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## Sea Beet for Hair & Scalp Protection

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**“Protection” has become a common word in the cosmetic claims vocabulary. The high exposure to external stress like UV exposure, pollution or blue light, and its consequence on the body, increased the awareness amongst consumers of the importance of protection and prevention of ageing factors. The different stresses we are exposed to are now covered by the concept “exposome”. This was defined by an American epidemiologist, Christopher Wild, as “all the factors to which an individual is exposed over the course of its life, from birth right through to death, incl. the prenatal stages”, thus including external as well as internal stress factors. What does it mean for hair beauty?**

At first, hair grows on the scalp in the hair follicles. The first stress hair can be exposed to is therefore an internal stress, like inflammation or lack of nutrients during the neogenesis of hair. Once hair grows, it starts being exposed to external stress: cleansing products, combing, UV, pollution etc. A 30 cm long hair strand is 30-months old. This represents 2 years of daily exposure to aggressors. Therefore, hair beauty really reflects how well hair was protected from stress in the long run. To achieve hair beauty, it is therefore necessary to care about a daily protection of the hair fiber as well as of the scalp. Following a bio-inspired approach, Seppic identified the sea beet (*Beta maritima*), also called the wild spinach, as a scalp & hair protector.

## An ancestral plant to protect hair & scalp

The sea beet is an ancestral Eurasian edible plant growing on the seashores. The leaves have been eaten as a vegetable since prehistoric times, as evidenced by neolithic finds. Its cultivation probably began as early as the second millennium BC in the Near East. Several cultivated forms started to appear and gave birth to new species with new genetic traits over the centuries. Inside this big family of descents, we find the sugar beet, the field beet, the beetroot, the chard and many more. Nowadays, the genetic resource of the sea beet is considered precious, containing more resistance genes (to stressful conditions like challenging climate conditions or biological stress) and is used for breeding of sugar beet or other cultivated forms to strengthen them [1]. An oil-soluble extract from the sea beet, sourced in Brittany, was developed as a natural solution for strengthening hair fiber and protecting scalp.

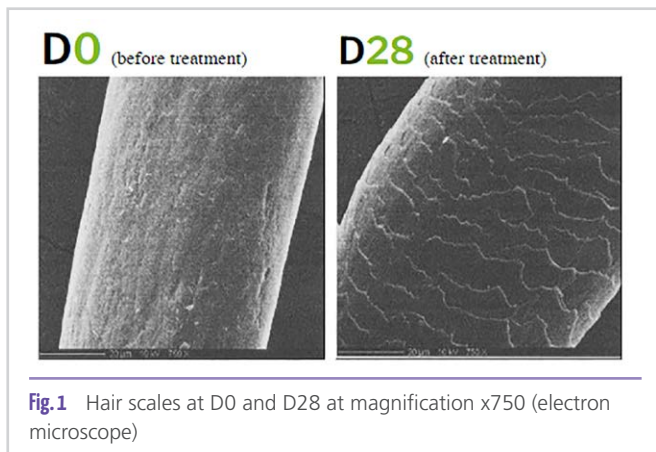


## Scalp protection

Oxidative stress is associated with many scalp disorders (dandruff, seborrheic dermatitis etc). The most common manifestation to hair emerged from an unhealthy scalp is an altered cuticle with evidence of surface pitting, roughness or breakage. The biochemical alterations observed in hair are most commonly oxidative damages of both proteins and lipids. A malondialdehyde assay was thus conducted on reconstructed epidermis exposed to UVB stress with or without treatment with the sea beet extract. From 0,2%, it demonstrated a significant reduction of lipoperoxidation (-13%) versus non treated. However, the scalp protection of the extract goes behind antioxidant action. Tested on keratinocytes exposed to UVB stress, it also exhibited significant soothing action from 0,2% by reducing the amount of inflammatory mediators like PGE2 (-13%), IL-1 (-21%) and IL-6 (-21%). Finally, it was shown that the sea beet extract protects the cell from ageing by significantly slowing down the senescence process (beta-galactosidase assay).

## Hair conditioning benefits

The efficacy of the extract was tested afterwards on hair. The study included 20 women, from 16 to 50 years old, with dry & damaged hair. Volunteers applied a leave-on product containing 1% of the sea beet extract once a day on hair before combing during 28 days. The study was made versus placebo. The structure of the hair fibers was evaluated by electron microscope at different magnifications and volunteers answered a questionnaire of self-evaluation.



As shown in **Fig. 1**, at the end of the study, the hair structure was significantly improved versus D0: +62% improvement of scales aspect (smoothing effect). The self-evaluation also allowed identifying the key benefits perceived by the consumer. Shine improvement is the benefit n°1 perceived by 100% of the volunteers (+22% satisfaction versus placebo). Easier combing is the benefit n°2 perceived by 100% of the volunteers (+11% versus placebo), while volume is the benefit n°3, perceived by 70% of the volunteers (+14% versus placebo).

## The ideal solution for natural anti-aging hair & scalp care products

The awareness about premature ageing has raised a lot for several years amongst consumers. The need for protection is now perceived necessary, not only for skin, but also for scalp and hair. The bio-inspired extract from the sea beet, a traditional plant sourced in Brittany, aligns with the protection and naturality expectations of consumers.

### References

- [1] Beta maritima, the origin of beets (*Enrico Biancardi, Leonard W. Panella & Robert T. Lewellen, 2012*)

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