World Journal of Biology Pharmacy and Health Sciences
eISSN: 2582-5542
Cross Ref DOI: 10.30574/wjbphs
Journal homepage: https://wjbphs.com/

(REVIEW ARTICLE)

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Review On *Hibiscus rosa* Sinensis pharmacogenetic activity and extraction method

Chaitali Mohan Barhate [1,*], Prachi Nanadkumar Padwal [2], Harsh Suryakant Chavan [3], Aditya Sampat Dere [1] and Vaishanavi Vikas Zaware [1]

[1]*Student of Samarth Institute of pharmacy Belhe, pune Maharashtra, India.*
[2] *Assistant Professor, Samarth Institute of pharmacy Belhe, pune Maharashtra, India.*
[3] *Assistant Professor, Department of Pharmaceutics Samarth Institute of pharmacy Belhe, pune Maharashtra, India.*

World Journal of Biology Pharmacy and Health Sciences, 2025, 24(02), 183-190

Publication history: Received on 27 September 2025; revised on 03 November 2025; accepted on 06 November 2025

Article DOI: https://doi.org/10.30574/wjbphs.2025.24.2.0987

Abstract

The promising antimicrobial properties of hibiscus suggest many potential uses, especially in food preservation, natural antimicrobial products, and alternative treatments for infection control. Future research should focus on understanding how hibiscus works at a molecular level, improving extraction methods for maximum effectiveness, and conducting clinical trials to confirm its benefits in different applications. Additionally, exploring the use of hibiscus in health-related products such as wound dressings and topical creams—could open up new possibilities for natural healthcare solutions. Hibiscus is particularly valuable because it contains natural polymers that are plant-based, easily available, affordable, and chemically versatile. The leaves of Hibiscus rosa-sinensis (family Malvaceous) contain a high amount of gum, which can be used as an ingredient in pharmaceutical formulations. The goal of this study was to extract gum from the leaves of Hibiscus rosa-sinensis and evaluate its disintegrating properties to determine its usefulness as a pharmaceutical excipient. Specifically, this research aimed to develop a fast-dissolving tablet of the drug imipramine using the natural gum from Hibiscus rosa-sinensis as a disintegrant and to compare its performance with a synthetic super disintegrant, risperidone.

Keywords: *Hibiscus rosa*-Sinensis; Medicinal Uses; Phytochemicals; Antibacterial-Antimicrobial; Traditional Uses; Pharmacological Effect

1. Introduction

Secondary metabolites are organic compounds found in many plants. They don't play a direct role in the plant's growth or development but are very important for its defense against pests, diseases, and environmental stress. The China rose, also known as the "Queen of the Tropics," is the common name for the beautiful flowering plant Hibiscus rosa-sinensis. It mainly grows in Southeast China and on several islands in the Pacific and Indian Oceans. This plant belongs to the Malvaceous family and is one of around 300 species in the Hibiscus genus. The juice extracted from the leaves and flowers of Hibiscus rosa-sinensis has been used for centuries as a natural remedy for various ailments and as an ingredient in herbal cosmetics. (3,4) Because hibiscus petals are easily available and pleasant-tasting, homemade herbal teas can be prepared from them with minimal effort. Before studying the effects of Hibiscus rosa-sinensis tea on humans, research has mainly focused on its effects on animals with diabetes and high cholesterol. In nature, colors in plants serve important purposes—they can warn predators of danger or attract helpful insects such as pollinators. The bright colors of flowers and fruits come from natural pigments such as battalions, carotenoids, flavonoids, and anthocyanins. Betacaine and carotenoids are responsible for yellow and red colors, while anthocyanins produce a wide range of shades from yellow (around 480 nm wavelength) to orange, blue, and red (up to 730 nm). These pigments are part of complex metabolic pathways that also involve colorless compounds like flavanols, tannins, and

* Corresponding author: Chaitali Mohan Barhate

proanthocyanidins. Hibiscus rosa-sinensis belongs to the subkingdom Trophobiont, which includes all vascular plants—plants that have specialized tissues for transporting water and nutrients. This group also includes familiar plants like apple trees, roses, and tulips. Within this subkingdom, plants are divided into two main classes: Magnoliopsida (dicotyledons) and Liliopsid (monocotyledons).[5,6]

Figure 1 *Hibiscus Rosa* Sinensis flower

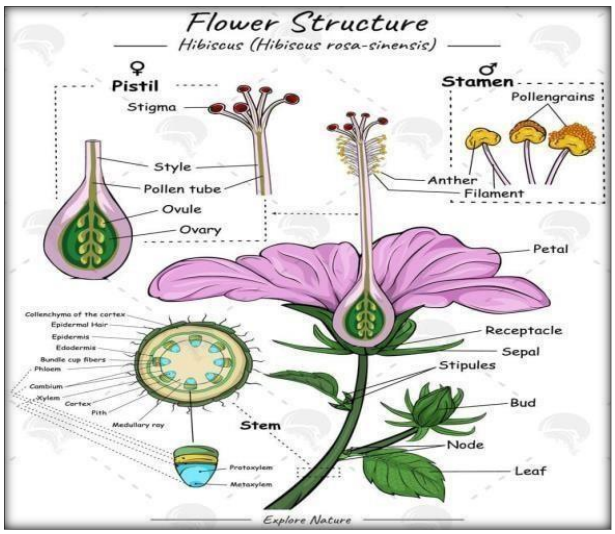


Figure 2 Flower Structure

2. Plant profile

SYNONYMS Chinese hibiscus, China rose, Hawaiian hibiscus, rose mallow and shoeblack factory.

2.1. Taxonomical classification

- Kingdom – Plantae
- Subkingdom – Trophobiont Subdivision
- Spermatophyta
- Division – Magnoliophyte
- Class – Magnoliopsida
- Order – Malave's

- Family – Malvaceous Genus – Hibiscus L
- Species – rosa

2.2. Chemical constituent

Hibiscus rosa sinensis is a shrubby species that generally reaches a height of 4 measures. It's evergreen and features round branches with stalks that are 10 cm wide by 15 cm long. most flowers have long stalks, measure roughly 20 cm in range, and have smooth edges, whorled round petals That act eggs, linked at the base to the central stamina column.

The comestible portion of the flower (61.6%) was reported to have the following nutrient composition(per 100gm) humidity 89.8%, nitrogen, fat 0.36, crude fiber 1.56, calcium 4.04 mg, phosphorus 26.68 mg, iron 1.69 mg, thiamine mg, riboflavin 0.048 mg, ascorbic acid 4.16 mg and niacin 0.16 mg. Patels of hibiscus rosa – sinensis were reported to contain quercetin-3-di- *O* – *β*- D- glucoside; quercetin- 3-di- O- *β*- D- glucoside; quercetin-3-O-*β*-D-sophoricoside; and kaempferol and kaempferol-3-O-*β*-xylosylglucoside.[1]

2.3. Pharmacogenetic activity

2.3.1. Antimicrobial activity

The antimicrobial exertion of Hibiscus rosa- sinensis excerpts was examined against Gram positive and Gram-negative bacteria and fungal strains by measuring zone of inhibition ANTI-INFLAMMATORY

Anti-inflammatory conditioning, the methanolic excerpt of hibiscus rosa sinensis leaves were used.

2.3.2. Antipyretic activity

The antipyretic exertion was determined by using the leaves of Hibiscus rosa sinensis and v Wistar rat.

2.3.3. Wound Healing Activity

Their study on Sprague Dawley rat by using hibiscus rosa sinensis having crack mending exertion, Ethanolic excerpt of Hibiscus rosa sinensis was used.

2.3.4. Anti-Cancer Activity

Hibiscus excerpt hindered the growth and palpebration of oral cancer cell.

2.3.5. Antifungal Activity

These fungi were attained from infected skins, and the chemical composites responsible for the antifungal exertion.

2.3.6. Anti-Hemolytic Activity

The anti-hemolytic exertion of Hibiscus rosa- sinensis flowers was delved in vitro.

2.3.7. Urinary Effect

The waterless excerpt of flowers of Hibiscus rosa- sinensis was estimated for antilithiatic eventuality in vitro.

2.3.8. Neuroprotective Activities

The methanolic excerpt of Hibiscus sassiness and codeine significantly dropped the number of coughing.[2]

3. Materials and Methods

Columns of different types, teacups, test tubes, conical steins, rotary evaporator, importing balance, sludge paper, Merc Millipore TLC silica gel 60 F254 plate, 10 H2SO4 in methanol imaging result, TLC chamber, Hot plate. All detergents used were logical grade and are distilled before use.

3.1. Instruments Used

Table 1 Instruments Used

Instruments	Make/Model
TLC glass plates silica gel 60 F254	Merck, Germany
Silica gel (60-120, 100-200 and 230-400) mesh	Qingdao Marine chemical, China.

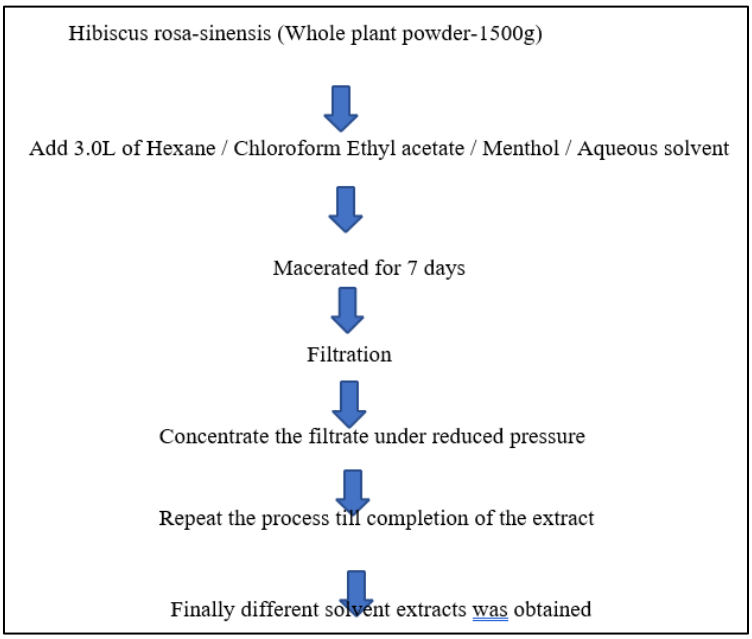
3.1.1. Drying

The whole factory material was shade dried to avoid corruption of bioactive ingredients. The dried whole factory was allowed to mechanical grinding.

3.1.2. Extraction Method

The dried whole plant material of Hibiscus rosa-sinensis was extracted step by step using different solvents hexane, chloroform, ethyl acetate, methanol, and water — in a process called successive solvent extraction. The extracts were then filtered and concentrated using a rotary vacuum evaporator.[10]

3.2. Solvent Extraction



3.3. Phytochemical screening of Hibiscus sassiness extract

Phytochemical tests of the methanolic excerpt of Hibiscus rosa- sinensis flower were performed following the styles.

3.3.1. Detection of Phytosterols

- **Liberman - Burchard Test**- 10 mg of excerpt was dissolved in 1mL of chloroform. 1 ml of acetic anhydride was added followed by the addition of 2mL of concentrated sulphury acid but no sanguine violet color was developed, indicating the absence of steroids.

3.3.2. Detection of Triterpenoids

- **Noller's test-** In the test tube 2 ml of 0.01 anhydrous stannous chloride in thionyl chloride result and test result was added. grandiloquent color formed changed to deep red color after many twinkles indicates the presence of Triterpenoids.

3.3.3. Detection of Flavonoids

- **Shinoda test-** To the excerpt magnesium turnings and also conc. hydrochloric acid (HCl) was added and red color was produced.

3.3.4. Detection of Alkaloids

- **Mayer's test**- 1.2 ml of excerpt was taken in a test tube. 0.2 ml of dilute hydrochloric acid and 0.1 ml of Mayer's reagent were added. conformation of unheroic buff colored precipitate gives positive test for alkaloid.
- **Dragendroff's test-** 0.1 ml of dilute hydrochloric acid and 0.1 ml of

Dandruff'' s reagent were added in 2ml result of excerpt in a test tube. Development of orange brown colored precipitate suggested the presence of alkaloid. Wagner's test 2 ml of excerpt result was treated with dilute hydrochloric acid and 0.1ml of Wagner's reagent. conformation of sanguine brown precipitate indicated the positive response for alkaloid.

3.3.5. Detection of Alkaloids

- **Biuret test-** 1 ml of 40 NaOH mixed with 2 drops of 1 bobby sulphate was added to the excerpt, a violet color indicated the presence of proteins.

3.3.6. Detection of Protein and Amino Acids

- **Ninhydrin test-** Excerpt result was treated with ninhydrin (Tri-ketohydrindene hydrate) at the pH range of 4-8. Development of grandiloquent color indicated the positive response for amino acids.

3.3.7. Detection of Glycosides

- **Legal test**- Excerpt was dissolved in pyridine; sodium nitroprusside result was added to it and made alkaline. Pink red color was produced.
- **Borntrager's test-**Many ml of dil. sulphury acid added to the test result. Boiled, filtered and uprooted the filtrate with ether or chloroform. also, organic subcaste was separated to which ammonia was added, pink red color was produced in organic subcaste.
- **Keller Killiani test**- Sample was dissolved in acetic acid containing trace of ferric chloride and transferred to the face of conc. sulphury acid. At the junction of liquid sanguine brown color was produced which gradationally becomes blue.

3.3.8. Detection of Phenolic composites and tannins

- **Ferric chloride test-** 5 ml of excerpt result was allowed to reply with 1 ml of 5 ferric chloride result. Greenish black achromatism indicated the presence of tannins.
- **Potassium dichromate test**- 5 ml of the excerpt was treated with 1 ml of 10 waterless potassium dichromate result. conformation of unheroic brown precipitate suggested the presence of tannins.

3.3.9. Detection of Saponins

- **Foam test-** 1 ml result of the excerpt was adulterated with distilled water to 20 ml and shaken in a graduated cylinder for 15 min. Development of stable froth suggested the presence of saponins.
- **Potassium dichromate test-** 1 ml excerpt was treated with 1 lead acetate result. conformation of white precipitate indicated the presence of saponins.[11]

Table 2 Evaluation test

Test	**Methanolic extract of Hibiscus rosa sinensis flower**
Phytosterols	+
Triterpenoids	+
Flavonoids	+

Alkaloids	+
Protein and amino acids	+
Deoxy sugars	-
Reducing sugars	+
Glycosides	-
Phenolic compound and Tannins	-
Saponins	-

4. Separation based on method of TLC chromatography

The crude methanolic extract was first tested using Thin Layer Chromatography (TLC) with different solvent systems such as ethyl acetate hexane and methanol ethyl acetate to check how many spots appeared and to identify the different compounds present.[10]

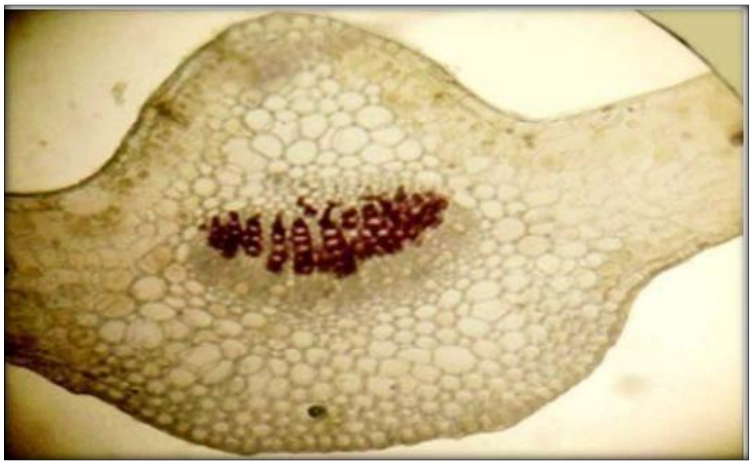


Figure 3 T.S. of midrib of H. rosa-sinensis leaf

5. Result

Scientific studies on Hibiscus rosa-sinensis extracts (from flowers, leaves, roots, and stems) have confirmed a wide range of pharmacological benefits, including antioxidant, anti-inflammatory, antibacterial, and antidiabetic effects, which are largely attributed to its rich phytochemical composition.

6. Conclusion

Hibiscus rosa-sinensis, a member of the Malvaceous family, has long been used as a traditional medicinal plant in China and many tropical countries. Almost every part of the plant has been used to treat various conditions such as fever, inflammation, bacterial infections, and even as a natural contraceptive. The main phytochemicals found in Hibiscus rosa-sinensis—including flavonoids, tannins, terpenoids, saponins, and alkaloids—are believed to be responsible for its medicinal properties. Its relatively low toxicity makes it a promising candidate for development as a new therapeutic agent.

This review provides an overview of recent research on the chemical composition and medicinal uses of Hibiscus rosa-sinensis. However, in some areas, the available research is still quite limited. More studies are needed to better understand the mechanisms of its active compounds, such as their potential anticancer effects. Before that, these natural compounds need to be properly isolated and identified. Additionally, clinical trials should be conducted to evaluate the plant's safety, possible side effects, and overall effectiveness in medical use.[12]

Compliance with ethical standards

Acknowledgments

I would like to express my sincere gratitude to all researchers and scholars whose valuable work has contributed to the understanding of Hibiscus rosa-sinensis. Their rigorous scientific efforts laid the foundation for this review. I also acknowledge the support of my institute Samarth institute of pharmacy and faculty mentor Miss. Prachi Padwal ma'am for their guidance and encouragement throughout the preparation of this manuscript.

References

[1] A REVIEW ON HIBISCUS ROSA-SINENSIS, EXTRACTION AND ITS PHARMACOLOGICAL ACTIVITY Satbir Singh*1, Manisha Kumari2, Megha Sharma31Associate Professor, Pt. LR College of Pharmacy, Faridaba2,3Undergraduate, Pt. LR College of Pharmacy, Faridabad May 2024, Volume 11.

[2] REVIEW ARTICLE HIBISCUS ROSA SINENSIS COMMONLY KNOWN AS GURHAR Anil Kumar*1, Krishanu Samanta*2*1,2Pharmacy College, Itaura, Chandeshwar, Azamgarh U.P-276128, India July 2023, Volume 05.

[3] Review on Hibiscus Rosa-Sinensis Flower Omkar .R. Pawbake*, Puja. S. Phatangare, Miss. Pratiksha. Mhaske, Miss. Pallavi. L. Phalke Department of pharmacy, Matoshri Radha College of D. Pharmacy, Virgaon, Akole May – June 2023, Volume 8.

[4] Review on Hibiscus rosa Sinensis Phytochemistry and Medicinal UsesMiss. Pratiksha Alabade, Kajal Jagtap, Neha Ade Department of Pharmacology Sarswati Institute Of Pharmacy Kurtadi, Tq. Kalmanuri, Dist. Hingoli 431701 March 2022, Volume 9 .

[5] Hibiscus rosa-sinensis L. (red Hibiscus) Tea, Can It Be Used as A Home-Remedy to Control Diabetes and Hypercholesterolemia? Subhashinie Sanadheera, Deepanjana Subasinghe*, Melissa Nethmi Solangaarachchi, Manju Suraweera, Noshara Yushanthi Suraweera, Nadeesha Tharangika Rajarata University of Sri Lanka, Mihintale - 50300, Sri Lanka April 2021, Volume 10.

[6] A Detailed Study of Hibiscus Rosa Sinesis L: Phytochemistry, Pharmacological Activities Therapeutic Uses and Its Antimicrobial, Antioxidant Activities Prakash Pralhad Sarwade1, Manoj Manjunath Bongale2, Nidhi Mittal3, Subhash Chand4, K.Vijayalakshmi 5, Radhika6, Rapborlang Khongshei7, Kavita Narayan Gaisamudre (Sarwade)8 2025;13(1).

[7] Extraction, Evaluation and Formulation of Herbal V -Wash from Hibiscus Rosa Sinensis Prof. Ashwini D. Rasal * 1, Anushka S. Varpe2, Sakshi A. Gawali3, Sonali K. Benke4, Jayashree P. Sonawane5, Tejaswini D. Pawar 6, Dr. Dipti G. Phadtare7, Prof. Preetam L. Nikam 2025, Volume 14.

[8] A Comprehensive Review of the Antimicrobial Effects of Hibiscus Species Ahmed E. Alharbi , Abdul Rahman M. AlHussaini , Issam Alshami 1. Medical Laboratories, College of Applied Medical Sciences, Taibah University, Al Madinah, S Basic Medical. Sciences, College of Medicine, Taibah University, Al Madinah, SAU 2024.

[9] ISOLATION AND EVALUATION OF HIBISCUS ROSA- SINENSIS LEAF MUCILAGE AS SUPERDISINTEGRANT Rajni Bala, *Reecha Madaan, Vibhu, Aneesh and Dr. Sandeep Arora Chitkara College of Pharmacy, Chandigarh-Patiala National Highway, Rajpura, Patiala, Punjab 140 401, India 2016, 3(8).

[10] A review on Hibiscus rosa-sinensis leaf extraction, phytochemical screening and thin layer chromatography K Devi and K Jacob Isaac 2022; 4(1).

[11] Authentication and Photochemical Screening of Hibiscus Rosa Sinensis. Mukhopadhyay Goutam1*, Dutta Kr Prabir2, Das Pranjal1, Sodani Akhsay1, Kundu Shymodip1, Sarkar Pintu1, Manna Debasmita3, Sarkar Argha1, Nazar Tarique1, Kumar Chandan4, Roy Chowdhury Sangita1 Dec 2018, Volume 5.

[12] An update review on Hibiscus rosa sinensis phytochemistry and medicinal uses Asmaa Missoum Department of Biological and Environmemntal Sciences, College of Arts and sciences, Qatar University (QU), Doha, Qatar 2018 4(3).

[13] Asian Journal of Pharmaceutical Research and Development. A Detailed Study of Hibiscus Rosa Sinesis L: Phytochemistry, Pharmacological Activities Therapeutic Uses and Its Antimicrobial, Antioxidant Activities 2025;13(1).

[14] Pharmacopoeial Standardization of Hibiscus rosa sinensis Linn. Gupta V1*, Bansal P1, Garg A2, Meena AK11National Institute of Ayurvedic Pharmaceutical Research, Patiala (Punjab), India 2Department of Pharmacognosy, S. B. S. College of Pharmacy, Patti, Punjab, India 2009 ;1(3).

[15] Green Synthesis of Silver Nano Particle Using Hibiscus Rosa Sinensis Ambili Reveendran1, Sanoj Varghese2, K.Viswanathan3,*Department of Physics, Karpagam University, Coimbatore, India Volume 8, Issue 3.

[16] The Phytochemical and Pharmacological Effects of Hibiscus rosa-sinensis: A Review Ezza Izzati Zulkurnain1, Salfarina Ramli1,2, Aida Azlina Ali1, Richard Johari James1,2, Ihsan Safwan Kamarazaman1,3, Hasseri Halim1,2,2023; 13(3).