

PHYACTYL®

A detoxifying agent from marine origin

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Keeps free radicals out and the skin healthy

*Protection against the most harmful ROS
ozone and chemical stress*



Environmental stresses generate numerous kinds of reactive oxygen species. This in turn increases the skin's inflammatory response and leads to premature skin aging.

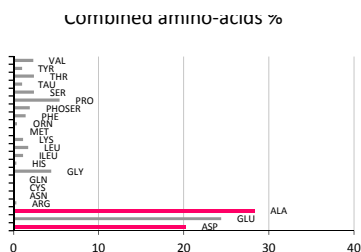
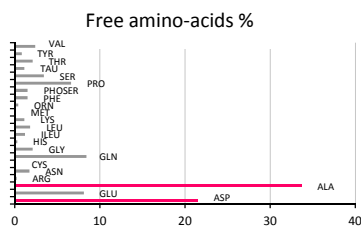
The best ways to slow these processes and to prevent damage are to support and strengthen the skin's defence mechanisms.

PHYACTYL® offers potent solution to protect the skin aggressed by reactive oxygen species of any nature and origin and to detoxify the skin.

PHYACTYL® is a patented, concentrated and standardized fraction of the brown invasive seaweed *Sargassum muticum* (Yendo) Fensholt, collected exclusively from populations growing along aquaculture farming sites in the Bassin of Thau (connected to the Mediterranean).

Mechanisms of action

PHYACTYL® provides balanced composition in nutrients



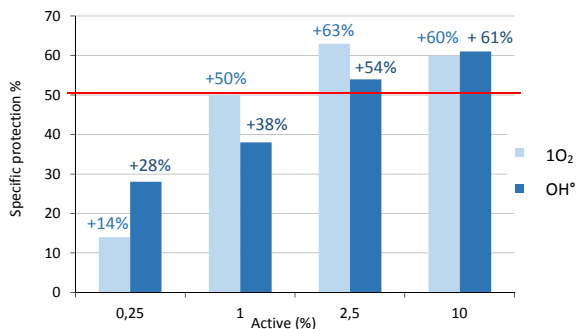
PHYACTYL® contains all amino-acids playing important roles in hydration maintenance and energy production. Alanine and aspartic acid constitute more than 55% of the total free amino acid pool and more than 48% of the total pool (red bars).

PHYACTYL® offers well-balanced mineral composition with high contents in potassium (2790 ppm*), sodium (639 ppm*) and magnesium (624 ppm*) and all trace elements essential for skin protection: Fe (1.63 ppm*), Zn (0.46 ppm*), Mn, (0.22 ppm*), Cu (0.16 ppm*) and Se (0.06 ppm*).

* data from a control batch.

PHYACTYL® assures optimal nutrition of the skin.

PHYACTYL® protects DNA against singlet oxygen and hydroxyl radical



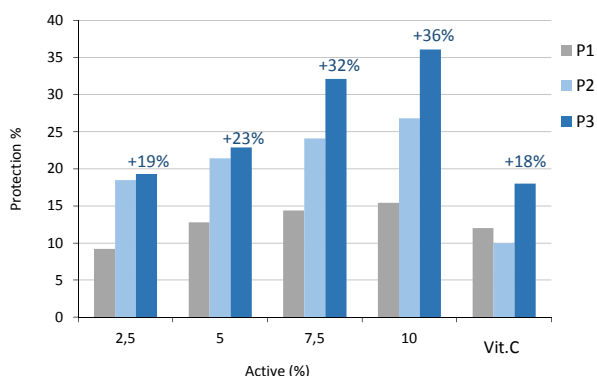
Chemiluminescent 3D assay performed on plasmid DNA based on a repair reaction of DNA after lesions induced by the generation of singlet oxygen.

PHYACTYL® induces potent genoprotection against both singlet oxygen and hydroxyl radical.

50% DNA protection only reach with

- 1% PHYACTYL® against singlet oxygen.
- 2.2% PHYACTYL® against hydroxyl radical.

PHYACTYL® protects skin cells against superoxide anion and hydrogen peroxide

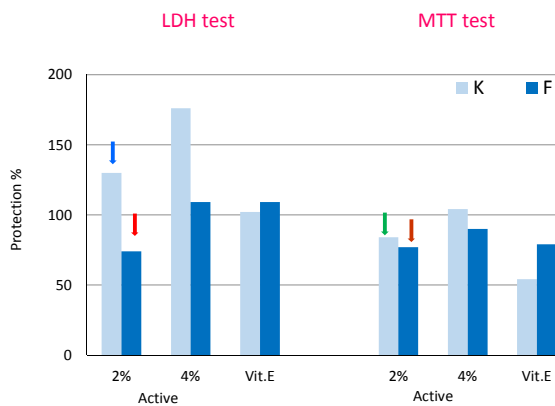


Human keratinocytes submitted to the hypoxanthine-xanthine oxidase (HX-XO) system that generates superoxide anion and hydrogen peroxide.

PHYACTYL® introduced according to 3 ways: P1 before aggression during 24h (absence during aggression) - P2 during aggression - P3 before and during aggression. Standard: vitamin C - dose $5.10^{-4}M$.

PHYACTYL® is able of detoxifying both superoxide anion and hydrogen peroxide, thus ensures biological protection before (P1) and during aggression (P2).

PHYACTYL® protects skin cells against ozone



Ozone is a powerful oxidant generating hydroxyl radical and toxic aldehydes.

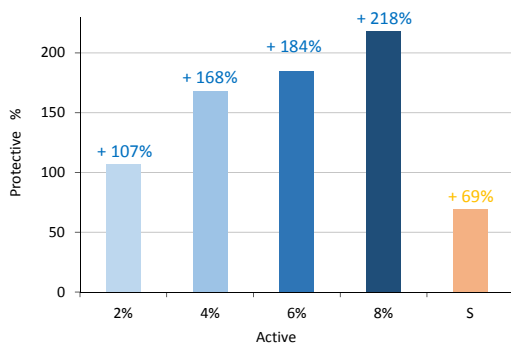
Keratinocytes (K) and fibroblasts (F) submitted to strong ozone stress (20 mg.h) in presence of 2% or 4% PHYACTYL®. After ozone exposure, two tests (MTT and LDH) quantify damage, compared to treated and untreated controls. Standard: vitamin E- dose $5 \cdot 10^{-4}M$.

With 2% active, the protection reaches respectively:
 - keratinocytes +130% (LDH test) +84% (MTT test)
 - fibroblasts + 74% (LDH test) +77% (MTT test).

With vitamin E, the protection reaches respectively:
 - keratinocytes +102% (LDH test) + 54% (MTT test)
 - fibroblasts + 109% (LDH test) +79% (MTT test).

Both tests prove that PHYACTYL® acts as a protective shield against ozone induces damage for the both kinds of skin cells.

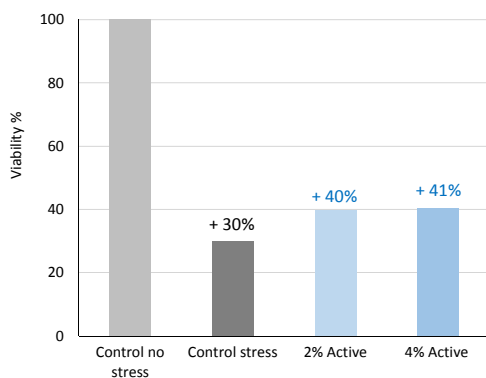
PHYACTYL® protects skin cells against UVA and UVB radiations



UVA irradiation causes premature photoaging and carcinogenesis of human skin because it penetrates deeply into the dermis. At the cellular level, it damages DNA and membranes through the induction of the lipid peroxidation.

Fibroblasts irradiated by UVA (dose: $24 J/cm^2$). PHYACTYL® (2%-4%-6%) added before and during aggression. MTT test performed immediately after UVA stress. Standard: silymarin (S) dose $5 \cdot 10^{-4}M$.

The protection reaches + 107% with 2% PHYACTYL® and only + 69% with silymarin.

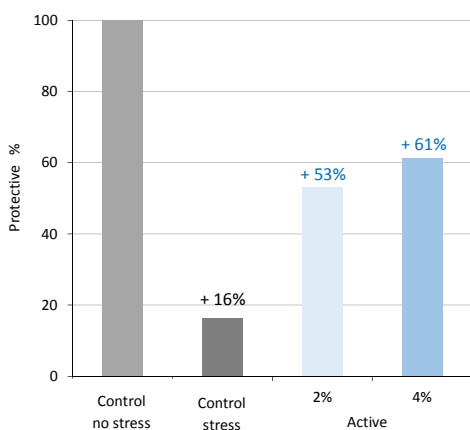


UVB irradiation is more powerful and more aggressive than UVA irradiation. It produces the formation of sun burn cells. It accelerates premature skin aging. It can induce apoptotic and necrotic effects in skin cells.

Reconstituted skins submitted to UVB irradiation (dose: $300 mJ/cm^2$). PHYACTYL® (2%-4%) is added before (for 3h) and after aggression. MTT test performed 48h after UVB stress, compared to unirradiated and irradiated controls.

At 2%, the protection of PHYACTYL® differs very highly significantly from the irradiated control ($p < 0.001$).

PHYACTYL® protects skin cells against chemical stress



Sodium lauryl sulphate (SLS) is a strong and harsh surfactant known to promote skin and scalp irritations and to cause dermatitis when prolonged contact.

Reconstituted skins submitted to SLS stress for 2h (dose: $30 \mu g/ml$ in the culture medium). PHYACTYL® (2%-4%) is added before (for 3h) and after aggression. MTT test performed 48h after UVB stress, compared to un-stressed and stressed controls.

At 2% as well as 4%, the protection of PHYACTYL® differs very highly significantly from the stressed control ($p < 0.001$).

Algal source

Sargassum muticum is a Japanese brown alga which is become invasive in Europe following its accidental introduction by aquaculture.

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Patent FR 2 838 342

Cosmetic benefits

By its balanced composition in amino-acids and minerals, PHYACTYL® provides the necessary supplies for cells to maintain an appropriate energy level and to produce their constituents (repairing role).

PHYACTYL® offers complete and natural protection against the major dangerous reactive oxygen species (singlet oxygen, superoxide anion, hydrogen peroxide, hydroxyl radical) caused by various sources.

PHYACTYL® enters into cells and interacts with intracellular free radicals, activating the skin's detoxification system.

PHYACTYL® protects DNA from oxidative damage.

PHYACTYL® prevents cellular damage resulting from ozone exposure, UV irradiation and chemical stress.

By reinforcing the skin defence potential, PHYACTYL® is the ideal active ingredient, quite beneficial for the skin: detoxifying and purifying it, enhancing the resistance of cells against oxidative stress-induced damage.

Cosmetic applications

Protective products against reactive oxygen species of any nature and origin.

Recommended use levels: 2 - 5%.

Characteristics

INCI names water CAS n° 7732-18-5 EINECS n° 231-791-2
Sargassum muticum extract

Limpid liquid amber colored.

Preservatives by selection: microcare SB or phenoxyethanol.

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



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