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Garcinia

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Garcinia

Garcinia (*Garcinia gummi-gutta* (L.) Roxb., formerly known as *Garcinia cambogia* (Gaertn.) Desr.) is a small, edible, pumpkin-like fruit that grows in parts of Southern Asia. In recent years, garcinia has received much media attention in relation to its reputed weight-loss properties. However, traditional uses of garcinia were to treat intestinal discomfort, parasitic infections, and rheumatism.[1]

Common names

Garcinia, malabar tamarind, brindleberry, kudam puli, among many others.

Preparations

Historically, the fruit rind was dried, smoked, and used in cooking; it was added to foods to preserve them and to enhance their taste. Presently, garcinia rind extract is marketed in solid-dose forms (eg tablets, capsules) and as powders. Garcinia products are available as single-ingredient products and as multi-ingredient products containing other herbal ingredients (eg green tea (*Camellia sinensis* (L.) Kuntze) leaf extract, capsicum (*Capsicum annuum* L.) fruit extract, mangosteen (*Garcinia mangostana* L.)) reputed to lead to weight loss. Some garcinia products contain up to 750 mg of hydroxycitric acid (HCA), a key constituent of garcinia fruit rind extract, per tablet.

Manufacturers' claims

Garcinia products are marketed for their weight-loss/anti-obesity properties, to increase energy, and to support digestive function, among other health claims.

Summary message

Garcinia gummi-gutta (L.) Roxb., commonly known as garcinia, is promoted for its reputed effects in achieving weight loss. Hydroxycitric acid (HCA) is considered the main bioactive ingredient in garcinia fruit rind, the part of the plant usually used medicinally. Preclinical studies indicate that garcinia fruit rind extracts and HCA may suppress appetite, reduce food intake, and contribute to weight loss. However, clinical evidence is conflicting. The safety profile of garcinia has not yet been comprehensively evaluated. Garcinia use has been associated with gastrointestinal and hepatic adverse reactions, but causality has not been definitively established. There have also been isolated reports of mania and psychosis associated with use of garcinia. *In vitro*, garcinia extract, but not isolated HCA, inhibits CYP2B6 activity; the clinical relevance of this for patients taking CYP2B6 substrate medications (eg certain opioids (methadone, pethidine), cancer chemotherapy (cyclophosphamide), antiretrovirals (efavirenz, nevirapine), and antiepileptics (sodium valproate)) is not yet known. Adulteration of some garcinia products with controlled substances (eg sibutramine) has been reported.

Active constituents

HCA is considered to be the main bioactive constituent of garcinia fruit rind. In preclinical studies, HCA inhibits the enzyme lyase, which is required for fatty acid synthesis, thereby reducing adipose tissue production. Through this mechanism, it is believed that HCA exerts its weight-loss effects.

Evidence for efficacy

Studies examining the effect of garcinia on bodyweight and body composition have shown conflicting results. A systematic review and meta-analysis of randomised controlled trials (RCTs) of the effects of garcinia supplementation on obesity indices in people who were overweight or obese found that garcinia, compared with placebo, significantly reduced bodyweight (BW) and body mass index (BMI), waist circumference, and percentage of fat mass. However, there was substantial heterogeneity among the included studies[2] and, overall, the studies included only small numbers of participants. A new randomised, controlled study, involving 44 overweight/obese women with non-alcoholic fatty liver disease, evaluated the effects of tablets containing *G. cambogia* bark leaf extract (containing HCA 187 mg, with vitamins B1 and C) taken as two tablets three times daily before meals for 8 weeks, with or without adhering to a calorie-restricted diet. There were no significant differences in anthropometric measures (BW, BMI) between groups, but statistically significant differences in serum concentrations of some liver enzymes were reported.[3] Several other studies have assessed the effects of products containing garcinia, or HCA, in combination with other (usually herbal) ingredients and have reported conflicting results.[4]

Adverse effects

The safety profile of garcinia has not yet been comprehensively evaluated. Gastrointestinal adverse reactions have been reported following use of garcinia fruit rind extract and HCA. There have also been isolated reports of hepatic adverse reactions, including raised liver enzyme concentrations, jaundice, and acute hepatitis, in people who had taken garcinia, or multi-ingredient products containing garcinia and other herbal and non-herbal substances. Causality in these cases has not been definitively established, and the mechanism by garcinia fruit rind extract, or HCA, could cause hepatotoxicity is not known. Garcinia use has also been associated with a small number of cases of mania and psychosis, including in some patients with a history of psychiatric illness and/or patients who were taking a selective serotonin reuptake inhibitor (SSRI). The evidence for this association is very limited and a causal relationship has not been established.

There is a lack of information on the use of garcinia fruit rind extracts and HCA during pregnancy and breastfeeding; as a general precaution, until further information is available, products containing garcinia fruit rind extracts, or HCA, should be avoided in women who are pregnant or breastfeeding.[5]

Adulteration of some garcinia products, including with controlled substances (eg sibutramine), has been reported by regulatory authorities.

Interactions

In-vitro experiments have shown that garcinia extract, but not isolated HCA, inhibits CYP2B6 activity in a concentration-dependent manner. The clinical relevance of this, if any, is not clear. As a general precaution, health professionals should consider the potential for drug interactions where patients are taking, or wish to take, garcinia with medicines metabolised by CYP2B6 (eg certain opioids (methadone, pethidine), cancer chemotherapy agents (cyclophosphamide), antiretrovirals (efavirenz, nevirapine), and antiepileptics (sodium valproate)).

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Conflicts of interest. J. B. is a co-author/co-editor of books on scientific aspects of herbal medicines and receives/has received royalties from Pharmaceutical Press, Elsevier, and SpringerNature/MacMillan Education. Authors do not have any other conflicts of interest to declare.

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