



Medicinal value of *Elaeocarpus sphaericus*: A review

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Abstract: Plants are natural therapeutics. Different parts of plants have medicinal property. Among them, *Elaeocarpus sphaericus* is one of the plants which hold traditional as well as scientific value of medicine within it. The aim of this review is to assemble the botany and medicinal value of *Elaeocarpus sphaericus*. The paper is fully based on secondary data. 36 published articles were extracted from different online portals and all the information was gathered, analyzed and presented well here in descriptive form. *Elaeocarpus ganitrus* is natively known as Rudraksha. Rudraksha is a large deciduous tree specially distributed in the foothills of the Himalayas. They are composed of different phytochemicals like saponins, cardiac glycosides, steroids, flavonoids, alkaloids, carbohydrates, fixed oils and many others and show antidepressant, antidiabetic, anti-inflammatory, antibacterial, antiulcerogenic property. Thus, more attention should be given for its production.

Keywords: *Elaeocarpus ganitrus*, Phytochemistry, Rudraksha, Beads, Traditional medicines

INTRODUCTION

Nepal is geographically diversified small country. It covers only 0.1 % of total land of the earth, but 3.2% of global floral species (GoN/MoFSC, 2014). 6500 species of phanerogams are found inhabiting on the diverse 118 ecosystems and 35 forest types. Majority of the population still resides in rural areas and are totally dependent on natural resources in various way for their livelihood (Lamichhane et al., 2021; Singh et al., 2021). From fruits to fodder, men to animal, all depend on nature. Plants are used as natural remedial for various illness of mankind, since ancient period (Miya et al., 2020). The phytonutrients tangled on protection of plant against pathogens are the reason behind the medicinal properties within them (Sharma et al., 2015). Out of 1950 species of medicinal plants of Nepal, 143 species are listed as marketable medicinal plants (Bhattarai and Ghimire, 2006). Out of which *Elaeocarpus ganitrus* (syn. *E. sphaericus*) is one of the important medicinal plants.

Elaeocarpus ganitrus, Gaertn.K. Schum (syn. *E. sphaericus*) is commonly known as Rudraksha in Nepal and India. Rudraksha is the Sanskrit name of *E. sphaericus* where “Rudra” refers to the Lord Shiva and “Akasha” refers to tears. According to Hindu Mythology it was said



that the plant Rudraksha was grown when the tears of lord shiva dropped on the land, so from the “Tears of Lord Shiva”, *E. sphaericus* was named as Rudraksha. The fully developed fruits of *E. sphaericus* are blue in color, for this reason it is well known as blueberry beads. *E. sphaericus* is multipurpose species. Its leaves, woods and beads are used. Non Timber Forest Product (NTFP), beads have high medicinal and religious value. Since prehistoric period, Rudraksha is used for the treatment of anxiety, depression, asthma, liver diseases, nerve pain, hypertension and migraine (Prabha and Kaur, 2014). Seeds are also used for jewelry.

METHODS

The entire data and findings of article are based on the secondary data. About 36 published articles were extracted from the online portals like Research gate and Google scholar (Timilsina et al., 2020; Sharma et al., 2021). Rudraksha, *Elaeocarpus sphaericus*, medicinal plant, phytochemistry, traditional medicines were some of the keywords used to search articles. This paper has supervised to analyze the taxonomy, distribution, structure, medicinal importance and economic importance of the species.

RESULTS AND DISCUSSION

Table: 1: Taxonomy of *Elaeocarpus sphaericus* (Hardainiyan et al., 2015)

Botanical Classification	
Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Oxalidales
Family	Ealeocarpaceae
Genus	<i>Elaeocarpus</i>
Species	<i>sphaericus</i>
Habit	Tree
Synonyms	<i>E. ganitrus</i> , Rudraksha, Blueberry beads

Distribution of Elaeocarpus sphaericus: *E. sphaericus* is an evergreen tree of the tropical and subtropical zone (Tewari et al., 2013), distinctly flourished 2000m from sea level on the Himalayan foothills of Nepal, Indonesia, South East Asia, Guam, Hawaii and Guinea to Australia (Kumari et al., 2018). Out of 360 known species of genera *Elaeocarpus*, Asia alone harbors 120 species (Kumari et al., 2018). In the context of Nepal, hilly and terai districts of central and eastern regions like Bhojpur, Morang, Sankhuwasaba, Illam, Jhapa, Panchthar, Terathum, etc. has a high abundance of *Elaeocarpus* (Bhatt and Dahal, 2019) at about 550-1600m altitude (Joshi et al., 2020). *E. sphaericus* favors to grow within the temperature of 20-30 °C with rainfall 2000-4500mm/year on soil type Regosol, Andosol, Podosol, Latosol, and alluvial (Rohandi and Gunawan, 2015). Commonly, *E. sphaericus* is also known as Rudraksha, Chattu Sampangi, Bhutnasan in Sanskrit, Rudraki or Rudraksha in Hindi and Wooden Begger bead, Utrasum Bead tree etc. in English (Hardainiyan et al., 2015).



Figure1. Leaf of *E. sphaericus*

Botany: *E. sphaericus* is a large evergreen tree of length 14.6m to 29.2m (Tripathy et al., 2021). Stem is cylindrical and rough textured with greyish white coloured bark (Kumari et al., 2018). 18-20 cm long and 6-8 cm wide leaves are shiny green in colour slightly bitter in taste and have no smell (Tewari et al., 2013). Flowers are white or yellow in colour, often seen flowering on the month of April and May and are in dense racemes which are likely to appear from axils of fallen leaves (Hardainyan et al., 2015). Fruits are small, round or oval shaped. They are green in appearance when not fully developed, which turns to blue or violet to brown or grey colours when matured (Kumari et al., 2018). *E. sphaericus* seeds are rough and the woody texture of colour dirty white, yellow, brownish-black or reddish-brown (Tripathy et al., 2021). Endocarp is hard, stony, globular and strongly tubercule (Hardainyan et al., 2015).

Chemical composition: Various research papers on the chemical composition of *E. sphaericus* have been reported, which reveals the presence of different gases and phytochemicals. Dubey (2018) says 50.03%, 30.53%, 17.89% and 0.95% of Carbon, Oxygen, Hydrogen and Nitrogen are present in *E. sphaericus* respectively. Similarly, Das (2017) reported the presence of Tannins, Flavonoids, Steroids, Saponins and Cardiac glycosides in three different extract of *E. sphaericus* i.e., ethanolic, methanolic and aqueous. Carbohydrates, tannins and proteins were found on extraction with water. Likewise with ethanol ether, Proteins, Alkaloids, Carbohydrates, Tannins and Flavonoids, were reported. Lastly, phytosterols and fixed oil fats were also observed when extracted with petroleum ether (Dubey, 2018).

Natural regeneration: The seed is hard and tough in structure which has both good and bad aspects. Because of this hard layer, seed is not easily prone to damage and destruction that prevents it from fungal rotting and stores seed for long time. Meanwhile, hard coating of seeds makes it difficult for natural regeneration as it prevents the absorption of moisture and other favourable conditions, limiting the natural regeneration rate just up to only 5% (Kumari et al., 2018). Besides this, the harsh collection of seed has led to decline of the seed stock in soil which directly affects the natural regeneration, driving it to threatened category (Chauhan et al., 2015).

Artificial regeneration: Natural regeneration of *E. sphaericus* is very slow; this is why artificial regeneration preferred than natural regeneration. For the artificial regeneration, at first mature fruits are collected. After the collection of fruit, the outer layer Pericarp, is to be removed which can be done mechanically. Then, the stony endocarp is to be made soft which could be done by

boiling the seed in hot water. Besides this, the seed could be treated with 1% H₂SO₄ solution, which eventually softens the hard outer layer (Kumari et al, 2018). Pant et al. (2013) on the other hand says the collected seeds are washed with concentrated sulphuric acid for 15 min at first then cleaned with tap water and dripped in water at 40°C for about 48 hours. Once the seed is ready, it is sown at the depth of 1-1.5cm in well drained, slightly acidic (6-6.3) pH to neutral (6.3-7.3) pH soil (Pant et al., 2013). Around after 40 days to 8 months, seed develops into seedlings and it could be transplanted in cultivable land commercially (Kumari et al., 2018; Pant et al., 2013).



Figure 2. Seeds of *E. sphaericus*

Economic importance: Though the seedling preparation is difficult process, the cultivation is easy once set up properly. In some districts of South Sumatera, *E. sphaericus* have been cultivated as the potential NTFPs. Agroforestry and monoculture system of cultivation was practiced among which agroforestry practice was found to be more beneficial (Nurlia et al., 2017). Rohandi and Gunwan (2014) reported around 350 thousand beads to be produced from a single tree. Medicinally, pericarp of fruit, seed, bark and leaves are useful. They are used for several therapeutic uses, acupuncture, curing circulatory disorder, neurological disorder, balance the blood pressure and heart rate etc. Meanwhile, timbers and seeds have high commercial value. Seeds have high market value. They are used to prepare necklaces and bracelets (Prasannan et al., 2020). Aeroplane-propellers are manufactured from the timbers of *E. sphaericus* (Pant et al., 2013). Because of its simple cultivation technique, potential product and income and high market demand of beads, *E. sphaericus* has been adopted as the best species in agroforestry and community forestry in South Sumatera (Nurlia et al., 2013).

Traditional medicinal value: From prehistoric period, there is the act of using different parts of floral species as natural curative for illness of human. Different parts of *E. sphaericus* have been used as medicine. Traditionally, seeds of *E. sphaericus* are believed to have high medicinal value. *E. sphaericus* seeds are categorized into different types on the basis of face they bear. It is said that seeds possess distinct benefit depending upon the number of faces they hold (Rao and Swamy, 1997). 1 faced(1M) Rudraksha is used to cure mental anxiety, heart problem, eye problem, etc. 2 faced(2M) is used to cure renal failure, lack of concentration, depression, intestinal disorder, etc. In a similar way, persistent fever in children is supposed to be cured by the application of 3M Rudraksha. Also, Garbh Gauri, Gaurishankar and Trijuti Rudraksha are used against frequent miscarriage, sexual disorder and internal and external body disorder respectively (Kumar et al., 2013). Prabha and Kaur (2014) reported *E. sphaericus* to be the finest medicine against hypertension and also used to relieve chicken pox, fever, epilepsy, mental diseases, increase the secretion of liver and to gain peace of mind. *E. sphaericus* is used to retrieve confidence (Pant et al., 2013). Chanting



the Rudraksha rosary, acupressures the fingertip which is very useful in the blood circulation of brain and eyes, similarly, hot nature of Rudraksha melts the cholesterol which helps in the easy circulation of blood and also Rudraksha oil obtained by boiling 10 Rudrakshya with 9 pieces of garlic in 200ml of ginger oil, when applied on chest helps to cure pneumonia (Rao and Swamy,1997).



Figure 3. Tree of *E. sphaericus*

Medicinal value: Different scientists have conducted different research works and surveyed to check out the correctness of the application of *E. sphaericus* as traditional medicine. Going through several research and review *E. sphaericus* is reported showing diverse medicinal value when treated with different extracts. It shows antiasthmatic (Singh et al., 2000a), analgesic (Nain et al., 2012), anticonvulsant (Dasgupta et al.,1984), antidepressant (Singh et al.,2000a), antifungal (Singh et al., 2010), anti-inflammatory (Singh et al., 2000b), anti-diabetic (Hule et al.,2011), anti-ulcerogenic (Singh et al., 2000a) activity. Hydro-methanolic leaf extract, RDLM of *E. sphaericus* showed antibacterial activity against *P. aeruginosa*, *L. lactis*, *S. pneumonia*, *E. coli*, *S. typhi*, and *S. aureus* among which finest antibacterial activity at the lowest concentration (0.21mg/ml) was recorded against *E. coli* (Sharma et al., 2015). However, in another report acetone and methanol extract is also reported showing remarkable antimicrobial activities against bacteria. Bhatt and Dahal (2019) surveyed and concluded that the methanol extract of *E. sphaericus* is extremely effective against *S. typhi*. Tripathi (2015) from his research revealed the antihyperglycemic activity shown by *E. sphaericus* seeds. It has curative power against Diabetes mellitus as it plays a vital role in decreasing the glucose level in blood of diabetic patients. Another research carried out on 73 stressed working women to check out the correctness of traditional belief that 4M Rudraksha decreases the cognitive dysfunction in working women. The study lay out sufficient research based evidences about the beneficial effect of 4M Rudraksha against cognitive dysfunction (Sharma et al, 2019). Though, *E.sphaericus* seeds are woody structures, it holds capacitance and inductance activities. They have the ability to store electric charge (Sharma et al., 2018). Similarly, in research conducted to know the electromagnetic field (EMF) effect of *E. sphaericus* beads on human body, SpO2 and Bpm of 10 humans between 20-40 ages had been observed before and after wearing a bead necklace. The oxygen saturation level was improved significantly and the high Bpm noted before was decreased noticeably which concluded that *E. sphaericus* seed have shielding effect against the negative electromagnetic field (Tripathy et al., 2021). These beads safeguard from negative energies so it has high importance and price in the market. To fulfil their money interest people are seen trading artificial beads. One must be careful while buying them. We can separate



natural beads form artificial beads by Cut test, copper coin test, properties test, eye test, x-ray test and CT scanning test (Prabha and Kaur, 2014).

CONCLUSION

E. sphaericus commonly known as Rudraksha has high religious and medicinal value. Different people use different parts of the tree on their own way. Some people directly consume powdered seeds, fruits or leaves while some people wear the rosaries, bracelets or necklaces and also some are seen chanting them. Several researches have been carried to know the effectiveness of followed tradition. Its electromagnetic effect keeps the negative energies far and helps to gain peace of mind and confidence. The species is found to be beneficial against depression, diabetes, asthma, bacterial and fungal infections, stomach ailments, etc. Thus, proper management plan for the plantation, production and management of *E. sphaericus* along with further scientific research on the traditional medicinal value is required.

DECLARATION OF CONFLICT OF INTEREST

No conflict of interest to declare.

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