

soy cell stimulated soy stem cells

stimulated soy stem cells for a younger and firmer skin

wrinkles reduction

- 10,7 % after 7 days
- 27,3 % after 21 days

skin firmness

+ 17,9 % after 7 days
+ 24,5% after 21 days

Introduction

Soy (Glycine max) is very well known for the different activities that its phytochemical, specially characterized by isoflavones, is able to exert on skin. As an example soy isoflavones are known to interact with the tyrosine kinase receptor in a number of different cells and tissues.

Some of soy phytochemical activities on skin/skin tissues reported in literature are:

- Increased proliferation of dermal fibroblasts (+75%) and improved synthesis of type I procollagen (+114%) on the same cell model (Varani *et al.* 2004);
- Skin protection from UV induced photo-aging/photo-damage (Wei *et al.* 2012, Wang *et al.* 2010);
- Skin protection from radical mediated damage (Huang *et al.* 2008);
- Improve conditions of aged skin (Morales *et al.* 2009)

Soy stem cells were obtained forcing differentiated soy tissues to go back in the undifferentiated form obtaining a soy callus. Then solid soy stem cells were placed in a fermenter to obtain a liquid culture. During fermentation the exclusive process of stem cells stimulation was performed in order to push the stem cells to overproduce the phytochemical active molecules.

To further increase the bioavailability of the stimulated soy stem cell phytochemical, a **bioliquefaction**[®] process was associated to the stem cell stimulation process



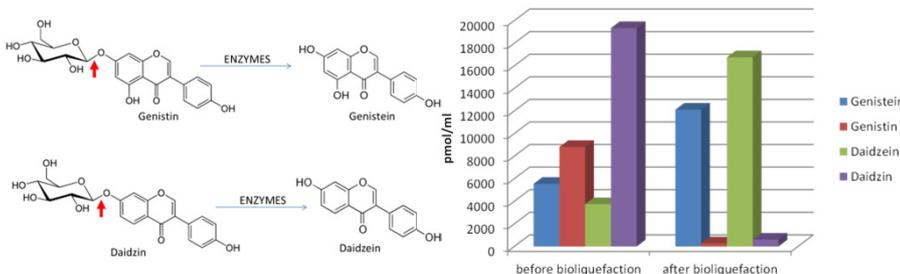
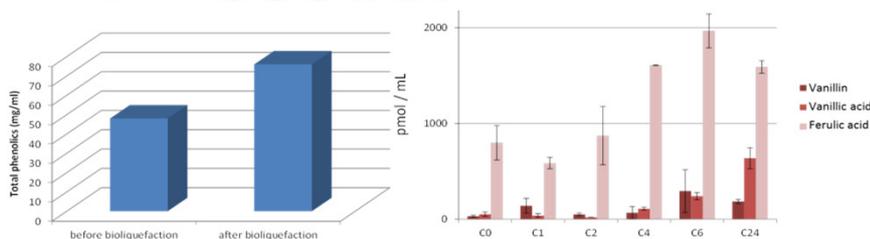
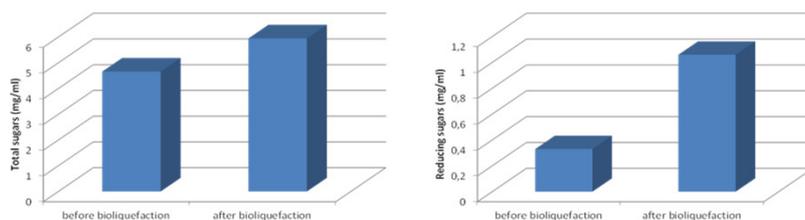
Phytochemical Biorefining Through Bioliquefaction[®]

The **bioliquefaction**[®] process is able to increase the contents of both total sugars and reducing sugars. These effects lead to a reduction of the average chain length of 1/3 (from 14,12 to 5,6 units) increasing the bioavailability.

The **bioliquefaction**[®] process is also able to intervene on the content of the bioavailable phenolic fraction. The total bioavailable phenolic content is increased of 58% after the **bioliquefaction**[®] process. Also monitoring some specific molecules of the phytochemical it is possible to see the increase of concentration through the **bioliquefaction**[®] process.

Isoflavones are one of the most interesting class of molecule of soy phytochemical. These molecules can be present both in the free form (aglycone) or in the glycosylated form. **The free form of isoflavones are far more biologically active than the glycosylated one.**

Main target of our **bioliquefaction** process are the glycosylated isoflavones that were treated with bespoke bio-catalytic processes in order to release the far more active aglycones



The bioliquefaction[®] process is able to release the free form of isoflavones deglycosylating the glycosylated fraction making the phytochemical more effective



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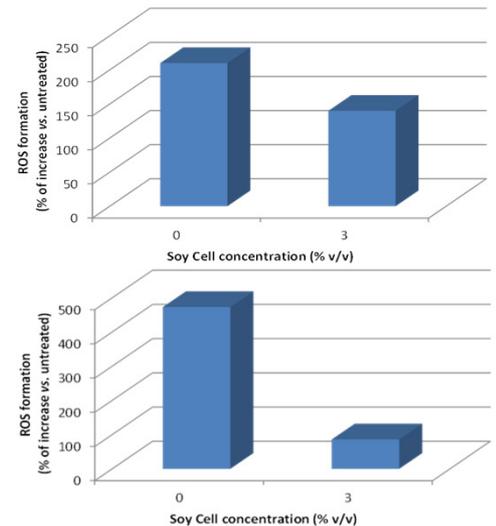
In vitro test

Radicals protection

The protective effect of **Soy Cell** 3% w/w on keratinocytes cell lines was studied. Keratinocytes were incubated for 20 minutes with a standard radical source, *tert*-Butyl hydroperoxyde (tBOOH). The amount of radicals at the end of the incubation was assessed and expressed as % vs. untreated samples. The phytocomplex of Soy Cell was able to reduce the radical content in the assay of -33% acting as a strong protectant against oxidative stress.

UV protection

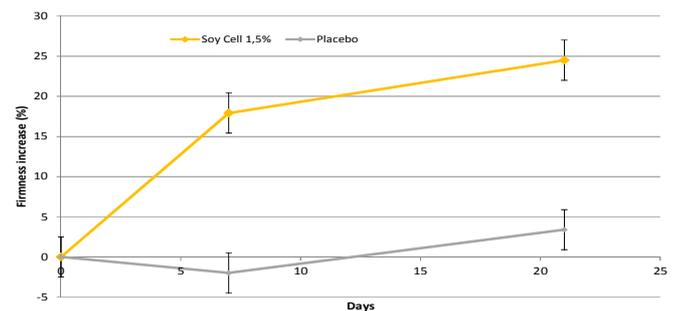
The protective effect of **Soy Cell** on keratinocytes cell lines was studied. Keratinocytes culture containing 3% w/w **Soy Cell** were exposed for 60 minutes to a 5J/cm² UVA-visible light. The amount of radicals generated by light exposure at the end of the treatment was assessed and expressed as % vs. untreated samples. The phytocomplex of Soy Cell was able to reduce the light generated radicals in the assay of -81% acting as a strong protectant against photo-oxidative stress.



In vivo test

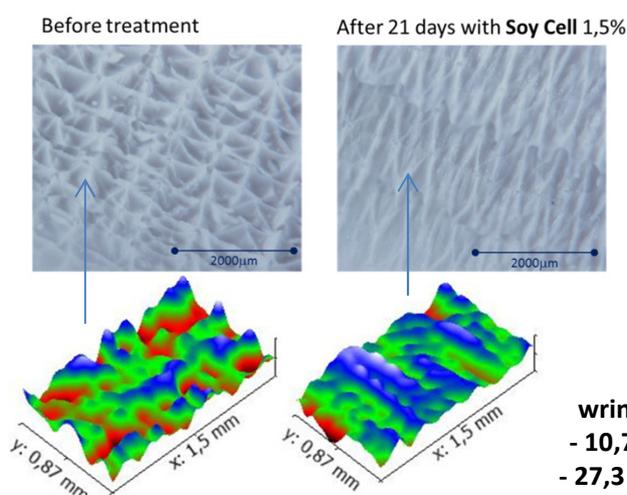
An instrumental assessment of the effectiveness of **Soy Cell** in improving skin properties and appearance was performed. 11 male and female healthy subjects, aged 28-66 years, were selected as panel of volunteers. Volunteers applied a simple gel formulation containing 1,5 % w/w **Soy Cell** twice per day on the volar surface of the forearm massaging until complete adsorption for a 21 days. The effectiveness of the product was evaluated measuring the variation in **skin firmness** and **wrinkles**.

The variation of skin **firmness** in the area treated with **Soy Cell** 1,5% w/w and with a placebo formulation are expressed as change of % vs. time zero. The analysis of the parameter showed a statistically significant increase of **skin firmness + 17,9 % after 7 days + 24,5% after 21 days**

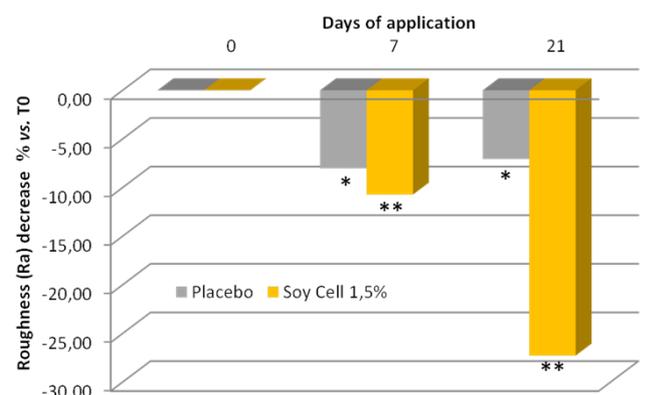


The **wrinkles variation** of skin treated with **Soy Cell** 1,5% w/w and with a placebo formulation were measured with the method of silicone replica at T0, and after 1 and 3 weeks of treatment. A 3D digital image of each replica was acquired with a HIROX KH-7700 multifocal portable microscope. Digital images were then imported on a software specifically dedicated to the data analysis of microscopy techniques to have a 3D measure of the mean roughness (Ra) of the samples.

The wrinkles profiles acquired shown a clear reduction of skin micro-relief depth. Results in terms of wrinkles reduction after 21 days of treatment with 1.5% w/w **Soy Cell** containing product and a placebo formulation are expressed as percentage of reduction compared with time zero.



wrinkles reduction
 - 10,7 % after 7 days
 - 27,3 % after 21 days



Technical specifications:

CTFA name: WATER (and) GLYCINE MAX (SOYBEAN) CALLUS CULTURE

- Ingredients: water, *Glycine max* (callus culture), citric acid, sodium benzoate, potassium sorbate.
- Suggested concentration of use: 1,5 % - 3% w/w
- Solubility: soluble in water, glycerin
- pH: 2.5 – 3.5



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