



## SEA HEATHER®

The best radical scavenger from the Mediterranean

\*

*Combats damage induced by the  
both pathways of the lipid peroxidation*

*Protects DNA*

*Soothes irritated skin*



Reactive oxygen species cause important cellular damage. They degrade cellular DNA, oxidize proteins & alter membrane lipids. The mechanisms by which radicals damage membranes are associated with peroxidation reactions in membrane lipids.

Lipoperoxidation occurs according to two different pathways: a non-enzymatic system & an enzymatic system, both being highly destructive. Therefore, it appears important to maximize skin protection against the lipid peroxidation.

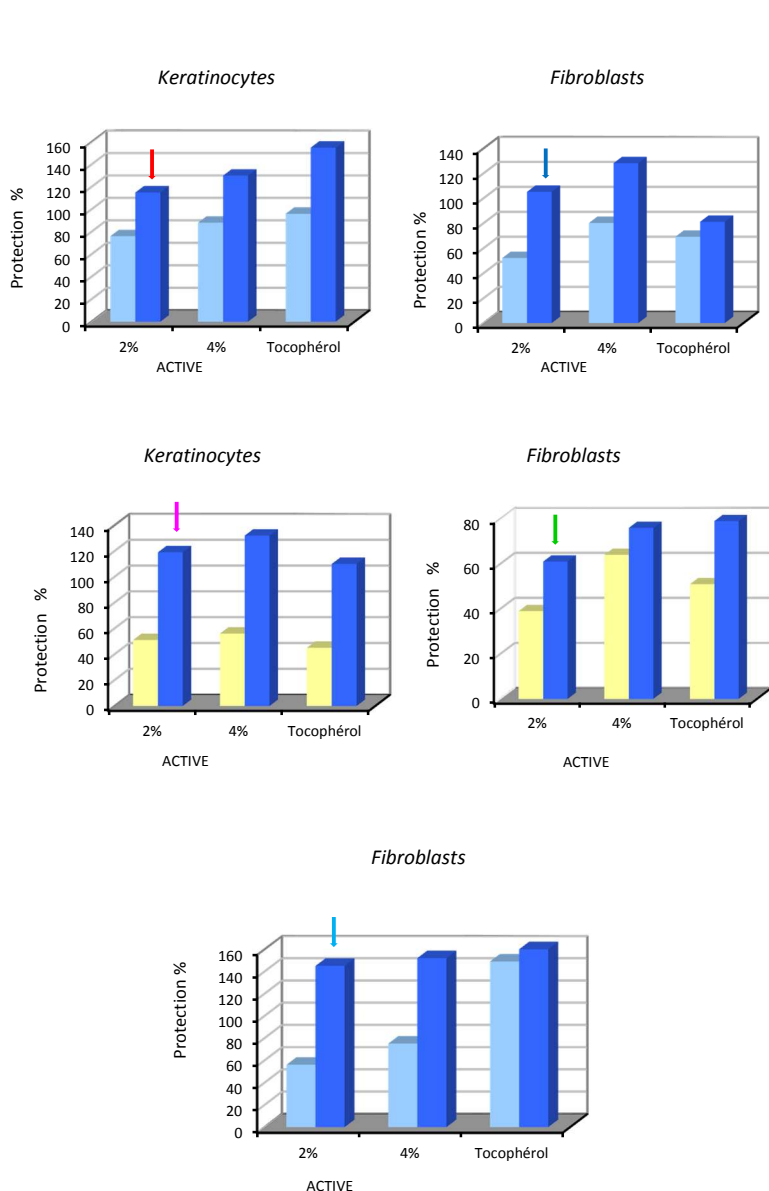
GELYMA proposes SEA HEATHER® a global anti-peroxidative defence system highly efficient (1) to bust up the attacks of reactive oxygen species (2) to fight inflammation. SEA HEATHER® is derived from Mediterranean endemic caespitose brown algae. Patent FR 2 838 341

## Mechanisms of action

SEA HEATHER fights reactive species generated during the lipid peroxidation

During the non-enzymatic pathway of the lipid peroxidation, the auto-oxidation of unsaturated fatty acids induces alterations of cytomembranes. It is a chain reaction which implies the formation of different radicals through successive steps, what may end in cellular lysis.

Skin cells submitted to 3 different peroxidative aggressions: HX-XO system - t-butyl hydroperoxide – UVA radiation. SEA HEATHER® (2% or 4%) introduced according to 3 ways: P1 before aggression during 24h (absence during aggression) - P2 during aggression - P3 before & during aggression. Protective activities evaluated by using LDH assay for quantifying eventual membrane alterations. Standard: tocopherol dose  $5.10^{-4}M$ .



Superoxide anion & hydrogen peroxide generated by the aggression HX-XO

The enzymatic hypoxanthine-xanthine oxidase HX-XO system generates superoxide anion and hydrogen peroxide which act during the initiation step and the Haber-Weiss cycle of the auto-oxidative pathway of the lipid peroxidation.

SEA HEATHER® protects both keratinocytes and fibroblasts from the harmful effects of these radicals. With 2% SEA HEATHER® applied before and during radicals attacks (P3), the protective activity reaches: + 111 % for keratinocytes & + 103 % for fibroblasts.

Alkoxy radical generated by the aggression t-butyl peroxide

The t-butyl-hydroperoxide generates alkoxy radicals which act during the reactivation step of the auto-oxidative pathway. Alkoxy radical is a radical with medium oxidant ability but it allows the propagation of the lipid peroxidation by dismutation of peroxides and consequently the membranes deterioration.

SEA HEATHER® protects both keratinocytes and fibroblasts from the harmful effects of alkoxy radicals. With 2% SEA HEATHER® applied during radicals attacks (P3) the protection is equal to + 116 % for keratinocytes & +58% for fibroblasts.

Singlet oxygen & hydroxyl radical generated by the aggression UVA radiation

SEA HEATHER® protects the cell membranes of fibroblasts against UVA irradiation. With 2% SEA HEATHER® applied during radicals attacks (P3) the protection of fibroblasts equal to + 140 %.

SEA HEATHER® protects skin cells against radicals released during different steps of the auto-oxidative pathway of the lipid peroxidation. According to the way of using, SEA HEATHER® is able of penetrating the cell and protecting it against intracellular radicals (P1). It also can intercept radicals (P2).

## SEA HEATHER protects DNA

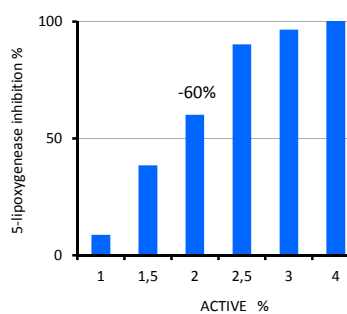
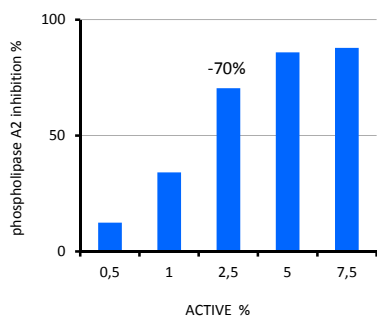
Chemiluminescent 3D Assay based on a repair reaction of DNA by using plasmid DNA adsorbed on sensitized microplates.

SEA HEATHER® shows a dose- dependent protection of DNA against damage caused by singlet oxygen.

IC 50 is reached with only 0.2% active.

## SEA HEATHER fights inflammation

The enzymatic pathway of the lipid peroxidation induces the arachidonic cascade and then inflammatory reactions.



Evaluation of the activity of phospholipase A2.

The enzyme phospholipase A2 plays a central role in the release of the arachidonic acid from membrane phospholipids upon cell stimulation. With 2.5% active, the inhibition reaches more than -70%.

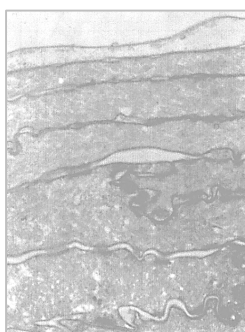
Evaluation of the activity of 5-lipoxygenase.

Lipoxygenases catalyze the oxidation of the arachidonic acid to bioactive lipid hydroperoxides. With 2% active the inhibition reaches -60%.

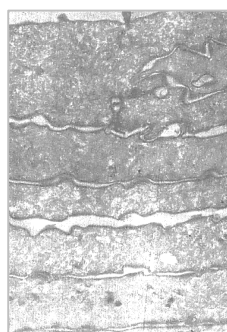
SEA HEATHER® acts within the arachidonic acid cascade at two levels with dose- dependent effects. It inhibits the activity of phospholipase A2 and stops the release of the arachidonic acid. It also inhibits the activity of 5-lipoxygenase that will inhibit the production of leukotrienes.

## SEA HEATHER® guarantees full cell membrane functionality after chemical-induced irritation

Reconstituted skins submitted to DMSO treatment (10% for 6h) in the absence or presence of 4% SEA HEATHER®. Observations in transmission electron microscope after 24h treatment.

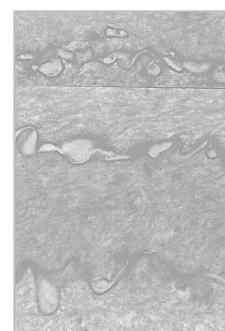


Control without DMSO treatment



DMSO treatment

Important alterations of the fine structure



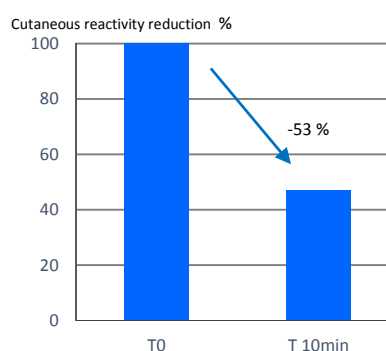
DMSO treatment + SEA HEATHER®

The addition of SEA HEATHER® leads to higher preservation of the fine structure of cell

## SEA HEATHER® lowers skin reactivity by reducing stinging sensations

### Clinical study

Evaluation of the anti-irritant properties of SEA HEATHER® incorporated at 10% into a gel on the nasolabial fold of 22 volunteers (18 female - 4 male between 20-66 years old) after irritation (at 10 sec – 2min30 sec – 5 min) induced by a solution 10% lactic acid (stinging test) (IDEA-FRANCE).



After treatment, significant reduction of irritation: 53% decrease in stinging compared to untreated area.

SEA HEATHER® gives efficient soothing activity on irritated skin.



## SEA HEATHER®

The best radical scavenger from the Mediterranean

### Algal source

SEA HEATHER® is a patented marine agent prepared from brown seaweeds endemic of the Western Mediterranean where they constitute dense populations at wave-exposed and unpolluted areas.

*Cystoseira* species contain large amounts of free phoroglucinol known as excellent free radical scavenger.

Patent FR 2 838 341

## Cosmetic benefits

SEA HEATHER® treats the skin with a defense approach through mechanisms which prevent the lipid peroxidation and inflammatory responses.

SEA HEATHER® combats reactive species:

- ♦ free radicals generated during the lipid peroxidation that induce cellular lysis
- ♦ singlet oxygen that alters DNA

SEA HEATHER® fights inflammation by inhibiting both:

- ♦ phospholipase A2 that induces the production of arachidonic acid
- ♦ 5-lipoxygenase that leads to the production of leukotrienes.

SEA HEATHER® reduces skin irritation (stinging sensations).

As the results, the skin is better protected, soothed with improved comfort.

This makes SEA HEATHER® an excellent ingredient for products aimed at helping to reduce irritation, soothing the skin and improving the comfort of reactive and sensitive skins.

## Cosmetic applications

Soothing care for reactive and sensitive skins - Protecting care for irritated, sunburnt, razor burnt skins - Daily protecting care - Anti-aging care - Sun and after sun care - Scalp care.

Recommended use levels: 2% - 10%.

## Characteristics

INCI names      water      CAS n° 7732-18-5      EINECS n° 231-791-2  
*Cystoseira amentacea/caespitosa brachycarpa* extract

Limpid liquid brown colored.

Preservatives by selection: microcare SB or phenoxyethanol or phenoxyethanol+chlorphenesin.

Packing size: 1kg -5kg -10kg.



The data presented in this document are offered solely for your consideration and investigation. No guaranty is expressed or implied. No responsibility or liability for any consequence arising from the use of these data can be accepted, including possible infringement of any patent.

**GELYMA**

Parc d'Affaires Marseille Sud (C4) - 1 Boulevard de l'Océan - 13009 Marseille - France  
Phone: +33 4 96 14 09 82 - Fax: +33 4 96 14 09 83 - E-mail: gelyma@wanadoo.fr.