SYNERGIE SKIN
CLEAN SCIENCE

CLINICAL DATA – PLANKTON EXTRACT

Description
Extract obtained by biotechnology from a marine microorganism isolated from the southwest coast of the Tenerife Island (Spain). Plankton extract acts on multiple stages of the pigmentation process to consistently reduce the deposition of melanin in the epidermis. As a consequence, it brightens the skin complexion, especially hyperpigmented spots, greatly contributing to increase evenness.

Properties
Plankton extract acts on various stages of melanin production and deposition in the skin for an integral and effective control of pigmentation. It improves luminosity and decreases visibility of hyperpigmented areas to even out the skin tone.

Applications
Plankton extract can be used in any cosmetic formulation to provide a brighter complexion and in anti-ageing products to even the skin tone by reducing dark spots.

Science
Melanin not only determines the colouration of the skin but also has an important role in protecting the skin against UV radiation. Its altered accumulation leads to hyperpigmentation, reducing evenness. In Asian skin, for instance, first signs of ageing, even before wrinkles, are dark spots appearing despite little sun exposure. The process by which melanocytes produce melanin (melanogenesis) and distribute it in the skin is complex and involves multiple steps. Activation of various signalling pathways in melanocytes results in gene transcription of diverse key melanogenic proteins. Then, melanosomes form and melanin is synthesized within them. Once these vesicles are mature and filled with pigment they are transferred to keratinocytes.

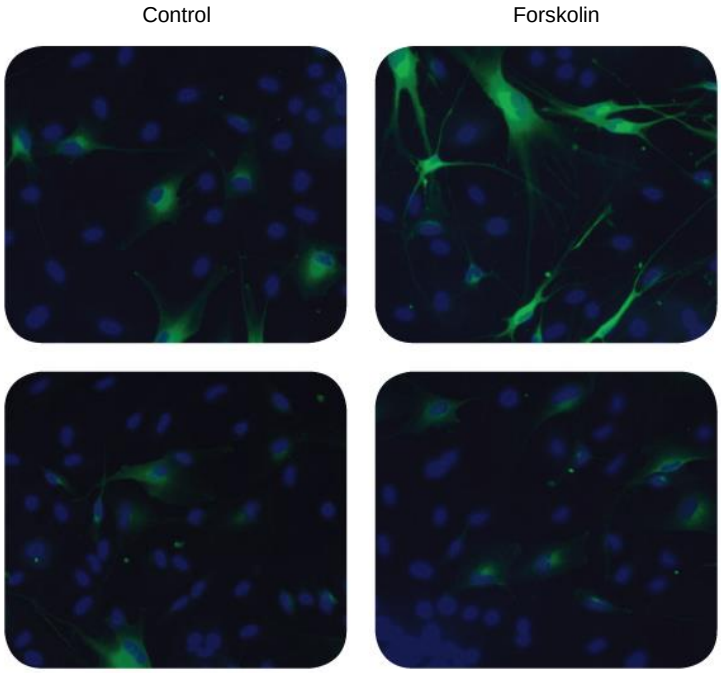
Plankton extract consistently modulates several steps that provide pigmentation. It regulates gene expression of melanogenic signalling proteins to decrease the formation and maturation of melanosomes, reduces tyrosinase levels and activity, and diminishes melanin uptake by keratinocytes. In addition, it induces the expression of genes involved in DNA repair, necessary due to the loss of UV-protective pigment. This extract has a brightening effect and homogenizes skin complexion by reducing melanin content, size and contrast of dark spots.

In vitro efficacy
1. Reduction in tyrosinase protein
Primary human melanocytes were treated with 10 or 50 µg/mL Plankton extract concentrate and a cell-based ELISA was performed to measure relative levels of tyrosinase in the cells.

Tyrosinase protein was diminished by 48.9% within melanocytes.

2. Decrease in melanosomes maturation

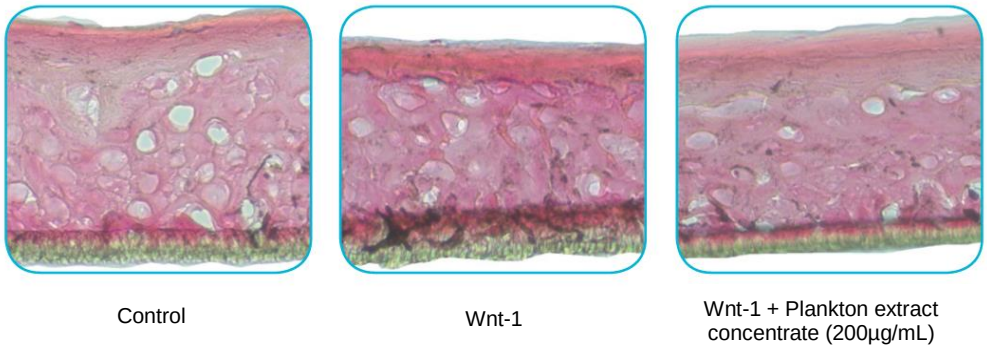
After treating a melanocyte-keratinocyte co-culture with forskolin (to induce melanosome maturation), kojic acid and Plankton extract concentrate, the melanosome-specific marker melan-A, which is required for maturation of melanosomes, was fluorescently stained (in green) and quantified.



Plankton extract interferes with melanosomes maturation – Melan-A protein levels were lowered by 40.0%.

3. Melanogenesis inhibition on reconstructed epidermis

Reconstructed human epidermis (phototype IV) was treated with wnt-1 to induce hyperpigmentation. The efficacy of Plankton extract concentrated to counteract wnt-1 activity was evaluated. Melanin was detected in tissue sections by means of Fontana-Masson staining.



Prevents hyperpigmentation related to age spots. Plankton extract neutralises induced melanin accumulation in the epidermis.

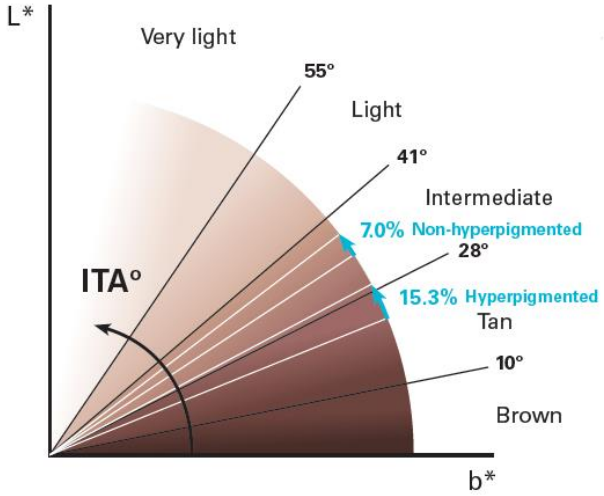
In vivo efficacy

Brightening and evening the skin complexion

22 Asian female volunteers (38-53 years old) with hyper-pigmented regions in skin applied a cream with 2% Plankton extract or a placebo cream twice a day for 8 weeks.

Increase of L* and ITA°

A spectrophotometer was used to assess luminance (L*) and the individual typological angle (ITA°). The higher these parameters, the lighter the skin. Also, the contrast between hyperpigmented and non-hyperpigmented skin was calculated to evaluate the more even tone.



ITA° was increased by 15.3% and L* by 2.5% in hyperpigmented areas. Plankton extract reduced contrast of dark spots by 12.7% from ITA° values.

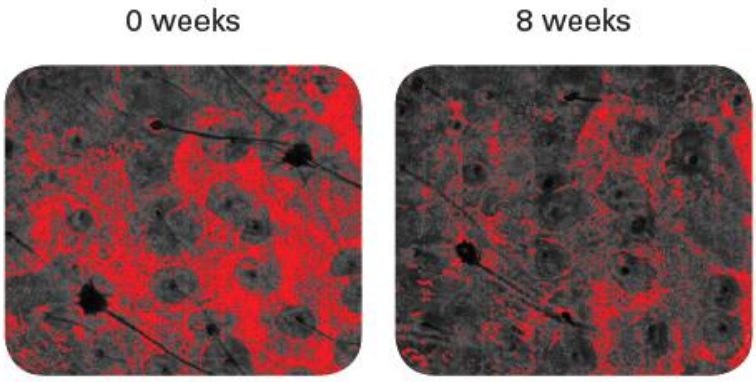
Size reduction of hyperpigmented spots

Variation in the area of hyperpigmented spots was assessed by image analysis of digital photographs using appropriate software.

Dark spots area is decreased- Hyperpigmented areas shrank by 6.9%

Effect on melanin content of dark spots

The amount of melanin on hyperpigmented regions was measured by reflectance confocal microscopy.



Melanin content of dark spots is notably smaller - Plankton extract diminished the pigment by 61.1%.