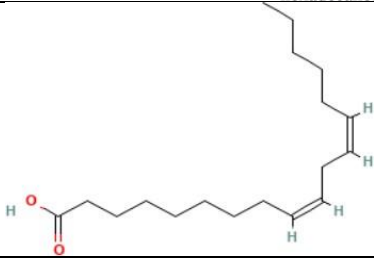
The preliminary phytochemical studies for ethanol extracts of *E. ganitrus* show proteins, glycosides, amino acid, alkaloids, flavonoids, fatty acids, tannins, and carbohydrates. The Rudraksha seed of the *Elaeocarpus* plant contains Carbon (C), Hydrogen (H), Oxygen (O), Nitrogen (N) and different trace phytoconstituents in a combined form.

Laboratory tests on *Elaeocarpus* leaves proved that it has a significant source of bioactive compounds such as 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. The quercetin chemical constituent remains in *E. ganitrus* seeds as glycoside (Arivu & Muthulingam 2017) [17]. Rudraksha contains the indolizidine type of alkaloids. Common phytoconstituents are (-)- isoelaecarpiline and (+)- elaeocarpiline. Elaeocarpidine, (+)- Epiisoelaecarpiline, (+)- Isoelaecarpin, (+)- Elaeocarpine, (+)- Pseudoepiisoelaecarpiline, (+)- Epiialloelaecarpiline, and Rudrakine are the most prevalent phytoconstituents in Rudraksha plants (Table 1).

Table 1. Phytoconstituents of *E. ganitrus*.

Phytoconstituents	Structure	Solubility (solvent)
Flavonol	 3-hydroxy-2-phenylchromen-4-one	Ethanol, water, methanol, DMSO, and 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	DMSO, slightly soluble in alcohol
Quercetin	 2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxychromen-4-one	Ethanol, water, organic solvents such as methanol, DMSO, and DMF

Rudrakine	 9-hydroxy-11-methyl-2,3,6,6a,8,9,10,11,12a,12b-decahydro-1H-chromeno[2,3-g]indolizin-12(5H)-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
Isoelaecarpine	 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

DMSO: Dimethyl sulfoxide; DMF: dimethyl formamide

CONCLUSION

Various Rudraksha pieces, including beads, bark, leaves, and outer shell, are used in traditional medicine to treat a variety of illnesses, such as mental problems, headache, fever, skin conditions, and wound healing.

Ayurvedic texts classify Rudraksha fruits as thermogenic, sedative, cough-relieving, and beneficial for conditions such as, neuralgia, cephalalgia, anorexia, migraine, and mania. Additionally, it is utilized in conventional medicine to treat liver illnesses, asthma, hypertension, arthritis, palpitations, stress, anxiety, depression, palpitations, nerve pain, and epilepsy.

REFERENCES

1. Pradhan S, Bhoi H, Hanmanta C, Rathor G, Verma S, Sahu BK, Chanda R. Medicinal, Astrological and Religious Comprehensive Description of Rudraksha. *International Journal of Research Publication and Reviews*. 2024; 5(1): 5104–5110p.
2. Vaidyaratnam PS. *Indian Medicinal Plant, Vol-1*. Kotakkal: Kotakkal University Press (India) Pvt Ltd.; 2010. 354–355p.
3. Yelne MB. Notes on the Botanical Identity of Beads Found Under the Name: Rudraksha, Biorhythm, AYU. *Academy Series*. 1995; 44: 39–44p.
4. Bhattacharya SK, Debnath PK, Pandey VB, Sanyal AK. Pharmacological investigations on *Elaeocarpus ganitrus*. *Planta Medica*. 1975; 28(06): 174–177p.
5. Chopra RN, Nayar SL, Chopra IC. *Glossary of Indian Medicinal Plants*. New Delhi, India: Council of Scientific and Industrial Research; 1956. 2p.
6. Rao KS, Rao OU, Rao AL. Hypoglycemic and antidiuretic potential of chitosan aqueous extract of *Elaeocarpus ganitrus*. *International Journal of Research in Pharmacy and Chemistry*. 2012; 2(2): 428–441p.
7. Hule AK, Juvekar AR. Effect of alkaloidal fraction of *Elaeocarpus ganitrus* Roxb. Seeds on murine in vitro immune parameters. *J Pharmacy Res*. 2009; 2: 1261–1265p.
8. Seetha KN. *The Power of Rudraksha*, 4th edition. Mumbai: Jaico Publishing House; 2008. 23–78p.
9. Sakat SS, Wankhede SS, Juvekar AR, Mali VR, Bodhankar SL. Antihypertensive activity of aqueous extract of *Elaeocarpus ganitrus* Roxb. seeds in renal artery occluded hypertensive rats. *Int J Pharma Tech Research*. 2009; 1: 779–782p.
10. Khare CP. *Encyclopedia of medicinal plants*, 3rd Reprint. New York: Spring Publications; 2004.
11. Gupta A, Aggarwal SS, Basu DK. Anticonvulsant activity of mixed fatty acids of the *Elaeocarpus ganitrus* Roxb. *Indian J Physiology Pharmacology*. 1984; 28: 245–286p.
12. Hardainiyan S, Nandy BC, Kumar K. *Elaeocarpus ganitrus* (Rudraksha): A reservoir plant with their pharmacological effects. *Int J Pharm Sci Rev Res*. 2015; 34(1): 55–64p.
13. Hwang-Bo J, Kim B, Park DW, Lee YG, Kwon JE, Chung JY, Kang SC. Safety, tolerability of ES16001, a novel varicella zoster virus reactivation inhibitor, in healthy adults. *Eur J Med Res*. 2021; 26 (1): 92p. Available from: <https://doi.org/10.1186/s40001-021-00565-z>.
14. Rosenberry TL, Brazzolotto X, Macdonald IR, Wandhammer M, Trovaslet LM, Darvesh S, Nachon F. Comparison of the binding of reversible inhibitors to human butyrylcholinesterase and acetylcholinesterase: a crystallographic, kinetic and calorimetric study. *Molecules*. 2017; 22(12) 2098p. Available from: <https://doi.org/10.3390/molecules22122098>.
15. Jayasinghe L, Amarasinghe NR, Arundathie BG, Rupasinghe GK, Jayatilake NH, Fujimoto Y. Antioxidant flavonol glycosides from *Elaeocarpus serratus* and *Filicium decipiens*. *Nat Prod Res*. 2012; 26(8): 717–721p. Available from: <https://doi.org/10.1080/14786419.2010.551514>
16. Sadasivam K, Kumaresan R. Antioxidant behavior of mearnssetin and myricetin flavonoid compounds — a DFT study. *Spectrochim Acta Part A: Mol Biomol Spectroscopy*. 2011; 79(1): 282–293p. Available from: <https://doi.org/10.1016/j.saa.2011.02.042>
17. Arivu, I. & Muthulingam, M. (2017). Detailed study on *Elaeocarpus ganitrus* (Rudraksha) for its medicinal importance—a review. *Int. J. Curr. Sci*, 20(1), 16-30