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MOMORDICA CHARANTIA - A MEDICINAL HERB

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ABSTRACT

India is a botanical garden of the world having rich natural resources. *Momordica charantiais* a herbal, slender, tendril climbing, annual vine grown in tropical and subtropical regions. It is a consuming and medicinal plant. It is known as bitter melon or gourd. It possesses properties like- anticancer, antidiabetic, anti-inflammatory, antimicrobial, antioxidant, antiulcer etc. It consists alkaloids, charantin, flavonoids, glycosides, phenolics, tannins, terpenoids etc. *Momordica charantia* is rich in momordicin, momordin, kuguacin etc. In this article there is a brief description including varieties, bioactive composition etc regarding *Momordica charantia* commonly known as Karela.

KEYWORDS

Momordica charantia, Balsam-pear, Favism and Karavellaka.

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INTRODUCTION

Momordica charantia (M. charantia), also known as bitter melon, karela, balsam pear, or bitter gourd[1]. All parts of the plant, including the fruit taste very bitter[2], as it contains a bitter compound called momordicin that is believed to have a stomachic effect[3]. Though they tast every bitter, they are filled with many beneficial antioxidants and essential vitamins[4]. *Momordica charantia* hasano. of purported uses including cancer prevention, treatment of diabetes, fever, HIV and AIDS, and infection[5]. *Momordica charantia* may be beneficial in diabetes, however, the effects seem to depend on how it is consumed[6].

The juice of the fresh fruit of Karavellaka is given in a dose of 20-25 ml to reduce the sugar level in blood. The fresh juice of the fruit is given in a dose of 15-20 ml to treat intestinal worms, anorexia and liver disorders. The juice of the fruit is consumed daily in a dose of 20-25 ml to detox the blood and act like a blood purifier[7]. Karela contains an array of biologically active plant chemicals including triterpens, proteins steroids, alkaloids, saponins, flavonoids and acids due to which plant possessanti-fungal, anti-bacterial, anti-parasitic, anti-viral, anti-fertility, anti-tumorous, hypoglycemi candanti-carcinogenic properties[8,9]. It is also found useful in the treatment of cancer and diabetes[10]. It improves peristaltic movements of gastro intestinal tract and also improves the absorption in the intestines[7,8]. Regular use of bitter melon over a period of time helps to bring the blood sugar level down[11]. The seed constituent vicine may induce "favism", an acute condition characterized by headache, fever, abdominal pain, and coma[12,13].

Classification of *Momordica charantia*

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Cucurbitales
Family: Cucurbitaceae
Genus: Momordica
Species: M.charantia
Common name is Karela, Bittergouard.

PHYTOCHEMISTRY

The main constituents of bitter melon (karela) are triterpene, protein, steroid, alkaloid, inorganic, lipid and phenolic compounds[16]. *M.charantia* primarily consists of glycosides, proteins, Sterols and fattyacids and volatile constituents[17]. The fruit pulphas soluble pectinbutno free pectic acid. Research has found that the leaves are nutrious sources of calcium, magnesium, potassium, phosphorus andiron; both the edible fruit and the leaves are great sources of the vitamin B[18]. *Momordica charantia* Linn. Has anonnitrogenous neutral principle charantin, and onhydrolysis gives glucoseandasterol. Charantin having 266^{o} melting point[19]. The beta-carotene content in bitter gourd helps in controlling eye disorders and enhances eyesight[16].

It also contains steroidal saponins called charantin, peptides similar to that of peptides and certain alkaloids that effectively control sugar level in blood[20].

CULTIVATION

Bittermelon originate din India and was introduced into chinain the 14th century[21]. After seeding, Momordica develops leaves in about 11 days and flowers after 40 to 50 days. After fertilization, the Momordica fruit will be developed in about 10 days[22]. The plant is cultivated throughout India and widely grown as a vegetable cropal lover the tropical countries especially in India, China, Africa and various part of Africa at analtitude of 1500m[23].

USES

Laboratory studies have confirmed that various species of Karela have antimalarial activity. Leaves brewed in hot water to create at eato treat malaria[24]. The fruits and leaves are useful in piles, jaundice, diabetes, leprosy, snakebite and it is found to have vermifuge and antioxidant property. Fruit is also usefuling out, rheumatism and subacute cases of spleen and liver[25].

Seeds are used in the treatment of ulcers, liver and spleen problems, diabetes, intestinal parasites, high cholestrol, and intestinalgas, heal wounds and stomachache etc[26]. Roots are used in the treatment of syphilis, rheumatism, boils, ulcer, septics wellings, opthalmia, and in prolapsusvagenae[20,21]. The leaves of plant has anti-diabetic, anti- hyper glycaemic, anthelmintic, anti-oxidant, anti-microbial, emetic, purgative, anti-hepatotoxic, anti-ulcerogenic and antiviral properties against chicken pox, measles[27]. It is used topically forsores, wound, infections and internally and externally for worms and parasites[28].

Table No.1: Various Species of genus Momordica[14,15]

S.No	Drug	Local name	Chemical constituents	Therapeutic uses
1	*M. balsamina*	Mokha	Momordicin, Lycopene, Carotene, Fatty oil	Stomachic, tonic, used in haemorrhoids, burns
2	*M. cochinchinensis*	Gulkakra, gangerua	Triterpenoid saponin, bessisterol, ascorbigen, ascorbic acid	Aperient, used in ulcers, soresobstructions of liver and spleen, external application for lumbago, ulceration
3	*M. dioica*	Kaksa, golkandra	Ascorbic acid	Used in bleeding piles, bowel affections and urinary complaints
4	*M.tuberosa*		Bitter glycoside, yellow acid resin	Abortifacient
5	*M. cymbalaria*	Kadavanchi		Abortifacient
6	*M. mixta*		----------	Used as a vegetable food

Bitter Melon Herbal Properties and Actions

S.No	Main Actions	Other Actions	Standard Dosage
1	kills bacteria	reduces inflammation	Leaves, Fruit
2	kills viruses	fights free radicals	Decoction: 1 cup 1-2 times daily
3	kills cancer cells	enhances libido	Tincture: 1-3 ml twice daily
4	kills leukemia cells	cleanses blood	Capsules: 1 g twice daily
5	prevents tumors	Detoxifies	
6	treats diabetes	expels worms	
7	reduces blood sugar	balances hormones	
8	reduces blood pressure	enhances immunity	
9	lowers body temperature	mildly laxative	
10	lowers cholesterol	promotes milk flow	

Table No.2: Botanical differences among the major Momordica species of India. *M. charantia M. dioica M. balsamina*

Plant	A much branched climbing annual	a dioecious, perennial climber with a tuberous root	A monoecious, much branched, climbing perennial from a tuberous root
Stem	Angled, grooved, young parts densely hairy, older branches more or less pubescent	slender, glabrous to rarely sparsely pubescent, angled and sulcate	slender, glabrous
Leaves	almost orbicular or reniform in outiline, lobes ovate-oblong, acute or subacute, apiculate	Much variable, membranous, ovate, obtuse or acute and mucronate, lobes triangular	Herbaceous or slightly hairy particularly on nerves beneath, lobes rhomboid or obovate to elliptic-rhomboid monoecious,
Flowers	male flowers solitary, peduncles slender, glabrous or slightly pubescent; Corolla some what irregular, lemon yellow; Female flowers on 5-10 cm long slender peduncles, bracteate usually at or near the base	Male flowers solitary, glabours peduncles which are hairy, Corolla yellow, Female flowers bracteate or ebracteate	Monoecious, all solitary; Male flowers on slender, filiform peduncles, glabrous or somewhat hairy towards apex, corolla pale yellow; Female flowers on ebracteate or bracteatependuncles
Fruit	Bright orange coloured, 5-15 cm long, fusiform, ribbed, with numerous triangular tubercles giving it the appearance of crocodile skin	Ellipsoid, shortly beaked, densely echinate with soft spines, apex shortly rostrate and annular, base usually rounded	Subglobose to ovoid, with a broad, conical rostrum, abruptly and shortly attenuate at base, bright orange-red to scarlet when ripe
Seeds	compressed, oblong, sub-bidentate at base and apex, sculptured on sides, cream or greycoloured	many, much variable in size and shape, turgid, more or less puriforms quite smooth	with a carmine red arillus, grey, ovate or oblong in outline, compressed

Figure No.1: Momordicacharantia

Figure No.2: Bitter melon (*Momordica charantia*)

Figure No.3: Flowers and leaves of Bitter melon

CONCLUSION

We concluded that *Momordica charantia* is a useful traditional medicinal plant. Bitter melon is a potential herbal plant. It is beneficial for human health. It is a good source of various biochemicals like protein, anti-diabetic, anti-cancer, anti-microbial, anti-viral etc. *Momordica charantia* have various properties which can be utilized as a good source of nutritional, medicinal and pesticidal agent.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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