

Bioactive Extract (Undaria pinnatifida)

ROPA is an Australian company producing high-performance marine extracts for advanced skincare formulations with naturally preserved bioactive profiles.

Using a combination of freeze-drying and ultrasound-assisted green extraction, we preserve the molecular integrity of each compound – resulting in a potent, pure, and effective extract.

Proudly based in Victoria, Australia, our divers sustainably wild-harvest *Undaria pinnatifida* – an invasive brown seaweed species – under a government-approved permit.

By transforming this environmental challenge into opportunity, ROPA contributes to marine ecosystem restoration while delivering an extract that is traceable, eco-conscious, and scientifically backed.

Our extract is rich in fucoxanthin, amino acids, fatty acids, alginate, and Omega-3s, compounds widely studied for their ability to support skin hydration, collagen production, barrier strength, and antioxidant protection. ROPA extracts are developed for premium cosmetic formulations – pure, research-aligned, and guided by environmental and scientific integrity.

Product Details

- Product Name: ROPA Bioactive Extract
- INCI: Undaria pinnatifida Extract
- Origin: Kelp-Victoria, Australia
- Type: Water-based extract, Glycerin-based extract options (ethanolic option available)

Application Potential

- Facial mists and sprays
- Body milks, lotions, and creams
- Day/night creams and serums
- Eye contour creams and serums
- Broad cosmetic applications
- Hair and scalp treatments
- Hand and foot creams
- Pigmentation-targeting serums
- Men's skincare products
- Sun and after-sun care
- Teen and blemish-prone formulas

Formulation Guide

- Use Level: 1.0–2.0% (concentrate); 3.0–6.0% (1:10 standardized format)
- Stability: 24 months (unopened)

Research & Development Opportunities

- Anti-aging and antioxidant care
- Skin barrier reinforcement
- Collagen and elastin support
- Hydration and texture improvement
- Inflammation and pollution defence
- Pigmentation and tone correction
- Hair/scalp health and wound recovery



Key Benefits

01

Hydration & Barrier Support

Rich in polysaccharides like fucoidan, our extract enhances skin hydration and fortifies the skin barrier.

02

Antioxidant Protection

Compounds such as fucoxanthin and loliolide provide robust antioxidant defenses against environmental stressors.

03

Collagen & Elasticity

Amino acids and adenosine in the extract stimulate collagen production, promoting skin firmness and elasticity.

04

Anti-Inflammatory Properties

The extract's components help soothe irritated skin and reduce inflammation.

Key Bioactive Compounds



Amino Acids and Derivatives

Amino acids are organic molecules that form the building blocks of proteins and peptides in the skin¹. *U. pinnatifida* contains a complete profile of both essential and non-essential amino acids, along with closely related compounds such as aromatic derivatives and nucleosides². These molecules are fundamental to skin repair, hydration, and collagen synthesis. They regulate gene expression³, stimulate collagen production in the dermis⁴, and accelerate wound healing⁵⁻⁶. They are also potent antioxidants⁷, supporting the skin's natural defence against oxidative stress. Amino acids play a key role in maintaining epidermal barrier integrity⁸, reducing visible signs of ageing⁹⁻¹⁰, and contributing to hair strand formation and strength¹¹⁻¹².

Tryptophan

An essential aromatic amino acid required for protein synthesis and a precursor to serotonin and melatonin¹³. It enhances skin hydration and reduces inflammation. Tryptophan supports collagen biosynthesis¹⁴ and contributes to a smoother, more elastic skin texture. Its metabolites, produced by the gut and skin microbiota, are known to reduce inflammatory responses in conditions like atopic dermatitis¹⁵⁻¹⁶. As a serotonin precursor, it may also influence skin health through the skin-brain-gut axis¹⁷.

L-Tyrosine

A non-essential amino acid critical to melanin synthesis, where it acts as a substrate for tyrosinase – the enzyme initiating pigment production¹⁸. Melanin provides photoprotection by absorbing UV radiation and limiting oxidative damage to skin cells¹⁹. L-Tyrosine derivatives can enhance dermal volume and increasing epidermal thickness when applied topically, suggesting its potential in non-invasive skin rejuvenation therapies²⁰. In addition to regulating pigmentation, L-Tyrosine has both antioxidant and anti-inflammatory properties, making it beneficial for managing skin conditions such as eczema and psoriasis²¹.

Adenosine (Nucleoside)

A naturally occurring purine nucleoside involved in cellular energy transfer and signalling. It supports collagen production and improves skin smoothness²². Topically applied adenosine has been shown to stimulate fibroblast activity and increase dermal collagen, leading to firmer, more elastic skin²³. It also provides anti-inflammatory effects, helping to soothe sensitive or acne-prone skin²³. Clinical studies demonstrate improvements in hydration, fine lines, and texture²⁴.

Loliolide (Benzofuranone)

A naturally occurring monoterpene hydroxylactone, classified as benzofuranone, commonly found in brown seaweeds and land plants²⁵. Loliolide is known for its powerful antioxidant and anti-aging effects. It has been shown to activate key antioxidant pathways (PI3K/AKT and HO-1) and suppress oxidative stress caused by pollution and UV exposure²⁵. It also downregulates matrix metalloproteinases (MMP-1 and MMP-3), enzymes that degrade collagen²⁶. Additionally, it stimulates growth factor pathways (IGF-1, VEGF) and Wnt signalling, which are associated with hair follicle stimulation and tissue regeneration²⁷⁻²⁸.

Fatty Acids (Omega-3 & Others)

Fatty acids, are essential lipids that play a critical role in maintaining the skin's natural barrier and hydration²⁹. They help reduce transepidermal water loss, improve skin flexibility, and support overall barrier function³⁰. They also exhibit anti-inflammatory properties that help soothe redness and irritation, making them beneficial in managing conditions such as dermatitis and eczema³¹. Fatty acids like omega-3s have been shown to regulate sebum production and reduce the severity of acne lesions³². Moreover, fatty acids also promote collagen synthesis, contributing to improved skin elasticity and reducing the appearance of scarring³³.

Fucoxanthin (Carotenoid)

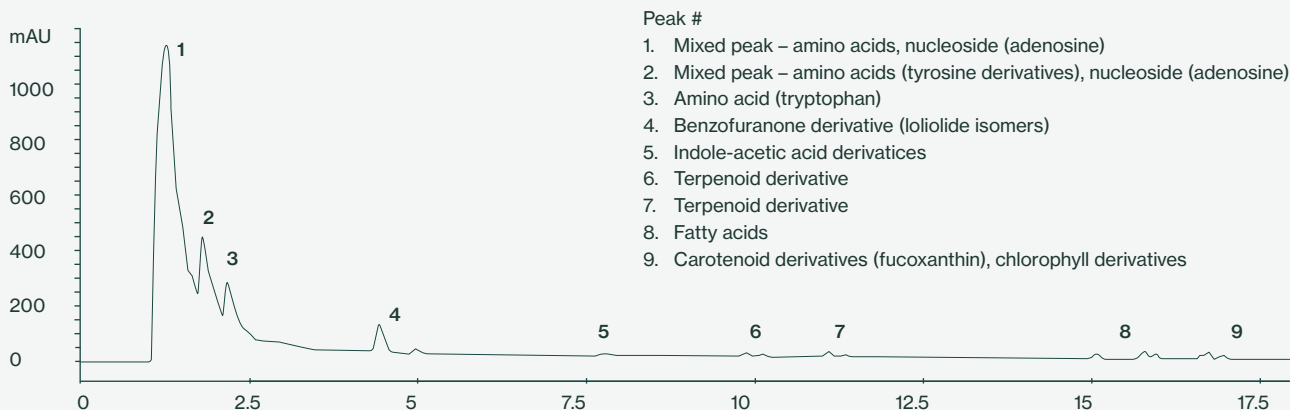
Fucoxanthin is a xanthophyll carotenoid pigment found in brown algae, responsible for its distinctive colour. It provides photoprotection and supports skin tone. Fucoxanthin absorbs UVB radiation and helps reduce UV-induced skin damage, including wrinkle formation and epidermal thickening³⁴. It also inhibits oxidative stress pathways and promotes the expression of filaggrin – a key skin barrier protein³⁵. Additionally, it may help reduce hyperpigmentation and regulate melanin production³⁶, making it suitable for brightening and tone-evening formulations.

“Harnessing the bioactive potential of invasive seaweed allows us to create bespoke cosmetic ingredients while actively restoring marine ecosystems.”

Henry Cole
CEO & Founder

Analysis & Results

Liquid Chromatography - Mass Spectrometry (LCMS) Compositional Analysis



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