Momordica charantia – Bitter Melon

**Momordica charantia 1:2 Fluid extract**

**Common Names:** Bitter Melon, Bitter Gourd, Balsam Pear, Karela, Bitter Cucumber, Cundeamor, Ku gua.

**Botanical family:** Cucurbitaceae

**Part Used:** Fruit

**Dosage:** 30-60 ml per week

**Primary Active Constituents:** Glycosides, saponins, alkaloids, phenolic compounds, fixed oils, cucurbitane-type triterpenoids (including momordicin, charantin, kuguacins & karavilagenins), peptides, enzyme-inhibitors, vitamins A, Bs, C & minerals Ca, Mg, Fe, K, & Ph.

**Warnings & Contraindications:** Avoid during pregnancy, breastfeeding, if trying to conceive, and those with glucose-6-phosphate dehydrogenase deficiency. May potentiate anti-diabetic & cholesterol-lowering medications.

**Primary Actions:** Anti-diabetic, anti-obesity, emmenagogue, hypoglycaemic, hypotensive, hypocholesterolemic, immunomodulating, antiviral, antibacterial, anthelmintic, anti-inflammatory, antioxidant, analgesic, hepatoprotective, anticancer.

**Main Indications:** Diabetes, obesity, metabolic syndrome, dyslipidaemia, CVD, viral & bacterial infections (including HIV), gastric ulcers, fatty liver, various cancers, autoimmune conditions (including psoriasis and rheumatoid arthritis).

**Historical Use & Research Summary**

The climbing perennial vine, *Momordica charantia* (Bitter Melon(BM)) is a member of the gourd (Cucurbitaceae) family and is recognisable for its bitter fruit, a warty gourd resembling a small cucumber. It is widely cultivated throughout tropical and sub-tropical countries, and has been used within many traditional medicine systems for a variety of complaints, including diabetes, microbial & parasitic infections, dyspepsia, menstrual stimulation, wound healing, inflammation & fever reduction, gastric ulcers, skin conditions including psoriasis, eczema, and scabies; and as an abortifacient.

Current research demonstrates the effectiveness of BM in the treatment of diabetes and its complications (including nephropathy, cataract and insulin resistance), obesity and metabolic syndrome, as an antibacterial and anti-viral agent (including for HIV and *H.Pylori* infection), and for various cancers (including lymphoid, leukaemia, lymphoma, melanoma, breast, prostate and renal).

**Diabetes, Metabolic Syndrome & Cardiovascular Disease**

At least three different groups of constituents, including charantin, a cucurbitane triterpenoid with insulin-like properties; insulin-like peptides (such as polypeptide-p) and momordicin, an alkaloid responsible for the bitter taste, have been identified as the primary anti-diabetic actives. These are most concentrated in the fruit and have been demonstrated in cell and animal studies to deliver antidiabetic actions including blood-glucose lowering effects, enhancing skeletal and peripheral glucose uptake, inhibiting intestinal glucose uptake via...
Research Summary continued

Mullein (Verbascum thapsus) against numerous viruses including Epstein-Barr, herpes, and HIV. The traditional use of BM for rheumatism and gout may be continued

BM has also demonstrated protective effects against diabetes-related complications, including diabetic cardiomyopathy caused by chronic hyperglycaemia. Various animal studies have indicated a significant reduction in systolic and diastolic blood pressure as well as total cholesterol and triglyceride lipid levels. In addition, its antioxidant and vasoprotective phenolic and flavonoid compounds have been shown to reduce lipid peroxide levels and associated tissue damage, increase vasodilating nitric oxide (NO) levels and also increase enzyme nitric oxide synthase (eNOS) and superoxide dismutase activity.

Obesity

Several investigational studies have reported that BM can reduce body weight in high-fat diet-induced obesity animal models. Supplementation with BM has been shown to significantly prevent body weight and visceral fat mass gain in various rodent studies through a variety of mechanisms including increased fatty acid oxidation, increased hepatic and muscle mitochondrial carnitine palmitoyltransferase and acyl-CoA dehydrogenase enzyme activity, and by reducing mRNA levels of fatty acid synthase, acetyl-CoA carboxylase-1, lipoprotein lipase and adipocyte fatty acid-binding protein.

Anti-inflammatory / Analgesic activity

The traditional use of BM for rheumatism and gout may be attributable to the active constituents Momordin Ic and its aglycone, oleanolic acid, which have been reported as the active anti-rheumatoid principles. In addition, significant analgesic activity has been demonstrated in an animal model using an ethanolic extract of BM indicating both centrally and peripherally mediated analgesic effects. BM extracts have also shown to reduce lipopolysaccharide-induced inflammation, by inducing the production of regulatory cytokines TGF-β and IL-10 in vitro.

Immunomodulation

Extracts of BM and its isolated constituents have demonstrated immunomodulatory effects, and have been traditionally used for both immunocompromised and autoimmune conditions. In some conditions, such as allograft rejection, bitter melon constituents alpha- and beta-momorcharin have demonstrated immunosuppressive activity. In others, it has exhibited an immunostimulant effect, demonstrating the ability to increase resistance to viral infections and enhance immunity in humans and animal by increasing interferon production and natural killer cell activity. It’s traditional use in the treatment of psoriasis has been supported by its ability to inhibit guanylate cyclase, an enzyme linked to the pathogenesis of psoriasis as well as a number of cancers, including leukaemia.

Antibacterial & Antiviral activity

In-vitro studies have demonstrated antiviral activity of BM against numerous viruses including Epstein-Barr, herpes, HIV, coxsackievirus B3 and polio viruses. Additionally, broad-spectrum antibacterial activity in-vitro has been shown against H. pylori, E. coli, Staphylococcus, Pseudomonas, Salmonella, Streptobacillus and Streptococcus, as well as anti-protozoal activity against Entamoeba histolytica. Ethanol fruit and seed extracts demonstrated moderate activity against only a few fungal species. Cell studies have shown two proteins, known as α- and β-momorcharin, present in the seeds, fruit and leaves are capable of inhibiting the HIV virus in vitro.

Cancer

BM extracts have also been shown to inhibit the growth and proliferation of various types of cancer cells in animal and in-vitro studies. The ribosome-inactivating proteins α- and β-momorcharin, momordin and cucurbitacin B have documented cytotoxic activity. Momordin has clinically demonstrated cytotoxic activity against Hodgkin’s lymphoma in vivo, and whole plant extracts have been shown to block the growth of rat prostate carcinoma and mice mammary tumours. In-vitro studies have demonstrated anti-cancer and anti-leukemic activity of bitter melon against liver, melanoma and sarcoma cancer cells. BM modifies the immune response in cancer patients via decreased intestinal secretion of interleukin-7, reduced lymphocyte number, and increased T-helper and natural killer cell populations.

References

10. Abas R et al, EXCLI J 2015 Jan 30; 14:179-189

Momordica charantia

Suggested Combinations

Diabetes & metabolic syndrome:

- Goat’s Rue
- Nigella
- Kudzu

Antiviral & immune modulating

- Lomatium
- Propolis
- Withania

Autoimmune

- Bupleurum
- Hemidesmus
- Astragalus