

Traditional Uses Vs Scientific Evidence: A Critical Review Of Hibiscus Flower In Herbal Medicine

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ABSTRACT

This review highlights the botanical characteristics, phytochemistry, traditional uses, pharmacological activities, and therapeutic potential of *Hibiscus rosa-sinensis*, a widely used medicinal plant in traditional medicine. The plant is rich in bioactive flavonoids, anthocyanins, and phenolic acids, which underpin its diverse pharmacological properties, including antioxidant, anti-inflammatory, antidiabetic, antimicrobial, and hepatoprotective effects. A critical comparison of traditional claims with scientific evidence shows that while some activities are strongly supported, others require further validation. The review also discusses available dosage forms, marketed formulations, and key limitations in current research, including a lack of clinical trials and standardization. Future perspectives emphasize the need for advanced molecular studies, novel drug delivery systems, and rigorous clinical evaluation. Overall, *Hibiscus rosa-sinensis* shows significant potential to be developed into evidence-based therapeutic agents, provided existing research gaps are addressed.

Keywords: Phytochemical Composition, Traditional uses in herbal cosmetics, Pharmacological Activities, Comparative table, Dosage forms, Future perspective.

INTRODUCTION

The use of medicinal plants has been an integral part of traditional healthcare systems across cultures for centuries. Among these, *Hibiscus sabdariffa* L. (commonly known as hibiscus or roselle) has gained widespread recognition for its diverse ethnomedicinal applications, ranging from the treatment of hypertension and liver disorders to diuretic and digestive aid. In many regions of Asia, Africa, and Latin America, preparations such as infusions, decoctions, and extracts of hibiscus flowers are routinely consumed as both therapeutic agents and functional foods. These traditional practices are largely attributed to the plant's rich phytochemical composition, including anthocyanins, flavonoids, organic acids, and other phenolic compounds, which are believed to confer significant health benefits. One of the primary reasons for the widespread traditional use of hibiscus lies in its rich phytochemical profile. The plant contains significant amounts of anthocyanins (such as delphinidin-3-sambubioside and cyanidin-3-sambubioside), flavonoids, phenolic acids, and organic acids like hibiscus acid. These

compounds are associated with strong antioxidant properties, which form the biochemical basis for many of their purported therapeutic effects. The antioxidant activity is particularly important in combating oxidative stress, a key factor implicated in chronic diseases such as cardiovascular disorders, diabetes, and cancer. [1-8]



Despite its long-standing use, the transition of hibiscus from a folk remedy to evidence-based herbal medicine requires critical scientific evaluation. Over the past few decades, numerous in vitro, in vivo, and

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clinical studies have attempted to validate its pharmacological properties. Reported biological activities include antioxidant, antihypertensive, hypolipidemic, anti-inflammatory, and antidiabetic effects, suggesting its potential role in managing chronic non-communicable diseases. However, much of the available evidence is heterogeneous, with variations in study designs, dosages, preparation methods, and study populations, making it difficult to draw definitive conclusions about its efficacy and safety. [1-7]

Another important consideration is safety and potential adverse effects. While hibiscus is generally regarded as safe when consumed as a beverage, high doses or concentrated extracts may interact with medications, particularly antihypertensive and antidiabetic drugs. There is also limited data on its long-term safety and effects in vulnerable populations such as pregnant women and individuals with chronic illnesses. This underscores the importance of integrating traditional knowledge with rigorous toxicological and pharmacokinetic studies. [3,6,7]

Additionally, although traditional knowledge often ascribes broad health benefits to hibiscus, scientific evidence remains limited in some areas due to a lack of large-scale clinical trials and an incomplete understanding of its mechanisms. This gap underscores the importance of critically comparing traditional uses with scientifically validated evidence. Doing so is crucial for accurately identifying genuine therapeutic effects and preventing overestimation of benefits based solely on ethnobotanical claims. [1,2,16]

Therefore, this review aims to critically analyse the traditional uses of hibiscus flower in herbal medicine in comparison with contemporary scientific evidence. By evaluating both ethnomedicinal knowledge and modern pharmacological research, the study seeks to provide a balanced perspective on its therapeutic relevance, limitations, and future research directions.

TAXONOMY [10,32]

- Kingdom: Plantae
- Division: Magnoliophyta
- Class: Magnoliopsida

- Order: Malvales
- Family: Malvaceae
- Genus: *Hibiscus*
- Species: *Hibiscus rosa-sinensis* L.

SYNONYMS [32,34]

- Hindi: Gudhal, Japa
- Sanskrit: Japa, Japapushpa, Rudrapushpa
- Bengali: Jaba
- Marathi: Jaswand
- Gujarati: Jasud
- Punjabi: Gudhal
- Malay/Indonesian: Bunga Raya
- English: Chinese Hibiscus, China Rose, Shoe Flower
- French: Hibiscus de Chine
- Spanish: Rosa de China

Note

- “Bunga Raya” is the national flower of Malaysia.
- “Gumamela” is widely used in traditional medicine in the Philippines.

CHEMICAL CHARACTERISTICS AND VARIABILITY [32,33,34]

❖ Variation Among Cultivars

- Red flowers → high anthocyanins, strong antioxidant activity.
- White/yellow flowers → higher flavonols, lower antioxidant capacity.



❖ Glycosylation

- Most flavonoids occur as **glycosides**
- Enhances:
 - Solubility
 - Stability
 - Bioavailability

❖ Structure–Activity Relationship

- Antioxidant activity increases with:
 - Hydroxyl group substitution
 - Conjugation in flavonoid structure

BIOLOGICAL SIGNIFICANCES OF PHYTOCHEMICALS

The phytochemicals present in hibiscus flowers contribute to: [10,11,13,35]

- Antioxidant activity
- Anti-inflammatory effects
- Anticancer potential
- Antimicrobial activity
- Cardioprotective effects

These properties are primarily due to flavonoids and phenolic compounds. The flowers of *Hibiscus rosa-sinensis* are chemically rich, with flavonoids (especially anthocyanins and flavonols) as the major constituents, along with phenolics, tannins, alkaloids, and saponins. Their phytochemical diversity underlies their medicinal, nutritional, and ornamental importance, as well as their high antioxidant potential.

TRADITIONAL USES IN HERBAL MEDICINES [14,15,18,25]

Hibiscus rosa-sinensis L. (Malvaceae) is widely used in traditional medicine systems, including Ayurveda, Traditional Chinese Medicine (TCM), and folk medicine. Different parts—especially the flowers and leaves—are used as decoctions, pastes, infusions, and extracts to treat various ailments.

Major Traditional Uses

➤ Reproductive and Gynecological Uses

- Used as an **emmenagogue** to regulate menstrual cycles.
- Employed in **menstrual disorders and dysmenorrhea**.
- Traditionally used as an **antifertility and contraceptive agent**.
- Used to **stimulate labor during childbirth**.

🌍 Reported in China, India, Bangladesh, and the Pacific regions.

➤ Antidiabetic and Cardiovascular Uses

- Used in folk medicine for **diabetes mellitus management**.
- Helps in **hypertension and heart disorders**.
- Exhibits **cardioprotective effects**.

🌍 Widely documented in ethnomedicinal practices.

➤ Anti-inflammatory and Analgesic Uses

- Flower paste applied to **reduce inflammation and pain**.
- Used in **fever and headache treatments**.
- Exhibits **anti-pyretic (fever-reducing) activity**.

➤ Respiratory Disorders

- Decoctions used to treat:
 - Cough and bronchitis
 - Influenza and cold

🌍 Used traditionally in Asia and the Pacific Islands.

➤ Gastrointestinal Disorders

- Used for:
 - Diarrhea and dysentery

- Gastric ulcers

- Leaf extracts used as **antidiarrheal agents**.

➤ Wound Healing and Skin Diseases

- Applied topically for:
 - Wounds and cuts
 - Skin infections and inflammation
- Acts as a **cooling and soothing agent**

➤ Hair Care and Cosmetic Uses

- Widely used in Ayurveda for:
 - Hair growth promotion
 - Prevention of hair loss and dandruff.
- Flowers used in **herbal oils and hair tonics**.

➤ Antimicrobial and Anti-infective Uses

- Used traditionally to treat:
 - Bacterial and fungal infections.
 - Sexually transmitted diseases (e.g., gonorrhea).

➤ Kidney and Urinary Disorders

- Used in traditional medicine for:
 - Kidney disorders
 - Diuretic effects

➤ Aphrodisiac and General Tonic

- Considered an **aphrodisiac** in some cultures.
- Used as a **general health tonic** to improve vitality.

REGIONAL ETHANOMEDICINAL USES

Asia

- India: Used in **Ayurveda for hair care, menstrual disorders, and wound healing**.
- China: Used to **regulate menstruation and reduce pain**.

Pacific Islands

- Used for:
 - Childbirth support
 - Respiratory ailments

Africa and South America

- Used for:
 - Fever, infections, and reproductive health

MODES OF PREPARATION

Traditional formulations include:

- Decoctions (boiled extracts)
- Infusions (tea-like preparations)
- Pastes (topical application)
- Oils (especially for hair treatment)

PHARMACOLOGICAL ACTIVITIES (SCIENTIFIC EVIDENCE) [20,22,24,28,31]

Hibiscus rosa-sinensis exhibits a wide range of pharmacological activities due to its rich phytochemical profile (flavonoids, anthocyanins, phenolics, saponins). These compounds modulate oxidative stress, inflammation, and metabolic pathways, leading to multiple therapeutic effects.

Major Pharmacological Activities

- ✦ **Antioxidant Activity**
 - Strong antioxidant activity demonstrated through:
 - DPPH radical scavenging assay.
 - Lipid peroxidation inhibition.
 - Methanolic extracts showed up to **75% radical scavenging activity**.

Mechanism

- Scavenging reactive oxygen species (ROS).

- Increasing endogenous antioxidant enzymes (SOD, GSH).

✦ **Anti-inflammatory Activity**

- Flower extracts inhibit **pro-inflammatory mediators** such as:
 - TNF- α
 - IL-6
 - Cyclooxygenase (COX)

Mechanism

- Suppression of inflammatory signaling pathways.
- Inhibition of cytokine production.
- ✦ **Antidiabetic Activity**
 - Extracts reduce:
 - Blood glucose levels
 - Postprandial glucose absorption
 - Improve lipid profile (cholesterol, triglycerides)

Mechanism

- Enhancement of insulin sensitivity.
- Inhibition of carbohydrate-metabolizing enzymes.
- ✦ **Cardioprotective and Antihyperlipidemic Activity**
 - Reduces:
 - LDL cholesterol
 - Triglycerides
 - Improves heart function

Mechanism

- Regulation of lipid metabolism pathways:
 - PPAR- γ
 - Fatty acid synthase

✦ Antimicrobial Activity

- Exhibits activity against:
 - Gram-positive and Gram-negative bacteria
 - Fungal pathogens

Evidence

- Agar diffusion assays confirmed antibacterial activity of flower extracts.

✦ Anticancer (Cytotoxic) Activity

- Extracts show cytotoxic effects against:
 - Cancer cell lines
- Induces apoptosis (programmed cell death)

Mechanism

- Modulation of oxidative stress and cell signaling pathways.
- ✦ **Antifertility Activity**
- Demonstrated **anti-implantation and anti-ovulatory effects** in animal studies.

Mechanism

- Hormonal modulation affecting reproductive cycles.
- ✦ **Antipyretic and Analgesic Activity**
- Reduces fever and pain in experimental models.

Mechanism

- Inhibition of prostaglandin synthesis.
- ✦ **Antidepressant and Neuroprotective Activity**
- Exhibits **CNS-modulating effects**.
- Improves mood and reduces depressive symptoms.

Mechanism

- Modulation of neurotransmitters and oxidative stress.

✦ Hepatoprotective and Nephroprotective Activity

- Protects the liver and kidneys against toxin-induced damage.

Mechanism

- Reduction of oxidative stress markers.
- Enhancement of detoxifying enzymes.

✦ Antiulcer and Gastroprotective Activity

- Protects gastric mucosa.
- Reduces ulcer formation.

Mechanism

- Increased mucus secretion.
- Reduction of gastric acid.

✦ Wound Healing Activity

- Promotes faster wound closure.
- Enhances tissue regeneration.

Mechanism

- Stimulation of collagen synthesis.
- Anti-inflammatory action.

Summary of Mechanisms

Key pharmacological actions are mediated through:

- Antioxidant defense (ROS scavenging).
- Anti-inflammatory pathways (cytokine inhibition).
- Metabolic regulation (glucose and lipid metabolism).
- Cellular protection (anti-apoptotic and cytoprotective effects).

Hibiscus rosa-sinensis demonstrates broad-spectrum pharmacological activities, including antioxidant, anti-inflammatory, antidiabetic, antimicrobial, and anticancer effects. These activities are strongly supported by in vitro, in vivo, and mechanistic studies, validating their traditional medicinal use and

highlighting their potential for drug development. [20,28-31,35]

TRADITIONAL CLAIMS VS SCIENTIFIC VALIDATION (CRITICAL COMPARISON)

Traditional Uses	Scientific Evidence	Validation	Gaps	References
Antioxidant	Strong in vitro/ in vivo evidence	Strong	Limited human trials	1,2,6,27
Anti-inflammatory	Cytokine inhibition studies	Strong	Few clinical trials	20,29
Antidiabetic	Animal studies show glucose reduction	Moderate-Strong	Limited human data	5,20,28
Cardioprotective	Lipid-lowering effects	Moderate-Strong	Long-term studies lacking	1,7,8
Antimicrobial	In vitro antibacterial activity	Moderate	Clinical evidence lacking	27
Anticancer	Cell line cytotoxicity	Moderate	No clinical trials	20,28
Hepatoprotective	Animal models show protection	Moderate	Human studies limited	24
Neuroprotective	Preliminary CNS studies	Weak-Moderate	Sparse data	20,31
Antiulcer	Animal models	Moderate	No human trials	20,24
Wound Healing	Experimental model	Moderate	Clinical studies lacking	20,24
Hair growth	Minimal evidence	Weak	Major research gap	14-16
Antifertility	Animal studies	Moderate	No human trials	20,24
Menstrual regulation	Traditional evidence	Weak-Moderate	Mechanism unclear	15,16
Respiratory	Limited support	Weak	No direct studies	14,18

DOSAGE FORMS AND FORMULATIONS



Dosage Form	Example Products	Key Constituents	Typical Dose	Uses	References
Capsule	Bioven Gudahal Capsule	450 mg extract	1/ day	Antioxidant, heart health	16,20
Tablets	Merlion Hibiscus Tablets	500mg extract	1-2 /days	Skin, hair, weight	16,20
Powder	Healthvit Jasud Powder	Crude flower powder	3-6 g/ days	Hair, digestion	14,18
Syrup	Herbal Cough Syrup Formulation	Decoction extract	As prescribed	Respiratory disorder	15,18
Tincture	Liquid extract	Hydroalcoholic extract	1-2 ml	General health	16,20
Tea	Hibiscus Infusion	Dried petals	1-3 cups/day	Antioxidant	1,3,4

FUTURE PERSPECTIVE

The future perspectives of *Hibiscus rosa-sinensis* research highlight the need to bridge the gap between traditional knowledge and modern scientific validation through a multidisciplinary approach. Although the plant demonstrates promising pharmacological activities, future work must prioritize well-designed randomized controlled clinical trials with larger sample sizes and longer durations to establish its therapeutic efficacy in humans. Standardization of extracts based on key bioactive compounds such as flavonoids and

anthocyanins is essential to ensure consistency, reproducibility, and regulatory acceptance. Advanced analytical approaches, including metabolomics, genomics, and proteomics, should be employed to identify novel compounds and elucidate biosynthetic pathways, thereby enhancing the understanding of their pharmacological potential. Furthermore, detailed mechanistic studies at the molecular level are required to clarify the pathways involved in its antidiabetic, anti-inflammatory, and anticancer effects.ssss

In addition, future research should focus on the development of novel drug delivery systems, such as nanoparticles and controlled-release formulations, to improve the bioavailability and stability of active constituents, particularly anthocyanins. Comprehensive toxicological evaluations, including long-term safety, reproductive toxicity, and herb–drug interaction studies, are also necessary for safe clinical application. There is a significant need to scientifically validate many traditional and cosmetic claims, such as hair growth promotion and menstrual regulation, which currently lack robust experimental evidence. Sustainable cultivation practices and studies on genetic diversity should be encouraged to maintain phytochemical consistency and conserve plant resources. Finally, integrating *Hibiscus rosa-sinensis* into modern healthcare systems as a nutraceutical or phytopharmaceutical will require strong regulatory frameworks and evidence-based validation.

CONCLUSION

In conclusion, *Hibiscus rosa-sinensis* is a promising medicinal plant with wide traditional use and many bioactive phytochemicals, especially flavonoids and phenolic compounds. Scientific research supports some of its benefits, like antioxidant and anti-inflammatory properties, but many traditional claims lack sufficient validation due to limited clinical evidence, standardization issues, and incomplete understanding of its mechanisms. To unlock its full therapeutic potential, future studies should emphasize rigorous clinical trials, standardized formulations, and advanced molecular research. Overall, *Hibiscus rosa-sinensis* shows great potential for development into evidence-based herbal medicines and nutraceuticals, as long as current research gaps are addressed.

REFERENCES

- Guardiola, S.; Mach, N.; Therapeutic potential of *Hibiscus sabdariffa*: A review of the scientific evidence; *Endocrinología y Nutrición*; 61(5); 274–295; 2014.
- Riaz, G.; Chopra, R.; A review on phytochemistry and therapeutic uses of *Hibiscus sabdariffa* L; *Biomedicine & Pharmacotherapy*; 102; 575–586; 2018.
- McKay, D. L.; Physiological effects and human health benefits of *Hibiscus sabdariffa*: A review of clinical trials; *PubMed Central*; 2022.
- Patel, S; *Hibiscus sabdariffa* L.–A phytochemical and pharmacological review; *Food Chemistry*; 165; 424–443; 2014.
- Bule, M.; *Hibiscus sabdariffa* in diabetes prevention and treatment—Does it work? An evidence-based review; *PubMed Central*; 2022.
- Ali, B.H.; Wabel, N. A.; Blunden, G.; Phytochemical, pharmacological and toxicological aspects of *Hibiscus sabdariffa* L.: A review. *Phytotherapy Research*, 19(5), 369–375; 2005.
- Hopkins, A. L.; Lamm, M. G.; Funk, J. L.; *Hibiscus sabdariffa* L. in the treatment of hypertension and hyperlipidemia: A comprehensive review; *Fitoterapia*; 84–94; 2013.
- Ojeda, D.; Jiménez-Ferrer, E.; Zamilpa, A.; Inhibition of angiotensin converting enzyme (ACE) activity by the anthocyanins delphinidin- and cyanidin-3-sambubiosides from *Hibiscus sabdariffa*; *Journal of Ethnopharmacology*; 127(1); 7–10; 2010.
- Khan, M.I.; Rahman, R.; *Hibiscus rosa-sinensis* L. (Malvaceae): Distribution, Chemistry and Uses; *International Journal of Chemical and Biomedical Sciences*; 147-151; 2017.
- Raza, H.; Maaz, M.; Ahmad, K.; *Hibiscus rosa-sinensis*: A Multifunctional Flower Bridging Nutrition, Medicine, and Molecular Therapeutics; *PubMed Central*; 2025.
- Meija, J. J.; Sierra, J. L.; Color, Antioxidant Capacity and Flavonoid Composition in *Hibiscus rosa-sinensis* Cultivar; *Molecules*; 2023.
- Sahani, V.; Kant, K.; Phytochemical and Pharmacognostic Study of *Hibiscus*; *International Journal of Novel Research and Development*; Vol 8; 2023.
- Sri, S. G.; Dewan, M.; Preliminary Phytochemical Screening of *Hibiscus rosa-sinensis*; *International Journal of Pharmacy and Biological Sciences*; 14(2); 16-18; 2024.
- Saju, F.; Sivaraman, M. C.; Medicinal value of *Hibiscus rosa sinensis*: A Review; *International Journal of Pharmacognosy and Chemistry*; 2(1); 01-11; 2021.
- Shukla, S. K.; A review on the Traditional Medicinal Uses of *Hibiscus rosa-sinensis*;

- International Journal of Advanced Research in Multidisciplinary Sciences; 2019.
16. Amtaghri, S.; Qabouche, A.; A Comprehensive Overview of Hibiscus rosa-sinensis L.: Its Ethnobotanical Uses, Phytochemistry, Therapeutic Uses, Pharmacological Activities, and Toxicology; Bentham Science Publisher; Vol 24; 86-115; 2024.
17. Silalahi, M.; Hibiscus rosa-sinensis L. dan Bioaktivitasnya; ResearchGate; 2019.
18. Missoum, A.; An Update Review on Hibiscus rosa sinensis Phytochemistry and Medicinal Uses; Journal of Ayurvedic and Herbal Medicine; 4(3) 135-146; 2018.
19. Sharma, Dr. Y.; Sharma, Dr. R.; Hibiscus rosa sinensis: A Botanical Marvel with Multifarious Physiological Activities; World Journal of Pharmaceutical Research; Vol 12; 2023.
20. Zulkarnain, I. E.; Ramli, S.; The Phytochemical and Pharmacological Effects of Hibiscus rosa-sinensis: A Review; International Journal of Pharmaceutical Investigation; 13(3); 422-431; 2023.
21. Gupta, A.; Sharma, P.; Phytoconstituents and Pharmacological activities of Hibiscus rosa-sinensis: A Review; International Journal of Trend Research and Innovation; Vol 8; 2023.
22. Kumar, A.; Kumar, S.; Pharmacological Review on Hibiscus rosa-sinensis; International Journal of Novel Research and Development; Vol 7; 2022.
23. Raj, B.; Kaur, R.; Hibiscus rosa-sinensis L.: A Phytochemical and Pharmacological Review; International Journal of Health Sciences; 5165-5193; 2022.
24. Singh, B.; Singh, D.; A Review on Phytochemical Constituents and Pharmacological Activity of Hibiscus rosa-sinensis; International Journal of Pharmaceutics and Drug Analysis; Vol 5; 56-66; 2017.
25. Gupta, D.; A Review On Ethnomedicinal Plants And Their Traditional Uses In India Section A-Research Paper; ResearchGate; Vol 12; 8442-8552; 2023.
26. Magdalita, P.M.; Pascual, S.A.O.; Development of New Hibiscus Hybrids (Hibiscus rosa-sinensis L.) in the Philippines; ResearchGate; 2022.
27. Khan, Z.A.; Naqvi, S.A.R.; Antioxidants and Antibacterial Activities of Hibiscus rosa-sinensis; Pakistan Journal of Pharmaceutical Sciences; Vol 27; 464-679; 2014.
28. Roy, S.; Das, R.; Sharma, C.; An Updated Review on Various Potential Pharmacological Activities of Hibiscus Rosa-sinensis L.; International Journal of Biology, Pharmacy and Allied Science; Vol 12; 132-149; 2023.
29. Geeganage, J.R.; Gunathilaka, M.D.T.L.; Mechanistic Insight into Anti-inflammatory Potential of Hibiscus rosa-sinensis Flower Extract as a Herbal Remedy: A Systematic Review; Journal of Herbal Medicine; Vol 45; 2024.
30. Mitra, D.; Saha, M.; A Mini Review on Phytochemical and Therapeutic Potentially of Hibiscus: An Ornamental Plant Species; Journal of Medicinal Plant Studies; Vol 12; 63-67; 2024.
31. Dr. Goswami, S.; Yadav, S.; A Review on the Pharmacological Activities of Hibiscus Rosa-sinensis: International Journal of Pharmaceutical Research and Applications; Vol 8; 3161-3172; 2023.
32. Rasane, S.; Bhalsing, M.; A Review of a Comprehensive Study on Hibiscus Rosa Sinensis; International Journal of Research and Analytical Reviews; Vol 10; 741-748; 2023.
33. Dnyandeo, S.J.; Mahadev, S.R.; A Detailed Review on Hibiscus Rosa Sinensis; International Journal of Novel Research and Development; Vol 8; 2023.
34. Shivnath, R.W.; The Review on Medicinal Uses of Hibiscus Rosa Sinensis; International Journal of Creative Research Thoughts; Vol 10; 352-357; 2022.
35. Tapkir, A. S.; Hibiscus Rosa Sinensis: A Review of the Morphology of H.Rosa sinensis Plant, Its Nutrients and Pharmacological Properties; Journal of Emerging Technologies and Innovative Research; Vol 9; 325-336; 2022.

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