

Technical Data Report

for

Huacapu

(*Miconia guianensis*)



© Copyrighted 2006. All rights reserved. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system, without written permission.

This document is not intended to provide medical advice and is sold with the understanding that the publisher and the author are not liable for the misconception or misuse of information provided. The author shall have neither liability nor responsibility to any person or entity with respect to any loss, damage, or injury caused or alleged to be caused directly or indirectly by the information contained in this document or the use of any plants mentioned. Readers should not use any of the products discussed in this document without the advice of a medical professional.

© Copyrighted 2006 by Dr. Leslie Taylor, ND., 3579 Hwy 50 East, Suite 222, Carson City, NV 89701. All rights reserved.

Huacapu

Family: Olacaceae

Taxon: *Minquartia guianensis* Aubl.

Synonyms: *Minquartia punctata*, *Minquartia macrophylla*, *Minquartia parifolia*, *Eganthus poeppigii*, *Endusa punctata*, *Secretania loranthacea*

Common names: acaiguara, acapu, acapú, acariguara, acarioba, acary, ahumado, aracuiba, aralta, arekuma, arratt, arratta, black manwood, black manu, bois agouti, caricuara negra, criollo, cuyubi, eur-a-grai, fierro caspi, guacuri de cangrejo, guayacan nego, guayacan pechiche, huacapo, huacapu, huacapú amarillo, huacapú negro, huacapú, ironwood, konbaut, kobakedive, makka, manu, manu platano, manwood, minche, mincouart, naaméhe, pechiche, puya caspi, puyaquiro, tomopio, urari, vacaricuana, wamania, wanania, yandira, yandiroba, zujugue

Part Used: Bark

Herbal Properties & Actions		
Main Actions:	Other Actions:	Standard Dosage: Bark
kills viruses	kills malaria parasite	Decoction: ½ cup twice daily
kills cancer cells	kills leishmania parasite	Tincture: 5 ml daily
kills bacteria		
reduces inflammation		
relieves pain		
expels intestinal worms		
heals wounds		

Huacapu is a huge canopy tree that can be found throughout the Amazon rainforest. It grows as far north as Nicaragua and Panama and can also be found in the rainforests of Costa Rica. Huacapu can grow up 25 meters high (8 stories high!) with a straight broad trunk up to 120 cm in diameter. The tree has a thin and fissured bark with many holes and it exudes a white latex when cut. Its leaves are 10-16 cm long by 4-6 cm wide and waxy in appearance. The huacapu tree blooms mainly during June and July with cascades of cream colored flowers on peduncles. Then it produces an oval drupe-like fruit with a single seed inside that is enjoyed by humans and animals alike. Fruits are dispersed in the forest by birds, bats and small rodents.

The huacapu tree is considered one of the most durable, heaviest, and hardest tropical woods of the Amazon. The tree is largely exploited and extracted by the timber and logging industries for lumber and house construction materials. It is commonly used by local inhabitants as foundation house poles since it is heavy, straight and rot-resistant. It has been so heavily logged in Costa Rica for construction materials, that it now appears on their local endangered species list.

TRIBAL AND HERBAL MEDICINE USES

The Indian tribes in the Amazon sometimes use huacapu bark as a fish poison. The Waorani and Ketchwa tribes in Ecuador pound the bark until it is bruised and then put it into small streams and ponds where it stuns the fish and they can be easily collected on the top of the water. The bark is also often used as a malaria remedy, as well as for tuberculosis, hepatitis, and rheumatism by various Indian communities in the Amazon. The outer bark is considered “too strong a medicine”

therefore, more often, the inner bark is used when preparing remedies for humans.

In herbal medicine systems in Ecuador huacapu bark is prepared as a decoction and used as a respected remedy for herpes, lung cancer, hepatitis, and tuberculosis. It is also used for intestinal worms and parasites, muscular pain, and externally for skin irritations. The pulverized bark of huacapu is also used externally as a poultice for sore limbs, sore kidneys and skin problems.

In Peruvian herbal medicine systems huacapu is employed for many of the same conditions. An infusion or decoction of the bark is highly regarded for hepatitis, malaria, herpes, and rheumatism. It is also used for leishmaniasis (a tropical parasitic disease carried by sand flies), and used externally on lacerations and wounds. A common remedy for rheumatism is to macerate 200 grams of huacapu bark in a liter of alcohol for 7-10 days (a tincture). It is taken in tablespoon dosages each day for 15 days.

PLANT CHEMICALS

Huacapu bark contains triterpenes, xanthenes, lipids, tannins, and acids.¹ The main bioactive chemical in the bark is a lipid called *minquartynoic acid*. This plant chemical has been the subject of research and various scientists have reported that it is cytotoxic to a large diverse line of cancer cells including human lung cancer cell lines, ovarian, colon and neuroblastoma cancer cell lines.²⁻⁴ Another research group reported it passed the initial screening test for antitumor activity as well as demonstrated actions against the malaria and leishmania parasites.⁵ A research group reported in 2000 that minquartynoic acid demonstrated effective anti-viral actions against the HIV virus at as little as 2.2 mcg/ml which might explain why the tree bark has been so popularly used for other virus like hepatitis and herpes.⁶

Chemical documented thus far in huacapu bark include: 3-beta-acetoxy-13-beta-28-epoxy-olean-11-ene, betulin myristate, betulin palmitate, betulin stearate, erythrodiol myristate, erythrodiol oleate, erythrodiol palmitate, erythrodiol stearate, lichexanthone, minquartynoic acid, and squalene.

BIOLOGICAL ACTIVITIES AND CLINICAL RESEARCH

The research on huacapu to date is quite preliminary since scientists now seem more focused on its main bioactive chemical instead. Researchers in the United States first reported in 1988 and 1989 that a water extract of huacapu bark passed the initial antitumor screening test, as well as an *in vitro* cell culture test against cancer cells in amounts less than 4 mcg/ml.^{3,4} This was reconfirmed by a European research group who published similar reports in 2003 and 2004.^{7,8} In earlier research in 1996 researchers reported that a methanol extract of huacapu bark demonstrated antibacterial actions against two antibiotic-resistant strains of *Staphylococcus*, as well as *Pseudomonas* and *Bacillus*.⁹

CURRENT PRACTICAL USES

While little research on the tree bark exists, research has been more forthcoming on huacapu's main active plant chemical which is documented with antimalarial, antiviral, antumoral, and antibacterial actions. The actions of minquartynoic acid do help to explain and support huacapu's main traditional uses for microbial diseases such as herpes, hepatitis, and tuberculosis, for lung cancer, and malaria. The tree bark is a significant source of this highly active plant chemical. Huacapu is quite popular in Ecuador and Peru, however it is not very well known here in the U.S; only one or two products are available for purchase in the American herbal market.

Huacapu Plant Summary	
Main Actions (in order): antiviral, antitumoral, antiparasitic, analgesic, anti-inflammatory	
Main Uses: 1. for viral infections (herpes, hepatitis, etc.) 2. for cancer 3. for intestinal parasites and worms 4. as a pain-reliever for rheumatism, arthritis and other muscular pains 5. as an antiseptic wound healer	
Properties/Actions Documented by Research: antibacterial, antiviral, antiparasitic (malaria, leishmania), antitumoral	
Other Properties/Actions Documented by Traditional Use: analgesic, anthelmintic, anti-inflammatory, antimalarial, antirheumatic, antiseptic, antitumorous, antiviral, purgative, vermifuge, vulnerary	
Cautions:	

Traditional Preparation: Huacapu bark is traditionally prepared in infusions and decoctions. However, for rheumatism and muscle pain, it is traditionally prepared as an alcohol tincture. The bark is a source of tannins that have been used to dye clothing. Practitioners report using the bark in tinctures and decoctions can cause dark-colored stools which is normal and due to the tannin content of the bark.

Contraindications: None known. Large dosages are reported to have a laxative or purgative effect.

Drug Interactions: None known.

WORLDWIDE ENTHNOMEDICAL USES	
Ecuador	as an anthelmintic; for hepatitis, herpes, intestinal parasites, lung cancer, malaria, muscular pain, skin irritations, sore kidneys, sore limbs, tuberculosis, worms
Peru	as a purgative; for confusion, hepatitis, herpes, lacerations, leishmaniasis, malaria, rheumatism

References:

1. El-Seedi, H. R., et al. "Triterpenes, lichexanthone and an acetylenic acid from *Minquartia guianensis*." *Phytochemistry*. 1994; 35 (5): 1297-1299.
2. Ito, A., et al. "Cytotoxic polyacetylenes from the twigs of *Ochanostachys amentacea*." *J. Nat. Prod.* 2001; 64(2): 246-248.
3. Marles, R. J., et al. "Isolation of a novel cytotoxic polyacetylene from a traditional anthelmintic medicinal plant, *Minquartia guianensis*." *J. Nat. Prod.* 1989; 52(2): 261-266.

4. Farnsworth, N. R., et al. "Isolation of a novel cytotoxic polyacetylene from a traditional anthelmintic medicinal plant: *Minquartia guianensis* Aubl. (Olacaceae). *Abstr International Congress on Natural Products Research* Park City, UT July 17-21 1988: Abstr-22 .
5. Rasmussem, H. B., et al. "Absolute configuration and antiprotozoal activity of minquartynoic acid." *J. Nat. Prod.* 2000; 63(9): 1295-1296.
6. Rashid, M. A., et al. "Absolute stereochemistry and anti-HIV activity of minquartynoic acid, a polyacetylene from *Ochanostachys amentacea*." *Nat Prod. Lett.* 2001; 15(1): 21-26 .
7. Quignard, E. L. J., et al. "Screening of plants found in Amazonas state for lethality towards brine shrimp." *Acta Amazonica.* 2003; 33(1): 93-104.
8. Quignard, E. L. J., et al. "Medium lethal concentrations of amazonian plant extracts in the brine shrimp assay." *Pharmaceutical Biology.* 2004; 42(3): 253-257.
9. Jovel, E. M., et al. "An ethnobotanical study of the traditional medicine of the Mestizo people of Suni Mirano, Loreto, Peru." *J. Ethnopharmacol.* 1996; 53: 149-156.

Ethnomedical Information on Huacapu (*Minquartia guianensis*)

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Bark / Ecuador	Ketchwas and Waorani Indians use it as a fish poison.	Bark / In streams	Fish	L01437 ZZ1005
Bark / Ecuador	Used as an anthelmintic against intestinal parasites and worms. (500 g of inner bark infused in 1 liter of water and the entire 1 liter is drunk all at once)	Infusion / Oral	Human adult	T14720
Bark / Ecuador	Pulverized inner bark is used in poultices to treat sore limbs, sore kidneys and skin irritations.	Poultice / External	Human adult	T14720
Bark / Ecuador	Used to treat lung cancer.	Decoction / Oral	Human adult	ZZ2013 H13322
Bark / Ecuador	Used to treat tuberculosis, herpes and lung cancer.	Infusion / Oral	Human adult	H13322
Bark / Ecuador	Used to treat intestinal parasites and muscular pain. Used to treat and skin irritations.	Infusion / Oral Infusion / External	Human adult	HU1002
Bark / Ecuador	Used to treat tuberculosis, lung cancer, malaria and herpes.	Not stated	Human adult	HU1001
Bark / Peru	Used to treat hepatitis, herpes, and malaria. Used to treat rheumatism.	Decoction / Oral Tincture / Oral	Human adult	ZZ2011
Bark / Peru	Used as a component in the Amazon Liqueur "21 roots" as an aphrodisiac.	Tincture / Oral	Human adult	ZZ2011
Bark / Peru	Used for confusion. Used as a purgative. Used for lacerations.	Infusion / Oral Infusion / Oral Infusion / External	Human adult	L17008
Bark / Peru	Used to treat herpes and malaria.	Decoction / Oral	Human adult	ZZ2013
Bark / Peru	Used to treat rheumatism. (200 g of bark macerated in 1 liter of cane alcohol and taken in 1 tablespoon dosages daily for 15 days)	Tincture / Oral	Human adult	ZZ2013

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Bark / Peru	Used to treat hepatitis, herpes, and malaria. Used to treat rheumatism.	Decoction / Oral Tincture / Oral	Human adult	ZZ1101
Bark / Peru	Shipibo-Conibo Indians prepare the bark in baths for hepatitis and malaria; a small amount of a decoction is also drunk for the same conditions.	Decoction / Oral Bath / External	Human adult	ZZ2003
Bark / Peru	Used to treat malaria.	Decoction / Oral	Human adult	ZZ2016
Bark / Peru	Used to treat malaria and leishmaniasis.	Not stated	Human adult	HU1002

Presence of Compounds in Huacapu (*Minquartia guianensis*)

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
Betulin myristate	Triterpene	Bark	Ecuador	Not stated	H13322
Betulin palmitate	Triterpene	Bark	Ecuador	Not stated	H13322
Betulin stearate	Triterpene	Bark	Ecuador	Not stated	H13322
Erythrodiol myristate	Triterpene	Bark	Ecuador	Not stated	H13322
Erythrodiol oleate	Triterpene	Bark	Ecuador	Not stated	H13322
Erythrodiol palmitate	Triterpene	Bark	Ecuador	Not stated	H13322
Erythrodiol stearate	Triterpene	Bark	Ecuador	Not stated	H13322
Lichexanthone	Xanthone	Bark	Ecuador	00.00086%	H13322
Minquartynoic acid	Lipid	Stembark Bark Bark Stembark	Ecuador Ecuador Peru Ecuador	00.00926% 00.05% 01.90909% Not stated	H05052 H13322 L12071 T14720
Olean-11-ene,3-beta-acetoxy-13-beta-28-epoxy:	Triterpene	Bark	Ecuador	Not stated	H13322
Squalene	Triterpene	Bark	Ecuador	Not stated	H13322

Biological Activities for Huacapu (*Minquartia guianensis*)

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Stembark / Ecuador	Cytotoxic Activity	H2O ext CHCL3 ext	Cell culture	ED50: 3.19 mcg ED50: 2.16 mcg	Active	Leukemia P388	H05052
Stembark / Ecuador	Anticrustacean Activity	H2O ext CHCL3 ext	Artemia larva	25.15 mcg/ml 20.4 mcg/ml	Active	Assay system is intended to predict for antitumor activity.	H05052
Bark / Brazil	Anticrustacean Activity	H2O ext MEOH ext	Artemia larva	20 mcg/ml	Active	Assay system is intended to predict for antitumor activity.	HU1003 HU1004
Bark / Peru	Antibacterial Activity	MEOH ext	Agar plate	10 mcl / disc	Active	<i>Pseudomonas aeruginosa</i> <i>Staphylococcus aureus</i> (resistant strain 19) <i>Staphylococcus aureus</i> (resistant strain 20) <i>Bacillus subtilis</i>	L17008
Bark / Ecuador	Antibacterial Activity	MEOH ext Petrol ext	Agar plate	Not stated	Inactive		H13322
Bark / Ecuador	Insecticidal Activity	MEOH ext Petrol ext	Agar plate	Not stated	Inactive		H13322
Compounds	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Minquartynoic acid	Cytotoxic Activity	Purified compound	Cell culture	IC50: 3.5 mcg IC50: 4.1 mcg IC50: 5.5 mcg IC50: 3.7 mcg IC50: 2.8 mcg IC50: 4.3 mcg IC50: 1.6 mcg IC50: 4.1 mcg IC50: 1.4 mcg IC50: 3.7 mcg	Active Active Active Active Active Active Active Active Active Active	Cancer line CA-BC-1 CA- LU-1 (lung cancer) CA-COLON-2 (colon cancer) CA-9KB (nasopharynx.) CA-KB-VI+ CA-KB-VI- CA-LNCAP CA-SW626 (ovarian) Human neuroblastoma mouse lung cancer	H27401
Minquartynoic acid	Cytotoxic Activity	Purified compound	Cell culture	ED50: 0.18 mcg	Active	Leukemia-P388	H05052 T14720

Compounds	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Minqartynoic acid	Anticrustacean Activity	Purified compound	Artemia larva	5.06 mcg/ml	Active	Assay system is intended to predict for antitumor activity	L12071
Minqartynoic acid	Antiviral Activity	Purified compound	Cell culture	IC50: 2.2 mcg/ml	Active	Virus-HIV-1	L15159
Minqartynoic acid	Antileishmaniasis Activity	Purified compound	In vitro	1.4 mcg/ml	Active	<i>Leishmania major</i>	L12071
Minqartynoic acid	Antimalarial Activity	Purified compound	In vitro	3.0 mcg/ml	Active	<i>Plasmodium falciparum</i>	L12071

Literature Cited - Huacapu

H05052	ISOLATION OF A NOVEL CYTOTOXIC POLYACETYLENE FROM A TRADITIONAL ANTHELMINTIC MEDICINAL PLANT, MINQUARTIA GUIANENSIS. MARLES,RJ: FARNSWORTH,NR: NEILL,DA: J NAT PROD (1989) 52 (2) pp. 261-266
H13322	TRITERPENES, LICHEXANTHONE AND AN ACETYLENIC ACID FROM MINQUARTIA GUIANENSIS. EL-SEEDI,HR: HAZELL,AC: TORSSELL,KBG: PHYTOCHEMISTRY (1994) 35 (5) pp. 1297-1299
H27401	CYTOTOXIC POLYACETYLENES FROM THE TWIGS OF OCHANOSTACHYS AMENTACEA. ITO,A: CUI,B: CHAVEZ,D: CHAI,HB: SHIN,YG: KAWANISHI,K: KARDONO,LBS: RISWAN,S: FARNSWORTH,NR: CORDELL,GA: PEZZUTO,JM: KINGHORN,AD: J NAT PROD (2001) 64 (2) pp. 246-248
L04137	AMAZONIAN ETHNOBOTANICAL DICTIONARY. DUKE, JAMES AND RUDOLFO VASQUEZ. BOCA RATON, FL: CRC PRESS INC., (1994)
L12071	ABSOLUTE CONFIGURATION AND ANTIPROTOZOAL ACTIVITY OF MINQUARTYNOIC ACID. RASMUSSEN,HB: CHRISTENSEN,SB: KVIST,LP: KHARAZMI,A: HUANSI,AG: J NAT PROD (2000) 63 (9) pp. 1295-1296
L15159	ABSOLUTE STEREOCHEMISTRY AND ANTI-HIV ACTIVITY OF MINQUARTYNOIC ACID, A POLYACETYLENE FROM OCHANOSTACHYS AMENTACEA. RASHID,MA: GUSTAFSON,KR: CARDELLINA II,JH: BOYD,MR: NAT PROD LETT (2001) 15 (1) pp. 21-26
L17008	AN ETHNOBOTANICAL STUDY OF THE TRADITIONAL MEDICINE OF THE MESTIZO PEOPLE OF SUNI MIRANO, LORETO, PERU. JOVEL,EM: CABANILLAS,J: TOWERS,GHN: J ETHNOPHARMACOL (1996) 1996 (53) pp. 149-156
T14720	ISOLATION OF A NOVEL CYTOTOXIC POLYACETYLENE FROM A TRADITIONAL ANTHELMINTIC MEDICINAL PLANT: MINQUARTIA GUIANENSIS AUBL. (OLACACEAE). MARLES,RJ: FARNSWORTH,NR: ABSTR INTERNATIONAL CONGRESS ON NATURAL PRODUCTS RESEARCH PARK CITY UT JULY 17-21 1988 (1988) pp. ABSTR-22
HU1001	ANTIMALARIAL ACTIVITY OF PLANT METABOLITES. SIANNE SCHWIKKARD AND FANIE R. VAN HEERDEN. NAT. PROD. REP; 2002, 19 675-692
HU1002	ACARIQUARA-ROXA MINQUARTIA GUIANENSIS AUBI. INFORMATIVO TECNICO REDE DE SEMENTES DA AMAZONIA. NO. 10, (2005)
HU1003	SCREENING OF PLANTS FOUND IN AMAZONAS STATE FOR LETHALITY TOWARDS BRINE SHRIMP. QUIGNARD, E.L.J., ET AL. ACTA AMAZONICA 2003; 33(1) 93-104.
HU1004	MEDIUM LETHAL CONCENTRATIONS OF AMAZONIAN PLANT EXTRACTS IN THE BRINE SHRIMP ASSAY. QUIGNARD, ELJ., ET AL. PHARMACEUTICAL BIOLOGY. 2004; 42(3): 253-257.
ZZ1005	THE HEALING FOREST: MEDICINAL AND TOXIC PLANTS OF THE NORTHWEST AMAZONIA. SCHULTES, R. E. AND RAFFAUF. PORTLAND: R.F. DIOSCORIDES PRESS. (1990)
ZZ1101	DICCIONARIO ENCICLOPEDICO DE PLANTAS UTILES DEL PERU. BRACK EGG, ANTONIO. CUZCO, PERU: CBC (1999)

ZZ2003	MEDICINA INDIGENA. LAS PLANTAS MEDICINALES Y SU BENEFICIO EN LA SALUD (SHIPIBO - CONIBO); GUILLERMO AREVALO VALERA; CENTRO ORIENTAMENTO EDUCATIVO; PULCALPA, PERU (1994)
ZZ2011	PLANTAS MEDICINALES DE LA AMAZONÍA PERUANA. ESTUDIO DE SU USO Y CULTIVO PINEDO P, MARIO; RENGIFO S., ELSA; CERRUTI S., TEODORO. DIC. IIAP, IQUITOS, PERU (1997)
ZZ2013	FITOMEDICINA, 1100 PLANTAS MEDICINALES; TEODORO AGAPITO F. & ISABEL SUNG; EDITORIAL ISABEL; LIMA. PERU (2003)
ZZ2016	ETHNOBOTANICA MEDICINAL Y BIOCIDAS PARA MALARIA EN LA REGION UCAYALI. DIANA PEREZ. FOLIA AMAZONICA 2002; 13(1-2) IIAP UCAYALI, PERU.