



PHYTOCHEMICAL SCREENING OF *DIOSPYROS PEREGRINA*

(Gaertn.) Gurke

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ABSTRACT

Diospyros species are valuable traditional medicines of Chinese herbal medicine, Tibetan medicine, and Ayurvedic medicine. Extractive values and qualitative identification of phytochemicals constituents of Diospyros species was carried out. The phytochemical screening was carried out for the selected plant and results are hereby reported. The results will definitely be useful for further phytochemical research to be done on this plant.

Keywords: Diospyros, Ebenaceae, phytochemicals, fruits, extracts

INTRODUCTION

In recent times, the rapid development of multi resistant bacterial and fungal strains of clinically important pathogens fetches the interest of scientist to develop newer broad spectrum antimicrobial agents. The less availability and high cost of new generation antibiotics necessitates looking for the substances from alternative medicines with claimed antimicrobial activity. A number of herbs with significant antimicrobial activity have been reported in different traditional literatures. Now it is

aimed to explore scientifically the antimicrobial potential of three traditional plants and substantiate the folklore claims. *Diospyros peregrine* Gurke. (Ebenaceae) is a small middle sized tree of costal West Bengal. The fruits have ethnomedicinal significance for the treatment of diarrhoea, dysentery, cholera, ulcer of mouth and in wounds. The fruits contain triterpenes, alkanes, flavonoids and tannins [1, 2].

Extraction Processes:-

The process of separation active principle

from powdered crude drug by using suitable solvents is called extraction. The basic principle behind extraction is the exceptional behavior of the active principles towards the solvent system.

Extraction is used for the separation of medicinally active portions of plant or animal tissues from the inactive or inert components by using selective solvents in regular extraction procedures. So the products developed from plants are comparatively impure liquids, semisolids or powders intended only for oral or external use. The extraction naturally depends on the texture and water content of the plant material being extracted and the type of substance being analysed. Generally, it is desirable for killing the plant tissue that means they prevent enzymatic oxidation or hydrolysis. The classical chemical procedure for obtaining organic constituents from dried plant tissue (heartwood, dried seeds, root leaf) is to be extract powdered material in a soxhlet apparatus with variety of solvents, starting in turn ether, petroleum and chloroform (to separate lipids and terpenoids) and then ethyl acetate and alcohol used for more polar compounds. This method is useful when working gram scale. However, one rarely achieves complete separation of constituents and the compounds may be recorded (in varying proportions) [3,4].

For extraction different methods are used

like decoction, infusion, fluids extracts, tinctures, pilular (semisolid) extracts. In second century Greek physician, Galen given the name for that preparation was galenicals. The main purpose of standardization of extraction procedure is for crude drug is to attain the therapeutically desired portion and to eliminate the inert material by treatment with selective solvent known as menstruum. The obtained extract may be ready for use as a medicinal agent in the form of tinctures and fluid extract it may be processed in any dosage form like tablet or capsule, or it may be fractionated to isolate different chemical entities such as hyoscine, vincristine and ajmalicine which are modern drugs. Thus, standardization of extraction procedures contributes significantly to the final quality of the herbal drugs [5].

There are various methods of extraction process such as Maceration, Infusion, Digestion, Decoction. Percolation, Hot Continuous Extraction (Soxhlet), Aqueous Alcoholic Extraction by Fermentation, Counter current Extraction, Ultrasound Extraction (Sonication), Supercritical Fluid Extraction [6].

Selection of suitable extraction process:-

Mentioned in Table 1.

PLANT PROFILE

***DIOSPYROS PEREGRINA* (Gaertn)**

Gurke

Diospyros is a large genus of shrubs and trees comprising of 500 species distributed in the warmer regions. It belongs to the family Ebenaceae. The genus *Diospyros* was first described by Linnaeus in 1753. Its generic name is from Greek: dios –divine; pyros – wheat; it is an allusion to the edible fruits of these plants (Ghazanfar, 1978). About 41 species occur in India mostly on

evergreen forests of Deccan, Assam, and Bengal; only few are found in North India. *Diospyros peregrine* (Gaertn.) Gurke also known as Kalatendu is a moderate evergreen shade bearing tree cultivated for ornamental purpose. It bears dark green foliage and velvety fruits and is cultivated for ornaments (Figure 1) [8].

Table 1: Methods of Extraction

Sr. No.	Drugs	Method of Extraction
1	Soft drugs	Maceration
2	Hard drugs	Percolation
3	Hard drugs which are heat sensitive	Simple percolation or reserved percolation
4	Unorganised drugs	Maceration



Figure 1: Whole plant of *Diospyros peregrina*

Vernacular names:-Family:-Ebenaceae

Tamil:-Panicccai, Panicika, Tumbika

Malyalam:-Paniccha, Panichi, Panacci, Panici, Panitsjika, Vananci, Vananchi

Kannda:-Bandadamara, Holetupare, Kusarta

Marathi:-Temburi **Telugu:-**Bandadamara

Synonym of *Diospyros peregrine*:-

Diospyros malabarica

Taxonomical Classification:-

Kingdom:- Platae

Order: - Ericales

Genus: - Diospyros

Species:- *D. malabarica*

Uses: The fruits, barks, of *Diospyros peregrine* used traditionally as antidiabetic,

antimicrobial activity, antitumor, antioxidant, antidiarrhoeal, aphrodisiac, anti-snake bite.

EXPERIMENTAL WORKDONE:

Diospyros peregrina (Gaertn) Gurke:-

Collection and Authentication:-

Fruits of *Diospyros peregrina* belonging to family *Ebenaceae* were collected in the month of august from local region of Solapur district, Maharashtra (India). It was authenticated by botanist from Sangola Mahavidyalay Sangola.

Extraction:-

Preparation of crude drug for extraction:-

The authenticated fresh fruits were dried under shade and used for the preparation of extract. These fruits are coarsely powdered with the help of mechanical grinder and passed through sieve no.60. The powder was stored in air tight container for further use.

For the preparation of extraction Soxhlet apparatus and cold maceration method was adopted. The procedure of is as below. The air dried powdered fruits (1000g) were defatted with petroleum ether (60-80⁰C) to get petroleum ether extract (2.5g) and remaining marc was further extracted with chloroform (55-56⁰C) which yielded chloroform extract (2.4g). The marc was further extracted with ethyl acetate resulted in to ethylacetate extract (4.2g). The marc was further extracted with acetone (55-

56⁰C) to get acetone extract (3.4g). The marc was further extracted with ethanol to get ethanol extract (3.7g). The remained marc was extracted with distilled water containing traces of chloroform to avoid any microbial growth, by cold maceration method, which resulted into aqueous extract (4.1g). All the extracts obtained by using various solvents such as petroleum ether, chloroform, ethyl acetate, acetone and ethanol were concentrated under reduced pressure by rota evaporator. The aqueous extract was concentrated on water bath. All the extracts were preserved in desiccators till further use. Bioactivity – guided fractionation was done by using column chromatography.

Phytochemical Investigation:-

Ultimately, the goal in surveying plants for biologically active useful compounds should be to isolate one or more constituents responsible for a particular activity.

Plant is selected for phytochemical investigation, either on the basis of phytopharmacological approach or through some other avenue, phytochemical screening techniques can be a valuable aid. The phytochemical investigation of a plant includes selection, collection, identification and authentication of plant material, extraction of the plant material, fractionation/ separation, and isolation of the constituents, characterization of the

isolated compound, quantitative evaluation and pharmacological activities.

The petroleum ether, ethanol, chloroform and ethyl acetate extract were subjected to preliminary phytochemical screening for the detection of various phytoconstituents such as alkaloids, glycosides, carbohydrates, tannins, flavonoids, saponins, sugars and proteins.

The following tests were carried out to identify the various phytoconstituents present in petroleum ether, ethanol, chloroform and ethyl acetate extract [9].

RESULTS AND DISCUSSION

Diospyros peregrina (Gaertn) Gurke:-

Extraction:-

The present work deals with authentication of plant material and subsequently, it is processed for drying under shade and was kept in dry and cold condition to avoid any degradation till its use, yield of various extracts are mentioned in table respectively (Table 2).

Phytochemical Investigation

Data showing the preliminary phytochemical screening of the various extracts of *Diospyros peregrina* (Table 3).

All the extracts of *Diospyros peregrina* were subjected to qualitative tests for the identification of various active constituents. The petroleum ether, chloroform, ethyl acetate, acetone and aqueous extracts showed presence of flavonoids, glycoside. Aqueous extract showed presence of saponins and alkaloids as mentioned in Table 3. The authenticated plant material of *Diospyros peregrina* was extracted successively by using petroleum ether, chloroform, ethyl acetate, acetone, ethanol and distilled water to get their respective extracts. Phytochemical screening of extracts were performed and it showed presence of flavonoids in the petroleum ether, ethyl acetate, acetone and ethanolic extracts. Aqueous extract was observed to have alkaloids and saponins also.

The Morphological and Physicochemical characters of fruits of *Diospyros peregrina* were performed and it was matched with the reference standard. Fruits of *Diospyros peregrina* aqueous extract was obtained by maceration method and upon phytochemical screening, it revealed presence of alkaloids, glycosides, saponins and flavonoids [10].

Table 2: Percentage yield of *Diospyros peregrina* extracts

Plant Name	Part used	Method of extraction	Percentage yield(w/w)					
			Petroleum ether	Chloroform	Ethyl acetate	Acetone	Ethanol	Aqueous
<i>Diospyros peregrina</i>	Fruits	Continuous hot percolation and cold maceration process (successive solvent extraction)	2.5	2.4	4.2	3.4	3.7	4.1

Table 3: Results of Preliminary Phytochemical Screening

Sr. No.	Constituents	Petroleum ether extract	Chloroform extract	Ethyl acetate extract	Acetone extract	Ethanol extract	Aqueous extract
1	Alkaloid	-	+	-	+	+	+
2	Glycosides	+	+	+	+	+	+
3	Fixed oils and Fats	+	+	+	-	-	-
4	Protein and Amino acids	+	+	-	+	-	+
5	Tannins	-	+	-	+	+	+
6	Gum and mucilage	-	-	-	+	+	-
7	Flavonoids	+	+	+	+	+	+
8	Carbohydrates	+	+	+	+	+	+
9	Saponins	-	+	-	-	+	+

+ Presence, - Absence

CONCLUSION

Recent studies have demonstrated that polyphenols are not involved in only as antioxidants but also to other pathways involved in the cellular metabolism and cellular survival. Flavonoids have been demonstrated to inhibit carcinogenesis. They may inhibit carcinogenesis by affecting them olecular events in the initiation, promotion, and progression stages. Animal studies and investigations using different cellular models suggested that certain flavonoids could inhibit tumor initiation as well as tumor progression. By phytochemical screening from all extracts, ethanolic extract shows all phytochemical constituents positive. It is concluded that, ethanolic extract contain flavonoid that shows promising cytotoxic activity. The result of this study provides the basis for further isolation of phytoconstituent for ethanolic extract in future for potential identification of novel bioactive compound with therapeutic and anticancer property.

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