Technical Data Report

for

TAYUYA

Cayaponia tayuya

Sage Press

Written by Leslie Taylor, ND Published by Sage Press, Inc.

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Tayuya

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Family: Cucurbitaceae

Genus: *Cayaponia*

Species: *tayuya*

Synonyms: *Cayaponia piauhiensis, C. ficifolia, Bryonia tayuya, Trianosperma tayuya, T. piauhiensis, T. ficcifolia*

Common Names: Tayuya, taiuiá, taioia, abobrinha-do-mato, anapinta, cabeca-de-negro, guardião, tomba

Part Used: Root

Tayuya is a woody vine found in the Amazon rainforest (predominantly in Brazil and Peru) as well as in Bolivia. This important Amazon plant belongs to the Cucurbitaceae (gourd) family, which comprises over 100 genera and over 700 species—most of which are characterized by their long, tuberous roots. It is this root that is employed medicinally. Harvesting of it can only be performed during rainy season, when the ground is soft and wet; during dry season, the ground is too hard to extricate the root (which can extend to three feet long) from the dry clay soils in the Amazon. About 50 species of *Cayaponia* occur in the warmer parts of the Americas, West Africa, Madagascar and Indonesia. In Brazil, *Cayaponia tayuya* is known as *taiuiá*; in Peru, it is called *tayuya*.

South American Indians have been using tayuya since prehistoric times, and the plant's value is well known. It has been used as a tonic and blood cleanser traditionally (and, usually, with a bit of honey or stevia added to tone down the strong, bitter taste). In the Amazon rainforest, Indians have used the root of tayuya for snakebite and rheumatism for centuries. Indians in Colombia use the plant for sore eyes; indigenous tribes of Peru use it for skin problems.

Tayuya has a long history in Brazilian herbal medicine; it was first recorded in the *Brazilian Pharmacopoeia* as an official herbal drug in 1929. Brazilian botanist J. Monteiro da Silva reports tayuya is used for the treatment of all types of pain and, recommends it as an anti-syphilitic agent. Monteiro also believes that tayuya helps to regulate metabolism. In Brazil today, tayuya is used as an analgesic, diuretic, anti-inflammatory, tonic, blood purifier and detoxifier; to treat diarrhea, epilepsy, metabolism disorders, backache, sciatic pain, headaches, gout, neuralgia, constipation, anemia, cholera, dyspepsia, stomach problems, fatigue and debility, skin disorders, arthritis and rheumatism, syphilis, tumors (especially in the joints)—and as a general analgesic for many conditions.

Currently, tayuya is employed in North and South America for its pain-reducing properties and more. Natural health practitioners in the United States are using tayuya to treat irritable bowel syndrome (IBS), dyspepsia and sluggish digestion, neuralgia, sciatica, gout, headaches, rheumatism, and as a metabolic regulator. Because of its reported effectiveness as a blood purifier and detoxifier, it is also being used to treat water retention, wounds, splotchiness on the face, eczema, herpes, severe acne, and other skin problems. It is also being used in athletic training and recovery to help remove lactic acid accumulation, reduce swelling, and to relieve emotional fatigue and depression.

Tayuya is phytochemically rich in flavones, glucosides, and cucurbitacin triterpenes.

Almost every species in the huge Cucurbitaceae family is documented to contain cucurbitacin compounds—many of which evidence biological activity (and, oftentimes, the plant's medicinal activity is ascribed to these chemicals). Novel cucurbitacins have been discovered in tayuya and named *cayaponosides* (24 distinct cayaponosides have been discovered thus far). These phytochemicals have been documented to have antioxidant, anti-inflammatory and analgesic properties[1–3] and, more recently, to have anticancerous potential. The National Cancer Center Research Institute in Tokyo, Japan reported (in 1995) that five cayaponosides in tayuya ". . . exhibited significant anti-tumor-promoter activity in screening tests using an Epstein-Barr virus activating system." and that two other cayaponosides ". . . also suppressed mouse skin tumor promotion in a two-stage carcinogenesis experiment . . ."[4,5] Another cucurbitacin found in tayuya, *cucurbitacin R*, has been studied extensively in Russia. There it is cited as a powerful adaptogen, preventing stress-induced alterations in the body.[6–8] Other flavone phytochemicals in tayuya have been reported act as potent scavengers of free radicals, providing an antioxidant effect[9] as well as protecting against damage induced by gamma-radiation.[10,11]

While tayuya's compounds have come under some scientific scrutiny (and many of the documented uses in herbal medicine could be explained by some of the activities of its chemicals), very little research has been performed on the biological activity of the plant itself. Two animal studies (performed in the early 1990s) do verify that root extracts provide analgesic and anti-inflammatory actions. One study documented that a root infusion given intragastrically to mice had an analgesic action.[12] Another research group prepared the root in a methanol extract and reported mild anti-inflammatory actions when administered orally to mice.[13] The latter group reported no toxic effects in mice (oral dosages of a methanol root extract) at 2 g per kg of body weight; however, an LD_{50} of 500 mg/kg was established when injected intraperitoneally. One *in vitro* study by Brazilian scientists reported that tayuya did not evidence any antimicrobial properties (against several common bacteria, fungi, and yeast microbes they tested).[14]

Of recent (2003) concern, a widely-publicized marketing campaign was started in Europe regarding tayuya that is, at best, unscrupulous—if not outright fraudulent. It makes unsupported claims that the plant can cure many diseases including arthritis, impotence, and gout, and was discovered through the "Tayuyis" Indians in Brazil (who never existed). Other easily-recognized fallacies in their literature are that tayuya is "rare" (as it, supposedly, makes the soil sterile for 15–20 years!), and that the leaf is used indigenously (rather than the root, which is well-documented in literature dating back a century). European consumers should be aware that no clinical studies exist to support any of these wild claims, and that tayuya will *not* provide the benefits advertised. While tayuya has a long history of traditional use by herbalists in the United States and South America for all types pain and joint aches, it is at best a mild analgesic; it will *not* cure arthritis (nor any of the other diseases claimed in the marketing literature). It is unfortunate that a handful of unethical companies can affect the entire herbal products industry negatively with such scurrilous practices, but it continues to happen.

Although not widely available, tayuya is being employed by several companies as an ingredient in various herbal formulas (typically for pain, arthritis, and detoxification). Generally it is employed by South American herbalists in combination with other plants, and not as a monotherapy. Consumers and manufacturers should stick with reputable harvesters and importers for sourcing this particular tropical plant. The official plant that is sold as tayuya should be *Cayaponia tayuya*. One independent published survey in Brazil (the main exporter of the root), however, reported that almost any species of *Cayaponia* (of which about 40 different species exist in South America) is harvested, marketed, and sold

as *taiuiá* in Brazil.[15] They also reported that another completely different plant, *Wilbrandia ebracteata,* frequently has been found among the "taiuiá roots" sold in Brazilian herbal commerce

Documented Properties and Actions: Analgesic, anti-inflammatory, antioxidant, antirheumatic, antisyphilitic, choleretic, depurative, digestive, diuretic, laxative, purgative, stomachic, tonic

Main Phytochemicals: Alkaloids, cayaponosides, cucurbitacins, isoorientin, isovitexin, orientin, resins, saponins, spinosin, sterols, swertisin, vicenin 2, vitexin

Traditional Remedy: It is traditionally prepared in infusions, or 3–4 g of the root is stirred into juice, water, or food daily .

Contraindications: None known.

Drug Interactions: None known.

WORLDWIDE ETHNOBOTANICAL USES

Country	Use
Amazonia	Depression, edema, eyes, fatigue, swelling
Brazil	Amenorrhea, analgesic, anti-inflammatory, arthritis, backache, bitter, blood cleanser, boils, cholera, depurative, dermatoses, diarrhea, digestive disorders, diuretic, dropsy, dyspepsia, eczema, emetocathartic, epilepsy, fatigue, gout, headache, hydropsy, laxative, leprosy, menstruation, metabolism, neuralgia, purgative, rabies, rheumatism,
Colombia	Eye (sore)
Peru	Rheumatism, skin disorders, snakebite
U.S.	Acne, alterative, arthritis, backache, depression, digestion disorders, dyspepsia, eczema, edema, epilepsy, gout, headache, herpes, irritable bowel syndrome, lactic acid excess, liver, metabolism, nervine, neuralgia, rheumatism, sciatica, skin disorders, spleen, stomachic, ulcers, wounds

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Ethnomedical Information on Tayuya (Cayaponia tayuya)

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Resin Amazonia	Used for wounded or sore eyes.	Resin Eye	Human Adult	ZZ1003
Plant Amazonia	Used to flush excess fluids from the tissues and to reduce swelling. Used to relieve emotional fatigue and depression.	Not Stated	Human Adult	ZZ1015
Fruit Brazil	Used for syphilis and dermatoses.	Hot H2O Ext Oral	Human Adult	M24654
Leaf Brazil	Used for gastric ulcers.	Hot H2O Ext Oral	Human Adult	M24654
Leaf Brazil	Used for ulcers and diverse pains.	Cataplasm External	Human Adult	ZZ1096
Root Brazil	Used as a laxative and for its antirheumatic properties.	Decoction Oral	Human Adult	H11602
Root Brazil	Used for snakebite.	Infusion External	Human Adult	J12450
Root Brazil	Used for amenorrhea, epilepsy, dropsy, syphilis, leprosy, dermatoses, as an analgesic in neuralgia and sciatica and as an anti-inflammatory in acute and chronic rheumatism.	Hot H2O Ext Oral	Human Adult	M24654
Root Brazil	Considered a strong tonic and cleanser of the blood. Said to be an analgesic and used for all types of pain such as neuralgias and sciatica. Used for syphilis, to regulate menstruation, for backache, headaches, rheumatism, gout and epilepsy.	Infusion Oral	Human Adult	ZZ1070
Root Brazil	Considered diuretic and depurative. Used for hydropsy, rheumatism, arthritis, scrofula, ulcers, syphilis and cholera.	Infusion Oral	Human Adult	ZZ1007
Root Brazil	Used for neuralgia and dermatoses; as a laxative, antisyphilitic, depurative and antirheumatic.	Decoction Oral	Human Adult	ZZ1096
Root Brazil	A bitter. Used for dyspepsia, affections of the stomach, constipation, debilitated organs, syphilis and skin disorders.	Not Stated	Human Adult	ZZ1013
Plant Brazil	Used as a depurative, bitter, emetocathartic, and antisyphilitic for dermatoses, boils, eczema, rheumatism, epilepsy, amenorrhea, rabies and dilated stomach.	Not Stated	Human Adult	ZZ1099

Part / Location	Documented Ethnomedical Uses	Type Extract / Route	Used For	Ref #
Plant USA	Used to remove lactic acid accumulations.	ETOH Ext Oral	Human Adult	ZZ1067
Plant USA	Used for nerve pain, neuralgias, sciatica, backaches, headaches, gout, epilepsy, rheumatism, for liver and spleen obstructions, ulcers, dyspepsia, irritable bowel syndrome, stomach tension, sluggish digestion, water retention, acne, eczema, herpes, skin problems and wounds. Thought to regulate metabolism, detoxify and purify the blood.	ETOH Ext Oral	Human Adult	ZZ1014

Presence of Compounds in Tayuya (Cayaponia tayuya)

Compound	Chemical type	Plant Part	Plant Origin	Quantity	Ref #
Cayaponoside A	Triterpene	Root Root Root	Brazil Brazil Brazil	Not Stated 00.10341% Not Stated	H11602 H14666 K21645
Cayaponoside A-1	Triterpene	Root Root Root Root	Brazil Brazil Brazil Brazil	00.02952% 00.03870% 00.02952% Not Stated	K18397 H12170 H14666 K21645
Cayaponoside A-3	Triterpene	Root Root	Brazil Brazil	00.01676% Not Stated	H14666 K21645
Cayaponoside A-4	Triterpene	Root Root	Brazil Brazil	00.00711% Not Stated	H14666 K21645
Cayaponoside A-5	Triterpene	Root Root Root	Brazil Brazil Brazil	00.00505% 00.00505% Not Stated	H17407 H14666 K21645
Cayaponoside A-6	Triterpene	Root Root	Brazil Brazil	Not Stated 00.00811%	K21645 H14666
Cayaponoside B	Triterpene	Root Root Root	Brazil Brazil Brazil	Not Stated Not Stated 00.11929%	K21645 H11602 H14666
Cayaponoside B-2	Triterpene	Root Root	Brazil Brazil	00.01688% Not Stated	H14666 K21645
Cayaponoside B-3	Triterpene	Root Root	Brazil Brazil	Not Stated 00.01417%	K21645 H14666
Cayaponoside B-4	Triterpene	Root Root	Brazil Brazil	00.03211% Not Stated	H14666 K21645
Cayaponoside B-5	Triterpene	Root Root Root	Brazil Brazil Brazil	00.00476% 00.00476% Not Stated	H17407 H14666 K21645

Compound	Chemical type	Plant Part	Plant Origin	Quantity	Ref #
Cayaponoside B-6-a	Triterpene	Root Root Root Root	Brazil Brazil Brazil Brazil	00.00235% 00.00235% 00.00235% Not Stated	H12170 K18397 H14666 K21645
Cayaponoside B-6-b	Triterpene	Root Root Root Root	Brazil Brazil Brazil Brazil	00.00441% 00.441% 00.00441% Not Stated	H12170 K18397 H14666 K21645
Cayaponoside C	Triterpene	Root Root Root	Brazil Brazil Brazil	Not Stated Not Stated 00.19970%	H11602 K21645 H14666
Cayaponoside C-2	Triterpene	Root Root	Brazil Brazil	Not Stated 00.07235%	K21645 H14666
Cayaponoside C-3	Triterpene	Root Root Root Root	Brazil Brazil Brazil Brazil	00.03770% 00.04117% 00.03770% Not Stated	K18397 H12170 H14666 K21645
Cayaponoside C-4	Triterpene	Root Root	Brazil Brazil	00.00617% Not Stated	H14666 K21645
Cayaponoside C-5-a	Triterpene	Root Root	Brazil Brazil	Not Stated 00.00517%	K21645 H14666
Cayaponoside C-5-b	Triterpene	Root Root Root	Brazil Brazil Brazil	00.00882% Not Stated 00.00882%	H17407 K21645 H14666
Cayaponoside D	Triterpene	Root Root Root	Brazil Brazil Brazil	Not Stated Not Stated 00.35352%	K21645 H11602 H14666
Cayaponoside D-1	Triterpene	Root Root	Brazil Brazil	Not Stated 00.03011%	K21645 H14666
Cayaponoside D-2	Triterpene	Root Root Root	Brazil Brazil Brazil	00.01882% Not Stated 00.02176%	H17407 K21645 H14666

Compound	Chemical type	Plant Part	Plant Origin	Quantity	Ref #
Cayaponoside D-3-a	Triterpene	Root Root Root Root	Brazil Brazil Brazil Brazil	00.00247% 00.00741% Not Stated 00.00247%	K18397 H12170 K21645 H14666
Cayaponoside D-3-b	Triterpene	Root Root Root Root	Brazil Brazil Brazil Brazil	Not Stated 00.00717% 00.02152% 00.00717%	K21645 K18397 H12170 H14666
Cucurbitacin B, 23-24-dihydro	Triterpene	Root	Not Stated	00.01396%	H00346
Cucurbitacin B, 23-24-dihydro: 2-o-beta-d-glucoside	Triterpene	Root	Not Stated	00.00655%	H00346
Cucurbitacin B, iso: Dihydro	Triterpene	Root	Not Stated	00.00121%	H00346
Cucurbitacin R	Triterpene	Root	Not Stated	00.01365%	H00346
Cucurbitacin R-2-o-beta-d-glucoside	Triterpene	Root	Not Stated	00.00382%	H00346
Orientin	Flavone	Root	Not Stated	Not Stated	H00346
Orientin, iso	Flavone	Root	Not Stated	Not Stated	H00346
Spinosin	Flavone	Root	Not Stated	00.05388%	H00346
Swertisin	Flavone	Root	Not Stated	Not Stated	H00346
Vicenin 2	Flavone	Root	Not Stated	00.00243%	H00346
Vitexin	Flavone	Root	Not Stated	Not Stated	H00346
Vitexin, iso	Flavone	Root	Not Stated	Not Stated	H00346

Biological Activities for Extracts of Tayuya (Cayaponia tayuya)

Part - Origin	Activity Tested For	Type Extract	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Root Brazil	Toxicity Assessment (quantitative)	CHCl3 Ext	Oral Mouse	LD50=375.0 mg/kg	Not Stated		M24654
Root Brazil	Toxicity Assessment (quantitative)	CHCl3 Ext	IP Mouse	LD50=67.0 mg/kg	Not Stated		M24654
Root Brazil	Toxicity Assessment (quantitative)	MEOH Ext	Oral Mouse	LD50=>2000 mg/kg	Not Stated		M24654
Root Brazil	Toxicity Assessment (quantitative)	MEOH Ext	IP Mouse	LD50=500.0 mg/kg	Not Stated		M24654
Root Brazil	Analgesic Activity	Infusion	IG Mouse	1.0 gm/kg	Active	vs. acetic acid-induced writhing.	J12450
Root Brazil	Anti-inflammatory Activity	CHCl3 Ext	Oral Mouse	123.0 mg/kg	Weak Activity	vs. carrageenan-induced pedal edema.	M24654
Root Brazil	Anti-inflammatory Activity	CHCl3 Ext	IP Mouse	28.0 mg/kg	Active	vs. carrageenan-induced pedal edema.	M24654
Root Brazil	Anti-inflammatory Activity	Infusion	IG Mouse	1.0 gm/kg	Equivocal	Dye diffusion assay.	J12450
Root Brazil	Anti-inflammatory Activity	MEOH Ext	Oral Mouse	ED50=>2000 mg/kg	Inactive	vs. carrageenan-induced pedal edema.	M24654
Root Brazil	Anti-inflammatory Activity	MEOH Ext	IP Mouse	ED50=235.0 mg/kg	Weak Activity	vs. carrageenan-induced pedal edema.	M24654
Plant Brazil	Antibacterial Activity	Not Stated	Not Stated	Not Stated	Inactive	*Escherichia coli*	T15630
Plant Brazil	Antibacterial Activity	Not Stated	Not Stated	Not Stated	Inactive Inactive Inactive	*Bacillus subtilis* *Staphylococcus aureus* *Streptococcus faecalis*	T15630
Plant Brazil	Antifungal Activity	Not Stated	Not Stated	Not Stated	Inactive	*Neurospora crassa*	T15630
Plant Brazil	Antimycobacterial Activity	Not Stated	Not Stated	Not Stated	Inactive	*Mycobacterium smegmatis*	T15630
Plant Brazil	Antiyeast Activity	Not Stated	Not Stated	Not Stated	Inactive	*Candida albicans*	T15630

Biological Activities for Compounds of Tayuya (Cayaponia tayuya)

Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Cayaponosides B, B3, D, D3b and C2	Antiviral Activity	In vitro	Not Stated	Active	Inhibited *Epstein-Barr virus* activation induced by tumor promoter TPA.	K21645
Cayaponoside B and C2	Antitumor promoting Activity	Mouse	Not Stated	Active	Inhibited skin tumor promotion in a two-stage carcinogenesis test.	K21645
Cucurbitacin R	Adaptogen Effect	Adrenal cortex	Not Stated	Active	Prevented stress-induced alterations of eicosanoids in blood, stimulated the adrenal cortex to adapt to stress, increased corticosteroid secretion which protected against the defense system becoming hyperactive.	BH1002
Cucurbitacin R	Adaptogen Effect	Rat Adrenal cortex	Not Stated	Active	Stimulated the release of arachidonic acid leading to increased synthesis of 5-HETE and 5-HPETE, a modulator of ACTH-induced corticosteroid secretion.	BH1003
Cucurbitacin R	Adaptogen Effect	Rat leukocyte	Not Stated	Active	Prevented changes caused by stress.	BH1004
Cucurbitacin R	Hypothalamic-Hypophysis-Adrenal cortex Modulator	Rat Adrenal cortex	Not Stated	Active	Regulated steroidogenesis by influencing the activity of prostaglandin G2-prostaglandin E2 isomerase in rats exposed to immobilization stress.	BH1005
Cucurbitacins	Antiproliferative Activity	HeLa cells	Not Stated	Active	Inhibition of HeLa S3 cell proliferation.	BH1006
Cucurbitacins	Radioprotective Activity	HeLa cells	Not Stated	Active	Inhibited the incorporation of radioprotective precursors into DNA, RNA and protein.	BH1006
Isoorientin	Antioxidant Activity	In vitro	Not Stated	Active		BH1001
Orientin	Toxicity (general)	IP Mice	100 mg/kg	Inactive		BH1009
Orientin	Antiviral Activity	In vitro	Not Stated	Active	*Parainfluenza type 3 virus*	BH1007
Orientin	Antioxidant Activity	In vitro	Not Stated	Active		BH1001
Orientin	Antioxidant Activity	In vitro	Not Stated	Active		BH1008
Orientin	Radioprotective Activity	Cell Culture	17.5 microM	Active	Cells pre-treated with orientin 30 minutes before exposure to gamma-radiation had a reduced micronucleus count by 51-67%.	BH1008

Compound Tested	Activity Tested For	Test Model	Dosage	Result	Notes/Organism tested	Ref #
Orientin	Radioprotective Activity	IP Mice	50 mcg/kg	Active	Orientin given 30 minutes before exposure to gamma-radiation. Orientin protected against death from gastrointestinal syndrome as well as bone marrow syndrome.	BH1009
Vitexin	Antiviral Activity	In vitro	Not Stated	Active	*Parainfluenza type 3 virus*	BH1007
Vitexin	Hepatoprotective Activity	Cell Culture	IC50=40.1 microM	Active	Inhibited TNF-alpha-induced cell death (mouse hepatocytes).	BH1010

Literature Cited - Tayuya (Cayaponia tayuya)

H00346	CUCURBITACINS AND FLAVONE C-GLYCOSIDES FROM CAYAPONIA TAYUYA. BAUER,R: BERGANZA,LH: SELIGMANN,O: WAGNER,H: PHYTOCHEMISTRY 24 7: 1587-1591 (1985) (INST PHARM BIOL UNIV MUNCHEN MUNICH D-8000 GERMANY)
H11602	STRUCTURES OF CAYAPONOSIDES A,B,C AND D, GLUCOSIDES OF NEW NOR-CUCURBITACINS IN THE ROOTS OF CAYAPONIA TAYUYA. HIMENO,E: NAGAO,T: HONDA,J: OKABE,H: IRINO,N: NAKASUMI,T: CHEM PHARM BULL 40 10: 2885-2887 (1992) (FAC PHARM SCI FUKUOKA UNIV FUKUOKA 814-01 JAPAN)
H12170	STRUCTURES OF NEW NON-AROMATIZED NOR-CUCURBITACIN GLUCOSIDES IN THE ROOTS OF CAYAPONIA TAYUYA. HIMENO,E: NAGAO,T: HONDA,J: OKABE,H: IRINO,N: NAKASUMI,T: CHEM PHARM BULL 41 5: 986-988 (1993) (FAC PHARM SCI FUKUOKA UNIV FUKUOKA 814-01 JAPAN)
H14666	STUDIES ON THE CONSTITUENTS OF THE ROOT OF CAYAPONIA TAYUYA (VELL.) COGN.I. STRUCTURES OF CAYAPONOSIDES, NEW 29-NOR-1,2,3,4,5, 10-HEXADEHYDROCUCURBITACIN GLUCOSIDES. HIMENO,E: NAGAO,T: NONDA,J: OKABE,H: IRINO,N: NAKASUMI,T: CHEM PHARM BULL 42 11: 2295-2300 (1994) (FAC PHARM SCI FUKUOKA UNIV FUKUOKA 814-01 JAPAN)
H17407	STUDIES ON THE CONSTITUENTS OF THE ROOT OF CAYAPONIA TAYUYA (VELL.) COGN. III. STRUCTURES OF CAYAPONOSIDES, 29-NOR-1,2,3,4,5, 10-HEXADEHYDROCUCURBIT-6-ENE GLUCOSIDES. HIMENO,E: NAGAO,T: HOHNDA,J: OKABE,H: IRINO,N: NAKASUMI,T: CHEM PHARM BULL 42 11: 2370-2372 (1994) (FAC PHARM SCI FUKUOKA UNIV FUKUOKA 814-01 JAPAN)
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BI1006	INHIBITION OF THE BIOSYNTHESIS OF DEOXYRIBONUCLEIC ACID, RIBONUCLEIC ACID AND PROTEIN IN HELA S3 CELLS BY CUCURBITACINS, GLUCOCORTICOID-LIKE CYTOTOXIC TRITERPENES. WITKOWSKI, A: WOYNAROWSKA, B: KONOPA, J: BIOCHEM PHARMACOL 33 7: 995-1004 (1984)
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Clinical Abstracts

Biol Pharm Bull 1995 Feb;18(2):284-7

Inhibitory effects of cucurbitane triterpenoids on Epstein-Barr virus activation and two-stage carcinogenesis of skin tumor. II.

Konoshima T, Takasaki M, Kozuka M, Nagao T, Okabe H, Irino N, Nakasumi T, Tokuda H, Nishino H. Kyoto Pharmaceutical University, Japan.

To search for possible anti-tumor-promoters, we carried out a primary screening of twenty-four 29-nor-cucurbitacin glucosides isolated from the roots of Cayaponia tayuya (Cucurbitaceae) using an in vitro synergistic assay system. Of these glucosides, cayaponosides B (5), B3 (7), D (8), D3b (22) and C2 (23) exhibited significant inhibitory effects on Epstein-Barr virus (EBV) activation induced by the tumor promoter, 12-O-tetradecanoylphorbol-13-acetate (TPA). Furthermore, 5 and 23 exhibited remarkable

Z Naturforsch [C] 1990 Jan-Feb;45(1-2):19-24

Superoxide scavenging properties of flavonoids in a non-enzymic system.

Huguet AI, Manez S, Alcaraz MJ.

Departament de Farmacologia i Farmacotecnia, Facultat de Farmacia, Valencia, Spain.

The superoxide anion scavenging activity of 38 flavonoids, some of them isolated from Sideritis mugronensis, Sideritis javalambrensis and Cayaponia tayuya were investigated by measurement of their inhibition of nitroblue tetrazolium reduction. Isoorientin, orientin, amentoflavone, leucocyanidol, eriodictyol, datiscetin and robinetin behaved as potent scavengers and structure-activity relationships were established.

Mem Inst Oswaldo Cruz 1991;86 Suppl 2:203-5

Pharmacological screening of plants recommended by folk medicine as anti-snake venom--I. Analgesic and anti-inflammatory activities.

Ruppelt BM, Pereira EF, Goncalves LC, Pereira NA.

Departamento de Farmacologia, CCS-ICB, UFRJ, Ilha do Fundao, Rio de Janeiro, Brasil.

We have observed that several plants used popularly as anti-snake venom show anti-inflammatory activity. From the list prepared by Rizzini, Mors and Pereira some species have been selected and tested for analgesic activity (number of contortions) and anti-inflammatory activity (Evans blue dye diffusion--1% solution) according to Whittle's technique (intraperitoneal administration of 0.1 N-acetic acid 0.1 ml/10 g) in mice. Previous oral administration of a 10% infusion (dry plant) or 20% (fresh plant) corresponding to 1 or 2 g/kg of Apuleia leiocarpa, Casearia sylvestris, Brunfelsia uniflora, Chiococca brachiata, Cynara scolymus, Dorstenia brasiliensis, Elephantopus scaber, Marsypianthes chamaedrys, Mikania glomerata and Trianosperma tayuya demonstrated analgesic and/or anti-inflammatory activities of varied intensity.

Phytomedicine 1999 Jul;6(3):147-55

On the mechanism of action of plant adaptogens with particular reference to cucurbitacin R diglucoside.

Panossian A, Gabrielian E, Wagner H.

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Cucurbitacin R diglucoside (DCR), one of the active principles of Bryonia alba L. root was found to have an effect on the production of corticosteroids and the biosynthesis of eicosanoids in the adrenal cortex, isolated adrenocortical cells, blood plasma, and leukocytes under stress and stress-free conditions in vitro and vivo. DCR prevents stress-induced alterations of eicosanoids in blood and moderately stimulates the adrenal cortex to adapt organism to stress, because a moderate increase in corticosteroid secretion protects the defense system of organisms from becoming hyperactive. DCR enhances sensitivity to stress due to the effects of eicosanoids and corticosteroids.

Life Sci 1999;64(26):2429-37

Anti-inflammatory effects of the products from Wilbrandia ebracteata on carrageenan-induced pleurisy in mice.

Peters RR, Saleh TF, Lora M, Patry C, de Brum-Fernandes AJ, Farias MR, Ribeiro-do-Valle RM.

Department of Pharmacology, Universidade Federal de Santa Catarina, Florianopolis, Brazil.

Wilbrandia ebracteata Cogn. (Cucurbitaceae) is commonly known in Brazil as "Taiuia". The roots are employed in folk medicine for the treatment of several diseases, such as rheumatic disease. This study has evaluated the anti-inflammatory action of dicloromethane fraction (F-DCM), purified fraction (PFIII) and Cucurbitacin B extracted from crude extract of W. ebracteata in experimental models in vivo. The F-DCM (0.3 to 10 mg.kg(-1), i.p. or 3 to 30 mg.kg(-1) p.o.) produced significant but not dose-dependent inhibition of the carrageenan-induced cell influx and exsudate leakage in the pleural cavity of mice. The F-DCM 0.01 to 10 mg.kg(-1), i.p. or 0.1 to 10 mg.kg(-1) p.o.) decreased the levels of PGE2 in the exsudate leakage induced by carrageenan in the pleural cavity after 4 h with a calculated ID50 of 0.01 (0.002-0.09, i.p.) and 0.29 (0.05-1.45, p.o.) mg.kg(-1). The PFIII (3 mg.kg(-1), i.p.) inhibited 80% of cell migration (1.50 +/- 0.09 x 10(6) cells/cavity) and exsudate leakage by about 50% (3.09 +/- 0.71 microg/ml) in relation to the control group. Cucurbitacin B (0.1 mg.kg(-1), i.p.), the main compound of PFIII, reduced significantly the levels of PGE2 in the exsudate leakage by 40.7% (10.41 +/- 2.67 ng.ml(-1)). These data show that the active principle(s) present in the F-DCM of W. ebracteata elicited pronounced anti-inflammatory effects when assessed by i.p. or p.o. routes, as well as PFIII. The F-DCM was also able to prevent PGE2 formation in exsudate leakage induced by carrageenan, as well as Cucurbitacin B, its active principle. These results indicate that the anti-inflammatory activity of Wilbrandia ebracteata can be related with the inhibition of the production of PGE2.

Planta Med 1997 Dec;63(6):525-8

Anti-inflammatory and analgesic effects of cucurbitacins from Wilbrandia ebracteata.

Peters RR, Farias MR, Ribeiro-do-Valle RM.

Department of Pharmacology, Universidade Federal de Santa Catarina, Brazil.

The anti-inflammatory and antinociceptive actions of the CH2Cl2 extract and semipurified fraction (F-III) from roots of Wilbrandia ebracteata Cogn. have been investigated in rats and mice. The CH2Cl2 extract (1-10 mg/kg, i.p.; ID50 5 mg/kg) and (3-30 mg/kg, p.o.; ID50 15 mg/kg) inhibited, in a dose-related manner, carrageenan-induced paw edema in rats. The subfraction (F-III) from CH2Cl2 extract and compounds isolated as cucurbitacin B and E also inhibited carrageenan-induced edema. The CH2Cl2 extract and F-III also exhibited significant analgesic action in acetic acid-induced pain in mice. In the formalin test, the CH2Cl2 extract (0.3-10 mg/kg, i.p.) and (3-30 mg/kg, p.o.) caused inhibition of the neurogenic (first phase) and inflammatory phase (second phase) of formalin-induced pain. However, the CH2Cl2 extract was more effective in relation to the second phase than in inhibition of the formalin-induced edema. These findings suggest that CH2Cl2 extract has potent anti-inflammatory and analgesic action and that F-III and cucurbitacin B and E may account for these actions.

Biol Pharm Bull 1994 May;17(5):668-71

Inhibitory effects of cucurbitane triterpenoids on Epstein-Barr virus activation and two-stage carcinogenesis of skin tumors.

Konoshima T, Takasaki M, Tatsumoto T, Kozuka M, Kasai R, Tanaka O, Nie RL, Tokuda H, Nishino H, Iwashima A.

Kyoto Pharmaceutical University, Japan.

To search for possible anti-tumor-promoters, we carried out a primary screening of 21 cucurbitane triterpenoids using an in vitro assay system. Of these triterpenoids, scandenoside R6 (6), 23,24-dihydrocucurbitacin F (14), 25-acetyl-23,24-dihydrocucurbitacin F (15), 2-O-beta-D-glucopyranosyl-23,24-dihydrocucurbitacin F (17) and cucurbitacin F (18) exhibited significant inhibitory effects on Epstein-Barr virus (EBV) activation induced by the tumor promoter, 12-O-tetradecanoyl-phorbol-13-acetate (TPA). Further, compounds 14 and 17 exhibited remarkable anti-tumor-promotion effects on mouse skin tumor promotion in an in vivo two-stage carcinogenesis test.

Probl Endokrinol (Mosk) 1989 Mar-Apr;35(2):70-4

[Action of adaptogens: cucurbitacin R diglucoside as a stimulator of arachidonic acid metabolism in the rat adrenal gland]

Panosian AG, Dadaian MA, Gevorkian GA.

It has been demonstrated that cucurbitacin R diglucoside (CRD), an adaptogen increasing the rat working capacity and stimulating corticosteroid secretion, stimulates the release of arachidonic acid (AA) in the rat adrenal cortex in vivo (the administration of CRD during 14 days) as well as in vitro (the incubation of isolated rat adrenocortical cells with CRD in the presence of eicosatetraenoic acid, the AA metabolism inhibitor) experiments. The incubation of isolated rat adrenocortical cell with CRD in the presence of AA increases the biosynthesis of 5-HETE, the precursor of which 5-HPETE is known to be a modulator of ACTH-induced corticosteroid secretion.

Probl Endokrinol (Mosk) 1989 Jan-Feb;35(1):58-61

[Effect of stress and the adaptogen cucurbitacin R diglycoside on arachidonic acid metabolism]

Panosian AG, Dadaian MA, Gevorkian GA.

Rat leukocytic lipoxygenase activity is decreased in stress. The production of 12-hydroxy-5z, 8z, 10E-heptadecatrienic acid (12-HHT) (the product of cyclooxygenase metabolism of arachidonic acid-AA) is increased. Cucurbitacin R diglucoside (CRD), an adaptogen, raising working capacity and corticosteroid secretion, produces a similar effect on leukocytes. Preliminary injection of CRD to animals prevents changes caused by stress, which indicates a CRD adaptogenic effect on the body.

Biull Eksp Biol Med 1987 Oct;104(10):456-7

[Cucurbitacin R glycoside--a regulator of steroidogenesis and of the formation of prostaglandin E2--a specific modulator of the hypothalamus-hypophysis-adrenal cortex system]

Panosian AG, Dadaian MA, Gabrielian ES.

2 beta,25-di(0-beta-D-glucopyranosyloxy)-16 alpha,20-dihydroxycucurbit-5-en-3,11,22-trione (cucurbitacin R glucoside--CRG), isolated from Bryonia alba roots, stimulates corticosterone secretion in the adrenal cortex of rats and augments the working capacity of mice. If rats after CRG injections were exposed to immobilization stress, the level of corticosterone in the adrenal cortex and blood plasma was not increased, like in the control groups of rats not receiving CRG. The level of prostaglandin E2 in the adrenal cortex was increased during stress and after CRG administration. These findings indicate that CRG regulates steroidogenesis by influencing the activity of prostaglandin G2-prostaglandin E2 isomerase.