Guayusa

What is it

Guayusa (*Ilex guayusa*) is an evergreen tree that is native to South America. It grows well in the upper Amazon region of Ecuador.[1] Ecuadorian natives have traditionally used Guaysua leaves to brew tea to stimulate the body and mind.[2] It has been used for its health benefits since ancient times by Amazon indigenous tribes.[1,2]

Guayusa tea contains health promoting, bioactive compounds such as methylaxanthines, chlorogenic acids, and flavonoids.[1] It has more theophylline and theobromine (chlorogenic acids) than mate tea leaves.[3] It also contains caffeine and l-theanine. It is high in antioxidants including include carotenoids. Lutein is the most abundant carotenoid in Guayusa and has benefits for eye health.[1,4]

Why is it used?

Guayusa has been used for a variety of reasons, most notably being its stimulant effect due to the caffeine content of guayusa.[4] It also contains compounds such as antioxidants and other plant-based chemicals that may provide health benefits.[1,4]

What Does the Science Say?

**It is important to note that research on guayusa is limited, and more research is currently needed before using guayusa for specific health conditions or health benefits.*

Anti-Inflammatory and Antioxidant Activity

Research suggests that bioactive compounds from guayusa may help to reduce inflammation in the body.[3] These compounds – including ursolic acid – may help to prevent and manage chronic health conditions such as diabetes and metabolic syndrome.[5] Guayusa is rich in caffeoylquinic acid derivatives which are partly responsible for its antioxidant and anti-inflammatory activities.[6]

Antidiabetic Effects

Caffeolyquinic acids may provide antidiabetic effects.[6] Research has shown chlorogenic acid can enhance insulin sensitivity, glucose tolerance, and inhibit gluconeogenesis.[6] Anti-inflammatory and antioxidant properties of guayusa may also contribute to potential antidiabetic effects.[5]

Antimicrobial Activity

There is some evidence that guayusa has antimicrobial activity.[7] One study found that it has antimicrobial activity against microorganisms associated with periodontal disease.[7]

Cognitive Benefits, Stress, and Anxiety

Doses of 100-300mg of caffeine have been found to be the most beneficial for having potential cognitive benefits.[4] Improvements in cognitive performance from caffeine consumption are well established and include improvement in tests assessing attention and alertness. Caffeine

combined with l-theanine – which are both present in guayusa – may improve attention and promote cognitive benefits.[3]

L-theanine releases serotonin and dopamine, along with GABA. These neurotransmitters promote relaxation and calmness. L-theanine appears to have most benefit when combined with caffeine as in guayusa. L-theanine may reduce unpleasant side effects from caffeine, such as jitteriness.[3]

Flavonoids in guayusa have antioxidant capacity which may provide cognitive benefits. Flavonoids can cause vasodilation leading to increased blood flow to the brain.[3]

The phytochemicals in guayusa may work synergistically with caffeine and/or theobromine to promote cognitive benefits and reduce side effects commonly associated with caffeine consumption.[3]

Chlorogenic acids found in guayusa have antioxidant and anti-inflammatory properties which may promote neurocognitive benefits by protecting neurons.[3] These compounds may also help to reduce anxiety and enhance mood.[3]

Cardiovascular Benefits

Theobromine and other chlorogenic acids found in guayusa may lower blood pressure and improve blood vessel function through release of nitric oxide and thromboxane A2.[3]

Safety

Studies have not found harmful effects from guayusa consumption.[4,8,9] More specifically, no safety concerns have been found at doses containing 200mg of caffeine from guayusa.[8] Research has concluded that guayusa poses no greater risk to human health than existing teas including green tea and yerba mate.[4]

Side effects: Not enough information; no common side effects currently known.

Dosing: There is currently not enough information known at this time for dosing of guayusa for specific conditions or potential health benefits. Doses of 100-300mg of caffeine have been found to be most beneficial for promoting cognitive benefits.[4] L-theanine promotes calmness at doses of 200mg, and l-theanine is present in guayusa.

Practical uses: Guayusa is most commonly used as a tea, and as an ingredient in functional foods.

Summary and Recommendations

Guayusa is safe to consume and contains many beneficial plant-based compounds including antioxidants which contribute to its anti-inflammatory properties. It contains caffeine and can be used as a simulant to increase alertness. Currently there is not enough research to use guayusa for specific health benefits or conditions.

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Green tea extract:

What is it?

Green tea is made by lightly steaming leaves of *Camellia sinesis.* It contains caffeine and beneficial plant-based compounds including polyphenols. One of the main polyphenols in green tea is epigallocatechin gallate (EGCG) which has been associated with many of green teas potential health benefits. It comes in many forms including loose leaf teas, tea bags, powdered green tea, and green tea extract.[10,11]

Why is it used?

Green tea is used for various reasons including the following: [10,11]

- To improve cognitive performance and mental alertness
- Treat intestinal issues
- Headaches
- Fatty liver disease treatment
- Depression
- Weight loss
- Osteoporosis
- Cancer prevention
- To promote cardiovascular health
- Diabetes
- Chronic fatigue syndrome
- Systemic Lupud Erythematosus
- Hypotension
- Cavities
- Skin damage

What does the science say?

Polyphenols (catechins) in green tea extract have shown antioxidant, antitumorigenic, anti-cancer, and anti-microbial properties. The polyphenols in green tea have been associated with a variety of potential health benefits including reduced cholesterol, lower risks of cardiovascular disease and diabetes, prevention of certain types of cancers, and helping limit the growth of uterine fibroids.[10,11]

Mental Alertness

According to Natural Medicines Database green tea contains caffeine which may help to prevent decline in alertness and cognitive capacity when taken throughout the day.[11]

Cardioprotective Effects

Green tea consumption has been associated with a reduced risk in cardiovascular disease.[11,12] Green tea has also been shown to possibly help reduce risk of death in individuals who have cardiovascular disease.[13]

Green tea has been found to have cardioprotective effects including helping to lower blood pressure.[14] According to Natural Medicines Database, green tea may be possibly effective in lowering blood pressure.[11] Preliminary evidence suggests green tea extract may reduce both systolic and diastolic blood pressure.[11]

Green tea has also been found to help lower cholesterol levels, specifically the LDL or "bad" cholesterol levels.[15] Elevated LDL cholesterol levels are associated with a higher risk of heart disease. According to Natural Medicines Database green tea may help lower cholesterol and triglycerides.[11] Taking green tea extract containing 150-2500 mg catechins daily for 24 weeks reduced total cholesterol and "bad" or LDL cholesterol levels.[11] Preliminary evidence suggests taking green tea extract may reduce oxidation of LDL cholesterol which may help to prevent cardiovascular disease.[11,16]

Green tea consumption has been associated with reduced risk of stroke.[17,18]

Cancer prevention

Some studies have found green tea consumption has been linked to a lower risk of liver, gastric, and ovarian cancer.[19,20,21] A study concluded that individuals who drank more than 5 cups of green tea per day have been found to have a lower risk of dying from cancer.[22]

A study found that individuals who took green tea extract in the form of tablets twice daily providing a total of 900mg of extract for a year had fewer colon polyps compared to individuals who did not consume green tea extract.[23] Colon polyps increase risk for developing colon cancer.

Research is currently mixed on green teas ability to reduce risk of prostate cancer. More research is needed. Some studies using green tea extract have shown promise in preventing prostate cancer.[24,25]

Drinking 3+ cups of green tea per day has been associated with lower risk of breast cancer recurrence in cancer survivors.[26]

Drinking green tea has been associated with lower risk of lung cancer.[27]

According to Natural Medicines Database, people who drink green tea have been found to have a lower risk of endometrial cancer.[11]

Uterine Fibroids

Taking green tea extract may be helpful for individuals with uterine fibroids.[28] More research is currently needed.

Diabetes

Green tea may help to reduce Diabetes risk.[29]

Weight Management

Green tea extract may help to reduce weight by inhibiting starch absorption.[30] According to Consumer Labs green tea extracts that include caffeine may be effective for facilitating short

term weight loss.[10] Further studies are needed before it can be recommended to use green tea for weight loss.

Safety

Green tea extract has been found to be possibly safe according to Natural Medicines Database when it contains 7% to 12% caffeine used for up to 2 years.[11] It has been advised to take green tea extracts with food or a meal to avoid very rare risk of liver toxicity/damage. Green tea catechins dosed at doses equal to or greater than 800mg/day may be associated with risk for liver injury.[10] Overall, the catechins from green tea infusions and drinks have been found to be safe. Green tea may be unsafe due to its caffeine content in very high doses. Doses of caffeine greater than 600mg per day or ~12 cups of green tea has been associated with safety issues.[11]

Dose:

Typical dose of green tea is 3 or more cups per day for potential health benefits. Supplements typically provide 200-300mg per day.[11] To stimulate mental alertness a product containing green tea extract (360mg capsule) has been used taken twice daily after meals. This product also contained L-theanine. More research is needed on dosage for mental alertness and effectiveness.[11]

Side effects:

Potential side effects include side effects associated with excess caffeine consumption. Side effects may include increased blood pressure, constipation, rash, liver injury at high doses of green tea extract.[10,11]

Summary and Recommendations:

Green tea extract is relatively safe to consume and may provide certain benefits due to its catechin content; most notably EGCG. The catechins in green tea may have benefits for lowering cholesterol, reducing growth of uterine fibroids, and have been associated with reduced risk for cancer, diabetes, and cardiovascular disease. The caffeine in green tea may help to prevent decline in mental alertness and improve cognitive capacity when taken during the day.[11]

Lions Mane (*Hericium erinaceus*)

What is it: A mushroom that grows on dead trunks of hardwood trees (oak, beech, and Japanese walnut trees). It has a long history of use in Chinese medicine, and is a culinary medicinal mushroom.[11]

What is it used for? [11]

It is used in Chinese and Japanese dishes as a food ingredient. For its potential health benefits/medicinal qualities it has been used for the following:

- Cognitive impairment, and to improve overall cognitive function and memory
- Depression
- Anxiety
- Gastritis
- Gastric ulcers
- H. Pylori
- Diabetes
- Cancer
- Hyperlipidemia
- Weight loss
- Immune system benefits
- Anti-fatigue
- Ant-aging

What does the science say?

Lions mane is rich in beta-glucan polysaccharides which have anti-cancer, immune-modulating, hypolipidemic, antioxidant, anti-inflammatory, and neuroprotective properties.[11,31] This mushroom has also been reported to have anti-microbial, anti-hypertensive, anti-diabetic, and wound healing properties.[32]

Cognitive impairment/memory

There is some evidence to suggest lions mane may help improve cognitive function. Evidence suggests it may promote positive brain and nerve health by inducing nerve growth factor from its bioactive ingredient.[33] Research is currently lacking in this area, and more research is needed at this time.

Other

Some research conducted in mice suggests it may be beneficial to consider using lions mane as a future treatment for depressive and anxiety disorders. More research is needed, and human trials are warranted.[34]

Preliminary research has found that taking lions mane before meals may help with abdominal pain and stomach inflammation (gastritis). More research is currently needed in this area.

Safety: Safe when used short-term. Not enough evidence to determine safety with long-term use.[11]

Dose: Lions mane powder 1000mg three times daily for 16 weeks has been used for cognitive impairment/memory. More research is needed to determine dosing of lions mane.[11]

Side effects: Gastrointestinal discomfort has been reported however, it appears to be well-tolerated in most individuals.[11]

Summary and Recommendations: Lions mane appears to be safe when consumed as a food and when used short-term. It has beta-glucan polysaccharides which have anti-cancer, anti-inflammatory, antioxidant, immune-modulating, and neuroprotective properties. More research is currently needed when it comes to using lions mane for specific health purposes and health conditions.

Cordyceps

What is it: Cordyceps is a fungus parasite that lives on caterpillars in mountain regions of China. It can be artificially propagated in the laboratory.[10,11]

What is it used for: strengthening the immune system, improving athletic performance, reducing effects of aging, reducing side effects of chemotherapy and radiation treatment, promoting longevity, treating fatigue, as a stimulant, as a tonic, and as an adaptogen to increase energy.[11]

What does the science say: Current evidence is lacking to support its use in promoting energy and combating fatigue. Some studies support that it seems to stimulate immune function.[11] Preliminary evidence suggests it may help combat stress, control blood sugar levels, reduce cancer risk, and lower blood pressure, however, more research is needed at this time.[10]

Safety: Appears to be safe when used orally and appropriately based on limited research.[11] Although rare, there have been cases of lead poisoning.[11]

Adverse effects: Generally, well tolerated. May cause diarrhea, constipation, and abdominal discomfort in some individuals, although this is uncommon.[11]

Dose: A typical traditional recommended dose is 5-10g per day.[11] Concentrated extracts are available and taken at lower doses.[11]

Summary and Recommendations: More research is needed on Cordyceps at this time. Research suggests it may stimulate immune function and have immune enhancing properties. It is considered safe when used orally and appropriately.

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