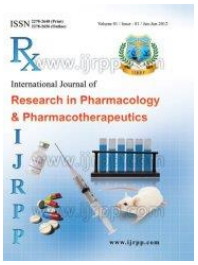
International Journal of Research in Pharmacology & Pharmacotherapeutics



ISSN Print: 2278-2648 IJRPP |Vol.10 | Issue 4 | Oct - Dec - 2021
ISSN Online: 2278-2656 Journal Home Page: www.ijrpp.com

Research Study Open Access

Elaeocarpusganitrus: As a potential herb

Sagar L. Pol[1]*, Sampada S. Bhosale[2], Sujata R. Jagtap[2], Vilasrao J. Kadam[1]

[1]*Bharati Vidyapeeth Institute of Pharmacy., YMCA Marg, Sector 8, CBD Belapur, Navi Mumbai, Maharashtra, India- 400614*
[2]*Department of Pharmaceutics, BharatiVidyapeeth College of Pharmacy. , YMCA Marg, Sector 8, CBD Belapur, Navi Mumbai, Maharashtra, India- 400614*

Corresponding author: Mr. Sagar L. Pol
E-mail: sagar.pol007@gmail.com

ABSTRACT

Elaeocarpusganitrus is a species of Elaeocarpus. Roxb (E. ganitrus), often known as Rudraksha, is a member of the Eleocarpaceae family. It has a significant role in Hinduism and Ayurveda, which have traditionally been used to treat a variety of health issues. It has medical properties as well as religious, medicinal, and spiritual importance. The presence of several primary and secondary metabolites such as alkaloids, glycosides, tannin, and phenolic compounds was shown by phytochemical analysis of various extracts. Several studies have been conducted to investigate the pharmacological properties of various extracts of *Elaeocarpusganitrus*. We attempted to compile the available reports on *Elaeocarpusganitrus*pharmacognostic, phytochemical, and pharmacological qualities in this review.

Keywords: *Elaeocarpusganitrus*; Rudraksha; Pharmacognosy; Phytochemistry; Pharmacology.

INTRODUCTION

Elaeocarpusganitrus is an evergreen tree with developed fruits containing a hard and extremely attractive stony endocarp known as a bead or nut and is well known in India as Rudraksha. Apart from its gorgeous stones, it has unshakeable popular faith-based experiments that it has proved medical properties [1,2]. More than 360 species of the Elaeocarpus genus were found in Australia, Malaysia, East Asia [3]. It is a huge evergreen broad-leaved tree that grows from the Gangetic plain to the Great Himalayan foothills. The tree is pyramidal in shape. Flowers are white, with a raceme-like inflorescence. In 7 years, the tree bears fruit. Drupe is the type of fruit. When stone beads ripen, they are encased in a blue outer shell, which is why they are sometimes referred to as blueberry beads. Beads are

abrasive by nature. It thrives in climates with temperatures ranging from 25 to 30 degrees Celsius [4]. The paraffin-embedded specimens were sectioned using a rotary microtome for microscopic examinations. The parts were 10-12 µm thick. The parts were de-waxed according to a standard method. A firm endocarp with lignified isodiametric sclereids, seeds with a membrane seed coat, and a dense cellular endosperm with calcium oxalate druses were discovered by microscopic examination [5]. Flowers are white or yellow and appear throughout April and May. The fruits appear in June and ripen in October. The luscious ripe fruit has a seed with a blue shell. Rudraksha refers to the seed's inner portion or bead [6-8].

Phytoconstituents of Elaeocarpusganitrus

Phytochemical components are non-nutritive plant chemicals that have been shown to have protective or disease-defensive effects against a variety of human disorders, which may explain why medicinal plants have been used traditionally for the treatment of certain illnesses [9]. Secondary metabolites with complex structures, such as phenolic chemicals, alkaloids, terpenoids, steroids, and saponins, have a more limited dispersion than primary metabolites [10]. Secondary metabolites, such as polyphenols and phenolics, are secondary plant metabolites that are found in abundance in plant products and plants. Several phenolic compounds have been proven to have high antioxidant activity [11-12]. Phytochemical investigation of methanol extract of different parts of plants as mentioned in Table 1. [13-16]

Table 1. Phytochemical investigation of methanolic extracts of different parts of *Elaeocarpusganitrus*

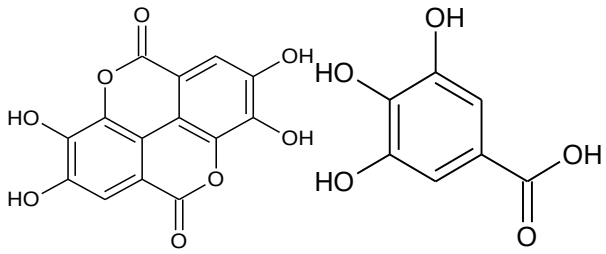
Phytochemicals	Epicarp	Endocarp	Bark	Seed	Root	Fruit
Anthraquinones	-	-	-	-	-	
Alkaloids	+	+	+	+	+	+
Carbohydrates	+	-	+	-	+	
Coumarins	+	+	+	-	-	
Flavonoids	+	+	-	+	+	+
Fixed oils	+	-	-		-	-
Glycosides	-	-	+	-	+	
Gums and mucilages	-	-	-	-	-	
Quinone	+	+	+	-	-	
Proteins	+	+	+	+	-	+
Phytosterols	+	-	+	-	-	+
Saponins	-	-	-	-	-	+
Tannins	+	+	+	-	-	+

Elaeocarpusganitrus seeds were tested for different parameters listed in table 2 [17]

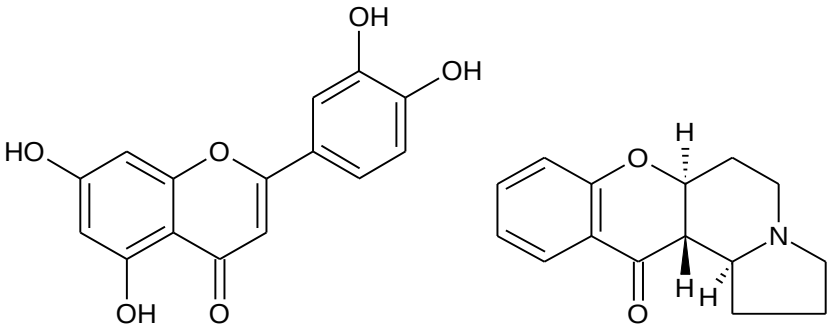
Table 2. *Elaeocarpusganitrus* seeds are phytoconstant.

Parameter	Seed extract percentage
Ash value	4.6
Water-soluble ash	0.85
Acid insoluble ash	1.7
Alcohol soluble extractive value	5.1
Water-soluble extractive value	9.23
Ether soluble extractive value	2.8

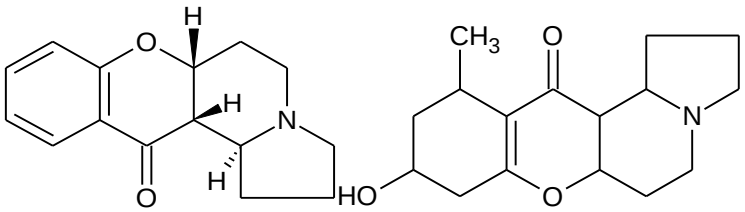
By extracting various parts of *Elaeocarpusganitrus* following compounds are isolated, characterized, and tested for their pharmacological activity [18-20].



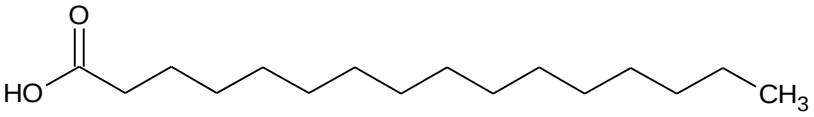
Ellagic acid **Gallic acid**



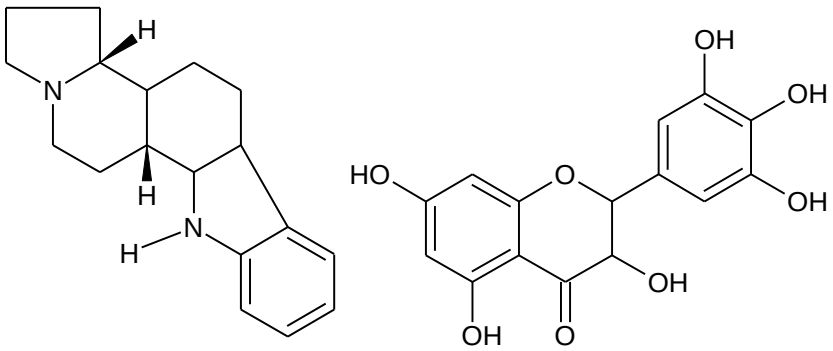
Quercetin(±)-Elaeocarpiline



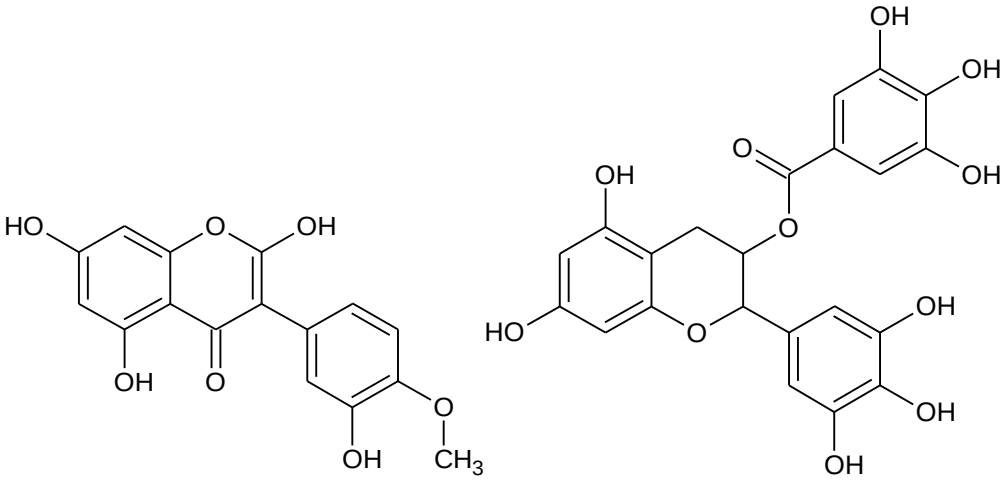
(±)-IsoelaeocarpineRudrakine



Palmitic acid



(+)- ElaeocarpineMyricetin



TamarixetinMeamsetin

Medicinal valuesof*Elaeocarpusganitrus* are listed in table 3.

Table 3. Medicinal values *Elaeocarpusganitrus*

Activity	Part of plant	References
Antiasthmatic activity	Fruit	21,
Anti-Parkinson's activity	Seed	22, 23
Antianxiety activity	Leaves	24
Antihypertension activity	Seed	25
Antimicrobial activity	Epicarp and endocarp, plant, seed	26, 27, 28
Anti-inflammatory activity	Bark	29
Anxiolytics action	Plant	30
Anti-oxidant	Bark	31, 32
Anti-atherosclerotic activity	Seed	33
Antidiabetic activity	Seed	34, 35
Immunomodulatory effects	Seed	36
Antibacterial activity	Beads	37
Cytotoxic activity	Beads	38

ACKNOWLEDGMENTS

The authors are gratifying to the Principal and management of BharatiVidyapeeth Institute of Pharmacy for providing support of my work.

CONCLUSION

From the above study, we understand all aspects of *Elaeocarpusganitrus* plant. Detail morphology, phytoconstituents, and medicinal uses of the plant. There's no denying that this plant is a treasure trove of potentially beneficial bioactive molecules that can be used as medications, as well as providing newer leads and clues for future research. Synthetic drug design is a current method of drug development. Due to its many medicinal properties, there is enormous scope for further research on *Elaeocarpusganitrus* and further clinical and pharmacological can be conducted to investigate the unexploited potential of this plant.

REFERENCES

1. Chopra RN, Nayar SL, Chopra IC. Glossary of Indian medicinal plants. 1st ed. CSIR New Delhi; 1956;1:105.
2. Dadhich A, Rishi A, Sharma G, Chandra S. Phytochemicals of Elaeocarpus with their therapeutic value: A review. Int J Pharm BiolSci 2013;4:591-8.
3. Singh B, Ishar MPS, Sharma A. Estimation of quercetin, an anxiolytic constituent, in Elaeocarpusganitrus. J PharmacognPhytochem 2013;1:117-21.
4. Singh RK, Acharya SB, Bhattacharya SK. The pharmacological activity of Elaeocarpussphaericus. Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives. 2000;14(1):36-9.
5. Johansen DA. Plant microtechnique. Plant microtechnique. 1940.
6. Yelne, MB, Notes on the Botanical Identity of Beads Found Under the Name: Rudraksha, Biorhythm, AYU. Academy series, 44, 1995, 39–44.
7. Sharma PV, DravyagunaVijnana, Chaukhambha Bharti academy, Varanasi, Vol. II, 2005, 219.
8. Vaidyaratnam PS, Indian Medicinal Plant, Kotakkal University Press (India) Pvt Ltd, Vol II, 2010, 354-355.
9. Katalinić V, Milos M, Modun D, Musić I, Boban M. Antioxidant effectiveness of selected wines in comparison with (+)-catechin. Food chemistry. 2004;86(4):593-600.
10. Dasgupta A, Agarwal SS, Basu DK. Anticonvulsant activity of the mixed fatty acids of *Elaeocarpusganitrus*roxb.(Rudraksh). Indian journal of physiology and pharmacology. 1984;28(3):245-6.
11. Razali N, Razab R, Junit SM, Aziz AA. Radical scavenging and reducing properties of extracts of cashew shoots (Anacardiumoccidentale). Food chemistry. 2008;111(1):38-44.
12. Katalinic V, Milos M, Kulisic T, Jukic M. Screening of 70 medicinal plant extracts for antioxidant capacity and total phenols. Food chemistry. 2006;94(4):550-7.
13. Das PK. Phytochemical Screening of Methanolic Extracts of Different Parts of Rudraksh Plant (*Elaeocarpusganitrus*). OnLine Journal of Biological Sciences. 2015;15(3):111.
14. Tripathy S, Mida A, Swain SR. Phytochemical screening and thin layer chromatographic studies of *Elaeocarpusganitrus* seed the magical electromagnetic bead (rudraksha). International Journal of Pharmacy and Biological Sciences. 2016;6(3):P16-24.
15. Krishna SM, Bhavya TN, Kumar RA, Eswaraiah CM. Phytochemical evaluation of Mussaendaerythrophylla, *Elaeocarpusganitrus*, Cassia sophera. Indian Journal of Research in Pharmacy and Biotechnology. 2015;3(6):464.
16. Shah G, Shiri R, Kumar R, Singh H, Nagpal N. Pharmacognostical standardization of fruits of *Elaeocarpussphaericus* (Gaertn). K. Schum. Pharmacognosy Journal. 2010;2(13):565-71.
17. Tripathy S, Mida A, Swain SR. Phytochemical screening and thin layer chromatographic studies of *Elaeocarpusganitrus* seed the magical electromagnetic bead (rudraksha). International Journal of Pharmacy and Biological Sciences. 2016;6(3):P16-24.

18. Singh B, Ishar MP, Sharma A, Arora R, Arora S. Phytochemical and biological aspects of Rudraksha, the stony endocarp of *Elaeocarpusganitrus* (Roxb.): a review. Israel Journal of Plant Sciences. 2015;62(4):265-76.
19. Kumar A, Kumar M, Verma RK, Kumar A, Punar S, Ram L, Kakodia AK, Singh U, Rani B, Maheshwari RK. A Comprehensive Review on Phytochemical, Pharmacological, Dielectric and Therapeutic Attributes of Multifarious Rudraksha (*Elaeocarpusganitrus*Roxb.). Applied Sciences. 2021;9(1):97-109.
20. Hardainiyan SW, Nandy BC, Saxena RI. Phytochemical investigation of fruit extracts of *Elaeocarpusganitrus*. International Journal of Pharmacy and Pharmaceutical Sciences. 2015;7(6):415-8.
21. Singh RK, Bhattacharya SK, Acharya SB. Studies on extracts of *Elaeocarpussphaericus* fruits on in vitro rat mast cells. Phytomedicine. 2000;7(3):205-7.
22. Bagewadi HG, Bhangale CS, Khanna N. *Elaeocarpusganitrus*: its beneficial antiparkinsonian effect in MPTP induced motor and non-motor impairments in mice. Indian Journal of Pharmaceutical and Biological Research. 2015;3(2):1.
23. Dubey GA. Effect of extract of rudraksha (*Elaeocarpusganitrus*) on parkinson's disease and depression. World J Pharm Res. 2018;7(12):937-47.
24. Sathish Kumar T, Shanmugam S, Palvannan T, Bharathi Kumar VM. Evaluation of antioxidant properties of *Elaeocarpusganitrus*Roxb. leaves. Iranian journal of pharmaceutical research. 2010; 20(3):211-5.
25. Sakat SS, Wankhede SS, Juvekar AR, Mali VR, Bodhankar SL. Antihypertensive effect of aqueous extract of *Elaeocarpusganitrus*Roxb. seeds in renal artery occluded hypertensive rats. International journal of pharmtech research. 2009;1(3):779-82.
26. Dalei J, Sahoo DE. Evaluation of antimicrobial activity and phytochemical screening of epicarp and endocarp parts of *elaeocarpusganitrus*. Int J Pharm Bio Sci. 2016;7(2):265-9.
27. Pandey K, Singh M, Pandey B, Upadhyaya A, Pande KK. Preliminary phytochemical screening and antimicrobial activities of plant extract of *Elaeocarpusganitrus*Roxb. International Journal of Bioassays. 2016;5(9):4885-9.
28. Kumar G, Karthik L, Rao KV, Venkata K. Antimicrobial activity of *Elaeocarpusganitrus*Roxb (Elaeocarpaceae): An in vitro study. Elixir Biotechnology. 2011 ;40:5384-7.
29. Lakshmi MA, Srinivas K, Rani SU, Praneetha V. Evaluation of in vitro anti inflammatory activity of *Elaeocarpusganitrus* of bark extract by HRBC membrane stabilization. International Journal of Pharmaceutical, Chemical & Biological Sciences. 2016;6(4).
30. Singh B, Ishar MP, Sharma A. Estimation of Quercetin, an Anxiolytic Constituent, in *Elaeocarpusganitrus*. Journal of Pharmacognosy and Phytochemistry. 2013;1(6).
31. Marisetti A, Kolli S. In-vitro anti-oxidant and thrombolytic activity of *Elaeocarpusganitrus* bark extracts. World Journal of Pharmacy and Pharmaceutical Sciences. 2016;5(10):1312-20.
32. Bhatt BD, Dahal P. Antioxidant and antimicrobial efficacy of various solvent extracts of seed of Rudrakshya (*Elaeocarpusganitrus*) from Ilam district of Nepal. Journal of Nepal Chemical Society. 2019;40:11-8.
33. Jain PK, Sharma PR, Joshi SC. Anti-Atherosclerotic Activity of *Elaeocarpusganitrus*Roxb. in Cholesterol-Fed Rabbits. Asian J Pharmaceutical Clinical Research. 2017;10(12):80-4.
34. Mida A. Antimicrobial and hypoglycemic effects of *ElaeocarpusGanitrus* Seed. Pharmaceutical science. 2016;2(1).
35. Jain PK, Sharma P, Joshi SC. Antioxidant and Lipid Lowering Effects of ElaeocarpusGanitrus in Cholesterol Fed Rabbits. International Journal of Pharmaceutical Science and Research. 2018;9:526-34.
36. Hule AK, Juvekar AR. Evaluation of immunomodulatory effects of methanol extract of Elaeocarpusganitrus seeds. Journal of Natural Remedies. 2010 ;10(1):1-0.
37. Sinha A, Manjhi J, Kumar V, Rai DV. Evaluation of Antibacterial Properties of Silver Nanoparticles Prepared via Green Route Using Elaeocarpusganitrus (Rudraksha) Beads Extract. Journal of Bionanoscience. 2018;12(4):553-61.