SYNERGIE SKIN
CLEAN SCIENCE

CLINICAL DATA – HYDROLYSED TOMATO SKIN (LYCOPENE)

Hydrolysed tomato skin is the first Lycopene containing product specifically created for the cosmetic sector.
Bioliquefying tomato skins completely in water phase without any use of toxic/harmful solvents, just relying on biotechnological tools to perform "molecular cuts" that release simple sugars, polysaccharides, the phenolic fraction and the lycopene trapped in the vegetal tissues in a bio- available form;

Microdispersing the free licopene obtained in the same water phase.

Hydrolysed tomato skin is the first aqueous product containing lycopene specifically developed for the cosmetic sector. Very easy to use:

- Completely water soluble
- Completely solvent free
- No need of solvents or dispersive agent
- No unpleasant smells
- No unwanted coloration
- Stable in emulsion

Beneficial effects of lycopene on skin
Recent studies showed that lycopene, particularly in cooperation with other natural antioxidants, has protective effects on fibroblasts cell lines exposed to UVA radiations.

Other trials showed the marked protective effect of topically applied lycopene containing cream on UVB exposed skin. This effect is dose dependent.

Tests on healthy volunteers proved that a 10 weeks lycopene rich diet (ca.30 mmol/day) caused a 40 % reduction of the minimal erythemal dose compared with the control group.

The antioxidant activity of lycopene is mainly expressed with the inactivation of singlet oxygen ($^1O_2$) and peroxides radicals (ROO•). The inactivation is mainly due to the donation of an electron to these reactive species.

Considering the singlet oxygen quenching, lycopene is the more effective carotenoid. Its effectiveness is more than twice those of beta-carotene and ten-folds higher than those of alpha-tocopherol. This is due to the high capability to donate an electron because of the high number of conjugated double bounds (Figure 2).

The Lycopene
Lycopene is a relatively new product from a commercial point of view, but its market is fast growing worldwide. Recently it is possible to find new lycopene containing fortified foods, such as yogurt, drinks and integrators, on the mass market. In the cosmetic sector the use of lycopene as an active ingredient is not widespread yet.

Lycopene is a molecule of the carotenoids family, natural pigments produced by plants and some microorganisms that generally support the photosynthesis and protect from the hazardous effect of sun exposure. In tomatoes, lycopene is the most abundant carotenoid accounting for more than 90% of total content. From a structural point of view lycopene is a carotenoid containing 40 carbon atoms ($C_{40}H_{56}$) with 13 carbon-carbon double bond, 11 of these conjugated (Figure 1). Lycopene is an isoprenoid; sequential biotransformations of this molecule lead to carotenes and xantophills. In plants these molecules are generally accumulated in chloroplasts having two main functions:

- Increasing the efficiency of light harvesting of chlorophyll antenna;
- Protect the photosynthetic apparatus from the Reactive Oxygen Species produced by a sun over-exposion.

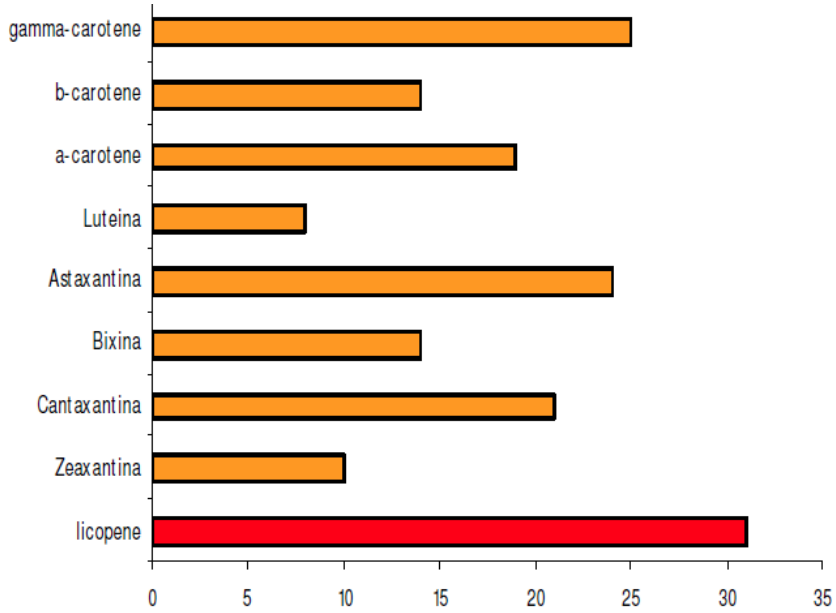

Figure 2: Quenching constant values against singlet oxygen of some carotenoids.

Several authors studied the interaction between carotenoids, such as lycopene, and the natural defenses of our organism to counteract the oxidative stress. There is an integrated mechanism with vitamin E, lycopene and vitamin C. The vitamin E is the first line of defense of our organism against free radicals, when this vitamin is oxidized by a radical the lycopene intervenes repristinating the vitamin. The oxidized lycopene is than repristinated by vitamin C. This mechanism elongates the electronic cascade making the free radical inactivation more effective.

Getting Lycopene by a specific diet.

Although the absorption via diet is still under exploration, there is evidence that the lycopene is absorbed in the intestine and it distributes in different organs such as liver and kidney. In skin, lycopene accumulates preferentially on the stratum spinosum of epidermis. The way lycopene is vehiculated on skin appears to be via sebaceous secretion. Therefore, the lycopene assumed with the diet tend to accumulate on specific regions, rich of sweat glands, such as forehead, nose, chin, hand palms, etc (Figure 5). During a scientific trial, it was shown that the increase of lycopene concentration on

skin of 0.11 µmol/Kg of skin lead to a decrease of the UV induced minimal erythemal dose of 40 % (Figure 3).

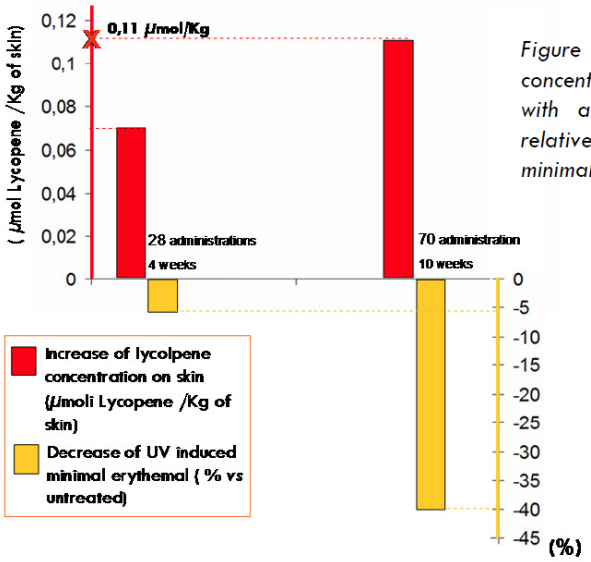

Figure 3: Increase of lycopene concentration on skin obtained with a specific diet with the relative decrease of UV induced minimal erythemal dose.

The L.A.M of Lycopene of Hydrolysed tomato skin

Hydrolysed tomato skin is the first product allowing easy use of lycopene in cosmetic formulations.

With Hydrolysed tomato skin the cosmetic product become the shuttle that vehiculate the L.A.M. Lycopene.

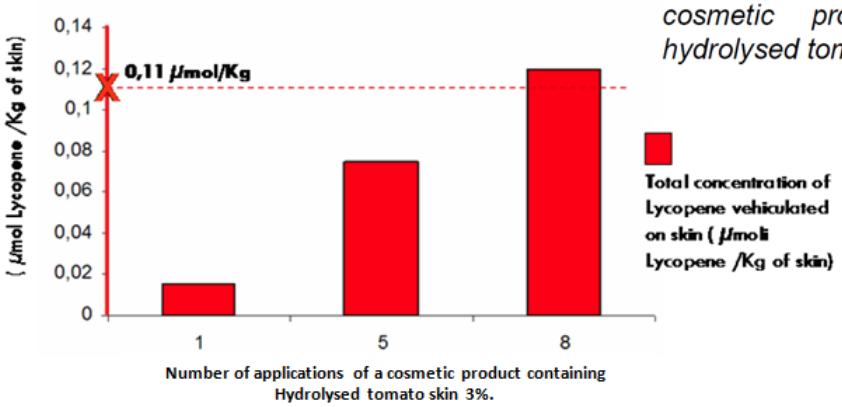

Figure 4: amount of Lycopene vehiculated on skin with a cosmetic product containing hydrolysed tomato skin 3%.

The L.A.M. Lycopene reach easily and quickly, the concentration needed in order to maximize the protective effects. In just 8 applications of a cosmetic product containing Hydrolysed tomato skin 3% is possible to have a concentration of lycopene on skin of 0.11 µmol/Kg of skin (Figure 4).

Moreover, the lycopene can be distributed homogeneously all over the body or on targeted areas (Figure 5).

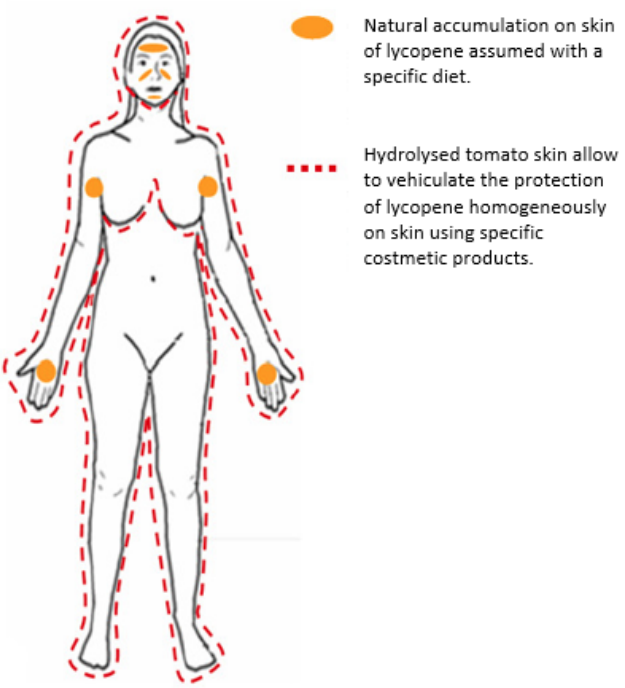

Figure 5: Distribution of Lycopene on skin via oral administration or topically applied

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