Dr. Duke's
Phytochemical and Ethnobotanical Databases

Myrciaria dubia (Kunth) MCVAUGH – Myrtaceae

1. Activities
The number in () indicates how many separate chemicals this species has for that activity, for example, Analgesic (3) indicates this species has three separate chemicals that have Analgesic activity. Select the activity to see the chemicals.
http://sun.arsgrin.gov:8080/npgspub/xsql/duke/pl_act.xsql?taxon=1241

2. List of chemicals
http://sun.arsgrin.gov:8080/npgspub/xsql/duke/plantdisp.xsql?taxon=1241

Research Articles

Abstract:

1) Vitamin C Fights Viruses, including Herpes, Shingles, Chicken Pox, & Others

The high Vitamin C content of Camu Camu is an instrumental factor in a surprising range of health-promoting effects including strengthening the immune system, especially against viruses.

The Epstein-Barr virus is a common form of the herpes virus which may linger in the body for years, raising the total viral load which the body must combat. Yet another form of the herpes virus is genital herpes which is caused by the herpes simplex virus 2. In total, more than 80% of the U.S. population suffers from some kind of herpes infection.

All forms of the herpes virus remain dormant at the base of the spine and become active when the immune system is stressed beyond its ability to respond effectively against pathogens. Common stressors include emotional upsets, other illnesses, prescription drugs, insufficient rest, poor diet, menstrual periods, vaginal yeast infections, and too much sunlight on the skin.

Genital herpes is usually transmitted sexually. The principal anti-viral pharmaceutical medicine is Acyclovir ® which has unpleasant side

effects in some people. The herpes virus takes a number of different forms and is widespread today as a public health problem in the United States. More than 50% of the U.S. population gets cold sores, which is the result of the herpes simplex virus 1 (HSV1).

Many people also suffer from shingles, which is a remanifestation of the chicken pox virus in adulthood in a new form.

Source/ References:
Gary Null, Ph.D., a nationally known nutritionist and researcher. Excerpted and adapted by Herbs America from his Clinician's Handbook of Natural Healing, (1998).

2) Volatile composition of some Brazilian fruits: umbu-caja (Spondias citherea), camu-camu (Myrciaria dubia), Araça-boi (Eugenia stipitata), and Cupuaçu (Theobroma grandiflorum).
(PMID: 10775382 -PubMed - indexed for MEDLINE - April 2000)

Twenty-one volatile compounds were identified for the first time by GC-MS in umbu-caja and in camu-camu, plus 30 volatile compounds were identified in araça-boi samples. Terpenic compounds predominated among the volatile compounds in these fruit samples, with the major compounds being identified as cis-beta-ocimene and caryophyllene in the northeastern fruit; alpha-pinene and d-limonene were the most abundant volatile compounds in the headspace of the Amazonian fruit camu-camu.

Sesquiterpenes were the most abundant compounds in the araça-boi sample, with germacrene D presenting a higher relative percentage. The chemical class of esters predominated in the cupuaçu sample. Ethyl butyrate and hexanoate were the major compounds in the headspace of this Amazonian fruit.

Source/ References:
Franco MR, Shibamoto T. Faculdade de Engenharia de Alimentos, UNICAMP, Campinas-SP, CP 6121, CEP 13081-970, Brazil. franco@fea.unicamp.br. J Agric Food Chem. 2000 Apr;48(4):1263-

3) Nutritional composition and vitamin C stability in stored camu-camu (Myrciaria dubia) pulp.
(PMID: 11464674 - PubMed - indexed for MEDLINE - December, 2000)

Camu-camu (Myrciaria dubia), a native fruit of the Amazon region, is one of the richest sources of vitamin C (2.4 to 3.0 g/100 g in the pulp) found in Brazil. The purpose of this work was the physical-chemical characterization of some nutrients and the valuation of vitamin C stability in stored camu-camu pulp, produced by the Agronomic Institute of Paraná (IAPAR), Paraná State, Brazil.

The vitamin C determination was made by titration with potassium iodate. The fruit produced in Paraná State, presented a lower content of vitamin C than the one native of the amazon region, possibly due to the different development conditions of the plant, and consequently of the fruit, as well as the climatic variation, the humidity and the characteristics of the soil.

Regarding the vitamin C stability in stored (-18 degrees C) camu-camu pulp, a considerable decrease in its concentration until the 28th day was observed lost 23% (from 1.57 to 1.21 g/100 g), staying approximately the same until the end of the experiment. After 335 days of storage, the content found was of approximately 1.16 g/100 g of pulp, the ascorbic acid losses amounted to 26%.

This content was still higher than the one found for most fruits that are good sources of this vitamin.

Source/ References:
Justi KC, Visentainer JV, Evelázio de Souza N, Matsushita M. Department of Chemistry, State University of Maring, Maringá, Paraná, Brazil. Arch Latinoam Nutr. 2000 Dec;50(4):405-8.

4) Aldose reductase inhibitors from the leaves of Myrciaria dubia (H. B. & K.) McVaugh. PMID: 15636180 - PubMed - indexed for MEDLINE, November 11th, 2004)

Ellagic acid (1) and its two derivatives, 4-O-methylellagic acid (2) and 4-(alpha-rhamnopyranosyl)ellagic acid (3) were isolated as inhibitors of aldose reductase (AR) from Myrciaria dubia (H. B. & K.) McVaugh. Compound 2 was the first isolated from the nature. Compound 3 showed the strongest inhibition against human recombinant AR (HRAR) and rat lens AR (RLAR). Inhibitory activity of compound 3 against HRAR (IC50 value = 4.1 x 10(-8) M) was 60 times more than that of quercetin (2.5 x 10(-6) M). The type of inhibition against HRAR was uncompetitive.

Source/ References:
Ueda H, Kuroiwa E, Tachibana Y, Kawanishi K, Ayala F, Moriyasu M. Kobe
Pharmaceutical University, Higashinada-ku, Kobe, 658-8558 Japan. Phytomedicine. 2004 Nov;11(7-8):652-6.

5) Determination of anthocyanins from camu-camu (Myrciaria dubia) by HPLC-PDA, HPLC-MS, and NMR.
(PMID: 16302773 - PubMed - indexed for MEDLINE, November 30th, 2005)

Camu-camu [Myrciaria dubia (HBK) McVaugh] is a small fruit native to the Amazonian rain forest. Its anthocyanin profile has now been investigated for the first time. Fruits from two different regions of the São Paulo state, Brazil, were analyzed. The major anthocyanins were isolated by high-speed countercurrent chromatography.

HPLC-PDA, HPLC-MS/MS, and 1H NMR were used to confirm the identity of the main anthocyanins of camu-camu. Cyanidin-3-glucoside was identified as the major pigment in the fruits from both regions, representing 89.5% in the fruits produced in Iguape and 88.0% in those from Mirandópolis, followed by the delphinidin-3-glucoside, ranging between 4.2 and 5.1%, respectively. Higher total anthocyanin contents were detected in the fruits from Iguape (54.0 +/- 25.9 mg/100 g) compared to those from Mirandópolis (30.3 +/- 6.8 mg/100 g), most likely because of the lower temperatures in the Iguape region.

Source/ References:
Zanatta CF, Cuevas E, Bobbio FO, Winterhalter P, Mercadante AZ.Department of Food Science, Faculty of Food Engineer, State University of Campinas, UNICAMP, Post Office Box 6121, Campinas, São Paulo, 13083-970, Brazil. J Agric Food Chem. 2005 Nov 30;53(24):9531-5.
6) "Prosperity and Poverty in a Globalized World- Challenges for Agricultural Research"- Camu-Camu: A Promising Fruit for the Amazon Basin
(Tropentag, October 11-13, 2006, Bonn- Germany)

The Amazon forest contains a great number of fruit bearing species in the wild state, with a small part being explored by harvesting from the wild or subsistence agriculture. This group includes the camu camu (Myrciaria dubia), family Myrtaceae.

The most distinctive feature of the camu camu fruit attracting attention is its extremely high content of vitamin C (1000 to 3000 mg/100 g in the pulp). The harvest of camu camu fruit in naturally occurring stands is difficult - at harvest time the shrubs are usually partially flooded. Recently, growing trials on non-flooded soils are promising. In the harvest regions, the fruit is consumed in the form of juice, ice-cream, fruit purees and jams, not being consumed in its natural state due to its high acidity. More recently there has been an increasing demand for camu camu pulp in the larger commercial centres of Brazil for the production of healthy beverages.

Compounds like ascorbic acid and anthocyanins, present in the camu camu, are known to act as dietary antioxidants. They are reactive oxygen species scavengers, which can play an important role in the prevention of illnesses like cancer or cardiovascular diseases or to slow down the ageing process.

For a better understanding of the health benefits from the camu camu fruit, we have determined the antioxidant capacity of the fruit with the Total Oxidant Scavenging Capacity assay. This assay is based upon the ethylene yielding reaction of -keto--methiolbutyric acid with three different reactive oxygen species (ROS). The time course of ethylene production was monitored during one hour by repeated headspace GC.

In comparison with other fruit, camu camu presents outstanding antioxidant features. Not only the extremely high content of ascorbic acid but also compounds likes anthocyanins or flavonolglycosides seem to contribute to the overall antioxidant capacity of camu camu fruit pulp.

The camu camu is, until now, a hardly known fruit that presents a high potential to be explored as a functional food not only in the Amazon region but also in the big markets of Europe and the USA.

Source/ References:
1) University of Bonn, Institute of Nutrition and Food Sciences, Germany
2) Federal University of Para, Food Chemistry, Brazil
3) Instituto Nacional de Pesquisa da Amazonia (INPA), Brazil
(Roberta B. Rodrigues 1, Menelaos Papagiannopoulos 1, Jos´e Guilherme S. Maia 2, Kaoru Yuyama 3, Friedhelm Marx 1)