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### PHYTOCHEMICAL AND PHARMACOLOGICAL OVERVIEW OF *HIBISCUS MUTABILIS* LINN.

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**Abstract:** *Hibiscus mutabilis* L. is ornamental plant bears beautiful flowers used in different diseased as an ayurvedic medicine. Pharmacology and phytochemistry of the plant is need extensive study to clear uses of this plant in medicine. General properties, phytochemical and pharmacological profile is studied in the current review. It contains Anthocyanin, Leucoanthocyanidin, Anthocyanidin, Sterol-glucosides, Lupinus, Luteus, Gibberellins, Flavonol and Naringenin-5,7-dimethyl-D-xylopyranosyl-I-darabino- pyranoside. The plant possesses anodyne, antidotal, demulcent, expectorant and refrigerant properties and used as antiphlogistic, depurative, febrifuge, pulmonary and stimulant. The plant is standardized by pharmacognostic and physic-chemical parameters. This overview of the plant helps scientist to explore the plant for its medicinal purpose.

**Keywords:** *Hibiscus mutabilis*, Pharmacological profile, Phytochemistry.

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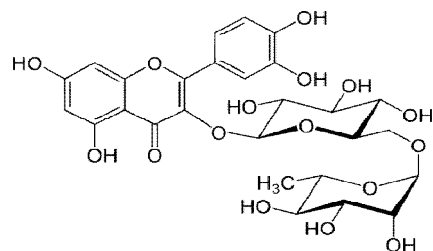
## INTRODUCTION

*Hibiscus mutabilis* Linn. is a large bushy shrub belonging to family Malvaceae and commonly known as changeable rose or cotton rosemallow. The plant is also known as Sthalkamal or Sthalspadma<sup>[1-2]</sup>. *Hibiscus mutabilis* is native to southern China and confederate state of America and cultivated in Indian gardens as an ornamental plant for its beautiful flowers. The flowers are of three distinct colors appear on the bush simultaneously as the blooms color cycle independent of one another. It shows white colour after flowering and gradually changes to red due to storage of anthocyanine in petal vacuole, as cyaniding glycosides have been isolated from deep red petals<sup>[3]</sup>. It is further clarified by considering the anthocyanin synthase (ANS) is an important enzyme in colouring stage of the anthocyanin, because it catalyses the reaction which converts the colourless Leucoanthocyanidin into coloured anthocyanidin<sup>[4]</sup>. Like grapes, apples and petunia, anthocyanin synthesis is promoted under low temperature. The flower colour change was also dependant on temperature over 20°C but not light or UV<sup>[5,6,7]</sup>.

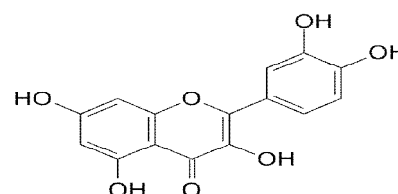
## Phytochemistry

The plant leaf contains rutin<sup>[8]</sup> and quercetin whereas flowers show presence of quercetin. Ong, H.C et al isolated Sterol-glucosides, Lupinus, luteus, Gibberellin<sup>[9]</sup>. Fiber and mucilages are without very much flavour in roots<sup>[10]</sup>.

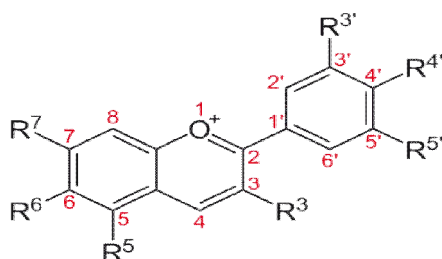
Figure 1: Structures of important chemicals present in *H. mutabilis* Linn.



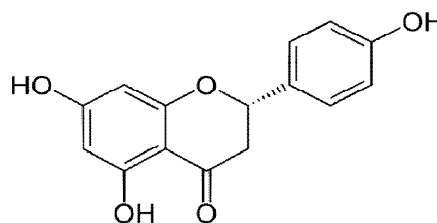
Rutin



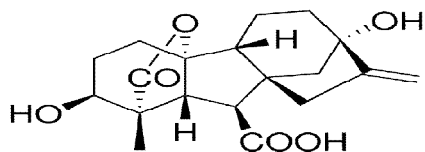
Quercetin



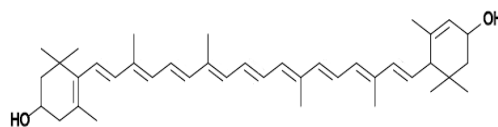
Anthocyanins and anthocyanidins



Naringenin



Gibberellin A1



Lutein

It also shows presence of free cyanidin in flowers. Pink basal blotch in petals of *Hibiscus mutabilis* is due to the presence of cyanidin, anthocyanidin occurring in flowers<sup>[11]</sup>.

Kemp, M.S. et al found new Glycoside from the stem of *Hibiscus mutabilis* namely Naringenin-5,7-dimethyl-D-xylopyranosyl-I-darabino- pyranoside<sup>[12]</sup>.

floral flavonol and anthocyanins also found in some malesian *Hibiscus* species. Flavonols and anthocyanins of *Hibiscus mutabilis* were of the same glycosidic type. They also said that free cyanidin is also present in flowers of this plant and the pink basal blotch in petals of *Hibiscus mutabilis* is due to the presence of cyanidine<sup>[13]</sup>. Free cyanidin in flowers of *Hibiscus mutabilis* was studied by Lowry, J.B et al (b)<sup>[14]</sup>.

### **Pharmacological profile**

Leaves and roots are said to be edible part of this plant<sup>[15]</sup>. The leaves are reported to have anodyne, antidotal, demulcent, expectorant and refrigerant properties. Flowers are used as antiphlogistic, depurative, febrifuge, pulmonary and stimulant<sup>[8]</sup>. This part is also used for burns, pectoral and pulmonary complaints, swellings and other skin problems<sup>[1]</sup>. A decoction of the flowers is used in the treatment of lung ailments. This plant is recommended for persistent cough, menorrhagia, dysuria and wound caused by burn and scalds<sup>[15]</sup>.

The plant has been reported as folkloric remedy for cancer. It contain large amount of mucilage which would act as emollient for burns. Inflammation is treated by the plant. With the fresh leaf of *Amblitropis multiflora* the plant gives relief from sloughing ulcers. Pound out juice when applied externally or powder leaves combine with oil or tea extract and used externally give the relief from inflammation<sup>[16]</sup>.

The different extracts of the plant bark showed analgesic activity. Petroleum ether, showed significant central and peripheral analgesic activity when compare with standard drug pentazocin<sup>[17]</sup>. The plant is possesses fertility regulating activity<sup>[18]</sup>. Flowering plant is used against snakebite<sup>[19]</sup>.

### **Miscellaneous**

Differential expression of three key anthocyanin biosynthetic genes in a color-changing flower was studied by Farzad, M. et al<sup>[20]</sup>. Effect of anthocyanin biosynthesis in some flowers, such as

*Hibiscus mutabilis* and *Cymbidium* sp., turn red after pollination. Sources of carry-over and possibilities of cultural control of *Pectinophora gossypiella* (Saunders) in the Punjab by Attique, M.R. et al (2001) was found on *Hibiscus mutabilis*. Abutilon infestation was also found on *Hibiscus mutabilis* being 0.8% (1 out of 150).

*Hibiscus mutabilis* L. was studied for standardization of the plant according to scientific methods by its pharmacognostic and physicochemical standardization<sup>[21]</sup>. Stem and leaves of the plant showed presence of steroids, terpenoids and phenolic content in different extracts.

## CONCLUSION

*Hibiscus mutabilis* linn. plant known for its mutable flowers. This change in flowers was studied extensively for its biochemical changes takes place in the flowers to know its mechanism for change in colour during its life in a day. The plant also reported for its folklore uses and need to study scientifically to challenge its physiological action. This overview is prepared for exploring the plant's potential. Some of them have been proved satisfactorily. This plant has beneficial medicinal potential and has presence of number of polyphenolics, now a day for health which is essential part of our life.

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