

GUARANA

- **Scientific names**
 - Paullinia sorbilis; Paullinia cupana kunth¹⁻⁵
- **Common names**
 - Brazilian Cocoa, Guar Gum, Guarana Paste, Zoom^{6,7}
- **Description of active ingredients**
 - Contains a crystallizable principle called guaranine, structurally similar to caffeine chemically as a methylxanthine derivative (primary ingredient) acting as a nervine tonic, which exists in the seeds, united with tannic acid (similar to the caffeine-tannic acid complex in tea). According to the Merck Index, guarana is approximately 4% caffeine, 5% catechutannic acid (which is sometimes used as a dye for clothing), resin, saponin, starch, and 0.6% catechic acid, 12% tannins, 30 % starch, and 15% protein^{1-5,8}. The only stimulant in guarana is apparently caffeine.
- **MOA**
 - Guarana contains exceptionally high levels of caffeine and tannins that are thought to be responsible for most of its pharmacologic effects. Caffeine increases norepinephrine (NE) and epinephrine (Epi) secretion and blocks central adenosine receptors. Tannins are supposed to precipitate proteins and to force dehydration of mucosal tissues. Studies about the active principle of guarana and its mechanism of action are lacking. Through its stimulatory effect centrally, it can have positive inotropic effects on the heart and causes relaxation of the vascular muscles and the bronchial tube.⁸
- **Current indications and efficacy**
 - Guarana is an herbal medicine that has been used as a stimulant, aphrodisiac, and appetite suppressant in the treatment of obesity, and dyslipidemia (shown by studies).^{12,14} It has also been used for diarrhea, protection from malaria, and weight loss.^{6,7} Guarana has also been tested for improving metabolic control in Type-2 diabetes patients.¹¹ Guarana may be effective in improving metabolic control in selected non-insulin-dependent diabetic patients not adequately controlled on sulfonylurea agents.⁹ In the treatment of dyslipidemia, the primary role of Guarana appears to be in combination with other established statin agents (i.e. lovastatin) due to its high dosing requirements for benefit as monotherapy.¹² Guarana is primarily used as a stimulant for weight loss in obese patients (also for FBG control in T2DM and dyslipidemia). However, high doses are needed to attain efficacy which can substantially increase risk for cardiotoxicity (arrhythmias). Therefore, The FDA is currently seeking to ban the use of Guarana as a weight-loss ingredient.¹³

- **Contraindications/allergies**
 - Patients with a history of arrhythmias, breastfeeding, hypersensitivity to guarana, pregnancy (possible teratogenic effects). Due to its stimulatory (ephedra-like) effects, this product should be used cautiously in athletes and those involved in strenuous physical activity due to risk of cardiac arrhythmias. Due to links of athlete deaths with ephedra products, guarana would not be recommended for use in athletes (with the exception of low doses – 20 to 200mg).¹⁰ Additionally, use of guarana should not be used in patients with GI obstruction since it is fermented to form short-chain fatty acids in the colon causing flatulence, nausea, abdominal discomfort, and diarrhea.⁹

- **Dosage forms**
 - Tablet, beverage, paste, gum (all oral forms)⁹

- **Recommended doses**
 - For short-term treatment of fatigue, exhaustion and headache relief, take 2 to 4 tablets before breakfast or one-half hour before mealtime (800 mg per tablet). Daily oral intake should not exceed 3 grams of guarana powder or its equivalent³⁻⁷. Single doses can contain 200mg (capsules) to 800 mg (tablets) guarana.

- **Duration**
 - Guarana is not recommended for excessive long-term use (greater than seven days due to increased risk of cardiac toxicity, anxiety, nausea, seizures).^{6,7} However, doses as low as 2–3 mg/kg are effective in improving performance (caffeine).¹⁰

- **Drug interactions**
 - *Clozapine* (caffeine component inhibits CYP1A2, a major metabolic pathway for clozapine. With such inhibition, clozapine metabolism is decreased with resultant increased clozapine levels), *fluvoxamine* (may inhibit the metabolism of the caffeine content of guarana. Patients may be predisposed to symptoms of excessive caffeine such as insomnia, headache, restlessness, nervousness, palpitations, and arrhythmias), *phenylpropanolamine* (caffeine can interact with PPA in additive fashion increasing blood pressure possibly leading to arrhythmias). However, *PPA* has been removed from the market. Excessive use of guarana can lead to hypokalemia and increase digoxin toxicity.⁹

- **Drug-Disease interactions**
 - Guarana should not be used or used with caution in patients with cardiovascular disease, chronic headache, diabetes, patients with a history of insomnia or psychiatric disorders such as mania, gastric ulcer, and in those patients taking theophylline.^{3,6}

- **Other safety issues**
 - With proper administration (therapeutic doses ranging from 200 – 3000mg per day), there are no known health hazards or side effects associated with the use of guarana. Caution is advised for use in patients with sensitive cardiovascular, renal diseases, hyperthyroidism, patients with high tendency of spasms and panic anxiety (due to the stimulatory effect of caffeine). Pregnant patients should take less than 300mg of guarana daily and try to avoid if possible. Its use should be avoided in nursing mothers as well as this herb could induce sleeping disorders of the infant.

References

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