REVIEW ARTICLE

ETHNO MEDICINAL VALUE OF HIBISCUS HISPIDISSIMUS: A REVIEW

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ABSTRACT

Medicinal plants or botanical medicines have been used traditionally by mankind for the prevention and treatment of various ailments. The plant kingdom plays a vital role in the life of human beings and animals. The plants are the major source of various compounds that are widely used in pharma industries and other nutraceutical sectors. Hibiscus hispidissimus is a climber under Malvaceae family. This is one of the much unexplored medicinal plants. The present work has been taken up to review the plant Hibiscus hispidissimus focusing on its taxonomical, pharmacological, chemical, biochemical, and ethno medicinal uses and to contribute this knowledge for further extensive studies on this plant.

INTRODUCTION

Medicinal plants have been a part of the human life for thousands of years. The rise in population, inadequate supply of drugs, side effects of allopathic medicines, resistance to drugs and high cost treatments have made human beings to use plant as a source of medicine for a variety of diseases. Green plants which are usually the reservoir of many biochemical products can be extracted and used for various scientific experiments thus leading to the development of plant based non-toxic, non-reactive product (1).

The method of using medicinal plants can be a mixture of many active components or a single active component. The present work has been taken up to document the detail about the plant Hibiscus hispidissimus focusing on taxonomical, pharmacological, ethno medicinal uses and Adverse Drug Reactions (ADR) of the plant.

Etymology

The meaning of the plant Hibiscus hispidissimus Hye-bisk-us: rose mallow His-pid-iss-imus: most bristly (2)

Habitat

The plant is widely distributed in South-western parts of India in the plains, hills and in waste lands. It is also reported from Sri Lanka, Tropical regions, South Africa, Asia, Myanmar and Thailand (3).

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Vernacular Names:

Common name: Wild Hibiscus, Hill Hemp Bendy  
Malayalam: Njaaranpuli / Panichakam  
Hindi: Van gurhal  
Tamil: Malai-p-puliccai  
Telugu: Adavigogu, Kondagogu  
Kannada: Betta bende  
Gujarati: Majnu phal  
Marathi: Kateri bhendi

Taxonomical classification

Kingdom: Plantae  
Sub Kingdom: Tracheobionta  
Super division: Spermatophyta  
Division: Magnoliophyta  
Class: Magnoliopsida  
Sub class: Dilleniidae  
Order: Malvales  
Family: Malvaceae  
Genus: Hibiscus  
Species: *Hibiscus hispidissimus*

Plant description

The plant *Hibiscus hispidissimus* belong to the family Malvaceae (Mallow family). The synonyms for the plant are *Hibiscus furcatus* DC. Non Wild and *Hibiscus aculeatus* Roxb. Non Walter. The common name of this plant is Wild hibiscus, Comfort root, Big thicket Hibiscus. The plant is a large climber having reddish stems that are covered with hooked prickles (4-8). The leaves are alternately arranged, 6-8cm, palmately 3-5 lobed, hairy and heart shaped at the base. Leaf margins are toothed, lobes are long pointed, leaf stalks 5-10cm long and prickly. Stipules are lane shaped. Yellow flowers arise singly from leaf axils which are carried on 3-5cm long prickly stalks. 8-12 bracts below the flowers with leafy appendages. Hairy sepals. Seed capsules are 1cm long, ovoid, pointed, enclosed in enlarged sepal cup (Figure 1-4). This plant is commonly found in the evergreen forests of Western Ghats. The flowering period is November-January. It is distributed throughout India. The method of propagation of the plant is by seeds (9).

Medicinal uses of some important Hibiscus species

Hibiscus species are medicinally important and many of the species are scientifically evaluated for their antioxidant and antibacterial activities. The biological activities of some hibiscus species (10) are mentioned in Table 1.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Name of Hibiscus species</th>
<th>Parts used</th>
<th>Bioactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Hibiscus rosa-sinensis</em></td>
<td>Leaf, Flower, Stem, Root</td>
<td>Anticancer, Antibacterial</td>
</tr>
<tr>
<td>2</td>
<td><em>Hibiscus sabdariffa</em></td>
<td>Leaf, Seed, Calyx, Fruit</td>
<td>Anticancer, Antibacterial, Antifungal</td>
</tr>
<tr>
<td>3</td>
<td><em>Hibiscus platanifolius</em></td>
<td>Leaf</td>
<td>Antioxidant, Hypoglycemic, Hypolipidemic</td>
</tr>
<tr>
<td>4</td>
<td><em>Hibiscus mutabilis</em></td>
<td>Leaf</td>
<td>Antibacterial</td>
</tr>
<tr>
<td>5</td>
<td><em>Hibiscus esculentus</em></td>
<td>Seed</td>
<td>Antibacterial</td>
</tr>
</tbody>
</table>

Ethnomedicinal Uses of *Hibiscus hispidissimus*

The sour leaves are used as food ingredient and used in the preparation of South Indian cuisine. The leaves are the source of the ayurvedic drug Sathamasthi. This drug is one of the five ayurvedic drugs (pancamalatailam), an oil preparation for body-anointing. The leaves are also an ingredient in Ayurvedic drug Annabhedi sinduram and Abhram. The leaves are anti-inflammatory and anthelmintic (11). Tribal healers of Kerala region use this plant to treat Liver diseases. It is said to improve digestion and have anthelmintic action. The Leaves of the plant are acidic and eaten after cooking. The juice of the leaves are mixed with honey and used in treatment of eye diseases (11,12). In summer the roots of the plant infused in water is used as a cooling drink. Decoction of the root bark is used as remedy for poisons, swellings and cleansing the kidneys (13)

Pharmacological properties of *Hibiscus hispidissimus*

Hepatoprotective activity of the plant was assessed in Wistar Albino rats using ethanol extract of *Hibiscus hispidissimus* whole plant. The wistar albino rats were induced liver damage using Paracetamol (PCM) and Carbon tetrachloride (CCL₄). The study showed decreased levels of serum enzymes like SGOT, SGPT, ALP, and Serum Bilirubin which support significant hepatoprotective activity of the Plant (14,15). The different solvent extracts of the plant were evaluated for antioxidant effects using DPPH, ABTS, Superoxide radical, Hydroxyl radical, Nitric oxide radical scavenging activities and Lipid peroxidation inhibition assay (16,17). The Ethyl acetate extract showed inhibition of H₂O₂ mediated haemolysis and lipid peroxidation in RBC (18).

**Chemical composition of the plant**

The leaf of *Hibiscus hispidissimus* shows the presence of Hibiscus acid, the chemical name being Tetrahydro-3-hydroxy-5-oxo-2, 3-furandicarboxylic acid. The optical isomer of hydroxycitric acid, Garcinia acid is also an important organic acid present in the plant giving it the medicinal properties (19, 20). The plant is also a rich source of triterpene and flavanoid compounds like hibiscatin and gossypin which is giving the plant its antioxidant properties (21). The plant also contains various acids like Citric acid, Malic acid, Tartaric acid and allo-hydroxyctic acid lactone (Hibiscus acid). The Flowers of the plant reported the presence of gossypin, gossypitrin and hibiscatin. The plant also found to contain alkaloids, anthocyanins and quercetin. All these phytochemicals present in *Hibiscus hispidissimus* contribute to the medicinal properties (22-24).
Biochemical studies of the plant

The Biochemical effect of the plant was studied in Wistar albino rats and Swiss albino mice by using the extract at concentration of 100, 200 and 300mg/kg. The study showed reduction in the values of SGOT, SGPT, ALP and Bilirubin by demonstrating its hepatoprotective activity. Even though the concentration of the extract was increased from 100mg to 200mg or 300mg, there was no significant increase in the hepatoprotective activity (25). The extract showed antilipid peroxidation effect at 100 and 200 mg/kg and also there was increase in the concentration of malondialdehyde (MDA) in Ferric chloride-Ascorbic acid treated rat liver homogenate, compared to normal control without Ferric chloride-Ascorbic acid (26). The extract also showed maximum inhibition in the DPPH free radical scavenging activity at 400 mg/ml. The percentage of inhibition increased as the concentration of the extract increased (27, 28).

Adverse Drug Reaction

The toxic effect of the drug was studied in animals by treating with the extract of Hibiscus hispidissimius. The animals were observed for signs of toxicity and mortality. It was found that extract of Hibiscus hispidissimius is toxic at the dose of 6400mg/kg but found to be safe at 3200mg/kg. The LD$_{50}$ of Hibiscus hispidissimius was 6400 mg/kg (29).

DISCUSSION AND CONCLUSION

The treatment of diseases in man using plants, plant extracts and pure compounds is increasing day by day. Medicinal plants and the active principles isolated from them are an important discovery in human beings to fight against diseases and disorders. Plants contain various phytochemicals like alkaloids, Terpenoids, Glycosides, Phenols, Tannins, and saponins which have an important role in the defense mechanism of the body.

The plant Hibiscus hispidissimitus is being used by Traditional healers and tribal communities for various ailments. The Hepatoprotective, antioxidant and Toxicity studies have showed significant results and this may be due to the presence of phytochemical compounds like triterpenes and flavanoids. As there are very limited researches have been carried out on this plant, there is a need of extensive research on this plant focusing on its pharmacological and biochemical aspects of studies.

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Conflicts of Interest: Nil

References

A study of working capital management, undergone at reddy's polymers processing ltd., hyderabad


29. www.toxicologycentre.com/English/plants/Botanical/nj arampul.html