

CLINICAL DATA – SEABUCKTHORN OIL

Seabuckthorn oil is:

- Rich in the rare Omega-7 palmitoleic acid
- Source of natural carotenoids & tocopherols
- Forceful in promoting epidermal regeneration
- Effective in combatting inflammation

Functionality

The richest source of the rare omega-7 palmitoleic acid - a major skin constituent - Seabuckthorn oil is also packed with carotenoids & tocopherols that efficiently protect skin. Seabuckthorn oil has traditionally been used to treat burns and wounds of the skin. Seabuckthorn oil is shown to be anti-inflammatory and it has been tested to promote epidermal regeneration. The efficacy tests also show that it is an ideal active for hair care since it increases hair sheen.

Anti-Ageing Efficacy

Test Products and Study Design

The anti-ageing efficacy of Seabuckthorn oil was evaluated through measuring skin hydration, elasticity and roughness. In a clinical study 30 healthy women (aged from 50 to 70) applied a beauty cream that contained 0.1% of Seabuckthorn oil on their face twice a day for three months. Instrumental measurements were performed on the periocular area at the beginning, after 1 month and after 3 months of treatment. At the end of the test the volunteers filled in a questionnaire for a subjective evaluation.

Skin hydration

Skin hydration was measured by Corneometer CM825. A highly significant increase in skin hydration was recorded during and after the treatment indicating the skin hydration efficacy of Seabuckthorn oil (Figure 1).

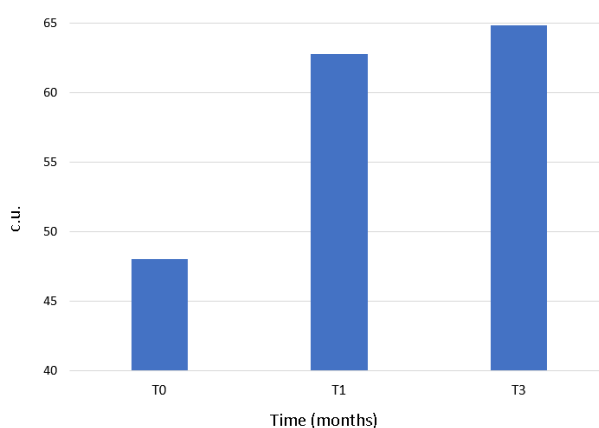


Figure 1 - Skin hydration

A highly significant increase in hydration:

- After 1 month: 30.8%
- After 3 months: 35%

29 out of 30 subjects thought the treatment was very effective or effective in hydrating the skin.

Skin Elasticity

The Cutometer SEM 575 (Courage & Khazaka) was used to measure the vertical deformation of skin. A highly statistically significant increase in skin overall elasticity was recorded during and after the treatment (Figure 2). The results show the efficacy of Seabuckthorn oil in increasing skin elasticity.

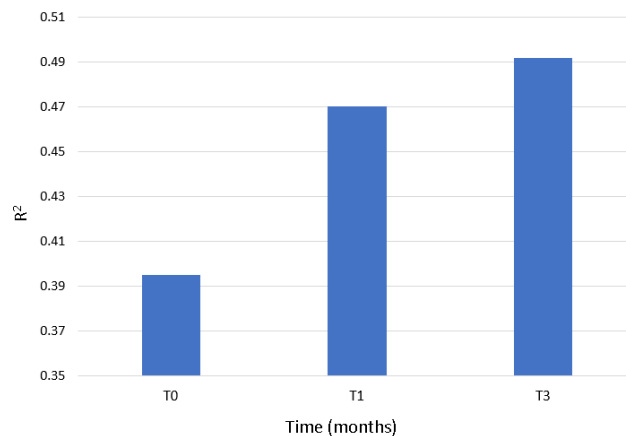


Figure 2 - Skin elasticity

A highly significant increase in skin overall elasticity:

- After 1 month: 19%
- After 3 months: 24.5%

26 out of 30 subjects thought the treatment was very effective or effective in making skin more tonic and elastic.

Skin Roughness

Image analysis (Monaderm) was used in measuring wrinkles. A decrease in skin mean roughness was recorded during and after the treatment indicating the anti-wrinkle efficacy of Seabuckthorn oil (Figure 3).

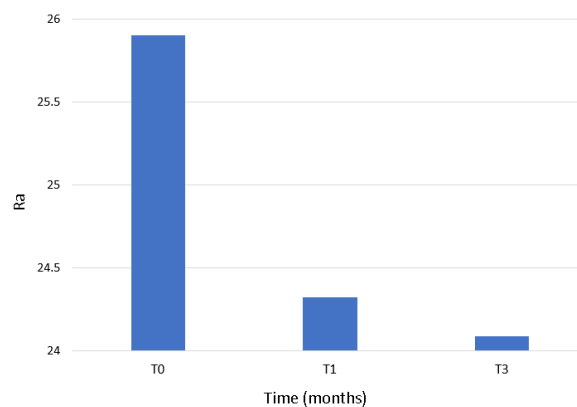


Figure 3 - Skin roughness

The decrease in skin mean roughness:

- After 1 month: - 6.1%
- After 3 months: - 7%

22 out of 30 subjects thought the treatment was very effective or effective regarding its anti-wrinkle effect.

The aim of the study was to evaluate the long-term anti-ageing efficacy of Seabuckthorn oil cream. 30 healthy women of age 30-60 years with signs of photo-aged skin applied a Cream containing 2.7 % of Seabuckthorn oils on half of the face and a base cream on the other half of the face twice a day for 8 weeks. Instrumental measurements of cutaneous hydration and elasticity were performed on the periocular area at the beginning and after 8 weeks of treatment.

Skin hydration

Corneometer CM 825 (Courage & Khazaka) was used to investigate skin hydration. A statistically significant increase in skin hydration was recorded after the Seabuckthorn oil cream treatment. (Figure 4)

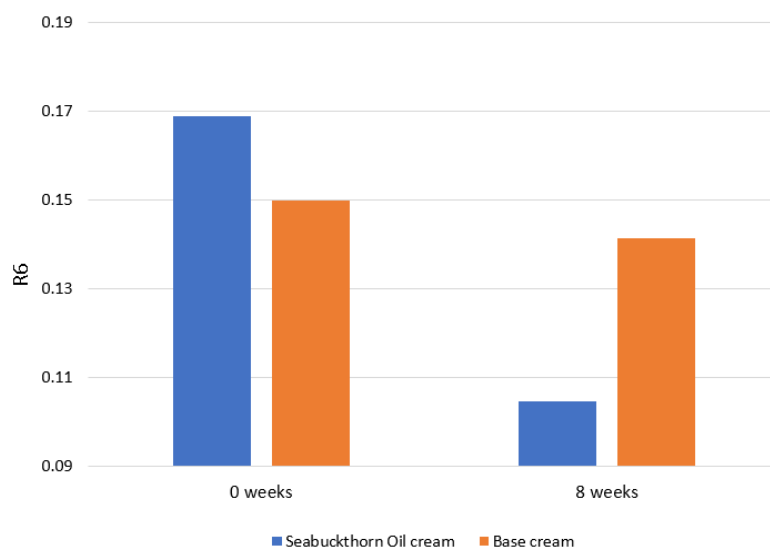


Figure 4 - Skin hydration.

Skin Elasticity

The Cutometer SEM 575 (Courage & Khazaka) was used to measure the vertical deformation of skin.

A highly statistically significant increase in skin overall elasticity was recorded after the Seabuckthorn oil cream treatment. A comparison between the variations of the Seabuckthorn oil cream and the base cream treatments showed a statistically significant difference after 8 weeks of treatment (Figure 5).

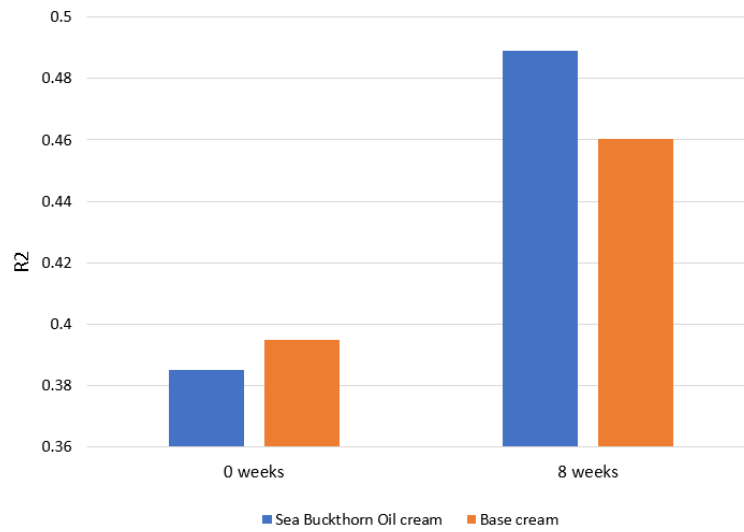


Figure 5 - Skin overall elasticity.

The area treated with Seabuckthorn oil cream showed a highly statistically significant decrease in the viscoelastic ratio. There was a highly statistically significant difference between the treatments (Figure 6).

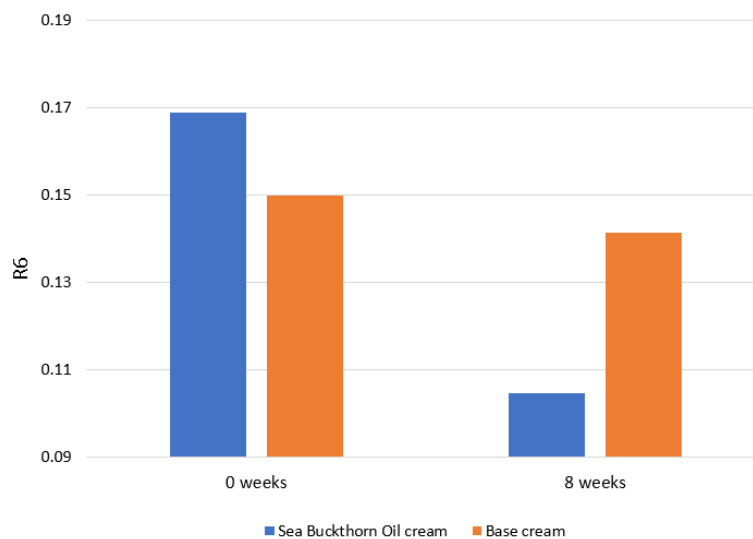


Figure 6 – Viscoelastic ratio.

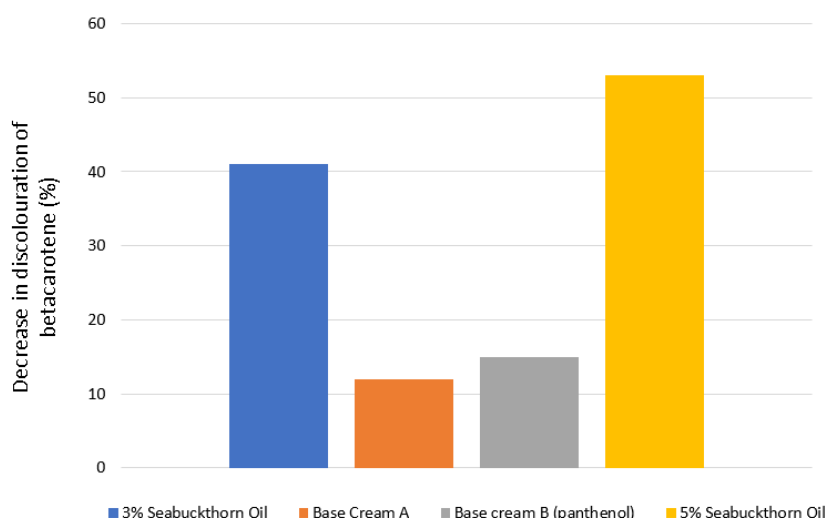
| Results after 8 weeks of treatment | Seabuckthorn oil cream | Base cream |
|-------------------------------------|------------------------|------------|
| Increase in skin hydration | + 9.7% | - 3.8% |
| Increase in skin overall elasticity | + 27% | + 16.5% |
| Decrease in viscoelastic ratio | - 38.1% | - 5.8% |

UVA Protection

Seabuckthorn oils protect skin from damage and oxidation induced by UV radiation and other stress factors.

Efficacy 1 – Radical Scavenging after UVA Radiation

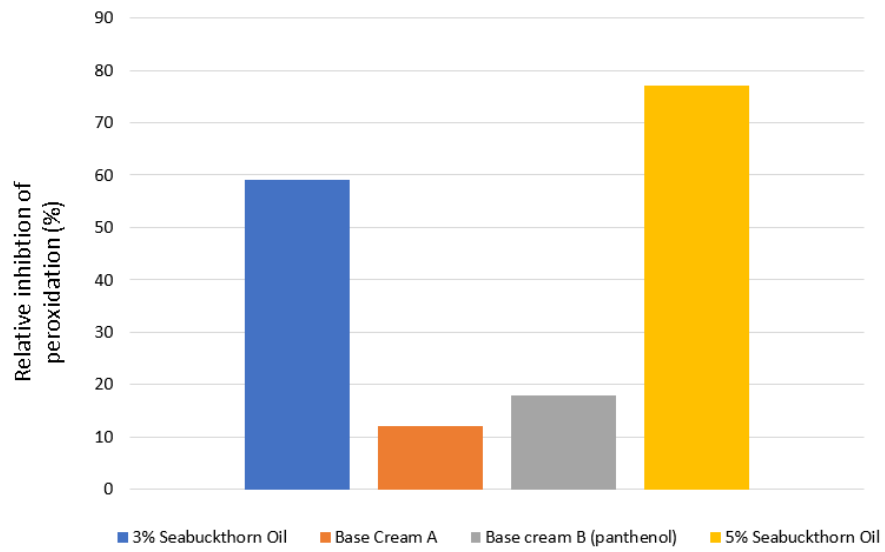
- Five persons with age range 19-40 years
- Different creams were applied on skin twice a day for seven days
- 30 min after the last treatment, diluted β -carotene solution was applied on the skin
- After another 30 min, skin was irradiated with UVA radiation (10 J/cm²)
- The colour was measured with Chromameter
- Untreated and non-irradiated skin area acted as 100 %value, untreated but irradiated skin area acted as a negative control.
- Protection (%) = $100 - 100 \times (100\% \text{ control} - \text{treatment}) / (100\% \text{ control} - \text{negative control})$



Seabuckthorn oil protects from UVA-induced damage.

Efficacy 2 – Inhibition of UVA-Induced photo-oxidate stress

- Five persons with healthy skin, age 19-27 years
- Six symmetrical areas were defined on each person's back
- Five areas were treated with one of the four formulations, 2 mg/cm², twice a day for one week. One area remained untreated.
- After the treatment these areas were irradiated with UVA (10 Joule/cm²)
- Lipids were extracted from these areas with ethanol
- Squalene (SQ) and squalene hydroperoxide (SQOOH) were analysed by HPLC
- % inhibition = $100 \times [SQOOH (\text{untreated}) - SQOOH (\text{treated})] / SQOOH (\text{untreated})$



Seabuckthorn oil reduces UV-induced lipid oxidation in the skin.