

Technical Data Report

for

Caigua (*Cyclanthera pedata*)



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Caigua

Family: Cucurbitaceaea

Taxon: *Cyclanthera pedata* (L.) Schrad.

Synonyms: *Cyclanthera pedata* var *edulis* (Naudin) Cogn. and *Momordica pedata* L.

Common names: caigua, achocha, achoccha, achojcha, caiba, caihua, caygua, concombregrimpant, korila, kaikua, lady's slipper, pepino de comer, pepino de rellenar, pepino andino, slipper gourd, stuffing cucumber, taimia de comer, taimia de cipo, wild cucumber

Parts Used: fruit, seeds

Herbal Properties & Actions		
Main Actions:	Other Actions:	Standard Dosage: Fruit juice
lowers cholesterol	relieves pain	Fresh: 1/4 cup twice daily
reduces blood pressure	reduces inflammation	Capsules: 1-2 g twice daily
cleans arteries	aids digestion	
balances blood sugar		
increases urination		

Caigua is a slender tropical vine that is indigenous to South America. It grows up to 40 feet in length with long tendrils for climbing. The leaves are 4-5 inches wide and divided into several lobes. It produces a pale green, semi-flattened fruit resembling a cucumber that is 4-6 inches long and 2-3 inches wide. Unlike a cucumber, the inside of the fruit is hollow (much like a bell pepper), with several black seeds attached to a placenta. In South America the fruits are eaten much like bell peppers - either raw or cooked (after the seeds are removed). They are also prepared as stuffed peppers; stuffed with meat, fish or cheese and then baked—earning it's name "stuffing cucumber." Caigua is currently cultivated as a food in the Carribean, Central and South America. It has been introduced into Florida where it is called "wild cucumber" and is considered a weed pest in lawns and gardens.

There are about 30 species of *Cyclanthera* that are native to warm-temperate and tropical America. Caigua can withstand more cold than many others and it can be found growing prolifically in mountainous valleys in South America up to 2,000 m in elevation. The plant is known in Peru by its Spanish name *caigua* or *caihua*. Its indigenous Quechua name is *achocha* or *achoccha*.

TRIBAL AND HERBAL MEDICINE USES

In herbal medicine systems in Peru, a tea from the fruit seeds is used for controlling high blood pressure. The seeds are also dried and crushed and taken in 1 gram doses for intestinal parasites. The seeds and/or the fruits are also recommended for gastrointestinal disorders. The leaves of caigua are considered hypoglycemic and prepared in a decoction for diabetes. The fruits are boiled in milk and gargled for tonsillitis. The fruit juice is also recommended for high cholesterol, hypertension, tonsillitis, arteriosclerosis, circulatory problems, diabetes and as a diuretic. The fruit and/or the leaves are boiled in olive oil and used externally as a topical anti-inflammatory and analgesic. The roots are used to clean the teeth.

PLANT CHEMICALS

Caigua seeds contain 28-30 amino acids as well as a group of trypsin inhibitors.¹ The leaves of the plant were recently reported to contain two new malonyl derivatives.² The fruits are known to

contain flavonoid glycosides³ including four novel ones never reported before that have shown an antioxidant effect in laboratory research.⁴ In addition, the fruits have yielded nine triterpenoid saponins, among them six new natural compounds never seen before.⁵ The seeds have been reported with six new cucurbitacin glycosides.⁶

Plant chemicals reported in caigua fruit include phenols, peptin, galacturonic acid, picrin, lipoproteins, flavonoids, glycosides, mucilage, alkaloids, lipids, tannins, terpenes, resins, carbohydrates, sterols, scoparin, vitamins, vitexin, and minerals.

BIOLOGICAL ACTIVITIES AND CLINICAL RESEARCH

Research conducted in Peru has reported that caigua can lower cholesterol levels in humans.⁷ A double-blind placebo study with 60 patients over one year reported that 82% of the patients lowered their LDL cholesterol by an average of 18.3% by reducing HDL by 23% and raising HDL-levels by 42%.⁸ Patients were given either a placebo, or 4 or 6 300 mg capsules daily of dehydrated fruit juice. Another study with 29 patients reported similar results in 10 days with total cholesterol dropping by 21.1% (HDL decreased by 63.55% and triglycerides by 36.37%).⁹ These subjects were given 100 cc daily of fruit juice (the equivalent of about 6 fresh fruits). Another study with 17 patients reported an average drop in cholesterol of 21.51% after 21 days taking two (300 mg dehydrated fruit juice) capsules daily (LDL decreased by 22.57% and triglycerides by 16.33%).¹⁰ In a 12-week study with postmenopausal women taking 6 (300 mg) capsules of caigua dehydrated fruit juice, they reported women lowered LDL cholesterol by 33% and increased HDL by 33%.¹¹ There were no drug interactions, contraindications or side effects reported in any of the studies.

CURRENT PRACTICAL USES

Caigua products have been gaining in popularity and availability in the U.S. natural products market over the last several years. Most are marketing these supplements as a cholesterol management aid, for hypertension, and blood-sugar regulation. Most of the available products in the United States are tablets or capsules of the dried or freeze-dried fruit juice.

Caigua Plant Summary
Main Actions (in order): anticholesterolemic, hypotensive, antidiabetic, diuretic, analgesic
Main Uses: 1. for high cholesterol 2. for hypertension and circulatory problems 3. for diabetes 4. for gastrointestinal problems 5. as a topical analgesic
Properties/Actions Documented by Research: anticholesterolemic, antihypertriglyceridemic
Other Properties/Actions Documented by Traditional Use: analgesic, anti-arteriosclerotic, anti-inflammatory, anticholesterolemic, antidiabetic, antiparasitic, diuretic, hypotensive
Cautions: None reported.

Traditional Preparation: In Peru, the fresh fruits are typically put into a blender and juiced. The juice is taken in 1/4 to 1/2 cup amounts twice daily. The fruits are also simply eaten as a vegetable, either fresh or cooked. For manufactured juice powder products in capsules or tablets, follow the label instructions.

Contraindications: None reported.

Drug Interactions: None reported.

WORLDWIDE ENTHNOMEDICAL USES	
Peru	as an anti-inflammatory, analgesic, diuretic and hypoglycemic; for angina, arterial plaque, arteriosclerosis, circulatory problems, diabetes, earaches, gastrointestinal disorders, high blood pressure, high cholesterol, intestinal parasites, tonsillitis

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Ethnomedical Information on Caigua (*Cyclanthera pedata*)

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Fruit / Peru	Fresh fruit eaten for high cholesterol and circulation problems.	Fresh fruit / Oral	Human adult	ZZ1105
Fruit / Peru	Used as a hypoglycemic and anti-inflammatory.	Infusion / Oral	Human adult	H25814
Fruit / Peru	Used to lower cholesterol.	Infusion / Oral	Human adult	H25814
Fruit / Peru	Fresh fruit or parboiled fruit or dried fruit juice in capsules is used for diabetes, circulatory problems, high cholesterol, and to clean the arteries of plaque.	Various / Oral	Human adult	ZZ1101
Fruit / Peru	Fresh fruit or parboiled fruit or dried fruit juice in capsules is used for diabetes and high cholesterol. Also recommended for menopausal women to prevent coronary problems.	Various / Oral	Human adult	ZZ2013
Fruit / Peru	Fresh fruit juice is put in the ear to treat earache and ear inflammation. Fresh fruits are ground up and used in poultices as an anti-inflammatory.	Fresh juice / External	Human adult	ZZ1101 ZZ1093
Fruit / Peru	Fresh fruits are ground up and used in poultices as an anti-inflammatory	Fresh juice / External	Human adult	ZZ1101
Fruit / Peru	Fruits are cooked in olive oil and gargled warm for tonsillitis. Fruits are cooked in milk and taken for angina.	Fresh fruit / Oral	Human adult	ZZ1101 ZZ1093
Fruit / Peru	Used as a diuretic.	Infusion / Oral	Human adult	ZZ1101
Fruit / Peru	Used for diabetes, hypertension, arteriosclerosis, and cardiovascular disturbances.	Fruit juice / Oral	Human adult	ZZ1093
Fruit / Peru	A maceration in olive oil is used externally for angina and tonsillitis.	Maceration / External	Human adult	ZZ1093
Fruit / Peru	Used for gastrointestinal disorders.	Not stated	Human adult	CA2001
Seeds / Peru	Seeds are ground to a powder and taken in 1 gram dosages as a vermifuge for intestinal parasites and worms.	Seed powder / Oral	Human adult	ZZ1101 ZZ2013
Seeds / Peru	Used for high blood pressure and diabetes.	Infusion / Oral	Human adult	L04137
Seeds / Peru	Used for high blood pressure.	Infusion / Oral	Human adult	ZZ1101
Seeds / Peru	Used for high blood pressure.	Infusion / Oral	Human adult	ZZ2013 ZZ1045

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Epicarp / Peru	Used for diabetes.	Decoction / Oral	Human adult	ZZ1107
Leaves / Peru	Used for diabetes.	Decoction / Oral	Human adult	ZZ1105
Root / Peru	Used to clean the teeth.	Not stated	Human adult	ZZ1101 ZZ1093
Not stated / Java	Used for fever.	Not stated	Human adult	ZZ1106 ZZ1022

Presence of Compounds in Caigua (*Cyclanthera pedata*)

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
Alanine, meta-carboxy-phenyl:	Proteid	Dried Seed	Peru	Not Stated	A14186
Apigenin-6-c-fucopyranoside	Flavone	Dried Fruit	Peru	00.0024%	H29532
Ascorbic acid		Dried Fruit	Peru	2800 ppm	ZZ1047
Beta-carotene		Dried Fruit	Peru	82 ppm	ZZ1047
Calcium		Dried Fruit	Peru	3160 ppm	ZZ1047
Chrysin-6-c-fucopyranoside	Flavone	Dried Fruit	Peru	00.0016%	H29532
Chrysin-7-o-beta-d-glucopyranosyl(1-4)-alpha-l-rhamnopyransoide	Flavone	Dried Fruit	Peru	00.0028%	H29532
Chrysin-7-o-beta-d-glucopyranosyl-6-c-fucopyranoside	Flavone	Dried Fruit	Peru	00.0072%	H29532
Chrysin-6-C-fucopyranosyl-(3-malonyl)	Flavone	Dried Fruit Dried Leaves	Not stated	Not stated	CA2007
Chrysin-6-C-fucopyranosyl-(4-malonyl)	Flavone	Dried Fruit Dried Leaves	Not stated	Not stated	CA2007
Citrulline	Proteid	Dried Seed	Peru	Not Stated	A14186
Cucurbit-5-en-11-one,3-beta-((6-o-beta-d-glucopyranosyl-beta-d-glucopyranosyl)-oxy)-16-alpha-20-22-25-tetrahydroxy:	Triterpene	Dried Seed	Peru	00.004%	H18567
Cucurbit-5-en-11-one,3-beta-(6-o-beta-d-glucopyranosyl-oxy)-16-alpha-20-22-trihydroxy:	Triterpene	Dried Fruit	Peru	00.0016%	H25814
Cucurbit-5-en-11-one,3-beta-(Beta-d-glucopyranosyl-oxy)-25-acetoxy-16-alpha-20-22-trihydroxy:	Triterpene	Dried Seed	Peru	00.0016%	H18567
Cucurbita-1-3-5(10)-trien-11-22-dione,29-nor: 25-acetoxy-2-((4-o-alpha-l-rhamnopyranosyl-6-o-beta-d-glucopyranosyl-beta-dglucopyranosyl)-Oxy)-3-16-alpha-20-trihydroxy:	Triterpene	Dried Seed	Peru	00.0064%	H18567

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
Cucurbita-1-3-5(10)-trien-11-22-dione,29-nor: 25-acetoxy-2-((6-o-beta-d-glucopyranosyl-beta-d-glucopyranosyl)-oxy)-3-16-alpha-20-trihydroxy:	Triterpene	Dried Seed	Peru	00.002%	H18567
Cucurbita-1-3-5(10)-trien-11-one,2-(6-o-beta-d-glucopyranosyl-beta-d-glucopyranosyl-oxy)-3-16-alpha-20-22-25-pentahydroxy-29nor:	Triterpene	Dried Fruit	Peru	00.0009%	H25814
Cucurbita-1-3-5(10)-trien-11-one,29-nor: 2-((6-o-beta-d-glucopyranosyl-beta-d-glucopyranosyl)-oxy)-3-16-alpha-20-22-25-pentahydroxy:	Triterpene	Dried Seed	Peru	00.006%	H18567
Cucurbita-1-3-5(10)-trien-11-one,29-nor: 25-acetoxy-2-((4-o-alpha-l-rhamnopyranosyl-6-o-beta-d-glucopyranosyl-beta-dglucopyranosyl)-oxy)-3-16-alpha-20-trihydroxy:	Triterpene	Dried Seed	Peru	00.004%	H18567
Cucurbita-1-3-5(10)-trien-11-one,29-nor: 25-acetoxy-2-((6-o-beta-d-glucopyranosyl-beta-d-glucopyranosyl)-oxy)-3-16-alpha-20-22tetrahydroxy:	Triterpene	Dried Seed	Peru	00.005%	H18567
Cucurbita-5-en-11-one,3-beta-(6-o-beta-d-glucopyranosyl-beta-d-glucopyranosyl-oxy)-16-alpha-20-22-25-tetrahydroxy	Triterpene	Dried Fruit	Peru	00.0012%	H25814
Cucurbita-5-en-11-one,3-beta-[(4-o-alpha-l-rhamnopyranosyl]-6-o-beta-d-glucopyranosyl)-beta-d-glucopyranosyl]-oxy]-16alpha-20-22-25-tetrahydroxy:	Sesquiterpene	Dried Fruit	Peru	00.0024%	H25814
Protopanaxadiol-3-{O-beta-d-glucopyranosyl(1-6)-beta-d-glucopyranosyl)-20(s)-o-beta-d-glucopyranoside	Triterpene	Dried Fruit	Peru	00.0022%	H25814
Protopanaxatriol-6-o-beta-d-glucopyranosyl-20-o-beta-d-glucopyranosyl[(1-2)-beta-d-glucopyranosyl][(1-6)-alpha-lrhamnopyranosyl, 17-alpha-hydroxy: 20(s):	Triterpene	Dried Fruit	Peru	00.00216%	H25814
Protopanaxatriol-6-o-beta-d-xylopyranosyl-20-o-beta-d-glucopyranosyl(1-2)-beta-d-glucopyranoside, 17-alpha-hydroxy: 20(s):	Triterpene	Dried Fruit	Peru	00.00214%	H25814
Protopanaxatriol-6-o-beta-d-xylopyranosyl-20-o-beta-d-glucopyranosyl[(1-2)-beta-d-glucopyranosyl][(1-6)-alpha-lrhamnopyranosyl, 17-alpha-hydroxy: 20(s):	Triterpene	Dried Fruit	Peru	00.003%	H25814

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
Protopanaxatriol-6-o-beta-d-xylopyranosyl-3-{O-beta-d-glucopyranosyl (1-6)-beta-d-glucopyranosyl}-20-o-beta-dglucopyranosyl[(1-2)-beta-d-glucopyranosyl](1-6)-alpha-l-rham nopyranosyl, 17-alpha-hydroxy-20)s):	Triterpene	Dried Fruit	Peru	00.0031%	H25814
Niacin		Dried Fruit	Peru	75 ppm	ZZ1047
Phosphorus		Dried Fruit	Peru	5615 ppm	ZZ1047
Riboflavin		Dried Fruit	Peru	5 ppm	ZZ1047
Scoparin, iso:	Flavone	Dried Fruit	Peru	00.002%	H29532
Thiamin		Dried Fruit	Peru	8 ppm	ZZ1047
Trypsin Inhibitors: CyPTI I thru VII	Proteid	Ripe Seeds	Not Stated	Not Stated	CA2006
Vitexin, iso:	Flavone	Dried Fruit	Peru	00.046%	H29532

Biological Activities for Extracts of Caigua (*Cyclanthera pedata*)

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Fruit - Peru	Antihypocholesterolemic Activity	300 mg dried fruit juice capsules	Human (60 patients) Double-blind placebo	4-6 capsules daily	Active	Normalized cholesterol levels in 82% of patients after 1 year. Reduced total serum cholesterol by 18.3%, reduced LDL by 23% and increased HDL by 42%	CA2003
Fruit - Peru	Antihypocholesterolemic Activity	H2O EXT	Human (29 patients)	100 cc daily	Active	After 10 days total serum cholesterol dropped by 21.1%. HDL increased by 63.55% and triglycerides decreased by 36.37%.	CA2004
Fruit - Peru	Antihypocholesterolemic Activity	300 mg dried fruit juice capsules	Human (17 patients)	2 capsules daily	Active	After 21 days, total serum cholesterol decreased 21.52% LDL decreased by 22.57% and triglycerides by 16.33%	CA2005
Fruit - Peru	Antihypocholesterolemic Activity	300 mg dried fruit juice capsules	Human-female 100 post-menopausal	6 capsules daily	Active	After 12 weeks patients LDL was decreased by 33%, and HDL increased by 33%	CA2009

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