

A Pharmacological and Phytochemical Study of *Hibiscus sabdariffa* L.

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DESCRIPTION

Traditional uses of *Hibiscus sabdariffa* L. include food, herbal beverages, hot and cold beverages, flavouring for the food industry, and herbal medicine. Studies conducted *in vitro* and *in vivo*, as well as a few clinical trials, offer some support for Hs extracts with poorly characterized phytochemical composition. In addition to additional effects on lipid metabolism, extracts have antibacterial, antioxidant, nephro and hepatoprotective, renal/diuretic, anti-diabetic, and anti-hypertensive properties. Strong antioxidant activity, suppression of glycosidase and amylase, inhibition of ACE, a direct vaso-relaxant impact, or calcium channel modulation may all be related to this. Anthocyanins, organic acids, and phenolic acids are likely to play a role in the effects that have been seen.

Hibiscus sabdariffa L. (Hs), sometimes referred to as roselle, is a crop that is perfect for poor nations because it is reasonably simple to grow, can be used in multi-cropping systems, and may be utilized as both food and fibre. While the leaves and powdered seeds are used in meals in West Africa, the oil from the seeds and the plant's therapeutic qualities are used in China. It is also utilized in the food and pharmaceutical industries. Citric acid, hydroxycitric acid, hibiscus acid, malic and tartaric acids are among the major organic acids present in significant concentrations in Hs extracts. Oxalic and ascorbic acid are minor organic acids.

There are four stereoisomers and lactone forms of this acid. The (2S, 3R)-hydroxycitric acid is the main organic acid present in the cHs. Hepatoprotective effects in a variety of toxin-induced hepatitis models, including those based on tert-butylhydroperoxide, lipopolysaccharides, azathioprine, carbon tetrachloride, cadmium, ammonium chloride, acetaminophen, and irradiation. Protocatechuic acid, among other phenolic chemicals, is abundant in Hs. This substance demonstrated *in vitro*

protective effects against tert-butylhydroperoxide (t-BHP)-induced cytotoxicity and genotoxicity of hepatocytes through inhibition of t-BHP-induced DNA repair synthesis and by demonstrating radical quenching effect.

The information that is now accessible on *H. sabdariffa* demonstrates a wide range of conventional and maybe novel health applications, as well as the therapeutic targets connected to such usage. To confirm its positive effects in pre- and moderately hypertensive individuals, further reliable, randomized, controlled clinical trials with well-characterized Hs formulations would be required. The same is true of its diuretic properties. Children as well as adults are increasingly affected by obesity. Since hyperlipidemia and hypertension are two conditions that are closely related to type II diabetes or the metabolic syndrome, further research into the effectiveness of Hs extract for metabolic disorders like type II diabetes is warranted.

Roots of *Hibiscus rosa-sinensis* L. have been used to control fertility because they contain potent anti-implantation and uterotrophic properties. This plant is a key ingredient in a number of Ayurvedic contraceptive medicines. Regarding gynecologic applications, additional study on *Hibiscus* species, including Hs, may be necessary.

A growing body of pharmacologic and clinical research is offering encouraging perspectives for a wide range of therapeutic applications and potential health claims. The quality of many parts of these research has, however, been linked to a wide range of issues, most notably the use of pharmacological or clinical techniques (or models) and a failure to link them to a careful profiling of the extracts. Future research with this extremely promising traditional plant will therefore require a better chemical profiling of the extracts, as well as their standardization and the association between the chemical components and the pharmacologic/therapeutic action.

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