



REVIEW ON HIBISCUS ROSA SINENSIS

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ABSTRACT

To examine the *Hibiscus rosa-sinensis* Linn belongs to the family of Malvaceae. Ayurveda, Unani, and Siddha are the Traditional medical practices that are most widely accepted. In the formulations of these systems, natural Herbs are used. The physicochemical parameters of the root extract: loss on drying 0.53%, ash values 5.52%, total ash 7.75%, acid Insoluble ash 0.75% and water soluble ash 6.32%) and swelling index 2.5%. Extractive values of plant part of root: chloroform soluble extract 2.80%, aqueous soluble extract 5.30%, carbinol soluble extract 7.60%, ethanol soluble extract 2.60% and Petroleum ether soluble extractive 1.45%. Phytochemical investigation shows the presence of flower part contains ethanolic extract was present in Flavonoids, Saponins, Tannins, Tritrpens, Alkaloids, Carbohydrates, and Cardiac Glycosides.

Phytochemical investigation shows the presence of flower part contains aqueous extract was present in Flavonoids, Saponins, Tannins, Tritrpens, Alkaloids, Carbohydrates, and Cardiac Glycosides. Phytoconstituents Present in the plant part of flower Anthocyanin, Cyanidin-3-sophoroside, Leucoanthocynins, Flavonol & carotenoids, Quercetin-3-diglucoside, Quercetin-3,7-diglucoside, Cyanidin-3,5-diglucoside, Cyanidin-3-sophoroside-3,5 glucoside, Kaempferol-3-xylosylglycoside. GC-MS analysis of methanolic and ethanolic extract of flower showed several active compounds. Among the identified compounds of methanolic extract contains 15 Phytochemical compounds and ethanolic extract contain 12 phytochemical compounds. The Pharmacological activity of Flower part contains Antioxidant, Antibacterial, Anti diabetic, Anti genotoxic effect & Hypotensive activity.

KEYWORDS: *Hibiscus rosa-sinensis* Linn, Hypotensive activity, Malvaceae, Semparutti and Pharmacological activity.

INTRODUCTION

Hibiscus rosa-sinensis belongs to the family of Malvaceae. The leaves are simple ovate or ovate lancolated with coarsely toothed at the apex. Flowers are pedicillate and 5 petals of red Colour (Lalit 2012).^[15] numerous herbs and medications are found in nature, and many drugs have been isolated from it. India is a diverse country with extensive traditional medicinal practices.

Ayurveda, Unani, and Siddha are the Traditional medical practices that are most widely accepted. In the formulations of these systems, natural Herbs are used. Various other names for *Hibiscus rosa sinensis* include Chinese Hibiscus, tropical Hibiscus, etc^[8] In addition, the juice extracted from the leaves and flowers has been Used since a long time ago as natural remedy for some diseases and painful symptoms, as well as in herbal Cosmetics as wilted.

Dark flowers' extract is used to make eyeliners, and in shoe-blackening. It was Believed that the species was given the name "rosa sinensis which means "Rose of China" in Latin, by the Famous Swedish biologist, Carolus Linnaeus in the early 1750s.^[3] Plants are also a great source of natural inhibitors, and they can be used In the food industry as dietary supplements or as a natural inhibitor to protect the quality And extend the shelf life of goods. (Tiwari et. al., 2009).^[13]

The Indian traditional medicine Sector is estimated to comprise approximately 25,000 licensed pharmacies. Currently, around 1,000 single ingredient medicines and 3,000 compound formulations are registered in the Country. As more is discovered about the advantages and disadvantages of synthetic drugs, there's a rising demand for natural remedies. According to the WHO, herbal medicines serve As primary healthcare solutions for over 80% of the global population.^[9]

Many chemical constituents such As cyanidin, quercetin, hentriacontane, calcium oxalate, Thiamine, riboflavin, niacin and ascorbic acids have been Isolated from this plant. Resistance towards reveling Antibiotics having become widespread among bacteria and Fungi, new class of antimicrobial substances are urgently required.

There are several studies which reveal the Presence of such compounds with antimicrobial properties In various plant parts.^[4,5] The petals have some protective Mechanism against microbial attack in most of the plants. The *H. rosa-sinensis* flower petals of a large number of plant Species growing in the vicinity of our environment were.^[1]

1. PLANT DESCRIPTION

According to different studies, the probably origin of the plant was tropical Asia, It was cultivated in China, Japan and the Pacific islands for an equal long time, it was Originated in South China (A. Snafi). The plant with deep- red flowers is belived to have an asian origin. Thus this plant is denoted by the name *rosa sinensis*.^[11]

Table No. 1: Description of *Hibiscus rosa sinensis*.^[5]

1	Biological Source	It is obtained from flowers and leaves <i>Hibiscus rosa sinensis</i> Linn.
2	Family	Malvaceae.
3	Common Names	Chembarathi (Malayalam), Semparutti (Tamil), Rudrapuspa (Sanskrit), Gurhal (Hindi), Shoe flower plant and Chinese hibiscus (English)
4	Soil condition	Preferably sandy and loamy clay and welldrained soil.
5	Propagation	Cutting, layering or grafting in springs.
6	Origin and Distribution	Native to tropical Asia, China and Philippines. This is the national flower of Malaysia.
7	Leaves	Simple ovate or ovate lancolate in shape and are rich in mucilage.
8	Flowers	Corolla consists of five petals. They are pedicillate, actinomorphic and complete in nature.
9	Chemical Constituents	Ascorbic acid, Thiamine, Citric acid, Glucose, Fructose, Oxalic acid and Riboflavia Leaves: Alkaloids, Reducing sugars, Fatty acid, Fatty alcohol, Glycosides, Resins and Hydro carbons.

2. BOTANICAL DISCRIPTION

Table No. 2: Scientific classification of *Hibiscus rosa sinensis* Linn^[8]

1	Kingdom	Plantae
2	Subkingdom	Tracheobionta
3	Division	Megnoliophyta
4	Class	Magnoliopsida
5	Subclass	Dilleniidae
6	Order	Malvaceae
7	Genus	Hibiscus
8	Species	Hibiscus rosa sinensis

3. MORPHOLOGICAL CHARACTERS



Fig. 1: Flowers of *Hibiscus rosa sinensis* Linn.

Flowers: Thiamine, riboflavin, niacin, and ascorbic acid; apiigenidin, citric acid, fructose, Glucose, oxalic acid, pelargonidin, quercetin.



Fig. 2: Leaves of *Hibiscus rosa sinensis* Linn.

Leaves: Carbohydrates and/or glycosides, steroids and/or triterpenes, flavonoids, tannins, Alkaloids and/or nitrogenous bases, saponins, coumarins.



Fig. 3: Stem of *Hibiscus rosa sinensis* Linn.

Stem: Teraxeryl acetate, β -sitosterol, and the cyclic acids sterculic and malvalic acids.

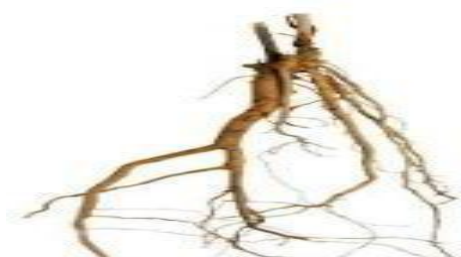


Fig. 4: Roots of *Hibiscus rosa sinensis* Linn.

Roots: Glycosides, tannins, phytosterols, fixed oils, fats, proteins, amino acids, flavonoids, Saponins, gums and mucilage.^[9]

4. PRELIMINARY PHYTOCHEMICAL INVESTIGATION^[27]

Table No. 3: Preliminary Phytochemical Analysis of *Hibiscus rosa sinensis* roots.^[28]

CHEMICAL CONSTITUENTS	METHANOLIC EXTRACT	AQUEOUS EXTRACT
Alkaloids	+	-
Tannins	+	+
Glycosides	+	-
Flavonoids	+	-
Saponins	+	+

Table No. 4: Preliminary Phytochemical Analysis of *Hibiscus rosa sinensis* leaves.^[28]

CHEMICAL CONSTITUENT	ETHANOL EXTRACT	AQUEOUS EXTRACT
Flavonoids	+	+
Saponins	+	+
Tannins	+	+
Triterpens	+	+
Alkaloids	+	+
Carbohydrates	+	+
Cardiacglycosides	-	-

Table No. 5: Preliminary Phytochemical Analysis of *Hibiscus rosa sinensis* flowers.

CHEMICAL CONSTITUENTS	ETHANOL EXTRACT	AQUEOUS EXTRACT
Flavonoids	+	+
Saponins	+	+
Tannins	+	+
Triterpens	+	+
Alkaloids	+	+
Carbohydrates	+	+
Cardiacglycosides	+	+

5. PHYSICOCHEMICAL PARAMETERS

Table No. 6: Physicochemical Parameters of Plant Part of Root.

S. NO	PARAMETERS	TOTAL VALUES
1	Ash values	5.52 %
2	Total ash	7.75%
3	Acid Insoluble ash	0.75%
4	Water soluble ash	6.32%
5	Loss on drying	0.53%
6	Swelling Index	2.5%

6. EXTRACTIVE VALUES

Table No. 7: Extractive Values of Plant Part of Root.

S. NO	PARAMETERS	TOTAL VALUES
1	Chloroform	2.80 %
2	Aqueous	5.30%
3	Carbinol	7.60%
4	Ethanol	2.60%
5	Petroleum ether	1.45%

8. PHYTOCONSTITUENTS

Petals of *Hibiscus rosa-sinensis* were reported to contain quercetin-3-di-O- β -D- glucoside; quercetin-3-7-di-O- β -D-glucoside; quercetin-3-O- β -D-sophorotrioside; and kaempferol and kaempferol-3-O- β -xylosylglucoside.

The varieties in the different coloured groups differed in the quantitative distribution of anthocyanins, leucoanthocyanins, flavonol and carotenoids. Flavonoid aglycones found in the flowers (per gm fresh tissues) included quercetin 7 mg and cyanidin 36 mg.

The flowers were also contain quercetin-3-diglucoside, quercetin-3, 7-diglucoside, cyanidin-3, 5-diglucoside and cyanidin-3-sophoroside-3-5 glucoside from deep yellow and white flowers and from ivory white flowers is kaempferol-3- xylosylglucoside.^[14]

9. TRADITIONAL USES

- ✓ In medicine, the red flowered variety was preferred. Roots and leaves, were anodyne and Demagogue. They were used to regulate menstruation and stimulate blood circulation.
- ✓ Leaves were also used as abortifacient and to stimulate expulsion of placenta after childbirth.
- ✓ Flower was used for regulation of menstrual cycle, for liver disorders, high blood pressure as antitussive, in stomach pain, for eye problems, as Abortifacient and as an

aphrodisiac.

- ✓ Young leaves and flowers were used in headache. Decoction of leaves, root and fruits were helpful in treatments of arthritis, boils and coughs.
- ✓ Fruits were employed externally in cases of Sprains, wounds and ulcers. ^[4]
- ✓ The leaves were utilised for dysentery, Diarrhoea, as analgesic in traditional Medicine of Cook Islands, Haiti, Japan and Mexico.
- ✓ Hibiscus flowers were used in Diabetes, epilepsy, bronchial catarrh and Leprosy.
- ✓ The flowers have beneficial effects in heart diseases and Petals were used as hair-tonic.
- ✓ The Roots can be used as cough suppressant. The decoction of root can be used to treat Venereal diseases. ^[10]

Ethnomedicinal Uses

Due to the wide range of medicinal uses of its leaves and flowers, *Hibiscus rosa Sinensis*, a traditional herbal plant, is utilized by various indigenous inhabitants groups in numerous ways. ^[29]

10. PHARMACOLOGICAL ACTIVITY

Table No. 8: Pharmacological Activity of Hibiscus rosa sinensis.

S. No	Part of The Plant	Solvent Used In Extraction	Pharmacological Activity	Reference
1	Leaves	Methanolic extract	Antibacterial, Antifungal, Antidiabetic and Anticancer.	Asmaa Missoum <i>et al.</i> ,2018
2	Leaves	Aqueous and ethanol	Antibacterial	Manish Kapoor <i>et al.</i> ,2021
3	Leaves	Ethanol, methanol and distilled water	Antibacterial and Antiinflammatory	Harshad Desa I <i>et al.</i> ,2022
4	Flower	Methanolic extract	Antioxidant and Antibacterial	Subhashini Shandilya <i>et al.</i> ,2020
5	Flower	Ethanol extract	Antioxidant activity, Antidiabetic and Antigenotoxic effects	Vincenta Khristiand V.H.Patel <i>et al.</i> ,2016
6	Flower	Petroleumether, chloroform and Hydroalcoholic extract	Hypotensive activity	Vincenta Khristiand V.H.Patel <i>et al.</i> ,2016
7	Petal	Anthocyanin extracts AEs	In-vitro antioxidant activity and DNA protective assay	Vincenta Khristiand V.H.Patel <i>et al.</i> ,2016
8	Root	Ethylalcohol	Antibacterial and Antifungal	Asmaa Missoum <i>et al.</i> ,2018
9	Root	Methanolic extract	Antidiabetic and Neuroprotective	Asmaa Missoum <i>et al.</i> ,2018
10	Root	Aqueous extract	Antipyretic effects	Subhashini Shandilya <i>etal.</i> ,

				2020
11	Aerialparts	Aqueous-ethanolic	Gastro protective	Asmaa Missoum et al., 2018
12	Leaf	Petroleum ether	Hair growth Promoting activity	Asmaa Missoum et al., 2018
13	Stem	Aqueous and methanolic	Antioxidant	Asmaa Missoum et al., 2018

11. Gaschromato Graphy–Mass Spectros Copy Analysis

The powdered sample of Hibiscus flowers (35g) was extracted with methanol (280 ml, 2 hr) at a temperature Around 60°C by using Microwave-assisted Hydrodistillation (MADH).^[30] Flowers of *Hibiscus rosa sinensis* were shade dried. 20 g of the powdered flowers were soaked In 95% ethanol for 12 h. The extracts were then filtered through Whatmann filter paper No. 41 Along with 2 g sodium sulphate to remove the sediments and traces of water in the filtrate. Before Filtering, the filter paper along with sodium sulphate was wetted with 95% ethanol. The filtrate was then concentrated by bubbling nitrogen gas into the solution. The extract contained both Polar and non-polar phyto-components of the plant material used. 2µl of these solutions was employed for GC/MS analysis.^[31]

Table No. 9: Components detected in the plant of methanol extract of Hibiscus Flowers.^[30]

S. NO	COMPOUNDS	RT
1	Ethanimidicacid, ethylester	3.03
2	Propanal, 2, 3-dihydroxy-	2.29
3	Propanamide, N-ethyl-	9.77
4	Ethylenediamine	3.21
5	o-Methylisoureaahydrogensulfate	9.52
6	Ethene,ethoxy-	9.38
7	Hexadecanoicacid,methylester	39.67
8	7-Formylbicyclo[4.1.0]heptanes	44.54
9	2-Butanamine, (S)-	9.57
10	1,3,5-Triazine-2,4,6-triamine	7.85
11	N-Formyl-β-alanine	13.06
12	(Z)6,(Z)9-Pentadecadien-1-ol	44.63
13	Butanedial	9.42
14	1-Propanol, 2-methyl-	9.64
15	Methanecarbothiolicacid	13.08

Table No. 10: Phytocompounds identified in the ethanolic extract of the flowers of H. rosa sinensis by GC-MS.^[31]

S. NO	COMPOUNDS	RT
1	Propanol,3,3'-dithiobis(2,2- dimethyl-	8.96
2	(SS)-or (RR)-2,3-hexanediol	17.59

3	2-Hydroxy-2-methylbutyricacid	21.98
4	n-Hexadecanoic acid	26.02
5	Heptanoicacid,2-ethyl-	26.57
6	Trans-(2-Ethylcyclopentyl) methanol	29.65
7	3-N-Hexylthiolane,SS-dioxide	29.76
8	Hexanedioic acid, bis(2-ethylexyl) ester	33.57
9	1,2-Benzenedicarboxylic acid, diisooctyl ester	35.91
10	1,3-Benzodioxole,5,5' tetrahydro H, H furo {3,4-c)furan-1,4-diyl}bis-,(1S- (1 α ,3 α ,4 β ,6 α))-	37.45
11	Squalene	41.55
12	2R-Acetoxymethyl-1,3,3-trimethyl- 4t-(3-methyk-2-buten-1-yl)-1c- cyclohexanol	43.50

RESULT AND DISCUSSION

The physicochemical parameters of the root extract: loss on drying 0.53%, ash values 5.52%, total ash 7.75%, acid Insoluble ash 0.75% and water soluble ash 6.32%) and swelling index 2.5%.

Extractive values of plant part of root: chloroform soluble extract 2.80%, aqueous soluble extract 5.30%, carbinol soluble extract 7.60%, ethanol soluble extract 2.60% and Petroleum ether soluble extractive 1.45%^[4]

Phytochemical investigation shows the presence of root part contains methanolic extract was present in Alkaloids, Tannins, Glycosides, Flavonoids and Saponins. Phytochemical investigation shows the presence of root part contains aqueous extract was present in Tannins and Saponins.

Phytochemical investigation shows the presence of leaves part contains ethanolic extract was present in Flavonoids, Saponins, Tannins, Triterpens, Alkaloids and Carbohydrates. Phytochemical investigation shows the presence of leaves part contains Aqueous extract was present in Flavonoids, Saponins, Tannins, Triterpens, Alkaloids and Carbohydrates.

Phytochemical investigation shows the presence of flower part contains ethanolic extract was present in Flavonoids, Saponins, Tannins, Triterpens, Alkaloids, Carbohydrates, Cardiac Glycosides. Phytochemical investigation shows the presence of flower part contains aqueous extract was present in Flavonoids, Saponins, Tannins, Triterpens, Alkaloids, Carbohydrates, Cardiac Glycosides.

Phyto-constituents Present in the plant part of Petals Quercetin-3-di-o- β -D-Glucoside,

Quercetin-3-7-di-o- β -D-Glucoside, Quercetin-3-o- β -Xylosylglucoside. Phytoconstituents Present in the plant part of flower Anthocyanin, Cyanidin-3-sophoroside, Leucoanthocynins, Flavonol & carotenoids, Quercetin-3-diglucoside, Quercetin-3,7-diglucoside, Cyanidin-3,5-diglucoside, Cyanidin-3-sophoroside-3,5 glucoside, Kaempferol-3-xylosylglycoside.

GC-MS analysis of methanolic and ethanolic extract of flower showed several active compounds. Among the identified compounds of methanolic extract contains 15 Phytochemical compounds and ethanolic extract contain 12 phytochemical compounds.

The Pharmacological activity of leaves part contain Antibacterial, Antifungal, Anti diabetic, Anticancer, Anti inflammatory, Hair growth promoting activity. The Pharmacological activity of Flower part contains Antioxidant, Antibacterial, Anti diabetic, Anti genotoxic effect & Hypotensive activity. The Pharmacological activity of Petals part contains In-vitro Antioxidant, and DNA Protective assay. The Pharmacological activity of Root part contains Antibacterial, Antifungal, Anti diabetic, Neuro Protective, Antipyretic effect. The Pharmacological activity of stem part contains Antioxidant. The Pharmacological activity of Aerial part contains Gastroprotective.

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