

# Technical Data Report

for

# JURUBEBA

*Solanum paniculatum*



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# Jurubeba

Preprinted from *Herbal Secrets of the Rainforest*, 2nd edition, by Leslie Taylor  
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**Family:** Solanaceae

**Genus:** *Solanum*

**Species:** *paniculatum*, *insidiosum*

**Common Names:** Jurubeba, jubeba, juribeba, juripeba, jupela, juripeba, juuna, juvena, jurubebinha, jurubeba-branca, jurubeba-verdadeira

**Parts Used:** Leaves, roots, fruit

Jurubeba is a small tree that grows up to 3 m high, with heart-shaped leaves that are smooth on top and fuzzy underneath. It produces a small, yellow fruit and lilac or white flowers. Both male and female jurubeba trees exist; the female grows slightly taller, has larger leaves, and bears fruit. The leaves and roots of both female and male specimens (as well as the fruit) are used interchangeably for medicinal purposes with equal effectiveness. Jurubeba is indigenous to the north of Brazil and other tropical parts of South America.

The indigenous uses of jurubeba are very poorly documented, but its uses in Brazilian medicine have been described quite well. Jurubeba is listed as an official drug in the *Brazilian Pharmacopoeia* as a specific for anemia and liver disorders. Jurubeba has long been used for liver and digestive disorders. In 1965, Dr. G. L. Cruz wrote that “. . . the roots, leaves, and fruit are used as a tonic and decongestive. It stimulates the digestive functions and reduces the swelling of the liver and spleen. It is a good remedy against chronic hepatitis, intermittent fever, uterine tumors, and hydropsy.” The leaves and roots commonly are used in Brazilian medicine today as a tonic and for fevers, anemia, erysipelas, hepatitis, liver and spleen disorders, uterine tumors, irritable bowel syndrome, chronic gastritis, and other such digestive problems as sluggish digestion, bloating, and flatulence. Jurubeba leaf tea is a very common household remedy throughout Brazil for hangovers. (Brazilians love to eat! A Brazilian hangover usually means relief is needed as much from indigestion and bloating from overeating as from alcohol consumption.) It is relied on there to speed the digestive process and promote gastric emptying for just that reason. It is also sometimes employed externally in poultices to heal wounds and ulcers.

Jurubeba's active constituents were first documented in the 1960s, when German researchers discovered novel plant steroids, saponins, glycosides, and alkaloids in the root, stem, and leaves.<sup>1-3</sup> The alkaloids were found more abundantly in the root (0.25–0.96%), although present in the stem (0.28%) and leaves (0.20%).<sup>3,4</sup> Solanidine and solasodine were discovered in the leaves and fruit of jurubeba, which accounted for its liver-protective properties.<sup>5-6</sup> The compound solanin, also found in the plant, has been documented by clinical research to possess analgesic activity (possibly through its ability to block pain impulses in the nervous system).<sup>7</sup> The steroids and saponins were found in higher quantities in the root, while the leaves had the greatest amount of glycosides.<sup>2,3,8</sup> The plant also has been found to contain a large proportion of bitter properties, which were thought to contribute to its ability to stimulate digestion.<sup>7,9</sup>

All of the clinical research on jurubeba has been done in Brazil—as the plant and its medicinal uses are not well known outside of Brazil. A recent (2002) study sought to validate the traditional use of the plant as a digestive aid. The root, stem, flower, leaf, and fruit of the plant were found to have anti-ulcer activity.<sup>10</sup> A water extract of the root given orally to mice (at 1.2 g/kg) inhibited gastric acid secretion induced by stress, as well as

prevented gastric lesions from developing.<sup>10</sup> Other extracts were found to inhibit gastric acid secretion in pylorus-ligated mice. Furthermore, when the root extract was injected into the duodenum, it inhibited histamine- and bethanechol-induced gastric secretion.<sup>10</sup> In another study, rats with acetic acid-induced gastric ulcers were given 250–500 mg/kg of a water extract of jurubeba.<sup>7</sup> The extract also enabled acceleration of chronic gastric lesion healing.<sup>7</sup> Researchers summarized, “Collectively, the results validate folk use of *Solanum paniculatum* plant to treat gastric disorders.”<sup>10</sup>

Animal studies with cats have indicated that water extracts and alcohol extracts of jurubeba lowered blood pressure, while only the water extract only increased respiration.<sup>11,12</sup> The plant also has been documented to have cardiotoxic activity, as evidenced by a stimulant action to the heart in frogs.<sup>11–12</sup> This positive inotropic effect on the heart may be due to the alkaloid solanidine, which has been documented to have this activity.<sup>13</sup>

While jurubeba is a very popular natural remedy, its use has been mostly confined to South America. The plant has demonstrated little toxicity: a recent study showed that a water extract of the flower, fruit, leaf, stem, or root (given orally to mice at 2 g/kg) had no toxicity.<sup>10</sup> It is a wonderful remedy for many types of digestive disorders, working quickly and efficiently, and is deserving of much more attention in the United States.

**Documented Properties and Actions:** Analgesic, anti-inflammatory, antiulcer, aperient, cardiotoxic, carminative, cholagogue, cicatrizant, decongestive, deobstruent, digestive, diuretic, emmenagogue, febrifuge, gastrotonic, hepatotoxic, hypotensive, stomachic, tonic

**Main Phytochemicals:** Isojurubidin, isopaniculidin, jurubin, jurubidin, jurubilin, paniculin, paniculidin, paniculonin A, paniculonin B, painculogenin, solanin, solanidin, solasodine, neochlorogenin

**Traditional Remedy:** One cup of a standard leaf infusion, or 3–4 ml of a fluid extract 1–3 times daily (with or just after meals). One to 3 g of powdered bark in tablets or capsules (or stirred into water or juice) with meals can be substituted, if desired.

**Contraindications:**

- The phytochemical solasodine has been documented to reduce sperm count and have an antifertility effect in male animals. While jurubeba itself has not been documented to have this action, males undergoing fertility treatment should probably avoid using this plant.
- This plant has been documented to have mild hypotensive activity as well as a stimulating action on the heart. Those with cardiovascular disorders, hypotension, or those on blood-pressure-lowering medications should only use this plant under the care and direction of a qualified health care professional.
- Herbalists in Brazil report that prolonged or chronic use of this plant may irritate the stomach lining in some individuals. Do not use chronically (daily) for longer than 30 days.

**Drug Interactions:** None known. May possibly potentiate hypotensive medications.

## WORLDWIDE ETHNOBOTANICAL USES

Region	Uses
<b>Amazonia</b>	Alcohol excess, anti-inflammatory, digestive, diuretic, liver, spleen, uterine tumors
<b>Brazil</b>	Abscess (internal), anemia, anhidrosis, anorexia, aperient, bitter, bladder, bloating, boil, catarrh, cicatrizant, cholagogue, contusions, constipation, convalescence, cystitis, debility, decongestant, diabetes, diuretic, dyspepsia, edema, erysipelas, emmenagogue, fever, furuncles, gallbladder inflammation, gastric atonia, gastritis, hangover, headache, heartburn, hepatic insufficiency, hepatitis, hepatotonic, hydropsy, irritable bowel syndrome, jaundice, liver problems, malaria, nausea, pruritus, skin, spleen inflammation, stomachic, tonic, tumor (uterine/abdominal), ulcers (stomach and skin), urticaria, wounds
<b>USA</b>	Alcohol excess, anti-inflammatory, digestion, diuretic, liver, spleen, uterine tumors

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The information contained herein is intended for education, research, and informational purposes only. This information is not intended to be used to diagnose, prescribe or replace proper medical care. The statements contained herein have not been evaluated by the Food and Drug Administration. The plant described herein is not intended to diagnose, treat, cure, mitigate, or prevent any disease.

## Ethnomedical Information on Jurubeba (*Solanum paniculatum*)

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Plant Amazonia	Used to stimulate digestion and acts as an anti-inflammatory for the liver and spleen, as well as a diuretic. Excellent for alcohol excesses. Used to treat uterine tumors.	Not Stated	Human Adult	ZZ1015
Leaf Brazil	Used on ulcers.	Not Stated External	Human Adult	ZZ1099
Leaf Brazil	Used as a cicatrizant.	Leaf External	Human Adult	ZZ1096
Leaf Brazil	Used for ulcers and wounds.	Maceration External	Human Adult	ZZ1072
Leaf Brazil	Used as a cicatrizant.	Cataplasm External	Human Adult	ZZ1092
Leaf Brazil	Used as a cicatrizant for wounds, ulcers, pruritis and contusions.	Decoction External	Human Adult	ZZ1081
Root Brazil	Used for diabetes, jaundice, hepatitis, fever and lack of perspiration.	Infusion Oral	Human Adult	ZZ1096
Root Brazil	Used for cystitis and edema. Used for affections of the liver, insufficient liver function, jaundice and hepatitis, gallbladder affections, inflammation of the spleen and gastric atonias.	ETOH Ext Oral Decoction Oral	Human Adult	ZZ1081
Root Brazil	Used for anemia, intermittent fevers and for convalescence after infections.	ETOH Ext Oral	Human Adult	ZZ1081
Root Brazil	Used as a tonic, febrifuge, cholagogue, lack of appetite, gastric atonia, debilitation, bilious fevers, malaria, liver affections, jaundice and affections of the liver and spleen. Also contains a high amount of iron and is used for anemias and convalescence after infections. Used as an ointment or cream for inflammation of the liver and spleen.	ETOH Ext Oral Cream External	Human Adult	ZZ1007
Root Brazil	Used as a deobstructant.	ETOH Ext Oral	Human Adult	ZZ1002
Fruit Brazil	Used for problems of the liver and stomach and for inflammation of the spleen and bladder. Used as a tonic.	Juice Oral	Human Adult	ZZ1096
Root + Fruit Brazil	Used for affections of the liver, hepatitis and jaundice. Used for intermittent fevers, spleen affections, hydropsy, anorexia, gastric atonia, dyspepsia, general organ debilitation and diabetes. Used for cystitis, anemia, uterine and abdominal tumors and internal abscesses.	Infusion Oral Juice or Infusion Oral	Human Adult	ZZ1072
Root + Berry Brazil	Used for its bitter properties, for chronic hepatitis, jaundice and malaria.	Not Stated	Human Adult	ZZ1099

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Plant Brazil	Used for internal tumors.	Infusion Oral	Human Adult	ZZ1096
Plant Brazil	Considered to be a deobstructant, tonic, cholagogue, diuretic, aperient and febrifuge.	Not Stated	Human Adult	ZZ1072
Plant Brazil	Used as a tonic and decongestive. Stimulates digestive functions and reduces swelling of the liver and spleen. Used for chronic hepatitis, intermitent fever, uterine tumors and hydropsy.	Not Stated	Human Adult	ZZ1075
Plant Brazil	Used as a tonic and deobstructant. Stimulates digestive function and used for affections of the liver and spleen, for chronic hepatitis, intermittent fever, uterine and abdominal tumors, hydropsy, jaundice and skin infections.	Not Stated	Human Adult	ZZ1013
Plant Brazil	Used as an aperient and digestive. Prolonged use may cause gastrointestinal irritation.	Decoction Oral	Human Adult	ZZ1092
Plant Brazil	Used as a diuretic, deobstructant, tonic and anti-inflammatory. Used for jaundice, cystitis, intermittent fevers and constipation. Used for inflammation of the spleen. Used for wounds.	Infusion Oral Fruit Juice Oral Maceration External	Human Adult	BH1001
Plant Brazil	Considered to be a tonic, antianemic, digestive, appetite stimulant, hepatic, cholagogue, febrifuge, antimalarial, diuretic, cicatrizant and hypoglycemic. Used to deobstruct the liver and spleen, for hepatomegaly and splenomegaly, jaundice, dyspepsia, heartburn, nausea, anorexia, post-hepatitis syndrome, chronic hepatic disorders, peptic ulcers, gastric ulcers and iron deficiency anemia. Believed to reduce gastric acid secretion and heal the gastrointestinal mucosa.	Not Stated	Human Adult	BH1002
Plant Brazil	Used as a hangover remedy after excess food or alcohol consumption. Alleviates digestion and bloating. Used for swelling of the liver and spleen, for liver disease, chronic hepatitis, liver obstruction and irritable bowel syndrome.	Not Stated	Human Adult	ZZ1014
Plant Brazil	Used after a heavy meal or drinking bout, for indigestion and bloating. Considered a powerful liver tonic.	Infusion Oral or ETOH Ext Oral	Human Adult	ZZ1070
Plant Brazil	Used for liver disease, hepatitis, obstructions of the liver, hydropsy, fevers, internal abscesses and uterine tumors. A tonic and aids digestion.	Not Stated	Human Adult	ZZ1070

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Not Stated Brazil	Used for liver affections, jaundice, hydrophy and skin infections. Considered a bitter tonic, stomachic, febrifuge, emmenagogue, cholagogue and hepatoprotective. Used for wounds and ulcers.	ETOH Ext Oral  Not Stated External	Human Adult	ZZ1088
Not Stated Brazil	Used for hyperpigmentation of the skin, for furuncles, skin eruptions, urticaria and for headaches.	ETOH Ext Oral	Human Adult	ZZ1002
Not Stated USA	Used for catarrh and for the bladder, liver and spleen.	Not Stated	Human Adult	ZZ1095
Not Stated USA	Used to tonify the liver, stimulate digestion and reduce swelling of the liver and spleen. Used for liver and spleen dysfunction, for uterine tumors, as an anti-inflammatory and diuretic. Used for liver and digestive problems caused by excess alcohol intake.	ETOH Ext Oral	Human Adult	ZZ1016



## Presence of Compounds in Jurubeba (*Solanum paniculatum*)

Compound	Chemical type	Plant Part	Plant Origin	Quantity	Ref #
Iron	Inorganic	Not Stated	Brazil	Not Stated	ZZ1007
Jurubin	Steroidal saponin	Not Stated Root	Germany Brazil	Not Stated Not Stated	BH1006 ZZ1088
Jurubidin	Steroidal saponin	Root	Brazil	Not Stated	ZZ1088
Jurubidin, iso	Steroidal saponin	Root	Brazil	Not Stated	ZZ1088
Jurubilin	Steroidal saponin	Not Stated	Brazil	Not Stated	ZZ1007
Paniculin	Steroidal saponin	Root	Brazil	Not Stated	ZZ1088
Paniculidin	Glycoside	Not Stated Root	Germany Brazil	Not Stated Not Stated	BH1006
Paniculidin, iso	Glycoside	Root	Brazil	Not Stated	ZZ1088
Paniculonin A	Glycoside	Not Stated Leaf	Germany Brazil	Not Stated Not Stated	BH1004 ZZ1088
Paniculonin B	Glycoside	Not Stated Leaf	Germany Brazil	Not Stated Not Stated	BH1004 ZZ1088
Painculogenin	Aglycone	Not Stated Leaf	Germany Brazil	Not Stated Not Stated	BH1005 ZZ1088
Solanin	Alkaloid	Not Stated	Brazil	Not Stated	BH1002
Solanidine	Alkaloid	Leaf + Fruit	Not Stated	Not Stated	BH1007 BH1008
Solasodine	Alkaloid	Leaf + Fruit	Not Stated	Not Stated	BH1007 BH1008
Neochlorogenin	Aglycone	Not Stated Leaf	Germany Brazil	Not Stated Not Stated	BH1005 ZZ1088

#### **OTHER PHYTOCHEMICAL SCREENING:**

Alkaloids	Present	ZZ1088
Steroidal saponins	Present	ZZ1088
Saponins	Present	ZZ1081
Aglycones	Present	ZZ1088
Organic Acids	Present	ZZ1081
Glycosides	Present	ZZ1088
Mucilagens	Present	ZZ1081
Resins	Present	ZZ1081
Bitter Principles	Present	ZZ1007
Flavonoids	Present	ZZ1081
Tanins	Present	ZZ1081

## Biological Activities for Extracts of Jurubeba (*Solanum paniculatum*)

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Root Brazil	Toxicity (general)	ETOH Ext	Mouse Fish	Not Stated Not Stated	Active Active		BH1009 BH1010
Flower + Fruit + Leaf + Stem + Root Brazil	Toxicity (general)	H2O Ext	Oral Mice	2 g/kg	Inactive		BH1003
Not Stated Brazil	Toxicity (general)	Not Stated	Not Stated	Not Stated	Active	Toxicity signs include diarrhea, nausea, vomiting, gastritis, gastrointestinal mucosa erosion, elevation of liver enzymes and neurological symptoms.	BH1002
Not Stated	Antifertility Activity	Solasodine Conc	Monkey Male	Not Stated	Active  Active	Interfered with spermiogenesis at stage XII of late spermatids (spermatids decreased by 69%). Reduced production in sperm count and Leydig cells. Antiandrogen activity seen.	BH1013
Not Stated	Antifertility Activity	Solasodine Conc	Dog Male	20 mg/kg	Active	Reduction of sperm and androgen production seen.	BH1014
Root Brazil	Anti-ulcer Activity	H2O Ext	ID Mice	ED50=418 mg/kg	Active	Inhibited gastric acid secretion in pylorus-ligated mice.	BH1003
Root Brazil	Anti-ulcer Activity	H2O Ext	Oral Mice	ED50=1.2 g/kg	Active	Prevented production of gastric lesions due to hypersecretion induced by stress following cold restraint.	BH1003
Stem Brazil	Anti-ulcer Activity	H2O Ext	ID Mice	ED50=777 mg/kg	Active	Inhibited gastric acid secretion in pylorus-ligated mice.	BH1003
Flower Brazil	Anti-ulcer Activity	H2O Ext	ID Mice	ED50=820 mg/kg	Active	Inhibited gastric acid secretion in pylorus-ligated mice.	BH1003
Leaf Brazil	Anti-ulcer Activity	H2O Ext	ID Mice	0.5-2 g/kg	Inactive	No effect on gastric secretion.	BH1003
Not Stated Brazil	Anti-ulcer Activity	H2O Ext	Rat	250-500 mg/kg	Active	In chronic gastric ulcers induced by 50 ml of acetic acid (10%) and 50 ml of saline, Jurubeba accelerated the healing of the chronic gastric lesions.	BH1002

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Fruit Brazil	Gastric Secretion Stimulation	H2O Ext	ID Mice	0.5-2 g/kg	Active	Activates the muscarinic pathway of gastric acid secretion.	BH1003
Root Brazil	Gastric Secretion Inhibition	H2O Ext	Injection Mice Duodenum	Not Stated	Active	Inhibited histamine- and bethanechol-induced gastric secretion in pylorus-ligated mice.	BH1003
Not Stated Brazil	Digestive Activity	Bitter Principles	Not Stated	Not Stated	Active	Stimulated secretion of digestive juices.	BH1002
Root Brazil	Hypotensive Activity	ETOH Ext H2O Ext	Cat	Not Stated	Active Active	Reduced arterial blood pressure.	BH1009 BH1010
Root Brazil	Cardiovascular Effect	ETOH Ext H2O Ext	Frog Heart	Not Stated	Active Active	Stimulant action on the heart - positive inotropic effect.	BH1009 BH1010
Not Stated	Cardiovascular Effect	Solanidine Conc	Frog Heart	Not Stated	Active	Cardiotonic and positive inotropic activity seen.	BH1011
Root Brazil	Respiratory Stimulant Effect	H2O Ext ETOH Ext	Cat	Not Stated	Active Inactive	Stimulated respiration.	BH1009 BH1010
Not Stated Brazil	Analgesic Activity	Solanin Conc	Oral Not Stated	>1 mg/kg	Active	Blocks the pain impulses of the nervous system.	BH1002
Not Stated Brazil	Antipruritic Activity	Solanin Conc	Oral Not Stated	>1 mg/kg	Active		BH1002
Not Stated Australia	Cytotoxic Activity	Solasodine Conc	External Human Adult	0.005%	Active	Regressed malignant and benign human skin tumors, keratoses, basal cell carcinomas and squamous cell carcinomas.	BH1012

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<b>BH1013</b>	ANTIFERTILITY PLANT PRODUCTS: TESTICULAR CELL POPULATION DYNAMICS FOLLOWING SOLASODINE (C27H43O2N) ADMINISTRATION IN RHESUS MONKEY (MACAC MULATTA). DIXIT, VP: GUPTA, RS: GUPTA, S: ANDROLOGIA 21 6: 542-6 (1989) (DEPARTMENT OF ZOOLOGY, UNIVERSITY OF RAJASTHAN, JAIPUR/INDIA)
<b>BH1014</b>	ANTISPERMATOGENIC/ANTIANDROGENIC PROPERTIES OF SOLASODINE (C27H43O2N) OBTAINED FROM SOLANUM XANTHOCARPUM BERRIES ON THE MALE GENITAL TRACT OF DOG (CANIS-FAMILIARIS). A HISTOPHYSIOLOGICAL APPROACH. DIXIT, VP: GUPTA, RS: INT J ANDROL 5 3: 295-307 (1983)