

# BiEau® Actif Brown Algae



bioactive botanical waters  
 isotonic harmonization  
 natural antioxidant  
 wrinkle reduction  
 refreshing sustainable  
 plant based

## BACKGROUND

Plants naturally utilize and bind water in their cells as a mechanism of survival. This cellular water or plant essence offers the ability to harness a nutritional, isotonic solution capable of nourishing the skin and hair in personal care applications. **BiEau® Actif** botanical waters combine advancements in sustainable beauty and leading edge science to provide brands essential ingredients to support their unique aspirations. Innovative development of botanical waters promote the natural balance of the skin, scalp, and hair while utilizing natural plant properties to work in conjunction with the skin.

Botanical waters offer brand-differentiating properties including unique origin stories, sustainability appreciation, and efficacious beauty benefits that work with your hair and skin care for a healthy complexion. From cultured algal and mushroom cells to reanimated agricultural waste, Active Concepts maximizes raw material sourcing and creation for minimal environmental impact with the development of our **BiEau® Actif** botanical waters line.

**BiEau® Actif Brown Algae** is a sustainably sourced essence of *Laminaria japonica*, designed to encourage an isotonic environment while promoting antioxidant protection for the skin. *Laminaria japonica*, also known as the brown algae, is commonly utilized to optimize skin health and is recognized as an abundant source of nutrients including fucoidan. Natural algae polysaccharides such as fucoidan are vital components typically involved in wrinkle reduction and providing antioxidant protection against free radical damage. **BiEau® Actif Brown Algae** utilizes a novel approach to sustainability while capitalizing on the presence of fucoidan, from *Laminaria japonica*, to offer antioxidant properties and visible reduce the appearance of fine lines and wrinkles.

**BiEau® Actif Brown Algae** utilizes cellular plant essence to deliver isotonic nutrients and harmonize skin and hair. Skin is the largest organ of the body and is composed of approximately 60% water. As a protective barrier, the skin is our best defense against external aggressors.

**Code Number: 16905**

**INCI Name:** Laminaria Japonica Extract

**INCI Status:** Approved

**REACH Status:** Compliant

**CAS Number:** 92128-82-0

**EINECS Number:** 295-780-4

**Origin:** Plant

**Processing:**

GMO Free

No Ethoxylation

No Irradiation

No Sulphonation

**Additives:**

Natural Antimicrobial: Leuconostoc/  
 Radish Root Ferment Filtrate

Preservatives: None

Antioxidants: None

Other additives: None

**Solvents Used:** N/A

**Appearance:** Clear to Slightly Hazy,  
 Yellow to Brown Liquid

**Soluble/ Miscible:** Water Soluble

**Microbial Count:** < 100CFU/g,  
 No Pathogens

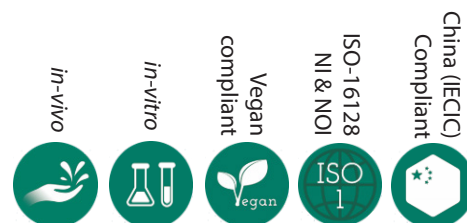
**Suggested Use Levels:** 1.0 – 10.0%

**Suggested Applications:**

Antioxidant, Reduces Wrinkles

## Benefits of BiEau® Actif Brown Algae:

- Rejuvenating
- Wrinkle Reduction
- Antioxidant



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However, the skin's permeability can be influenced by a variety of environmental attributes including pollution particles, cosmetic actives, temperature fluctuations, and water exchange. A delicate balance exists between water introduced onto our skin, using cosmetics, cleansers etc., and the water present in our skin and cells. Water exchange occurs through the cell membrane through the process of osmosis. Deionized or demineralized water can be traditionally used in the creation of cosmetic ingredients, but this water typically lacks minerals and natural components that our skin craves. Isotonic solutions offer an environment most beneficial and least disruptive to skin cells while enhancing affinity with the skin due to a mineral content close to that of skin cells. Isotonic materials maintain the size, shape, and integrity of skin cells. Some cosmetic solutions are hypotonic or hypertonic and can damage skin cells by drawing out cellular water, thereby drying out the skin, or even forcing water into the cells and causing cell deformation. Isotonic solutions maintain a natural environment and healthy balance for the skin.

## SCIENCE

Algae embodies the concept of marine sourced sustainability promoting utilization in various industries as food, biofuels, filtering materials, soil fertilizer, pharmaceuticals and laboratory growth media. Grown in house, cultured algae cells diminish the demand for algae harvesting while allowing the manufacture of various algae ingredients including algae botanical waters. The renewable nature of algae prompts their incorporation into beauty applications across skin, hair, and body care formulations. As a powerhouse of natural nutrients, vitamins, and minerals algae actives maintain the cutting edge of innovation in the cosmetic market.

Algae absorbs water and nutrients in their cells, directly from the surrounding water. Depending on the species, fresh algae are 70-90 percent water by weight. This internal cellular water contains an abundance of biologically active components and is often disregarded in the extraction of algal lipids for biofuel. Active Concepts has utilized solar energy to effectively evaporate and isolate the nutrient-rich water of *Laminaria japonica* to produce a bioactive cellular water capable of providing antioxidant capabilities and minimizing the appearance of fine lines and wrinkles.

*Laminaria japonica* is a rich, natural source of the sulfated polysaccharide fucoidan, found in many species of brown algae and brown seaweed. When used in cosmetics, this unique polysaccharide enhances antioxidant activities while minimizing photoaging by inhibiting the progression of oxidative stress. Fucoidan has also been shown to down-regulate matrix metalloproteinase (MMP), a common cause of connective tissue damage. By lessening oxidative stress, collagen synthesis may be enhanced, resulting in skin with fewer fine lines and wrinkles<sup>2</sup>.

## BENEFITS

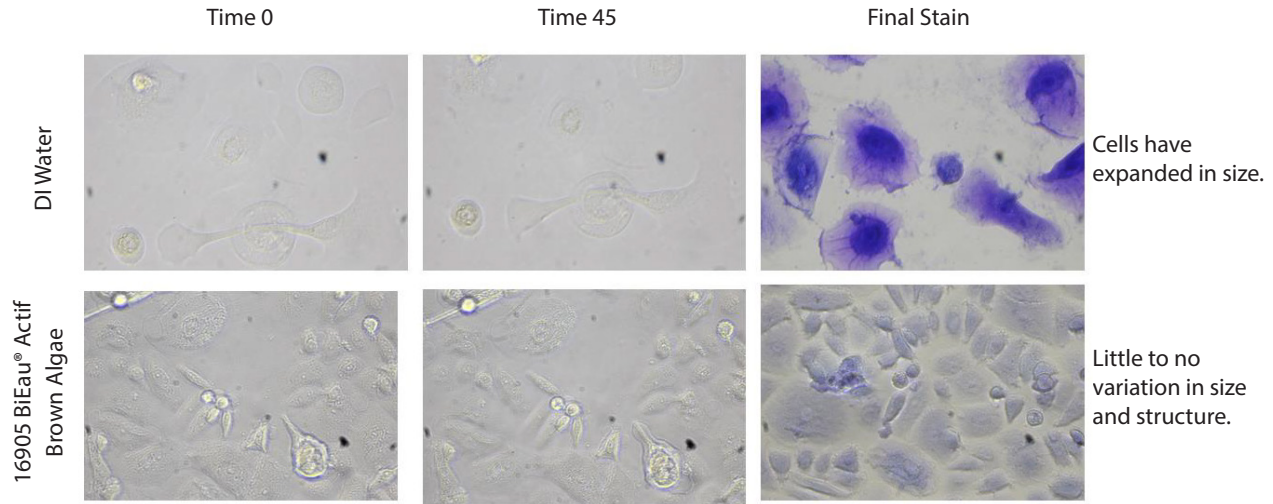
**BiEau® Actif Brown Algae** is a vital botanical essence capable of providing antioxidant capabilities while minimizing fine lines and wrinkles. **BiEau® Actif Brown Algae** utilizes a novel approach to eco-conscious cosmetic active development, while capitalizing on the presence of fucoidan from brown algae, to promote revitalized, younger-looking skin. **BiEau® Actif Brown Algae** can be used in a variety of cosmetic and personal care formulations aimed to nourish and rejuvenate.

## EFFICACY

An Osmotic Cell Pressure Membrane study was performed to evaluate how cellular water or plant essence offers the ability to harness a nutritional, isotonic solution capable of nourishing the skin and hair in personal care applications. Human dermal keratinocytes were seeded into 24-well tissue culture plates and allowed to grow to confluency in complete media. The complete media was removed and either 100% Deionized Water or 100% **BiEau® Actif Brown Algae** was added to the respective test well. Set to a 40x magnification, images were taken at time zero and every 5 minutes all the way up to the final 45 minute time mark. Crystal Violet Stain was used for enhanced microscopy imaging and a final stain image was taken of the test well.

As demonstrated in Figure 1, nature constantly tends to maintain balance. In the presence of a hypotonic deionized water solution, the deionized water will penetrate the skin cells to balance out the differences in concentration on either side of the membrane. Skin cells then swell due to the water pressure on the cell walls. The internal cellular water of the plants used in the production of our **BiEau® Actif** product line harnesses a nutritional, isotonic solution capable of supporting the skin's natural environment and promotes cellular balance. The skin cells remain in a natural environment and their morphology and integrity remain unaltered.

# BiEau® Actif Brown Algae

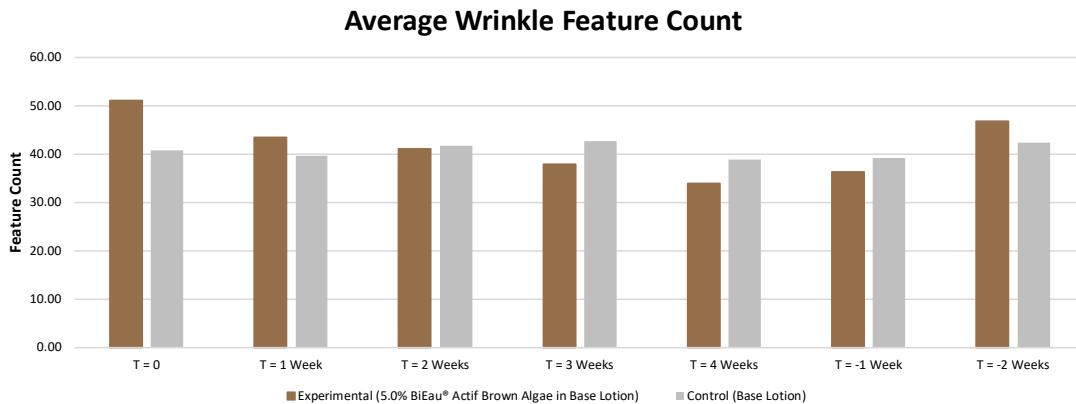


**Figure 1.** Cell Images.

\*Please note that due to the post treatment fixation and staining, the plate was removed from the microscope to complete the process. Final stain images were taken of the exact same treatment culture well, though the individual cells captured may vary from the original images.

An *in-vivo* VISIA® complexion analysis study was conducted over a period of six weeks to evaluate the effects of 5.0% **BiEau® Actif Brown Algae** in a base lotion on wrinkle parameters compared to the base lotion alone. **BiEau® Actif Brown Algae** in base lotion demonstrated the ability to reduce the average feature count of wrinkles after one week by 14.86%, compared to the control. After four weeks of treatment, **BiEau® Actif Brown Algae** in base lotion demonstrated the ability to reduce the average feature count of wrinkles by 33.51%, compared to the control. Following one week of regression, **BiEau® Actif Brown Algae** in base lotion demonstrated the ability to reduce the average feature count of wrinkles by 28.94%, compared to the control.

This study was conducted using 10 M/F participants between the ages of 24 - 60. Each participant was instructed to apply 2.0 mg of lotion to their entire face twice a day for a four week period. Participants were instructed to continue their usual skin care routine and to apply the lotion once their everyday skin care routine is finished. Half of the participant population used 5.0% **BiEau® Actif Brown Algae** in a Cetaphil Daily Facial Moisturizer for all skin types, while the other half used the Cetaphil Daily Facial Moisturizer alone as a control.



**Figure 2.** Average feature counts comparing experimental and control values at each time point.

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**Figure 3.** Panelist #2 treated with 5.0% **BiEau® Actif Brown Algae** in Base Lotion displays a reduction (16.7%) in feature counts for wrinkles from beginning of treatment (T=0) to T=4 Weeks via VISIA Image Analysis. Images on the left are panelist #2 with image enhancement, through VISIA, which provides higher visualization of feature changes. Images on the right are natural photos of panelist #2.

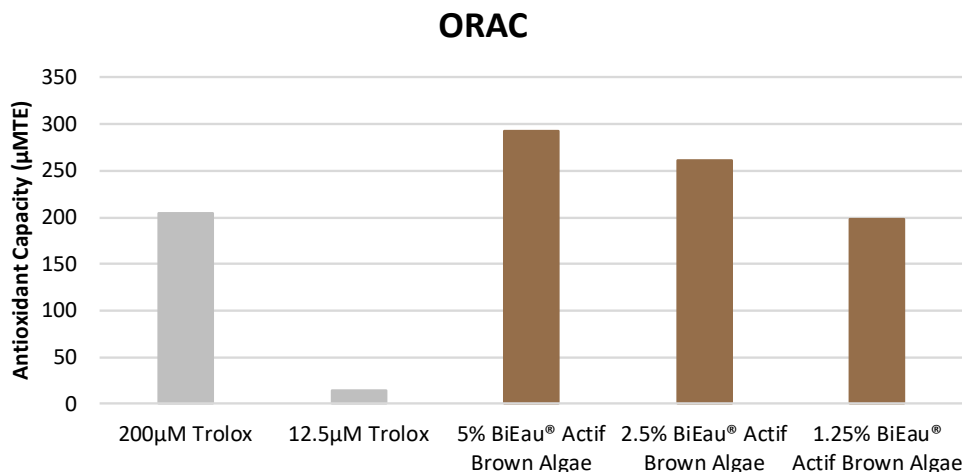


**Figure 4.** Panelist #2 treated with 5.0% **BiEau® Actif Brown Algae** in Base Lotion displays an increase (90.0%) in feature counts for wrinkles (due to the halted use of product) from 4 weeks to -2 weeks (regression) via VISIA Image Analysis. Images on the left are panelist #2 with image enhancement, through VISIA, which provides higher visualization of feature changes. Images on the right are natural photos of panelist #2.

An *in-vitro* Oxygen Radical Absorbance Capacity (ORAC) assay was conducted to assess the antioxidant capacity of **BiEau® Actif Brown Algae**. Reactive oxygen species (ROS) are generated by normal cellular processes, environmental stresses, and UV irradiation. ROS are dangerous to cellular structures and functional molecules (i.e DNA, proteins, lipids) as they act as strong oxidizing agents or free radicals. The ORAC assay is a standard method used to assess antioxidant capacity of physiological fluids, foods, beverages, and natural products. The assay quantitatively measures a sample’s ability to quench free radicals that have the potential to react with and damage cellular components.

Figure 5 displays the ability of **BiEau® Actif Brown Algae** to exhibit greater antioxidant activity than 200µM Trolox®. The antioxidant capacity of **BiEau® Actif Brown Algae** increased as the concentration increased, therefore indicating that the ability to minimize oxidative stress is dose dependent. This study concludes that **BiEau® Actif Brown Algae** is capable of providing antioxidant properties and aids in the anti-aging process offering protection at the cellular level.

# BiEau<sup>®</sup> Actif Brown Algae



**Figure 5.** Antioxidant capacity of **BiEau<sup>®</sup> Actif Brown Algae**.

**References:**

1. Jutur PP, Nesamma AA and Shaikh KM (2016) Algae-Derived Marine Oligosaccharides and Their Biological Applications. *Front. Mar. Sci.* 3:83. doi: 10.3389/fmars.2016.00083
2. Kim, Young-In, et al. "Anti-Photoaging Effects of Low Molecular-Weight Fucoïdan on Ultraviolet B-Irradiated Mice." *Marine Drugs*, MDPI, 18 Aug. 2018, www.ncbi.nlm.nih.gov/pmc/articles/PMC6117676/.
3. Wang, Jing, et al. "Potential Antioxidant and Anticoagulant Capacity of Low Molecular Weight Fucoïdan Fractions Extracted from Laminaria Japonica." *International Journal of Biological Macromolecules*, Elsevier, 31 Oct. 2009, www.sciencedirect.com/science/article/pii/S0141813009002384.



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