Berberine

Berberine HCl 1 g

Available in 120 capsules

Clinical Applications

- Supports Healthy Blood Glucose and Lipid Metabolism*
- Supports Gastrointestinal Health*
- Supports Immune Health*

Berberine *is a naturally occurring plant alkaloid broadly used in traditional ayurvedic and Chinese herbal practices with demonstrated benefits for blood glucose and lipid metabolism. In addition, it is used to support gastrointestinal and immune health.**

Discussion

Berberine is a plant alkaloid derived from several different plant species that have been traditionally used in Ayurveda and traditional Chinese medicine for a variety of therapeutic applications. Modern clinical use as well as published in vivo, in vitro, and animal research studies have demonstrated a role for berberine in supporting healthy blood glucose and lipid metabolism as well as positively impacting gastrointestinal health.*[1-5]

One of the most time-honored uses of berberine is as a traditional remedy for loose bowels. Although the exact mechanism isn't clear, the beneficial use of berberine for this purpose has been attributed in animal and in vitro studies to its antisecretory effect and to its support of healthy microbial activity in the gastrointestinal (GI) tract.[6-8] Preliminary human clinical studies in India in the 1960s, followed by a slew of research in the 1980s, have helped to establish an evidence base for these effects. In a randomized controlled trial in subjects with watery stools thought to be caused by certain strains of bacteria, it was found that a single 400 mg dose of berberine resulted in significantly reduced stool volume in the test group.*[9]

While widely used for its effect on loose bowels, berberine was serendipitously discovered to have an effect on blood glucose metabolism in studies using it to ease GI upset in diabetic patients. Subsequent research has since established berberine's effect on blood glucose metabolism followed by lipid metabolism.[10] Although the mechanisms underlying these beneficial effects are not entirely clear, it has been hypothesized that the modulation of gut microbes may be one mechanism by which berberine affects blood glucose metabolism.[11] Results from animal and in vitro studies suggest that berberine moderates glucose and lipid metabolism through a multi-pathway mechanism that includes adenosine monophosphate activated protein kinase (AMPK), the c-Jun N-terminal kinase (JNK) pathway, and the peroxisome proliferator-activated receptor (PPAR)-alpha pathway.[2,10] Separate research on AMPK reports that the activation of the AMPK pathway stimulates glucose uptake and fat oxidation while suppressing lipogenesis and gluconeogenesis.[12] Berberine is also believed to be involved in the regulation of pancreatic beta cell function, and it has been observed to inhibit the expression of disaccharidases in the duodenum, resulting in less glucose being formed from carbohydrate digestion.*[13]

Although more research is needed to evaluate the effects of berberine in healthy subjects, several trials have assessed the hypoglycemic effect of berberine as an adjuvant to existing treatments. These studies were primarily in subjects with type 2 diabetes who were administered doses ranging from 1,000 to 1,500 mg per day. The results demonstrated a reduction in HbA1c, fasting blood glucose, and post-prandial plasma glucose levels.*[1]

A wide range of studies have also demonstrated that berberine provides cardiovascular benefits due to its lipid-lowering effect. According to the results of several studies including a meta-analysis of 27 clinical trials with over 2,500 participants, berberine doses ranging from 500 mg to 1,500 mg per day had a positive benefit on lipid profile cardiovascular markers, including LDL cholesterol, HDL cholesterol, and triglyceride levels.*[1,4,14,15]

In addition to the well-established effects reviewed above, berberine has been shown in animal and in vitro models to affect the function of the immune system. Research studies reveal that berberine alkaloids have an immunomodulatory effect through a shift in cellular immune response to Th2, Treg induction, and stimulation of IL-4 and IL-10.[16] The immunomodulatory effect of berberine on neuroprotective activity has also been well-explored.*[17]

XYMOGEN's **Berberine** contains 1,000 mg of berberine hydrochloride (HCl) derived from *Berberis aristata*, commonly known as Indian barberry. This multidimensional formula is designed to provide support for blood glucose and lipid metabolism while also promoting gastrointestinal and immune support.*

Blood Sugar Support

Cardiovascular Support

Gastrointestinal Support

Immune System Support

Berberine Supplement Facts

Serving Size: 2 Capsules

	Amount Per Serving	%Daily Value
Berberine HCL	1 g	**
** Daily Value not established.		

Other Ingredients: Capsule (hypromellose and water), dicalcium phosphate, ascorbyl palmitate, and silica.

DIRECTIONS: Take two capsules twice daily, or as directed by your healthcare professional.

Consult your healthcare professional before use. Individuals taking medication should discuss potential interactions with their healthcare professional. Do not use if tamper seal is damaged.

STORAGE: Keep closed in a cool, dry place out of reach of children.

FORMULATED TO EXCLUDE: Wheat, gluten, corn, yeast, soy, animal and dairy products, fish, shellfish, peanuts, tree nuts, egg, ingredients derived from genetically modified organisms (GMOs), artificial colors, artificial sweeteners, and artificial preservatives.

VEGETARIAN CAPS

References

1. Imenshahidi M, Hosseinzadeh H. *Phytother Res.* 2019 Mar;33(3):504-523. doi:10.1002/ptr.6252.
2. Zhang Q, Xiao X, Feng K, et al. *Evid Based Complement Alternat Med.* 2011;2011:924851. doi:10.1155/2011/924851.
3. Yin J, Xing H, Ye J. *Metabolism.* 2008 May;57(5):712-17. doi:10.1016/j.metabol.2008.01.013.
4. Zhang Y, Li X, Zou D, et al. *J Clin Endocrinol Metab.* 2008 Jul;93(7):2559-65. doi:10.1210/jc.2007-2404.
5. Li Z, Geng YN, Jiang JD, et al. *Evid Based Complement Alternat Med.* 2014;2014:289264. doi:10.1155/2014/289264.
6. Sack RB, Froehlich JL. *Infect Immun.* 1982 Feb;35(2):471-5. doi:10.1128/IAI.35.2.471-475.
7. Amin AH, Subbaiah TV, Abbasi KM. *Can J Microbiol.* 1969 Sep;15(9):1067-1076. doi:10.1139/m69-190.
8. Lakes JE, Richards CI, Flythe MD. *Anaerobe.* 2020 Feb;61:102145. doi:10.1016/j.anaerobe.2019.102145.
9. Rabbani GH, Butler T, Knight J, et al. *J Infect Dis.* 1987 May;155(5):979-84. doi:10.1093/infdis/155.5.979.
10. Zhou L, Yang Y, Wang X, et al. *Metabolism.* 2007;56(3):405-412. doi:10.1016/j.metabol.2006.10.025.
11. Han J, Lin H, Huang W. *Med Sci Monit.* 2011;17(7):RA164-RA167. doi:10.12659/msm.881842.
12. Wang Q, Zhang M, Liang B, et al. *PLoS One.* 2011;6(9):e25436. doi:10.1371/journal.pone.0025436.
13. Chen C, Yu Z, Li Y, et al. *Am J Chin Med.* 2014;42(5):1053-1070. doi:10.1142/S0192415X14500669.
14. Lan J, Zhao Y, Dong F, et al. *J Ethnopharmacol.* 2015 Feb 23;161:69-81. doi:10.1016/j.jep.2014.09.049.
15. Derosa G, D'Angelo A, Bonaventura A, et al. *Expert Opin Biol Ther.* 2013 Apr;13(4):475-82. doi:10.1517/14712598.2013.776037.
16. Kalmarzi RN, Naleini SN, Ashtary-Larky D, et al. *Oxid Med Cell Longev.* 2019 Nov 19;2019:6183965. doi:10.1155/2019/6183965.
17. Kumar A, Ekavali, Chopra K, et al. *Eur J Pharmacol.* 2015 Aug 15;761:288–297. doi:10.1016/j.ejphar.2015.05.068.

Additional references available upon request

All XYMOGEN® Formulas Meet or Exceed cGMP Quality Standards.

***These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**