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A Review on *Ziziphus mauritiana*

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ABSTRACT

The kingdom of plants still has many undiscovered medicinally valuable plant species. Numerous plants are continuously examined for potential medicinal usefulness. *Ziziphus mauritiana*, sometimes known as boor, is a member of the Rhamnaceae family. *Ziziphus mauritiana* is a spiny, evergreen shrub or small tree with a trunk diameter of 40 cm or more, a spreading crown, stipular spines, and numerous drooping branches. It can grow as high as 15 m. Protein, fat, fiber, carbohydrates, reducing sugars, and non-reducing sugars are all present in fresh fruit. Triterpenes and triterpene saponins are the main distinctive components. As anodyne, anticancer, pectoral, refrigerant, sedative, stomachache, styptic, and tonic, dried fruits are utilized. They are thought to improve digestion and cleanse the blood.



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INTRODUCTION:

The use of a drug known as a diuretic stimulates the kidneys to eliminate salt and water through the urinary tract. For diuretics to operate, the kidneys must be stimulated to excrete additional water, salt, toxins, and metabolic waste. This procedure restores the body's optimum electrolyte and water balance. Along with their effects on the excretion of sodium (Na^+), other cations (such as K^+ , H^+ , Ca^{2+} , and Mg^{2+}), and anions (such as Cl^- , HCO_3^- , and H_2PO_4^-), diuretics can affect how the kidneys handle uric acid. Additionally, diuretics could indirectly affect how renal hemodynamics are activated. They help the body get rid of edoema, commonly known as extra fluid that builds up in the tissues because of disease [1]. Many medical conditions, such as congestive heart failure, high blood pressure, liver cirrhosis, renal diseases, pulmonary and systemic edoema, and swelling of the feet and ankles (commonly known as "water retention"), might benefit from the use of diuretics. They accomplish this by preventing sodium and chloride from being reabsorbed from the filtrate, which increases sodium chloride excretion and, in turn, increases the rate of water loss (natriuresis) [2].

Either directly, by influencing nephron cells, or indirectly, by altering the filtrate's chemical make-up, are viable options for doing this. Below [3] is a more thorough explanation of both techniques. Subcategories of the Drugs Diuretic The inhibition of carbonic anhydrase involves the use of medications like acetazolamide and dichlorophenamide. Drugs like furosemide and ethacrynic acid, for instance, fall within the category of loop diuretics. In addition to other thiazides, there are thiazides such chlorothiazide and benzthiazide. Diuretics with osmotic characteristics, like mannitol or glycerol, include spiro lactone and others that maintain potassium levels. There is a substantial growth in the need for knowledge regarding the properties of natural treatments made from plants since more and more people worldwide are turning to them.

PLANT INFORMATION:

Ziziphus mauritiana is a common weed wherever it is planted, but most of it is made in India for commercial purposes. India has given it a lot of horticultural attention and developed it despite its inclination to escape cultivation. The bulk of *Ziziphus mauritiana* is grown in arid and semi-arid areas of India. Production on an 88,000-hectare area increased to 0.9 million tonnes between 1984 and 1995 with the help of better cultivars. Additionally, Pakistan,

Bangladesh, and several regions of Africa cultivate the crop. It wasn't imported to Guam until approximately 1850, and even then, most of its uses were purely ornamental. In many locations across the world, such as the West Indies, the Bahamas, Colombia, Venezuela, Guatemala, Belize, and southern Florida, there are a few dispersed settlements. The tree may be found naturally growing in thickets all over the countryside in the Caribbean islands of Barbados, Jamaica, and Puerto Rico. Six trees were sent all the way from Malaysia to Israel in 1939, and they were a huge success. It was important to eliminate them to curb the spread of fruit fly populations since they only produced such tiny amounts of fruit. The Sanskrit term for "tree," badari, appears in various Hindu epic literature.

Badari. In stories like the Ramayana, a tree is shown as failing to shield Sita's clothing before withering in humiliation and confessing to Rama.

Morphology classification of *Ziziphus mauritiana*

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| Kingdom | Plantae |
| Clade | Tracheophytes |
| Clade | Angiosperms |
| Clade | Rosids |
| Order | Rosales |
| Family | Rhamnaceae |
| Genus | <i>Ziziphus</i> |
| Species | <i>Z. mauritiana</i> |



Constituents

Plants also include ceryl alcohol and the alkaloids protopine and berberine, quercetin, kaempferol, sitosterol, stigmasterol, lanosterol, and diosgenin. They also contain crude protein, fat, fiber, ash, calcium, phosphorus, magnesium, potassium, salt, chlorine, and Sulphur. The leaves also include sterol, triterpenoids, cardiotonic glucosides, Oses and hillsides, mucilage, leucoanthocyanes, and flavonoids. Fruits in their natural state include a variety of nutrients, including pectin, citric acid, ascorbic acid, calcium, phosphorus, iron, fibre, reducing and non-reducing sugars, ash, and carotene. Additionally, fresh fruits contain some malice, oxalic, and quercetin acids. Moisture, protein, fat, carbohydrates, sugar, and fiber are all present in dried fruits. Triterpenes and triterpene saponins, including the aliphatic, betulinic, maslinic, oleanolic, and ursolic acids, as well as the zizyphus saponins I, II, and III, jujuboside B, spinosin, and swertisin, are the main characteristic constituents.

PHARMACOLOGICAL ACTIVITY:

Anti-Tumor Activity: *Tinospora cordifolia* was followed in effectiveness by *Ziziphus mauritiana*. Biologically active substances like triterpenes, cyclopeptide alkaloids, and flavonoids are abundant in ZM, according to a review of the literature (Lee et al., 2004). These substances have been shown to have inhibitory effects on histamine release, COX-1 and COX-2, activation activity of choline acetyl transferase, cytotoxic activity, and immunological adjuvant activity. ZM shown chemopreventive potential in a large series of patients with cirrhosis of the liver where it avoided liver cancer and boosted the activity of natural killer cells, therefore may be labelled an immunopotentiator. When administered orally to mice and rats, ZM is said to have very low toxicity; a massive dosage of 50g/kg-bw did not cause any toxic symptoms, and a daily dose of 20g/kg-bw for 30 days did not result in harmful effects. There were no negative effects noted.

Antifungal activity: The methanol extracts of *Cassia occidentalis* Linn., *C. singuena* (Del.) Lack, *C. tora* Linn., *Detarium microcarpum* Guill. & Perr., *Ziziphus abyssinica* (Hochst ex A. Rich) Fiori, *Z. mauritiana* Lam., *Z. mucronata* Willd. and *Z. spina-christi* Willd. found in Bauchi State, Nigeria, showed antifungal activity when tested by the agar diffusion method against dermatophytes, viz. *Trichophyton rubrum*, *T. mentagaphytes*, *Microsporium canis* and *Aspergillus fumigatus*.

Antidiabetic activity: The antihyperglycemic effects of several *Zizyphus mauritiana* Lam. (Rhamnaceae) fruit extracts, including petroleum ether, chloroform, acetone, ethanol, aqueous, and crude aqueous, as well as fractions of petroleum ether and aqueous extracts, were examined in hyperglycemic rats that had been overfed glucose. At two dosage levels, 200 and 400 mg/kg, respectively, the potent antihyperglycemic extracts and fraction were examined for their hypoglycemic efficacy. The efficient extracts and fraction of *Z. mauritiana* were further put through an anti-diabetic investigation in the alloxan-induced diabetes model at two dose levels, 200 and 400 mg/kg, to validate their efficacy in a higher model. Significant antihyperglycemic and hypoglycemic effects were discovered in the *Z. mauritiana* aqueous extract and non-polysaccharide fraction of the aqueous extract. It was discovered that the petroleum ether extract only had an antihyperglycemic effect. Treatment of diabetic rats with petroleum ether extract, aqueous extract, and non-polysaccharide fraction of this plant significantly brought back to near-normal levels the elevated levels of glucose, urea, creatinine, serum cholesterol, serum triglyceride, HDL, LDL, haemoglobin, and glycosylated haemoglobin. Comparatively, the petroleum ether extract, the aqueous extract, and the non- polysaccharide fraction of the aqueous extract were shown to be more effective. The non- polysaccharide fraction's activity is equivalent to that of the common medication gliben clamide.

Several plants were utilised in traditional medicine to cure diabetes. One of them included research on the aqueous extract of *Zizyphus mauritiana* Lam leaves. In the first example, Wistar rats were given an oral glucose tolerance test to temporarily make them diabetic, and in the second case, alloxan was injected subcutaneously to permanently make them diabetic.

In the first example, 300 mg/kg administered 90 minutes prior to the test's commencement resulted in a startling drop of the hyperglycemic arrow (p 0.05). In the second instance, glibenclamide at 0.2 mg/kg per day produced results that were equal to those achieved with a dosage of 300 mg/kg given once or twice daily. The antidiabetic effect was thus demonstrated in an experimental setting, but it has to be standardised for widespread usage.

Antidiarrhoeal activity: Alkaloids, flavonoids, glycosides, saponins, and volatile oil were found in the root extract of *Zizyphus mauritiana* during a preliminary phytochemical screening to see if this species was present in other resources. The extract's intraperitoneal LD50 in mice was determined to be 447.21 20 mg/kg (bw). The isolated rabbit jejunum's spontaneous pendular movement was suppressed by the methanolic extract's antidiarrheal

effect, which was examined, and the rat ileum's acetylcholine-induced contraction was also inhibited.

Ayurvedic Properties:

Rasa : Kashaya, Madhura, Amla

Guna : Lakhu, Snigdha

Virya : Seeta

Vipaka : Madhura

The leaves are astringent, cooling, antipyretic, and they treat "kapha," biliousness, diarrhoea, and obesity. The berries are said to aid with digestion and cleanse the blood.

Fruits are anodyne, astringent, cooling, styptic, and tonic (wild variety); when mature and dried (cultivated variety). emetic and mild laxative.

Vitiated pitta, kapha, obesity, fever, burning sensations, cough, wound, skin illness, ulcers, stomatitis, diarrhoea, sexual weakness, and overall weakness are all calmed by plants.

Ayurvedic formulations: The words "Badaradi churna," "Badaradi kwatha," "Badri phalasava," "Badri patrasava," "Kumar Kalian Ghrita," and "Badaradi Pak" all refer to food.

Uses:

Jujube is a tasty fruit as well as a potent herbal cure. It promotes weight gain, strengthens the muscles, and boosts endurance. It is recommended as a tonic in Chinese medicine to support healthy liver function. It has antidotal, diuretic, emollient, and expectorant properties. Both astringent and febrifuge, the leaves. Supposed to encourage hair growth as well. The dried fruits have analgesic, anticancer, pectoral, cooling, sedative, styptic, and tonic properties. They are said to improve digestion and cleanse the blood. They are taken internally to treat hysteria, anaemia, diarrhoea, lack of appetite, chronic weariness, and other conditions. The seed has hypnotic, sedative, narcotic, stomachache, and tonic properties. It is used internally to treat excessive sweating, nocturnal sweats, nervous weariness, palpitations, and sleeplessness. Dyspepsia can be treated using the root. Fever has been treated with a decoction of the root. Old wounds and sores are treated using the root's powdered form. The herb is used as a folk treatment for nephritis, anaemia, hypertonia, and nerve disorders. The fruits are used to treat fevers and respiratory diseases as well as wounds and ulcers. The

leaves are used as poultices and are beneficial for fever, asthma, and liver problems.

Edibility / Nutritional

Food: Fresh fruit and preserved rind.

Food: Fresh fruit and preserved rind.

CONCLUSION:

An LC-ESI-MS analysis was utilised to create a thorough profile of the phenolic compounds from three organs of *Z. lotus* and *Z. mauritiana* in order to evaluate the bioactive compounds of two wild members of the genus *Ziziphus* that were collected from dry zones in Tunisia. The antibacterial potential and antioxidant activity against four pathogenic bacterial strains were assessed. In all, 28 phenolic components were identified and measured in various extracts. Compared to the other organs, the leaves had significantly higher levels of antioxidant and antibacterial phenolic substances (10 phenolic acids and 9 flavonoids). The predominate chemicals included quinic acid, p-coumaric acid, rutin, and quercetin, supporting the potential for both species to be used as sources of bioactive molecules. The related species *Z. lotus* and *Z. mauritiana* have extremely distinct phytochemical concentration variations that may be distinguished between them quantitatively. Therefore, more research into each phenolic compound's potential medical and industrial applications should be conducted.

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