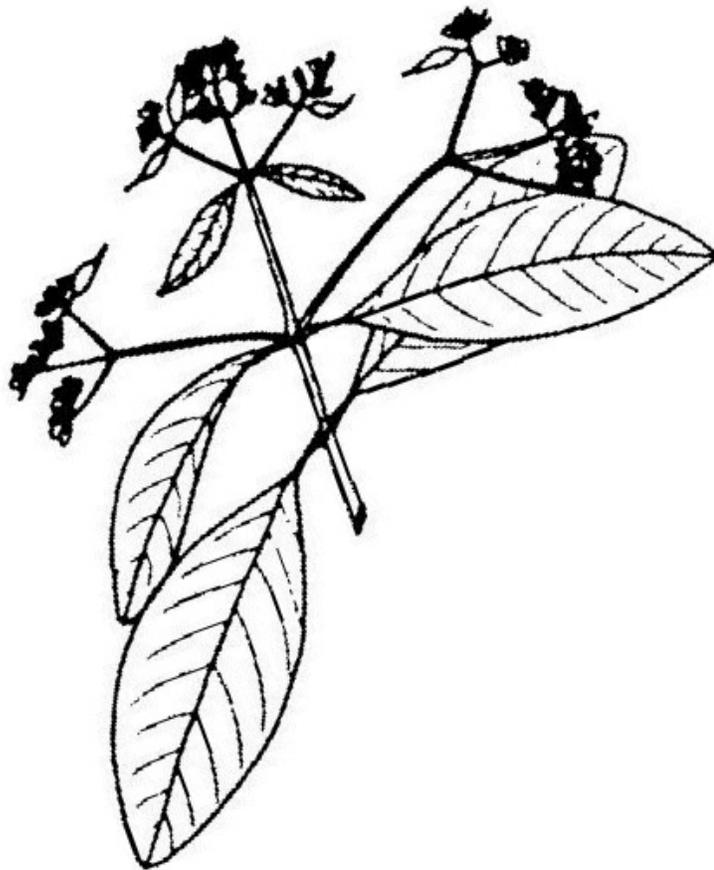


Technical Data Report

for

Mulateiro or Capirona **(*Calycophyllum spruceanum*)**



© 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.

Mulateiro

Capirona

Family: Rubiaceae

Taxon: *Calycophyllum spruceanum* (Benth.) Hook. F. ex K.

Synonyms: *Eukylista spruceana* Benth.

Common names: ashi, asho, capirona, capirona de bajo, capirona negra, corusicao, escorregamacaco, firewood tree, mulateiro, mulateiro-da-várzea, naked tree, palo mulato, pau-marfim, pau mulato, pau-mulato-da-várzea, uhuachaunin, haxo, huiso asho, nahua

Part Used: Bark

Herbal Properties & Actions		
Main Actions:	Other Actions:	Standard Dosage:
kills bacteria	stops bleeding	Decoction: ½ -1 cup 2-3 times daily
kills fungi		Decoction: Applied topically
heals wounds		
fightes free radicals		
kills parasites		
kills insects		
repels insects		
soothes skin		

Mulateiro is a fascinating multi-purpose canopy tree in the Amazon. It grows tall and straight up to a height of about 30 m, and has been long used as a source of good, high density lumber. It produces an abundance of small, white, aromatic flowers (from June to July), which are followed by elongated seedpods with three to five seeds inside. The tree propagates easily from the many seeds it produces. It can often be found near water, as it can survive common periodic flooding in the region.

Mulateiro is noted for its ability to completely shed and regenerate its bark on a yearly basis, making harvesting the bark a totally renewable and sustainable enterprise. The bark is smooth (as if polished) and changes colors throughout the year as it matures—going from a green tone to a brownish tone. *Calycophyllum* is a small genus with only about six species spread through tropical America; all are medium-sized to large trees. This particular species is indigenous to the Amazon basin in Brazil, Peru, Bolivia, and Ecuador. It is called mulateiro or pau-mulato in Brazil, and capirona in Peru.

TRIBAL AND HERBAL MEDICINE USES

Mulateiro bark is deeply ingrained in the native culture—from being used as an admixture in the ayahuasca rituals, to its many different uses in folkloric medicine. In the Amazon, a poultice made from the bark is used topically in treating cuts, wounds, and burns and believed to have antifungal and wound-healing qualities. The Indians also use a tea made from the bark on their bodies after bathing, and then sun-dry themselves. This forms a thin film covering their bodies believed to help fight the effects of aging, parasites, and fungal infections. Indigenous people of the Amazon also use a bark decoction to treat diabetes. They boil 1 kg of bark in 10 liters of water until 4 liters remain. It is believed that if this decoction is drunk every day (about 5 ounces daily) for three consecutive months that it is a “cure” for diabetes. Peruvian tribes also apply the powdered bark

to fungal infections of the skin. They also prepare a bark decoction to treat skin parasites—especially “sarna negra”—a nasty little bug that lives under the skin, which is commonly found in the Amazon basin area.

In Peruvian herbal medicine today, mulateiro is used for many purposes. A bark decoction is used topically for eye infections and infected wounds as well as for skin spots, skin depigmentation, wrinkles, and scars. It stops bleeding quickly and is often applied to bleeding cuts. It’s also thought to soothe insect bites and reduce bruising and swelling. The bark is decocted and used internally for diabetes and disorders of the ovaries. The resin is used for abscesses and skin tumors. Due to its beneficial effects to the skin, it is appearing as an ingredient in natural cosmetic products in Peru and Brazil.

PLANT CHEMICALS

Mulateiro bark contains a great deal of tannin chemicals, which give it an astringent or drying effect. Recently, the plant has been documented to contain a high content of phenols and organic acids, which have demonstrated antibacterial, antifungal, and insecticidal activity.¹ The isolated phenols have demonstrated strong antioxidant activity, which may explain its traditional use to stop the aging process of the skin.¹

BIOLOGICAL ACTIVITIES AND CLINICAL RESEARCH

Only two studies have been published thus far on mulateiro. In 2001, researchers reported that it demonstrated strong antifungal activity *in vitro* against eleven common skin fungi and yeasts.² In 2003, researchers reported the discovery of several new plant chemicals called *seco-iridoids* and reported that three of them were active against the tropical parasite, *Trypanosoma cruzi*.³ With these studies, as well as the two groups of chemicals demonstrating antibacterial, antifungal, and insecticidal properties, scientists are just beginning to validate its traditional uses for various bacterial and fungal infections of the skin and as an insect repellent.

CURRENT PRACTICAL USES

Mulateiro is better known today as a rainforest hardwood tree which is logged in the Amazon and exported around the world for high density, durable lumber and building materials, than as a medicinal plant. It has recently sparked the interest of scientists and formulators of natural body care products in South America for its beneficial effect to the skin. Even a branch of the Brazilian government is currently working with researchers and manufacturers about these new possible uses and markets for mulateiro bark in the body care products industry. With the tree shedding its bark annually, this resource would be highly sustainable. If a sufficient market were established for this renewable resource, then landowners would not cut the trees down for the value of the lumber, and would protect them for the income realized by annual harvesting of the bark. As a result of this work, mulateiro was been approved in the European Union as an ingredient employed in cosmetic products in February, 2006.

Plant Summary
Main Actions (in order): antifungal, anticandidal, astringent, insecticidal, wound healer
Main Uses: 1. for fungal infections of the skin (athlete's foot, nail fungus, etc.) 2. for skin parasites 3. for <i>Candida</i> and yeast infections 4. as a skin aid for wrinkles, scars, freckles, and age spots 5. for diabetes
Properties/Actions Documented by Research: antibacterial, anticandidal, antifungal, antioxidant, insecticidal, insect repellent
Other Properties/Actions Documented by Traditional Use: antidiabetic, antiparasitic, astringent, emollient, wound healer
Cautions: None reported.

Traditional Preparation: For internal use, the standard remedy is ½–1 cup of standard decoction two to three times daily. This decoction is also a common topical remedy for skin problems, wounds, skin fungus, and overall skin health. It is applied directly to the affected area several times daily and allowed to dry before covering.

Contraindications: None known.

Drug Interactions: None known.

WORLDWIDE ETHNOMEDICAL USES	
Amazonia	as a contraceptive, emollient and vulnerary; for burns, cuts, diabetes, fungal infections, skin parasites, and wounds
Brazil	for age spots, cuts, diabetes, eye infections, ovarian problems, scars, scrapes, skin fungi, skin parasites, skin problems, wrinkles, and wounds, and as an antioxidant and cosmetic
Paraguay	for diabetes
Peru	as an antiseptic, cicatrizant, contraceptive, emollient, hemostat, tonic, and vulnerary; for abscesses, age spots, anti-aging, bleeding, bruises, cancer, diabetes, eye infections, fibromas, fungal infections, infections (skin), insect bites, liver problems, malaria, ovarian disorders, pellegra, rashes, scabies, scars, skin parasites, skin problems, skin tumors, swelling, tumors, uterine cancer, wounds, and wrinkles

References:

1. Lopes, Reinaldo Jose. "Rede de bioprospeccao ja pensa em patente." Folha Online. 12/08/2002 www.folha.uol.com.br/folha/ciencia/
2. Portillo, A., et al. "Antifungal activity of Paraguayan plants used in traditional medicine." *J. Ethnopharmacol* 2001; 76(1): 93–98.
3. Cardona Zuleta, L. M., et al. "Seco-iridoids from *Calycophyllum spruceanum* (Rubiaceae)." *Phytochemistry*. 2003 Sep; 64(2): 549-53.

Ethnomedical Information on Mulateiro (*Calycophyllum spruceanum*)

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Bark - Amazonia	Used to treat diabetes.	Decoction / Oral	Human Adult	ZZ1011 L04137 ZZ1045 ZZ1101
Bark - Amazonia	Used to treat fungal infections on the skin.	Powder / External	Human Adult	ZZ1011 L04137 ZZ1005 ZZ1101
Bark - Amazonia	Considered contraceptive, emollient, and vulnerary.	Various	Human Adult	L04137
Bark - Brazil	Used for wounds, cuts, scrapes, skin fungi and skin parasites.	Poultice / External	Human Adult	CS1001
Bark - Brazil	Used for eye infections, diabetes, and ovarian problems.	Infusion / Oral	Human Adult	CS1001
Bark - Brazil	Used for the skin: to prevent or reduce wrinkles, scars, and age spots.	Infusion / External	Human Adult	CS1001
Bark - Peru	Used for eye infections.	Infusion / Ocular	Human Adult	ZZ1101
Bark - Peru	Used to treat malaria.	Decoction / Oral	Human Adult	ZZ2016
Bark - Peru	Used as a tonic; for cancer and liver problems.	Infusion / Oral	Human Adult	L17008
Bark - Peru	Used to treat infected wounds, skin tumors, and pellegra worms.	Infusion / External	Human Adult	L17008
Bark - Peru	Used for vaginal infections.	Infusion / Douche	Human Adult	L17008
Bark - Peru	Used for ovarian cysts and ovarian cancer.	Decoction / Oral	Human Adult	ZZ1101
Bark - Peru	Used as a contraceptive.	Infusion / Oral	Human Adult	ZZ1105
Bark - Peru	Used as a vulnerary; for skin problems, skin fungi, and skin parasites.	Decoction / External	Human Adult	ZZ1105
Bark - Peru	Used for ovarian problems, uterine cancer, and diabetes.	Decoction / Oral	Human Adult	ZZ2013

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Bark - Peru	Used for eye infections, infected wounds, and skin parasites. Bark powder sprinkled over fungal infections on the skin. Used as a cicatrizant and hemostat for wounds. Made into a salve for wrinkles, scars, and age spots on the skin.	Decoction / External Powder / External Poultice / External Salve / External	Human Adult	ZZ2013
Bark - Peru	A decoction is used to wash infected wounds.	Decoction / External	Human Adult	ZZ1101
Bark - Peru	Used as a hemostat and cicatrizant. Used for skin tumors and fibromas.	Poultice / External	Human Adult	ZZ1101
Bark - Peru	Used for wrinkles, scars, and age spots on the skin. Used for bruises, swellings, insect bites, rashes, and other skin problems.	Decoction / External	Human Adult	ZZ1101

Presence of Compounds in Mulateiro (*Calycophyllum spruceanum*)

Compound	Chemical Type	Plant Part	Plant Origin	Quantity	Ref #
Diderroside	Monoterpene	Trunk bark	Brazil	00.00146%	H32326
Diderroside methyl ester	Monoterpene	Trunk bark	Brazil	00.00064%	H32326
Diderroside, 7-methoxy:	Monoterpene	Trunk bark	Brazil	Not stated	H32326
Diderroside, 6'-O-acetyl:	Monoterpene	Trunk bark	Brazil	Not stated	H32326
Diderroside, 6'-acetyl-beta-d-glucopyranosyl:	Monoterpene	Trunk bark	Brazil	00.00113%	H32326
Diderroside, 8-O-tigloyl:	Monoterpene	Trunk bark	Brazil	00.0001%	H32326
Kingiside	Monoterpene	Trunk bark	Brazil	Not stated	H32326
Loganetin	Monoterpene	Trunk bark	Brazil	00.00016%	H32326
Loganin	Monoterpene	Trunk bark	Brazil	00.00096%	H32326
Loganin, secoxy:	Monoterpene	Trunk bark	Brazil	00.00047%	H32326

Biological Activities of Mulateiro (*Calycophyllum spruceanum*)

Plant Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Bark - Brazil	Antioxidant Activity	H2O ext	Not stated	Not stated	Active		CS1002
Bark - Brazil	Antitrypanosomal Activity	Compound fractions	<i>Trypanosoma cruzi</i>	IC50: 59.0 mcg/ml IC50: 90.02 mcg/ml IC50: 74.2 mcg/ml IC50 84.9 mcg/ml	Active		H32326
Bark - Brazil	Antibacterial Activity	H2O ext	Not stated	Not stated	Active		CS1002
Bark - Brazil	Antifungal Activity	H2O ext	Not stated	Not stated	Active		CS1002
Bark - Brazil	Antifungal Activity	MEOH ext	Agar plate	Various	Active	11 fungal strains comprising several filamentous fungi and yeasts	CS1003

Literature Cited - Mulateiro (*Calycophyllum spruceanum*)

H32326	SECO-IRIDOIDS FROM CALYCOPHYLLUM SPRUCEANUM (RUBIACEAE). ZULETA,LMC: VAVALHEIRO,AJ: SILVA,DHS: FURLAN,M: YOUNG,MCM: ALBUQUERQUE,S: CASTRO-GAMBAO,I: BOLZANI,YDS: PHYTOCHEMISTRY (2003) 64 (2) pp. 549-553 UNIV ESTAD PAULISTA BIOSSIN ECOFISITOL PROD NAT INST QUIMIC SAO PAULO BRAZIL
L04137	AMAZONIAN ETHNOBOTANICAL DICTIONARY. DUKE, JAMES AND RUDOLFO VASQUEZ. BOCA RATON, FL: CRC PRESS INC., (1994)
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 UNIV BRITISH COLUMBIA DEPT BOTANY VANCOUVER V6T 1Z4 CANADA
M05165	THE HEALING PRACTICES OF A PERUVIAN SHAMAN. LUNA,LE: J ETHNOPHARMACOL (1984) 11 (2) pp. 123-133 PERHONKATU HELSINKI 00100 FINLAND
CS1001	PAU-MULATO-DA-VARZEA (CALYCOPHYLLUM SPRUCEANUM). MARILENE DE CAMPOS ALMEIDA. INFORMATIVO TECNICO REDE DE SEMETES DA AMAZONIA, NO 6., 2004. UNIVERSIDADE FEDERAL DO ACRE, CEP, BRAZIL
CS1002	REDE DE BIOPROSPECCAO JA PENSA EM PATENTE. REINALDO JOSE LOPES. CIENCIA FOLHAONLINE. JUNE 18, 2003
CS1003	ANTIFUNGAL ACTIVITY OF PARAGUAYAN PLANTS USED IN TRADITIONAL MEDICINE. PORTILLO A, VILA R, FREIXA B, ADZET T, CANIGUERAL S. J ETHNOPHARMACOL. 2001 JUN;76(1):93-8. UNITAT DE FARMACOLOGIA I FARMACOGNOSIA, FACULTAT DE FARMACIA, AVENIDA DIAGONAL 643, E-08028, BARCELONA, SPAIN.
ZZ1005	THE HEALING FOREST: MEDICINAL AND TOXIC PLANTS OF THE NORTHWEST AMAZONIA. SCHULTES, R. E. AND RAFFAUF. PORTLAND: R.F. DIOSCORIDES PRESS. (1990)
ZZ1011	A FIELD GUIDE TO THE MEDICINAL AND USEFUL PLANTS OF THE UPPER AMAZON; J.L. CASTNER, S.L. TIMME AND J.A. DUKE; FELINE PRESS; GAINESVILLE, FL (1998)
ZZ1045	USEFUL PLANTS OF AMAZONIAN PERU. VASQUEZ, MR: SECOND DRAFT. FILED USDA'S NATIONAL AGRICULTURAL LIBRARY (1990)
ZZ1099	MEDICINAL PLANTS OF BRAZIL; WALTER MORS, CALOS RIZZINI, NUNO PEREIRA; REFERENCE PUBLICATIONS, INC.; ALGONAC, MI (2000)
ZZ1101	DICCIONARIO ENCICLOPEDICO DE PLANTAS UTILES DEL PERU. BRACK EGG, ANTONIO. CUZCO, PERU: CBC (1999)
ZZ1105	PERU: INFORME NACIONAL PARA LA CONFERENCIA TECNICA INTERNACIONAL DE LA FAO SOBRE LOS RECURSOS FITOGENETICOS; SANTIAGO PASTOR SOPLIN, ET AL. LEIPZIG. LIMA PERU (1996)
ZZ1106	CRC ETHNOBOTANY DESK REFERENCE; TIMOTHY JOHNSON. CRC PRESS LLC., NY NY (1999)

ZZ2003	MEDICINA INDIGENA. LAS PLANTAS MEDICINALES Y SU BENEFICIO EN LA SALUD (SHIPIBO - CONIBO); GUILLERMO AREVALO VALERA; CENTRO ORIENTAMENTO EDUCATIVO; PULCALPA, PERU (1994)
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.

