

Medicinal Insights and Ethnobotanical Survey of Phyllanthaceae Species in Udupi District

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Abstract: About: The floristic wealth of India is diverse and enormous. Many species of Phyllanthaceae used in medicine grow in all climatic conditions. Medicinal plant knowledge along with their therapeutic benefits, phenology, geological conditions is essential in current era. Materials and Methods: Field survey was conducted during flowering and fruiting season of Phyllanthaceae species in and around Udupi district plants identified, authenticated herbarium was prepared. Ethno - medico - botanical information about each species was collected by consulting local healers and detailed information listed by referring floras. Results: *P. emblica*, *P. acidus*, *P. reticulatus*, *P. urinaria*, *P. amarus*, *P. tenellus*, *P. debilis*, *P. rheedi*, *P. virgatus*, *P. lawii* and *P. myrtifolius* are major species found in study area. Discussion and Conclusion: Family Phyllanthaceae, having diverse medicinally beneficial plant species available wild, also found in cultivated status. 11 species of Phyllanthaceae have been documented from Udupi district, each having medicinal usage. Morphological, phytochemical, geological differences also found interesting among species.

Keywords: Ayurveda, Phyllanthaceae, ethno - medicinal uses, field survey

1. Introduction

Universal role of plants in the treatment of disease is exemplified by their employment in all major systems of medicine irrespective of the underlying philosophical premise¹. Plants sustain human life by providing the raw materials needed for living such as food, clothing, shelter, medicine, energy, along with rendering various ecosystem services to maintain the ecological balance². The floristic wealth of India is diverse and enormous. Western Ghats is one among biodiversity hotspots of India which is rich with diverse medicinal plants. In India it is estimated that there are around 17000 species of higher plants, among which 7500 are known for medicinal use³.

Phyllanthaceae considered as a subfamily of Euphorbiaceae many of which are possessing medicinal value, most numerous in tropical region⁴. Genus *Phyllanthus*, member of the flowering plant family Phyllanthaceae, includes more than 1000 species, distributed in tropical and subtropical regions⁵. Most of its species have *phyllanthoid* branching produce flowers only on the ultimate branchlets. Because of these branchlets often fall as a unit and resemble that of pinnate leaves, the flowers of the plant superficially appear to be borne on the leaves⁶. In some species of *Phyllanthus*, the ultimate branches are essentially leafless and flattened into strikingly leaf like cladodes; their homology with branches is clearly demonstrated by the cymules of flowers along the margins⁷. The difference between Euphorbiaceae and Phyllanthaceae are listed in table 1.

Table 1: Difference between Euphorbiaceae and Phyllanthaceae⁸

Plant characters	Euphorbiaceae	Phyllanthaceae
Ovary	Single ovule per locule	2 per locule
Style	3	2-5
Stigma	3, lobed (furtherlobed)	1
Fruit	Regma, capsule, drupe, or berry	Fruits usually capsules berries or drupes.
Seed	Arillate seeds	Non arillate seeds

Several Phyllanthaceae species are widely used in medicine, comprising diverse medicinal properties, and phytochemical constituents. Udupi is a coastal district of Karnataka, characterized by excessive humidity during greater part of the year. The purpose of this study is to conduct a comprehensive ethnobotanical survey of Phyllanthaceae species in the Udupi district, document their medicinal uses, and contribute to the knowledge of traditional medicine practices. This study is significant as it provides detailed ethno - medico - botanical information on Phyllanthaceae species, contributing to the preservation of traditional knowledge and potential discoveries in herbal medicine.

Hence with all this background a study has been planned to conduct a survey on medicinal plant species of Phyllanthaceae of Udupi district, along with their documentation on ethno - medico - botanical uses.

2. Materials and Methods

Field survey was conducted during flowering and fruiting season of Phyllanthaceae species in and around Udupi district plants identified, authenticated herbarium was prepared, referring flora and botanist opinion. Ethno - medico - botanical information about each species was

collected by consulting local healers and detailed information listed by referring floras, Materia medica as per standard guidelines^{9, 10}.

3. Results

Below listed plants have been found during systematic survey conducted in study area, which were documented along with their traditional medicinal benefits.

a) *Phyllanthusemblica* Linn.

A medium - sized deciduous tree with light grey bark found exfoliating in irregular patches. Leaves were sessile, oblong - elliptic with flowers in axillary fascicles.^{11, 12} Drupaceous fruits and trigonous seeds were features. Planted in public parks, medicinal gardens. Fruits used in jaundice, dyspepsia, bacillary dysentery, eye trouble also as a gastrointestinal tonic. Juice with turmeric powder and honey is prescribed in diabetes insipidus. Seed as anti - asthmatic used in bronchitis. Leaf - juice is given in vomiting. Fruits are rejuvenator used in Indian system of medicine.^{13, 14} A decoction of powdered pericarp advised for peptic ulcer. Root bark as astringent, said to be beneficial in ulcerative stomatitis. Leaves recorded beneficial in conjunctivitis, inflammation, dyspepsia, diarrhoea and dysentery.

b) *Phyllanthusacidus* Skeels. / *Ciccaacida* (Linn.) Merrill

It is a small tree with ovate leaf and acute apex. Flowers reddish, minute with drupaceous, globose, 6 - 8 - angled fruit.^{15, 16} Usually cultivated in gardens for the edible fruits, which are used in pickling. It is used as liver tonic which improves appetite, useful in biliousness, constipation, vomiting, bronchitis.

c) *Phyllanthusreticulatus*. Poir^{17, 18}

It is an erect or straggling shrub having slender and drooping branchlets. Leaves found elliptic - orbicular, rounded at both ends, glabrescent; with 3 mm long petioles. Flowers located in axillary fascicles with globose, purple - black fruits. Commonly grown in hedges. *P. reticulatus* leaves are used in bleeding gums along with *Kankola* (*Piper cubeba*) and *Karpura* (*Cinnamon camphor*) as it stops the bleeding. The decoction of its root said to be beneficial in children for bronchitis. Stem decoction is also used in painful eyes and conjunctivitis. Fruits used in blood purification, also as a diuretic.

d) *Phyllanthusurinaria* L.

It is an erect, annual herb with sessile, closely placed, often overlapping leaves. Male flowers pedicellate whereas female flowers axillary, solitary. Fruits were capsule with transversely ridged seeds¹⁹. Found common in wastelands and as weed in gardens. It is an excellent diuretic whereas leaves are eaten by cattle. The juice of the leaves administered with coconut milk as an appetizer to children.

e) *Phyllanthusenellus* Roxb²¹.

It is an annual glabrous herb, with elliptic to obovate, acute leaf. Flowers found in axillary fascicles having filiform Capsule and trigonous seeds. Native to Mascarene Islands, but now well naturalized, found everywhere. It is used to treat inflammation and liver diseases.

f) *Phyllanthusamarus* Schumach & Thonn.

It is an erect herb with sessile, closely placed and often overlapping, oblong to obovate leaves. Flowers found in fascicles with depressed globose capsule²². Found as a weed in cultivated and waste lands. Used as a single drug in the treatment of jaundice as decoction. Used in prescriptions for dyspepsia, indigestion, chronic dysentery, urinary tract diseases, diabetes, skin eruptions. It is also useful in jaundice, diarrhoea, dysentery, intermittent fevers, diseases of the urino - genital system, scabies, ulcers.

g) *Phyllanthusmyrtifolius* (Wight) Muell. Arg.

It is a rigid shrub with angled branches and narrowly oblanceolate leaf. Flowers pinkish or greenish, found in bracteate axillary fascicles. Fruits are filiform capsules having trigonous seeds. Native to Sri Lanka; often cultivated in garden as a hedge plant²³.

h) *Phyllanthus debilis* Klein ex Willd.

It is an erect herb with closely placed, elliptic - acute leaves and short petiole. It has very short, flowers in fascicles. Found as a common weed in paddy fields after harvest.²⁴

The herb said to be bitter in taste, and is reported to possess astringent, diuretic, febrifugal and antiseptic properties. It is used in stomach troubles such as dyspepsia, colic, diarrhoea and dysentery. It is also employed in swelling and diseases of urinogenital system²⁵.

i) *Phyllanthusrheedi* Wight

It is a slender, erect glabrous herb with branched stem. Leaves were elliptic or ovate and flowers found in axillary fascicles with oblate capsule having trigonous, 6 - 7 - ridged seed inside. Found in grass lands and commonly used in dysentery²⁶

j) *Phyllanthusvirgatus* G. Forst

It is an erect herb or undershrub with woody rootstock and long flattened branches. Leaves were sessile, closely placed and often overlapping. Male flowers few, minute, sessile whereas female on filiform pedicels. Depressed - globose, long - stalked capsule and red tubercular seeds are characteristic features. Commonly found in waste lands, hedges.

Plant said to be antiseptic, wound healing. Fresh leaves, bruised in butter milk, are used as a wash for itching. Fresh leaves, flower and fruits along with cumin seeds and sugar, are used in gonorrhoea. Root application said to be beneficial in mammary abscesses. The juice of the leaves is employed in eye diseases²⁷.

k) *Phyllanthuslawii* J. Graham

Thorny bushy shrub with purplish branches armed with stipular tubercles. Leaves long, elliptic - oblong, shortly stalked. Flowers in axillary fascicles with globose capsule. Frequently found on the banks and in the beds of rocky rivers. Its branches are used for making baskets²⁸.

Thus, totally around 11 species have been found in Udupi district, among which herbarium and live photographs of 8 species have been documented.



1/a. *Phyllanthus emblica* Linn.



21/b. *Phyllanthus tenellus* Roxb



1/c. *Phyllanthus urinaria* Linn.



1/d. *Phyllanthus reticulatus*. Poir



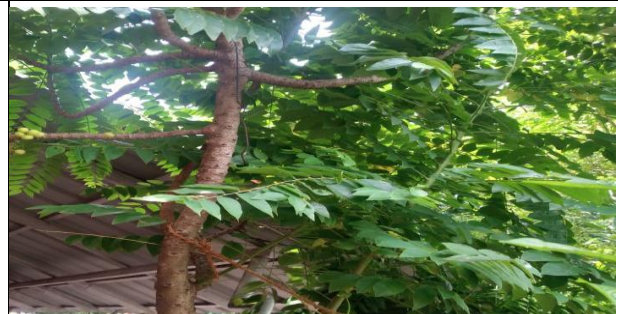
1/e. *Phyllanthus amarus* Schumach & Thonn



1/f. *Phyllanthus debilis* Klein ex Willd.



1/g. *Phyllanthus virgatus* G. Forst

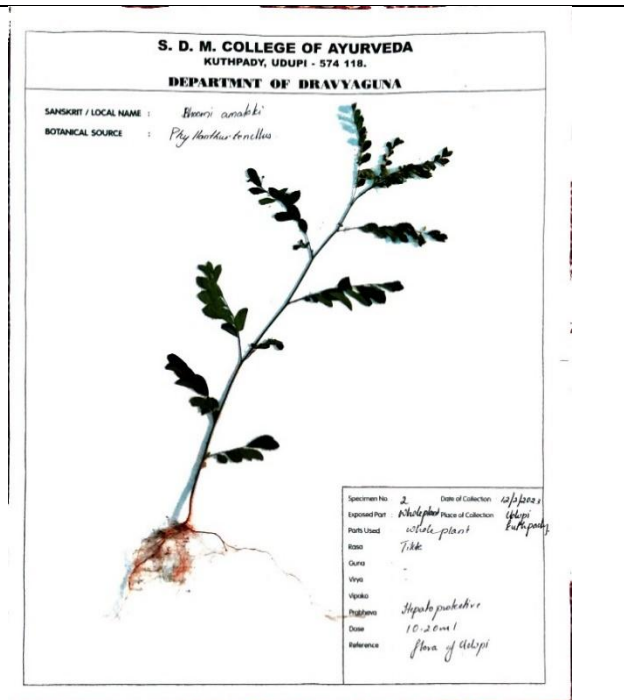


1/h. *Phyllanthus acidus* Skeels.

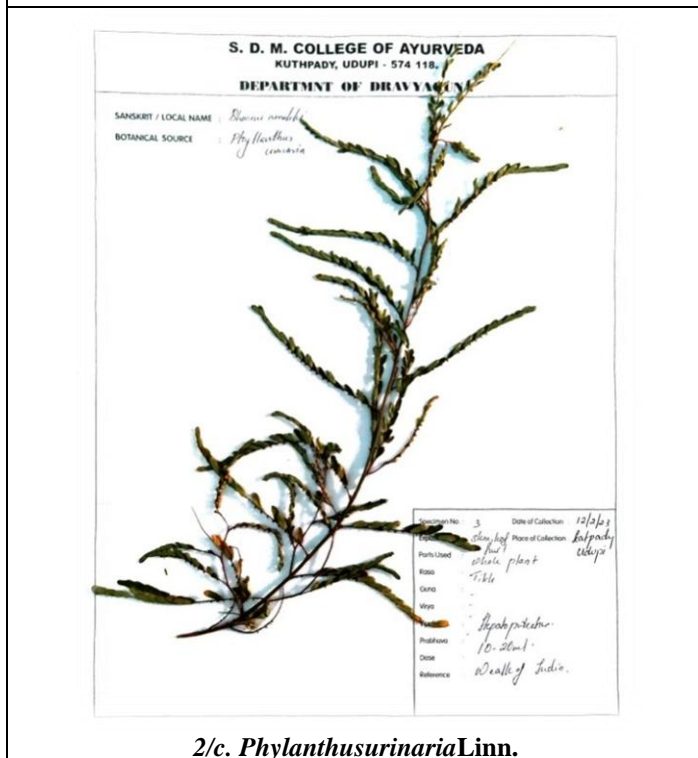
Figure 1: Plant Species belonging to Family *Phyllanthaceae*



2/a. *Phyllanthusemblica* Linn.



22/b. *Phyllanthus tenellus* Roxb



2/c. *Phyllanthusurinaria* Linn.



2/d. *Phyllanthusreticulatus*. Poir

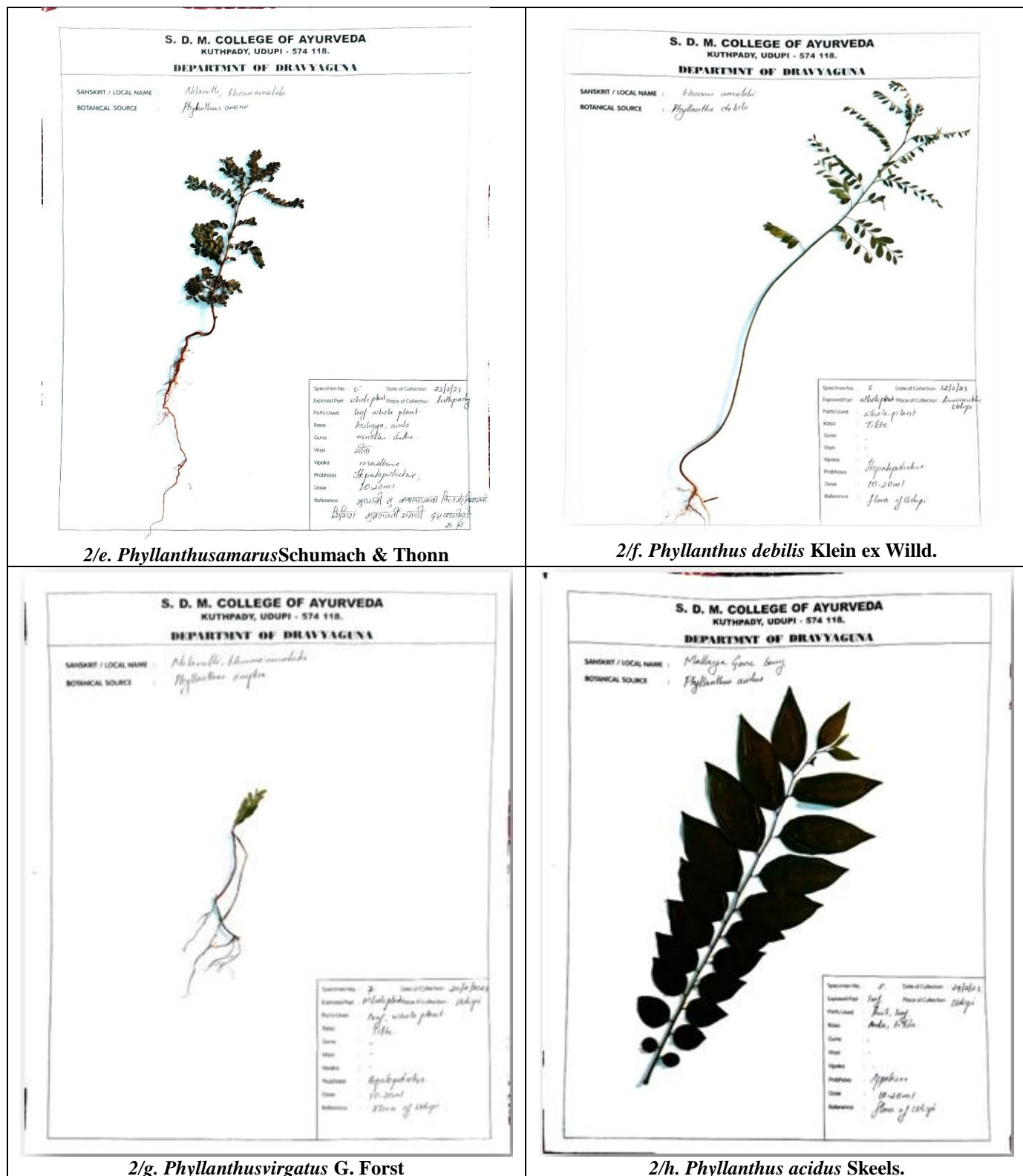


Figure 2: Herbarium of Plant Species belonging to Family Phyllanthaceae

4. Discussion

India treasure house of medicinal plant species, has diverse sources which are used in various therapeutics²⁹. Phyllanthaceae subfamily of Euphorbiaceae found numerous in tropical region. Genus Phyllanthus a member of the flowering plant family Phyllanthaceae, includes more than 1000 species showing characteristic phyllanthoid branching producing flowers only on the ultimate branchlets.

Ethno medico botanical survey has its application in many fields such as biodiversity, conservation strategy, human health, sustainable harvesting procedures etc³⁰.

Survey revealed that many plants of phyllanthaceae species have ethno - medicinal uses. Among these Phyllanthus emblica Linn. a medium sized tree, fruits of which are most widely used in Ayurveda for rejuvenation. Phyllanthus acidus Skeels. is a small tree having edible fruits, used in culinary preparations.

Phyllanthusreticulatus Poir. an erect or straggling shrub aerial part of which are used in wound healing. *Phyllanthusurinaria* an annual herb known as an excellent diuretic, whereas *Phyllanthus amarus* Schumach & Thonn, and *Phyllanthus debilis* effective medicine used in the treatment of liver diseases. *Phyllanthus rheedii* Wight is given in dysentery and *Phyllanthus virgatus* G. Forst used as antiseptic in gonorrhoea. Others like *Phyllanthus lawii* J. Graham and *Phyllanthus myrtifolius* (Wight) Muell. Arg. have commercial importance³¹.

11 species of *Phyllanthaceae* have been documented from Udupi district, each having medicinal usage. Morphological, phytochemical, geological differences also found interesting among species.

5. Conclusion

Family *Phyllanthaceae*, having varied medicinally beneficial plant species available wild, also found in cultivated status. Morphological characters, medicinal benefits enlisted above contributory in further new drug research. This study not only documents the medicinal properties of *Phyllanthaceae* species in the Udupi district but also underscores the importance of preserving traditional knowledge for future pharmacological explorations.

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