

**GURHAL (HIBISCUS ROSA-SINENSIS): MEDICINAL IMPORTANCE IN
PERSPECTIVE OF UNANI MEDICINE AND PHARMACOLOGICAL STUDIES****Mohd. Afsahul Kalam*¹, Barjes Jalal², Urzeeba Zahoor² and Ansar Ahmed³**¹Research Officer Unani, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseem bagh Campus, Hazratbal, 19006, J&K.²PG Scholar Department of Ilmu Advia, Regional Research Institute of Unani Medicine, Kashmir University, Srinagar-190006 J&K- India.³Professor Department of Ilmu Advia, Regional Research Institute of Unani Medicine, Srinagar-190006. J&K.***Corresponding Author: Mohd. Afsahul Kalam**

Research Officer Unani, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseem bagh Campus, Hazratbal, 19006, J&K.

Article Received on 20/02/2024

Article Revised on 10/03/2024

Article Accepted on 30/03/2024

ABSTRACT

The natural plant products are widely used nowadays because of increasing burden of diseases. *Hibiscus rosa-sinensis* L. is a plant which is widely distributed throughout the world. Its leaves, bark, roots and flowers have been used in the Indian traditional system as medicine to treat different diseases. Various studies on *Hibiscus rosa-sinensis* shows the pharmacological activities such as it acts as anti-parasitic, anti-pyretic, antioxidant, antimicrobial, anti-diabetic, anti-ulcer, hepatoprotective, antigenotoxic, anti-inflammatory, anti-convulsant, dermatological, anti-tussive properties. Current review highlights distribution, chemical composition and major uses of this plant with the aim of accessing the future research demand and investigating its pharmacological applications through clinical experiments.

KEYWORDS: *Gurhal*, *Hibiscus rosa-sinensis*, Malvaceae, hair tonic, menorrhagia, herbal medicine.**INTRODUCTION**

Gurhal is a well-known flower used in Unani System of Medicine (USM) for various therapeutic purposes. It is obtained from *Hibiscus rosa-sinensis* which belongs to Malvaceae family. This plant is widely known with the name of China rose or "Queen of Tropics". The flower is also known as "Shoe flower" because its petals are used for shining the shoe. Dark flowers' extract is also used 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. There are a number of hybrids of different colours and double flowers but all are considered good for ornamental purposes.^[1,2] In USM, various plants of Malvaceae family e.g. *Khatmī*,^[3] *Khubbāzi*,^[4] *Bījband*,^[5] *Gurhal*.^[6] etc. are used for medicinal purposes since long time. *Gul-i-Gurhal*, the type with red flowers is commonly used to treat various diseases. Due to its therapeutic qualities, it is frequently used as the main component in various herbal formulations like, syrup, tea, shampoo etc.

The flowers were also used as a contraception agent for males and females, as well as an abortifacient in rural regions of India.^[2]

The flowers, leaves and roots of the plant have various functions like *Muħallil* (anti-inflammatory), *Muffrih qalb* (exhilerant), *Mubhi* (aphrodisiac), *Muqawwi-i-Sha'r* (hair-tonic), *Mubarrid* (refrigerant), *Mulattif* (demulcent), *Dafi' Khafaqan* (Antipalpative), etc. and mostly the flower is used as a medicine.^[5,7,8,9] The plant has various bioactive constituents such as glycosides, flavonoids, terpenoids, stigmaterol, quercetin-3-diglucoside, kaempferol-3-xylosylglucoside, margaric acid, lauric acid, etc. and these are responsible for its pharmacological actions. It also has carbohydrates, proteins, calcium, iron, phosphorous, vitamins (B₁, B₂, B₃, C), β-carotene and also fats and fiber.

Several research studies have looked into the medicinal potential of *Gurhal*, and the results have shown that it can help with a variety of conditions, including burns, wounds, hair loss, menorrhagia, cystitis, gonorrhoea, sexual weakness etc.^[10,11,12,13]

The purpose of this paper is to highlight the medicinal uses of *Gurhal* by referencing Unani classical literature and scientific investigations done on various plant sections. The numerous phytoconstituents present in the plant highlight the plant's potential and their application in therapeutic fields.

MATERIALS AND METHODS

All materials available on printed, electronic and online were used to prepare this review. For its description, identification, temperament, pharmacological investigations, actions, therapeutic uses etc. both modern, Unani classical books were consulted and published articles and research papers were searched from PubMed, Google scholar, Science direct, Scopus etc. The detail about the plant and its parts were searched by the key words *Gurhal*, *Hibiscus rosa-sinensis* and Malvaceae.

OBSERVATIONS

The detail of various aspect of the plant is as follow:

Distribution

Native to Eastern Europe and Western Asia; in India it is found in Kashmir, Uttar Pradesh, Punjab, Rajasthan and Himachal Pradesh.^[10]

Botanical description

It is a perennial plant which flowers almost throughout the year. It is glabrous, showy shrub which is about 5-8 ft. high. It is arborescent, branches are without prickles. Leaves are short petioled ovate or ovate-lanceolate, more or less acuminate, irregularly and coarsely serrate towards the top, entire near the base, glabrous on both sides or with a few minute stellate hairs on the nerves beneath; stipules lanceolate-subulate, glabrous. Pedicels axillary, solitary, very long, as long as or longer than the leaves, jointed above the middle. Involucral bracts 5 to 7, about half as long as the calyx, lanceolate, glabrous. Calyx divided almost the middle, puberulous with very minute stellate hairs, lobes 2 cm long, lanceolate. Corolla 7.5 cm diameter, tubular below, red-petals thrice as long as the calyx. Staminal tube exerted far beyond the petals. No fruits are produced in India.^[7,14]



Fig. 1. Showing *Gul-i-Gurhal* (*Hibiscus rosa-sinensis* flower) *a*, and ornamental Hibiscus flowers in various colours *b,c,d*.

Taxonomical Classification

Kingdom- Plantae
 Division- Magnoliophyta
 Class- Magnoliopsida
 Order- Malvales
 Family- Malvaceae (mallow family)
 Genus- Hibiscus L.-Rosemallow
 Species- Hibiscus rosa sinensis L. -Shoeblackplant
 Synonyms- Shoe flower, China rose

Description in Unani literature

The plant of *Gurhal* (*Hibiscus rosa-sinensis*) is an evergreen woody, glabrous, shrub. Leaves are bright green, ovate, entire below, coarsely toothed above;

flowers are solitary, axillary and bell shaped which range from 4-6 inches in diameter. Pistil and stamens project from the centre; capsules are round with many seeds. Different parts of the plant such as flowers (*Gul-i-Gurhal*), leaves (*Barg-i-Gurhal*) and roots (*Bikh-i-Gurhal*) are used for the treatment of various diseases. In the USM, this drug is used to cure a wide range of ailments.^[13,14]

Mutarādifūt (Vernacular names)

Gurhal belongs to family Malvaceae. The plant is used by different vernacular names in Unani Medicine as^[10,15,16,17,18]

Arabic: Anghra.

Bengali: Joba, Jiwa, Jowa.
 Chinese: Ch 'uan Chin, Fu Sang.
 English: Chinese hibiscus, Shoe-flower, Rose-of-China.
 French: Rose de Chine, Ketmie de Cochin Chine.
 German: Rosen artige Ketmie.
 Hindi: Jasut, Jasum.
 Malayalam: Jampa, Japa, Shemparatti.
 Persian: Anghara-i-hindi.
 Portuguese: Flor de sapato.
 Sanskrit: Java, Japa, Rudra pushpam.
 Spanish: Rosa de China.
 Tamil: Shamberattai, Semparathan.
 Telugu: Javapushpamu, Dasani.
 Urdu: Gurhal

Ajzā-i-Musta'mala (Parts used): Roots, flowers and leaves are used medicinally in USM.^[15]

Mizāj (Temperament)

Various Unani physicians have put forward different opinions related to the temperament of the drug. Most of them have the thought that it is cold and wet in 1st degree while others have the thought that the temperament of the drug is *mu'tadil*. The white variety is cold, root being hot and wet in 1st degree and leaves are hot and dry.^[6,8]

Miqdar Khurak (Dose): 5-7 g, 6-9 g.^[8,9]

Af'al (Action) *Muffrih Qalb* (exhilerant), *Dafi-i-Khafaqān* (Antipalpative), *Muqawwi-i-Qalb* (cardio-tonic), *Musakkin* (Analgesic), *Muḥallil* (anti-inflammatory), *Mubarrid* (refrigerant), *Mulattif* (demulcent), *Dāfi'-i-Humma* (anti-pyretic), *Muqawwi-i-Sha'r* (hair-tonic), *Mubhi* (aphrodisiac), *Nāfi'-i-Jarāthim* (antimicrobial), *Nāfi'-i-Dhayābītus* (antidiabetic), *Muqawwi-i-Jigar* (hepatotonic), *Muqawwi-i-Mi'da* (gastro-protective), *Mudammil Qurūh* (wound healing).^[2,8,11,12]

Iste'mālāt (therapeutic uses) *Kathrat-i-Ṭamth* (menorrhagia), *Itihāb-i-Mathāna* (cystitis), *Humma* (fever), *Surfa* (cough), *Intihār al-Sha'r* (hair fall), irritable conditions of genito-urinary tract, gonorrhoea, sexual weakness, wounds and burns.^[6,10,16]

Turkīb-i-Iste'māl (Method of administration) in various diseases

Amrād-i-Ri'a (Diseases of lung)

Bronchial catarrh: A decoction of flowers is useful in bronchial catarrh.^[14]

Amrād-i-Nizam-i-Bawl (Diseases of urinary system)

- *Hurqa al-Bawl* and *Sozish-i-Bawl* (burning micturition or urethritis): Dark red petals are administered in the form of mucilaginous infusion in ardor-urinae, strangury, cystitis, and other irritable conditions of genito-urinary tract.^[15]
- *Sozak* (Gonorrhoea): The petals or the fresh root juice of white flowered variety combined with milk,

sugar and cumin is given in gonorrhoea. Seeds pounded into a pulp and mixed with water are also given. Expressed juice of the leaves is also beneficial in this disease.^[19]

Itihāb, Buthūr, Khanāzīr etc

Awarām, Busur wa Khanāzīr (Swellings, inflammation, furuncles and scrofula): Externally, flowers are used on inflammations and boils, a thick paste is made and is applied over inflammations and boils. Flowers are also used in the same manner for wounds and burns.^[14]

Amrad-i-Mardāna (Male sexual diseases)

Muqawwi-i-bāh (Aphrodisiac): Buds are used to cure seminal weakness.^[13]

Amrad-i-Niswān (Gynaecological diseases)

- Vaginal and uterine discharges: Buds are used to treat vaginal and uterine discharges.^[10]
- *Kathrat-i-Ṭamth* (Menorrhagia): Flowers fried in ghee is useful in menorrhagia. Also, powder of the root combined with equal quantity of the powdered lotus root and the bark of *Eriodendron anfractuosum* is given in doses of 1 to 1 ½ drachms is beneficial.^[13,19]
- During labor: Flowers when mixed with the juice of *Vernonia cinerea*, stimulates the expulsion of placenta after child birth.^[14]

Amrad-i-Sha'r (hair diseases)

Muqawwi-i-Sha'ar (hair strengthener): juice of fresh petals and olive oil is mixed in equal proportions and is boiled till water is evaporated. It is beneficial for strengthening hair, increasing the hair growth and color of hair.^[19]

Miscellaneous

Humma (Fever): A decoction of leaves is used as lotion in fevers.^[14]

Maḍarrat (Toxicity, side effect and adverse effect (ADR))

Harmful for individuals having cold temperament. It is also contraindicated in children, pregnant and lactating women.^[8,20]

Musleh (Correctives)

Nabāt Safed (Sugar), *Misrī*, *Mirch Siyāh* (black pepper) are the correctives and are recommended to use along with *Gurhal* to prevent side effects.^[8]

Badal (Substitutes)

Gul-i-Chandani (Moon Flower), *Kewra* (*Pandanus tinctorius*), *Gajar* (Carrot) are used as substitute.^[6,8]

Compound Formulations

Arq Gurhal, *Sharbat-i-Gurhal*, *Sharab al-Salihīn*, *Rogan-i-Gurhal* etc. See **table 1** for detail.

Table 1: Compound formulations having *Hibiscus rosa-sinensis* flowers as one of the ingredients, mentioned with their dose, method of administration, action and uses.

S. No	Name of the compound	Parts used as one of the main ingredients	Dose and method of administration	Action and uses
1	<i>Sharbat-i-Gurhal</i> ^[21]	Flower	50ml/orally	It has sedative, exhilarant and has cardiac tonic properties. It is used to cure palpitations, restlessness and excessive thirst.
2	<i>Sharab Salihīn</i> ^[18]	Flower	40 ml /orally	It is used as liver and cardiac tonic. It is used in diseases like melancholia. It helps to enhance the skin color by increasing circulation to facial area and reducing pigmentation. It is also useful in flatulence.
3	<i>Arq Gurhal</i> ^[22]	Flower	As per requirement/orally	It is used as a tonic for vital organs (heart, liver and stomach) and is an aphrodisiac used for sexual weakness.
4	<i>Rogan-i-Gurhal</i> ^[15]	Flower	As per requirement/locally	It is used for strengthening the hair, prevents premature greying and promotes the growth of hair.

Chemical Constituents

The plant contains the cyclopropanoids, methyl stercolate, methyl-2-hydroxystercolate, 2-hydroxystercolate, malvalate and beta-sitosterol. The major anthocyanin in the flower is cyanidin 3-

sophoroside. The flower nectar is rich in amino acids, mainly aspartic acid and asparagine. During pollination, the amino acid concentration increases substantially.^[11] See table 2 for details.

Table 2: Showing parts of plant with chemical constituents and nutritional compositions present in them.

Part of the plant	Chemical constituents and nutritional composition
Flower	Cyanidin diglucoside, flavonoids, fat, protein, fiber, carbohydrates, calcium, iron, vitamin B ₁ , vitamin B ₂ , vitamin B ₃ , vitamin C. ^[11]
Leaves and stem	β-sitosterol, stigmasterol, taraxeryl acetate and three cyclopropane compounds and their derivatives, phosphorous, calcium, fats, fiber, carbohydrates. ^[11]
Root	Sterols, carbohydrates and glycosides, phenolic compounds and tannins, triterpenoids, saponins, mucilage and flavonoids. ^[11]
<i>H. rosa sinensis</i> aqueous extract	Quercetin, glycosides, riboflavin, niacin, carotene, malvalic acid gentisic acid, margaric acid and lauric acid. ^[23,24,25,26,27]
Ethanol extract of the flowers of <i>H. rosa sinensis</i>	Propanol, 3,3'-dithiobis, 2-Hydroxy-2-methylbutyric acid, n-Hexadecanoic acid, Heptanoic acid, 2-ethyl- Trans-(2-Ethylcyclopentyl) methanol, 3-N-Hexylthiolane, SS-dioxide Hexanedioic acid, bis(2-ethylhexyl) ester, 1,2-Benzenedicarboxylic acid, diisooctyl ester, 1,3-Benzodioxole, (1S-(1α,3a α,4β,6a α)-Squalene, 2R-Acetoxyethyl-1,3,3-trimethyl-4t-(3-methyl-2-buten-1-yl)-1-cyclohexanol. ^[28]

Pharmacological Studies**Anti-fertility activity**

Several studies investigating the effects of floral extracts from *Hibiscus rosa-sinensis* on reproductive organs in rats and mice. In male albino rats, three floral extracts (benzene, alcohol, and chloroform) at dosages of 125 mg and 250 mg/kg for 20 days resulted in a significant reduction in spermatogenic components and sperm count, along with a decrease in androgen synthesis and an increase in testosterone cholesterol levels. In another study on mice, a crude aqueous extract of *Hibiscus rosa-sinensis* administered orally at 500 mg/kg led to decreased testis and epididymis weights and lowered testosterone levels. Additionally, the benzene extract of *Hibiscus rosa-sinensis* disrupted the estrous cycle in female albino mice after 30 days of treatment,

accompanied by reductions in ovarian, pituitary gland, and uterine weights.^[29,30,31]

Anti-diabetic activity

In experiments conducted on diabetic rats, the ethyl acetate extract of *Hibiscus rosa-sinensis* petals showed promising potential in preventing diabetes. A dose of 25 mg/kg of the extract was administered, resulting in significant reductions in serum glucose and glycated haemoglobin levels, akin to the effects of metformin. The extract regulated the activity of enzymes involved in glycogen metabolism, leading to the normalization of blood levels of hepatotoxicity marker enzymes and glycogen levels. Another study using streptozotocin-induced diabetic rats examined the anti-diabetic effects of an aqueous ethanolic extract of *Hibiscus rosa-sinensis*. The extract, administered orally at a dose of 500

mg/kg for four weeks, significantly reduced elevated blood glucose, creatinine, uric acid, and urea levels, while increasing albumin, insulin, and C-peptide activity, and restoring marker enzyme levels. Additionally, in diabetic rats given alloxan, *Hibiscus rosa-sinensis* extracts (administered at doses of 50–200 mg/kg) exhibited anti-diabetic, hyperlipidemic, and antioxidant properties comparable to prescription medications. Treatment for twenty-eight days led to considerable improvements in the size, quantity, and diameter of islets, along with amelioration of atrophy and necrosis.^[32,33,34]

Anti-microbial activity

The antibacterial property of a methanolic extract of *Hibiscus rosa-sinensis* leaves was examined against the bacteria *Streptococcus pyogenes*, *Enterobacter aerogenes*, *Pseudomonas aeruginosa*, and *Escherichia coli* by employing the well diffusion method. The highest inhibition zone against *Escherichia coli* and *Enterobacter aerogenes* (13 ± 00 and 12 ± 00 mm, respectively) was seen following a 24-hour incubation period at 37 °C. Using the disk diffusion method, a second study was carried out to investigate the antibacterial properties of an aqueous extract of *Hibiscus rosa-sinensis* leaves. At a dosage level of 40 mg/ml, the extract exhibited the highest inhibitory zone against *Staphylococcus aureus*, *Bacillus subtilis*, and *Escherichia coli*, measuring 11.00 ± 1.20, 14.00 ± 1.05, and 12.30 ± 0.95 mm, respectively. Incredibly, a different study that used hexane and aqueous extracts of *Hibiscus rosa-sinensis* flowers reported findings that were comparable. The highest inhibitory zone against *Bacillus subtilis* and *Escherichia coli* was obtained using aqueous extract (15.00 ± 2.81 and 15.00 ± 2.81 mm, respectively). The highest inhibitory zone of hexane extract was observed against *Bacillus subtilis* (19.86 ± 0.15 mm) and *Escherichia coli* (18.00 ± 1.53 mm), respectively.^[2,35,36]

Antioxidant activity

Several solvent extracts of *Hibiscus rosa-sinensis* were tested for their antioxidant properties by measuring the total phenolic and flavonoid levels, DPPH free radical scavenging capability, and ability to block linoleic acid oxidation. Total flavonoid levels (32.25–2.21 and 53.28–1.93 mg/100g) and total phenolics (59.31 ± 4.31 and 61.45 ± 3.23) mg/100g as gallic acid equivalent were found in the ethanol and methanol extracts. The extracts' respective potential to suppress linoleic acid oxidation was 61.6 ± 2.01% and 75.8 ± 3.22%. DPPH scavenging effect was found to be 64.98 ± 2.11% and 75.46 ± 4.67. An additional research project was carried out to examine the potential antigenotoxic and antioxidant properties of ethanolic *Hibiscus rosa-sinensis* flowers (in vitro) excerpts. Lipid oxidation was prevented and the free radical scavenging potential was increased in a dose-dependent manner by the ethanolic extract. In a different study, the antioxidant potential of *Hibiscus rosa-sinensis* flower extracts was assessed using the ferric reducing

antioxidant power (FRAP) and DPPH inhibition tests. The solvents used during extraction affected the antioxidant activity of the extracts. High concentrations of tannins and anthocyanins were present in aqueous extracts, which also showed potent antioxidant properties.^[37,38,39]

Anti-inflammatory and anti-pyretic activities

The ethanol extract from *Hibiscus rosa-sinensis* (0.125, 0.25, and 0.5g/kg) was tested for its anti-inflammatory properties against mice that had paw edema caused by carrageenan, ear edema caused by xylene, and granuloma caused by cotton pellets. Brewer's yeast-induced pyrexia was used to test the antipyretic effect, while writhing and formalin tests were used to assess the analgesic impact in rats. The extract demonstrated notable antipyretic, anti-inflammatory, and analgesic properties. Apart from this, the anti-inflammatory properties of ethanolic flower and leaf extracts from red (*Hibiscus rosa-sinensis* L.) and white (*Hibiscus rosa-sinensis* var *alba*) hibiscus were investigated in relation to carrageenan-induced paw edema. The dosage levels of the extracts were 5, 50, and 100 mg/kg. White hibiscus has a stronger anti-inflammatory effect than red hibiscus because the latter's extract only demonstrated a significant (P<0.05) anti-inflammatory effect at dose levels of 50 and 100 mg/kg, whereas the former's extract demonstrated a significant (P<0.05) anti-inflammatory effect at all dose levels (5, 50, and 100mg/kg). An additional investigation was carried out to assess the antipyretic potential of aqueous extracts of *Hibiscus rosa-sinensis* leaves in fevers caused by yeast suspension. To create fever, mice received an intraperitoneal injection of yeast suspension at a concentration of 100 mg/kg. Aqueous extract was given orally to animals with fever at a dosage of 0.5 grams per kilogram. The extract had a substantial effect against fever, according to the results.^[40,41,42]

Hypolipidemic activity

The ethanolic extract of roots when given at a dose of 500mg/kg/bw to Charles Foster male rats which caused inhibitory effect of hepatic steatosis.^[43]

Antiulcer activity

The methanolic extract of leaves was given at a dose 200 and 400 mg/kg/bw was administered to wistar rats. Antiulcer activity was noted in pylorus ligated rats.^[44]

Cytotoxic activity

Petroleum ether, ethyl acetate and methanol extracts of leaf and stem of *Hibiscus rosa-sinensis* was used using Leukaemic cell line (K-562) model. It was noted that it possessed potentials as effective cytotoxic agents against K-562 cells.^[45]

Hepatoprotective effect

The crude anthocyanin extract of petals of *Hibiscus rosa-sinensis* at a dose of 0.25ml/100g body weight was given to Albino rats. The lead precipitate, non-slimy red

fraction possessed the greatest protective property on rat liver. In another research project, an aqueous extract of flowers at a dose of 80, 160 and 240 mg/kg body weight was administered to male Wistar albino rats. It proved to have hepatoprotective role against hypercholesterolemia.^[46,47]

Cardioprotective effect

The flower extract of *Hibiscus rosa-sinensis* was used using 80% ethanol reconstituted in water at a dose of 90, 180 and 360 µg/ml in male adult Wistar rats. It showed positive inotropic and cardioprotective effect. In another study, 2% carboxymethyl cellulose was used as a medium for flower extract of *Hibiscus rosa-sinensis*. Male Wistar albino rats were administered 125, 250 and 500 mg/kg of the extract. It protects the myocardium from isoproterenol induced myocardial injury.^[48,49]

Immunomodulatory activity

The hydroalcoholic extract of flowers of *Hibiscus rosa-sinensis* was used at a dose of 75, 150 and 300 mg/kg in Wistar albino rats. It showed to possess immunostimulatory action on immune system. In another study, ethyl acetate extract of the petals was used at a dose of 100 mg/kg in Wistar albino rats. It increased tolerance to stress and eventually had an immune potentiating action.^[50,51]

Anti-depressant like activity

The methanol extract of flowers of *Hibiscus rosa-sinensis* administered to adult male swiss albino rats at a dose of 30 and 100 mg/kg showed anti-depressant activity. It showed to have therapeutic potential in the treatment of various CNS disorders like epilepsy.^[52]

In androgenic alopecia

An ethanolic fraction (2% finest eride and extract solution) of leaves of *Hibiscus rosa-sinensis* was used in male Wistar albino rats. It possessed anti-androgenic alopecia activity.^[53]

Fibrinolytic activity

The aqueous extract of flowers of *Hibiscus rosa-sinensis* have proved to have fibrinolytic activity.^[54]

Ameliorative effect

The hydroalcoholic extract of leaves of *Hibiscus rosa-sinensis* was administered in male Swiss albino mice at the dose of 50, 100 and 200 mg/kg p.o. It proved to have inhibitory effect on proinflammatory mediator like NO and TNF- α . In another study, methanolic extract of flowers of *Hibiscus rosa-sinensis* was used in Charles Foster rats at a dose of 200, 400 and 800 mg/kg. It showed mechanism of action for haemoprotective activity of methanolic extract of flowers.

One more study done with hexane, petroleum ether, diethyl ether, ethyl acetate and methanolic extract of flowers of *Hibiscus rosa-sinensis* on adult female swiss albino mice at a dose of 3.5 mg/kg body weight and 7

mg/kg body weight showed protective effect against tumour promotion stage of cancer development.^[55,56,57]

Gastroprotective effect

The ethanolic and distilled water extract of flowers of *Hibiscus rosa-sinensis* was used in albino wistar rats at a dose of 250 and 500 mg/kg. It proved to have gastroprotective activity.^[58]

Antilithiatic activity

The aqueous extract of flowers of *Hibiscus rosa-sinensis* has an excellent inhibitory effect against crystal growth, nucleation and aggregation.^[59]

SIDE EFFECTS AND TOXICITY

The safety of *Hibiscus rosa-sinensis* was demonstrated when all of its extracts were administered to mice and showed no toxicity up to a dosage level of 500 mg/kg.^[40]

CONCLUSION

The present review reveals that there is the tremendous scope of Unani single drugs Gurhal in management of diseases like gonorrhoea, menorrhagia, cough, as an abortifacient, wounds and burns and it can also be utilized as a potent conventional traditional Unani drug due to its diverse and related beneficial pharmacological activity and suggest that further phytochemical, clinical and advance research should be done on this medicinal plant for the benefit of mankind.

ACKNOWLEDGEMENT

The authors are very thankful to Assistant director I/C RRIUM Srinagar for providing necessary facilities at the institute. We are also thankful to the librarian for providing best possible facilities to carry out present review work in RRIUM Srinagar, University of Kashmir.

CONFLICT OF INTEREST

The authors declare no any conflict of interest.

REFERENCES

1. Afaq SH. Ethnomedicobotany of Western Uttar Pradesh. Aligarh: AMU Press, 2011; 42-43.
2. Missoum A. An update review on *Hibiscus rosa-sinensis* phytochemistry and medicinal uses. J Ayurvedic Herb Med, 2018; 4(3): 135-146.
3. Kalam MA, Riyaz A, Avid M, Rahim A, Habib A. Khatmī (*Althea officinalis* L. and *Althea rosea*): Medicinal importance in the perspective of Unani medicine and pharmacological studies. J Drug Deliv Ther, 2023; 3(2): 270.
4. Ashraf M. Makhzan Al-Mufradat Ma' Murakkabat. New Delhi: Ajaz Publishing House, 2011; 116.
5. Ghani N. Khazainul Advia. Vol II. New Delhi: Idara Kitab-us-Shifa, 2010; 492.
6. Ghani N. Khazainul Advia. Vol VI. New Delhi: Idara Kitab-us-Shifa, 2010; 28, 29, 30.
7. Anonymous. Standardisation of Single Drugs of Unani Medicine, Part 3, Central Council for Research in Unani Medicine, New Delhi, 1997; 103.

8. Hakim MA. Bustanul Mufradat. Idara Kitab ul Shifa, New Delhi, 2015; 485.
9. Kabiruddin HM. Makhzan al-Mufredat. Idara Kitab-ul-Shifa. New Delhi, 2007; 342.
10. Khare CP. Indian medicinal plants and illustrated dictionary. New Delhi: Springer Science+Business Media, Berlin/Heidelberg: LLC, 2007; 309,310.
11. Patel VH, Khristi V. Therapeutic potential of *Hibiscus rosa-sinensis*: A Review. International Journal of Nutrition and Dietetics, 2016; 4(2): 105-123.
12. Mushtaq A, Khan IM, Rahman R and Rezgui M. *Hibiscus rosa-sinensis* L. (Malvaceae): Distribution, Chemistry and Uses. International Journal of Chemical and Biochemical Sciences, 2017; 12: 147-151.
13. Anonymous. Medicinal plants of India. Vol II. New Delhi: Indian Council of Medical Research, 1987; 25.
14. Anonymous. The Wealth of India. Vol V. New Delhi: CSIR, 1959; 91,92.
15. Singh MP, Panda H. Medicinal herbs with their formulations. Vol I. Daya publishing house, Delhi, 2005; 464,465,468.
16. Kirtikar and Basu. Indian medicinal plants. Vol I, edn 2nd. Periodical Experts Book Agency, D-42 Vivek Vihar, Delhi, 2012; 335-336.
17. Al-Snafi AE. Chemical constituents, pharmacological effects and therapeutic importance of *Hibiscus rosa-sinensis*- A review. Journal of pharmacy, 2018; 8(7): 101-119.
18. Ghani N. Qarabadin Najmul Ghani. Idara Kitab-us-shifa. Darya ganj, New Delhi, 2019; 543.
19. Nadkarni KM. Indian Materia Medica. Vol I. Bombay. Bombay Popular Prakashan, 1976; 360, 361.
20. Duke JA. Handbook of Medicinal Herbs. 2nd ed. CRC Press LLC. Florida, 2013; 186.
21. Aazmi HW. Murakkabat-i-Advia. Idara Kitab-us-shifa. Darya Ganj, New Delhi, 2012; 585.
22. Kabiruddin M. Al-Qarabadin. New Delhi: Central Council for Research in Unani Medicine, 2006; 856.
23. Hemens CH, Stampfer MJ, Willett W. Micronutrients and cancer chemoprevention. Cancer Detection and Prevention, 1984; 7: 147-158.
24. Weisburger JH. Nutritional approach to cancer prevention with emphasis on vitamins, antioxidants, and carotenoids. Am J Clin Nutr, 1991; 53(1): 226S-237S.
25. Block G, Patterson B, Subar A. Fruit, vegetables and cancer prevention: a review of the epidemiological evidence. Nutrition and Cancer, 1992; 18(1): 1-29, 118.
26. Makita H, Tanaka T, Fujitsuka H, Tatematsu N, Satoh K, Hara A, Mori H. Chemoprevention of 4-nitroquinoline 1-oxide-induced rat oral carcinogenesis by the dietary flavonoids chalcone, 2-hydroxychalcone and quercetin. Cancer Res., 1996; 56(21): 4904-4909.
27. Woutersen RA, Appel MJ, Hoetmer AVG. Modulation of pancreatic carcinogenesis by antioxidants, food and chemical. Toxicology, 1999; 37(9): 981-984.
28. Bhaskar A, Nithya V, Vidhya VG. Phytochemical screening and in vitro antioxidant activities of the ethanolic extract of *Hibiscus rosa sinensis* L. Ann Biol Res., 2011; 2(5): 653-661.
29. Reddy CM, Murthy DR, Patil SB. Antispermatic and androgenic activities of various extracts of *Hibiscus rosa-sinensis* in albino mice. Indian Journal of Experimental Biology, 1997; 35(11): 1170-1174.
30. Mishra N, Tandon VL, Munjal A. Evaluation of Medicinal Properties of *Hibiscus rosa-sinensis* in male Swiss Albino Mice. International Journal of Pharmaceutical and Clinical Research, 2010; 1(3): 106-111.
31. Kholkute SD, Chatterjee S, Udupa KN. Effect of *Hibiscus rosa sinensis* Linn. on oestrous cycle & reproductive organs in rats. Indian Journal of Experimental Biology, 1976; 14(6): 703.
32. Pillai SS, Mini S. *Hibiscus rosa-sinensis* Linn. petals modulate glycogen metabolism and glucose homeostasis signalling pathway in streptozotocin-induced experimental diabetes. Plant Foods for Human Nutrition, 2016; 71(1): 42-48.
33. Mandade R, Sreenivas SA. Anti-Diabetic Effects of Aqueous Ethanolic Extract of *Hibiscus rosa-sinensis* L. on Streptozotocin-Induced Diabetic Rats and the Possible Morphologic Changes in the Liver and Kidney. International Journal of Pharmacology, 2011; 7(3): 363-369.
34. Pethe M, Yelwatkar S, Manchalwar S, Gujar V. Evaluation of biological effects of hydroalcoholic extract of *Hibiscus rosa-sinensis* flowers on alloxan induced diabetes in rats. Drug Research, 2017; 67(08): 485-492.
35. Udo IJ, Ben MG, Etuk CU, Tiomthy AI. Phytochemical, proximate and antibacterial properties of *Hibiscus rosa-sinensis* L. leaf. Journal of Medicinal Plants Studies, 2016; 4(5): 193-195.
36. Agarwal S, Prakash R. Evaluation of Antibacterial activity of *Hibiscus rosa-sinensis* flower extract against *E. coli* and *B. subtilis*, Biological Forum, 2014; 194.
37. Khan ZA, Naqvi S, Mukhtar A, Hussain Z, Shahzad SA, Mansha A, Ahmad M, Zahoor AF, Bukhari IH, Janjua M. Antioxidant and antibacterial activities of *Hibiscus rosa-sinensis* L. flower extracts. Pak J Pharm Sci., 2014; 27(3): 469-474.
38. Khatib N, Ghoshal G, Nayana H, Joshi RK, AD Taranalli. Effect of *Hibiscus rosa-sinensis* extract on modifying cyclophosphamide induced genotoxicity and scavenging free radicals in Swiss albino mice. Pharmacologyonline, 2009; 3: 796-808.
39. Mak YW, Chuah LO, Ahmad R, Bhat R. Antioxidant and antibacterial activities of *Hibiscus rosa-sinensis* L. and *Cassia* (*Senna*

- bicapsularis L.) flower extracts. *Journal of King Saud University-Science*, 2013; 25(4): 275-282.
40. Birari RB, Jalapure SS, Changrani SR, Shid SL, Mtote M, Habade B. Anti-inflammatory, analgesic and antipyretic effect of *Hibiscus rosa-sinensis* Linn Flower. *Pharmacology Online*, 2009; 3: 737-747.
41. Raduan SZ, Abdul Aziz M, Roslida AH, Zakaria ZA, Zuraini A, Hakim ML. Anti-inflammatory effects of *Hibiscus rosa-sinensis* L. and *Hibiscus rosa-sinensis* var. *alba* ethanol extracts. *International Journal of Pharmacy and Pharmaceutical Sciences*, 2013; 5(4): 754-762.
42. Daud D, Arsad M, Asmida I, Tawang A. Anti-pyretic action of *Caulerpa lentillifera*, *Hibiscus rosa-sinensis*, and *Piper sarmentosum* aqueous extract in mice. *Asian Journal of Pharmaceutical and Clinical Research*, 2016; 9(1): 9-11.
43. Kumar V, Singh P, Chander R, Mahdi F, Singh S, Singh R, Khanna AK, Saxena JK, Mahdi AA, Singh VK. Hypolipidemic activity of *Hibiscus rosa sinensis* root in rats. *Indian Journal of Biochemistry & Biophysics*, 2009; 46(6): 507-510.
44. Srivastava S, Jiaswal J, Gautam H, Sharma S, Rao CHV. Antiulcer activity of methanolic extract of *Hibiscus rosa-sinensis* leaves. *International Journal of Pharmacy and Pharmaceutical Sciences*, 2013; 5(3): 829-830.
45. Arullappan S, Muhamad S, Zakaria Z. Cytotoxic activity of the leaf and stem extracts of *Hibiscus rosa sinensis* (Malvaceae) against Leukaemic Cell Line (K-562). *Tropical Journal of Pharmaceutical Research*, 2013; 12(5): 743-746.
46. Onyesom I, Mordi J, Opajobi AO, Esume CO. Hepatoprotective potentials of *Hibiscus rosa-sinensis* Petal anthocyanin extracts against carbon tetrachloride-induced acute liver damage in Wistar rats. *Sudanese Journal of Medical Sciences*, 2008; 3(1): 33-37.
47. Biswas A, D'Souza UJ, Bhat S, Damodar D. The hepatoprotective effect of *Hibiscus rosa sinensis* flower extract on diet-induced hypercholesterolemia in male albino Wistar rats. *International Journal of Medical and Pharmaceutical Sciences*, 2014; 4(6): 1-10.
48. Khandelwal VKM, Balaraman R, Pancza D, Ravingerová T. *Hemidesmus indicus* and *Hibiscus rosa-sinensis* affect ischemia reperfusion injury in isolated rat hearts. *Evidence-based Complementary and Alternative Medicine*, 2011; 2011: 1-9.
49. Gauthaman KK, Saleem MT, Thanislas PT, Prabhu VV, Krishnamoorthy KK, Devaraj NS, Somasundaram JS. Cardioprotective effect of the *Hibiscus rosa sinensis* flowers in an oxidative stress model of myocardial ischemic reperfusion injury in rat. *BMC Complementary and Alternative Medicine*, 2006; 6: 1.
50. Gaur K, Kori ML, Nema R. Comparative screening of immunomodulatory activity of hydro-alcoholic extract of *Hibiscus rosa sinensis* Linn. and ethanolic extract of *Cleome gynandra* Linn. *Global Journal of Pharmacology*, 2009; 3(2): 85-89.
51. Desai SK, Mulgaonkar SS, Pandey CH. Comparative study of immunomodulatory and adaptogenic activity of *Hibiscus rosa sinensis* extracts in rats. *International Journal of Pharmacy and Pharmaceutical Sciences*, 2013; 5(2): 101-103.
52. Shewale PB, Patil RA, Hiray YA. Antidepressant-like activity of anthocyanidins from *Hibiscus rosa-sinensis* flowers in tail suspension test and forced swim test. *Indian Journal of Pharmacology*, 2012; 44(4): 454.
53. Upadhyay S, Upadhyay P, Vinode R, Dixit VK. Effect of ethanolic fraction of *Hibiscus rosa sinensis* leaves in androgenic alopecia. *Egyptian Dermatology Online Journal*, 2013; 9(5): 2.
54. Aruna A, Meenakshipriya P, Parameswari SPT, Meera R, Devi P, Nagarajan K. Fibrinolytic activity of *Hibiscus rosa sinensis*. *Journal of Pharmacy and Chemical Biology Sciences*, 2013; 3(3): 530-532.
55. Kandhare AD, Raygude KS, Ghosh P, Ghule AE, Gosavi TP, Badole SL, Bodhankar SL. Effect of hydroalcoholic extract of *Hibiscus rosa sinensis* leaves in experimental colitis in rats. *Asian Pacific Journal of Tropical Biomedicine*, 2012; 2(5): 337-344.
56. Meena AK, Patidar D, Singh RK. Ameliorative Effect of *Hibiscus rosa sinensis* on Phenylhydrazine induced Haematotoxicity. *International Journal of Innovative Research in Science, Engineering and Technology*, 2014; 3(2): 1-6.
57. Sharma S, Sultana S. Effect of *Hibiscus rosa sinensis* extract on hyperproliferation and oxidative damage caused by benzoyl peroxide and ultraviolet radiations in mouse skin. *Basic and Clinical Pharmacology and Toxicology*, 2004; 95(5): 220-225.
58. Kumar PK, Annapurna A, Ramya G, Sheba D, Gopal Krishna Ch, lakshmi Sudeepthi NL. Gastroprotective effect of flower extracts of *Hibiscus rosa sinensis* against acute gastric lesion models in rodents. *Journal of Pharmacognosy and Phytochemistry*, 2014; 3(3): 137-145.
59. Nirmaladevi R, Kalpana S, Kavitha D, Padma PR. Evaluation of antilithiatic potential of *Hibiscus rosa-sinensis* in vitro. *Journal of Pharmacy Research*, 2012; 5(8): 4353-4356.