

# “Preliminary Phytochemical And Biochemical Analysis of *Breynia Vitis-Idaea* (Burm. F.) C. E. C. Fisch.;”

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**Abstract-** The present study was undertaken to find out the preliminary phytochemical constituents and biochemical analysis of the leaf of *Breynia vitis-idaea* (Burm.f.) C.E.C. Fisch.; Plants have always been known as a traditional source of medicine since they contain primary and secondary metabolites of high chemical diversity. Phytochemistry deals with the knowledge of bioactive natural products or phytochemicals isolated from natural products. They have a beneficial effect on health or active role in the treatment of diseases. Because of the accelerated local, national and international interest in recent years the demand for medicinal and aromatic plants has been increased in pharmaceutical industry as a source of income. In the present study phytochemical and biochemical analysis of ethanol, methanol and ethyl acetate leaf extract of *B.vitis-idaea* aims to reveal the presence of carbohydrates, protein, amino acids, steroids, glycosides, flavonoids, alkaloids, tannins, saponins and terpenoids.

**Keywords-** Phytochemical, Biochemical, *Breynia vitis-idaea*

## I. INTRODUCTION

Herbal medicines are a valuable as well as a precious gift from nature. They were existing even before human beings made their appearance on the earth. Wherever we are born we have around us herbs, shrubs, and plants useful to us. It is gratifying to note that in India, the importance and relevance of herbal system (Ayurveda, Unani and Siddha) is increasingly being realized for the last few decades (Manju Gowda *et al.*, 2014). They have a beneficial effect on health or active role in the treatment of diseases (Mohammad Ali, 2008). Globally, about 85% of the traditional medicines used for primary healthcare are derived from plants. Conservation and sustainable use of medicinal plants are issues on which immediate focus is required in the context of conserving biodiversity. Considering these facts it is important to know about the medicinal plants of the nearby areas and become more crucial when the area is almost in the vicinity of the forest and well protected (WHO). Therefore, the aim of the

study is to improve our quality of life by using medicinal plants for various illnesses and as traditional medicine is an alternative for health care and also for human beings in day today life.

## II. MATERIALS AND METHODS

### Study area - (Plate-1 & 2)

Kerala is a state on India's tropical Malabar Coast, has nearly 600 Km of Arabian shoreline. Chelannur is a town in Chelannur Taluk in Kozhikode district of Kerala state, India. It is located 11 km towards North from district headquarters Kozhikode. The area is blessed with diversified habitats such as hills and hill rocks, highlands, different crop plantations and trees. It has a tropical climate. This area get rain from two monsoon seasons, the south- west monsoon starts in June and ends in September. The North West monsoon season is from October to November.

Plate -1: Location map

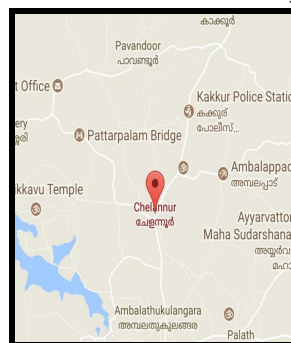
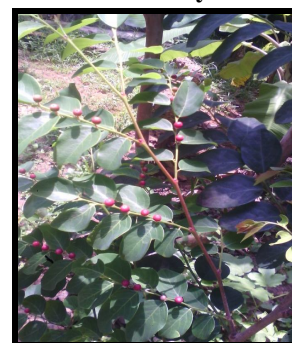


Plate -2: Study area



### Systematic position

Kingdom	- Plantae
Division	- Tracheophyta
Class	- Magnoliopsida
Order	- Malpighiales
Family	- Euphorbiaceae
Genus	- <i>Breynia</i>
Species	- <i>B.vitis-idaea</i> (Burm. f.) C. E. C. Fisch.;

**Plate - 3 : Habit of *Breynia vitis-idaea***

*Breyniavitis-idaea*(Burm.f.) C. E. C. Fisch.; (Euphorbiaceae) is an evergreen, glabrous tree or large shrub found in scrub, forest edges and along paths near beach forest. The plant is distributed in India, Malaysia, Cambodia, Myanmar, Nepal, Pakistan, Philippines, Thailand, Vietnam, Gangetic Plain, Western Peninsula, China, Malay Peninsula and Sri Lanka. Altitude of the plant is up to 1500 m. The trade name of the plant is Indian snow berry or coffee bush. It is an erect shrub up to 3 m tall, glabrous; stipules ovate triangular. Leaf is simple, alternate, green, egg shaped, leaf blade elliptic often rarely ovate or broadly ovate distichous, base obtuse, apex acute. The flower is small, green, solitary or several in axillary racemes divide in male and female flowers. Male flowers in axillary, perianth turbinate, yellow, lobes 5; stamens 3. Female flowers axillary, solitary, reddish, perianth campanulate, 5-6 lobed; ovary 3- celled; style short; stigmas 3, sunk at top of ovary fruits ovoid, compressed at apex, apex sometimes obscurely beaked, without apical rim, red and twining black-purple when fully mature, drying shiny brown. The flowering period of the plant is July to September. The type of the fruit is capsule, ovoid, compressed at apex, apex sometimes obscurely beaked, without apical rim, red and turning black-purple when fully mature, drying shiny brown, seeds are yellow- brown. Fruiting period of the plant is October to December. Bark of the plant is prickly in texture and greenish in colour. These plants are planted as ornamental hedge in the garden.

**Collection of sample**

For the present study the plant sample was selected from Chelannur Taluk, Calicut, to find out the phytochemical and biochemical activity. Disease free leaves were collected for this investigation. Then, the leaves were surface sterilized with 0.1% mercuric chloride and alcohol for few seconds. The plant sample was thoroughly washed with distilled water. The

collected leaves were shade dried and powdered using a mechanical grinder. Fine powder was made and transferred into air tight containers with proper labeling for further analysis.

**Plate - 4 : Dried sample****Plate - 5: Powdered sample****Preparation of the plant extracts**

15 grams of the powdered sample was extracted with 100 ml of ethanol, methanol and ethyl acetate solvents separately in the shaker system for 48 hours.

**I. Preliminary phytochemical analysis**

The phytochemical screening of leaves with ethanolic, methanolic and ethyl acetate extracts of *Breynia vitis-idaea* were analyzed by standard methods and it showed various phytochemical constituents such as carbohydrate, protein, amino acids, steroids, flavonoids, alkaloids, tannins, saponins, terpenoids and glycosides.

**II. Biochemical analysis**

The biochemical analysis of Carbohydrate and Starch were analyzed by Anthrone method (Hedge, J.E. and Hofreiter, B.T 1962).

Protein estimation was analyzed by Lowry's method (Lowry, *et al.*, 1951).

**III. RESULTS AND DISCUSSION**

Successive isolation of the phytochemical compounds from the plant material largely depends on the type of solvent used in the extraction procedure. In the present study, ethanolic, methanolic and ethyl acetate extracts were analyzed. The qualitative phytochemical screening of leaves in ethanolic extract revealed the presence for carbohydrates, proteins, amino acids, glycosides, flavonoids, alkaloids and saponins and showed the absence of steroids, tannins and

terpenoids. Of all these phytochemicals alkaloids, flavonoids, glycosides and saponins were found to be more prominent. The similar trend was observed in the preliminary phytochemical screening in three studies on *Breynia vitis-idaea*. It was observed in the evaluation of hepatoprotective activity of leaf extract by using chag liver cell line (Manju Gowda *et al.*, 2014).

In the case of methanolic extract, carbohydrates, proteins, amino acids, glycosides flavonoids, alkaloids, tannins, saponins and terpenoids gave positive results. Among these flavonoids, saponins, glycosides and terpenoids were present at a higher rate. The results obtained from the present study supports the results of the previous researchers on the antimicrobial activity of this plant leaf (Devi Prasad *et al.*, 2014). In another study, alkaloids, tannins and steroids were present (Bharath Kumar *et al.*, (2009). Flavonoids were found to be highly present in the in-vitro antioxidant activity of *Breynia vitis-idaea* extracts (Chandrashekar *et al.*, 2011). Another study reports shows steroids were present (Venkata kantameddi *et al.*, 2010). In ethyl acetate extract, carbohydrates, proteins, amino acids, glycosides, flavonoids, alkaloids, tannins, saponins and terpenoids were observed. Of these glycosides and flavonoids were found to be highly dominant. An identical result was observed in the study of hepatoprotective activity and adaptogenic activity of the leaf extract of *Breynia vitis-idaea* (Manju Gowda *et al.*, 2015). In the study of in-vitro antioxidant activity of *Breynia vitis-idaea*, it showed the presence of flavonoids at a higher level (Chandrashekar *et al.*, 2011).

Table: 1 Qualitative analysis of phytochemicals present in the ethanol leaf extract of *Breynia vitis-idaea* (Burm. f.) C. E. C. Fisch.;

S.No	Phytochemicals	Ethanol extract
1.	Carbohydrates	+
2.	Proteins	+
3.	Amino acids	+
4.	Steroids	-
5.	Glycosides	++
6.	Flavonoids	++
7.	Alkaloids	++
8.	Tannins	-
9.	Saponins	++
10.	Terpenoids	-

(++ indicates strongly present, + indicates moderately present, - indicates absent)

Table: 2 Qualitative analysis of phytochemicals present in the methanol leaf extract of *Breynia vitis-idaea* (Burm. f.) C. E. C. Fisch.;

S.No	Phytochemicals	Methanol extract
1.	Carbohydrates	+
2.	Proteins	+
3.	Amino acids	+
4.	Steroids	+
5.	Glycosides	++
6.	Flavonoids	++
7.	Alkaloids	+
8.	Tannins	+
9.	Saponins	++
10.	Terpenoids	++

(++ indicates strongly present, + indicates moderately present, - indicates absent.)

Table: 3 Qualitative analysis of phytochemicals present in the ethyl acetate leaf extract of *Breynia vitis - idaea* (Burm. f.) C. E. C. Fisch.;

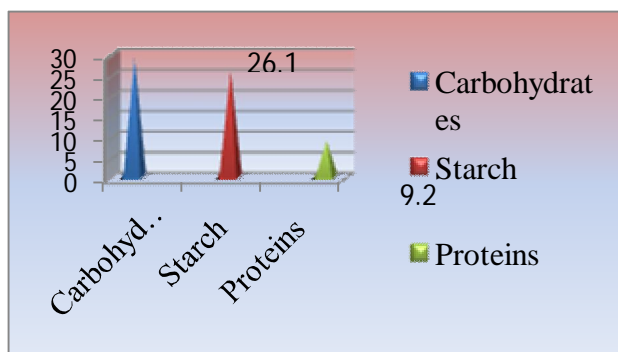
S.No	Phytochemicals	Ethyl acetate
1.	Carbohydrates	+
2.	Proteins	+
3.	Amino acids	+
4.	Steroids	+
5.	Glycosides	++
6.	Flavonoids	++
7.	Alkaloids	+
8.	Tannins	+
9.	Saponins	+
10.	Terpenoids	+

(++ indicates strongly present, + indicates moderately present.)

Table: 4 Carbohydrate, starch and protein content present in the selected sample

Sample	Carbohydrate content in mg/g	Starch content in mg/g	Protein content in mg/g
Leaf powder	29 mg	26.1 mg	9.2 mg

Chart: Carbohydrates, Starch and Protein content present in the leaf extract of *Breynia vitis-idaea* (Burm. f.) C. E.C. Fisch.;



The present study reveals that the leaf of *Breynia vitis-idaea* (Burm. f.) C. E. C. Fisch.; contains primary metabolites that are carbohydrates, starch and proteins. In mg/g it contains 29 mg of carbohydrates, 26.1 mg of starch and 9.2 mg of protein (Table 4). The leaves contain more amounts of carbohydrates, starch and less amounts of proteins. It can treat many diseases of mankind to an extent. Hence it is a very beneficial plant which can be dependent upon for traditional medicinal systems. Root, leaves and bark are medicinal. Roots decoction is used as mouthwash. The whole plant of Indian snowberry is used for tonsillitis, menorrhagia, hemorrhage, piles, leucorrhoea, diabetes, and dental cares. This plant is also having larvicidal properties. The leaf paste applied on the affected part cures skin problems. A cup of crushed leaves ground with few pepper seed and garlic is taken with milk is used to treat Gynaecological fibroids (Bharath Kumar *et al.*, 2009). The leaves smoked like tobacco in swelled uvula and tonsils. *Breynia vitis-idaea* is a plant of great medicinal value. It can be grown in our home garden without any expenses and plays an important role in the society because of good results in a short period of time. The plant can be used as traditional medicine in alternative form for human health and development. And it is to improve our quality of life and disease-free life by using medicinal plant for various illnesses.

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