

A review on phytochemicals, and pharmacological activities of Momordica dioica Roxb. Fruit

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ABSTRACT: Momordica dioica is commonly known as spiny gourd is perennial dioecious climber which matures in each tropical and subtropical country. It is not only used as a vegetable but also preventive and curative for various diseases. The phytochemicals screening shows it contains many chemical constituents like alkaloid steroids, terpenoids, flavonoids, glycoside, saponin, triterpenes, saturated fatty acid, ascorbic acid, vitamin A, thymine, Riboflavin, niacin, carbohydrates, lecithin, carotenes, better principles, oleanoic acid, alpha spiranosterol hederagenin, and it also have high nutritional value but still it is underutilize plant. Moreover, as a traditional medicinal plant, it is still potential for its phytochemical component increases the demand of further extensive evaluation to justify its other therapeutical roles. In this review, we gathered information about drug profile, phytochemical constituents and pharmacological activities done there on.

KEYWORDS: Momordica dioica, antioxidant, pharmacological activity, active constituents, spine gourd, teasle gourd.

I. INTRODUCTION:

In developing nations numerous types of edible wild plants are available as a source of food. Hence, provides adequate level of nutrition to inhabitants. Plant resources play a significant role in nutrition. Furthermore, food and agricultural organizations (FAO) reported at least 1 billion people are thought to use wild food in their diet.

Herbal drugs are natural product, and their chemical composition varies depending upon several factors and therefore varying from people to people.

Traditional medicines have a very long history. It is the sum of total practices based on theories, beliefs and experiences of different cultures and times. It is often inexplicably used in the maintenance of health, as like prevention, diagnosis, improvement, and treatment of illness. The World Health Organization (WHO) is engaged to establish definitive guidelines for methodology of clinical research and appraisal of effectiveness of traditional medicines.

Momordica dioica is a perennial, dioecious climber belonging to the Cucurbitaceae family. Momordica genus contains about 80 species. This climbing creeper generally found throughout India, Pakistan, Bangladesh, Sri Lanka, Myanmar, China, Japan, Southeast Asia, Tropical Africa and South America.

Momordica dioica climber plant commonly known as teasle gourd, small bitter gourd is a small oval to ovoid vegetable. It is also called as Junglee Karela. It is cultivated for its fruits which are used as a vegetable. The fruit, young twigs and leaves of a crop are used as vegetables or cooked as a vegetable. It has two types of varieties male and female as well as fruited variety and fruitless variety. Green fruit is extensively used as vegetable by cooking or frying. Leaves 1.5 to 5 inches long, cordate, acute more or less 3 to 5 lobed, flowers are large, dioecious and yellow in color. Fruit 1 to 3 inch long, shortly beaked, densely covered with soft spine.



Vernicular Name	Taxonomical Class
English – Small Bitter gourd, Spine Gourd	Kingdom - Plantae
Bengali - Kartoli	Super Division - Spermatophyta
Malayalam – Venpaval, Erima Pasel	Class - Magnoliopsida
Tamil – Aegaravali, Tholoopaval	Order - Violales
Kannada – Madahagala, Kayi	Genus - Momordica
Assam - Batkarila	Subkingdom - Tracheobionata
Hindi – Kakora, Parora	Division - Magnoliphyta
Sanskrit - Vahisi	Subclass - Dilleniidae
Marathi - Kartoli	Family - Cucurbitaceae
Telugu - Karkotaki	Species - Dioica
Punjabi - Dharkareb	

2) Phytochemical and nutrient study.

The fruit of *Momordica dioica* contains Ashesh 9.1%, Crude Protein 5.44%, Crude Lipid 3.25%, Crude Fiber 22.9% and Carbohydrate 59.31%. Its fruit has a high energy value (288.25 Kcal/100 Gram) in dry weight. Its mineral ranges (mg/100 Gram dry weight) are Potassium (4.63), Sodium (1.62), Calcium (7.37), Iron (5.04) and Zinc (3.83). It also contains 84.1% moisture and small quantities of essential vitamins like carotene, thiamin, riboflavin, and niacin. So, its fruit is recommended as a nutritionally rich source of Protein, Lipid crude fiber, Carbohydrate, Iron, Calcium, and Phosphorous. Additionally, it is the highest amount of Carotene (162 mg/100 Gram of edible Portion) among the cucurbitaceous vegetables. It is also a potential source of Chromium and Zinc. The fruit also contains higher amount of ascorbic acid and iodine also the secondary metabolites like alkaloids, steroids,

triterpenoids and saponin were also determined. The alkaloid present in seed and root were known as Momordicin and *Momordica foetida*.

From the spiny gourd fruit 6-methyl tritriacont-50 on-28 of and 8-methyl hentriacont-3-ene along with known sterol pleuchiol. The pentacyclic triterpenoid momodicaursenol also isolated from seed.

Phytochemical investigations also show the presence of Lectins, b-sitosterol, triterpenes of urosolic acid, hederagenin, olenolic acid, a spiransterol, stearic acid, gypsogenin are two novel constituents.

Pharmacological activities

1. **Antidiabetic activity:** - The *Momordica dioica* plant possesses antidiabetic activity. The main constituent of spine gourd i.e., steroidal, saponin, charantin is responsible for antidiabetic activity. The oral hypoglycemic

effect of spiny gourd in a rat model was screened by Fernadopulle et.al. which shows that the aqueous, chloroform, ethyl acetate and ethanolic extract of fruit has antidiabetic activity in alloxan induced experimental model of rat. Also, ethyl acetate and ethanol extract which contains steroid, triterpenoids had marked role in alloxan induced diabetic rat and broadly type 2 diabetes. Gupta et.al found the anti-diabetic and renal protective effect of *Momordica dioica* methanolic extract in streptozotocin treated diabetic rats.

2. **Antioxidant Activity:** - It is the property which provides protection against free radicals. The alcoholic extract inhibited the formation of oxygen derived free radicals. *In vitro* 4000 µg/ml ascorbic system. The total antioxidant capacity of ethanolic extract was found to be 26 µg/ml that was equivalent to ascorbic acid. The antioxidant activity of methanol and aqueous extract of fruit were analyzed and phenolic compounds like flavonoids, steroids, alkaloids, amino acid were observed. And it is also observed that due to the presence of flavonoid spiny gourd fruit possesses potent antioxidant property.
3. **Neuroprotective Activity:** - In neuropharmacological experimental models in mice it was found that methanol and aqueous extract of fruit pulp (100 mg/kg and 200 mg/kg) possesses neuroprotective activity.
4. **Antimicrobial Activity:** - The methanolic extract and aqueous extract of fruit had more promising antimicrobial activity. Shrinivas et.al, Arekar et.al screened antibacterial activity of ethyl acetate and found the concentration of 200 µg/disc was more active against *E. Coli* compared to *S. Aureus*, *S. Paratyphi* and *P. Mirabilis* bacteria.
5. **Anti-inflammatory Activity:** - The anti-inflammatory activity of methanolic extract was evaluated against CCl_4 induced hepatotoxicity and found fruit pulp possesses anti-inflammatory activity.
6. **Hepatoprotective Activity:** - The CCl_4 induced hepatotoxicity prevention by methanol extract of *Momordica Dioica* was studied and observed by Choudhary et.al. Kushwaha et.al evaluated the flavonoid fraction from ethanolic extract of fruit used as a hepatoprotective in winstar strain of albino rats of either sex against CCl_4 induced hepatic damage. Ethyl acetate soluble fraction of methanolic extract and hexane extract of fruit pulp at a dose 400

mg/kg administered for 7 days in rats executed significant therapeutic effect.

7. **Analgesic Activity:** - It is reported that methanolic soluble extract of spiny gourd fruit possesses analgesic activity when compared to standard drug.
8. **Antiallergic Activity:** - The alcoholic extract was evaluated in mice and rat and its efficacy to inhibit passive cutaneous anaphylaxis was found.
9. **Antitumor Activity:** - Krishna et.al studied antitumor activity of fruit extract of *Momordica Dioica*. They examine the antitumor effect of chloroform and methanolic extract of *Momordica Dioica* fruit on DLA induced tumor model in mice and concluded in DLA chloroform extract of *Momordica Dioica* at a dose 400 mg/kg decreased the growth of solid tumor as evidence by reduction of solid tumor weight and volume.
10. **Antiulcer Activity:** - M. Vijaykumar et.al carried out study to evaluate antiulcer activity of *Momordica Dioica* fruit on hydro alcohol extract. The gastroprotective activity of *Momordica Dioica* in ethanol induced ulcer might be because of decrease in gastric lesion, proton pump activity and by increased gastric wall mucus. This study clarifies at a dose 100, 200 and 400 mg/kg twice a day for 5 days prevented the gastric ulcer in dose related manner.

II. CONCLUSION: -

Herbal drugs are safe and highly beneficial. We traditionally used medicinal plants from local or an ancestor person from long time for the protection or recovery against diseases. But now a days the tendency to avoid natural source, lack of knowledge about plants, due to difference in language same plant identify by different name, the use of traditional plants are restricted.

The researchers help people to identify plants and provide basic knowledge about pharmacological use of plants. As natural drugs are safer as compared to synthetic drugs. The medicinal plant is alternative way to synthetic drugs.

This paper mainly focused on chemical constituents and pharmacological activity of *Momordica Dioica* Roxb. Fruit contains a significant amount of protein, lipid, fiber, carbohydrates, essential vitamins so it is rich in nutrients. It also contains ascorbic acid, iodine, alkaloid, steroid, triterpenoids and saponins and it contains many pharmacological activities like Antidiabetic

activity, Antioxidant Activity, Neuroprotective Activity, Antimicrobial Activity, Anti-inflammatory Activity, Hepatoprotective Activity, Analgesic Activity, Antiallergic Activity, Antitumor Activity, Antiulcer Activity.

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