Technical Data Report

for

JATOBA

(Hymenaea courbaril)

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Jatoba

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Family: Fabaceae

Genus: *Hymenaea*

Species: *courbaril*

Synonyms: *Hymenaea animifera, H. candolleana, H. multiflora, H. resinifera, H. retusa, H. stilbocarpa, Inga megacarpa*

Common Names: Jatoba, jatobá, stinking toe, algarrobo, azucar huayo, jataí, copal, Brazilian copal, courbaril, nazareno, Cayenne copal, demarara copal, gomme animee, pois confiture, guapinol, guapinole, loksi, South American locust

Part Used: Bark, leaves, fruit, resin

Jatoba is a huge canopy tree, growing to 30 m in height, indigenous to the Amazon rainforest and parts of tropical Central America. It produces bright green leaves, white, fragrant flowers that are pollinated by bats, and an oblong, brown, pod-like fruit with large seeds inside. The fruit is considered edible although hardly tasty; one of its common names, “stinking toe,” is used to describe the smell and taste of the fruit! In the Peruvian Amazon the tree is called *azucar huayo* and, in Brazil, *jatobá*. The *Hymenaea* genus comprises two dozen species of tall trees distributed in tropical parts of South America, Mexico, and Cuba.

Several species of *Hymenaea,* including jatoba, produce usable resins. At the base of the jatoba tree an orange, sticky, resinous gum collects which is dug up and burned as incense, used in the manufacture of varnishes, and employed medicinally. Indians in the Amazon have long used this copal resin in magic rituals, love potions and in wedding ceremonies. The genus name *Hymenaea* is derived from Hymen, the Greek God of marriage, referring to the green leaflets that always occur in matching pairs. The resin of *Hymenaea* trees converts to amber through a remarkable chemical process requiring millions of years. During this process, volatile mono- and sesquiterpene phytochemicals leach out of the resin and nonvolatile diterpene chemicals bond together. This forms a hard polymer that is resistant to natural decay processes and the ravages of time. As portrayed in the *Jurassic Park* movies, amber of million-year-old *Hymenaea* trees have provided scientists with many clues to its prehistoric presence on earth as well as to the insects and other plants encased in it.

Jatoba also has an ancient history of use with the indigenous tribes of the rainforest. In addition to the resin, the bark of the tree is macerated by the Karaja Indians in Peru and Creole people in Guyana to treat diarrhea. In Ka’apor ethnobotany, jatoba is taken orally to stop excessive menstrual discharge, applied to wounded or sore eyes, and used as a vermifuge. It is used medicinally in the Peruvian Amazon for cystitis, hepatitis, prostatitis, and cough. In the Brazilian Amazon, the sap is used for coughs and bronchitis, and a bark tea is used for stomach problems as well as foot and nail fungus.

It would follow that jatoba has a long history of use in herbal medicine systems throughout South America. It was first recorded in Brazil in 1930. The bark was described by Dr. J. Monteiro Silva as being carminative, and astringent, and recommended for hematuria, diarrhea, dysentery, general fatigue, dyspepsia, constipation, bexiga, and hemoptysis. The resin was recommended for all types of upper respiratory and cardiopulmonary problems. According to Dr. Silva, whoever drinks jatoba bark tea feels “. . . strong and vigorous, with a good appetite, always ready to work.” In 1965, the traditional uses of jatoba were still being employed much as they had been since the ’30s, and a liquid extract called *Vinho de Jatobá* was widely sold throughout Brazil as a tonic and fortificant,

for energy, and for numerous other disorders. In Brazilian herbal medicine today, jatoba bark and resin is still recommended for the same indications and problems as it has since 1930—and is documented to be tonic, stomachic, astringent, balsamic, antifungal, vermifuge, pectoral, and hemostatic. It is employed for diarrhea, prostatitis, cystitis, dysentery, intestinal colic, coughs, bronchitis, catarrh, asthma, and pulmonary weakness. Jatoba bark tea is still quite a popular drink among lumberjacks working in the forests in Brazil: it is a natural energy tonic that helps them to work long hours without fatigue. In traditional medicine in Panama, the fruit is used to treat mouth ulcers and the leaves and wood are used for diabetes. In the United States, jatoba is used as a natural energy tonic, for such respiratory ailments as asthma, laryngitis, and bronchitis, as a douche for yeast infections and as a decongestant. It is also used in the treatment of hemorrhages, bursitis, bladder infections, arthritis, prostatitis, yeast and fungal infections, cystitis, and is applied topically for such skin and nail fungus. At present, none of the research has indicated that jatoba has any toxicity. One study highlighted the mild allergic effect that jatoba resin may have when used externally.[1]

Phytochemical anaylsis of jatoba shows that it is rich in biologically active compounds including diterpenes, sesquiterpenes, flavonoids, and oligosaccharides. The phytochemical makeup of jatoba is very similar to another resin-producing rainforest tree, copaiba, which is also featured in this book. Some of these same chemicals occuring in both plants (such as copalic acid, delta-cadinene, caryophyllene and alpha-humulene) have shown to exhibit significant cytotoxic, antimicrobial, antifungal and antitumor activities in clinical studies.[2–6] In other research, another of jatoba's phytochemicals, astilbin, was shown in a 1997 clinical study to provide antioxidant and liver-protective properties.[7,8] Jatoba also contains terpenes and phenolics which are responsible for protecting the tree from fungi in the rainforest.[9,10] In fact, the jatoba tree is one of the few trees in the rainforest that sports a completely clean trunk bark, without any of the usual mold and fungus found on many other trees in this wet and humid environment. These terpenes and phenolics have been documented in several studies over the years and the antifungal activity of jatoba is attributed to these chemicals.[11–13] In addition to its antifungal properties, jatoba also has been documented to have anti-yeast activity against a wide range of organisms including *Candida*.[14,15]

Other clinical studies have been performed on jatoba since the early 1970s which have shown that it has antimicrobial, molluscicidal, and antibacterial activities,[16–18] including *in vitro* actions against such organisms as *E. coli, Psuedomonas, Staphylococcus and Bacillus*.[16] In addition, a water extract of jatoba leaves has demonstrated significant hypoglycemic activity, producing a significant reduction in plasma glucose levels (which validates another traditional use).[19]

Practitioners have long reported that jatoba has shown good results with acute and chronic cystitis and prostatitis. Many practitioners today are discovering that these chronic conditions oftentimes can be fungal in nature rather than bacterial. The widespread use of antibiotics to treat these types of cases can actually kill off friendly bacteria which live off fungi—and increase the chances of a fungal problem or encourage fungal growth—even to the point of making the condition chronic. When these types of chronic prostatitis and cystitis cases react so quickly and dramatically to jatoba supplements, is it probably from jatoba's antifungal and anti-yeast properties at work, not its antibacterial properties.

Natural health practitioners in the United States are learning of jatoba's many uses and employing it as a natural remedy for prostatitis and cystitis, as a healthful tonic for added energy (without any caffeine or harmful stimulants), and for many fungal and yeast problems such as *Candida*, athlete's foot, and stubborn nail fungus. It is a wonderful, helpful natural remedy from an important and ancient rainforest resource.

Documented Properties and Actions: Antibacterial, antifatigue, antifungal, anti-inflammatory, antioxidant, anti-spasmodic, antiyeast, astringent, decongestant, diuretic, expectorant, hemostatic, hepatoprotective, hypoglycemic, laxative, molluscicidal, stimulant, stomachic, tonic, vermifuge

Main Phytochemicals: Alpha-copaene, alpha-cubebene, alpha-himachalene, alpha-humulene, alpha-muurolene, alpha-selinene, astilibin, beta-bisabolene, beta-bourbonene, beta-copaene, beta-cubebene, beta-gurjunene, beta-humulene, beta-selinene, beta-sitosterol, calarene, carboxylic acids, caryophyllene, catechins, clerodane diterpenes, communic acids, copacamphene, copalic acid, cubebene, cyclosativene, cyperene, delta-cadinene, gamma-muurolene, gamma-cadinene, halimadienoic acids, heptasaccharides, kovalenic acid, labdadiene acids, octasaccharides, oligosaccharides, ozic acids, polysaccharides, selinenes, taxifolin

Traditional Remedy: One-half to one cup bark decoction 1–3 times daily or 1–3 ml of a 4:1 tincture twice daily. A strong bark decoction or standard tincture diluted with water and a small amount of cider vinegar is used topically for skin or nail fungi or employed as a douche for yeast infections.

Contraindications: Jatoba leaves have been documented to have a hypoglycemic effect and, as such, should be used under practitioner supervision in those with hypoglycemia or on medication to lower their blood glucose levels.

Drug Interactions: None reported.

WORLDWIDE ETHNOBOTANICAL USES

Country	Uses
Amazonia	Eyes (wounded or sore), menstrual discharge, vermifuge
Brazil	Aches, ache (stomach), anemia, anuria, appetite (lack of), arthritis, asthma, astringent, athlete's foot, bladder, blennorrhagia, bronchitis, bursitis, carminative, catarrh, colic, cough, cystitis, decongestant, diarrhea, digestive, dysentery, dyspepsia, dysuria, energy, expectorant, fever, flatulence, fungicide, gastric atonia, hemorrhage, hematuria, hemoptysis, hepatitis, infections (yeast & fungi), laryngitis, laxative, lung, pains, pectoral, prostatitis, secretions (purulent), sedative, skin, stomachic, tonic, tuberculosis, urethritis, urine retention, vermifuge, wound
Elsewhere	Anti-inflammatory, asthma, beri-beri, blennorrhagia, bronchitis, cystitis, dyspepsia, expectorant, indigestion, laryngitis, liqueur, malaria, pain (testicles/prostate), prostatitis, rheumatism, stomachic
Guatemala	Diuretic, fever, rheumatism, sudorific, ulcer (mouth)
Haiti	Antiseptic, arthritis, asthma, bruise, catarrh, diarrhea, emphysema, headache, intestine, kidney, laxative, respiratory, rheumatism, sore, spasm, stomach
Mexico	Asthma, catarrh, purgative, rheumatism, sedative, sore, venereal
Panama	Asthma, diabetes, diarrhea, hypoglycemia, stomach, ulcer (mouth)
Peru	Cough, cystitis, diarrhea, hepatitis, prostatitis
Venezuela	Fracture, lung, vermifuge

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Ethnomedical Information on Jatoba (Hymenaea courbaril)

Part / Location	Documented Ethnic Use	Type Extract / Route	Used For	Ref #
Bark Amazonia	Used as a vermifuge, applied to wounded or sore eyes, and taken orally to stop excessive menstrual discharge.	Various / Various	Human Adult	ZZ1003
Bark Brazil	Used for stomach trouble.	H2O Ext / Oral	Human Adult	J02754
Bark Brazil	Used as a tonic. Used for the stomach, as an astringent, for weakness, debilitation, lack of appetite, gastric atonia, flatulence, diarrhea, hematuria and for catarrh of the respiratory and urinary tract.	Hot H2O Ext / Oral	Human Adult	ZZ1007
Bark Brazil	Used for athlete's foot and foot fungus.	Infusion / Topical	Human Adult	ZZ1024
Bark Brazil	Used as a tonic and energizer. Used to keep a good appetite. Used for chronic coughs, asthma, lung weaknesses, laryngitis, bronchitis, hemorrhage, bursitis, bladder infections, yeast and fungal infections, cystitis, arthritis and prostatitis. Used for its decongestant and antifungal properties.	Infusion / Oral	Human Adult	ZZ1067
Bark Brazil	Used to decongest the urinary tract, for cystitis and prostatitis, as an anti-inflammatory to the bladder. Used as an energizer and tonic; as a decongestant for respiratory problems; to reduce inflammation, to clear toxic pus, for painful urination and dribbling and for pain in the testicles or prostate.	Decoction / Oral	Human Adult	ZZ1016
Bark Brazil	Used for cystitis, hepatitis, prostatitis and tuberculosis.	Hot H2O Ext / Oral	Human Adult	L04137
Bark Brazil	Used for athlete's foot or food fungus. Used for diarrhea.	Infusion / Various	Human Adult	L04137
Bark Brazil	Used for stomach troubles.	Not stated	Human Adult	AN1009
Bark Brazil	Used for acute and chronic cystitis, prostatitis, blennorrhagia, diarrhea and dysentery.	Decoction / Oral	Human Adult	ZZ1072
Bark Brazil	Used as an astringent, sedative and carminative for inflammation of the prostate, hemorrhage, diarrhea, dysentery, dyspepsia, coughs and bronchitis.	Decoction / Oral	Human Adult	ZZ1092
Bark Brazil	Used for hemoptysis, hematuria, diarrhea, dysentery, colic, to fortify the system and to improve appetite.	Hot H2O Ext / Oral	Not Stated	ZZ1075
Bark Brazil	Used as a tonic, stomachic, astringent, balsamic, vermifuge and hemostatic.	Hot H2O Ext / Oral	Human Adult	ZZ1013

Part / Location	Documented Ethnic Use	Type Extract / Route	Used For	Ref #
Bark Brazil	Used as an astringent and pectoral. Used for skin diseases.	Decoction / Oral Bath / External	Human Adult	ZZ1099
Bark + Leaf Brazil	Used for bronchitis and coughs, bladder and prostate problems and as an astringent	Hot H2O Ext / Oral	Human Adult	ZZ1096
Bark + Leaf Brazil	Used for diarrhea, dysentery and intestinal colic. Used for coughs, bronchitis, catarrh, asthma and pulmonary weakness.	Decoction / Oral	Human Adult	ZZ1081
Leaf Brazil	Used for affections of the urinary system, chronic cystitis and prostatitis.	Decoction / Oral	Human Adult	ZZ1081
Resin Brazil	Used for bronchitis.	H2O Ext / Oral	Human Adult	J02754
Resin Brazil	Used for coughs, bronchitis, asthma, laryngitis and as an expectorant. Used for cystitis, urethritis, purulent secretions of the respiratory or urinary tract.	Resin / Oral	Human Adult	ZZ1007
Resin Brazil	Used as a tonic, balsamic, stomachic and vermifuge.	Resin / Oral	Human Adult	ZZ1099
Resin Brazil	Used to relieve aches and pains.	External	Human Adult	ZZ1099
Resin Brazil	Used for general debilitation, for pulmonary affections, for coughs, bronchitis, asthma, hemoptysis, worms and a lack of appetite, for acute and chronic cystitis, dysuria, anuria, prostatitis and blennorrhagia. Used as a tonic, to stimulate digestion and fortify the system.	Resin / Oral	Human Adult	ZZ1072
Resin Brazil	Used for hemoptysis, general weakness, coughs, bronchitis, asthma, pulmonary weakness, laryngitis.	Not stated	Human Adult	ZZ1075
Resin Brazil	Used for asthma, bronchitis, laryngitis, dyspepsia and a lack of appetite.	Resin / Not stated	Human Adult	AN1012
Sap Brazil	Used for bronchitis.	Not Stated / Oral	Human Adult	T08730
Sap Brazil	Used for wound healing and for the treatment of chronic cystitis, urine retention, anemia, prostatitis, blennorrhagia and chronic bronchitis.	Sap / Oral	Human Adult	ZZ1099
Sap Brazil	Used for coughs.	Sap / Oral	Human Adult	L04137
Sap Brazil	Used for bronchitis.	Infusion / Oral	Human Adult	AN1009
Seed Brazil	Used as a laxative.	Pulp / Oral	Human Adult	ZZ1099

Part / Location	Documented Ethnic Use	Type Extract / Route	Used For	Ref #
Not stated Brazil	Used as a tonic, to improve appetite and to increase energy. Used for acute and chronic cystitis and prostatitis. Used for respiratory conditions such as bronchitis, chronic coughs and asthma.	Infusion / Oral Infusion / Oral	Human Adult Human Adult	ZZ1099
Not stated China	Used to decongest the urinary tract, for cystitis, bladder and prostate infections. Used as a system fortifier, energizer and decongestant and to treat respiratory problems.	Not Stated / Oral	Human Adult	ZZ1015
Bark Guatemala	Used as a febrifuge, sudorific and as an antirheumatic	Hot H2O Ext / Oral	Human Adult	T15295
Fruit Guatemala	Used to treat mouth ulcers: three fruits are eaten daily for ten days.	Fruit / Oral	Human Adult	T01287
Bark Peru	Used for diarrhea.	Decoction / Oral	Human Adult	ZZ1039 ZZ1041 ZZ1045
Bark Peru	Used for cystitis, hepatitis, prostatitis, and tuberculosis.	Not stated / Oral	Human Adult	ZZ1041
Fruit Panama	Used to treat mouth ulcers.	Fruit / Oral	Human Adult	AN1009
Leaf Panama	Used as a hypoglycemic agent.	Hot H2O Ext / Oral	Human Adult	T01287
Leaf + Cortex Panama	Used for diabetes.	Infusion / Oral	Human Adult	AN1009

Presence of Compounds in Jatoba (Hymenaea courbaril)

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
(13R)-13-hydroxy-1(10), 14-ent-halimadien-18-oic acid	Diterpenoid	Not stated	Suriname	Not stated	AN1001
(13R)-2-oxo-13-hydroxy-1(10)-ent-halimadien-18-oic acid	Diterpenoid	Not stated	Suriname	Not stated	AN1001
(2S,13R)-2,13-dihydroxy-1(10), 14-ent-halimadien-18-oic acid	Diterpenoid	Not stated	Suriname	Not stated	AN1001
(5R*,8S*,9S*,10R*)-cleroda-3, 13E-dien-15-oic acid	Diterpene	Seed	Brazil	Not stated	AN1002
4-4-(a)-5-6-7-octahydro:1-beta-(3-methyl-4-carboxy-butanyl)-1-alpha-2-alpha-5-alpha-trimethyl: dimethyl ester naphthalene-5-carboxylic acid,1-2-3	Diterpene	Leaf + Stem	Not stated	Not stated	A01895
4-4-(a)-5-6-7-octahydro:1-beta-(2-(3-furyl)-ethyl)-1-alpha-2-alpha-5-alpha-trimethyl:naphthalene-5-carboxylic acid,1-2-3	Diterpene	Leaf + Stem	Not stated	Not stated	A01895
4-4-(a)-5-6-7-octahydro: 1-beta-(trans-3-methyl-4-carboxy-but-3-enyl)-1-alpha-2-alpha-5-alpha-trimethyl:dimethyl-selina-4(14)-7(11)-diene	Sesquiterpene	Leaf + Stem	Not stated	Not stated	A01895
Astilibin	Flavonoid	Leaf + Stem	Not stated	Not stated	K01545
Bisabolene, beta	Sesquiterpene	Bark	Not stated	Not stated	AN1011
Bourbonene, beta	Sesquiterpene	Leaf + Stem	Not stated	Not stated	A01895
Cadinene, delta	Sesquiterpene	Leaf Leaf Leaf Leaf + Stem Leaf + Seed+ Stem Leaf Leaf Leaf Leaf Leaf Leaf	Brazil Brazil Not stated Not stated Not stated Mexico Honduras Costa Rica Puerto Rico Venezuela Brazil	Not stated Not stated Not stated Not stated Not stated Not stated Not stated Not stated Not stated Not stated Not stated	J04745 A03106 J05393 A01895 AN1011 J04745 J04745 J04745 J04745 J04745 J04745

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
Cadinene, gamma	Sesquiterpene	Leaf Leaf Leaf Leaf Leaf Leaf Leaf Leaf Leaf + Stem	Brazil Mexico Honduras Costa Rica Puerto Rico Venezuela Brazil Not stated Not stated	Not stated Not stated Not stated Not stated Not stated Not stated Not stated Not stated Not stated	J04745 J04745 J04745 J04745 J04745 J04745 J04745 J05393 AN1011
Calarene	Sesquiterpene	Pod	Not stated	Not stated	AN1011
Caryophyllene	Sesquiterpene	Leaf Leaf Leaf + Stem Leaf Leaf Leaf Leaf Leaf Leaf + Seed +Stem	Brazil Not stated Not stated Mexico Honduras Costa Rica Puerto Rico Brazil Not stated	Not stated Not stated Not stated Not stated Not stated Not stated Not stated Not stated Not stated	A03106 J05393 A01895 J04745 J04745 J04745 J04745 J04745 AN1011
Catechin, epi: (-)	Flavonoid	Leaf	Costa Rica	00.014%	K20463
Communic acid,iso-enantio: methyl ester	Diterpene	Leaf + Stem	Not stated	Not stated	A01895
Copacamphene	Sesquiterpene	Leaf	Brazil	Not stated	A03106
Copaene, alpha	Sesquiterpene	Leaf Leaf Leaf + Stem	Brazil Not stated Not stated	Not stated Not stated Not stated	A03106 J05393 AN1011
Copaene, beta	Sesquiterpene	Leaf Leaf Leaf Leaf + Stem	Brazil Brazil Not stated Not stated	Not stated Not stated Not stated Not stated	J04745 A03106 J05393 AN1011
Copalic acid	Diterpene	Bark	Not stated	Not stated	AN1011

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
Cubebene, alpha	Sesquiterpene	Leaf Leaf Leaf Leaf + Stem	Brazil Brazil Not stated Not stated	Not stated Not stated Not stated Not stated	J04745 A03106 J05393 AN1011
Cubebene, beta	Sesquiterpene	Leaf	Brazil	Not stated	J04745
Cyclosativene	Sesquiterpene	Leaf + Stem Seed	Not stated Not stated	Not stated Not stated	A01895 AN1011
Cyperene	Sesquiterpene	Leaf	Not stated	Not stated	AN1011
Diterpene	Diterpene	Fruit Hulls	Venezuela	Not stated	M08536
Eperua-7-13-dien-15-oic acid, ent	Diterpene	Bark	Brazil	Not stated	J02754
Gurjunene, beta	Sesquiterpene	Leaf + Stem	Not stated	Not stated	A01895
Heptasaccharide (XXXG)	Xyloglucan Oligosaccharide	Seed	Not stated	Not stated	AN1005
Himachalene, alpha	Sesquiterpene	Leaf + Stem Seed	Not stated Not stated	Not stated Not stated	A01895 AN1011
Humulene	Sesquiterpene	Leaf + Stem	Not stated	Not stated	A01895
Humulene, alpha	Sesquiterpene	Leaf	Brazil	Not stated	A03106
Humulene, beta:	Sesquiterpene	Leaf Leaf Leaf + Stem Leaf	Not stated Brazil Not stated Brazil	Not stated Not stated Not stated Not stated	J05393 A03106 AN1011 J04745
Iso-ozic acid: (-)-	Diterpene	Seed	Brazil	Not stated	AN1002
Kovalenic acid: (-)-	Diterpene	Seed	Brazil	Not stated	AN1002
Lab-13-en-8-beta-ol-15-oic acid, ent	Diterpene	Bark Bark	Brazil Not stated	Not stated Not stated	J02754 AN1011
Labda-8(17),13-diene-15-oic acid, ent	Diterpene	Bark	Not stated	Not stated	AN1011

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
Labdan-8-beta-ol-15-oic acid, ent	Diterpene	Bark Bark	Brazil Not stated	Not stated Not stated	J02754 AN1011
Methyl (5S*,8S*,9S*,10R*)-cleroda-3, 13E-dien-15-oate	Diterpene	Seed	Brazil	Not stated	AN1002
Muurolene, alpha	Sesquiterpene	Leaf + Stem Seed	Not stated Not stated	Not stated Not stated	A01895 AN1011
Muurolene, gamma	Sesquiterpene	Leaf Leaf Leaf + Stem	Brazil Brazil Not stated	Not stated Not stated Not stated	A03106 J04745 AN1011
Naphthalene-5-carboxylic acid, 1-2-3	Diterpene	Leaf + Stem	Not stated	Not stated	A01895
Octasaccharide (XXLG)	Oligosaccharide	Seed	Not stated	Not stated	AN1005
Ozic acid: (-)-	Diterpene	Seed	Brazil	Not stated	AN1002
Polysaccharide	Oligosaccharide	Leaf	Brazil	Not stated	AN1003
Polysaccharide B1	Oligosaccharide	Seed	Brazil	Not stated	AN1007
Selina-4(14)-7(11)-diene	Sesquiterpene	Seed	Not stated	Not stated	AN1011
Selina-4(14)-7-diene	Sesquiterpene	Leaf + Stem Seed	Not stated Not stated	Not stated Not stated	A01895 AN1011
Selinene, alpha	Sesquiterpene	Leaf Leaf Leaf Leaf + Stem	Brazil Brazil Not stated Not stated	Not stated Not stated Not stated Not stated	J04745 A03106 J05393 AN1011
Selinene, beta	Sesquiterpene	Leaf Leaf Leaf Leaf + Stem	Not stated Brazil Brazil Not stated	Not stated Not stated Not stated Not stated	J05393 A03106 J04745 AN1011
Sitosterol, beta	Steroid	Leaf + Stem	Not stated	Not stated	K01545
Taxifolin-3-o-rhamnoside	Flavonoid	Leaf	Costa Rica	00.013%	K20463
XXXXG	Oligosaccharide	Cotyledons	Brazil	Not stated	AN1006

Biological Activities for Extracts of Jatoba (Hymenaea courbaril)

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Stembark Brazil	Uterine Stimulant Effect	H2O Ext	Rat oral	Not stated	Inactive	Uterus (estrog).	A03531
Resin Not stated	Allergenic Activity	Resin	External Human Adult	Not stated	Equiv.		T15941
Not stated Brazil	Anti-inflammatory Activity	Not stated	Not stated	Not stated	Active	Inhibited 5-lipoxygenase.	AN1004
Bark Guatemala	Diuretic Activity	Decoction	Nasogastric Rat	1.0 gm/kg	Active		T15295
Leaf + Stem Panama	Antifungal Activity	MEOH Ext	Agar plate	100.0 mcg	Active	*Cladosporium cucumerinum*	K11142
Resin Surinam	Antifungal Activity	ETOH (95%) Ext	Agar plate	5.0 mg/ml	Active	*Aspergillus niger*	T14756
Leaf Brazil	Antifungal Activity	Resin	Not stated	3.0 mg/ml	Active	*Pestalotia subcultularis*	M07240
Leaf Mexico	Antifungal Activity	Resin	Not stated	3.0 mg/ml	Active	*Pestalotia subcultularis*	M07240
Leaf + Stem Panama	Antifungal Activity	CHCL3 Ext	Agar plate	100.0 mcg	Active	*Cladosporium cucumerinum*	K11142
Leaf + Stem Panama	Antifungal Activity	H2O Ext	Agar plate	100.0 mcg	Inactive	*Cladosporium cucumerinum*	K11142
Bark Panama	Antifungal Activity	CHCL Ext H2O Ext MEOH Ext	Agar plate	100.0 mcg	Inactive	*Cladosporium cucumerinum*	K11142
Bark Surinam	Antifungal Activity	ETOH (95%) Ext	Agar plate	50.0 mg/ml	Inactive	*Aspergillus niger*	T14756
Leaf + Stem Brazil	Anti-yeast Activity	Not stated	Agar plate	100.0 mcg	Active	*Candida albicans*	AN1010
Leaf + Stem Panama	Anti-yeast Activity	CHCL3 Ext	Agar plate	100.0 mcg	Active	*Candida albicans*	K11142
Bark Panama	Anti-yeast Activity	CHCL3 Ext	Agar plate	100.0 mcg	Weak Activity	*Candida albicans*	K11142
Resin Surinam	Anti-yeast Activity	ETOH (95%) Ext	Agar plate	50.0 mg/ml	Inactive	*Candida albicans*	T14756
Leaf + Stem Panama	Anti-yeast Activity	H2O Ext MEOH Ext	Agar plate	100.0 mcg	Inactive	*Candida albicans*	K11142
Bark Surinam	Anti-yeast Activity	ETOH (95%) Ext	Agar plate	50.0 mg/ml	Inactive	*Candida albicans*	T14756

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Bark Panama	Anti-yeast Activity	H2O Ext MEOH Ext	Agar plate	100.0 mcg	Inactive	*Candida albicans*	K11142
Stembark Guatemala	Anti-yeast Activity	ETOH (60%) Ext	Agar plate	Not stated	Inactive	*Candida albicans*	M31296
Leaf + Stem Brazil	Antibacterial Activity	CHCL3 Ext	Agar plate	100 ug/ml	Active	*Klebsiella pneumoniae*	AN1010
Bark Surinam	Antibacterial Activity	ETOH (95%) Ext	Agar plate	50.0 mg/ml	Active	*Bacillus subtilis*	T14756
Bark Brazil	Antibacterial Activity	H2O Ext	Agar plate	4.2%	Active	*Bacillus cereus* *Staphylococcus aureus*	ZZ1002
Bark Surinam	Antibacterial Activity	ETOH (95%) Ext	Agar plate	50.0 mg/ml	Active	*Escherichia coli* *Staphylococcus aureus* *Pseudomonas aeruginosa*	T14756
Resin Surinam	Antibacterial Activity	ETOH (95%) Ext	Agar plate	50.0 mg/ml	Inactive	*Bacillus subtilis* *Escherichia coli* *Pseudomonas aeruginosa* *Staphylococcus aureus*	T14756
Bark Brazil	Molluscicidal Activity	Essential oil	Not stated	1-10 mg	Inactive	*Biomphalaria glabrata*	T07475
Bark Brazil	Molluscicidal Activity	ETOH (95%) Ext H2O Ext	Not stated	10000 ppm	Inactive	*Biomphalaria glabrata* *Biomphalaria straminea*	W02949
Seed Mexico	Hemagglutinin Activity	H2O Ext	Cow Human Adult Rabbit	Not stated	Inactive	RBC.	T00351
Seed Mexico	Trypsin Inhibition	H2O Ext	Not stated	Not stated	Active	16.57 trypsin units inhibited.	T00351

Biological Activities for Compounds of Jatoba (Hymenaea courbaril)

Compound	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
(13R)-13-hydroxy-1(10), 14-ent-halimadien -18-oic acid	Cytotoxic Activity	Agar plate Cell culture	Not stated Not stated	Weak Activity Weak Activity	1138 mutant yeast strain. A2780 human ovarian cancer cell line.	AN1001
Astilbin	Hepatoprotective Effect	Rat	40 mg/kg	Active	In Cl(4)C-induced hepatotoxicity astilbin restored lipoperoxides and tissue prostanoids to basal levels.	AN1008
Alpha-humulene	Antitumor Activity	Not stated	Not stated	Active		AN1015
Alpha-humulene	Antibacterial Activity	Not stated	Not stated	Active		AN1014
Beta-bisabolene	Abortifacient Effect	Not stated	Not stated	Active		ZZ1022
Beta-bisabolene	Antiviral Activity	Not stated	IC50=1800 mcg	Active	*Rhinovirus*	AN1022
Beta-bisabolene	Antiulcer Activity	Not stated	IC50=100 mg/kg	Active		AN1023
Caryophyllene	Anticarcinogenic Activity	Not stated	MIC=1600 mcg/ml	Active		AN1019
Caryophyllene	Antitumor Activity	Not stated	Not stated	Active		AN1015
Caryophyllene	Antifungal Activity	Not stated	Not stated	Active	*Candida albicans*	ZZ1022
Caryophyllene	Antibacterial Activity	Not stated	Not stated	Active		AN1014
Caryophyllene	Antibacterial Activity	Not stated	Not stated	Active	*Staphylococcus* *Streptococci*	ZZ1022
Caryophyllene	Antifeedant Activity	Not stated	500 ppm	Active		AN1021
Caryophyllene	Anti-inflammatory Activity	Not stated	Not stated	Active		AN1016
Caryophyllene	Anti-inflammatory Activity	Not stated	IC50=100 uM	Active		AN1020
Caryophyllene	Antiedemic Activity	Not stated	Not stated	Active		AN1020
Caryophyllene	Antiulcer Activity	Oral Rat	Not stated	Active	Inhibited gastric mucosal injury by ETOH and HCl.	AN1016
Caryophyllene	Anti-asthmatic Activity	Not stated	Not stated	Active		AN1018

Compound	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Caryophyllene	Aldose-Reductase Inhibitory Activity	Not stated	Not stated	Active		ZZ1022
Caryophyllene	Antiacne Activity	Not stated	Not stated	Active		ZZ1022
Caryophyllene	Glutathione-S-transferase Induction	Mouse	Not stated	Active	(liver & small intestine)	AN1015
Caryophyllene	Sedative Effect	Not stated	Not stated	Active		ZZ1022
Copalic acid	Antimicrobial Activity	Agar Plate	MIC=<10 mcg/ml	Active	Gram-positive bacteria. *B. subtilis* *S. aureus* *S. epidermidis*	AN1017
Copalic acid	Anti-inflammatory Activity	Rat	Not stated	Active	vs. carrageenin-induced pedal edema. Reduced granuloma formation and vascular permeability to intracutaneous histamine.	AN1013
Copalic acid	Cytotoxic Activity	Cell Culture	IC50=>10 mcg/ml	Inactive	P-388 (lymphoid neoplasm). A-549 (human lung carcinoma). HT-29 (human colon carcinoma). MEL-28 (human melanoma).	AN1017
Delta-cadinene	Anticarcinogenic Activity	Not stated	MIC=800 mcg/ml	Active		AN1019
Delta-cadinene	Antibacterial Activity	Not stated	MIC=800 mcg/ml	Active		AN1019
Delta-cadinene	Antibacterial Activity	Not stated	Not stated	Active	*Streptococci*	ZZ1022
Delta-cadinene	Aldose-reductase Inhibitory Activity	Not stated	Not stated	Active		ZZ1022
Delta-cadinene	Antiacne Activity	Not stated	Not stated	Active		ZZ1022

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