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Swathi H

Department of Pharmacology,
National College of Pharmacy
Balraj Urs Road, Shimoga -
577201, Karnataka, India.

T Shekshavali

Department of Pharmacology,
National College of Pharmacy
Balraj Urs Road, Shimoga -
577201, Karnataka, India.

IJ Kuppast

Department of Pharmacology,
National College of Pharmacy
Balraj Urs Road, Shimoga -
577201, Karnataka, India.

MC Ravi

Department of pharmacognosy,
National College of Pharmacy
Balraj Urs Road, Shimoga -
577201, Karnataka, India.

Priyanka R

Department of Pharmacology,
National College of Pharmacy
Balraj Urs Road, Shimoga -
577201, Karnataka, India.

Correspondence

Swathi H

Department of Pharmacology,
National College of Pharmacy
Balraj Urs Road, Shimoga -
577201, Karnataka, India.

A Review on *Rhus Mysorensis*

Swathi H, T Shekshavali, IJ Kuppast, MC Ravi, Priyanka R

Abstract

The plant *Rhus mysorensis* is known to possess various active constituents like steroids, alkaloids, flavonoids, glycosides, tannins and Phenols. The plant is screened for hepatoprotective, anti-diabetic, hypolipidemic, antimicrobial and anti-oxidant activity. The present review is therefore, an effort to give a detailed survey of the literature on the pharmacological properties of *Rhus mysorensis*.

Keywords: *Rhus Mysorensis*, traditional uses, anti-diabetic, hepatoprotective, anti-microbial activity.

Introduction

Medicinal plants being as an important natural resource and potentially safe drugs can play an important role in assuaging human health by contributing herbal medicines. The high cost of allopathic medicine and their potential side effects, encouraged the people to use the traditional medicine. The increasing demand of plant extracts to use in the cosmetic, food and pharmaceutical industries suggests that systematic studies of medicinal plants are very important in order to find active compounds and their use as a medicine for curing various diseases [1]. According to World Health Organization, medicinal plants would be the best source to obtain a variety of drugs. Therefore, such plants should be investigated to better understand their properties, safety and efficacy [2].

Rhus mysorensis is one among such medicinal traditionally used plants.



Fig 1: leaves & fruits of *Rhus mysorensis*



Fig 2: *Rhus mysorensis* flora

Scientific classification**Synonym:** *Searsia mysorensis***Family:** Anacardiaceae**Kingdom:** Plantae**Phylum:** Magnoliophyta**Class:** Magnoliopsida**Order:** Sapindales**Genus:** *Rhus***Species:** *Rhus mysorensis* [3].**Vernacular Names:** English: Mysore Sumac, Hindi: Dasni, Dansara, Darsan, Marathi: Amboni, Malayalam: Chippamaram, Telugu: Sitha, Sundari, Kannada: Hulmari, Sabale, Sappli.**Description**

Rhus mysorensis – “Rhus”, ancient Greek name for sumac, which refers to the various shrubs or small trees of the genus *rhus* [4]. *Rhus mysorensis* is a Shrubs with thorny branches; young parts densely pubescent. Leaves 3 or rarely 5 foliolate; leaflets ovate, 1-3 x 0.7-2.2 cm, cuneate at base, broadly crenate, obtuse, often emarginated, pubescent on both surfaces (Fig.1). Flowers minute in small axillary panicles. Calyx pubescent outside with 4-6 ovate lobes. Petals greenish-white, oblong, 2-2.5 mm long, subacute. Disk 5-lobed, lobes often notched. Ovary globose, 1-locular. Drupes globose, 4-5 mm in diam., brownish-black, glabrous, shining (Fig.2).

Flowers & Fruits: August-December [5].**Distribution:** Found in hot dry places in Punjab, Haryana, Rajasthan, Gujarat, Karnataka Andhra Pradesh and the Western Peninsula. Also grow on stony regions [6].**Chemical Constituents:** Phytochemical screening of the plant has revealed the presence of Cardiac Glycosides, Saponins, Flavonoids, Tannins, Alkaloids, Sterols, Phenols [7]. Limonene, Sabinene, α -pinene, β -caryophyllene, α and β -eudesmol [8].**Traditional uses:** Fruits are used to treat Dysentery, Leaf decoction is given in itching [5], Leaves given in Diarrhea and Stomatitis, Leaf paste rubbed against rash and allergy [9], The root, stem and leaf are traditionally used in treatment of diabetes [10], famine periods [11], plant extracts for protection against HSV2 infection [12], Immune-modulating properties [13], Antifertility [14], Psoriasis [15].**Literature Review****Hepatoprotective Activity****A. Carbon tetrachloride induced hepatotoxicity**

The ethanolic extract of *Rhus mysorensis* was tested for hepatoprotective activity against carbon tetrachloride induced hepatotoxicities in rats. Administration of ethanolic extract of the whole plant of *Rhus mysorensis* protect the liver from toxic effects of carbon tetrachloride by reducing the elevated levels of Serum glutamate pyruvate transaminase (SGPT), Serum glutamate oxaloacetate transaminase (SGOT), serum bilirubin, Serum alkaline phosphatase (SALP). The hepatoprotective activity was also supported by histopathological studies of liver tissue. Since results of biochemical studies of blood samples of carbon tetrachloride treated rats showed significant increase in the levels of serum enzyme activities, reflecting the liver injury caused by CCl₄ and blood samples from the animals treated with the ethanolic extract of *Rhus mysorensis* showed significant decrease in the levels of serum markers, indicating the protection of hepatic cells, the extract of above

plant could afford significant protection against CCl₄ induced hepatocellular injury [16].

B. Paracetamol induced hepatotoxicity

The hepatoprotective effect of *Rhus mysorensis* against paracetamol- induced liver damage in rats, was investigated using ethanolic extract of the whole plant of *Rhus mysorensis*. Administration of ethanolic extract of the whole plant of *Rhus mysorensis* protect the liver from toxic effects of paracetamol by reducing the elevated levels of Serum glutamate pyruvate transaminase (SGPT), Serum glutamate oxaloacetate transaminase (SGOT), serum bilirubin, Serum alkaline phosphatase (SALP). The hepatoprotective activity was also supported by histopathological studies of liver tissue. Since results of biochemical studies of blood samples of paracetamol treated rats showed significant increase in the levels of serum enzyme activities, reflecting the liver injury caused by paracetamol and blood samples from the animals treated with the ethanolic extract of *Rhus mysorensis* showed significant decrease in the levels of serum markers, indicating the protection of hepatic cells, the extract of above plant could afford significant protection against paracetamol induced hepatocellular injury [17].

Anti-microbial activity

Anti-microbial activity of the methanolic extracts of leaves and fruits of *Rhus Mysorensis* was evaluated against *Staphylococcus aureus*, *Salmonella typhi*, *Enterobacter aerogenes*, *Pseudomonas aeruginosa*, *Xanthomonas oryzae pv. Oryzae*, *Xanthomonas axonopodis pv. malvacearum*, *Bacillus cereus* and *Micrococcus sp.* by paper disc diffusion assay. The methanolic extract of leaves of *Rhus Mysorensis* at the concentration of 1.25mg/disc showed significant anti-microbial activity against *Xanthomonas oryzae pv. Oryzae*, *Xanthomonas axonopodis pv. malvacearum*, *Staphylococcus aureus* and *Salmonella typhi*. It exhibited moderate activity against *Enterobacter aerogenes*, *Pseudomonas aeruginosa*, *Micrococcus sp.* and *Bacillus cereus*. The methanolic extract of fruits of *Rhus Mysorensis* at the concentration of 1.25mg/disc showed significant anti-microbial activity against *Xanthomonas oryzae pv. Oryzae*, *Xanthomonas axonopodis pv. malvacearum*, *Staphylococcus aureus* and *Salmonella typhi*. It has shown moderate activity against *Enterobacter aerogenes*, *Pseudomonas aeruginosa* but no activity against *Micrococcus sp.* and *Bacillus cereus* [7].

Anti-diabetic Activity

The Anti-diabetic effect of *Rhus mysorensis* against streptozotocin induced diabetes in Wistar rats, was studied using hydroethanolic root extracts of *Rhus mysorensis*. Hydroethanolic root extract of *Rhus mysorensis* showed significant anti-diabetic activity, which provide the scientific proof for its traditional claims. The results also put forward that the HERM is promising for development of standardized phytomedicine for the treatment of diabetes mellitus. Oral administration of hydroethanolic root extracts of *Rhus mysorensis* (HERM) 400 and 800 mg/kg for 21 days significantly decreased the blood glucose level and considerably increased the body weight of diabetic rats [18].

Hypolipidemic Activity

Oral administration of *Rhus mysorensis* (HERM) showed dose dependent hypolipidemic activity. It reduced plasma cholesterol, triglyceride, LDL in streptozotocin treated rats. In addition, to hypolipidemic activity, HERM also produced a

noteworthy dose dependent increase in level of high density lipoproteins (HDL). HERM 800mg/kg showed highest decrease in the level of plasma cholesterol, triglyceride, LDL whereas increase in HDL level in STZ treated rats as compared to the left over groups of HERM [18].

Anti-oxidant Activity

Hydroethanolic root extracts of *Rhus mysorensis* (HERM) strongly restored liver antioxidant parameters and decreased lipid peroxidation in diabetic animals. Treatment with HERM 400 and 800 mg/kg for 21 days inhibited hepatic lipid peroxidation in diabetic rats as shown by the reduction of thiobarbituric acid reactive substances (TBARS) levels towards normal levels [18].

Isolation of novel endophytic fungal communities of Fusarium species

A total of ten plant samples of *Rhus mysorensis* (Darsan) from unique locations of Sanganer region of Rajasthan were collected for isolation of fungal endophytes. Of these, maximum frequency of *Fusarium* species (26.33 %) were recorded which are morphologically similar but ecologically variant. In the above investigation, the most frequently isolated endophytic fungal communities were *Fusarium* species which are dominantly associated with the darsan plants [19].

Composition of the essential oils of the leaves and flowers

Hydrodistillation of the leaves (L) and flowers (inflorescence, F) of *Rhus mysorensis* plants growing on the Aravalli ridge at New Delhi in India gave sweet scented volatile oils which were investigated by GC and GC-MS analyses. Both the oils were found to contain almost the same compounds. The major components of the oils were identified as α -pinene (F, 15.5%; L, 26.8%), limonene (L, 26.2%; F, 51.3%), sabinene (L, 3.8%; F, 4.1%), β -caryophyllene (L, 6.6%; F, 9.4%) and α - and β -eudesmol (L, 7.8%; F, 4.4%) [8].

Conclusion

Rhus mysorensis have several pharmacological properties like, hepatoprotective, anti-diabetic, hypolipidemic, anti-microbial and anti-oxidant activity. Hence in this review article, effort has been taken to collect and compile the details regarding *Rhus mysorensis* which will be useful to the society to venture into a field of alternative systems of medicine.

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