



PHARMACOLOGICAL REVIEW ON *HIBISCUS ROSA SINENSIS*

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ABSTRACT

Plants have been a source of medicinal compounds since ancient times and have been used to treat various diseases in humans as well as animals. *Hibiscus rosa sinensis* is known as China rose belongs to family Malvaceae family. This plant has various important uses for treating wounds, inflammation, fever, and cough, diabetes, infections caused by bacteria, fungi, hair loss, and gastric ulcers in several tropical countries. Many of the modern clinical drugs are of natural origin are of natural product origin play an important role in drug development programs in the pharmaceutical industry. *Hibiscus rosa sinensis* is one of the miraculous medicinal herbs and play a major role in herbal health supplements and medicines both in daily self-care and in professionally managed health care system.

Phytochemical investigation documented that the present bioactive compounds responsible for its medicinal properties. The chemical constituents of hibiscus roseus contain alkaloids, flavonoids, terpenoids, saponins, tannins cardiac glycoside, carbohydrates reducing sugar, essential oils, steroids proteins, and free amino acid,

The present study on *Hibiscus rosa sinensis* that shows the pharmacological activities such as it acts as an anti-inflammatory, antipyretic, antimicrobial, dermatological, anticonvulsant, antiparasitic, neuroprotective, antitussive, antioxidant. Anxiety. anti-depressant, and antidiabetic etc. The current review will discuss the chemical constituents, traditional uses, pharmacological activities, and importance of *Hibiscus rosa sinensis*.

Keywords: *Hibiscus rosa sinensis*, Traditional uses, Pharmacology. chemical constituents.

INTRODUCTION

Nature has been a source of medicinal agents for thousands of years have been isolated from natural sources based on their use in traditional medicine. *Hibiscus rosa sinensis* a well-known member of the family Malvaceae and grows as an evergreen herbaceous plant A native to tropical and sub-tropical regions. This plant is extensively cultivated as an ornamental plant. The flowers are usually dark red in color Today, various new varieties have been cultivated and developed through cross breeding. Different cultivars and hybrids have been produced and developed with flowers ranging in colors and other features.

There are 300 species of the plants. Traditionally Hibiscus flower has been reported it should be used as an analgesic memory enhancement, diabetic anti-inflammatory, antioxidant anti-microbial, anti-diabetic, antitussive, Anti-tumor, antimodulatory, hepatoprotective, dermatological, urinary, fibrinolytic and many other effects Many of them have played important role in the pharmacological effect and developing better therapeutic effect for various disease.[3].China rose or “Queen of tropics” is often a popular name for the gorgeous flowering plant *Hibiscus rosa-sinensis*, as it is mainly found in south-east China and some islands in the Pacific and Indian Ocean.

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 world. Dark flowers’ extract is used to make eyeliners, and in shoe- blacking. 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. Several studies have proved the presence of anti-oxidant, anti-fungal, and antimicrobial properties in flowers of *Hibiscus rosa-sinensis* Traditionally, *Hibiscus* flowers has been reported to possess antitumor properties, as well as have been used as analgesic, antipyretic, anti-asthmatic, and anti-inflammatory agents. Research on extracts of stems, roots, leaves, and flowers from *Hibiscus* have revealed that its photochemical components contributed to beneficial findings to human’s health. Current scientific literature suggests that more than 50% of today’s clinical medications were of natural product origin. Many of them have played a significant role in pharmacological industry and in developing better therapies for various diseases. This plant is economically very essential owing to the herbal products and medicinal uses Because of insufficient current pharmacological information, there is not much scientific research or clinical trials conducted on the chemical extracts.

DISTRIBUTION

In Hindi *Hibiscus rosa sinensis* is known as gurhal. It belongs to the Malvaceae family. It grows on its own in tropic and sub tropic regions of the world are native to Tropical Asia, South-eastern Asia (China), It is grown as an ornamental plant in gardens throughout India This is a glabrous shrub and widely cultivated in tropics. In India it is a perennial ornamental shrub which is available easily. There are so many. Pharmacological and pharmaceutical importance of *Hibiscus rosa sinensis* It shows various pharmacological activities

Common Name

China rose, China rose plant, Gurhal, Gurhal, Jaba, Mandaar, Japaphool, Jasum, Jasunt, Jaswand,

VERNACULAR NAME

English-	Shoe-flower plant, Chinese Hibiscus.
Hindi-	Jasut, Jasum, Java, Odhul, Gurhal, Arahul.
Marathi-	Jasavanda, Jassvandi.
Sanskrit-	Japa, Java, Rudrapuspa, Aundrapuspa, Trisandhya.
Bengali-	Joba, Jiwa, Oru.
Gujrati -	Jasvua, Jasunt.
Kannada -	Dasavala.
Malayalam-	Himbarathi, Ayamparatti, Chebarathi.
Punjabi. -	Jasum, Jaipushpa, Gurhal.
Tamil -	Sapattuu, Semparutti.

Plant Profile

Botanical Name: *Hibiscus rosa-sinensis* L.

CLASSIFICATION

Kingdom;	<i>Plantae</i>
Subkingdom:	<i>Tracheobionta</i>
Super division:	<i>Spermatophyta</i>
Division:	<i>Magnoliophyta</i>
Class:	<i>Magnoliopsida</i>
Subclass:	<i>Dilleniidae</i>
Order:	<i>Malvales</i>
Family:	<i>Malvaceae</i>
Genus:	<i>Hibiscus</i>
Species:	<i>Hibiscus rosa-sinensis</i>
Plant Type:	Shrub or Small tree
Parts used:	Flowers, leaves, and root

CHEMICAL CONSTITUENTS

The edible portion of the flower was reported to have the following nutrients like nitrogen, fats, crude fibers, calcium, phosphorus, iron, thiamine, ascorbic acid and niacin. 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 and kaempferol. The major anthocyanin contained in the red flowers of *H. rosa-sinensis* was cyanidin-3-sophoroside. Red-petalled varieties of *H. rosa-sinensis* were found to have a greater number of anthocyanin bands compared with that observed in yellow-yellow orange varieties. The varieties in the different colored 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 reported to contain the following flavones:

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. Leaves and stems contain β -sitosterol, stigma sterol, taraxeryl acetate and three cyclopropane compounds and their derivatives. Fatty acids, fatty alcohols and hydrocarbons were identified from *Hibiscus rosa Sinensis* leaves. Quercetin, β -sitosterol and linoleic acid can be selected as bioactive markers for Quantification of *Hibiscus rosa sinensis* flower ⁽⁶⁾.

PHARMACOLOGICAL REVIEW

Hibiscus rosa sinensis (Malvaceae) is a perennial ornamental shrub available throughout India. Various parts of this plant like flowers, leaves and roots have been known to possess medicinal properties

Antimicrobial Activity

The antimicrobial activity of *Hibiscus rosa-sinensis* extracts was examined against Gram positive and Gram-negative bacteria and fungal strains by measuring zone of inhibition. The leaf extract showed high activity against *Staphylococcus aureus* at very low concentration (2.5 μ g/ml) compared to *E. coli*, *Bacillus subtilis*. Leaf extract also showed high activity against *Candida parapsilosis* at a very low concentration (2.5 μ g/ml) compared to *Aspergillus niger*. The *Hibiscus rosa-sinensis* root extract showed high activity against all the tested bacteria at very low concentration (2.5 μ g/ml). Root extract showed high activity against *Candida parapsilosis* and *Aspergillus niger* at a very low concentration (2.5 μ g/ml) compared to *Trichophyton rubrum*. The flowers extract showed activity against *E. coli* and *Staphylococcus aureus* (12 mm) at low concentration (2.5 μ g/ml). Flower extract also showed high activity against *Candida parapsilosis* and *Aspergillus niger* at a low concentration (2 μ g/ml).

Anti-inflammatory

Ethanol extract of dried leaves administered intraperitoneally to rats at a dose of 100.0mg/kg, was active carrageenin induced pedal edema. Vivek Tomer et al explains the anti-inflammatory activity of *hibiscus rosa sinensis*. So many inflammatory conditions such as inflammation of blenorhorea, bronchitis and oral mucosa is treated by *Hibiscus rosa sinensis*. For anti-inflammatory activities, the methanolic extract of *hibiscus rosa sinensis* leaves were used. Indomethacin is used as standard against carrageen and dextran induces inflammation.

Antipyretic Activity

Antipyretic activity 24 Sawarkar. A.R et al studied about the effect of *Hibiscus rosa sinensis* as an antipyretic in rats. The antipyretic activity was determined by using the leaves of *Hibiscus rosa sinensis* and v wistar rat. Aqueous and alcoholic extract of *Hibiscus rosa sinensis* were used to reduce the increased temperature and compared with the control group. Wound healing activity 25 B. Sivananda Nayak et al performed.

Wound Healing

Their study on Sprague dawley rat by using *hibiscus rosa sinensis* having wound healing activity,

Ethanol extract of *Hibiscus rosa sinensis* was used. Study indicates that there was 86 % reduction in wound area in those animals which were treated with ethanol extract of *Hibiscus rosa sinensis* when compared against control.

Anti-Cancer activity

Oral cancer cell lines KB were treated with 75µ g and 125 of h. rosa sinensis oil extract for 24 hours. After subjecting the treated cells to be DNA fragmentation assay, and using agarose gel electrophoresis, it was observed that the cells DNA from the both concentrations has been fragmented compared to control sample. This means that hibiscus extract hindered the growth and proliferation of oral cancer cell.

Dermatological Effect

The wound-healing activity of the ethanol extract of the flowers of *Hibiscus rosa-sinensis* (5 and 10% w/w) was studied in rats using three different models (excision, incision and dead space wound). The extract increased cellular proliferation and collagen synthesis at the wound site, as evidenced by increase in DNA total protein and total collagen content of granulation tissues. The extract-treated wounds were found to heal much faster as indicated by improved rates of epithelialization and wound contraction. The extract of *Hibiscus rosa-sinensis* significantly ($P < 0.001$) increased the wound-breaking strength in the incision wound model compared to controls. The extract-treated wounds were found to epithelialize faster, and the rate of wound contraction was significantly ($P < 0.001$) increased as compared to control wounds. Wet and dry granulation tissue weights in a dead space wound model increased significantly ($P < 0.001$).

Hair Growth Promoting Activity

The petroleum ether leaf extract of *Hibiscus rosa sinensis* was proven to be a good hair growth promoter in a study involving Wistar albino rats. After 14 days, the 5% w/w extract ointment resulted in 4.91 ± 0.261 mm hair length compared to 6.06 ± 0.431 mm in 2% minoxidil treated group, and 2.21 ± 0.108 mm in negative control group. The extract also contributed to 1937 ± 37.84 hairs per cm² area, while Minoxidil gave 2315 ± 05.78 hairs per cm² area. The alopecia was induced by exposure to sonic stress, and there were no side effects such as erythema or edema, compared to synthetic hair growth promoting ointment. Similarly, 5% hydrochloric leaves extract exhibited 5.97 ± 0.13 mm hair length, and 2058 ± 19.23 hairs per cm² area.

Antifungal Activity

According to previous studies, the methanol extracts prepared from the leaves of the *Hibiscus rosa-sinensis* were shown to have antimicrobial activities against *Candida albicans*, *Aspergillus niger*, *Candida parapsilosis* and *Trichophyton rubrum*. Using well diffusion method and after an incubation period of 24 hours at 37° C, the maximum observed zone of inhibition was 9.3 ± 0.57 mm and it was against *Aspergillus niger* followed by 6.6 ± 0.57 mm against *Candida albicans* at 80 µg/ml concentration of leaves methanolic extract. These fungi were obtained from infected skins, and the chemical compounds

responsible for the antifungal activity may be due to flavonoids, tannins, terpenoids, saponins, or alkaloids identified in the study.

Antioxidant Effect

Antioxidant potential of different solvent extracts of *Hibiscus rosa-sinensis* was evaluated by estimation of total flavonoids contents, total phenolic contents, DPPH free radical scavenging activity and percentage inhibition of linoleic acid oxidation capacity. Methanol and ethanol extract of *Hibiscus rosa-sinensis* showed total phenolic 61.45 ± 3.23 and 59.31 ± 4.31 mg/100g as gallic acid equivalent, total flavonoids 53.28 ± 1.93 and 32.25 ± 1.21 mg/100g as catechine equivalent. DPPH free radical scavenging activity was 75.46 ± 4.67 and $64.98 \pm 2.11\%$ and inhibition of linoleic acid oxidation potential 75.8 ± 3.22 and $61.6 \pm 2.01\%$ respectively.

Anti-haemolytic Activity

The anti-haemolytic activity of *Hibiscus rosa-sinensis* flowers was investigated *in vitro*. The flower extract at various concentrations was incubated with erythrocytes and analysed for hydrogen peroxide induced hemolysis and lipid peroxidation as indices of erythrocyte damage. The extract significantly reduced hydrogen peroxide induced hemolysis and lipid peroxidation *in vitro*.

Urinary Effect

The aqueous extract of flowers of *Hibiscus rosa-sinensis* was evaluated for antilithiatic potential *in vitro*. The presence of calcium oxalate crystals was evaluated immediately and after 24 hrs. of stone induction. Crystal aggregation after 24hrs. was inhibited by *Hibiscus rosa-sinensis* extract. The extract interfered with early stages of stone formation and may represent an alternative form of treatment and or prevention for urolithiasis

Antitussive Effect

The methanolic extract of *Hibiscus rosa-sinensis* was evaluated for antitussive activity in histamine chamber using citric acid (7.5% W/V) induced cough model. The methanolic extract of *Hibiscus rosa-sinensis* and codeine significantly decreased the number of coughing.

Neuroprotective Activities:

The methanolic extract of *H. rosa-sinensis* roots has beneficial effects on the central nervous system in Swiss albino mice and Wistar rats. Using acetic acid to induce writhing, 200 mg/kg i.p of extract resulted in an analgesic activity as inhibited the pain sensation by 78.5 %, compared to 81.0 % in 30 mg/kg Diclofenac treated group [66]. The number of head twitches induced by lithium was lowered to 10.2 ± 1.06 , compared to 9.0 ± 1.7 by ondansetron, a 5HT₃ antagonist, as a positive control. Pentobarbital induced sleeping period was also extended, suggesting sedative effect by reducing dopaminergic transmission. The anxiolytic effect of roots extract was also demonstrated, as in elevated plus maze, mice spent more time in open arms. In addition,

the extract's phytochemicals were tannins, flavonoids, saponin and glycosides.

Antibacterial Activities

The methanol extracts prepared from the leaves of the *H. rosa-sinensis* were shown to have antimicrobial activities against *Pseudomonas aeruginosa*, *Escherichia coli*, *Enterobacter aerogenes*, and *Streptococcus pyogenes*. Using well diffusion method and after an incubation period of 24 hours at 37° C, the maximum observed zone of inhibition was 13 ± 00 mm and it was against *E. coli* followed by 12 ± 00 mm against both *S. aureus* and *E. aerogenes* at 80 µg/ml concentration of leaves methanolic extract. These microorganisms were obtained from infected skins, and the chemical compounds responsible for the antibacterial activity may be due to flavonoids, tannins, terpenoids, saponins, or alkaloids identified in the study.

CONCLUSION

Hibiscus rosa sinensis, which belongs to *Malvaceae* family, has been widely used as traditional remedial plant in China and several tropical countries. All of its parts have been used in the treatment of fever, inflammation, bacterial infections, and even as contraceptive agent. Flavonoids, tannins, terpenoids, saponins, and alkaloids are the main phytochemicals as they are present in different extracts, and are more likely responsible for their biological activities. Lower toxicity of this plant can be an advantage to qualify it to be used as new therapeutic agent. The current review discussed the chemical constituents, pharmacological effects and therapeutic importance of *Hibiscus rosa-sinensis* as a promising medicinal plant with wide range of pharmacological activities which could be utilized in several medical applications because of its effectiveness and safety. According to the obtain data it is conclude that the extract was hibiscus have pharmacological activity. The plant is effective for herbal alternative to many diseases.

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