



## AN OVERVIEW: HEALTH BENEFITS OF *MOMORDICA CHARANTIA* (BITTER GOURD)

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### ABSTRACT

*Momordica charantia* (bitter gourd; family Cucurbitaceae) is a crucial medicative vegetable crop, mostly found in tropical and climatic zone regions of Asia, tropical continent, geographical region and America. Bitter melon has been used as a folks remedy for tumors, asthma, skin infections and high blood pressure. The plant has been used as a conventional drug in China, India, Africa, and therefore the south-eastern United States of America. It's a nonnitrogenous neutral principle charantin, and on chemical reaction offers aldohexose and a steroid alcohol. The fruit pulp has soluble cellulose however no free acid. Galacturonic acid is additionally obtained from the flesh. Bitter gourd is rich in nutrients like B, carotin, folate, riboflavin, and minerals like metal, iron, phosphorus, manganese, potassium, magnesium, metal and dietary fiber. Regular use of bitter gourd juice boosts body stamina and prevents chronic fatigue. The carotin content in bitter gourd helps in controlling eye disorders and enhances sight. Bitter melon has anti-Tumor, anti-inflammatory drug, Inhibitor action, hypo-lipidemic, hypo-glycaemic properties etc.

**Key Words-** *Momordica charantia*, medicinal properties, pharmacology, Chemical Composition, Phytochemical constituents.

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### INTRODUCTION:



Figure 1: *Momordica charantia* (Bitter gourd)

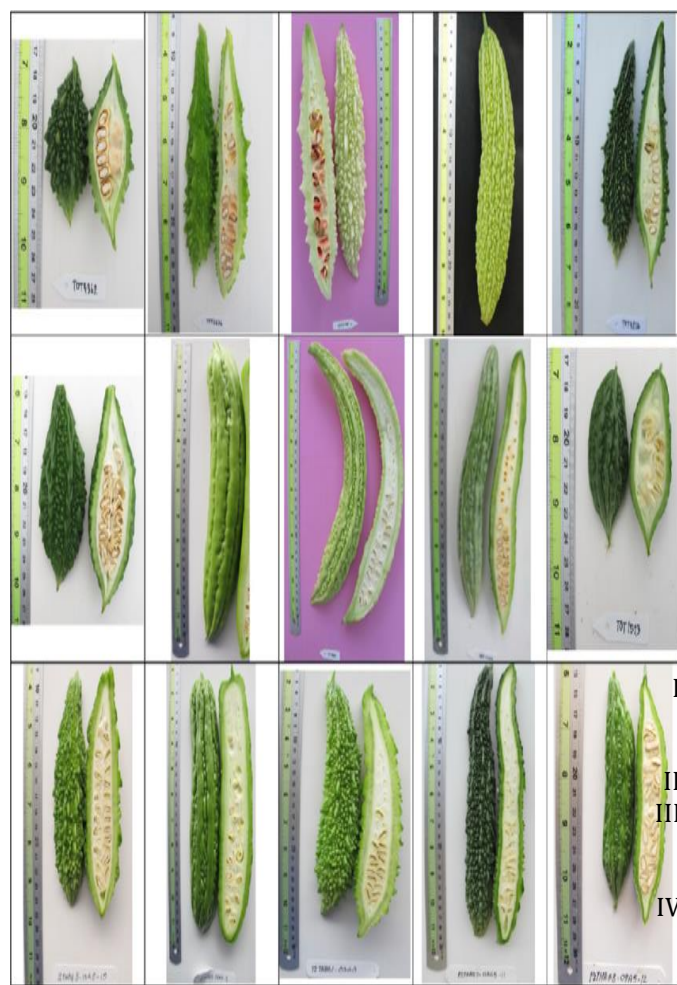
*Momordica charantia* (casually: undesirable melon; serious apple; unforgiving gourd; brutal squash; sap pear; with much more names recorded below)[1] is a tropical and subtropical plant of the family Cucurbitaceae, for the most part filled in Asia, Africa, and the Caribbean for its consumable characteristic item. Its various arrangements contrast liberally in the shape and sharpness of the regular item. Brutal melon began in India and was brought into China in the fourteenth century [2]. It is extensively used in the nourishments of East Asia, South Asia, and Southeast Asia.

This herbaceous, curl bearing plant grows up to 5 m (16 ft) long. It bears clear, substitute leaves 4–12 cm (1.6–4.7 in) finished, with three to seven significantly segregated folds. Each plant bears separate yellow male and female blooms. In the Northern Hemisphere, blooming occurs during June to July and fruiting during September to November [3]. The natural item has an obvious warty outside and a circular shape. It is vacant in cross-fragment, with a by and large slight layer of tissue enveloping a central seed sorrow stacked up with immense, level seeds and substance. The natural item is routinely eaten green, or as it is turning yellow. At this stage, the natural item's tissue is crunchy and watery in surface, similar to cucumber, chayote or green ringer pepper, yet brutal. The skin is fragile and edible. Seeds and substance appear to be white in unripe normal items; they are not truly serious and can be taken out before cooking. A couple of sources ensure the substance (skin) ends up being genuinely harder and even more serious with age, anyway various sources ensure that in any function for the customary Chinese variety the skin doesn't change and sharpness reduces with age. The Chinese groups are best gathered light green possibly with a slight yellow clue or not long already. The embodiment ends up being sweet and truly red; it will in general be eaten uncooked in this state, and is a standard fixing in some Southeast Asian plates of blended greens.

Exactly when the normal item is totally prepared, it turns orange and sensitive, and parts into areas which contort back to reveal seeds campaigned in awe inspiring red squash [3].

**Varieties:**

- I. Undesirable melon shows up in a combination of shapes and sizes. The cultivar typical in China is 20–30 cm (7.9–11.8 in) long, oval with roughly fixing terminations and light green in concealing, with a gently undulating, warty surface [3].
- II. The undesirable melon more customary of India has a more modest shape with pointed completions, and a surface made sure about with harsh, three-sided "teeth" and edges [3].
- III. It is green to white in tone. Between these two limits are many midway structures. Some bear more modest than regular result of only 6–10 cm (2.4–3.9 in) long, which may be served solely as stuffed vegetables [3].
- IV. These more modest than regular natural item are notable in Bangladesh, India, Pakistan, Nepal and various countries in South Asia. The sub-terrain variety is by and large standard in Bangladesh and India [3].

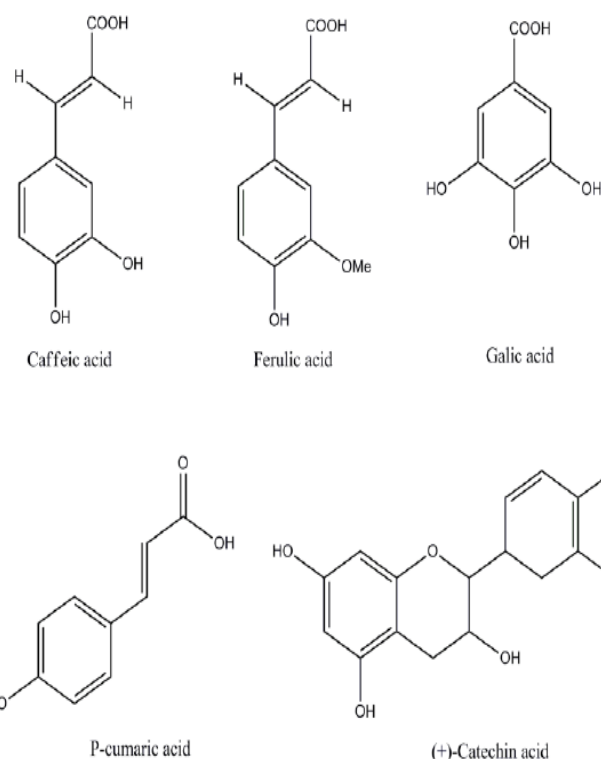


**Figure 2: Bitter gourd fruit type variation [4]**

**Chemical Compostion:**

*Momordica charantia* has a non-nitrogenous impartial principle charantin, and on hydrolysis gives glucose and a sterol. The characteristic item squash of *M. charantia* has dissolvable gelatin anyway no free pectic destructive.

Galacturonic destructive is also procured from the substance. *M. charantia* common items glycosides, saponins, alkaloids, decreasing sugars, gums, phenolic constituents, fixed oil and free acids. The presence of unidentified alkaloid and 5-hydroxytryptamine is also uncovered. The 5HT substance is offered an explanation to be accessible. The ether remove development of the alcoholic concentrate from the leaves of *M. charantia* is offered an explanation to reveal hypoglycemia development like that of tolbutamide. The unadulterated protein named as P-insulin isolated from *M. charantia* natural items in glasslike structure is moreover attempted [5].



**Figure 3: Fruits of different variety of *Momordica charantia* [6]**

**Properties:**

*Momordica charantia* is a significant vegetable. It is useful in most metabolic and physiological patterns of the human body. It has the going with properties: -

- I. Bitter melon is made out of various manufactured mixes that have hypoglycemic development, i.e., they decline the proportion of sugar in the blood.
- II. Bitter melon vitalizes hunger.
- III. Bitter melon helps in the entire ingestion measure. In this manner it is used in the treatment of stomach related issues.
- IV. Bitter melon has emetic, purgative and anthelmintic properties. It is in like manner antagonistic to self important.
- V. Bitter melon is used in the breaking down of fats from the body. It is known to have against lipolytic properties.
- VI. Bitter melon has all the principal supplements in reasonable aggregates, for instance, supplement A, thiamine, riboflavin, supplement C and besides minerals like iron. Bitter melon is quieting and astringent. It has a unequivocal movement on the improvement of inner parts [7]

Helpful occupations:



Figure 4: Health benefits *Momordica charantia* (Bitter gourd) [8]

1. Serious gourd is well off in supplements like thiamine, beta-carotene, folate, riboflavin, and minerals like calcium, iron, phosphorus, manganese, potassium, magnesium, zinc and dietary fiber.
2. Conventional usage of serious gourd juice underpins body perseverance and prevents industrious shortcoming.
3. The beta-carotene content in brutal gourd helps in controlling eye issues and overhauls vision.
  - I. Upsetting melon vivifies a sluggish stomach related structure and treats dyspepsia.
  - II. Consistent examinations show that new press of unforgiving melon can lower glucose regards and hold Insulin under check.
  - III. Unforgiving gourd juice can in like manner prevent jaundice by invigorating the liver. By detoxifying and taking care of liver, cruel melon juice may be worthwhile in the treatment of a migraine.
  - IV. Undesirable melon is as an Immuno modulator. It might improve safe cell work in people with danger.

V. **Loads:** A notable society fix is to mix three teaspoonfuls of juice from terrible melon leaves with a glassful of buttermilk to be taken every day for about a month on an empty stomach.

**Cholera:** Fresh crush of leaves of undesirable gourd is moreover a important drug in starting periods of Cholera and various sorts of the runs [9]

**Phytochemical constituents:**

**Plant body**

Momorcharins, momordenol, momordicilin, momordicins, momordicinin, momordin, momordolol, charantin, chlorine, cryptoxanthin, cucurbits, cucurbitacins, cucurbitanes, cycloartenols, diosgenin, eleostearic acids, erythrodiol, galacturonic acids, gentisic acid, goyaglycosides, goyasaponins, multiflorenol. Glycosides, saponins, alkaloids, fixed oils, cucurbitane-type triterpenes, proteins and steroids Momordicine, charantin, polypeptide- p insulin, ascorbigen etc .

**Fruits -Amino acids**

Aspartic acid, serine, glutamic acid, threonine, glutamic acid, threonine, alanine, g-aminobutyric acid and pipercolic acid, luteolin. Fatty acids – Lauric, myristic, palmitic, palmitoleic, stearic, oleic, linoleic, linolenic acid.

**Enzyme**

Urease Seeds Amino acids – valine, threonine, methionine, isoleucine, leucine, phenylalanine and glutamic acid [10].

Pharmacological and medicinal uses:

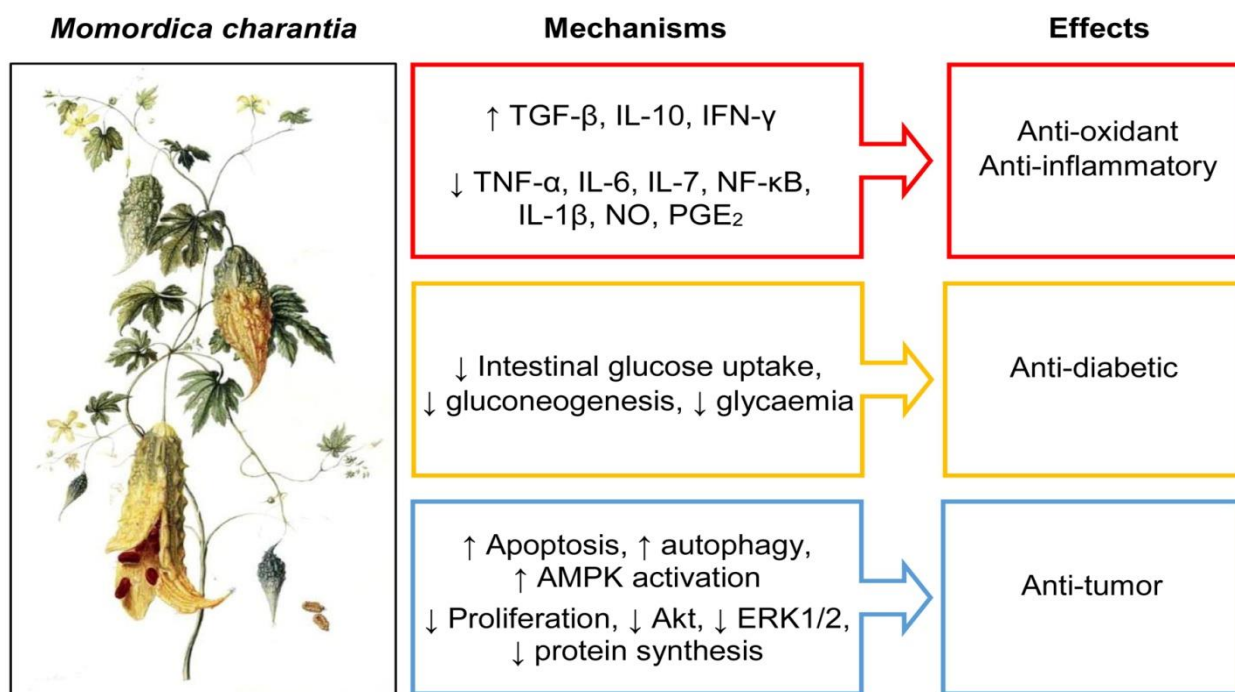


Figure 5: *Momordica charantia* a Nutraceutical Approach for Inflammatory Related Diseases [11]

1. Anti-tumor properties

A couple of researchers have found that Thai unforgiving gourd normal item contained foes of malignant growth causing operators or chemo-preventive master [11]. Viral in vivo examinations have indicated the antagonistic to tumoral activity of the entire plant of unforgiving gourd. In one study, a water eliminate hindered the improvement of rat prostate carcinoma; another examination declared that a bubbling water concentrate of the entire plant curbed the improvement of mammary tumors in mice. Different in vitro assessments have as well indicated the counter hazardous and against leukemic development of extreme gourd against different cell lines, including liver harmful development, human leukemia, melanoma and solid sarcomas]. The other space is exhibiting that serious gourd is as a working safe modulator. Regardless, one clinical starter found lacking verification that serious gourd may improve safe cell work in people with harmful development, yet this needs to be affirmed and strengthened in other investigation [12].

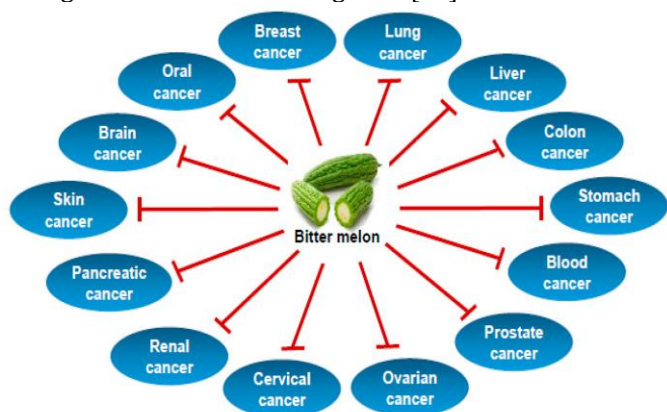


Figure 6: Bitter Melon (*Momordica Charantia*), a Nutraceutical Approach for Cancer Prevention and Therapy [14]

2. Anti-inflammatory

It indicates that quieting activity of dried leaves was like 10 mg/kg of indomethacin. Further, declared injury repairing breaking point of common item powder were identical to those of povidone-iodine demulcent in an extraction, cut and dead space turned model in rodents [13].

3. Anti-microbial Activity

The In vitro assessments have shown serious melon eliminates additionally, the MAP30 protein basic, bound from the seeds of *Momordica charantia* removes, have wide range antimicrobial activity. *Momordica charantia* removes ruin defilement and improvement of a couple of contaminations, checking HIV, Epstein Barr virus.2 An and 24 Herpes simplex, major report on the effect of *Momordica charantia* remove in three HIV patients demonstrated a normalization of CD4/CD8 extents with *Momordica charantia* treatment. It is confided in *Momordica charantia* removes ruin HIV replication by thwarting syncytial course of action and cell-to-cell infection. *Momordica charantia* eliminates also appear to control the advancement of different gram-negative and gram-positive organisms, including Salmonella, E. coli, Shigella, Staphylococcus, Pseudomonas, Streptococcus, Streptobacillus, and H. pylori, and parasitic living creatures E. histolytica and Plasmodium falciparum[14-17].

4. Anti-Malarial Activity

*Momordica charantia* is usually regarded by Asians, similarly as Panamanians and Colombians, as significant plant for thwarting against used treating intestinal affliction. Exploration focus assessments have asserted that various sorts of *Momordica charantia* have against malarial development. Leaves arranged in high temp water to make a tea to treat malaria [18].

## 5. Antioxidant Activity

*Momordica charantia* Different bits of the plant have been used in the Indian remedial system for a number of hardships other than diabetes. Cell fortification development of removed phenolic compound from serious melon has been represented the Antioxidant properties of *Momordica charantia* Seeds on Streptozotocin impelled diabetic rodents has been analyzed and results clearly recommend that seeds of *Momordica charantia* may effectively normalize the blocked cell support status in streptozotocin impelled diabetes [19-20].

## 6. Hypocholesterolemic activity

Preliminaries finished in ordinary likewise diabetic animals have shown hypo-cholesterolemic impacts by *Momordica charantia*. In an examination, sunflower dealt with rodents were dealt with shaped octadecatrienoic unsaturated fat segregated from *Momordica charantia* seeds for 4 weeks. Following a month, these rodents showed tremendous bringing down of the plasma lipid peroxidation and erythrocyte layer lipid peroxidation similarly as nonenzymatic liver tissue lipid peroxidation [21].

## 7. Immunomodulatory Activity

Immunomodulatory activity of *Momordica charantia* demonstrated that it fluidly influences the safe structure in specific conditions, like allograft excusal, some place it was seemed to have immunosuppressive sway and in some various cases immunostimulant. Immunomodulatory activity has been attributed to increase in interferon creation and trademark killer cell activity [22].

## 8. Antidiabetic Activity

Karela contains disagreeable manufactured substances like, charantin, vicine, glycosides and arabinosides close by polypeptide-p plant insulin, which is hypoglycemic, all things considered, and improves blood sugar levels by extending glucose take-up and glycogen blend in the liver, muscles and fat cells. Reports show that they also improve insulin release from pancreatic beta cells, and fix or advance new improvement of insulin-releasing beta cells. P-Insulin, a polypeptide from the results of the dirt immediately lessened and normalized the glucose level in rodents. Unsavory melon contains another bioactive compound, i.e., lectin that has insulin-like activity. The insulin-like bioactivity of lectin is a result of its interfacing together two insulin receptors. This lectin cuts down blood glucose centers by chasing after up periphery tissues and, similar to insulin's possessions in the psyche, smothering yearning. This lectin is a huge ally of the hypoglycemic effect that makes in the wake of eating Karela. Charantin eliminated by alcohol is an incredible hypoglycemic authority made out of mixed steroids which are now and again used in the treatment of diabetes to cut down the glucose levels [23-24].

## Side effect

*Momordica charantia* Oral ingestion of extreme melon natural item is protected as appeared by Oral ingestion of brutal melon natural item is protected as appeared by Subcutaneous mixture of p-insulin isolated from *Momordica charantia* appears, apparently, to be secured; in any case, intravenous imbue of *Momordica charantia* isolates is out and out more harmful and not

proposed. Since serious melon seeds contain momorcharin, are seemed to have antifertility effects in female mice, serious melon seed having antifertility effects in female mice, serious melon seed pregnancy.

## CONCLUSION:

*Momordica charantia* is a plant of the Cucurbitaceae family is known as cruel melon, karela, and pare. *Momordica charantia* have given various fixes for different ailments from old-fashioned days to now every day. It has been used in various Asian ordinary prescriptions for the treatment of cholera, paleness, ulcer, free entrails blood diseases, bronchitis, gout, looseness of the bowels, worms, gonorrhoea firmness colic, disease of liver and spleen, sickness and diabetes, etc

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