

Garcinia (*Garcinia cambogia*), Hydroxycitric acid

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While some complementary and alternative techniques have been studied scientifically, high-quality data regarding safety, effectiveness, and mechanism of action are limited or controversial for most therapies. Whenever possible, it is recommended that practitioners be licensed by a recognized professional organization that adheres to clearly published standards. In addition, before starting a new technique or engaging a practitioner, it is recommended that patients speak with their primary healthcare provider(s). Potential benefits, risks (including financial costs), and alternatives should be carefully considered. The below monograph is designed to provide historical background and an overview of clinically-oriented research, and neither advocates for or against the use of a particular therapy.

Related Terms:

- Bitter kola, brindal berry, brindall berry, brindleberry, Cambodia, Camboge, *Cambogia gummi-guta* L., *Cambogia gutta* L., *Cambogia gutta* Lindl., CitriLean, CitriMax®, citrin, Citrinate, Criton K, desoxygambogenin, gambodge, gamboge (French), gambogellic acid, gambogenic acid, gambogin, gambogenin, gambogenin dimethyl acetal, Gambogium, gambooge, ganburin, *Garcinia atroviridis*, *Garcinia bracteata*, Garcinia Cambogi, *Garcinia Cambogia*, *Garcinia hanburyi*, *Garcinia hunburyi*, *Garcinia indica*, *Garcinia kola*, *Garcinia mangostana*, *Garcinia multiflora*, *Garcinia neglecta*, *Garcinia puat*, *Garcinia pyrifera*, garushinia kanbogia (Japanese), geelhars (Dutch), Gomaguta, Gomma gutta, Gomme Gutte, gomme-gutte (French), gorikapuli, Gumme gutte, Gummigut, Gummigutt (German), Gummiguttbaum (German), gummi-gutti (Italian), gummiguttræ (Danish), gummiharpiks (Danish), *Gummi-resina gutti*, *Gutta gamba*, *guttegom* (Dutch), Gutti, Guttiferae (family), hydroxycitrate, (-)-hydroxycitric acid (HCA), isogambogenin, isomoreollin B, korakkaipuli (Sinhalese), Malabar tamarind, *Mangostana cambogia* (Gaertn.), mangosteen, Mangoustanier du Cambodge (French), morellin dimethyl acetal, moreollic acid, rubber resin, Tamarinier de Malabar (French), uppagi.

BACKGROUND

- *Garcinia (Garcinia cambogia)* is a diminutive purple fruit native to India and Southeast Asia. It is used as a weight loss aid, but the evidence is inconclusive. The rind is rich in hydroxycitric acid (HCA) and has been used for centuries throughout Southeast Asia as a food preservative, flavoring agent and carminative (induces expulsion of gas from stomach or intestines). According to Indian folk tradition, *Garcinia cambogia* is used for rheumatism and bowel complaints.
- Neither acute nor chronic toxicity is reported with regular consumption of garcinia products as either food or tonics. These products have been used routinely in the coastal areas of South Asia for centuries and they continue to be consumed in large amounts. There is preliminary evidence for the use of garcinia in exercise performance and weight loss, although current, available evidence is mixed.

SCIENTIFIC EVIDENCE

Uses

These uses have been tested in humans or animals. Safety and effectiveness have not always been proven. Some of these conditions are potentially serious, and should be evaluated by a qualified healthcare provider.

Grade *

<p><u>Exercise performance</u></p> <p>Hydroxycitric acid, a constituent in garcinia, may increase fat metabolism and enhance exercise performance. Additional study is needed to confirm these results.</p>	<p><u>C</u></p>
<p><u>Weight loss</u></p> <p>Evidence supporting hydroxycitric acid, the active ingredient in <i>Garcinia cambogia</i>, for weight loss is mixed. Additional study is warranted to clarify early findings.</p>	<p><u>C</u></p>
<p><i>*Key to grades: A: Strong scientific evidence for this use; B: Good scientific evidence for this use; C: Unclear scientific evidence for this use; D: Fair scientific evidence against this use (it may not work); F: Strong scientific evidence against this use (it likely does not work).</i></p>	

TRADITION/THEORY

The below uses are based on tradition, scientific theories, or limited research. They often have not been thoroughly tested in humans, and safety and effectiveness have not always been proven. Some of these conditions are potentially serious, and should be evaluated by a qualified healthcare provider. There may be other proposed uses that are not listed below.

- Anthelmintic (expels worms), antibacterial, antifungal, anti-inflammatory, antimicrobial, antioxidant, antitumor, antiviral, appetite suppressant, bowel disorders, bronchodilator (relaxes the muscles of the airways), cancer, carminative (reduces gas), catarrh (inflammation of mucous membrane), cathartic (produces bowel movements), constipation, diabetes, diuretic, dropsy (edema), dysmenorrhea (painful menstruation), edema (swelling), Ebola virus (*Garcinia kola*), flavoring agent, food uses, gastric ulcer prophylaxis, hepatoprotection (liver protection), HIV, influenza (*Garcinia kola*), intestinal motility disorders, menstrual disorders, rheumatism, sore throat, tumors, urinary tract disorders, uterus disorders.

DOSING

The below doses are based on scientific research, publications, traditional use, or expert opinion. Many herbs and supplements have not been thoroughly tested, and safety and effectiveness may not be proven. Brands may be made differently, with variable ingredients, even within the same brand. The below doses may not apply to all products. You should read product labels, and discuss doses with a qualified healthcare provider before starting therapy.

Adults (over 18 years old)

- Dosing evidence is conflicting, and there is no proven effective dose for garcinia. There is sufficient available scientific evidence suggesting that intake of hydroxycitric acid at levels up to 2,800 milligrams per day is safe for human consumption. Garcinia has been well tolerated for up to 12 weeks in available human trials.
- For exercise performance, 250 milligrams of hydroxycitric acid capsules administered for five days may be beneficial. However, a dose of 3,000 milligrams was not effective in three doses daily for three days in adult untrained males. For weight loss, 1,500 milligrams of hydroxycitric acid per day (three times daily as 500-milligram-caplets) given in combination with a high-fiber, low-energy diet has been studied with no effect on weight loss. However, hydroxycitric acid given three times daily 30-60 minutes before meals for a total of 4,667 milligrams per day reduced body weight index and body mass index in 60 moderately obese subjects.

Children (under 18 years old)

- There is no proven safe or effective dose for garcinia in children, and use is not recommended.

SAFETY

The U.S. Food and Drug Administration does not strictly regulate herbs and supplements. There is no guarantee of strength, purity or safety of products, and effects may vary. You should always read product labels. If you have a medical condition, or are taking other drugs, herbs, or supplements, you should speak with a qualified healthcare provider before starting a new therapy. Consult a healthcare provider immediately if you experience side effects.

Allergies

- Avoid in individuals with a known allergy or hypersensitivity to *Garcinia cambogia*.

Side Effects and Warnings

- Garcinia has been well tolerated for up to 12 weeks in available human trials. Hydroxycitric acid from the rind given by mouth is likely safe in recommended doses.
- Garcinia may lower blood sugar levels. Caution is advised in patients with diabetes (high blood sugar) or hypoglycemia (low blood sugar), and in those taking drugs, herbs, or supplements that affect blood sugar. Serum glucose levels may need to be monitored by a qualified healthcare professional, including a pharmacist, and medication adjustments may be necessary.
- Rhabdomyolysis (serious and potentially fatal disease involving degeneration of skeletal muscle) has been reported three hours after ingestion of a weight-loss herbal medicine containing ma huang (ephedrine), guarana (active alkaloid caffeine), chitosan, *Gymnena sylvestre*, *Garcinia cambogia* (50% HCA), and chromium. Since there were multiple substances, it cannot exclusively be attributed to *Garcinia cambogia*. Nevertheless, use cautiously in patients with a history of rhabdomyolysis or in patients taking HMG-CoA reductase inhibitors ("statins") as they may increase the risk for rhabdomyolysis.
- Avoid in patients with Alzheimer's disease and other dementia syndromes due to the theoretical possibility of forming acetylcholine in the brain.

Pregnancy & Breastfeeding

- Garcinia is not recommended in pregnant or breastfeeding women due to a lack of available scientific evidence.

INTERACTIONS

Most herbs and supplements have not been thoroughly tested for interactions with other herbs, supplements, drugs, or foods. The interactions listed below are based on reports in scientific publications, laboratory experiments, or traditional use. You should always read product labels. If you have a medical condition, or are taking other drugs, herbs, or supplements, you should speak with a qualified healthcare provider before starting a new therapy.

Interactions with Drugs

- Garcinia may lower blood sugar levels. Caution is advised when using medications that may also lower blood sugar. Patients taking drugs for diabetes by mouth or insulin should be monitored closely by a qualified healthcare professional, including a pharmacist. Medication adjustments may be necessary.
- Taking hydroxycitric acid with statin medications, such as atorvastatin calcium (Lipitor®), may increase the risk of rhabdomyolysis (disease involving the degeneration of skeletal muscle). An incidence of rhabdomyolysis was reported in a case report of a patient taking a weight-loss

herbal medicine that contained 50% hydroxycitric acid.

Interactions with Herbs & Dietary Supplements

- Garcinia may lower blood sugar levels. Caution is advised when using herbs or supplements that may also lower blood sugar. Blood glucose levels may require monitoring, and doses may need adjustment.
- The combination of HCA-SX (calcium/potassium-bound hydroxycitric acid complex) with niacin-bound chromium or *Gymnema sylvestre* may increase the effects on weight loss. Consult with a qualified healthcare professional, including a pharmacist, before combining therapies.

AUTHOR INFORMATION

- This information is based on a systematic review of scientific literature edited and peer-reviewed by contributors to the Natural Standard Research Collaboration (www.naturalstandard.com).

REFERENCES

Natural Standard developed the above evidence-based information based on a thorough systematic review of the available scientific articles. For comprehensive information about alternative and complementary therapies on the professional level, go to www.naturalstandard.com. Selected references are listed below.

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