

PI-100-07

INKAAkech



INKA AKECH is a natural ingredient original from the Peruvian Andes, with ancient knowledge to be used as skin cleanser. It contains a series of chemical compounds that help in the improvement of oily skin.

INCI Denomination: Propanediol (and) Water (and) Schkuhria Pinnata Extract

Description of the plant:



Family: Asteraceae

Botanical name: *Schkuhria pinnata* (Lam.) Kuntze ex Thell.¹

Synonyms: *Schkuhria octoaristata*, *S. virgata*, *S. anthemoidea*²

Common name: Canchalagua

Other names: piqui-pichana, Jayaq pichana, akech, anisillo cimarrón, zureta, cachalagua, canchalagua, escoba de anisillo, kanchalawa, pinqui-pichana³

Annual herbaceous plant, erect from 10 to 50 cm tall, has numerous thin striated stems. Leaves are opposed, slender, divided in very thin segments. Inflorescences typically grouped. And it has yellow central flowers⁴.

Distribution:

The genus *Schkuhria* (Asteraceae, Heliantheae tribe) is mainly located in America and some specimens have been reported in Africa⁵. In Peru, it is located in the Andean region, in the sheltered places of valleys and slopes between 1000 and 3000 meters above sea level. It is found as wild herb at the edge of the road or as fallow^{6, 7}.

¹ ARIAS TOLEDO, B, (2009), pp. 389-401

² LEÓN A., (2009).

³ TAYLOR (2006) in Duke (2009)

⁴ VIACAVA M. et al., (2006).

⁵ ARRÁZOLA, S. et al., (2002).

⁶ BRACK EGG A., (1999).

⁷ SAGÁSTEGUI A., (1995).

Traditional uses:

The Asteraceae family plants have several uses in traditional medicine. Canchalagua is the Peruvian name given to this plant by the Ketchwa indigenous people of the Andes. The canchalagua has been used as blood purifier and for skin cleansing through the improvement of its blood circulation. The natives treat skin problems caused by toxins, such as dermatitis, eczema and acne with this herb. When combined with cancha piedra (*Phyllanthus niruri*) and llanten (*Plantago major*), it is used for facial cleansing in the treatment against acne, pimples and blackheads.

In Peruvian natural medicine it is also used as anti-inflammatory, digestive, antitussive, hair tonic, diuretic and hypoglycemic substance. When ingested, it is believed that it helps regulate the hormones and the lipid production in the skin in teenage acne. It is also used to eradicate blackheads and pimples; for wound healing, for kidney and liver problems; to cure malaria, diabetes, allergies⁸.

Phytochemicals:

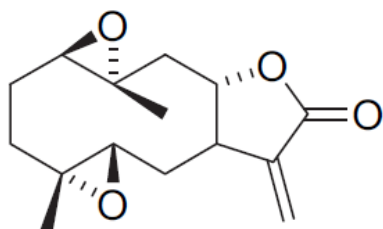


Fig 1: 11,13-dehydroeriolin

Scientific studies ensure that the sesquiterpene lactones are the biggest and most diverse group of compounds in the Asteraceae⁹. These compounds have a bitter taste. Their biological activity has been proven and they are considered powerful anti-inflammatories and potent smooth muscle relaxants. This would explain their use in traditional medicine to treat gastrointestinal disorders¹⁰.

The sesquiterpene lactone 11,13-dehydroeriolin has been identified as the major constituent of the *S. pinnata*¹¹.

Other isolated compounds of Canchalagua include several new sesquiterpene lactones (Schkuhripinnatolides)¹² germacranolides (Schkuhrin I and II) that exhibit antibacterial activity over some gram-positive organisms¹³ and present cytotoxicity (anticancer), heliangolides, flavonoids and sulfur compounds¹⁴.

⁸ DUKE J. (2009)

⁹ HEINRICH et al., (1998) in ARRÁZOLA, S. et al., 2002.

¹⁰ NAM N.H. (2006).

¹¹ ARRÁZOLA, S. et al., (2002).

¹² GANZER U. Y JAKUPOVIC J., (1989)

¹³ LUSEBA, D et al., (2007)

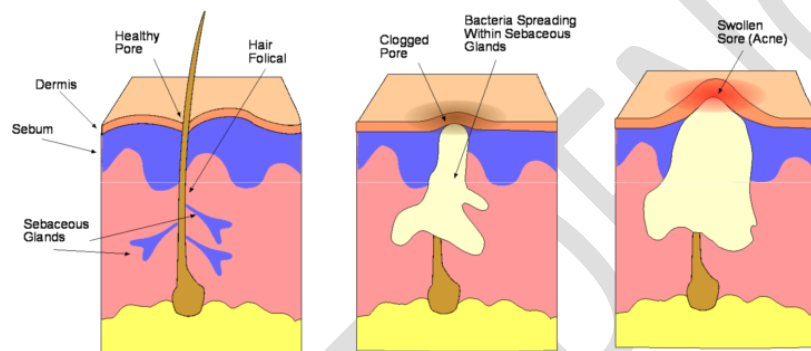
¹⁴ LIMAYLLA C, LOCK O. (1990).

Cosmetic Benefit:

TREATMENTS FOR OILY SKIN

Oils produced by the body help keep skin healthy, but there can be too much of a good thing. Excess oil can lead to blemishes and acne flare-ups.

Experts link the cause of oily skin to the increased production of hormones, especially during puberty. But fluctuations in hormone levels can change even after puberty. Menstrual cycles, stress and emotional state can influence hormonal changes that contribute to oily skin. In addition to hormones, there is a hereditary component to having oily skin. Some people simply have skin that produces more oil than others.



However, the skin's production of oil is not all bad. In fact, it's normal.

The oil produced by the sebaceous glands in the skin -- especially on the scalp, face, neck, chest and back -- is an essential component of skin's health. Oil from the scalp makes hair look

glossy and healthy. Oil on the face keeps facial skin, which is generally exposed to the elements more often than other body parts, from losing moisture and becoming dry and dull. But when the skin produces too much oil, problems can arise. Excess oil traps pore-clogging dirt and bacteria, and it causes the face to feel greasy and look shiny.

Ketchwa indigenous people of the Andes have long used this plant as an effective blood cleanser. Usually the entire plant is uprooted and chopped up and brewed into an infusion (fresh plant) or a decoction (dried plant) for this local remedy. Many types of skin problems, including eczema, dermatitis, and acne, are believed to cause by toxins and partially digested bacteria circulating in the bloodstream, and this canchalagua herbal remedy is used as a natural remedy for those types of skin conditions as well.

The bioassay for Canchalagua showed strong inhibition of *Staphylococcus aureus*. This indicates that Canchalagua have antimicrobial properties. Canchalagua may indeed be

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able to reduce the amount of *P. acnes* present in skin follicles and may help reduce the inflammatory response caused by the bacterium¹⁵.

ANTIOXIDANTS AND SKIN HEALTH

Consistent antioxidant use has long been known to strengthen body's natural resistance to sickness and infection by bolstering the immune system, but it can also play positive a role in helping to treat and prevent skin ailments, such as acne.

Antioxidants serve as the first line of defense against free radicals, molecules of oxygen that course through the body, especially within the skin, and damage healthy cells and tissue by seizing their electrons through oxidation. Though cell damage brought on by free radicals may not manifest itself immediately, such interactions touch off a long chain of microscopic events that will eventually penetrate deep enough into the cell, as to cause irreparable harm that can manifest itself in many ways.



If left to roam freely, over time these cells can cause extensive damage to cells, leading to decreased immunity, cell mutation, hearing and eyesight impairment, and, with regard to skin care, wrinkles, loose skin and acne.

The outermost layer of skin, the epidermis, contains the highest concentration of antioxidants in the body, which makes sense because exposure to the sun can affect skin cells in such a way as to create free radicals from healthy cells. This store of antioxidants, then,

stabilizes those free radicals before they can penetrate into the outer layer and wreak destruction on the cells there. Therefore, it is of considerable importance to keep the antioxidant level high at all times in order to prevent oxidation-related cell damage to the skin, which can, in turn, lead to acne and other blemishes.

EFFICACY TESTS

Hydroxyl radical scavenging activity

The hydroxyl radical plays a significant role in the damage caused by the UV radiation and is more reactive towards the damage of the cellular constituents compared to the hydrogen superoxide and peroxide radicals.

¹⁵ Rainer W. Bussmann, et al. (2008)

The antioxidant activity for the hydroxyl radical of the INKA AKECH was determined according to the method described by Apak et al¹⁶ where the Mannitol was used as compound of reference. This assay shows the abilities of the extract and standard mannitol to inhibit hydroxyl radical-mediated deoxyribose degradation. The results are shown in figure 2. The IC₅₀ values of the INKA AKECH and standard in this assay were 28.85 ± 4.78 µg/ml and 39.99 ± 1.12 µg/ml, respectively.

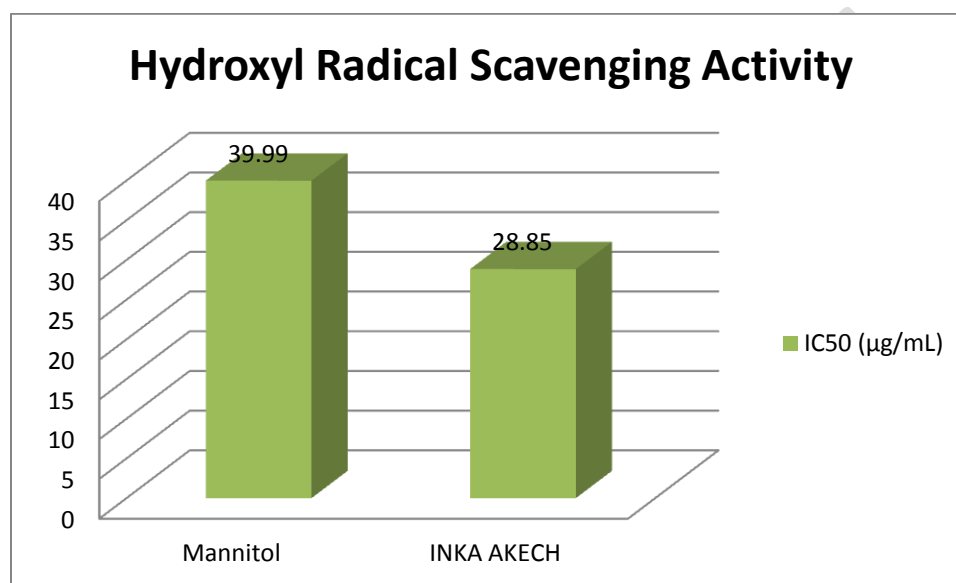


Fig 2. INKA AKECH Hydroxyl Radical scavenging activity

The IC₅₀ value indicates that INKA AKECH has an interesting activity; **27.85% higher hydroxyl radical scavenger potential than the standard Mannitol.**

Inhibition of Collagenase Activity

Collagenase from the bacteria *Clostridium histolyticum* (ChC) degrades Extracellular Matrix. This bacterial collagenase hydrolyses triple-helical collagen in both physiological conditions and *in vitro* conditions using synthetic peptides as substrates. In this study ChC was used to test INKA AKECH for anti-collagenase activity.

¹⁶ Apak R. et al., (2008)

The inhibition of the collagenase activity was carried out using the method described by Thring et al¹⁷. It used the enzyme Collagenase of *Clostridium* and the epigallocatechin gallate (EGCG) as compound of reference. See Figure 3.

Collagenase from *Clostridium histolyticum* was dissolved in buffer and the synthetic substrate *N*-[3-(2-furyl) acryloyl]-Leu-Gly-Pro-Ala (FALGPA) was dissolved in Tricine buffer to 2 mM. EGCG (epigallocatechin gallate), 250 μ M (0.114 mg/mL) was used as a positive control.

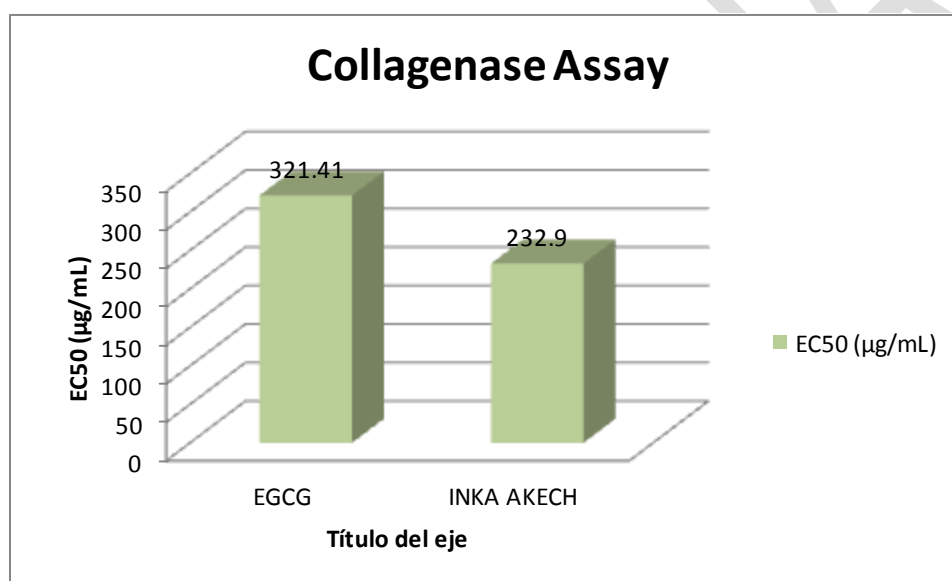


Fig 3: Inhibition of Collagenase by INKA AKECH

The results show that the INKA AKECH has an **important inhibition of the collagenase enzyme with an IC50 of 232.90** less than the one exhibited by the control EGCG; 321 ± 10.65 . As a result INKA AKECH protects collagen from degradation.

CONCLUSION

INKA AKECH is a novel innovative **Natural Ingredient with Traditional Knowledge** of use and studies that confirmed its employ over centuries. Reduced synthesis of collagen is characteristic of chronologically aged skin and INKA AKECH could be **use in cosmetic products in a new way for defense against cellular oxidation and collagen degradation, protecting oily skin from premature aging.**

¹⁷ Thring T., (2009)

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INKA AKECH is indicated for skin and hair care, especially for oily skins prone to blackheads and acne.

Dose of use – Solubility – Preparation

INKA AKECH is manufacture **without preservatives, without GMO organism** and without petroleum or animal derivatives.

DOSE OF USE: From 1 to 10%.

SOLUBILITY: Water-soluble.

PREPARATION: The 3QP INKA AKECH is a product sensitive to light, humidity and contact with iron. Preferably, it will be incorporated into the cosmetic preparations at the end of the preparation and below 35°C.

Analytical Information (preliminary)

Aspect:	homogeneous liquid
Odor:	characteristic
Color:	amber to dark amber
Solubility in water:	miscible
pH (20°C)	5.0 – 6.5
Specific gravity, 20°C:	1.030 – 1.050

PRESERVATIVES: None

MICROBIOLOGY:

Total aerobic mesophilic count:	≤ 1000 cfu/gr
Total fungi and yeast count:	≤ 100 cfu/gr
Pathogen count:	Absence

PRESERVATION: Store in airtight container, protected from light and humidity and at 15 – 25 °C.

If the original container is opened, it should be handled with special care in order to avoid a secondary microbiological contamination.

We provide our best knowledge about the subject; however, the formulator will have the responsibility to ensure the stability of the formulation by performing the necessary tests.

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