



Pharmacognostical study of *Dioscorea oppositifolia* bark

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Abstract

Extraction of bioactive compounds from herbal plants allows demonstration of their various properties including physiological activity. It also demonstrate pharmacology studies which result in the discovery of synthesis of more effective drugs. The plant used in the present studies is *Dioscorea pentaphylla* bark. Which is widely used traditionally for its antiseptics, ulcers curing and abscesses. The root of this plant is taken and chewed to relief toothache and aphthae. The plant whole part (extract) is helpful in curing secondary syphilis and Psoriasis. The present study was performed to find out the preliminary phytochemical characters and fluorescence analysis of this species.

Keywords: *Dioscorea oppositifolia*, leaves, Ayurveda, siddha, unani, bryophyta

Introduction

Nature is a storehouse of all the medicines which can cure simple to deadly diseases of mankind. Nature provide full and effective remedies to cure many diseases. The knowledge and use of drugs (Plant extract) has been used over a long time. In past years medicinal plant play a key role in caring many health issues. Today, a huge information and knowledge regarding medicinal and therapeutic properties of different plant has been collected and studied. Various classes of plant like Thallophyta, Bryophyta, Pteridophyta and Spermatophyta contain species that provide primary and secondary products which are highly useful in medicinal field. Herbal plants (medicines) has been used worldwide and now a days recognized and used by WHO as an essential element for primary healthcare [1]. People belonging to different areas identified and named their herbal plants according to their knowledge and experience. In india we have mainly three main traditional systems of medicine known as Ayurveda, Siddha and Unani. Ayurveda, the Indian indigenous system of medicine, dating back to the Vedic Age (1500-1800 BC) has been an integral part of the Indian culture and tradition. The siddha system of medicine has been originated from sangam period. This system is as ancient as Ayurveda.

In the nineteenth century, the term "Materia Medica" was used for the subject called as "Pharmacognosy". It was Seydler, a German who coined the term "Pharmacognosy" in 1815 used in the title of his work "Analecta Pharmacognostica". Pharmacognosy is mainly derived from two Greek words pharmakon and Gignosco. Pharmakon means a drug & Gignosco means required the knowledge. The whole parts of plant such as leaves, flowers, tender shoots and tubers of *Dioscorea pentaphylla* Bark [2] are widely used for cooling and demulcent; they are used in the form of decoction for urine flow, contraceptive manufacture, rheumatism, arthritis, digestive disorders including gall bladder inflammation, irritable bowel syndrome (IBS) & diverticulitis. Root is helpful in sooth

Dysmenorrhoea, allay uterine and overine pain [3, 4]. The leaves are antiseptic in nature; the paste of leaves are applied on ulcers and abscesses. The root is chewed to cure toothache and aphthae. The plant as a whole used in application for oedematous tumours and the ash extract of flowering twigs along with tender bark cure cancer and leprosy. All the parts of the plant extract are used for secondary syphilis and Psoriasis [5]. Pharamacognosy study mainly deals the drug plants, their history, selection, collection, identification and preservation. Characters such as anatomical powdered drugs proved to be great significance especially at a period when adulteration of both in drugs and food articles is common. Quality control of a crude drug and its pharmaceuticals can be attempted by various methods of examination depending upon the morphological and microscopical studies of the crude drugs and their physical, chemical and biological behaviour. The proper and systematic identification of crude drugs and their quality assurance form an integral part of drug-description [6].

Materials and Methods

Dioscorea oppositifolia bark. (Dioscoreaceae) was collected from Karaiyar hills in Tirunelveli district. Taxonomic features collected from the species have been checked with the Flora of Presidency of Madras.

Macroscopic Studies

The observation was made using a student dissection microscope and the morphological and taxonomical characters were described in technical terms

Phytochemical Studies

The gathered plants were dried and powdered. About 10gms of the powdered sample of the species was separately extracted with benzene, methanol, chloroform, petroleum ether and distilled water. These extracts were carefully concentrated and used for preliminary phytochemical screening⁷.

Chemical composition

Chemical Composition Diosgenin an aglycone is a chemical substance found in Dioscorea and are used commercially in pharmaceutical industry. Apart from diosgenin, dioscorin, dioscin and other alkaloids are also found. Bark contains phytosterols, alkaloids, tannin and rich source of starch. Other substance found are aluminium, ascorbic acid, ash, beta-carotene, calcium, chromium, cobalt, iron, magnesium, manganese, niacin, potassium, phosphorus, protein, riboflavin, selenium, silicon, sodium, thiamine, zinc [8, 9, 10].

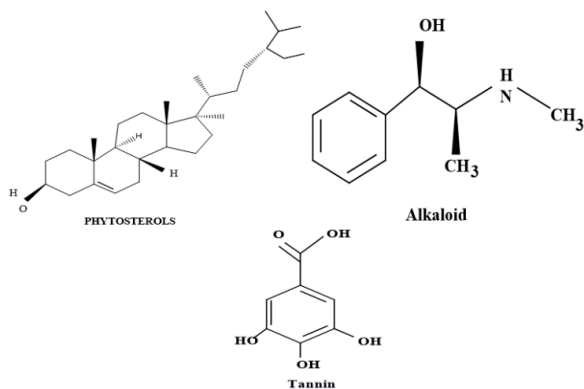


Fig 1

Results and Discussion

Taxonomic Studies

Morphological characters were studied in *Dioscorea oppositifolia* bark and their variations were presented. It is a small climber. Stem woody, clothed with minute gland tipped hairs. Branchlets viscid. Leaves sub-opposite, 4 cm; leaflets 7-9 pairs, opposite, oblong-elliptic, 1 - 15 x 0.4- 0.6 cm, pubescent, base and apex obtuse, margin entire, petiole 1.5 cm; stipules setaceous, 4 mm; stipules minute. Inflorescence racemes or panicles, axillary to 7 cm; peduncle to 7 cm; bracts linear, 4 mm; pedicel 1mm. Flowers 4mm, across, base narrow, claw 0; wings oblong 3.5 mm; keels obovate, 4.5 mm; spur to 0.5 mm. Staminal sheath 3 mm, ovary 3 mm, hispid, style 1 mm. Pod spreading, straight, 2.5 cm, hirsute, torulose. Seeds 10 - 12, cuboids, pitted, rotted and round tubers. It is usually distributed in hilly regions. Flowering period is November to February.

Preliminary Phytochemical Analysis

Preliminary phytochemical screening of the *Dioscorea oppositifolia* bark plant powder was done as per standard methods and results are presented in the Table 1. Petroleum ether extract shows the presence of sugar, Catachin, amino acid and saponin. Methanol extracts shows the presence of alkaloid, phenolic group, catachin and tannin. Benzene and chloroform extracts show the presence of Sugar, Alkaloids, Catachin and amino acid. In distilled water extract shows the presence of steroid, sugar and tannin.

Quantitative Determination

Ash Analysis

The percentage of loss of weight on drying, total ash, acid insoluble ash, water soluble ash and sulphate ash are obtained by employing standard method of analysis and described in Table 2 and 3.

The loss of weight on drying is 40.3% and it is found to be maximum. The total ash content is 6.7%, the acid insoluble ash content is 1.5 and it is found to be minimum. The water insoluble ash content is (20.7%). The sulphate ash content is 28 %. This method is used to check the adulterants present in the species.

Table 1: Phytochemical analysis of various extracts of *Dioscorea oppositifolia*. Bark.

Phytochemicals	Petroleum ether Extract	Methanol Extract	Benzene Extract	Chloroform Extract	Water Extract
Steroid	-	-	-	-	+
Triterpene	-	+	+	+	-
Sugar	+	-	+	+	+
Alkaloid	-	+	+	+	-
Phenolic group	-	+	-	-	-
Flavone	-	+	-	-	-
Catachin	+	-	+	+	-
Saponin	+	+	-	-	-
Tannin	-	+	-	-	+
Amino acid	+	-	+	+	-

(+ present, - absent)

Table 2: Physiochemical characteristics of bark in *Dioscorea oppositifolia*.

S. No	Particulars	Percent Value
1.	Loss of weight on drying	40.3
2.	Total ash	6.7
3.	Acid insoluble ash	1.5
4.	Water insoluble ash	20.7
5.	Sulphate ash	28.0

Table 3: Ash for mineral constituents.

S. No	Plant Part	Chlorine	Sulphur	Phosphorous	Iron	Calcium
1	Bark	+	-	-	+	+
2	Stem	+	-	+	+	-

(+ present, - absent)

Conclusion

The comparative and multidisciplinary approach to the study of *Dioscorea oppositifolia* Bark play and important role in understanding their identification taxonomical determination, and medicinal importance in detail. The adulterants in drugs obtain from *Dioscorea oppositifolia* Bark can be identified by this investigation and study. Adulterants if any can be easily identified and corrected, analyzed using these parameters.

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