Technical Data Report

for

MUIRA PUAMA

Ptychopetalum olacoides

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Muira Puama

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Family: Olacaceae

Genus: *Ptychopetalum*

Species: *olacoides*, *uncinatum*

Synonyms: None

Common Names: Muira puama, potency wood, marapuama, marapama, muiratã, muiratam, pau-homen, potenzholz

Parts Used: Bark, roots

Muira puama, also called "potency wood," is a small tree that grows to 5 m high and is native to the Brazilian Amazon and other parts of the Amazon rainforest. The small, white flowers have a pungent fragrance similar to jasmine's. The *Ptychopetalum* genus is a small one—only two species of small trees grow in tropical South America and five in tropical Africa. The two South American varieties, *P. olacoides* (found in Brazil, French Guiana, Guyana, and Suriname) and *P. uncinatum* (found only in Brazil), are used interchangeably in South American herbal medicine systems. The *olacoides* variety is usually preferred, as it has a higher content of lupeol (one of the plant's active phytochemicals). A completely different species of Brazilian tree, *Liriosma ovata*, also goes by the common name of muira puama (and is often sold in commerce as such); however, it is a completely different tree with a different phytochemical makeup.[1]

Historically, all parts of muira puama have been used medicinally, but the bark and roots are the most-utilized parts of the plant. It has long been used in the Amazon by indigenous peoples for a number of purposes. Native peoples along the Brazilian Amazon's Rio Negro use the stems and roots from young plants as a tonic to treat neuromuscular problems; a root decoction is used in baths and massages for treating paralysis and beri-beri; and a root-and-bark tea is taken to treat sexual debility, rheumatism, grippe, and cardiac and gastrointestinal asthenia. It's also valued there as a preventive for baldness. In Brazilian herbal medicine, muira puama still is a highly-regarded sexual stimulant with a reputation as a powerful aphrodisiac. It has been in the Brazilian Pharmacopoeia since the 1950s.[2] It is used as a neuromuscular tonic for asthenia and paralysis, dyspepsia, menstrual disturbances, chronic rheumatism (applied topically), sexual impotence, grippe, ataxia, and central nervous system disorders.

Muira puama is employed around the world today in herbal medicine. Early European explorers noted the indigenous uses and the aphrodisiac qualities of muira puama and brought it back to Europe, where it has become part of herbal medicine in England. It is still listed in the British Herbal Pharmacopoeia (a noted herbal medicine source from the British Herbal Medicine Association); it is recommended there for the treatment of dysentery and impotence.[3] It is also used in Europe to treat impotence, infertility, neurasthenia, menstrual disturbances, and dysentery. In Germany, muira puama is employed as a central nervous system tonic, for hookworms, menstrual disturbances, and rheumatism. Muira puama has been gaining in popularity in the United States, where herbalists and health care practitioners are using it for impotence, depression, menstrual cramps and PMS, neurasthenia, and central nervous system disorders.

Scientists began searching for the source of muira puama's efficacy in the 1920s.[4–6] Early researchers discovered that the root and bark were rich in fatty acids and fatty acid esters (the main one being behenic acid), essential oils (including beta-caryophyllene and alpha-humulene), plant sterols, triterpenes (including lupeol), and a new alkaloid—which they named *muirapuamine*.[7] Scientists resumed researching the plant's constituents and pharmacological properties in the late 1960s and continued into the late 1980s.[8–14] These studies indicated that the active constituents also included free long-chain fatty acids, sesquiterpenes, monoterpenes, and novel alkaloids.

In one of the early studies, researchers indicated that muira puama was effective in treating disorders of the nervous system and sexual impotence, and that "permanent effect is produced in locomotor ataxia, neuralgias of long standing, chronic rheumatism, and partial paralysis."[7] In 1930, Meiro Penna wrote about muira puama in his book *Notas Sobre Plantas Brasilerias*. He cited physiological and therapeutic experiments conducted in France by Dr. Rebourgeon that confirmed the efficacy of the plant for "gastrointestinal and circulatory asthenia and impotency of the genital organs."[15]

The benefits of treating impotence with muira puama have been studied in two human trials in France, which reported that muira puama was effective in improving libido and treating erectile dysfunction. In a Paris, France, study among 262 male patients who experienced lack of sexual desire and the inability to attain or maintain an erection, 62% of the patients with loss of libido reported that the extract of muira puama "had a dynamic effect," and 51% of patients with erectile dysfunction felt that muira puama was beneficial.[16] The second study evaluated positive psychological benefits of muira puama in 100 men with male sexual asthenia.[17] The therapeutic dosage was 1.5 g of a muira puama extract daily. In their final report, researchers indicated muira puama could "enhance libido [in 85% of test group], increase the frequency of intercourse [in 100 %] and improve the ability to maintain an erection [in 90%]."[17]

In other recent clinical research, muira puama extracts have been reported to have adaptogenic, antifatigue, antistress, and CNS effects.[18,19] A specially-prepared extract from the root of muira puama has been patented for its ability to "relieve physical and mental fatigue" and for "ameliorating a weakened constitution."[18] Researchers in Brazil documented a definite CNS effect of the bark in studies with mice.[19,20] The bark of muira puama also has demonstrated a mild, short-lived, hypotensive effect.[21] The root was found to inhibit stress-induced ulcers,[22] while the leaf demonstrated an analgesic effect.[23] Another U.S. patent has been filed on muira puama, citing that it can "reduce body fat percentage, increase lean muscle mass and lower cholesterol" in humans and animals with long-term use (and with no toxicity noted).[24] Toxicity studies with mice (published in 1983) also indicated no toxic effects (at dosages of 50mg/kg, in an ethanol extract).[25]

While so-called aphrodisiacs have come and gone in history, muira puama has retained its stature and may well provide one of the more effective natural therapeutic approaches for erectile dysfunction and libido enhancement. Before trying to self-treat, however, men should always seek the advice of a health practitioner (if erectile dysfunction or impotency is indicated); this often can be an early warning of vascular insufficiency and/or heart conditions.

To achieve the libido and potency effects of this particular plant, proper preparation methods must be employed. The active constituents thought to be responsible for muira puama's potency and libido effect are not soluble in water—taking bark or root powder in capsules or tablets will not be very effective. High heat for at least 20 minutes with alcohol is necessary to free the volatile and essential oils, terpenes, gums, and resins found in the bark and root which have been linked to muira puama's beneficial effects.

Documented Properties and Actions: Adaptogen, analgesic, antidysenteric, antifatigue, antirheumatic, antistress, antiulcer, anxiogenic, aperitif, aphrodisiac, central nervous system stimulant, hypocholesterolemic, hypotensive, lipolytic, nervine, neurasthenic, tonic

Main Phytochemicals: Alpha-copaene, alpha-elemene, alpha-guaiene, alpha-humulene, alpha-muurolene, alpha-pinene, alpha-resinic acid, alpha-terpinene, arachidic acid, allo-aromadendren, behenic acid, beta-bisabolene, beta-caryophyllene, beta-pinene, beta-resinic acid, beta-sitosterol, beta-transfarnesene, borneol, campesterols, camphene, camphor, car-3-ene, caryophyllene, cerotic acid, chromium, coumarin, cubebene, delta-cadinene, dotriacontanoic acid, elixene, ergosterols, eugenol, essential oils, gamma-muurolene, hentriacontanoic acid, heptacosanoic acid, lignoceric acid, limonene, linalool, lupeol, melissic acid, montanic acid, muirapuamine, myrcene, nonacosanoic acid, para-cymene, pentacosanoic acid, phlobaphene, stigmasterols, trichosanic acid, uncosanic acid

Traditional Remedy: Since many of the most active principals are not water soluble it is best to prepared this plant as a tincture, using 1–3 ml of a 4:1 tincture twice daily. Boiling the tincture for 20 minutes will help facilitate extraction of the non-water-soluble chemicals. For its tonic effect, one of the traditional remedies is to gently simmer 1 teaspoon of root and/or bark in one cup of water for 15 minutes and take 1/3 to 1 cup daily.

Contraindications: None reported.

Drug Interactions: None reported.

WORLDWIDE ETHNOBOTANICAL USES

Country	Uses
Amazonia	Asthenia, astringent, baldness, beri-beri, cardiac asthenia, central nervous system stimulant, diarrhea, gastrointestinal, grippe, impotence, invigorating, low libido, neuromuscular, paralysis, rheumatism, sexual debility
Brazil	Aphrodisiac, appetite stimulant, asthenia, astringent, ataxia, baldness, beri-beri, central nervous system disorders, debility, depression, dysentery, dyspepsia, frigidity, gastrointestinal, grippe, heart, hookworm, impotence, low libido, menstrual cramps, menopause, neuralgia, neurasthenia, neuromuscular, nervous exhaustion, ovarian atony, paralysis, PMS, poliomyelitis, rheumatism, stimulant, stomachic, stress, tonic, trauma
Germany	CNS tonic, hookworm, menstrual disturbances, rheumatism
Guiana	Aphrodisiac, sexual potency, stimulant, tonic
Europe	Aphrodisiac, dysentery, impotence, infertility, menstrual disturbances, nervine, neurasthenia, tonic
United States	Aphrodisiac, central nervous system disorders, impotence, menstrual, nervine, neurasthenia, PMS
Elsewhere	Apertif, aphrodisiac, baldness, CNS stimulant, dyspepsia, exhaustion, gastrointestinal, hookworm, impotency, infertility, low libido, menstrual irregularities, muscle paralysis, nervine, nerve stimulant, neuralgia, neurasthenia, neuromuscular problems, paralysis, poliomyelitis, reproductive disorders, rheumatism, stress, tonic, trauma

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Ethnomedical Information on Muira Puama (Ptychopeltalum olacoides)

Plant Part / Location	Documented Ethnomedical Use	Type Extract / Route	Used For	Ref #
Bark Brazil	Used for male impotence.	Infusion Oral	Human Male	J16115
Bark Brazil	Used as an aphrodisiac.	Alcohol Ext Oral	Human Male	K20642
Bark Brazil	Used as an aphrodisiac, tonic for the nervous system and antirheumatic. Said to be neurosthenetic and to fortify the stomach and intestines. Used for gastrointestinal and circulatory asthenia, impotency, problems of the nervous system, lack of libido, neurasthenia and neuralgia.	Infusion Oral	Human Adult	ZZ1075
Bark Brazil	Used in nervous diseases, gastrointestinal and circulatory asthenias, ovarian atony, impotency, neurasthenic and postgrippal anaphrodisias, locomotor ataxia, neuralgias of long standing, chronic rheumatism, partial paralysis and dysentery.	Not stated	Human Adult	AT1005
Bark + Root Brazil	Used as a stimulant, aphrodisiac, stomach tonic and for rheumatism.	Not stated	Human Adult	ZZ1061
Bark + Root Brazil	Used as an aphrodisiac and nerve tonic.	Alcohol Ext Oral	Human Male	K20642
Stem + Root Brazil	Used as an aphrodisiac, for partial paralyses, dyspepsia, menstrual disturbances and rheumatism.	Not stated	Human Adult	ZZ1099
Stem + Root Brazil	Used as a tonic to treat neuromuscular problems. Used for paralysis and beri-beri. Used for sexual debility, rheumatism, grippe and cardiac and gastrointestinal asthenia. Used for the prevention of baldness.	Not stated Decoction External Infusion Oral	Human Adult	ZZ1005
Root Brazil	Used as a genital stimulant.	Hot H2O Ext Oral	Human Male	T01002
Root Brazil	Used for chronic rheumatism, acute poliomyelitis and central nervous system diseases, hookworm disease, dysentery, and as an appetite stimulant.	Hot H2O Ext Oral	Human Adult	T01002
Root Brazil	Used as an aphrodisiac.	Alcohol Ext Oral H2O Ext Oral	Human Adult Male	K20642
Root Brazil	Used as a tonic.	H2O Ext Oral	Human Adult	K20642
Root Brazil	Used as a tonic, stimulant, nerve tonic, and to treat nervous disorders.	Alcohol Ext Oral	Human Adult	K20642
Root Brazil	Used as a stimulant and nerve tonic.	Hot H2O Ext Oral	Human Adult	K20642

Plant Part / Location	Documented Ethnomedical Use	Type Extract / Route	Used For	Ref #
Root Brazil	Used for ataxia, asthenia, chronic rheumatism, partial paralysis, gripe, impotency, debilitation and as a neuromuscular tonic.	Hot H2O Ext Oral	Human Adult	ZZ1002
Root Brazil	Used as an aphrodisiac.	Decoction Oral	Human Adult (male)	L10703
Root Brazil	Used as an aphrodisiac.	Not Stated Oral	Human Adult	T08730
Root Brazil	Used as an aphrodisiac and nerve stimulant.	Not stated	Human Adult	ZZ1010
Root Brazil	Used for impotence, low sex drive, as an aphrodisiac, astringent and as a stimulating tonic.	Not stated	Human Adult	AT1024
Not Stated Brazil	Used to balance hormones of the menstrual cycle and during menopause. Used for menstrual cramps, premenstrual syndrome, frigidity, as a tonic for the nervous system, for depression and impotence.	Not stated	Human Adult	ZZ1067
Not Stated Brazil	Used for nervous problems and disorders, neurasthenia, neuralgia, nervous depression, as a nervous system tonic, for genital weakness, frigidity, impotency, menstrual cramps, premenstrual syndrome. Used as an aphrodisiac. Thought to fortify the stomach and intestines.	Not stated	Human Adult	ZZ1014
Not Stated Brazil	Used to tonify the nervous system, as an antirheumatic, to fortify the stomach and intestines. Used for nervous exhaustion, stress and trauma; enhances libido.	ETOH Ext Oral	Human Adult	ZZ1016
Not Stated Brazil	Used as an aphrodisiac, as an astringent and aromatic. Used for dysentery and impotence.	Not stated	Human Adult	ZZ1062
Not Stated Brazil	Used as an aphrodisiac, neurosthenetic, antirheumatic and tonic for the nervous system.	Not stated	Human Adult	AT1004
Root Guiana	Used as an aphrodisiac.	Alcohol Ext Oral	Human Adult (male)	K20642
Root Guiana	Used as an aphrodisiac.	H2O Ext Oral	Human Adult	K20642
Root Guiana	Used as a tonic and stimulant.	Alcohol Ext Oral	Human Adult	K20642
Root Guiana	Used as a tonic and stimulant.	H2O Ext Oral	Human Adult	K20642
Root Guiana	Used as a potency promoter.	Alcohol Ext Oral H2O Ext Oral	Human Adult (male)	K20642
Stembark French Guiana	Used as an aphrodisiac.	Stembark Ext Oral	Human Adult (male)	M05122

Plant Part / Location	Documented Ethnomedical Use	Type Extract / Route	Used For	Ref #
Root + Stem Amazonia	Used as an astringent for diarrhea. Stimulates the central nervous system and enhances libido.	Not stated	Human Adult	AT1014
Not Stated Amazonia	Used as an invigorating or restoring tonic.	Not stated	Human Adult	AT1013
Root Not Stated	Used for impotency, infertility and neurasthenia.	Hot H2O Ext Oral	Human Adult	ZZ1011
Root Not Stated	Used to bathe the genitals. Used for rheumatism and muscle paralysis.	Decoction External	Human Adult	ZZ1049
Root Not Stated	Used as an apertif, aphrodisiac, CNS stimulant, nervine, nerve stimulant, tonic for dyspepsia, neuralgia, paralysis, rheumatism, sexual impotence, menstrual irregularities and paralysis caused by poliomyelitis.	Not stated	Human Adult	ZZ1049
Not Stated	Used to tonify the nervous system, used for mild exhaustion, for gastrointestinal and reproductive disorders, stress, trauma and rheumatism. Used to enhance the libido, for neuromuscular problems and prevention of baldness.	Not stated	Human Adult	ZZ1015
Not Stated	Used for impotency, as a central nervous system tonic, for European hookworm, for menstrual disturbances and chronic rheumatism.	Not stated	Human Adult	AT1006

Presence of Compounds in Muira Puama (Ptychopeltalum olacoides)

Compound	Chemical type	Plant Part	Plant Origin	Quantity	Ref #
Arachinic acid	Fatty acid	Not stated	Not stated	Not stated	ZZ1049
Aromadendren, allo-	Sesquiterpene	Root Essential Oil	Brazil	00.7%	T12654
Behenic acid		Not Stated	Brazil	Not stated	AT1001 AT1002 AT1003 ZZ1049
Bisabolene, beta-	Sesquiterpene	Root Essential Oil	Brazil	00.4%	T12654
Borneol	Monoterpene	Root Essential Oil	Brazil	00.5%	T12654
Cadinene, delta-	Sesquiterpene	Root Essential Oil	Brazil	00.5%	T12654
Campesterol	Fatty acid	Not stated	Not stated	Not stated	ZZ1049 AT1007
Camphene	Monoterpene	Root Essential Oil	Brazil	06.6%	T12654
Camphor	Monoterpene	Root Essential Oil	Brazil	06.2%	T12654
Car-3-ene	Monoterpene	Root Essential Oil	Brazil	00.8%	T12654
Caryophyllene oxide	Sesquiterpene	Root Essential Oil	Brazil	02.9%	T12654
Caryophyllene, beta-	Sesquiterpene	Root Essential Oil	Brazil	07.7%	T12654
Cerotic acid	Lipid	Root	Brazil	Not stated	T12654
Chromium	Inorganic	Not Stated	Brazil	Not stated	M29199
Copaene, alpha-	Sesquiterpene	Root Essential Oil	Brazil	03.2%	T12654
Coumarin	Coumarin	Root Essential Oil	Brazil	Not stated	T12654
Cubebene	Sesquiterpene	Root Essential Oil	Brazil	00.3%	T12654
Cymene, para-	Monoterpene	Root Essential Oil	Brazil	00.5%	T12654
Dotriacontanoic acid	Lipid	Root	Brazil	00.4%	T12654
Elemene, alpha-	Sesquiterpene	Root Essential Oil	Brazil	00.4%	T12654
Elixene	Sesquiterpene	Root Essential Oil	Brazil	05.1%	T12654

Compound	Chemical type	Plant Part	Plant Origin	Quantity	Ref #
Ergosta-4-6-8(14)-22-tetraen-3-one	Steroid	Root	Brazil	Not stated	K24499
Ergosterol peroxide	Steroid	Root	Brazil	Not stated	K24499
Ergosterol peroxide, 9-11-dehydro-	Steroid	Root	Brazil	Not stated	K24499
Eugenol	Phenylpropanoid	Root	Brazil	Not stated	K24499
Essential Oil	Lipid	Root	Brazil	Not stated	AT1005
Trans-farnesene, beta-	Sesquiterpene	Root Essential Oil	Brazil	00.5%	T12654
Guaiene, alpha-	Sesquiterpene	Root Essential Oil	Brazil	00.6%	T12654
Hentriacontanoic acid	Lipid	Root	Brazil	Not stated	T01002
Heptacosanoic acid	Lipid	Root	Brazil	Not stated	T01002
Humulene, alpha-	Sesquiterpene	Root Essential Oil	Brazil	09.2%	T12654
Lignoceric acid	Fatty acid	Not stated	Not stated	Not stated	ZZ1049
Limonene	Monoterpene	Root Essential Oil	Brazil	01.1%	T12654
Linalool	Monoterpene	Root Essential Oil	Brazil	00.9%	T12654
Lupeol	Triterpene	Root	Brazil	Not stated	K24499
Melissic acid	Lipid	Root	Brazil	Not stated	T01002
Montanic acid	Lipid	Root	Brazil	Not stated	T01002
Muirapuamine	Alkaloid	Bark	Brazil	0.055% 0.05%	AT1005 ZZ1049
Muurolene, alpha-	Sesquiterpene	Root Essential Oil	Brazil	00.8%	T12654
Muurolene, gamma-	Sesquiterpene	Root Essential Oil	Brazil	00.5%	T12654
Myrcene	Monoterpene	Root Essential Oil	Brazil	00.5%	T12654
Nonacosanoic acid	Lipid	Root	Brazil	Not stated	T01002
Pentacosanic acid	Fatty acid	Not stated	Not stated	Not stated	ZZ1049
Phlobaphene		Not stated	Not stated	0.6%	ZZ1049
Pinene, alpha-	Monoterpene	Root Essential Oil	Brazil	25.9%	T12654

Compound	Chemical type	Plant Part	Plant Origin	Quantity	Ref #
Pinene, beta-	Monoterpene	Root Essential Oil	Brazil	07.8%	T12654
Resinic acid, alpha		Not stated	Not stated	0.6%	ZZ1049
Resinic acid, beta		Not stated	Not stated	0.7%	ZZ1049
Sitosterol, beta	Steroid	Root	Brazil	Not stated	K24499
Stigmast-4-en-3-one	Steroid	Root	Brazil	Not stated	K24499
Stigmast-4-ene-3-6-dione	Steroid	Root	Brazil	Not stated	K24499
Stigmast-5-ene-3-beta-7-alpha-diol	Steroid	Root	Brazil	Not stated	K24499
Stigmasta-4-22-dien-3-one	Steroid	Root	Brazil	Not stated	K24499
Stigmasta-4-22-diene-3-6-dione	Steroid	Root	Brazil	Not stated	K24499
Stigmasterol	Steroid	Root	Brazil	Not stated	K24499
Terpinene, alpha-	Monoterpene	Root Essential Oil	Brazil	00.2%	T12654
Tricosanic acid	Fatty acid	Not stated	Not stated	Not stated	ZZ1049
Uncosanic acid	Fatty acid	Not stated	Not stated	Not stated	ZZ1049

OTHER PHYTOCHEMICAL SCREENING:

Alkaloids Present	Root	T01002
	Leaf	M05122
	Stembark	M05122
	Rootbark	M05122
Coumarins Absent	Leaf	M05122
	Stembark	M05122
	Rootbark	M05122
Flavonoids Absent	Leaf	M05122
	Stembark	M05122
	Rootbark	M05122
Leucoanthocyanin Absent	Leaf	M05122
Leucoanthocyanins Present	Stembark	M05122
	Rootbark	M05122
Saponins (Unspecified Type or Hemolytic) Absent	Leaf	M05122
	Rootbark	M05122
Saponins (Unspecified Type or Hemolytic) Present	Stembark	M05122
Sterols and/or Triterpenes Absent	Leaf	M05122
	Stembark	M05122
	Rootbark	M05122
Tannins (Ferric Chloride Test) Absent	Leaf	M05122
Tannins (Ferric Chloride Test) Present	Stembark	M05122
	Rootbark	M05122

Biological Activities for Extracts of Muira Puama (Ptychopeltalum olacoides)

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism Tested	Ref #
Stembark French Guiana	Toxic Effect (General)	ETOH (90%) Ext ETOH (90%) Ext	IG Mouse IG Mouse	50.0 mg/kg 50.0 mg/kg	Inactive Inactive		M05122 M05122
Bark Brazil	Toxic Effect(general)	Not stated	Injection	21 cc/kg Not stated	Active Active	Death by heart arrest. Increase in the rate of respiration, returning to normal after 5 minutes.	AT1008
Root Brazil	Neuromuscular Toxicity	ETOH (95%) Ext	IP Mouse	LD50 = 200.0 mg/kg	Active	vs.yohimbine-induced toxicity. Results significant at $p < 0.01$ level.	L06824
Not Stated France	Sexual Performance Enhancement	Not stated	Oral Human Adult	Not stated	Active	Frequency of intercourse increased. Libido enhanced. Morning erections improved. Stability of erection during intercourse improved. Post-coital asthenia improved.	AT1009
Not Stated France	Sexual Performance Enhancement	Not stated	Oral Human Adult	Not stated	Active	In 26 patients treatment was effect in 100% with asthenia, 85% with diminished libido and 90% with instability of erection during coitus.	AT1009
Not Stated France	Sexual Performance Enhancement	ETOH Ext (4:1)	Oral Human Adult	1-1.5 g	Active	In 262 patients with a lack of sexual desire and the inability to attain or maintain an erection, after 2 weeks of treatment 62% had improved libido and 51% of patients had improved erection.	AT1010
Bark Brazil	Adaptogenic Activity	ETOH (10%)	IG Male *Macaca radiata*	100.0 mg/kg	Active	vs.forced swimming test. Results significant at $p < 0.01$ level.	J16115
Not Stated France	Antifatigue Activity	Not stated	Oral Human Adult	Not stated	Active	62 out of 94 patients had less fatigue.	AT1009
Not Stated	Antifatigue Activity	Not stated	Not stated	Not stated	Active	Physical and mental fatigue.	AT1013
Not Stated	Antistress Activity	ETOH Ext	Oral Human Adult	50-1,500 mg	Active		AT1013
Not Stated	Antistress Activity	ETOH Ext	Oral Rat	0.8 w/v%	Active	Extended the durable swimming time in rats forced to swim.	AT1013
Not Stated Brazil	Relaxation Activity	Not stated	Rabbit (*Corpus cavernosum*)	Not stated	Active	Short-lived relaxation.	AT1012
Bark Brazil	Hypotensive Activity	Not stated	Injection	Not stated	Active	Causes a transient lowering of blood pressure which disappears within 6 minutes; due to dilatation of the splanchnic vessels.	AT1008

GI = Gastric Intubation IG = Intragastric IP = Intraperitoneally IV = Intravenously SC = Subcutaneously IM = Intramuscular

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism Tested	Ref #
Bark Brazil	Autonomic Nervous System Modulation Activity	Not stated	Not stated	Not stated	Active	Sensitizes the terminal nerve organs of the sympathetic but lessens the excitability of the terminal nerve organs of the parasympathetic nervous system.	AT1008
Bark Brazil	CNS Depressant Activity	ETOH (10%)	IG Male Mouse	25.0 mg/kg	Active	vs. open-field test. Results significant at $p < 0.05$ level.	J16115
Bark Brazil	CNS Stimulant Activity	ETOH (10%)	IG Male Mouse	100.0 mg/kg	Active	vs. forced swimming test. Results significant at $p < 0.01$ level.	J16115
Not Stated France	Sleep Enhancement Activity	Not Stated	Oral Human Adult	Not stated	Active	Improvement in the quality and quantity of sleep seen in 18 patients.	AT1009
Leaf Brazil	Analgesic Activity	Hydro-Alcoholic Ext	IG *Macaca radiata*	200.0 mg/kg	Active	vs. formalin-induced algesia.	J13503
Leaf Brazil	Analgesic Activity	Hydro-Alcoholic Ext	IG Mouse	200.0 mg/kg	Active	Effects described are from a multi-component Rx vs. hot plate method.	J13503
Leaf Brazil	Analgesic Activity	Hydro-Alcoholic Ext	IG Mouse	200.0 mg/kg	Active	Effects described are from a multi-component Rx vs. tail flick response to radiant heat.	J13503
Leaf Brazil	Analgesic Activity	Hydro-Alcoholic Ext	IG Mouse	200.0 mg/kg	Active	Effects described are from a multi-component Rx vs. capsaicin-induced algesia.	J13503
Leaf Brazil	Analgesic Activity	Hydro-Alcoholic Ext	IG Mouse	200.0 mg/kg	Active	vs. acetic acid-induced writhing.	J13503
Root Brazil	Muscle Effects (Unspecified)	ETOH (95%) Ext	IP Mouse	200.0 mg/kg	Active	Eye. vs. reserpine-induced ptosis. Results significant at $p < 0.01$ level.	L06824
Root Brazil	Antiulcer Activity	Not Stated	IG Rat Male and Female	Not Stated	Active	73.8% inhibition vs water immersion stress induced ulcer. Biological activity reported has been patented.	L07806
Root Brazil	Antistereotypic Behavior Effect	ETOH (95%) Ext	IP Mouse	200.0 mg/kg	Active	vs.apomorphine-induced stereotypy. Results significant at $p < 0.01$ level.	L06824
Root Brazil	Anxiogenic Activity	ETOH Ext	In Vivo	30 mg/kg 100 mg/kg 300 mg/kg	Active Active Inactive	vs. hole-board test - exploratory behavior decreased. vs. rota-rod test - locomotion or motor coordination interference.	L10703
Root Brazil	Anxiety Induction	ETOH (100%) Ext	IP Mouse	30.0 mg/kg	Active		L10703
Not Stated	Hypocholesterolemic Activity	ETOH Ext	Oral Rat	200 mu/L	Active	Total cholesterol reduced by 25% in animals fed ad libitum, while total triglycerides increased by 65%.	AT1014

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism Tested	Ref #
Not Stated	Hypocholesterolemic Activity	ETOH Ext	Oral Human Adult	50-100 mg twice daily	Active	Total cholesterol slightly decreased. HDL rose from 50 to 75.	AT1014
Not Stated	Lipolytic Effect	ETOH Ext	Oral Rat	200 mu/L	Active	Weight gain seen but fat gain reduced. Fat pad weights of control were 1.25 g compared to treated group of 0.96 g. Lean muscle mass increased.	AT1014
Not Stated	Lipolytic Effect	ETOH Ext	Oral Human Adult	50-100 mg twice daily	Active	Body weight increased but body fat percentage decreased by 5%.	AT1014
Commercial Sample Brazil	Colony-Stimulating Factor Production Stimulation	Infusion	IP Adult Mouse	0.5 ml/Animal	Equiv.	vs. LPS-induced proliferation.	L07194
Commercial Sample Brazil	Mitogenic Activity	Infusion	Cell Culture	Not Stated	Equiv.	Splenoctyes (mouse).	L07194
Not Stated France	Appetite Improvement Effect	Not stated	Oral Human Adult	Not stated	Active	Appetite improved in 8 patients.	AT1009
Not Stated Brazil	cAMP Stimulation Activity	Not stated	Rabbit (corpus cavernosum)	1 mg/ml 10 mg/ml 100 mg/ml	Active Active Active		AT1012

Biological Activities for Compounds of Muira Puama (Ptychopeltalum olacoides)

Compound	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Borneol	Nicotinic Acetylcholine Receptor Inhibition Activity	Cell Culture (bovine adrenal chromaffin cells)	IC50 = 56 M IC50 = 49 M IC50 = 70 M	Active Active Active Inactive	Inhibited nicotinic acetylcholine receptor agonist DMPP-induced calcium release. Inhibited nicotinic acetylcholine receptor agonist DMPP-induced calcium release. Inhibited DMPP-induced norepinephrine release. No effect on calcium increases induced by high K(+), veratridine and bradykinin.	AT1015
Caryophyllene	Antimicrobial Activity	Agar Plate	Not stated	Active Active Weak Activity Weak Activity Weak Activity Inactive Inactive Inactive Inactive	*Bacillus cereus* *Proteus mirabilis* *Enterococcus faecalis* *Staphylococcus epidermidis* *S. aureus* *Micrococcus luteus* *Klebsiella* sp. *E. coli* *Candida albicans*	AT1017
Beta-caryophyllene	Antibacterial Activity	Agar Plate	Not stated	Active	Gram-positive *Enterococcus hirae.*	AT1016
Delta-cadinene	Antibacterial Activity	Agar Plate	Not stated	Active	Gram-positive and -negative bacteria.	AT1018
Allpha-copaene	Antibacterial Activity	Agar Plate	Not stated	Active	Gram-positive and -negative bacteria.	AT1018
Beta-caryophyllene	Antifungal Activity	Agar Plate	Not stated	Active		AT1016
Eugenol	Anti-estrogenic Activity	Cell Culture	Not stated	Active	Able to displace 17beta-estradiol from isolated alpha- and beta- human estrogen receptors.	AT1019
Eugenol	Muscle Relaxant Activity	Rat (ileum)	IC50 = 83 mcM IC50 = 228 and 237 mcM	Active Active	Relaxed the basal tonus and the precontracted ileum. Inhibited contractions induced by acetylcholine and K+.	AT1020
Lupeol	Human Leucocyte Elastase Inhibitory Activity	Cell Culture	IC50=1.9 mcM	Active		AT1021
Lupeol	Antioxidant Activity	Cell Culture	Not stated	Active	Suppressed superoxide generation induced by arachidonic acid.	AT1022
Behenic acid	Hypercholesterolemic Activity	Oral Human Adult	Not stated	Active	Cholesterol-raising.	AT1023

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