

Short Communication

Phytochemical Screening of Methanolic Extracts of Different Parts of Rudraksh Plant (*Elaeocarpus ganitrus*)

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Abstract: Since time immemorial plants have played a vital role in the field of health care and medicines. There are many plants with high medicinal values among which *Elaeocarpus ganitrus* (Rudraksh) holds utmost importance, both scientifically as well as spiritually. The different parts of a rudraksh tree have high concentrations of important phytochemical constituents thus adding to its medicinal value. This work is focused on phytochemical screening of methanolic extracts from the epicarp, endocarp of the seed and bark sample of rudraksh tree and their comparison to justify the high medicinal efficacy of the plant.

Keywords: *Elaeocarpus ganitrus*, Rudraksh, Secondary Metabolites, Phytochemical Screening

Introduction

Elaeocarpus ganitrus Roxb (also known as Rudraksh) belonging to the family Elaeocarpaceae is a large evergreen broad-leaved tree mainly found in the Himalayan range of India and Nepal along with Manila, Philippines, Myanmar, Bangladesh and Bhutan (Pant *et al.*, 2013). The *Elaeocarpus* fruits consist of a highly ornamental stony endocarp (Fig.1) which is used as a religious ornament. The endocarp in addition is covered with a bluish thin epicarp. Due to large number of infections being caused by microorganisms and the side effects being caused by the antibiotics thus used to treat them, there has been a considerable shift in the demand towards natural herbal medicines. As such *Elaeocarpus ganitrus* has been reported to exhibit wide range of medicinal effects such as anti-fungal activity as reported by Singh *et al.*, 2010, anti-microbial activity (Singh and Nath, 1999) etc. It is eminent that the medicinal property of the plant is a function of the phytochemicals present in them, which in turn play a major role in eliciting good physiological effects on our body (Chinedu *et al.*, 2015). Plants with wide variety of chemical constituents provide to be a promising source of medicinal compounds with general as well as disease specific activity (Vijayalakshmi and Ravindhran, 2012). The objective of the work is to carry out the screening process to detect the phytochemical constituents present in the epicarp, endocarp of the seed and the bark of the plant and to carry out a comparative study of the same to justify the high medicinal efficacy of the plant.

The plant samples were air dried inside the laboratory for around 2 weeks. After complete drying the samples were crushed to fine powder by the help of a mortar and pestle. Extraction was carried out by maceration following the procedure reported by Alamgir *et al.*, 2014, using methanol as the solvent. Then the plant extracts were screened for presence of secondary metabolites. For the purpose, a series of tests were performed to confirm either the presence or absence of a particular phyto constituent. Alkaloids were screened by Mayer's Test, Wagner's Test and Dragendorff's Test. Similarly detection of carbohydrates was carried out using Fehling's Test, Barfoed's Test and Benedict's test. Legal's test and Evan's test were carried out for detection of glycosides. Detection of phenols was carried out by lead acetate test and that of tannins by ferric chloride test. Three different tests viz. Fehling's test, Barfoed's test and Benedict's test were carried out to screen for the presence of carbohydrates. Detection of presence of proteins and amino acids was carried out by Millon's test, Biuret test and Ninhydrin test. Libermann-Buchard's test for detection of phyto sterols, spot test for detection of fixed oils, alkaline reagent test for flavonoids was conducted. Similarly certain pre described and pre published protocols were followed for detection of saponins, gum and mucilages (Raaman, 2006), quinone, anthraquinones and coumarins (Vijayalakshmi and Ravindhran, 2012). The results of the tests were pooled and compared as shown in Table 1. (+ - present in low concentration, ++ - moderately present, +++ - present in high concentration).

Table 1. Results of phytochemical screening of methanolic extracts of different parts of rudraksh plant

Phyto chemicals	Epicarp sample	Endocarp sample	Bark sample
Alkaloids	+++	+++	++
Flavonoids	+	++	-
Carbohydrates	+++	-	++
Glycosides	-	+	++
Proteins	++	+	+++
Phytosterols	+	-	-
Quinone	+++	+++	+++
Anthraquinones	-	-	-
Saponins	-	-	-
Coumarins	+++	+++	++
Tanins	+++	+++	++
Gum and mucilages	-	-	-
Fixed oils	+	-	-



Fig. 1. Endocarp of Rudraksh fruits

The epicarp, endocarp and bark extracts were found to be highly rich in alkaloids, quinone, coumarins and tannins. Flavonoids were detected in both the epicarp and endocarp extracts but were absent in the extracts of bark. Anthraquinones, saponins and gum and mucilages were absent in all the above three extracts. The epicarp and the bark extracts had high concentrations of carbohydrates present in them but the endocarp sample lacked it. Glycosides were not found except in some moderate quantities in the bark extract. Proteins were found to be in higher concentration in the endocarp sample followed by the epicarp and very less amount in the bark sample. Fixed oils were detected only in the epicarp sample in a small quantity.

Rich in large numbers of phytochemical constituents justifies the medicinal value of *Elaeocarpus ganitrus*. It creates a good scope for further research on it in the field of pharmacological sciences and animal testing providing a platform for novel drug development for treatment of many chronic diseases and health ailments.

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Ethics

The author hereby declares that no ethical issues are going to arise after the work has been published.

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