

BH Blood Sugar Support[®]

Banaba Extract

Properties:¹³

- Hypoglycemic, insulin like activity – blood glucose and lipid regulation
- Antioxidant affects
- Decrease in blood pressure
- Weight management

Clinical Study Findings:

- Exhibited a 13.5 % average decrease in blood glucose levels (N=24, Type 2 diabetes).
- Significant decrease in fasting glucose (16.6%) and significant improvement in glucose tolerance and glycated albumin (N=15, 1 year open label).
- 30% decrease in blood glucose levels (N=10, Type 2 diabetes, 2 week interventional).
- 12% decrease in fasting and postprandial glucose (N=12, non diabetic, 2 week open label).
- Lower glucose levels than control ($p < 0.05$) (N=31, Double blind crossover)

7. Y. Ikeda, et al, "Effectiveness and safety of banabamin tablet containing extract from banaba in patients with mild type 2 diabetes," *Japanese Pharm and Therap*, 27, (5).72–73, 1999. 8. Y. Ikeda, et al., "Blood glucose controlling effects and safety of single and long-term administration on the extract of banaba leaves," *J of Nutrition & Food*.(5)41–53, 2002. 9. W. V. Judy, et al, "Antidiabetic activity of a standardized extract (Glucosol) from *Lagerstroemia speciosa* leaves in Type II diabetics: a dose-dependence study," *J of Ethnopharmacology*, (87)1.115–7, 2003. 10. S. Tsuchibe, S. Kataumi, M.Mori, and H.Mori, "An inhibitory effect on the increase in the postprandial glucose by banaba extract capsule enriched corosolic acid," *J for the Integrated Study of Dietary Habits*, (17), 255–9, 2006. 11 M. Fukushima, et al., "Effects of corosolic acid on post-challenge plasma glucose levels," *Diabetes Research and Clinical Practice*, (77) 174–7, 2006. 12 Miura T, S Takagi, and T Ishida. Management of Diabetes and its Complications with Banaba (*Lagerstroemia speciosa* L.) and Corosolic acid. Evid Based Complimentary and Alt Med. 12.1-8. 2012.

BH Blood Sugar Support[®] Bitter Melon

Properties:

- Contains active substances with anti-diabetic and appetite suppressing properties¹³⁻¹⁶:
 - Charantin - blood glucose lowering effect
 - Vicine – glycol alkaloid shown to induce hypoglycemia
 - Polypeptide-p. 1 - an insulin-like compound (lower blood sugar)
 - Lectin - Suppresses appetite (hypoglycemic effect)

Clinical Study Findings:

- Daily dose of bitter melon significantly reduced blood glucose levels (T2D, 4 weeks).¹⁵
- Resulted in statistical significance in MetS improvement (N=42, 3 month, open label).¹⁷
- Daily dose resulted in statistical significance in glucose reduction (N=26, randomized, 4 weeks).¹⁸
- Statistically significant hypoglycemic effect (N=19 DM, controlled).¹⁹

13 <http://www.diabetes.co.uk/references.html>. Accessed 12Sept2017. 14 Tan MJ¹, et al. Antidiabetic activities of triterpenoids isolated from bitter melon associated with activation of the AMPK pathway. *Chem Biol*. 2008 Mar;15(3):263-73 15 A. Fuangchan et al. *Hypoglycemic Effect of Bitter Melon Compared With Metformin in Newly Diagnosed Type 2 Diabetes Patients*; *Journal of Ethnopharmacology*; Jan 2011. 16 L. Leung. *Anti-Diabetic and Hypoglycaemic Effects of Momordica Charantia (Bitter Melon): A Mini Review*; *British Journal of Nutrition*; ; Dec 2009 17 Tsi C, Chen EC, Tsay H, Huang C. Wild bitter gourd improves metabolic syndrome: A preliminary dietary supplementation trial. *Nutr J* 2012; 11: 4. 18 Hasan I, Khatoon S. Effect of Momordica charantia (bitter gourd) tablets in diabetes mellitus: Type 1 and 2. *Prime Res Med (PROM)* 2012;2(2):72-4. 19 Baldwa VS, Bhandari CM, Pangaria A, Goyal RK. Clinical trials in patients with diabetes mellitus of an insulin-like compound obtained from plant source. *Ups J Med Sci* 1977; 82: 39-41.

BH Blood Sugar Support[®]

Licorice

Properties:

- Contains amorfrutins shown *in vitro* ^{20,21}
 - To reduce blood sugar levels and inflammation
 - Prevent the development of a fatty liver
 - Weight management

Clinical Study Findings:

- Daily dosage reduced body fat and suppressed aldosterone (N=15, 2 weeks).²²
- Licorice flavonoid oil daily for 8 weeks reduced body fat, body weight, body mass index, and LDL cholesterol levels.²³

20. Weidner C, et al. Amorfrutins are potent antidiabetic dietary natural products. *Proc Natl Acad Sci U S A*. 2012 May 8;109(19):7257-62

21 Nakagawa K, et al. Licorice Flavonoids suppress abdominal fat accumulation and increase in blood glucose level in obese diabetic KK-A^y mice. *Biol Pharm. Bull.* 27(11) 1775-78 (2004)

22 . Armanini D, De Palo CB, Mattarello MJ, et al. Effect of licorice on reduction of body fat mass in healthy subjects. *J Endocrinol Invest.* 2003;26:646-50.

23 Fuhrman B, Volkova N, Kaplan M, et al. Antiatherosclerotic effects of licorice extract supplementation on hypercholesterolemic patients: increased resistance of LDL to atherogenic modifications, reduced plasma lipid levels, and decreased systolic blood pressure. *Nutrition.* 2002;18(3):268-73.

BH Blood Sugar Support[®] Cinnamon

Properties:

- Increase insulin sensitivity ²⁴
- Improve glucose and lipids in Type 2 diabetes ²⁵

Clinical Study Findings:

- Improved hemoglobin A1C levels (p<.001), blood sugar levels and lipid levels (N=109 T2D, 90 days).²⁴
- Resulted in significantly reduced fasting blood glucose levels and no change in placebo group (N=66 subjects T2D, 3 month, randomized double blind study).²⁶
- A review of six clinical trials with doses of cinnamon from 1–6 grams per day showed a “significant decrease” in average HbA1c levels of 0.09% (N=435, 40 days and 4 months). ²⁷
- A review of clinical trials associated a “statistically significant” decrease in fasting blood sugar, total cholesterol, LDL, and triglyceride levels, but not HbA1c (N=543, 4-18 weeks).²⁸

²⁴ Khan A, Khattak , et al. *Cinnamon improves glucose and lipids of people with type 2 diabetes*. Diabetes Care. 2003; 26: 3215-3218.

²⁵ Anderson, R. et al.; Agricultural Research Magazine; *Cinnamon Extracts Boost Insulin Sensitivity*; July 2000.

²⁶ Lu et al. Cinnamon extract improves fasting blood glucose and glycosylated hemoglobin level in Chinese patients with type 2 diabetes. Nutr Res 2012 Jun;32(6):408-12.

²⁷ Akilen R, et al. Cinnamon in glycaemic control: Systematic review and meta analysis, Clin Nutr. 2012 Oct, 31(5):609-15.

²⁸ Allen, R et al. Cinnamon use in Type 2 diabetes: An updated Systematic review and meta-analysis, Ann Fam Med. 2014 Sep; 11(5):452-9.

BH Blood Sugar Support[®]

Gymnema Sylvester

Properties:²⁹⁻³⁵

- Insulin secretion
- Control hyperglycemia
- May regenerate/repair beta cells
- Appetite suppressant

Clinical Studies Findings:

- Lowered blood glucose levels by 11% and increased glycemic control (N= 65, 90 days).³⁵
- As a supplement to conventional oral drugs, resulted in significant reduction in fasting blood glucose levels ($p < 0.001$), hemoglobin A1c levels and glycosylated plasma protein levels. 5 patients stopped conventional drugs and maintained normal glucose and hemoglobin levels (N=22, T2D, 18-20 months).²⁹
- Appeared to enhance endogenous insulin and possible regenerate residual beta cells (N=27 with ISSM, 10-12 months).³⁰

29 Baskaran K¹, Kizar Ahamath B, Radha Shanmugasundaram K, Shanmugasundaram ER. **Antidiabetic effect of a leaf extract from *Gymnema sylvestre* in non-insulin-dependent diabetes mellitus patients.** J Ethnopharmacol. 1990 Oct;30(3):295-300. 30 Shanmugasundaram ER, Rajeswari G, Baskaran K, et al. Use of *Gymnema sylvestre* leaf in the control of blood glucose in insulin-dependent diabetes mellitus. J Ethnopharmacol. 1990;30:281-294 31 Srivasta Y, Bhatt HV, Prem AS, et al. Hypoglycemic and life-prolonging properties of *Gymnema sylvestre* leaf extract in diabetic rats. Isr J Med Sci 1985;21:540-542. 10. 32 Okabayashi Y, Tani S, Fujisawa T, et al. Effect of *Gymnema sylvestre*, R.Br. on glucose homeostasis in rats. Diabetes Res Clin Pract. 1990;9:143-148. 11. 33 Venkatakrishna-Bhatt H, Srivastava Y, Jhala CI, et al. Effect of *Gymnema sylvestre*, R.Br. leaves on blood sugar and longevity of alloxan diabetic rats. Indian J Pharmacol 1981;13:99. 12, 32 34 Teresawa H et al. *Yonago Acta Med* 1994; 37: 117 35 Joffe DJ, Freed SH. *Newsletter for Professionals in Diabetes Care*. Oct 31, 2001, Issue 76.

BH Blood Sugar Support[®]

Yarrow, Cayenne and Juniper Berry

Yarrow Properties:

- β -cell protective³⁶ and anti-inflammatory effect^{38,39}
- Anti-oxidant (may be due to high content of flavonoids and phenolics)^{37,40}
- Reduce blood sugar⁴¹

Cayenne Properties:

- Contains capsaicin
 - Increase insulin and decrease blood glucose levels^{42,43}
 - Improve pain status in diabetic neuropathy⁴⁴
 - Attenuate postprandial hyperinsulinemia⁴⁵

Juniper Berry Properties:^{46,47}

- Anti-obesity effects
- Antioxidant
- Reduce blood sugar levels
- Increase insulin sensitivity and production

36 Zolghadri, et al. *Achillea Millefolium* L. Hydro-Alcoholic extract protects pancreatic cells by downregulating II-1 β and iNOS gene expression in diabetic rats. *Int J Mol Cell Med*. 2014; 3(4) 255-62.
37 Konyalioglu S, Karamenderes C. The protective effects of *Achillea* L. species native in Turkey against H₂O₂-induced oxidative damage in human erythrocytes and leucocytes. *J Ethnopharm*. 2005;102:221–227. 38 Zargari A. *Medicinal Plants*. 4th ed. Tehran: Tehran University Publication; 1996. pp. 106–117. 39 Tunón H, et al.; Evaluation of anti-inflammatory activity of some Swedish medicinal plants: Inhibition of prostaglandin biosynthesis and PAF-induced exocytosis. *Journal of Ethnopharmacology* 1995, 48: 61-76. 40 Candan F, et al. Antioxidant and antimicrobial activity of the essential oil and methanol extracts of *Achillea millefolium* subsp. *millefolium* Afan. (Asteraceae). *J Ethnopharmacol*. 2003 Aug; 87(2-3):215-20. 41 Molokovskii DS, et al. The action of adaptogenic plant preparations in experimental alloxan diabetes. *Probl Endokrinol (Mosk)*. 1989. 25(6):82-7. 42 Chaiyasit K, et al. Pharmacokinetic and the effect of capsaicin in *Capsicum frutescens* on decreasing plasma glucose level. *J Med Assoc Thai*. Jan 2009;92(1):108-113. 43 <https://www.mskcc.org/cancer-care/integrative-medicine/herbs/cayenne>. 44 Tandan R, et al. Topical capsaicin in painful diabetic neuropathy. Controlled study with long term follow up. *Diabetes Care*. 1992 Jan; 15(1):8-14. 45 Ahuja KDK, Robertson IK, Geraghty DP, Ball MJ. Effects of chili consumption on postprandial glucose, insulin, and energy metabolism. *Am J Clin Nutr* 2006;84:63–9. 46 Keskes H, et al. In vitro anti-diabetic, anti-obesity and anti-oxidant properties of *Juniperus phoenicea* L. leaves from Tunisia. *Asian Pac J of Tropical Biomedicine* 2014; 4(suppl 2): S649-55. 47 De Medina, S., et al. *Planta Medica Journal*. Jun 1994;60(3): 197-200.

BH Blood Sugar Support[®] Huckleberry

Properties: ⁴⁸⁻⁵²

- Contains
 - Anthocyanins – Antioxidant and improve retina problems
 - Chromium – Lowering glucose levels
 - Flavonoids – Improve blood circulation

Clinical Study Findings:

- Resulted in a significant reduction of glucose compared with the diabetic control as well as glibenclamide treatment (Controlled study, 4 weeks). ⁴⁸
- Significant improvements in the ophthalmoscopic parameters or in angiographic parameters in subjects with diabetic and/or hypertensive retinopathy(N=14, diabetic and/or hypertensive) double blind placebo control, 1 month).⁴⁹
- Significant improvement in subjects with polyneuritis due to vascular insufficiency was noted in microcirculation (N=15). ⁵⁰
- Effective in rapidly decreasing symptomology and improving both venous microcirculation and lymph drainage (N=568, review of uncontrolled studies). ⁵¹

BH Blood Sugar Support[®]

Alpha Lipoic Acid

Properties:⁵³⁻⁵⁷

- Antioxidant
- Helps turn glucose into energy
- Slow down cellular damage
- Improve insulin sensitivity
- Protect against metabolic syndrome
- Decrease side effects of peripheral neuropathy

Clinical Study Findings:

- Increased insulin sensitivity in diabetic patients (N=24, Controlled study, 4 weeks).⁵⁸
- Improved diabetic neuropathy and increased serum antioxidant capacity (N=46 T1D, 60D).⁵⁹
- Significant improvement in neuropathic symptoms (N=120 T2D, Placebo controlled, 3 weeks).⁶⁰

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BH Blood Sugar Support[®]

L-Taurine

Properties ^{61,62, 66}

- Essential amino acid
 - Cytoprotective protective
 - Antioxidant
 - Retinopathy, nephropathy , neuropathy atherosclerosis and cardiomyopathy benefits
 - Hyperglycemia suppression

Clinical Studies:

- Improved carbohydrate metabolism and decreased triglyceride (N=10 with IDDM, 30 days).⁶³
- Improved impaired insulin sensitivity and prevented the rise in lipid peroxidation products in plasma in normal, overweight subjects (N=6, 2 weeks).⁶⁴
- Exhibited protective role on endothelium (N=9, 2 weeks, crossover study).⁶⁵

BH Blood Sugar Support[®] Vanadyl Sulfate

Properties: ⁶⁷⁻⁷²

- Trace mineral
 - Improves insulin sensitivity
 - Improve glycemic control

Clinical Study Findings:

- Shown to reduce hyperglycemia, improved liver and muscle insulin sensitivity, significantly improved glycemic control and reduced cholesterol levels (LDL) (N=11 T2D, controlled 6 weeks).⁶⁸
- Resulted in significantly improved fasting plasma (3 weeks).⁷⁰
- Decrease in mean fasting blood sugar and daily doses of insulin (N=14 T1D, 30 months).⁷²

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71 Goldfine AB, Patti ME, Zuberi L, Goldstein BJ, LeBlanc R, et al. (2000) Metabolic effects of vanadyl sulfate in humans with non-insulin-dependent diabetes mellitus: In vivo and in vitro studies. Metabolism 49(3): 400-410.

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