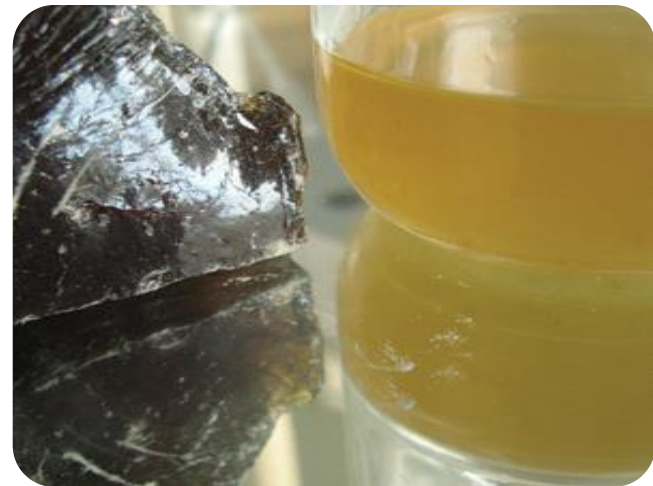


## HTRE, the Amazonian resin



A biomimetic shield for the protection  
of Hair, Nails and Skin

## The Oleoresin in its ecosystem

The *Canarium luzonicum* oleoresin is a pentacyclic triterpene resin. Within the plant, it plays many roles and in particular as cicatrizing agent.

The essential oil contained in the resin allows the plant to defend itself against the colonization of external pathogens. The essential oil also acts as a plasticizer for the resin. Once the essential oil evaporated, the cured resin forms a perfectly tight dressing.

The resin also protects the plant from desiccation, UV radiation and high temperatures, especially in young leaves and stems

The resin is produced endogenously in specialized epithelial cells (parenchymal cells), in the roots, in the leaves, in the woody tissues and in the bark. The secretory cells will dissociate and form small pockets. The cavities constitute the secretory device where the secretion products are stored before oozing through the bark or following an injury.

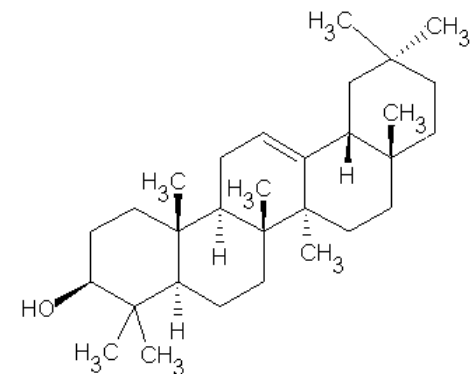


## Process & Composition

Once the resin is harvested is extracted by solvent and then transferred and concentrated in a lipophilic support.

The essential oil and other volatile compounds are separated by molecular distillation

The extracted resin presents a crude skeleton of pentacyclic triterpenes represented mostly by Amyrine in the  $\alpha$  and  $\beta$  form. This molecule has been widely investigated demonstrating its anti-nociceptive (anti-pain), anti-inflammatory and antioxidant properties.



## Protective activity against UV radiation

The sun deteriorates the structure of the hair and nails causing a loss of keratin, but also the weakening and drying of the fiber. The hair becomes discolored, loses its shine and elasticity by becoming rough and brittle.

Among the amino acids constituting the keratin, tryptophan, cysteine, tyrosine and histidine are the most sensitive to UV. Cysteine is mainly damaged by C-S bonds. It is mainly located at the level of the cuticle of the hair generating a greater photo-degradation in this region. The structural integrity of the hair is also affected by disulfide bonds break caused by radical species generated by UV radiation. The hair is therefore weakened and less resistant to external attacks.

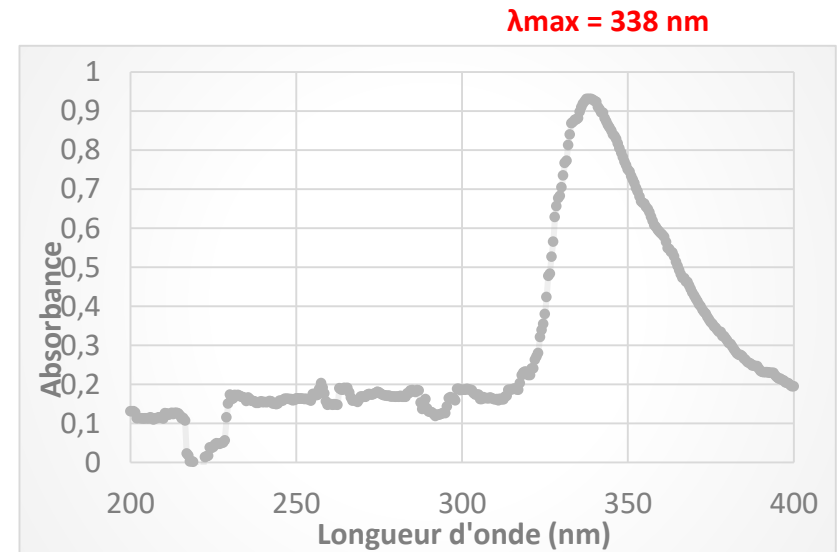


Photo Credits Dr Ali Naqy Syed

# Protective activity against UV radiation

Fine hair, naturally less resistant than thick hair, is the most affected by UV. Blond hair and colored hair are also affected by UV. A photo-protective effect of the active would then protect the hair fiber when exposed to the sun.

The absorption spectrum has a maximum peak around 338 nm showing that HTRE absorbs well in the ultraviolet range and more particularly in UVA range.

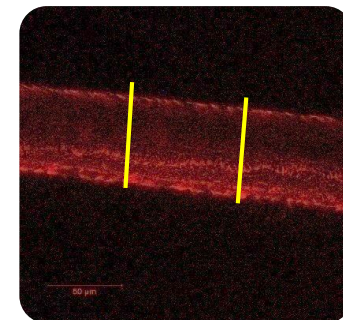
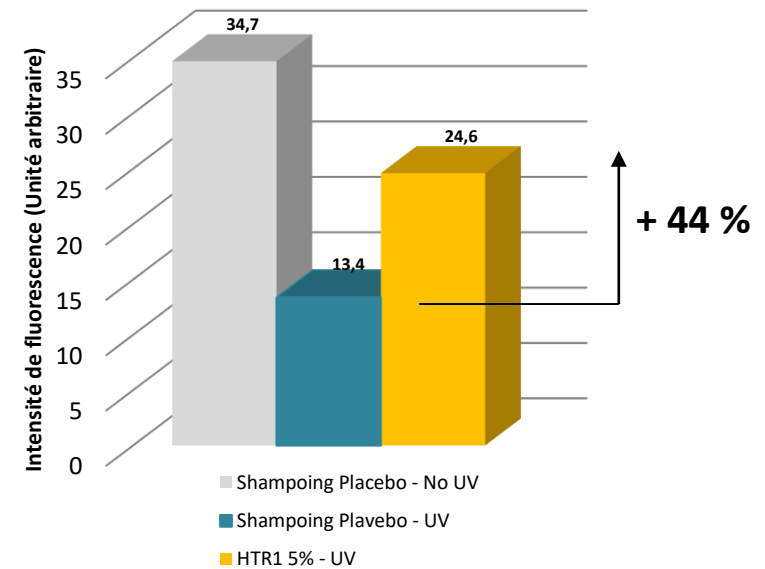


# Protective activity against UV radiation

Brown European human hair strands are used for the test. The hair is pre-washed daily during a week with a 15% SLS (Sodium Lauryl Sulfate) solution, rinsed with hot water, and dried with cold air. Before being irradiated by UV, hair are washed with a shampoo containing the HTRE in order to evaluate its action. After rinsing with water, the labeling of the proteins (keratin) is carried out using Rhodamine.

Hair strands are observed by confocal fluorescence microscopy. Using the operational-condition, three different strands are observed on 1 cm length portion. The fluorescence intensity is measured for each image on two different spots (as shown in the picture here on the right).

As can be observed, the use of the can effectively protect the hair against UV radiation



## Ex-Vivo, Film-forming effect on the hair

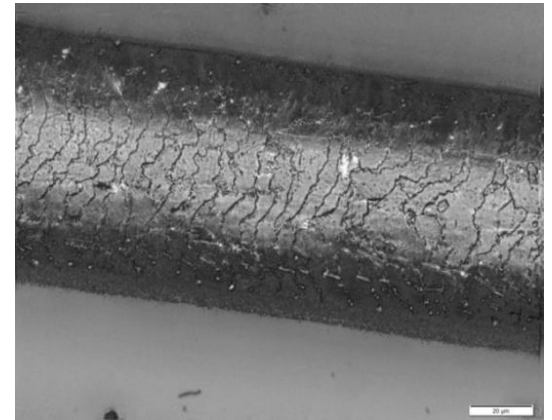
Brown European human hair strands are used for the test. The hair is pre-washed daily during a week with a 15% SLS (Sodium Lauryl Sulfate) solution, rinsed with hot water, and dried with cold air.

Hair has been treated with acetone in order to delipidate it and then treated with a hair mask in the presence or absence of the active ingredient (5% HTRE).

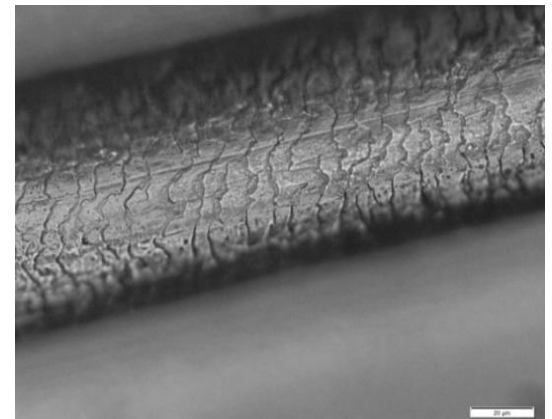
The picture of the treated hair with the placebo mask shows the damage caused by delipidation. The cuticles of the hair appear more open. The presence of small crystals (white dots) is also observed. According to the studies (Lu, 2007), these latter represent the denaturation of the capillary fiber.

Hair treated with the hair mask containing HTRE shows a decrease in porosity with a more compact and smooth cuticle.

Hair treated with a placebo mask (x50)



Hair treated with a mask containing 5% of HTRE (x50)



# In vitro : soothing action on skin and scalp

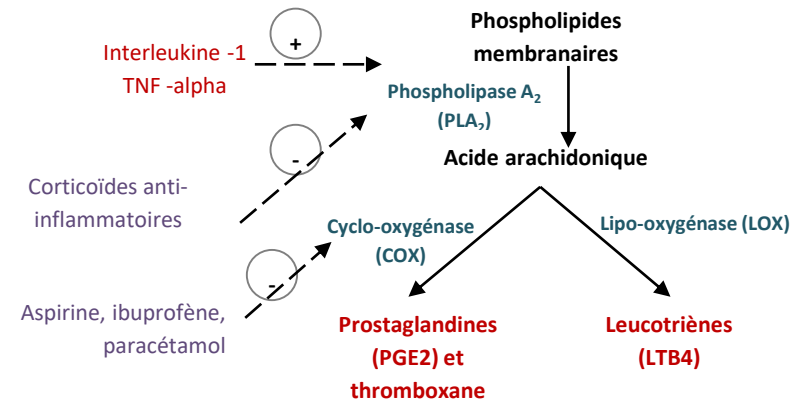
## MATERIAL AND METHOD :

A soothing (anti-inflammatory) action can be demonstrated by the inhibition of the enzymes involved in the cascade of arachidonic acid, in particular phospholipase A2.

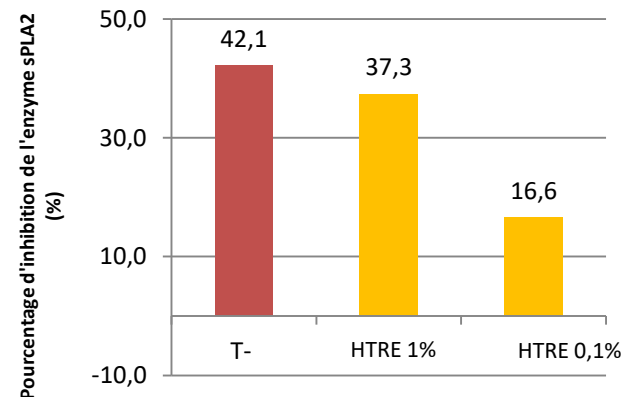
The inhibitory activity of phospholipase A2 is studied by enzymatic analysis

HTRE at a dose of 1% inhibits by 37% the activity of PHOSPHOLIPASE A2, the key enzyme of the inflammatory process

Control is Tioetheramide PC 0,14mM (T-), it inhibits by 42,1% the PLA2 activity.



Activité inhibitrice du HTRE sur la sPLA2



Average significantly different from Control's one ( $p < 0,05$ ).

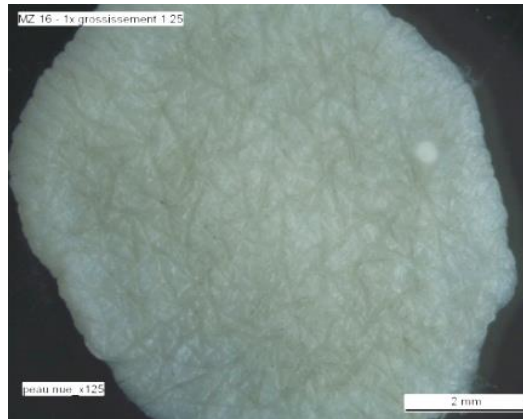
# Ex-Vivo, Film-forming effect on the skin

The film-forming action of the HTRE has been studied ex-vivo by microscopic observation on human skin explants.

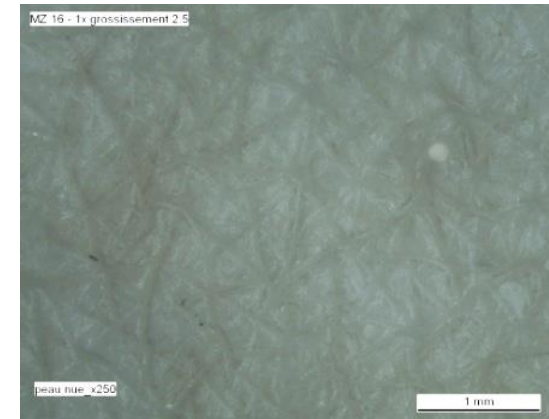
The pictures obtained by optical microscopy show skin depression areas.

The skin treated with an oil based product containing HTRE at 3% shows a gloss effect on the skin surface.

Untreated Skin



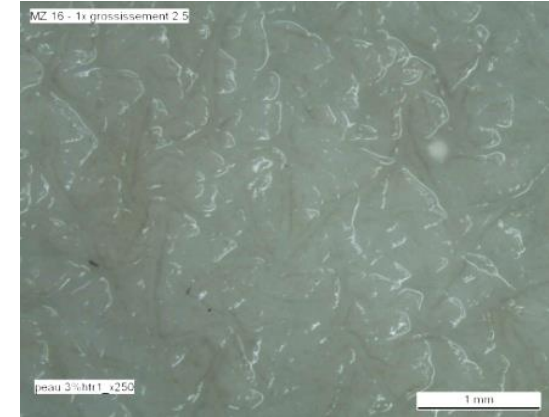
Magnification



Skin treated with HTRE



Magnification



# HTRE, technical specification

- INCI: Helianthus annuus seed oil & Canarium luzonicum gum nonvolatiles
- CAS: 8001-21-6 & 8023-89-0
- EINECS: 232-273-9 & Na
- COSMOS ready
- APPARENCE: viscous liquid
- Resin concentration 25- 30%
- FORMULATION: lipophilic
- STORE CONDITIONS: 24 months in a ventilated area
- DOSAGE
  - 1-5 %
- TOLERANCE:
  - Cutaneous: non-irritant (tested at 6,5%)
  - Ocular: moderately irritant (tested at 6,5%)
  - Cutaneous skin sensitization test: non-irritant and non-sensitizing (tested at 6,5%)



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