



# Whole Protection Red-flowered silk cotton tree

*A global protection for skin*

## A STORY

The Red flowered silk cotton tree | *Bombax costatum*, *Bombacaceae*  
**A key tree in Africa**

*Big tree from the Western and centre of Africa, it can be 25 metres high, its fruit gives kapok, a white vegetal fibre, which looks like cotton. It can well resist dryness and fires in savannah, but it suffers now from late regeneration in particular zones (Burkina Faso) because of the aridity of soil and of the anthropic pression. Recognized as essential to men and animals, many parts of this tree are used in food and medicinal purposes; it is also used as fodder for cattle.*

## 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 protective action

Provides a biological protection to epidermis cells

Because skin is continually aggressed by sun rays, it is necessary to protect it in a global way. To get a skin with a better resistance to fight external aggressions.



## PRODUCT BENEFITS

### Protection

#### Protective

Decreases damages made on skin cell DNA. Protects from environmental aggressions.

#### Soothing

Calming, decreases irritations by increasing the level of skin tolerance.

#### Anti-ageing

By protecting skin cells, helps to limit photo ageing.

#### Repairing

Helps to repair damages caused by 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 protecting skin.*

**HOW IT WORKS**

# Whole Protection Red flowered silk cotton tree: supporting self defense mechanisms of epidermis cells

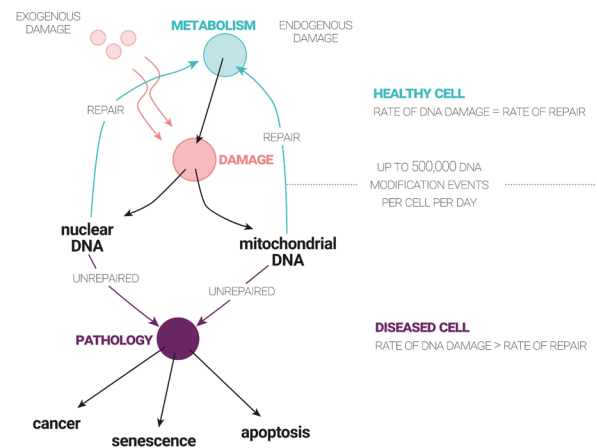
Whole Protection Red flowered silk cotton tree is dedicated to give skin means to protect itself by supplying a biological protection efficient up to the heart of skin cells, against two natural sources of aggressions, UVA and UVB. First with an action of protection at two levels, at a global level by contributing to release defense proteins and, at a deeper level, by protecting the DNA of epidermis cells. Then, it is efficient on irritation phenomena by limiting the release of inflammation mediators - they accentuate the sensation of irritation. Thanks to those combined actions, skin is protected longer and keeps its supply of defenses.

## *in vitro* testing results

### Skin, UV and DNA

The exposition of skin to solar rays, UVA and UVB, stimulates skin ageing through the combination of several modifications at the level of epidermis and the dermis. Because UV rays constitute the most active part of the solar radiation that affect living organisms. UVB are absorbed essentially at the level of the epidermis and superficial dermis. When they have become damaged, cells become fragile and don't work properly. UV induce genetical mutations in cell DNA, especially UVB. According to new studies (2006), in skin, the global rate of de lesions made in DNA following a UVB irradiation is about 156 lesions/cell/J.m<sup>-2</sup> when it is only about 0,024 lesion/cell/J.m<sup>-2</sup> after a UVA irradiation.

If UVA modify only indirectly cell DNA, they damage extra-cellular matrix and break fibres: skin loses firmness and elasticity. Therefore a high exposition to UVA causes a premature ageing of skin and increases wrinkle formation.



DAMAGES ON SKIN CELLS DNA BY UV AND OTHER SOURCES

### Technical information on the formulation of Whole Protection Red flowered silk cotton tree

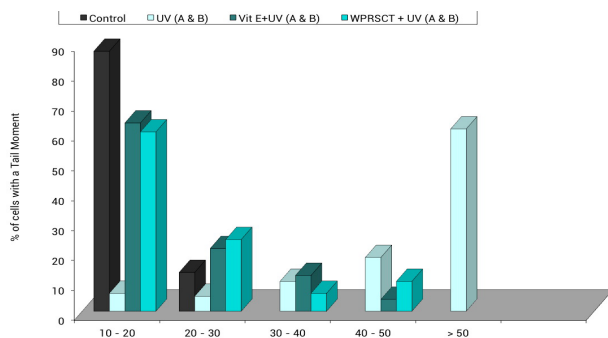
<b>INCI name of cells</b> bombax costatum leaf cell extract	<b>form</b> cells (20%) in glycerin or sunflower oil (80%)	<b>aspect</b> liquid	<b>concentration</b> starting at 0.5%	<b>dispersible</b> in any type of formulation
--	---	-------------------------	--	--

## Study of the cell DNA

To evaluate the effect of Whole Protection Red flowered silk cotton tree on damages made by UV on DNA of epidermis cells, Naolys used the Comets test, also called «Single Cell Gel Electrophoresis» (SCGE). It is an electrophoresis technique on agarose microgel created at the end of seventies. It allows to detect and measure the deterioration of DNA induced by specific agents individualized cells. It is also used to evaluate DNA repairs after a chemical exposition or an irradiation.

Naolys used this test to measure damages caused on DNA of keratinocytes, by estimating the size of DNA in the tail of the comets after an irradiation of UVB and UVA rays. That size of DNA changed according to the irradiation dose.

## Study of DNA fragmentation



### Decrease of the DNA fragmentation

→ At concentrations of 0.5%, the majority of irradiated cells (90%) have a «tail moment» higher than 30, and 61% of cells have a «tail moment» higher than 50. That result means that DNA of cells was very fragmented by UVA and UVB rays. Only 10% of cells present a «tail moment» lower than 30. In the conditions of irradiation, the product Whole Protection Red flowered silk cotton tree (WPRSCT) induces a significant decreasing of the DNA fragmentation due to UVB and UVA rays, after 24 hours of treatment.

## Study of the natural protection, HSP 70 - Heat Shock Proteins 70

To counterfight the stress coming from different origins (chemical or mechanical, either environmental, physiological or pathological), human cells produce specific defense proteins, especially stress proteins or heat shock proteins, that appear when the body experiences heat shocks. Because any temperature increase in our body, then in our skin, induces a protein modification, then damages their function.

Heat shock proteins are bioprotectors that preserve cells and their walls, by repairing special proteins, destroying too damaged proteins, and transporting proteins. The HSP 70 (70 Kdaltons is their molecular weight) regulate especially the stress coming from chemical aggressions (like heavy metals) and heat.

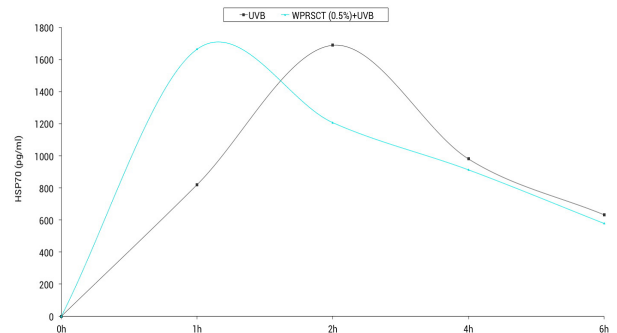
Therefore Naolys tested the protective effect of Whole Protection Red flowered silk cotton tree in its capacity to increase more rapidly the apparition of stress proteins (HSP70), that leads a preventive protection against damaging effects of UVB.

With that mechanism, Whole Protection Red flowered silk cotton tree allows to repair more quickly damages induced by UVB rays and a better control of their synthesis.

### Kinetik of HSP70

→ In the test run by Naolys, the quantification of stress proteins has been performed with and without Whole Protection Red flowered silk cotton tree after irradiation of reconstructed epidermis to UVB. At the concentration of 0.5%, the protective effect has been translated by the speed of the apparition of stress proteins (HSP70) while maintaining the concentration of those proteins at the same level as the one induced by UVB rays only.

### Study of HSP 70 (Heat Shock Proteins 70)



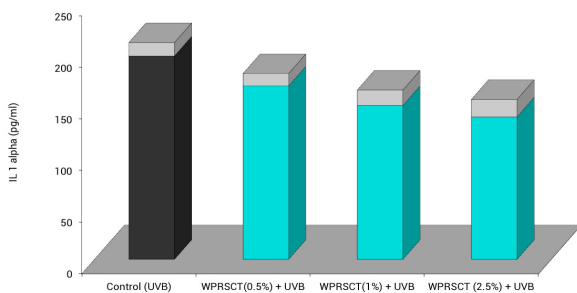
## Study of inflammation

The inflammation is the answer of tissues to aggressions: all defense mechanisms through which they recognize, destroy and eliminate any foreign substances. Different types of cells take part in those mechanisms but in the epidermis, it is the keratinocytes we will study. The beginning of inflammation, its diffusion starting from the initial location involve chemical factors that are locally synthesized or at the state of inactive precursors. Naolys decided to study 3 inflammation mediators synthesized at the level of the keratinocytes of hair bulb, 2 famous cytokines and a prostaglandine.

- IL1-alpha is an intracellular messenger cytokine synthesized then stocked inside cell as an inactive precursor. It has many biological local and systemic functions (on expression of genes, cell proliferation, nervous system, etc.)
- IL-6 is a pro-inflammatory cytokine, that regulates activation, growth and differentiation of lymphocytes. It belongs to the group of proteins that direct to the secretion of anti-bodies to fight against extra-cellular pathogens.
- PGE2 is an eicosanoïde, derived from phospholipids of cell membrans. PGE2 acts on smooth muscular fibers of vessels: vasodilatation, increase of permeability, œdema.

## Study of the inflammation mediators

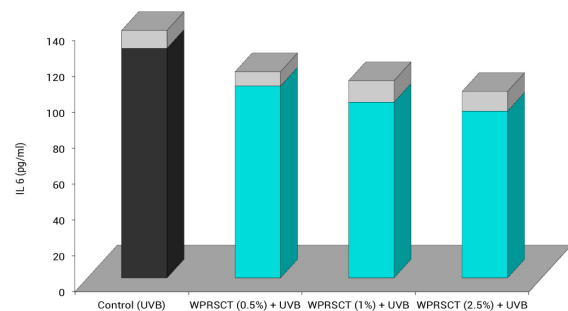
### Study of the IL-1 alpha



#### Decrease of IL-1 alpha

→ At concentrations of 0.5%, 1% and 2.5%, decrease of IL-1alpha respectively by 15%, 24% and 30%

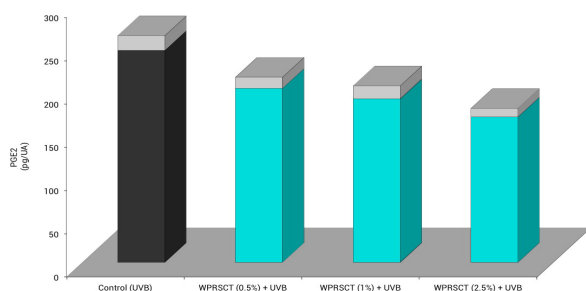
### Study of the IL-6



#### Decrease of IL-6

→ At concentrations of 0.5%, 1% and 2.5%, decrease of IL-6 respectively by 16%, 23% and 27%

### Study of the PGE2



#### Decrease of PGE2

→ At concentrations of 0.5%, 1% and 2.5%, decrease of PGE2 respectively by 18%, 23% and 31%