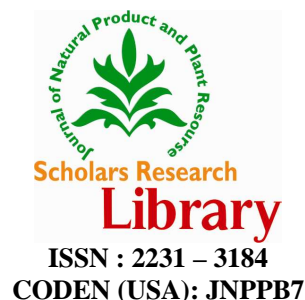




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Pharmacognostical, phytochemical and physiochemical findings over the root extract of *Hibiscus rosa sinensis* [Malvaceae]

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ABSTRACT

The present aim of this study is to conclude the traditional approaches of the ancient healers about the plant Hibiscus rosa sinensis belonging to the family Malvaceae. This Plant is a boon to us from the nature as it claims its potentiality as a wide range of herb. The investigation carried out by us was on the Pharmacognostical, Phytochemical and Physiochemical aspects of the root part of the plant as it always remained out of sight. Although the root section have also been reported to have significant activity. Morphological studies of root showed the presence of various diagnostic characters. Ash value, extractive value and moisture content was determined for quality standard of drugs. During the course of the experimental work the root part showed the presence of various phytoconstituents like flavonoids, tannins, protein, sterol etc.

Keywords: Phytochemical, Pharmacognostical ,Physiochemical ,Extractive value, Moisture content.

INTRODUCTION

Hibiscus rosa sinensis Linn. (Family Malvaceae) is a plant which is widely distributed throughout the world. There are several species of this plant which throughout possess the medicinal properties in each and every part of itself. This plant is utilized by every civilization in direct or indirect ways but the usefulness remains all the same during the course of time. The approach of *Hibiscus rosa sinensis* is equally significant in alternative system of medicine as well as in conventional system of medicine. [1] There are various polyherbal formulation present in the market which contains *hibiscus* as chief constituents. As a traditional medicine, the fresh juice of the wild flowers is used to treat gonorrhoea, the powdered roots are used to treat

menorrhagia, and the infusion of the petals is used as a refrigerant drink in fevers.[2]. The alcoholic extract of flowers of *H. sabdariffa* inhibited Angiotensin-I converting enzyme[3]. The alcoholic extract of flowers of *H. rosasinensis* has been proved to possess anticonvulsant property[4]. Powdered leaves of *H. rosasinensis* showed lowering of blood pressure[5]. In spite of its use in cardiovascular ailments, the hypotensive activity of the flowers of *H. rosa sinensis* has not been explored. Hence in the present study an attempt has been done in order to investigate about the Pharmacognostical features of the root of *hibiscus rosa sinensis*, Physiochemical and Phytochemical characteristics of the Aqueous root extract of *Hibiscus rosa sinensis*.

MATERIALS AND METHODS

Plant Selection:

The root part of *Hibiscus rosa sinensis* was collected from Sambalpur district Orissa, in the month of April 2010. It was further identified and authenticated by the Botanical Department, Howrah, Kolkata as *Hibiscus rosa sinensis*. Some voucher specimen numbers were submitted to the authority for future references. The root plant parts were dried in shade and powdered to get a coarse powder. About 2.5kg of dry coarse powder was extracted with Distilled water (40-60°C) by hot extraction. The aqueous extract was filtered and concentrated to a dry mass by using vacuum distillation. A deep brownish viscous residue obtained having characteristic mucilaginous odour (yield=4.5gm). Further the solvents were evaporated to dryness and then the residue of extract obtained is evaporated to dried mass and then it was taken for the experiment.

Macroscopic study:

The fresh plant was taken for various macroscopic organoleptic evaluation like colour, odour, size, shape, taste, appearance, texture, fracture etc.

Microscopy Study:

Qualitative microscopic evaluation was carried out by taking transverse sections of fresh root of *Hibiscus rosa sinensis*. The thinnest section was selected and cleared by boiling with chloral hydrate solution for 20mins and then carefully stained with phloroglucinol and HCl (1:1).[6] Then mounted on a slide and a cover slip was placed over it and observed the different histological characters.

Physicochemical parameters:

The determination of various physicochemical parameters such as total ash, acid insoluble ash, water soluble ash, water soluble extractive value, alcohol soluble extractive value, swelling index, foaming index, moisture content, ash value, pH were calculated as per Indian Pharmacopoeia.

Preliminary phytochemical screening of Root of Hibiscus rosa sinensis:

For preliminary phytochemical screening, 100 g of powder drug was extracted with Distilled water.[7] The mother extract obtained from successive solvent extraction were then subjected to various qualitative chemical tests to determine the presence of various phytoconstituents like

glycosides, tannins, phytosterols, fixed oils and fats, proteins and amino acids, flavonoids, saponins, gums and mucilages etc

RESULT AND DISCUSSION

Macroscopy of Root of Hibiscus rosa sinensis:

The macroscopic character were always served as useful keys in faster and early identification of plant material and also serves as an important standardization parameter. The macroscopic features of Root of *Hibiscus rosa sinensis* are described here. The organoleptic evaluation is discussed in table no.1.

Microscopy of T.S. of Root of Hibiscus rosa sinensis:

The roots show cork, phelloderm and the secondary phloem which is stratified due to 8-10 tangential bands of phloem fibres alternating with parenchyma. The xylem is a broad zone and some of the vessels show tyloses. Clusters of calcium oxalate are present in the phelloderm.[6,7]

Physicochemical parameters:

The determination of physico-chemical parameter is important in determination of adulterants and improper handling of drugs. Table- 2 shows the result of various physico chemical parameter of powdered drug carried out using standard methods. Moisture content of drugs could be at minimal level to discourage the growth of bacteria, yeast or fungi during storage. Ash values used to determine quality and purity of crude drug. It indicates the presence of various impurities like carbonate, oxalate and silicate. [8,9] The acid insoluble ash consist mainly silica and indicate contamination with earthy material. The water soluble ash is used to estimate the amount of inorganic elements present in drugs. The extractive values are useful to evaluate the chemical constituents present in the crude drug and also help in estimation of specific constituents soluble in a particular solvent.

Phytochemical Analysis of Hibiscus rosa sinensis:

The powder drug with different chemical reagents show different color when seen on naked eye. The different colour observed shows presence of different type of phytoconstitue (Table No.3) .**Fluorescence Analysis:** Many drugs fluorescence when their powder is exposed to ultraviolet radiation. It is important to observe all materials on reaction with different chemical reagents under U.V. light. The fluorescence characteristics of powdered drug were studied under U.V. light after treating with different chemical reagents are reported. (Table No. 4) The extract was subjected to different qualitative chemical tests (Table no.5). The presence of various phytoconstituents were observed during the test. [10,11,12].Theses test were carried out over the aquaeous extract. The data obtained is specified in table no.5

Figure. I T. S. of Root of Hibiscus rosa sine

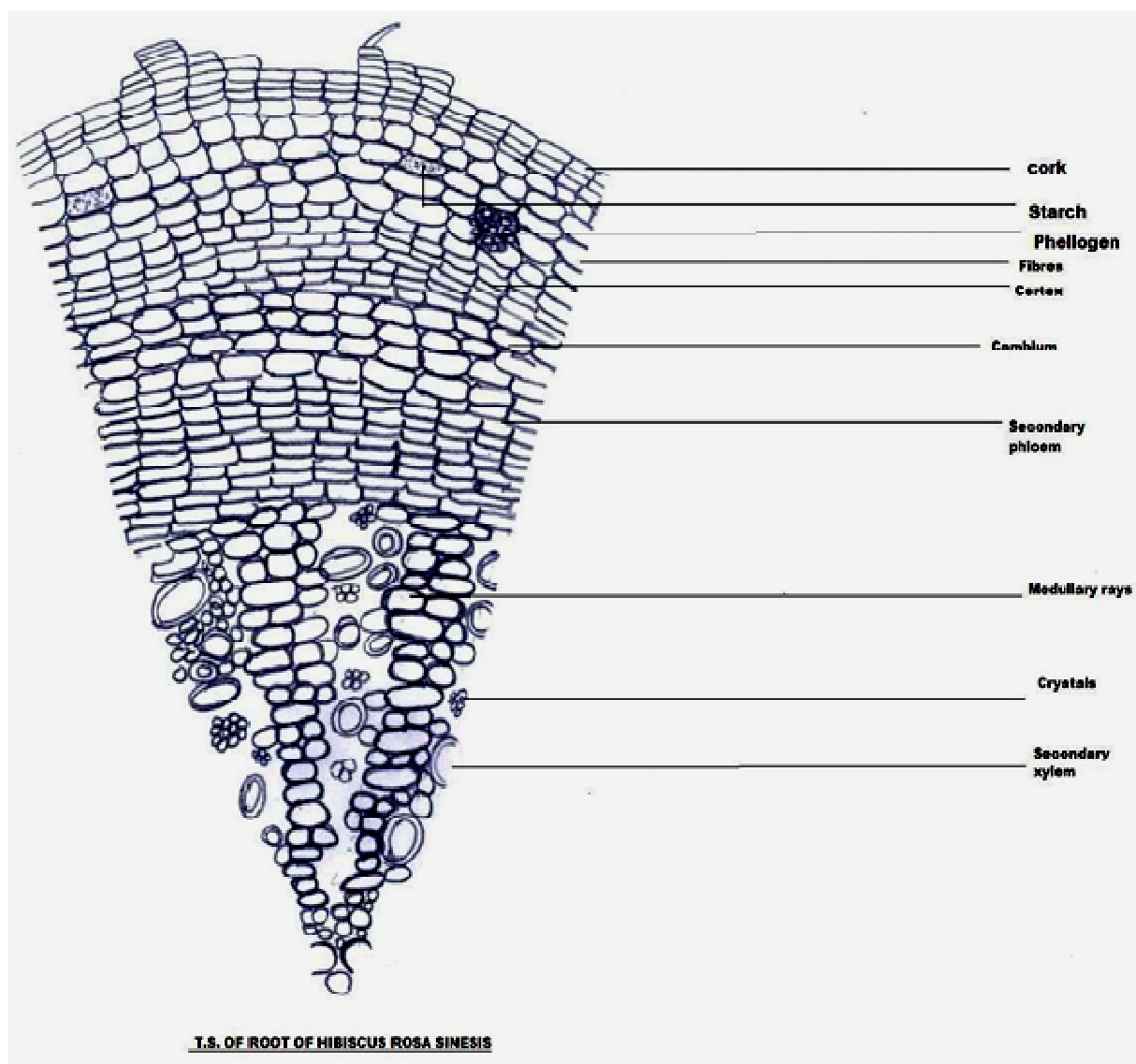


Table.1. Organoleptic Evaluation of Root of Hibiscus rosa sinesis

S. No.	Oraganoleptic Parameters	Result
1.	Colour	Yellow
2.	Odour	None
3.	Taste	Mucilagenous.

Table 2. Physical Evaluation Parameters

S. No.	Parameter	Values (%)w/w
1.	Loss on Drying	0.53%
2.	Ash Values	
	Total Ash	7.75%
	Acid insoluble ash	0.75%
	Water soluble ash	6.32%
	Extractive Values	
3.	Chloroform soluble extractive	2.80%
	Water soluble extractive	5.30%
	Carbinol soluble extractive	15.60%
	Ethanol soluble extractive	2.60%
	Petroleum ether soluble Extractive	1.45%
4.	Swelling Index	2.5%

Table .3 Powder Analysis With Chemical Agents

Reagents	Colour observed
Powder as such	Pale Yellow
Powder + Concentrated HCL	Orange
Powder + Concentrated HNO ₃	Light Orange
Powder + Concentrated H ₂ SO ₄	Black
Powder + Glacial acetic acid	Light Brown
Powder + 5% KOH solution	Yellow
Powder + 5% NaOH solution	Yellowish Orange
Powder + 5% Ferric chloride solution	Blackish Green
Powder + Picric acid	Dark Yellow
Powder + Ammonia	Yellowish Brown

Table 4. Fluorescence Analysis Of Powdered Drug

Reagents	Fluorescence Observed
Powder as such	Dark Yellow
Powder + 1N NaOH in methanol	Light Green
Powder + 1N NaOH in water	Light Green
Powder + 50% Hydrochloric acid	Light Green
Powder + 50% Sulphuric acid	Green
Powder + 50% Nitric acid	Light Green
Powder + Petroleum ether	Colourless
Powder + Chloroform	Colourless
Powder + Picric acid	Yellow
Powder + 5% Ferric chloride solution	Brown
Powder + 5% Iodine solution	Dark green
Powder + Methanol	Colourless
Powder + (HNO ₃ + NH ₃)	Light Yellow

Table.5. Phytochemical Analysis of Aqueous Root Extract Of *Hibiscus rosa sinensis*

Plant Constituents Test/Reagent Used	Powdered Drug	Aqueous Extract
[1] TEST FOR CARBOHYDRATES		
Molisch's Test	+	+
Fehling's Test	+	+
Benedict's Test	+	-
Barfoed's Test	+	+
Test for Starch	-	-
TEST FOR GUMS & MUCILAGE	+	+
[2]TEST FOR PROTEINS & AMINO ACIDS		
Ninhydrin Test	-	+
Biuret Test	+	+
Millon's Test	+	+
Xanthoproteic Test	+	-
Tannic Acid (10% w/v)	+	+
[3] TEST FOR FIXED OILS & FATS		
Spot Test	-	-
Saponification Test	-	-
[4]TEST FOR ALKALOIDS		
Dragendroff's Test	-	-
Mayer's Test	-	-
Wagner's Test	-	-
Hager's Test	-	-
Tannic Acid	+	-
[5] TEST FOR GLYCOSIDE		
Legal's Test	+	+
Baljet's Test	+	+
Borntrager's Test.	+	+
Keller-Killiani's Test	+	+
Liebermann's test	+	+
[6] TEST FOR PHYTOSTEROL		
Salkowski's test	+	+
Liebermann burchad's test	+	+
FeCl ₃ Test	-	-
Fluorescence Test	+	+
Reaction with alkali and acid	-	-
5% FeCl ₃ solution	-	+
Reaction with copper sulphate	+	+
Reaction with lead acetate	+	+
Reaction with Potassium dichromate	+	-
Drug + K ₃ Fe(CN) ₆ + NH ₃	-	-
Foam Test	+	+

CONCLUSION

Hibiscus rosa-sinensis, also known as China rose, is cultivated as an ornamental plant throughout the world. From a very long time it is being utilized as a herbal medicine in traditional system of medicine. Many researches have been done on this plant but much of the claims are inspired and based on traditional evidence instead of scientific studies. By the systematic scientific studies only, one can truly come across about the cause of multi-tasking activity of *Hibiscus rosa*

sinesis, The potentiality embedded inside this plant by the nature is although surprising but still the exact and accurate combinations are needed for the correct detection of the plant and its utilization to its fullest. The investigation carried out by us led to certain findings about the pharmacognostical physiochemical and phytochemical features which no doubt can be proved beneficial and serve as scientific background for further isolationary steps to obtain the lead.

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