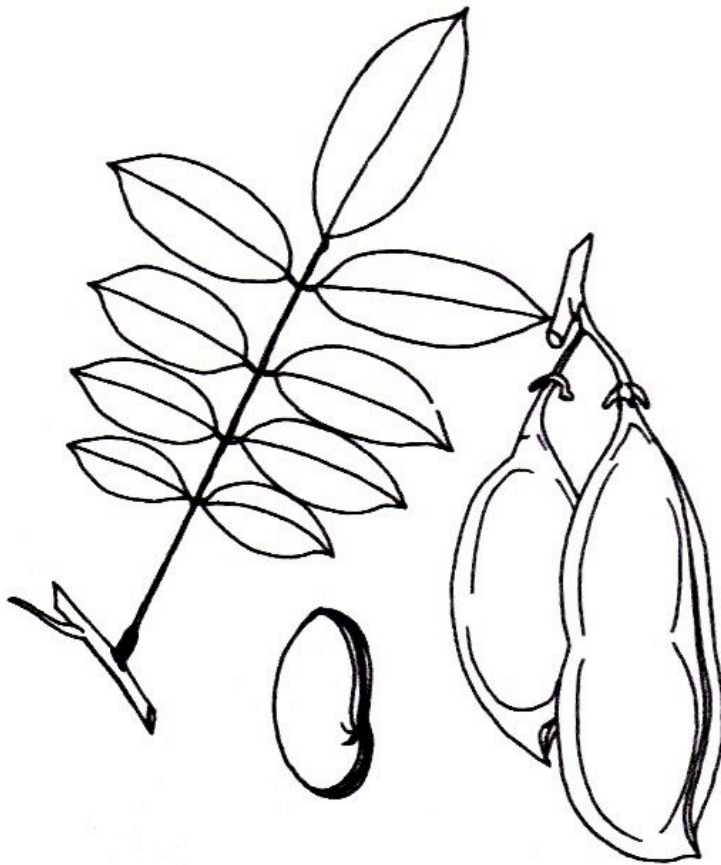


# Technical Data Report

for

## **Cumaseba** (*Swartzia polyphylla*)



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# Cumaseba

**Family:** Fabaceae

**Taxon:** *Swartzia polyphylla* DC.

**Synonyms:** *Swartzia acuminata*, *Swartzia opacifolia*, *Swartzia platygyne*, *Swartzia urubuensis*, *Tounatea acuminata*, *Tounatea oblonga*, *Tunatea acuminata*

**Common names:** anushi remo caspi, arabá, cumaceba, cumaseba, jabelona, marin comatsehue, paracutaca, pitaica

**Part Used:** Bark

Herbal Properties & Actions		
<b>Main Actions:</b>	<b>Other Actions:</b>	<b>Standard Dosage:</b> Bark
reduces inflammation	female aphrodisiac	<b>Tincture:</b> 2-3 ml twice daily
relieves pain	hormonal support	<b>Decoction:</b> 1 cup twice daily
kills bacteria		
kills fungi & candida		
kills cancer cells		

Cumaseba is a tropical rainforest tree that grows up to 15 meters high. It can be found in lower elevations throughout the Amazon basin area in Brazil, Peru, Colombia, Venezuela and the three Guianas (Guyana, French Guiana, & Suriname). It has olive-green lanceolate leaves, produces small white flowers, and a smooth, brown seed pod with 2 large seeds inside.

The *Swartzia* family comprises approximately 133 species of mostly trees, many of which are native only to the Amazon rainforest.

## TRIBAL AND HERBAL MEDICINE USES

In the Amazon, the bark and/or wood of the cumaseba tree is employed as a postpartum tonic, for rheumatism, and to speed the healing of bone fractures and dislocations. The Tirio Indians in Suriname prepare the bark in a decoction for malaria. The Shipibo-Conibo Indians in the Peruvian Amazon use the bark as an antiseptic, and use the tree resin dropped into the eyes for eye infections, failing eyesight and for optic nerve injuries. Other tribes in the Amazon believe that the tree bark gives strength and prevents laziness. It is also used to strengthen the body during illness and to speed healing.

In Peruvian herbal medicine systems cumaseba bark is considered an aphrodisiac and tonic; it is recommended for yeast infections, colds and flu, rheumatism, for female disorders and as a postpartum tonic.

## PLANT CHEMICALS

Cumaseba is rich in flavonoids and isoflavones. It contains a significant amount of an isoflavone chemical called biochanin A which has been well studied and documented (over 150 studies published to date). Biochanin A is a chemical referred to as a "phytoestrogen" which is found in other plants like red clover (the richest source of biochanin A documented thus far). Phytoestrogens are molecules that closely resemble human hormones (estrogen and/or progesterone) and that may exert some type of estrogenic activity by interacting with estrogen receptor sites in the human body (called Selective Estrogen Receptor Modulators or SERMs). SERMs are reported with anticancer effects (especially to hormone-driven breast and prostate

cancers). While there is research that is conflicting, generally biochanin A has been documented with SERM actions, the ability to lower PSA levels in prostate cancer cells, cancer-preventative actions, and direct anti-tumor and cytotoxic actions against colon, breast and prostate cancer cell lines.

Cumaseba bark has been documented to contain biochanin A, dalbergioidin, dihydrocajanin, dihydroicoisoflavone, dihydrobiochanin A, ferreirin, ferreirinol, formononetin, naringenin, and T-cadinol.

## BIOLOGICAL ACTIVITIES AND CLINICAL RESEARCH

Scientists have confirmed through *in vitro* testing that cumaseba is a good antimicrobial. It has been reported to kill *Mycobacterium tuberculosis*, including several antibiotic-resistant strains,<sup>1, 2</sup> the stomach bacteria linked to ulcers and stomach cancer, *H. pylori*,<sup>3</sup> several types of mouth bacteria that cause cavities and gingivitis,<sup>4</sup> and other gram-positive strains of bacteria.<sup>5</sup> Cumaseba has also been documented to have actions against fungus and candida.<sup>2,3,5</sup> Most of these researchers have attributed the antimicrobial actions of cumaseba to its isoflavone chemicals.

A Brazilian research group screening plants against cancer reported that cumaseba bark was toxic to colon and lung cancer cell lines *in vitro* but the action was not very strong.<sup>6</sup> Another research group identifying a new isoflavone in cumaseba reported that an ethanol extract of the heartwood (as well as the new chemical they discovered) was able to inhibit Protein Kinase C (PKC).<sup>5,7</sup> PKC inhibitors have attracted a great deal of scientific interest worldwide, as there is evidence that too much PKC enzyme is involved in a wide variety of disease processes including arthritis, asthma, brain tumors, cancer, and cardiovascular disease.

## CURRENT PRACTICAL USES

Cumaseba's documented antimicrobial activity does support the plant's traditional uses for colds and as an antiseptic. Its use as a female tonic, postpartum tonic and aphrodisiac is probably related to the phytoestrogen chemicals that are documented as major constituents in cumaseba. Scientists have yet to confirm why the plant is so widely used for rheumatism and other painful and inflamed joint, muscle and bone problems. It continues to be a popular remedy in Peru but American consumers know very little about cumaseba. Only a few companies offer it in the U.S.

Cumaseba Plant Summary
<b>Main Actions (in order):</b> antibacterial, antiseptic, anticandidal, tonic, anti-rheumatic
<b>Main Uses:</b> <ol style="list-style-type: none"> <li>1. for rheumatism and arthritis</li> <li>2. for painful and/or inflamed joint, muscle and/or bone conditions</li> <li>3. as a female hormonal tonic and aphrodisiac</li> <li>4. for candida, yeast infections and fungal infections</li> <li>5. for colds, flu, tuberculosis and other upper respiratory bacterial infections</li> </ol>
<b>Properties/Actions Documented by Research:</b> antibacterial, anticandidal, antifungal, antimycobacterial, cytotoxic, larvacidal, PKC inhibitor
<b>Other Properties/Actions Documented by Traditional Use:</b> analgesic, anti-candidal, anti-fatigue, anti-inflammatory, antimalarial, anti-rheumatic, antiseptic, aphrodisiac, tonic, and vulnerary
<b>Cautions:</b> None reported.

**Traditional Preparation:** Cumaseba bark is traditionally prepared in the Amazon in alcohol tinctures. When it is used externally (for fractures and dislocations), sometimes it is prepared in a decoction and the affected part of the body is soaked in the warm decoction.

**Contraindications:** None reported.

**Drug Interactions:** None reported.

WORLDWIDE ETHNOMEDICAL USES	
Peru	as an aphrodisiac, antiseptic, and tonic; for bad eyesight, bone fractures, childbirth, colds, dislocations, fatigue, fungal infections, laziness, optic nerve injuries, rheumatism, and yeast infections
Suriname	for malaria

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7. Du Bois, J. L., et al. "Fereirinol, a new 3-hydroxyisoflavanone from *Swartzia polyphylla*." *J. Nat. Prod.* 1996; 59(9): 902-903.

## Ethnomedical Information on Cumaseba (*Swartzia polyphylla*)

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Bark - Peru	Used for rheumatism and childbirth.	Not stated	Human Adult	ZZ2010
Bark - Peru	Used for rheumatism, dislocations, as a postpartum tonic, and as an aphrodisiac.	Tincture / Oral	Human Adult	ZZ2013
Bark - Peru	Used for colds and as a postpartum tonic.	Infusion / Oral	Human Adult	L17008
Bark - Peru	Used for rheumatism.	Not stated	Human Adult	ZZ1105
Heartwood - Peru	Used for vaginal yeast infections.	Decoction / Oral Decoction / Vaginal	Human Adult	SP2001
Heartwood - Peru	Used for dislocations and as a postpartum tonic.	Tincture / Oral	Human Adult	L04137
Heartwood - Peru	Used to speed healing.	Infusion / Oral	Human Adult	H15918
Heartwood - Peru	Used for rheumatism, dislocations, and as a postpartum tonic.	Tincture / Oral	Human Adult	ZZ1101
Leaf - Peru	Used for colds and as a postpartum tonic.	Infusion / Oral	Human Adult	L17008
Resin - Peru	Shipibo-Conibo put 2-3 drops of the heartwood resin in the eyes for poor eyesight, loss of vision, and optic nerve injuries.	Resin / Ocular	Human Adult	ZZ2003
Root - Peru	Used for colds and as a postpartum tonic.	Infusion / Oral	Human Adult	L17008
Bark - Suriname	Tirio Indians use it for malaria.	Decoction / Oral	Human Adult	ZZ1104

## Presence of Compounds in Cumaseba (*Swartzia polyphylla*)

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
Biochanin A	Isoflavone	Heartwood Heartwood Heartwood Bark	Peru	Not stated Not stated Not stated 00.0588%	H11066 H15918 H18197 SP2003
Biochanin A, dihydro:	Flavonoid	Heartwood Heartwood Bark	Peru	Not stated Not stated 00.2314%	H11066 H15918 SP2003
Cajanin, dihydro:	Flavonoid	Heartwood	Peru	Not stated	H11066
Dalbergioidin	Flavonoid	Heartwood	Peru	Not stated	H11066 H15918
Ferreirin	Flavonoid	Heartwood	Peru	Not stated	H11066 H15918
Ferreirinol	Flavonoid	Heartwood	Peru	00.00035%	H18197
Formononetin	Isoflavone	Heartwood	Peru	Not stated	H11066
Licoisoflavone, dihydro:	Flavonoid	Heartwood	Peru	Not stated	H18197 H15918
Naringenin, (S):	Flavanone	Heartwood	Peru	Not stated	H11066
T-cadinol	Isoflavone	Bark	Peru	00.0321%	SP2003

## Biological Activities of Cumaseba (Swartzia polyphylla)

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Bark- Brazil	Cytotoxic Activity	H2O ext DMSO ext	Cell Culture	100 mcg / plate	Active	HT29 and NCI-H460 human cancer cell lines (colon, lung)	SP2005
Heartwood - Peru	Protein Kinase C Inhibition	ETOH ext	In vitro	IC50: 31 mcg/ml	Active		H15918 H18197
Heartwood - Peru	Antibacterial Activity	ETOH ext	Agar Plate	100 mcg / plate	Active Active Inactive Inactive Inactive	<i>Helicobacter pylori</i> <i>Pseudomonas aeruginosa</i> <i>Staphylococcus aureus</i> <i>Bacillus cereus</i> <i>Escherichia coli</i>	SP2002
Heartwood - Peru	Antibacterial Activity	MEOH ext	Agar Plate	Various	Active	Potent activity against various strains of cariogenic bacteria.	H11066
Heartwood - Peru	Antibacterial Activity	Fractions: isoflavanones	Agar Plate	Various	Active	Potent activity against various strains of cariogenic bacteria.	H11066
Heartwood - Peru	Antibacterial Activity	ETOH ext	Agar Plate	Not stated	Active		H15918
Bark - Peru	Antimycobacterial Activity	ETOH	Microplate	MIC: 50 mcg/ml	Active	Exhibited powerful antimycobacterial action against the sensitive H37Rv and multi-drug resistant strains of <i>Mycobacterium tuberculosis</i> .	SP2003 SP2004
Bark - Peru	Antimycobacterial Activity	Fraction: T-cadinol	Microplate	MIC: 50 mcg/ml	Active	<i>Mycobacterium tuberculosis</i>	SP2003
Bark - Peru	Antifungal Activity	ETOH ext	Agar Plate	25 mg / ml	Active	<i>Trichophyton mentagrophytes</i>	SP2003
Bark - Peru	Antifungal Activity	Fractions: Biochanin A	Agar Plate	1 mg / ml	Active	Very active against several strains of filamentous fungi.	SP2003

GI = Gastric Intubation    IG = Intragastric    IP = Intraperitoneally    IV = Intravenously    SC = Subcutaneously    PO = Orally



Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Heartwood - Peru	Antifungal Activity	ETOH ext	Agar Plate	100 mcg / plate	Active Inactive Inactive	<i>Saccharomyces cerevisiae</i> <i>Epidermophyton floccosum</i> <i>Trichophyton mentagrophytes</i>	SP2002
Heartwood - Peru	Antifungal Activity	ETOH ext	Agar Plate	Not stated	Active		H15918
Heartwood - Peru	Anti-yeast Activity	ETOH ext	Agar Plate	100 mcg / plate	Active	<i>Candida albicans</i>	SP2002
Bark - Peru	Anti-yeast Activity	ETOH ext	Agar Plate	25 mg / ml	Active	<i>Candida albicans</i>	SP2003
Bark - Peru	Anti-larvicidal Activity	ETOH ext	In vitro	25 mg / ml	Active	<i>Culex quinquefasciatus</i>	SP2003
Bark - Peru	Anti-larvicidal Activity	Fraction: T-cadinol	In vitro	300 mcg/ml	Active	100% mortality after 1 hour. <i>Culex quinquefasciatus</i>	SP2003

## Biological Activities of Compounds in Cumaseba (Swartzia polyphylla)

Compound	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Biochanin A	Anti-edema Activity	IG Mouse & External Ear	1.67 mg - 2.78 mg	Active	vs. croton oil- & arachidonic acid-induced inflammation	K16466
Biochanin A	Anti-inflammatory Activity	IP Rat	20 mg / kg	Active	vs. four lab-induced models of inflammation	L27564
Biochanin A	Protein Kinase Inhibition	In vitro	IC50: < 50 mcg / ml IC50: 26 mcg / ml	Active Active		H15918 T15521
Biochanin A	Anti-spasmodic Activity	In vitro	Various 20 micromols	Active Active	vs. lab-induced spasms in rabbit muscle vs. lab-induced spasms in guinea pig ileum	L26970 L11580
Biochanin A	Cholesterol Lowering Activity	Oral Rat	100 mg / kg 15 mg / kg	Active Active		N05484 K04521

GI = Gastric Intubation IG = Intra-gastric IP = Intraperitoneally IV = Intravenously SC = Subcutaneously PO = Orally

Compound	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Biochanin A	Oestrogenic Effect	Oral Rat IP Rat	Not stated 300 mcg / animal	Active Active	Response equal to 1 mcg/animal of Estradiol-17-beta or Diethylstilbestrol.	K00033 T04993
Biochanin A	Progestagenic Effect	Cell Culture	3.5 nanomols/liter	Active		T03820
Biochanin A	PSA Inhibition Activity	Cell Culture	5 micromol	Active	Lowered PSA and 5-alpha-reductase in prostate cancer cells and benign prostatic hyperplasia homegenates by 54%.	K23978 J16207
Biochanin A	Antimutagenic Activity	IG Rat	50 mg / kg	Active	vs. lab-induced mammary gland mutagenesis	J16387
Biochanin A	Antiproliferation Activity	Cell Culture	IC50: 0.18 micromols IC50: 17 mcg/ml IC50: 0.47 micromols	Active Active Active	Human tumor cell line. CA-INCAP tumor cells Human prostate cancer cell line	L14495 L25813 J17891
Biochanin A	Anti-tumor Activity	IP Mouse	400 mcg / animal	Active Active Active	CA-HSC-45M2 cancer CA-SH101-P4 cancer vs. xenograph tumors	K23604 K23604 L25813
Biochanin A	Cancer Inhibition / Prevention Activity	PO Mouse IG Mouse PO Mouse	20 ppm 500 mg / kg Not stated	Active Active Active	Prevented lab-induced liver tumors. vs. lab-induced tumors Prevented virus-induced breast cancer.	K23547 L20102 L25360
Biochanin A	Cytotoxic Activity	Cell Culture	50 micomols 10 micromols IC50: 22 mcg/ml	Active Active Active	Colon cancer cell line Colon cancer cell line Breast cancer cell line	J10590 J16030 M27396
Biochanin A Naringenin	P-glycoprotein Inhibition	Cell Culture	Various	Active	Both chemicals reduced p-glycoprotein in multi-drug resistant breast cancer cells by over 2 times the control drug used (verapamil).	SP2006
Biochanin A	Anti-giardial Activity	In vitro	IC50: 3.5 mcg/ml	Active	<i>Giardia intestinalis</i>	L12374
Biochanin A	Anti-fungal Activity	Agar Plate	5 mcg / plate 25 mcg/ sq cm	Active Active	<i>Cladosporium cladosporoides</i> <i>Cladosporium herbarum</i>	H24620 M26097

GI = Gastric Intubation IG = Intragastric IP = Intraperitoneally IV = Intravenously SC = Subcutaneously PO = Orally

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