

Bitter Melon

Scientific Name¹⁻⁹

Momordica charantia

Common Names¹⁻⁹

Bitter melon, balsam pear, bitter cucumber, bitter pear, karalla, balsam apple, cerasee, carilla cundeamor, papailla, melao de sao ceatano, bitter gourd, sorosi, karela, kurela, kor-kuey, pava-aki, salsamino, sorossies, pare, peria, karla, margose, goo-fah, mara chean

Herb Description⁷⁻⁹

Bitter melons may be cultivated in tropical areas including Africa, India, South America, and Asia. It is characterized as a perennial vine bearing yellowish green oblong bumpy fruit resembling a cucumber. Once ripened, it releases brown and white color seeds which are embedded in its red pulp.

Principal Constituents^{1,4,7,9,10}

Medicinal components of bitter melon include its seeds, fruits and to a lesser extent leaves and roots. Alpha and beta-momorcharin are proteins that may be isolated in seeds, fruit as well as the leaves. Insulin-like polypeptides called p-insulin and alkaloid momordicine could be isolated from both the fruits and seeds. The seeds, additionally, contains vicine and 32% oil combined with stearic, linoleic, and oleic acids. Other chemical components include steroid glycosides momordin and charantin which has been identified in the fruits and leaves. The leaves alone contain iron, sodium, thiamine, riboflavin, niacin, and ascorbic acid.

Mechanism of Action^{1,4,7,9,10}

Many mechanisms of action have been proposed for the hypoglycemic effects of bitter melon. However, many clinical studies showed contradictory results therefore the mechanism of action for hypoglycemic effects remains unclear. Some data indicated that bitter melon stimulates the functioning pancreatic islet cells causing a release in insulin while others would contradict and report that an increase in utilization of glucose by the liver rather than the secretion of insulin by pancreatic cells are responsible for the hypoglycemic effects. Less common mechanisms that are proposed for hypoglycemic effects include inhibition of glucose absorption and increase glucose tissue uptake.

Current Indications^{1,6,10}

Bitter melon has many worldwide indications however most clinical data are from trials examining the hypoglycemic properties of bitter melon. In addition to the hypoglycemic effects of bitter melon, other worldwide traditional uses include antimicrobial, psoriasis, gastrointestinal upset, ulcers, colitis, constipation, intestinal worms, kidney stones, fever, menstrual disorder, leprosy, cough, headache, hypertension, anemia, and appetite stimulant.

Efficacy Data¹¹

Alcoholic extract taken from the pulp of bitter melon was administered to rat models to evaluate its hypoglycemic activity in comparison to a sulphonylurea, tolbutamide. The alcoholic extract was prepared by blending 1 kg of unripe bitter melon fruit in 1500ml of 95% alcohol. Results in rat models showed that bitter melon 500mg/kg cause a 10-15% reduction in blood glucose after 1

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hour while tolbutamide 100mg/kg has a more modest reduction of 40% in blood glucose after 1 hour.

Contraindications^{3,10}

Hypersensitivity to bitter melon, pregnancy, lactation, hepatic disease, fertility drugs, and hypoglycemia.

Dosage Forms Availability^{2,3,5,6,10}

Bitter melons are available in tablet, aqueous extract, fruit, juice, seed, and tea.

Recommended Doses^{2,3,5,6,10}

Adult: PO aqueous extract: 15g QD or 100ml QD

PO juice: 2 oz QD

PO standard leaf: 0.5-1 cup QD-BID

Tincture: 1-3 ml of 4:1 BID

Powdered leaf in tablets/capsules: 1g QD, 3 tbsp QD

Children (<18 years old): There have been 2 reports of coma associated with the use of bitter melon in children due to hypoglycemia. The use of bitter melon is not recommended in children less than 18 years of age.

Duration⁴

Bitter melon is considered relatively safe for duration of ≤ 4 weeks. Use for more than 4 weeks is not recommended.

Drug Interactions^{1,10}

Bitter melon may interact with antidiabetic drugs. Concomitant use of bitter melon with other antidiabetic drugs may enhance blood glucose reduction resulting in hypoglycemia

Drug-Disease Interactions^{1,10}

Hepatic disease

Diabetes

Drug-Lab Interactions¹

Urinary glucose

Additional Safety Issues^{4,6,8}

Bitter melon is relatively safe with side effects including headache, diarrhea, nausea, vomiting and abdominal pain with excessive amounts. Concomitant use of bitter melon with other antidiabetic drugs may enhance blood glucose reduction resulting in hypoglycemia. Use bitter melon with other antidiabetics only under the supervision of a physician. Bitter melon has toxic red arils that surround the seeds, avoid gestation and keep away from children.

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