



# A COMPREHENSIVE PROPERTIES OF *HIBISCUS ROSA SINENSIS*

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**Abstract :** These days, natural plant products are frequently used due to the rising number of illnesses. Plants of the Family Malvaceae, including *Hibiscus rosa sinensis* Linn, are found all over the world. The Indian traditional medical system has used its roots, flowers, bark, and leaves as medication to cure a range of medical conditions. Numerous research has indicated that the various sections of *Hibiscus rosa sinensis* plants have antibacterial, anti-ulcer, anti-diabetic, hepatoprotective, antioxidant, anti-inflammatory, antifertility, antigenotoxic qualities that aid in the treatment of a range of medical conditions. The flowers and leaves of *Hibiscus rosa sinensis* are evaluated in numerous animal-based research studies as antioxidant and anti-diabetic substances. This review aims to emphasize the medicinal uses of hibiscus.

**Keywords :** *Hibiscus rosa Sinensis*, Phytochemical constituents, Therapeutic applications, Traditional medicines.

## INTRODUCTION:-

Medicinal herbs have been used extensively throughout history for a variety of reasons. The ability of the plants to generate chemical factors that are important in avoiding lots of illnesses like diabetes, cancer, and other conditions has led to their identification as medicinal plants. Various other chemical compounds serve vital biological roles, including defense against herbivorous animals, fungus, insects, and predators. Less than 10% of the total, or at least 12,000 compounds, has been identified to date.

There are three main categories into which medicinal plants can be categorised: (a) modern medicine, which uses roughly 30 to 35 species of medicinal plants; (b) traditional medicine, which is organised and codified and has written treatises, such as Ayurveda, Siddha, Unani, Amchi, and Tibetan systems of medicine, which use roughly 1,200 to 2,000 species of medicinal plants; and (c) local health traditions, which are based on customs followed by villagers, folk healers, vaidyas, and tribal people, and which use over 8,000 species of medicinal plants for primary medical purposes [1,2,3].

The stunning flowering plant *Hibiscus rosa sinensis* is commonly referred to as the "China rose" or "Queen of tropics" because it is mostly found in southeast China as well as some islands in the Pacific and Indian Oceans. One of Hawaii's most beloved national flora, hibiscus is frequently worn in hair for ceremonial purposes [4, 5]. This plant is vascular and produces seeds; it is a member of the class Magnoliopsida and sub-kingdom Magnoliophyta. It is one of the 300 species in the genus *Hibiscus* and a member of the family Malvaceae [4]. Furthermore, the liquid that was taken from the flowers and leaves has been used for a very long time as a cheap herbal cosmetic and as a natural cure for a number of illnesses and excruciating symptoms [6, 7]. Extract from dark flowers is used to blacken shoes and create eyeliners [7]. It was thought that the renowned Swedish biologist Carolus Linnaeus named the species "rosa sinensis," which translates to "Rose of China" in Latin, in the early 1750s [8]. Hibiscus blossoms have long been used as analgesics, anti-pyretics, anti-inflammatory medicines, and asthma relievers. It has also been suggested that they contain anticancer effects. Numerous investigations have demonstrated that *Hibiscus rosa-sinensis* flowers possess anti-oxidant, anti-fungal, and antibacterial qualities [9]. Studies conducted on Hibiscus flower, stem, root, and leaf extracts have shown that the plant's phytochemical components have positive effects on human health, including antioxidant activity the elimination of free radicals that can damage DNA [10]. Cassia, or *Senna bicapsularis* L. Flower extracts, are another example of a plant-based source of antioxidants [10, 11]. The blossoms were also utilized as a method of contraception for both sexes as an abortifacient in India's rural areas [12].

More than half of most recent research claims that natural ingredients are the source of today's medicinal medications. Many of them have made major contributions to the pharmaceutical industry and the advancement of various disease remedies [13]. Because of its medical applications and herbal products, this plant is quite important commercially [13]. There haven't been a lot of clinical studies or scientific study done on the extracts from *Hibiscus rosa-sinensis* chemically, which could be important in examining its immediate prospective utilizes in healthcare due to insufficient existing pharmacological information.



Fig. No.1 *Hibiscus rosa Sinensis*

Table no. 1 Taxonomical classification

Common name	Chinese hibiscus
Kingdom	Plantae
Division	Tracheophyta
Subdivision	Angiospermae
Class	Magnoliopsida
Order	Malvales
Family	Malvaceae
Genus	Hibiscus

Table no. 2 Herbal plant Formulation, along with their manufacture and applications

Formulations	Uses	Manufacturers
Hair gel	protect hair from turning gray rapidly while stimulating new hair growth	Dr. Jain's Forest Herbals Pvt. Ltd
Hair oil	Hair Conditioner	Dhee Ayurved
Moisturizer	Hibiscus flower extract is rich in antioxidants and amino acids, providing a brighter, younger appearance.	Serendepite Organics
Handmade Hibiscus Soap	Great nourishing formulation for skin that is dry.	Vatu Healthcare
Dead sea essentials by Hand cream	Hand Cream	AHAVA Hydrating
Coconut Hibiscus	Fragrance mist for women	Bodycology
Herbal Tisane Hibiscus Immunity tea	An all-natural herbal mixture created using a special recipe to support improved general health and immunity	Blessed Tea & Tisane
Hibiscus Flower Extract	Maintains appropriate blood pressure encourages a healthy weight that maintains appropriate cholesterol levels	Nusapure

## PHYTOCHEMICAL CONSTITUENTS:-

### Phenol:-

Phenolic substances Scutellarein, one of the more recent active chemicals, and ten polyphenolic compounds vitexin, apigenin, p-hydroxybenzoic acid, kaempferol, Gallic acid, quercetin, quercetin-7-O-galactoside and neochlorogenic extracted from the methanolic extract of shade-dried -6-O- $\alpha$ -L-rhamnopyranoside-8-C- $\beta$ -D-glucopyranoside, flowerkaempferol-7-O-[6"-O-p-hydroxybenzoyl  $\beta$ -D-glucosyl-(1-6)- $\beta$ -D glucopyranoside].

### Flavonoids:-

Four flavonoids have been identified in Hibiscus Rosa Sinensis flowers: quercetin, myricetin, rutin, and kaempferol.

### Essential oils:-

Fresh Hibiscus Rosa Sinensis flowers were found to contain the following: 1-iodoundecane (50.568%), essential oils v/w (0.30-0.50%), 2, 2, 4-trimethyl 3-pentanone (1.556%), 2-cyclopentylethanol (2.404%), 1,2-benzene dicarboxylic acid isodecyl octyl ester (11.056%), neopentane (7.641%), 2-propenamide (1.543%), 2-5176 propeonic acid, 1-tetrazol-2-ylethanone (3.993%), 1-4 butanediyl ester (1.543%), amyl nitrite (3.993%), and 4-trifluoroacetoxystane (1.480%)[14].

## PHARMACOLOGICAL ACTIVITIES:-

### Antimicrobial activity:-

By assessing the zone of inhibition, the antimicrobial activity of *Hibiscus rosa-sinensis* extracts was investigated against strains of fungi, bacteria, and both Gram positive and Gram negative bacteria. Comparing the leaf extract to *E. coli* and *Bacillus subtilis*, it demonstrated strong efficacy against *Staphylococcus aureus* at extremely low concentrations (2.5 $\mu$ g/ml). Comparing leaf extract to *Aspergillus niger*, it shown strong actions used at a very low dose (2.5 $\mu$ g/ml) against *Candida parapsilosis*. At extremely low concentrations (2.5 $\mu$ g/ml), the *Hibiscus rosa-sinensis* root extract shown strong efficacy against every tested bacterium. In comparison to *Trichophyton rubrum*, root extract shown strong activity against *Aspergillus niger* and *Candida parapsilosis* at a very low dose (2.5  $\mu$ g/ml). The floral extract shown efficacy against *Staphylococcus aureus* and *E. coli* (12 mm) at a low dosage of 2.5 $\mu$ g/ml. At low concentrations (2 Sug/ml), flower extract also demonstrated strong efficacy against *Aspergillus niger* and *Candida parapsilosis* [15].

### Anti-inflammatory activity:-

Active carrageenin-induced pedal edema was produced in rats by intraperitoneal injection of andried leaf ethanol extract at a concentration of 100.0 mg/kg. Many inflammatory conditions are treated with hibiscus rosa sinensis, such as blenorrea, bronchitis, and mucosal inflammation. The methanolic extract of hibiscus rosa sinensis leaves was utilized for its anti-inflammatory properties. As a standard, indomethacin is used to combat carrageen, while dextran causes inflammation [16].

### Wound Healing:-

Healing of Wounds In their investigation on Sprague-Dawley rats, hibiscus rosa sinensis with wound-healing properties was utilised as an ethanolic extract. When compared to controls, the study shows that mice treated with an ethanolic extract of *Hibiscus rosa sinensis* had an 86% reduction in wound area [17].

### Antifungal Properties:-

Previous research has demonstrated the antibacterial properties of methanol extracts made from *Hibiscus rosa sinensis* leaves against *Candida parapsilosis*, *Trichophyton rubrum*, *Trichophyton rubrum*, and *Aspergillus niger*. The maximum observed zone of inhibition, measured using the well diffusion method, the results were 9.3  $\pm$  0.57 mm against *Aspergillus Niger* and 6.6  $\pm$  0.57 mm against after a 24-hour incubation period at 37 $^{\circ}$  C. *Aspergillus Niger*, then 6.6  $\pm$  0.57 mm against the methanolic extract of leaves at 80  $\mu$ g/ml concentration of *Candida albicans*. The study revealed flavonoids, tannins, terpenoids, saponins, or alkaloids as potential chemical components responsible for the antifungal activity of the fungi derived from afflicted skins [18].

### Antioxidant Properties:-

By estimating the total flavonoid levels, total phenolic levels, the percentage of the DPPH free radical scavenging activity and inhibition of linoleic acid oxidation capabilities were used to evaluate the antioxidant potential of various solvent extracts of *Hibiscus rosa-sinensis*. The *Hibiscus rosa-sinensis* methanol and ethanol extract displayed total flavonoids of the comparable amounts of catechine and gallic acid were 53.28  $\pm$  1.93 and 32.25  $\pm$  1.21 mg/100g, respectively, while total phenolic was 61.45  $\pm$  3.23 and 59.31  $\pm$  4.31 mg/100g. The suppression of linoleic acid oxidation potential was measured at 75.8  $\pm$  3.22 and 61.6  $\pm$  2.01%, while the DPPH free radical scavenging activity was 75.46 $\pm$ 4.67 and 64.98  $\pm$  2.11%, respectively [19].

### Antipyretic activity:-

24 antipyretic activities the effects of *Hibiscus rosa sinensis* as an antipyretic in rats were investigated by Sawarkar, A.R. et al. Wistar rats and *Hibiscus rosa sinensis* leaves were used to measure the antipyretic effect. *Hibiscus rosa sinensis* aqueous and alcoholic extracts were utilised to lower the elevated temperature and were contrasted with the control group [20].

**Anti-haemolytic activity:-**

In vitro research was done on the anti-haemolytic properties of *Hibiscus rosa-sinensis* flowers. After incubating the floral extract at different concentrations with erythrocytes, lipid peroxidation and hydrogen peroxide-induced hemolysis were measured as markers of erythrocyte damage. In vitro, the extract dramatically decreased lipid peroxidation and hemolysis caused by hydrogen peroxide [21].

**Urinary effect:-**

Using an aqueous extract, the antilithiatic activity of *Hibiscus rosa-sinensis* flowers was evaluated in vitro. After inducing a stone, the crystals of calcium oxalate present were assessed both instantly and 24 hours later. After 24 hours, the extract from *Hibiscus rosa-sinensis* reduced crystal aggregation. The extract disrupted the initial phases of stone formation and could potentially offer a different approach to treating or preventing urolithiasis [22].

**Antitussive effect:-**

A citric acid (7.5% W/V) induced cough paradigm was used to assess the antitussive efficacy of the methanolic extract of *Hibiscus rosa-sinensis* in a histamine chamber. Codeine and *Hibiscus rosa sinensis* methanolic extract dramatically reduced the amount of coughing [23].

**Hair growth promotes activity:-**

In an experiment with Wister albino rats, *Hibiscus rosa sinensis* leaf extract in petroleum ether was shown to be an effective hair growth booster. After 14 days, the hair length of the 5% w/w extract ointment group was  $4.91 \pm 0.261$  mm, whereas the 2% minoxidil treatment group's hair length was  $6.06 \pm 0.431$  mm and the negative control group's was  $2.21 \pm 0.108$  mm. Moreover, the extract was produced in Minoxidil produced  $2315 \pm 05.78$  hairs per cm<sup>2</sup>, compared to  $1937 \pm 37.84$  hairs per cm<sup>2</sup> area. The alopecia was brought on by exposure to sonic stress, as opposed to synthetic hair growth-promoting ointment, and there were no adverse consequences such as erythema or edema. Similarly, hair length was  $5.97 \pm 0.13$  mm and there were  $2058 \pm 19.23$  hairs per centimetre in the 5% hydrochloric leaf extract [24].

**Anticancer activity:-**

Anti-tumor action For a full day, mouthcancerous cell lines KB were subjected to 125 hours and 75 $\mu$  g of oil extract from *Hibiscus Rosa sinensis*. Using agarose gel electrophoresis and a DNA fragmentation assay on the treated cells, it was shown that the DNA of the cells at both concentrations had fragmented more than the control sample. This indicates that hibiscus extract prevents oral cancer cells from growing and spreading [25].

**Antiparasitic effect:-**

The anti cestodal properties of *Hibiscus rosa-sinensis* leaf methanol extract were studied against *Hymenolepis diminuta* both in vitro and in vivo. The effects of exposing *H. diminuta* worms to doses of using methanol leaf extract at 10, 20, and 40 mg/ml, the worms' physical motility and mortality were measured. Rats infected with *H. diminuta* were given dosages of leaf extract at 200, 400, and 800 mg/kg individually for five days during the in vivo investigation. Worm counts and the decrease in eggs per gramme (EPG) of excrement were used to evaluate the effects. In an in vitro experiment, the 40 mg/ml concentration of extract exhibited a strong anticestodal effect, resulting in worm paralysis in  $3.00 \pm 0.53$  hours and mortality in  $4.08 \pm 0.21$  hours. Nevertheless, an in vivo investigation showed that an extract dose of 800 mg/kg had the most anticestodal effect, resulting in a 66.55% decrease in the EPG count and a 75.00% decrease in the worm count in the treated animals [26].

**Fibrinolytic effect:-**

The fraction in charge of the fibrinolytic impact was examined, as well as the fibrinolytic effect of the *Hibiscus rosa-sinensis* aqueous extract. The outcomes demonstrated that *Hibiscus rosa sinensis* extract had higher fibrinolytic activity without causing hemolysis. Of the 11 fractions of the extracts, fraction 5 had the highest level of fibrinolytic activity [27].

**TRADITIONAL USES OF *HIBISCUS ROSA SINENSIS* LINN:-**

- The roots of *Hibiscus rosa sinensis* Linn have the ability to suppress coughs.
- You can treat scalp diseases, inhibit premature graying, and promote hair development with leaves and blossoms.
- There are reports that the blossoms are useful in treating leprosy, diabetes, epilepsy, and heart issues.
- The root's infusion can be used to treat venereal diseases.
- Use the leaves and roots to stimulate blood flow, which aids in controlling menstruation.
- Utilize the leaves as a means of stimulating placenta ejection following childbirth and as an abortifacient.
- *Hibiscus rosa sinensis* blossoms are used to treat a range of conditions, such as liver issues, high blood pressure, and stomachaches.
- *Hibiscus rosa sinensis* fruits are used to cure wounds, sprains, and other diseases. The fruits also have diuretic effects [28, 29].

**SIDE EFFECTS AND TOXICITY:-**

When all of the *Hibiscus rosa sinensis* extracts were given to mice, there was no toxicity up to 500 mg/kg of dosage, showing the safety of the extracts. When mice were given all of the *Hibiscus rosa sinensis* extracts up to a dose level of 500 mg/kg, the safety of the extracts was shown without causing any harm. The safety of *Hibiscus rosa sinensis* extracts was demonstrated when all of the extracts were administered to mice up to a dose level of 500 mg/kg without causing any harm. Even when the highest dose level of 500 mg/kg of *Hibiscus rosa sinensis* extracts was administered to mice, no toxicity was seen. This suggests that *Hibiscus rosa sinensis* extracts are safe to eat [30].

**CONCLUSION:-**

In China and other tropical nations, *Hibiscus rosa sinensis*, a plant belonging to the family Malvaceae, is widely utilised as a traditional medicinal plant. Its constituents have all been utilised as contraceptive agents as well as to treat fever, inflammation, and bacterial infections. The most significant phytochemicals include flavonoids, tannins, terpenoids, saponins, and alkaloids; these are found in many extracts and are probably what cause their biological effects. Its reduced toxicity, this plant may work to its favour as a novel medicinal agent. A thorough synopsis of current research on the phytochemistry and therapeutic applications of *Hibiscus rosa sinensis* has been provided in this review. Because there hasn't been much research done in some areas, more work needs to be done to investigate the mechanisms of action of phytochemicals, such as their anti-cancer properties. These biological substances must first be properly extracted and recognised, though. Furthermore, to evaluate this plant's safe use and desired side effects, clinical investigations on its toxicity and pharmacological effects need to be conducted.

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