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PHARMACOGNOSTIC ACCOUNT AND PHYTOCHEMICAL STUDIES OF HIBISCUS SABDARIFFA LINN

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ABSTRACT

Hibiscus sabdariffa, an important medicinal plant is one of the most widely cultivated species of the family Malvaceae. The present article provides all necessary information regarding its Phytochemical investigation and Pharmacognstic study and morphological studies. The plant is used in various Pharmacological conditions like Antibacterial, Antihyperlipidemic and Antioxidants. Anti-oxidant principles from Hibiscus sabdariffa possess multiface tendness in their multitude and magnitude of activities and provide enormous scope in correcting the imbalance. Every part of Hibiscus is said to have beneficial properties that can serve humanity so the whole plant can be extensively studied for further research aspects.

KEYWORDS: Hibiscus sabdariffa, Anti-oxidant, Antibacterial, Antihyperlipidemic Properties.

INTRODUCTION

In the last few decades there has been exponential growth in the field of herbal medicines. It is getting popularized in developing and developed countries owing to its natural origin and lesser side effect.[IJP] However, the last few years have seen a major increase in their use in the developed world. Herbal medicines also find in market as nutraceuticals (health foods) whose current market is estimated at about 250 billion in USA and also in Europe.[1] The World Health Organization (WHO) has recently defined traditional medicine (including herbal drugs) as comprising therapeutic practices that have been in existence, often for hundreds of years, before the development and spread of modern medicine and are still in use today.[2]

Hibiscus sabdariffa commonly known as Red Sorrel, Pulichai Kerai, Lal ambadi or Patwa in different status is the only genus in the family Malvaceae.[3] The plant is used in various Pharmacological conditions like Antibacterial, Antihyperlipidemic and Antioxidants.[4] The antibacterial effect of the leaves, stems and roots of Hibiscus sabdariffa was evaluated on bacterial strains like streptococcus aures, Bacillus subtilis, Enterobacter aerogenes, and Escherichia coli.[5] From the literature survey it was found that Hibiscus *sabdariffa Linn* lowers the viscosity of blood. The different extracts of *Hibiscus sabdariffa* have not yet been screened for the above activity.[6] So we decide to work on the different extracts of leaves,stem and root of *Hibiscus sabdariffa.* Because of the vast utility of the anti-oxidants, in treatment of various diseases including cancer as discussed earlier, we were interested to screen the aqueous, 95% ethanol, extract and ethyl acetate fraction of leaves of *Hibiscus sabdariffa Linn*, for its anti-oxidant potentials.[7]

PHARMACOGNOSTIC ACCOUNT

Plant Profile & Botanical Description

Kingdom: Plantae

Botanical Name: *Hibiscus Sabdariffa Linn.*

Family: Malvaceae

Genus: *Hibiscus*

Species: *Sabdariffa*

Synonyms

India, Germany, Egypt: Red Sorrel

Tamil: Pulichai Kerai

Marathi: Lal ambadi

Hindi: Lal ambari

Bengal: Patwa

Genus: *Hibiscus*

Species: *Sabdariffa*

Morphology: ***Hibiscus sabdariffa*** (Fam. Malvaceae) is an erect, mostly branched, annual shrub. Stem reddish in colour and up to 3.5 m tall, with a deep penetrating taproot. Leaves variously colored, dark green to red; leaves alternate, glabrous, long-petiolate, palmately divided into 3-7 lobes, with serrate margins. Flowers large, short-peduncled, red to yellow

with dark center. The accrescent large and fleshy sepals become enlarged and succulent, making excellent jelly. Capsules ovoid, beaked and hairy 5 cm long, 5.3 cm wide.[8]

Fig. 1: *Hibiscus sabdariffa Linn.*

Microscopy: A transverse section of the young stem (3 mm in diameter) oval to circular in outline. It shows an epidermis carrying anomocytic stomata and trichomes followed by the cortex. The vascular tissues are formed of continuous vascular bundles arranged in ring surrounding wide parenchymatous pith. Mucilage cavities as well as secretory glands are scattered in parenchymatous tissues of the cortex, pith and sometimes in the chlorenchymatous cells.[9]

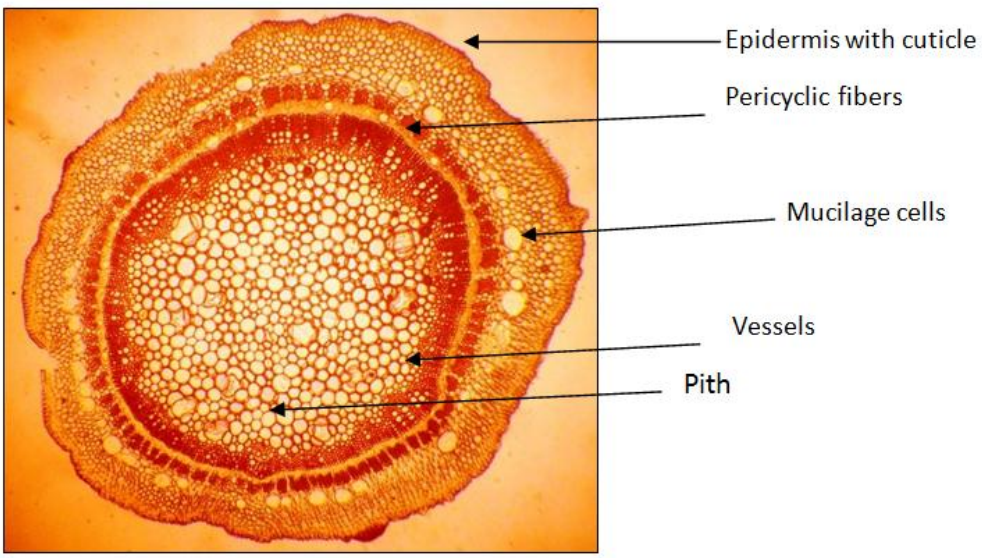

Fig. 2: T.S. of stem.

A transverse section of the young stem (3 mm in diameter) oval to circular in outline. It shows an epidermis carrying anomocytic stomata and trichomes followed by the cortex. The vascular tissues are formed of continuous vascular bundles arranged in ring surrounding wide parenchymatous pith. Mucilage cavities as well as secretory glands are scattered in parenchymatous tissues of the cortex, pith and sometimes in the chlorenchymatous cells.[9]

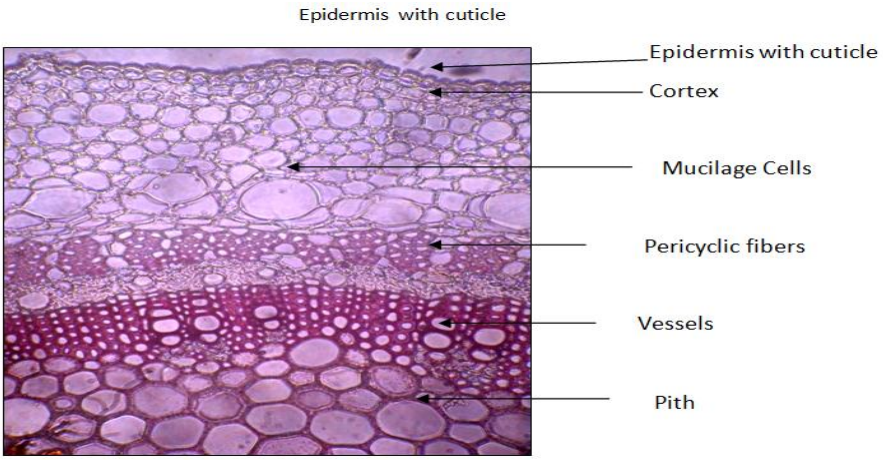

Fig. 3: T.S. of part of stem.

The epidermis is formed of polygonal, axially elongated cells with straight anticlinal walls and covered with cuticle. Epidermis shows the presence of few anomocytic stomata. The trichomes are of unicellular covering type. The cortex is formed of 2-3 rows of collenchymatous cells followed by 3-4 rows of thin walled parenchymatous cells with intercellular spaces. Inner potion of cortex also contains large sized mucilage cells. The pericycle is consist of batches of lignified fibers. They are strap-shaped fibers with lignified walls, uneven lumen and acute or blunt apices. The vascular tissue is formed of a ring continuous vascular bundles composed of an outer phloem of thin-walled cellulosic elements and inner xylem showing a narrow lignified spiral and border pitted vessels 25-30 □ in diameter). The medullary rays are narrow parenchymatous and formed of oval cells with cellulosic walls. The pith is wide formed of large polyhedral parenchymatous cells with thin-cellulosic walls and wide intercellular spaces few of them containing simple starch grains (4-8 µ in diameter).[10]

PHYTOCHEMICAL ACCOUNT: *Hibiscus sabdariffa plant initially evaluated for* preliminary phytochemical studies like colour, consistency and yield of the extracts and fraction.[11]

Table 1: The colour, consistency and yield of the extracts and fraction.

Name	Colour	Consistency	Yield (%w/w)
Aqueous extract	Dark brown	Powder	16.5
95% ethanol extract	Dark green	Sticky Powder	14.1
Ethyl acetate fraction	Light green	Powder	4.03

Later study was focused on Determination of analytical parameters like Ash Values, Extractive Values and Fibres contents of leaves.

Table 2: Ash values of leaves of *Hibicus sabdariffa.*

Sl.No.	Types of Ash	Ash Value in %w/w
1.	Total ash	7.50
2.	Acid insoluble ash	1.06
3.	Water soluble ash	2.12
4.	Sulphated ash	8.25

Table 3: Extractive values of the leaves of *Hibicus sabdariffa.*

Sl. No.	Plant Material	Extractive Values (%w/v)	
		Alcohol soluble	Water soluble
1.	*Hisbiscus sabdariffa*	13.05	15.92

Table 4: Fibre content of leaves of *Hibiscus sabdariffa.*

S. No.	Plant	fibre content %w/w
1	Leaves of *Hibiscus sabdariffa*	9.96

Qualitative phytochemical analysis[12,13]

The aqueous extracts, 95% ethanol extracts and ethyl acetate fractions were subjected to the chemical tests separately for the identification of various active constituents and results were tabulated in table 5.

Table 5: Qualitative phytochemical analysis.

SI. No.	Tests	Aqueous extract	95% Ethanol extract	Ethyl acetate fraction
1.	Alkaloids	-	-	-
2.	Carbohydrates	+	+	+
3.	Proteins	+	+	+
4.	Amino Acid	+	+	+
5.	Glycoside	+	+	+
6.	Steroids and Sterols	-	+	+
7.	Anthraquinones	-	-	-
8.	Flavonoids	+	+	+
9.	Tannins and Phenol compounds	+	+	+
10.	Triterpenoids	+	+	+
11.	Saponin Test	-	-	-
12.	Fixed oils	-	-	-

Fluorescence analysis of powder: The fluorescence character of powdered leaves of *Hibiscus sabdariffa* was studied both in day light and UV light. The observation has been recorded in Table 6.

Table 6: Fluorescence Analysis of powder.

Sl. No.	Drug	UV Light	Visible Light
1	1N NaoH	Yellow	Yellow
2	Ammonia	Greenish yellow	Green
3	1N HCl	Light brown	Green
4	50% HNO_3	Reddish brown	Green
5	Only powder	Green	Green

Table 7: Thin Layer Chromatographic analysis Chromatographic analysis.[14-17]

Sl. No.	Extract	No. of spots	Rf values	Colour
1	Ethanol	1	0.06	Light yellow
2		2	0.48	Light yellow
3		3	0.77	Green
4		4	0.9	Light green
1	Water	1	0.05	Light Yellow
1	Ethyl acetate	1	0.05	Light yellow
2		2	0.64	Light yellow
3		3	0.428	Green
4		4	0.88	Green
5		5	0.92	Green

Table 8: High performance thin layer chromatography parameter specifications.

Analysis	:	HPTLC analysis of leaves *Hibiscus sabdariffa*
Plate (Stationary Phase)	:	HPTLC precoated silica gel plates (Merck 60) (Silica gel GF_{254}
Solvent System	:	Chloroform : water : methanol : acetic Acid (7:1:1:0.3)
Application mode	:	CAMAG LINOMAT IV
Development mode	:	CAMAG Twin trough chamber
Scanning Parameters		
Plate size (width x length)	:	5 x 10cm
Position of solvent front	:	7.7 cm
Lamp	:	Deuterium
Wave length	:	366 nm
Slit dimension	:	5 x 0.45

CONCLUSION

The source of many plants can often be identical from the peak pattern of the chromatograms obtained directly from headspace analysis. The present study, which reveals the presence of components in *Hibiscus sabdariffa* suggest that the contribution of these compounds on the pharmacognostic accounts and phytochemical investigation should be evaluated. The study

was confirm that active constituents are used as Antibacterial, Antihyperlipidemic and Antioxidants agents.

AKNOLEDGEMENT

Dr. Kailas Biyanee sir Principal of Anuradha college of pharmacy, Chikhali, Dist. Buldhana, help me to authentify the given drug species and its different parts uses, future beneficial, biological potential to treat particular disease.

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