Pearlessence
INTRODUCTION

Pearls are one of the great secrets hidden under the deep waters. They are created by certain mollusks, animals that have a soft body covered by a shell, which live in marine waters, lakes or rivers.

When a foreign particle enters the mollusk's soft body, an encystment reaction is originated, covering the object with layers of aragonite (calcium carbonate crystals); between its layers, it secretes a protein called conchiolin. These two materials are the substances that form the pearl.

The combination of layers forms a substance known as nacre, which is the element that lines the mantle cavity of the animal and reflects the light providing unique beauty. It acts as a small set of prisms that form the rainbow.

The size and shape of the pearl depend on the species of mollusk, the time, the type of foreign particle and where the pearl is formed inside the body. Many years under perfect conditions are necessary to achieve a perfect pearl. Therefore, irregular pearls are more common, although they all have a gritty feel that differentiates them from artificial pearls.

Pearls can be found in different colors, usually ranging from white to golden, but black, lilac or pink pearls can also be found, depending on the organic pigment contained by conchiolin, the mollusk's environment and the mollusk that produces it.

CHEMISTRY

Pearls are formed by 10% protein, various nutritional active ingredients such as 17 types of amino acids, approximately 86% calcium carbonate and oligoelements such as Magnesium, Zinc, Manganese, Iron, Selenium, Strontium and Titanium.
Essential minerals and traces

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>49%</td>
</tr>
<tr>
<td>Magnesium</td>
<td>79 ppm</td>
</tr>
<tr>
<td>Copper</td>
<td>5 ppm</td>
</tr>
<tr>
<td>Iron</td>
<td>41 ppm</td>
</tr>
<tr>
<td>Zinc</td>
<td>13 ppm</td>
</tr>
<tr>
<td>Aluminum</td>
<td>&lt;1 ppm</td>
</tr>
<tr>
<td>Selenium</td>
<td>0.6 ppm</td>
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</tbody>
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Aragonite is one of the isomorphic crystalline forms of calcium carbonate (CaCO3). It can be found in the shell of virtually all mollusks and in coral skeletons. The ions required to form calcium carbonate are secreted by the mollusk mantle, producing aragonite.

Nacre is composed of hexagonal platelets of aragonite, crystallized calcium carbonate, structured in continuous parallel layers. These stratifications of nacre are separated and compacted by sections of an organic matrix composed of conchiolin elastic biopolymers.

Conchiolin is a scleroprotein secreted by the epithelium of mollusks, such as oysters. They are part of an organic macromolecule matrix mainly formed by proteins and polysaccharides, which generates the nacre together with calcium carbonate, providing brightness and smoothness to the shells.
TRADITIONAL USES

It is not known who the first person was to extract the pearls from the mollusks to use them as decoration or medicine, although it is highly likely that they have been used since prehistoric times due to their obvious beauty.

Nowadays, pearls are used in jewelry, but their oldest use was in medicine. From India to China, they have been used as remedies for dementia, aphrodisiacs, ingredients in potions, balms to cure different diseases and to heal wounds due to their antiseptic properties.

Their first use is found in China, 3000 years ago, where they were already used in jewelry, but mainly as a medicine or in cosmetics. They are registered as a medicine in the Pharmacopoeia of the Republic of China. Asian women used powdered pearls to keep a youthful appearance, but they also discovered their healing, skin enlightening, wrinkle prevention and sun protection properties.

The last empress of China during the Qing dynasty not only applied them on her skin, but she also ingested them every day. She was famous for her beauty and youthful appearance until the age of 74.

Like other gemstones, pearls have been offered to gods, especially the sea gods, and they have an important presence in Asian mythology. In this mythology, dragons appear playing with a pearl. They are linked to wealth, happiness and prosperity.

COSMETIC PROPERTIES

A study conducted in China showed that marine pearl powder, from *Pteria martensii*, has anti-aging and toning properties. More than 140 volunteers, with an average age of 57, were divided into three groups and took 3 or 1.5 g of pearl or placebo daily for 2 months. After the treatment, patients with daily doses of pearl reported an improvement in the symptoms of aging, such as memory loss, insomnia and fatigue. In addition, researchers concluded that pearls accelerate the functions of the autonomic nervous system and reduce age processes (Tong, Z.H. et al, 1988).

In another study (Shao, D.Z. et al, 2010), the effectiveness of pearl powder was tested and it was seen that it has a significant moisturization effect. Moreover, it reduces the activation of tyrosinase.
and free radicals, retains water in the epidermis, stimulates collagen production and intercellular lipid production, and prevents the formation of the enzymes responsible for the degradation of elastic fibers.

By participating in the metabolism it improves skin immunity, accelerates the growth of new cells that increase skin smoothness and elasticity, and promotes the elimination of rough patches, skin toxins and blemishes. At the same time, with the help of the other active principles, the skin of the face and neck recovers its full radiance and young appearance, in a natural and non-aggressive way.

Conchiolin is a pearl protein that acts like keratin, one of the fibrous proteins found in the skin and hair. This protein has the ability to hydrate skin cells, accelerate cell metabolism, facilitate the repair of damaged cells, and increase peripheral circulation.

Researchers that apply traditional Chinese medicine believe that the minerals and amino acids of the pearls can be absorbed through the skin. They play an important role in cellular activities, maintaining physiological balance and repairing cells and tissues. They increase moisturization and elasticity, and they also activate cell metabolism, protecting skin against external aggressions.

Pearls cause a gentle exfoliation that regenerates skin, leaving it smooth and radiant. When they are applied externally, it has been discovered that they accelerate skin metabolism to tone and rejuvenate skin, fade blemishes, reduce pores and decrease redness. These activities can help achieve a brighter and healthier appearance.

For these reasons, pearls are highly recommended to formulate cosmetic products with moisturizing and emollient activity, improve skin appearance and protect the hair against external aggressions.
COSMETIC APPLICATIONS

<table>
<thead>
<tr>
<th>Action</th>
<th>Active ingredient</th>
<th>Cosmetic application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-aging</td>
<td>Conchiolin</td>
<td>Anti-wrinkles</td>
</tr>
<tr>
<td>Lightening</td>
<td>Calcium</td>
<td>Toothpastes</td>
</tr>
<tr>
<td>Exfoliating</td>
<td>Conchiolin</td>
<td>Exfoliating creams and gels</td>
</tr>
<tr>
<td>Moisturizing</td>
<td>Conchiolin, Minerals, Amino acids</td>
<td>Emollients and conditioners Anti-aging Hair care Hair coloration protection Hair repairer</td>
</tr>
</tbody>
</table>

RECOMMENDED DOSAGE

The recommended dose is between 0.5% and 5%.

BIBLIOGRAPHY


Websites:

http://www.allaboutgemstones.com/pearl_composition.html
http://www.newhope.com/nutritionsciencenews/bsn_backs/Jul_00/pearls.cfm
http://chinesepearlpowder.com/default.aspx
http://www.amnh.org/exhibitions/pearls/
http://nature.berkeley.edu/classes/eps2//wisc/Lect17.html
http://www.dfarmacia.com/farma/ctl servlet? f=37&i=13069607