

# Guacatonga

## *Casearia sylvestris*

Monograph 5/1/04

**Family:** Flacourtiaceae

**Synonyms:** *Samyda parviflora*, *S. sylvestris*, *Casearia affinis*, *C. attenuata*, *C. benthamiana*, *C. caudata*, *C. chlorophoroidea*, *C. ekmanii*, *C. formosa*, *C. herbut-smithii*, *C. lindeniana*, *C. oblongifolia*, *C. onacaensis*, *C. ovoidea*, *C. parviflora*, *C. punctata*, *C. samyda*, *C. schulziana*, *C. serrulata*, *C. subsessiliflora*, *Anavinga samyda*, *Guidonia sylvestris*

**Standard Common Name:** Casearia (Herbs of Commerce, 2<sup>nd</sup> edition)

**Other Common Names:** Burro-kaa, café-bravo, cafeiillo, café silvestre, congonghas-de-bugre, corta-lengua, crack-open, dondequiera, erva-de-bugre, erva de pontada, guayabillo, guassatonga, mahajo, papelite, pau de lagarto, piraquina, raton, sarnilla, ucho caspi, wild coffee, sombre de armada, sombra de conejo, wild-sage.

### Overview

#### Botanical Description

Guacatonga is a shrub or small tree usually 2 or 3 meters tall, but sometimes growing up to 10 meters in undisturbed areas of the Amazon. It has extensive lateral roots that are white, stiff, and covered with a corky bark. The tree produces small white, cream, or greenish flowers, which smell like a mixture of honey and urine, crowded on short stalks on the leaf axils. After flowering it produces small fruits, 3–4 mm in diameter, which split open to reveal three brown seeds covered with a red-to-orange aril.

#### Ethnobotanical Uses

The bark, leaves and root have traditionally been used medicinally for their analgesic, antacid, anti-inflammatory, anti-ulcerogenic, antivenin, antiviral, depurative, hemostatic and vulnerary properties.<sup>1</sup>

The use of guacatonga has been recorded in herbal medicine systems in the following countries: Bolivia,<sup>2</sup> Brazil,<sup>3-9</sup> Colombia,<sup>10</sup> India<sup>11</sup> and Peru.<sup>4</sup>

#### **Summary of Traditional Uses of Guacatonga:** <sup>1</sup>

Bark: Diarrhea, fever, inflammation, snakebite.

Leaf: Fever, snakebite, herpes, syphilis, insomnia, skin diseases, inflammation, diarrhea, low libido in men, rheumatism, ulcers, eczema.

Root: Pain, wounds, leprosy.

Seed Oil: Leprosy.

### Primary Uses

#### Internal

Guacatonga is considered a safe plant and a great natural herbal remedy for ulcers, inflammation, and pain. It continues to be used as a snakebite remedy throughout the Amazon jungles by the indigenous peoples.<sup>12</sup>

#### External

Traditionally the leaf and bark are used for skin diseases, fever, snakebites and ulcers.<sup>8-10</sup>

## Chemistry

Guacatonga contains a complex chemical makeup. The leaves and twigs contain the chemical lapachol.<sup>13</sup> The plant is rich in clerodane diterpenes, including novel groups that scientists have named casearins (A through S) and casaervestrins (A through C). Other chemicals include: capronic acid, casearia clerodane I through VI, hesperitin, vicenin.<sup>1</sup>

### Antitumor Activity

Diterpenes extracted from the leaf were active against various cancer cell lines *in vitro*.<sup>14</sup>

## *In vivo* and *In vitro* Research and Pharmacological Actions

### **Anticancerous Activity**

#### Cytotoxic Activity

An ethanol extract of the leaf demonstrated strong activity against various cancer cell lines *in vitro*.<sup>15</sup>

#### Antitumor Activity

Extracts of the leaf and twig have shown antitumor activity, both *in vivo* and *in vitro*, to numerous cancers and cancer cell lines. Ethanol and methanol extracts of the leaf and/or leaf and twig have shown activity towards a panel of tumor cell lines *in vitro*.<sup>16,17</sup> In two *in vivo* studies, 100 mg/kg of an ethanol extract of the leaf was given intraperitoneally to mice with sarcoma; the extracts showed strong activity against sarcoma 180 (ASC).<sup>18,19</sup>

### **Antimicrobial Activity**

#### Antiviral

Topical application of an ethanol leaf extract in three human adults with herpes found guacatonga to be active against herpes simplex type 1.<sup>20</sup>

#### Antifungal

In one *in vitro* study a methanol extract of the leaf and twig showed activity against *Aspergillus niger*.<sup>21</sup>

#### Antibacterial

A chloroform-methanol leaf extract at 5mg/plate showed activity against *Bacillus cerus* *in vitro*.<sup>22</sup> In another study *in vitro* activity was demonstrated towards *Bacillus subtilis*.<sup>23</sup>

### **Antiulcer Activity**

Ethanol leaf extracts administered intragastrically to rats at doses of 44.3-57.5 mg/kg had antiulcer activity towards stress-induced ulcers, H. pylorus ligation-induced ulcers and acetic acid-induced ulcers.<sup>24,25</sup> Its activity was considered equivalent to the antiulcer drug cimetidine (Tagamet).<sup>24</sup> Gastric secretion was inhibited by 42%.<sup>24</sup>

### **Anti-inflammatory and Analgesic Activity**

#### Anti-inflammatory Activity

A bark and leaf infusion given at 1 gm/kg intragastrically to mice showed anti-inflammatory activity.<sup>9</sup> In another study an alcoholic leaf extract given at 100 and 300 mg/kg intraperitoneally to mice inhibited induced inflammation at the same rate as the drugs Piroxicam and Meloxicam.<sup>26</sup>

#### Analgesic Activity

A bark and leaf infusion of 1 gm/kg given intragastrically to mice showed analgesic activity, inhibiting acetic acid-induced writhing.<sup>9</sup>

## Antivenin

Water extracts of the leaf in both *in vitro* and *in vivo* (mice) studies showed guacatonga to be an antivenin for venoms containing class I, II and II Pla2.<sup>27</sup> In one *in vitro* study an ethanol extract of the leaf inhibited phospholipase A2 by 64% for *Botrops jararacussu* venom and 48% for *Lachesis muta* venom.<sup>13</sup> A water extract neutralized the hemorrhagic, coagulant and proteolytic activity on casein or fibrinogen induced by five snake venoms and two bee venoms.<sup>28</sup>

### Patents Filed / Pending

A patent was filed in Japan in 1989 on the antitumor activity of ethanol leaf extracts and diterpene fractions against various cell lines.<sup>14</sup>

### Mechanism of Action

#### Anticancerous Activity

Cytotoxic and antitumor activity of guacatonga is attributed to the clerodane diterpenes.<sup>14-19</sup>

#### Antiulcer Activity

In rats a crude leaf extract reduced the volume of gastric secretion by 42%, with little effect on pH.<sup>24</sup> Its antiulcer effect may be due to this activity. The plant also contains chemicals that protect the stomach mucosa from changing gastric pH levels, and sped healing of damaged gastric mucosa.<sup>25</sup> The anti-inflammatory and analgesic activity of the plant may also attribute to its antiulcer activity.<sup>26</sup>

#### Antivenin Activity

The antivenin activity of the leaf of guacatonga is attributed to the ability of the plant to inhibit phospholipase A2, by as much as 64% for some types of venom.<sup>13</sup> It is also able to block venom-induced hemorrhagic, coagulant and proteolytic activity via affecting casein or fibrinogen.<sup>28</sup>

### Dosage

#### Internal

Crude Preparations, Leaf & stem

1-2 grams twice daily.

Infusion: ½ cup 2-3 times daily

### Duration of Administration

Duration of administration varies per complaint and individual. Literature does not report any adverse effects with long-term use.

### Contraindications

Pregnancy and Lactation: No clinical or laboratory research has yet determined whether guacatonga is safe or unsafe to use in pregnancy or lactation. Until such research exists this plant should not be used during pregnancy and lactation.

## Drug Interactions

None reported.

## Side Effects

None known.

## Safety Rating

Not rated.

In one toxicity study an ethanol extract of the leaf administered intragastrically to rats had an LD50=>1840 mg/kg; researchers concluded the plant had no toxicity.<sup>24</sup>

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