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## *Hibiscus rosa-sinensis*: A landscape shrub

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Nature has been a great source of medicinal plants since ages. *Hibiscus rosa-sinensis* is one of the magical landscape shrub or a flowering plant, which belong to the family Malvaceae. The plant is found to be the hub of anthraquinones, quinines, phenols, flavanoids, tannins, saponins, terpenoids, alkaloids, glycosides, thiamine, riboflavin and niacin which are found to be effective against treating wounds, gastric ulcers, inflammation, fever, diabetes, hair loss, fungal infections and tumors. It has wide application in terms of contraception since earlier times and also used in food industries to make jams, tea and flowers powders. Therefore present article focuses on significance of *Hibiscus rosa-sinensis*, its bioactive composition, utilization in pharmacological and food industries.

*Hibiscus rosa-sinensis* is a popular landscape shrub and a flowering plant commonly known as Shoe flower, China rose or Queen of Tropics, belongs to family Malvaceae (Portis *et al.*, 2010). This species was given the name as *Rosa Sinensis* (Rose of China in Latin) by Carolus Linnaeus, Biologist in 1750s (Mishra *et al.*, 2018). Hibiscus is known to be the Hawaii's national plants, and is often worn in hair at cultural occasions or ceremonies (Carillo *et al.*, 2013). **The genus "Hibiscus" comprises of more than 200 species which are distributed all over tropical and subtropical regions. *Hibiscus rosa-sinensis* is among the most variable cultivated species, widespread throughout tropical Asia** (south-east China and some islands in Pacific and Indian Ocean). **The plant grows up to 4.7 m with alternately arranged leaves (ovate shaped) which are 5 to 15 cm long with dark green color and** flowers are found on long stalks with variant shades of **white, pink, red, yellow and orange** which measures about 20 cm wide, and consist of 5 oval petals (Patel *et al.*, 2017). This plant aims various medical benefits such as treating wounds, gastric ulcers, inflammation, fever, diabetes, hair loss, fungal infections in several countries. Hibiscus flowers traditionally were reported to be effective against tumors (Breast Cancer) and have immunomodulatory, anticonvulsant, antidepressant, memory enhancement, anti-inflammatory, analgesic, anti-asthmatic, properties (Kumar, 2013). It is also effective against the treatment of gall bladder and kidney stones. The flower powder is made from sepals of this plant which has wide preference in Ayurvedic medicines to stimulate hair growth and avoid graying (Upadhyay *et al.*, 2011). The red flowered variety is very much preferred for medication purposes. Roots and leaves of the plant were earlier used to regulate menstruation and stimulate blood circulation (Ali, 2018). Flowers of this plant were used in treatment of liver disorders, high blood pressure and stomach pain. The extracts of stem, roots, leaves and flowers are also the rich source of antioxidants (effective against free radicals). It has a wide scope in food and beverage industries where the hibiscus flower powder is used in tea and jams, widely available in the form of tea bags and capsules. In earlier times flower buds of Hibiscus genus were also used as natural contraceptive for females and males as well as it acts an abortifacient in rural areas of India (Ali, 2018). The plant is full of bioactive compounds (Phytochemical) for which it is known to have above listed properties. Main bioactive compounds found are anthraquinones, quinines, phenols, flavanoids, tannins, saponins, terpenoids, alkaloids, glycosides, some vitamins such as thiamine, riboflavin and niacin is found in roots, leaves and stem of the plant (Kumar, 2013). Therefore the plant is effective against treating various health issues. The



present article focuses on significance of *Hibiscus rosa-sinensis*, its bioactive composition, pharmacological and food applications for better utilization.



Fig 1) Different varieties of Genus *Hibiscus*



Fig 2) *Hibiscus rosa-sinensis*

#### **Requirements for growth and plantation:**

*Hibiscus rosa-sinensis* can be grown throughout the year with proper sunlight and irrigation provided. These plants prefer to grow in sandy loamy soil enriched with organic matter (Cow dung and leaves). The plants require 4-8 months with moderate temperature and high humid conditions (Jadhav *et al.*, 2009). Hibiscus plant blooms good when supplied with minerals such as potassium.

#### **Physiochemical composition:**




The plant is found to contain some minerals and vitamins at a certain concentration for being utilized as medicine as well as in food industries. On an account the flower contains more than 89% of water, 0.4g of fat, 0.06g of protein, 1.56g of fiber (Ali, 2018) minerals such as iron (1.7mg), calcium (4mg), phosphorous (27mg), zinc (0.82mg), vitamins like Thiamine (B1) 0.03mg, Riboflavin (B2) 0.05mg, Niacin 0.6mg, vitamin C 4.2mg per 100gms of the flower (KG *et al.*, 2018).

#### **Bioactive Compounds:**

*Hibiscus rosa-sinensis* is rich in phytochemicals. Almost every part (bark, leaves, flowers, and stem) contains anthraquinones, quinines, phenols, flavanoids, tannins, saponins, terpenoids, alkaloids, glycosides, lipids, amino acids, reducing sugars which are responsible for treating ailments. Flavonoids are the low molecular weight phytochemicals (Rice-Evans, 2001) which helps in preventing chronic diseases as they are rich source of antioxidants and exhibit chelating properties (Schroeter *et al.*, 2002). Phenols are very important plant constituents as they have radical scavenging activity due to the hydroxyl groups present (Kolay *et al.*, 1989). Anthraquinones are the active components which are used as medicines and exhibit laxative, diuretic and immuno-modulatory properties.



**Table 1) Bioactive compounds in stem, leaves and flowers of Hibiscus rosa-sinensis**

Plant used	Bioactive compounds	Pharmacological activity	References
<p>Leaves</p>  <p>Stem</p> 	<p><math>\beta</math>-sitosterol, stigmasterol, taraxeryl acetate and cyclopropane derivatives</p>	<p>Leaves and stems are used in treating wounds, gastric ulcers, inflammation, fever and rich source of antioxidants which helps in dealing with free radicals</p> <p>Leaves were also used to regulate menstruation and stimulate blood circulation</p>	<p>Ali, 2018</p> <p>Vasudeva <i>et al</i>, 2008</p> <p>Kumar, 2013</p> <p>Upadhyay <i>et al</i>, 2011</p>
<p>Flowers</p> 	<p>Ethanimidic acid, ethyl ester, Propanal, 2,3dihydroxy, Propanamide, contains 4 kinds of Flavanoids (rutin, quercetin, kaempferol and myricetin)</p>	<p>Flowers are used in treatment of inflammation, asthma, tumors, memory enhancement, also acts as anticonvulsant; analgesic treats gall stones and kidney stones too. Flower buds act as natural contraceptive.</p>	

**Application of *Hibiscus rosa-sinensis* in food and pharmacological industries:**

The plant exhibits a number of activities and has potency to be utilized for pharmacological purposes like anti bacterial (works against human pathogens), antioxidant, anti diabetic, analgesic (in leaves), antimicrobial, anticonvulsant (in flower petals which protects animals from kindling and electro shocks), immuno-modulatory, anti inflammatory (in leaves), anti depressant, memory enhancement, anti pyretic, anabolic activities etc (Kumar, 2013). For the above listed properties Hibiscus genus is found to be useful in pharmacological industries. Red flowers of the genus Hibiscus (*rosa-sinensis*) are used for the production of juices, wine, jams cakes, herbal tea, beverages and chocolates (KG *et al*, 2018). They are rich in carotene, riboflavin, ascorbic acid, niacin, calcium, iron and vitamin C. Hence it has full potential to be utilized in food industries for making various value added products. Hibiscus powders are also made out of dried flower petals which are beneficial in treating weight loss problems, anemia, improves appetite, cure menstrual pain and effective against hair fall.



## Conclusion

*Hibiscus Rosa Sinensis* is one of the magical plant, **distributed allover tropical and subtropical regions** which belong to the family Malvaceae. This genus is an important source of various bioactive compounds of different chemical structures as well as is full of pharmacological activities, due to which it has full potency to be utilized in pharmacological and food industries. Since it has less or zero side effects it is still known for its contraceptive and abortifacient activities. Although more scientific research is required so that Hibiscus species can be used at large scale for making valuable products out of it.

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