

Total Generation Curry plant

The global skin regeneration

A STORY

The Curry plant | *Helichrysum italicum*, Asteraceae
A rare flower in Mediterranean sunshine

An endemic and hardy shrub from the Mediterranean area that lives on chalky soils. It is known for its strong fragrance similar to curry and used for its healing properties discovered many centuries ago in the South of France, for instance, its essential oil is used for anti-inflammatory effects. It is a quite rare species, although it is now cultivated and grows a lot in some places. Its French name that means «everlasting» comes from the exceptional long lasting bunches of the dried flowers, that Roman used in their funeral wreaths in Antiquity.

Key points

An active plant cell

Developed to deliver the highest amount of original active molecules.

A high tech natural ingredient

Created to preserve and improve the identity and the benefits of a natural product.

A global anti-ageing action

Reinforces cell activities at the dermo-epidermis level to limit ageing signs.

Because skin limits its renewal process when ageing, it is necessary to maintain it in order that it keeps its supporting functions at their original level. To get a skin looking younger, firmer and soother.



PRODUCT BENEFITS

Anti-ageing

Firming

Contributes to densify the dermis. Helps to improve or restore the dermis functions, skin resistance.

Regenerating

Increases epidermis cell regeneration and reinforces the protective skin barrier.

Restructuring

Restores higher levels of the synthesis of fiber and glycoproteins in the extra cellular matrix.

Anti oxidant

Slows down general cell oxidation, reduces excessive production of free radicals.

To be used in skincare or make-up products such as cream, fluid, serum, balm, lotion, milk, foundation, concealer, etc. In any cosmetic or skincare product dedicated to fighting and preventing skin ageing.

NÆOLYS

Related products | FIBER BOOSTER PLUS SAFFRON | ALL EVEN SWEET IRIS | TOTAL GENERATION CENTELLA ASIATICA

HOW IT WORKS

Total Generation Curry plant: reinforcing densities and dermo-epidermic anchorings

Total Generation Curry plant helps to get back a natural densification thanks to a better cohesion between the two skin layers, dermis and epidermis. It boosts and changes the initial cell and fiber synthesis, the one of keratinocytes and of collagens - the two elements that allow skin to stay young and thick. Therefore it can help that synthesis to recover its initial function: creating skin supporting fibers. But also in order that the contact zone between the two skin layers keeps its anchorage points. In the same time, it limits the creation of free radicals, the 3rd essential factor of skin ageing.

Thanks to those actions, the different layers keep on being linked to each other with cells always operating.

in vitro testing results

Study of the extra-cellular matrix - dermis level

The first chronological ageing expresses basically at the level of dermis through a functional ravage of fibroblastes and the dermo-epidermis junction. The collagen synthesis decreases, especially collagen 3 (called a « young » or « immature» collagen) leading to an increase of the relation between collagen type I and type III. At the level of the dermo-epidermis junction, its lowering leads to a decrease of cohesion between dermis an epidermis inducing a decrease in their exchanges. The visible signs of that ageing are expression wrinkles. Therefore Naolys decided to study many types of collagens involved in chronological ageing.

The extra-cellular matrix (ECM) contains polysaccharides (proteoglycans and GAG) but also structuring fibrous proteins (collagens and elastin) and adhesion proteins (fibronectine and laminine). Collagens bring resitance to stretching, regulates cell adhesion (the adhesion phenomenae of cellsto ECM), sustain cell chemotaxis and migration and also guide tissue development. Collagens are the most abundant fibrous proteins in the interstitial ECM and are the essential structural component in the ECM, especially fibrillar collagens: collagen type I represents 60% to 80% of collagens in dermis, collagen type III represent 15% to 25%. Fibrillar collagens type I, III and V gather in thicker fibres which form a tridimensional network in the whole dermis size. They give to skin its resilience strenght and are essential to its tissue integrity.

At the level of the dermo-epidermis junction, there are collagens type III, reticular fibres, but also collagens type IV (the majority at the level of the *lamina densa*, the intermediate anchorage zone for anchorage filaments coming from epidermis and anchorage fibres coming from the fibrillar zone in the papillar dermis) and collagens type VII (at the level of the fibrillar zone, the closest zone to dermis) that make the connection with anchorage patches in papillar dermis or form tangled loops linking two parts of *lamina densa*.

Studies about 2 components of ECM: total collagens, collagens IV and VII, relation between collagens I and III, and MMP3

The different studies on the components of the ECM and MMP3 run by Naolys have been carried out on culture of fibroblasts. Collagen is the most abundant fibrous protein within the interstitial ECM and constitutes the main structural element of the ECM; collagens provide tensile strength, regulate cell adhesion, support chemotaxis and migration, and direct tissue development. MMP3 (or Stromelysin-1) is an enzyme of the ECM that is involved in the breakdown of the ECM and tissue remodeling. It degrades collagen types II, III, IV, IX and X, proteoglycans and other fibrous proteins.

Technical information Formulating Total Generation Curry plant

INCI name of cells

helichrysum italicum leaf cell extract

form

cells (20%) in glycerin or sunflower oil (80%)

aspect

liquid

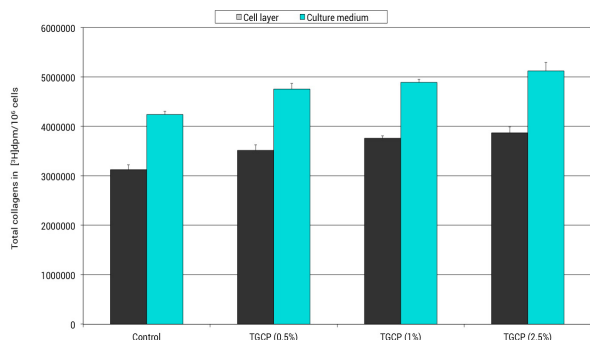
concentration

starting at 0.5%

dispersible

in any formulation

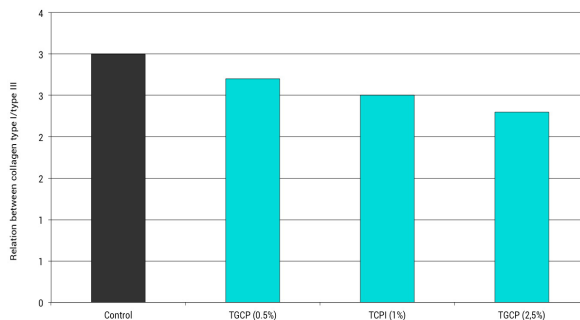
Study of the neosynthesis of total collagens



Increase of the neosynthesis of total collagen

→ At concentrations of 0.5%, 1% and 2.5%, induction of the collagens synthesis respectively by 13%, 20% and 24% translated by a release of collagens in culture medium by 12%, 15%, 21%

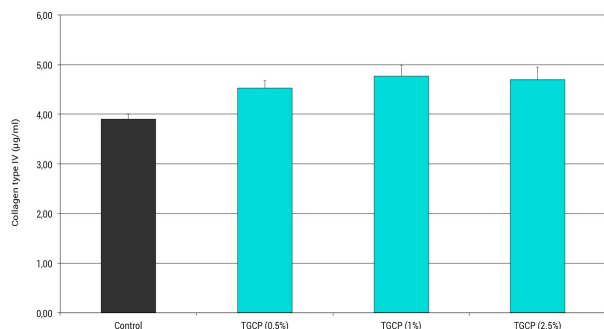
Study of synthesis of collagen type 1 and 3



Decrease of the relation between collagen type 1 and collagen type 3

→ At concentrations of 0.5%, 1% and 2.5%, increase of collagen rates type 1 and 3 with a decrease of the relation between collagen 1 and 3

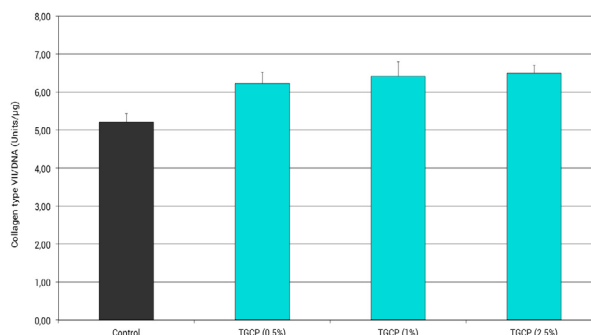
Study of the synthesis of collagen type 4



Increase of the synthesis of collagen rate type 4

→ At concentrations of 0.5%, 1% and 2.5%, increase of the collagen rate type 4 respectively by 16%, 22% and 20%

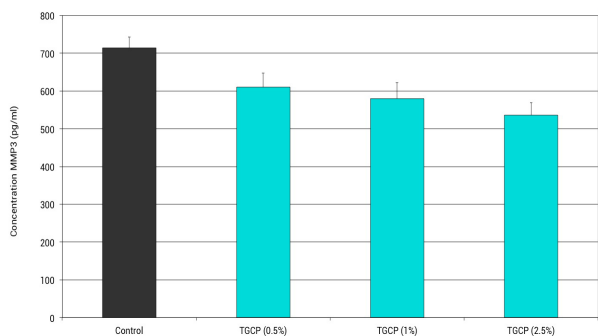
Study of the synthesis of collagen type 7



Increase of the synthesis of collagen rate type 7

→ At concentrations of 0.5%, 1% and 2.5%, increase of collagen rate type 7 respectively by 19%, 23% and 25%

Study of MMP3



Decrease of MMP3

→ At concentrations of 0.5%, 1% and 2.5%, decrease of MMP3 respectively by 15%, 19% and 25%

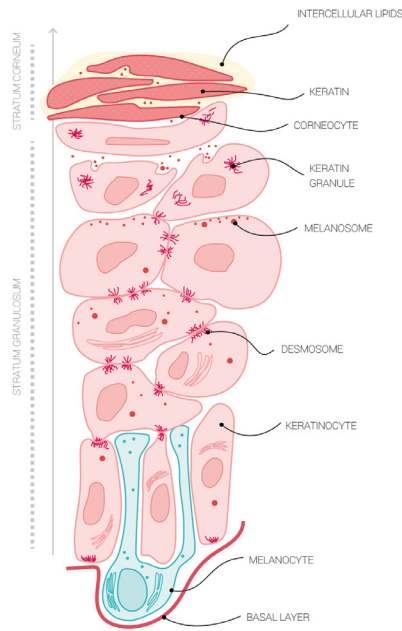
Study of cell renewal - epidermis level

The epidermis, the superficial layer of skin is first made of cells called keratinocytes which renew non stop according to a 21 days cycle. That renewal of the epidermis is made thanks to the cell proliferation and the differentiation that keep the balance of adult tissues, therefore keratinocytes, divide at the level of the basal layer of the epidermis, which is mainly made of non differentiated cells and migrate to the surface changing their form: they lose their nuclei and load hard filaments of keratine. When they reach the cornified layer, they become corneocytes, dead cells that create a solid membran (thanks to keratine) impermeable and protective: the protective natural barrier of the epidermis. Those built up corneocytes will naturally break away and be shed. The alteration of that balance, essential to the good of tissues called homeostasis is responsible for physical changings linked to ageing: skin wilting because of the decrease of cell proliferation, lack of healing in case of wounds, loss of hair...

Study of the proliferation of epidermis cells

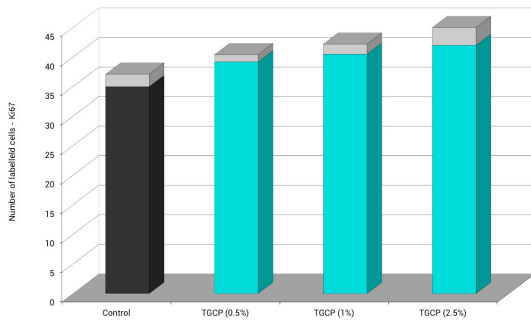
KI67 is a anti-gene to mark cell proliferation.

Studies have been carried out on reconstructed epidermis.



THE EPIDERMIS AND KERATINISATION PROCESS

Study of epidermis cell proliferation



Increase of KI 67

→ At concentrations of 0.5%, 1% and 2.5%, stimulation of the proliferation of keratinocytes in the basal layer for treated epidermis respectively by 12%, 16% and 20%

Study of the lipid peroxidation

Because it is a reaction indicating oxidative stress, Naolys chose to study the release of MDA during physiological lipid peroxidation and lipid peroxidation induced by UVB.

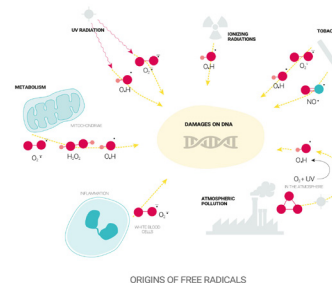
When we measure the MDA (malondialdehyde), one of the chemical products created by the chemical chain reaction induced by the free radicals, indicating of cytotoxicity by oxidative processes, then we have a good information about the anti-oxidant activity of a substance.

Normally, the endogenous production of free radicals (physiological lipid peroxydation) is counterbalanced by various defense mechanisms.

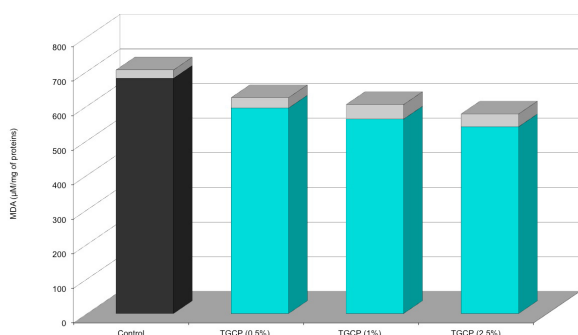
However, many situations can induce the appearance of an excess of free radicals (induced lipid peroxidation) such as intense exposition to sun, intoxication by certain chemical products, contamination by toxins, intense inflammatory reactions, etc.

These oxygenated free radicals attack phospholipid membranes, thereby altering the properties of the cell membrane.

They also induce the formation of lipid derived cytotoxic mediators which react with proteins. The consequences are numerous and can lead to several pathologies (inflammation, arteriosclerosis, etc.)



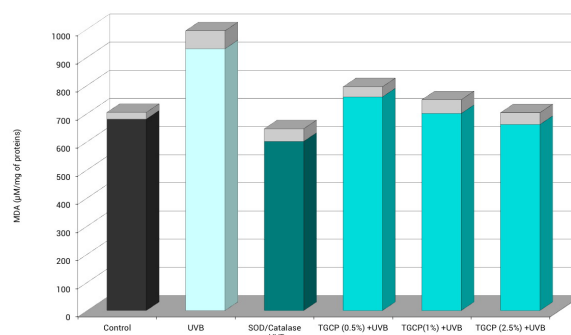
Lipid peroxidation in the physiological conditions



Decrease of MDA (Malondialdehyde) rate

→ At concentrations of 0.5%, 1% and 2.5%, decrease of the physiological lipid peroxidation, which was translated by a decrease of the MDA rate respectively by 13%, 17% and 21%

Lipid peroxidation induced by UVB



Decrease of MDA (Malondialdehyde) rate

→ At concentrations of 0.5%, 1% and 2.5%, decrease of the lipid peroxidation induced by UVB (150mJ/cm²) which was translated by a decrease of the MDA rate respectively by 18%, 25% and 29% compared to SOD/catalase (-35%)