

## Inca Omega Oil® Organic oil for cosmetology

### Natural high grade Omega Oil from botanical source

Extracted entirely only using **cold pressure techniques**, in order to maintain all its natural components with no degradation, INCA OMEGA OIL® contains one of the highest amounts of polyunsaturated fatty acids (PUFA) among all oily seeds used for human consumption. It reaches an average of **48%** content of alfa-linolenic acid (**Omega 3**) and an average of **37%** content of linoleic acid (**Omega 6**). Additionally it contains approximately **8%** of oleic acid (**Omega 9**). It also very important its high concentration of **tocopherols**, with gamma and delta-tocopherol contents rarely seen at other seeds.

#### INCI name

Plukenetia Volubilis Seed Oil

#### Description



FAMILY: Euphorbiaceae

GENUS: Plukenetia

SPECIES: *Plukenetia Volubilis* Linneo sp.

SYNONYMS: Plukenetia peruviana muell. arg., Plukenetia macrostyla Ule

COMMON NAMES: Inca peanut, Sacha Inchik, Sacha Yuchi

BOTANICAL NAME:

Plukenetia volubilis, Tetracapidium conophorum

HABITAT

Highland tropical jungles. Plant native to the high altitude rain forests of the Andean region of South America

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An herbaceous vine native to the high altitude rain forests of the Andean region of South America, the Inca peanut is a legume with branched nitrogen fixing root nodules. The white flowers develop into a tetra-globular fruit containing one seed, with a nut like coat in each fruit. The pods sundry on the vine. The seeds or nuts are flattened spheres about the size of a penny. The individual seeds weigh 6.6g and the kernels make up 63% of the seed weight. The seeds contain a heat labile substance which gives them a bitter taste if not roasted. The seeds are valued for their high oil content, 35 – 60% of which 90% is unsaturated and protein (33%) content. Inca peanut seeds contain a nutritionally complete and a highly digestible water soluble (albumin) storage protein (IPA) that accounts for 31% total seed proteins. To our knowledge IPA is the first plant protein to contain all the essential amino acids required by an adult human<sup>1</sup>. The rather viscous oil is yellow to orange in color.

The harvest and collection of the seeds from were INCA OMEGA OIL® is extracted is done following strict methods to guarantee the best quality. These strict methodologies continue at the storage and **cold pressure extraction** to assure oil with the **lowest acidity**, and maintaining all its natural components.

### TRADITIONAL USES

It is known that this plant was used by the Pre Incas civilizations, because it was found in pots inside their tombs. The Inca peanut has been used traditionally by the Chancas Indians of Peru as a food.

Secoyas, Chandosas, Amueshas, Cashibos, Dapanahuas and Boras natives, eat the toasted nut in order to recover strength and as a tonic for the hard work. With the oil they rub their bodies to heal from muscle and rheumatic pain. The indigenous societies Sharanahua, Amuesha, Amahuaca, Aguaruna, Arabela, Chayahuita, Yagua, Shipibo, Huitoto, Murui, Campa, of the Gran Pajonal, Machiguenga, Asháninca, Mayoruna, Arabela, Quechua of San Martín region, Quechua of Tigre region, etc., extract, crafts manly, oil from Inca peanut to use it as food and as a fuel. They also produce flour from the cake by an empirical process.

In Peru the crop of *Plukenetia volubilis* is being promoted for edible oil extraction and the oilcake as an animal feed. Mayorunas, Chayuhuitas, Campas, Huitotas Shipibas, Yaguas and Boras women mix the oil with the flour meal and make a special cream to revitalize and give youth to the skin.

In some woodland communities the Inca peanut cake is used not only as human food, but also as animal food to replace the soy cake. It appears as an important economic alternative for the Peruvian Amazon peasants.

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### SUSTAINABLE DEVELOPMENT – SUPPORT TO LOCAL COMMUNITIES

BioTrade refers to those activities of collection, production, transformation, and commercialization of goods and services derived from native biodiversity under the criteria of environmental, social and economic sustainability.



Cobiosa Bio-Trade: **ethiplayer**

We have the commitment of giving the highest priority to indigenous, botanical ingredients for the purpose of supporting the development of local communities and the principles of fair trade.

**ethiplayer**

**ethiplayer** is a warranty that the products are cultivated not depreeding the Peruvian natural resources, and with sustainable collection, education and support of local communities:

#### **ETHICAL COSMETIC SUPPLIER**

- ✓ Ethical work with people
- ✓ Ethical work with products
- ✓ Ethical work with environment



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### Effects in Cosmetic Products

#### ROLES OF LIPIDS

Lipids in the body have three roles:

- \* Storage of energy
- \* Essential part of the structure of the cell membrane
- \* Precursors of hormones and autocoids



Some fatty acids are essential: man cannot synthesize them and deficiency brings disorders.

Lipids are important multifunctional ingredients commonly used in cosmetic and personal care products. They might function as emollients, moisturizers, emulsifiers, binders, lubricants, solubilisers, dispersing agents, penetration enhancers, carries, viscosity modifiers, spreading agents, antimicrobials as well as biologically actives ingredients in a wide range of applications including skin care, hair care, decorative cosmetics and toiletries.

Natural lipids are closely link to biochemical processes including the regulation of epidermal growth, reduction of skin irritation and provision of a skin barrier function. The barrier properties of the skin are known to be exclusively dependent on the presence of epidermal lipids

#### LIPIDS IN SKIN CARE

Natural lipids are important ingredients in all skin care categories and of special importance for dry and sensitive skin, for anti-aging, protecting and caring skin care formulation.

Dry skin have become a wide spread occurrence. Each time there is more people suffering from this problem. There is an important demand for re-lipidating and smoothing skin care products.

The skin functions as a barrier to protect the body from excessive water loss and from penetration of foreign substances. The optimal state of the skin is typified by a balanced ratio of skin lipids to skin moisture. The health of the skin depends on the moisture retention supplied by the outer layer of the epidermis.

Dry skin is characterized by a reduced content of water and a deficient lipid composition. A defect skin barrier results in increased water evaporation and an enhanced sensitivity to the environment. Thus, an ideal skin care formulation should contain ingredients that improve the barrier function and repair as well as supplement the natural epidermal lipids.

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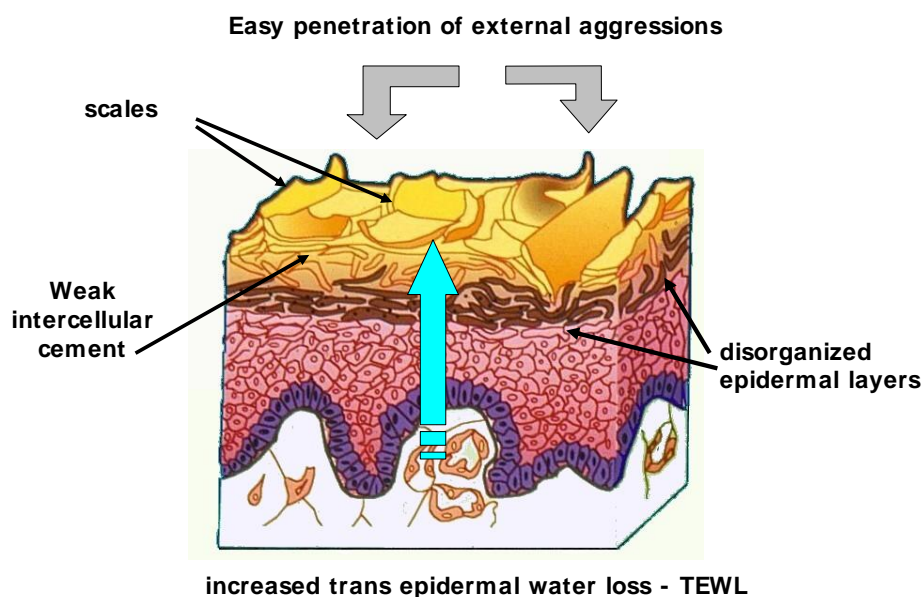
### ESSENTIAL FATTY ACIDS

The essential fatty acids are the polyunsaturated fatty acids (PUFA). They are necessary for good health, taking part at many important processes, like controlling blood pressure, reducing the cholesterol or playing a role at inflammatory processes and allergic responses. The PUFAs cannot be synthesized in the body.

The Stratum Corneum requires three main types of lipids to perform its barrier function: Ceramides, Cholesterol and Polyunsaturated Fatty Acids. If these lipids are tightly packed into the spaces between the keratinocytes, the alienate substances cannot penetrate the skin surface and enter the body. On the contrary, if there is a disruption in the number or tightness of the intercellular lipids, the skin barrier becomes permeable

Deficiency of PUFA leads to skin disorders such as:

- \* Dry skin
- \* Desquamation (scaly skin)
- \* Wounds fail to heal
- \* Loss of humidity
- \* Erratic keratinisation process (blocking of follicles)
- \* Increase of rate of mitosis (disorganized skin layers)
- \* Tendency towards eczema and itchiness



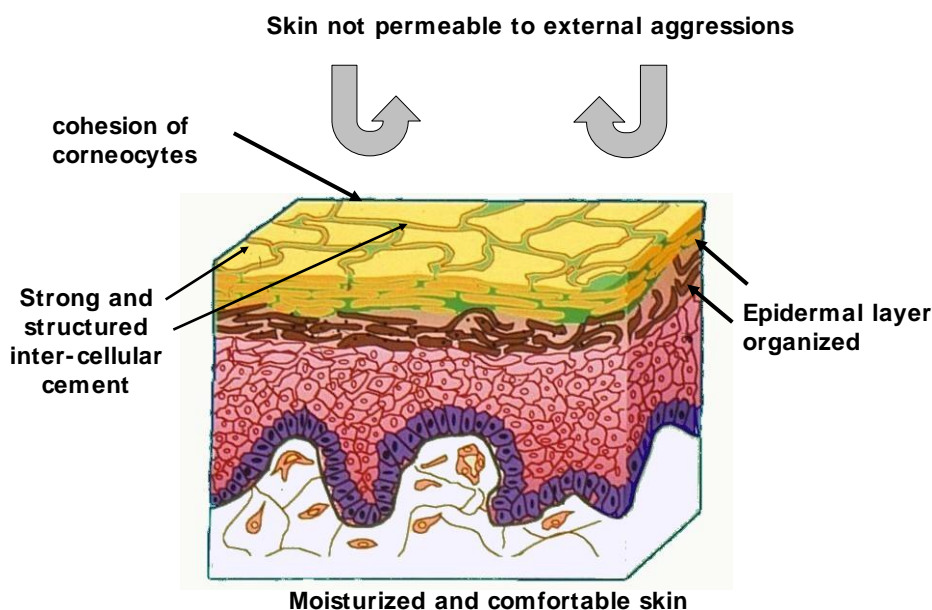
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Linoleic acid is an important precursor of ceramides and it is essential for the skin's barrier function<sup>1</sup>. Both topical application and dietary intake of essential fatty acids have been shown to restore dry skin conditions as well as therapeutic effects on skin disorders<sup>2</sup> such as atopic dermatitis, psoriasis and acne<sup>3</sup>.

Skin displays highly active metabolism of PUFAs, but is not able to perform all desaturation / elongation steps. PUFAs can be incorporated into the structure of the skin through topical application. Fatty acids can be metabolized by the skin.

Cutaneous application of PUFAs leads to:

- \* Reduction of Trans-epidermal Water Loss
- \* Improvement of "Normal" Barrier Function of the Skin
- \* Normalization of Keratinization Process



<sup>1</sup> Basnayake V, Sinclair HM. Skin permeability in deficiency of essential fatty acids. J. Physiol 1954, 126: 55-68

<sup>2</sup> Hartop PJ, Prottey C. Changes in trans-epidermal water loss and the composition of epidermal lecithin after applications of pure fatty acid triglycerides to the skin of essential fatty acid deficient rats. Br. J Dermatol 1976; 95: 255-64

<sup>3</sup> Downing DT et al Essential fatty acids and acne. J Am Acad Dermatol

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Organic oil for cosmetology

### MAJOR FATTY ACID COMPOSITION OF SOME OILS

Seeds								
	Inca Omega Oil	Sunflower	Cotton	Palm	Olive	Sweet Almond	Borage	Evening Primrose
<b>Total Oil</b>	<b>54</b>	<b>49</b>	<b>16</b>	<b>ND</b>	<b>ND</b>	<b>53</b>	<b>33</b>	<b>24.6</b>
Saturated Fatty Acids								
<b>Palmitic</b>	<b>3.85</b>	<b>7.5</b>	<b>18.4</b>	<b>45</b>	<b>13</b>	<b>7.5</b>	<b>11.1</b>	<b>6.5</b>
<b>Stearic</b>	<b>2.55</b>	<b>5.3</b>	<b>2.4</b>	<b>4</b>	<b>3</b>	<b>0.9</b>	<b>4.2</b>	<b>1.8</b>
Unsaturated Fatty Acids								
<b>Oleic Omega-9</b>	<b>8.3</b>	<b>29.3</b>	<b>18.7</b>	<b>40</b>	<b>71</b>	<b>69.6</b>	<b>17.9</b>	<b>10.2</b>
<b>Linoleic Omega-6</b>	<b>36.8</b>	<b>57.9</b>	<b>57.5</b>	<b>10</b>	<b>10</b>	<b>22.2</b>	<b>36.7</b>	<b>71.8</b>
<b>Linolenic Omega-3</b>	<b>48.6</b>	<b>0</b>	<b>0.5</b>	<b>0</b>	<b>1</b>	<b>0.05</b>	<b>0.55</b>	<b>0.1</b>
<b>Total EFA</b>	<b>93.7</b>	<b>57.9</b>	<b>58</b>	<b>10</b>	<b>11</b>	<b>22.25</b>	<b>37.25</b>	<b>71.9</b>

ND: Not Determined

EFA: Essential Fatty Acids

#### ANTI-FREE-RADICAL ACTIVITY

Free-Radicals are chemical elements with a high oxidant capacity. It can have exogenous origin (contamination, cigarettes ...) but also endogenous (stress, tiredness...)

At normal conditions, a healthy skin can keep a balance between free-radicals and systems to neutralize their actions. If this balance is not maintained, the oxidative stress is produced attacking the skin's tissues and cells, causing premature skin aging.

Free-Radicals will specially harm the cell membranes, destroying them. These membranes are the delicate support of the genetic map of our cells, which nucleus contains the DNA. The integrity of the cell's membrane protects the DNA and the existence of the cells.

INCA OMEGA OIL® will help the prevention the DNA destruction with two actions: First its PUFA will reinforce the lipids of the cell's membranes. Secondly, its rich composition in tocopherols, natural anti-oxidants, will help to reduce the mechanisms of formation of free-radicals.

Tocopherols are the main substances with anti-oxidant activity found naturally at seed oils. There are four chemical forms called alpha, beta, gamma, and delta tocopherol.

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The action of the tocopherol consists in the stabilization of the biological membranes, particularly those rich in PUFA content. Oxidation of the unsaturated lipids produces lipidic peroxides which interfere with the structure and functions of the biological membranes. Tocopherol operates as anti-oxidant, and can inhibit the formation of free radicals. A deficiency in tocopherols, on the contrary, will accelerate this process, causing chain reactions of free-radicals at the membrane lipids.

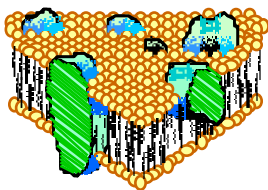
It is quite significant the high concentrations of delta and gamma-tocopherol found at INCA OMEGA OIL®. Many laboratory tests show that these two forms of tocopherol have both a high anti-oxidant capacity followed, at long distance, by alpha-tocopherol.

Non delta and gamma-tocopherol can be chemically synthesised while alpha-tocopherol can be produced industrially. The first two tocopherols must be extracted from natural products. It is thus, quite interesting the high concentrations that can be found at INCA OMEGA OIL®

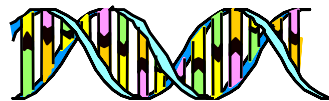
### Free Radicals :

#### Damage at:

Cell membranes



DNA chains



Protein degradation





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### TOCOPHEROLS OF PLUKENETIA VOLUBILIS\*

Tocopherole	[mg/100 g]
α-Tocopherol	0,54
γ-Tocopherol	112,2
Plastochromanol-8	0,55
γ-Tocotrienol	0,48
δ-Tocopherol	62,17
<b>Total</b>	<b>175,94</b>

\* Bibliographical information

### TOCOPHEROL COMPOSITION OF DIFERENT OILS (mg/Kg)

OIL	ALFA	BETA	GAMMA	DELTA	TOTAL
Hazelnut	354	-	32	4	390
Almond	392	-	6	-	398
Soy	84	24	545	367	1020
Sunflower	694	26	-	-	720
Apricot	28	24	750	-	802
Peanut	229	17	198	17	461
Colza	377	9	506	28	920
Cotton	398	-	352	-	750
Corn germ	196	7	1202	38	1443
Walnut	56	5	500	5	566
Olive	115	-	4	-	119
Grape seed	133	21	817	4	975
Sesame	12	6	244	32	294
<b>INCA OMEGA</b>	<b>32,3</b>	<b>-</b>	<b>1329</b>	<b>732</b>	<b>2093</b>

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### **Dosage – Solubility – Processing**

A- DOSAGE:

From 2 to 5%.

B- SOLUBILITY:

Lipo-soluble.

C- PROCESSING:

INCA OMEGA OIL<sup>®</sup> is compatible with most of the raw materials normally used in cosmetics, nevertheless, it is the duty of the formulator to make sure of the stability of the formulae with the necessary tests.

It would be preferably incorporated into cosmetic preparations during the oil phase preparation.

### **Analytical Data**

- APPEARANCE: Liquid, yellow colored.
- Relative Density (at 20 °C): 0,90 – 0,93
- Refractive index (at 20 °C): 1,475 – 1,485
- Acidity index: ≤2 mg KOH/g
  
- PRESERVATIVES: None
  
- MICROBIOLOGY: Total germs: ≤ 1.000 cfu/gr  
Yeasts and molds: ≤1.000 cfu/gr  
Pathogen: Absence
  
- TOLERANCE: Excellent. Tested under dermatologist control
  
- STORAGE: Store refrigerated (4 to 8 °C), dry and **away from light**.

If original container is opened, to avoid secondary microbiological contamination handle with special care and keep refrigerated.