

• CHASTE TREE •

COSMETICS

**NATRISE
EXOSOME**

•

**NEXT
BEAUTY
EXPERIENCE**

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EXOSOMES IN COSMETICS

Intercellular communication is the future of advanced cosmetics for the beauty and well-being of the skin.

In this system of communication, exosomes perform a fundamental carrier function: **they transport and exchange information and bioactive molecules between the cells** of our body. They store the contents they carry to their destination and are able to penetrate even the deepest layers of the skin.

Valued for their antioxidant, anti-inflammatory and cell regeneration properties, they are mainly used in cosmetic treatments to attenuate and delay the processes of skin ageing.

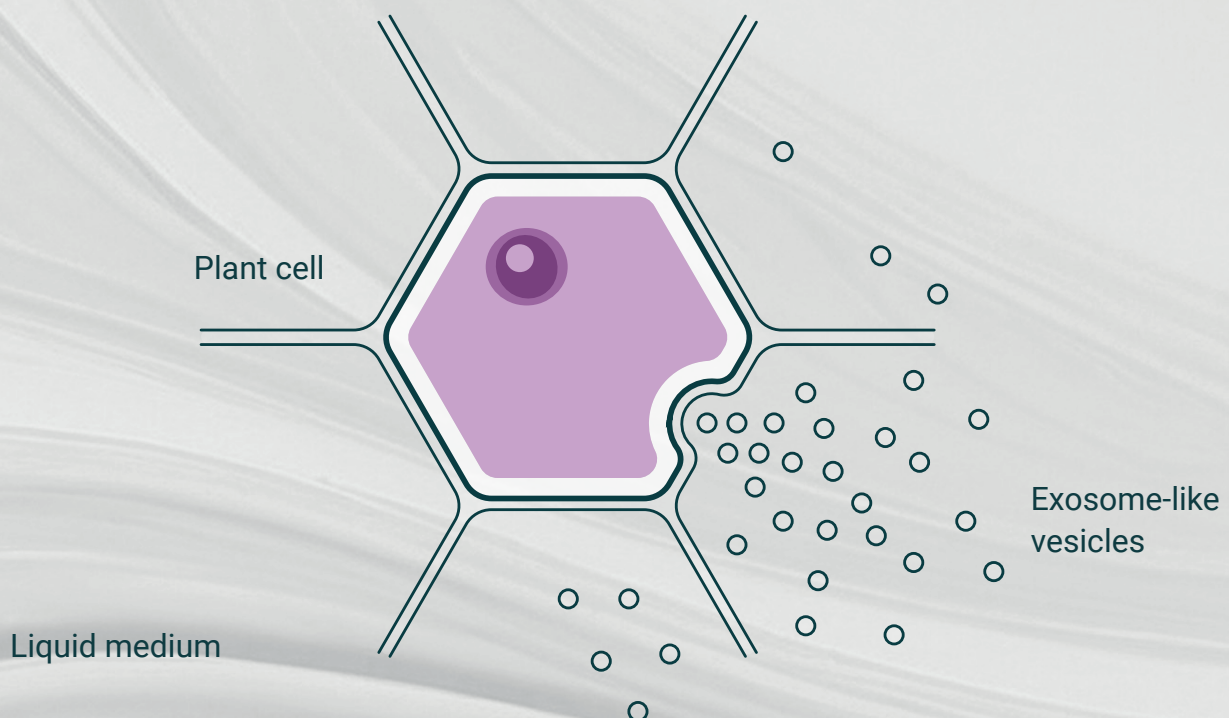
PLANT EXOSOMES FROM PLANT CELL SUSPENSION CULTURES

At ABResearch, we produce *exosome-like* plant extracellular vesicles (Plant Evs) for the cosmetics market, more commonly known as **plant exosomes, from plant cell suspension cultures**.

We use our **Natrise Exosome biotechnology, a production platform that preserves the integrity of plant exosomes**.

Natrise Exosome plant exosomes are the result of physiological processes occurring in the plant cells that we cultivate in liquid medium and which are released by the plant cells themselves in a completely natural way, with no external intervention.

We use neither animal products nor GMOs in our production process.



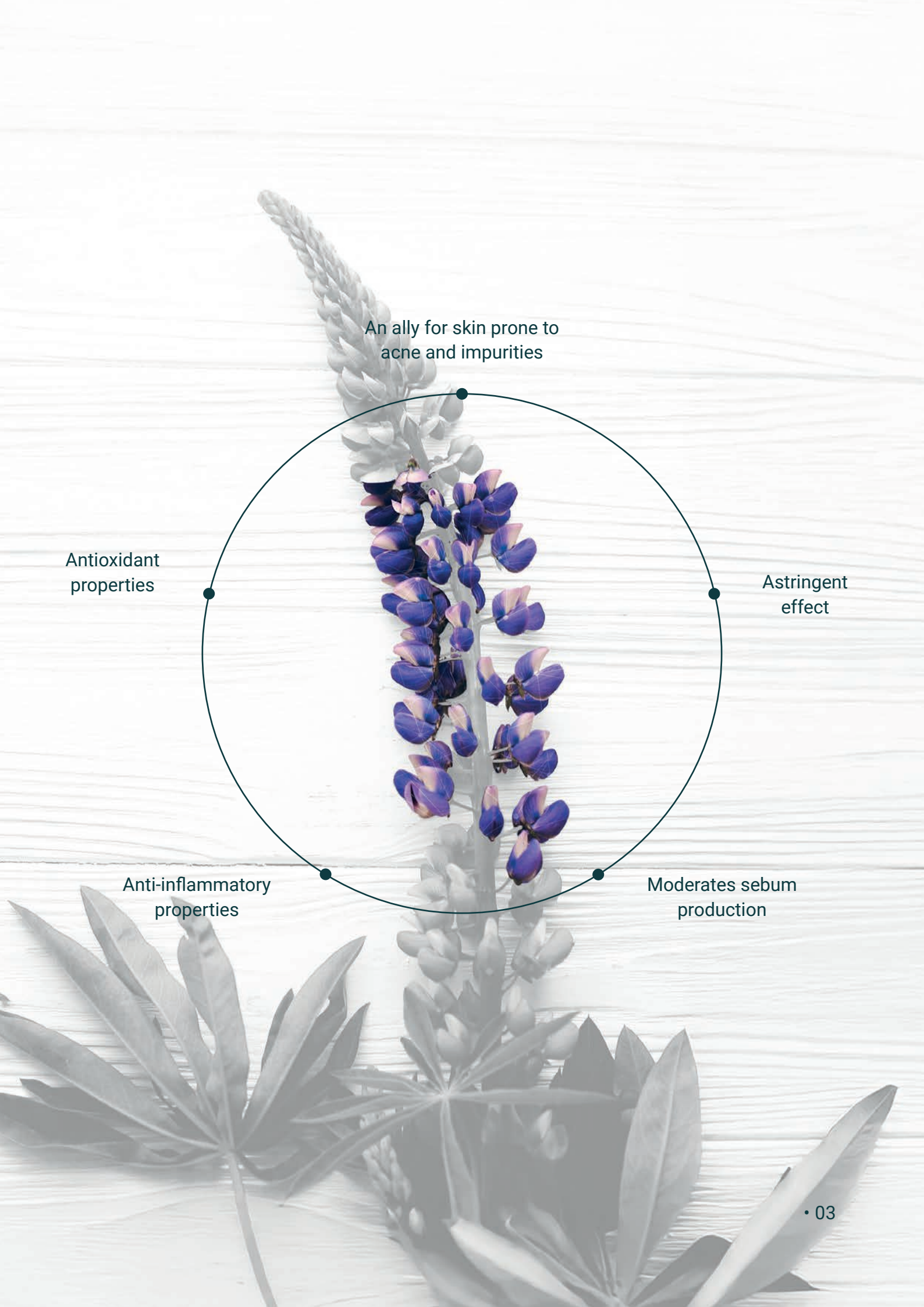
CHASTE TREE • *VITEX AGNUS-CASTUS*

The Chaste tree is used as an ingredient in cosmetic formulations for **skin well-being**. Its **antioxidant and anti-inflammatory properties** make it suitable not only for anti-aging cosmetics, but also for products specifically designed for sensitive skin prone to impurities and acne.



The Chaste tree is chosen as a cosmetic ingredient because:

- Thanks to its **anti-inflammatory and soothing properties**, it helps alleviate typical irritation of reddened or inflamed skin.
- It boasts an **astringent effect**, improving the appearance of pores and promoting smooth, even skin.
- Helps **moderate sebum production** for skin that appears less shiny.
- Rich in **natural antioxidants** that protect cells from the damaging effects of free radicals and oxidative stress, slowing down the physiological processes of cellular aging.
- It is an ally for the skin **against environmental stresses**.



An ally for skin prone to
acne and impurities

Antioxidant
properties

Astringent
effect

Anti-inflammatory
properties

Moderates sebum
production

CHASTE TREE PLANT EXOSOMES FROM PLANT CELL SUSPENSION CULTURES

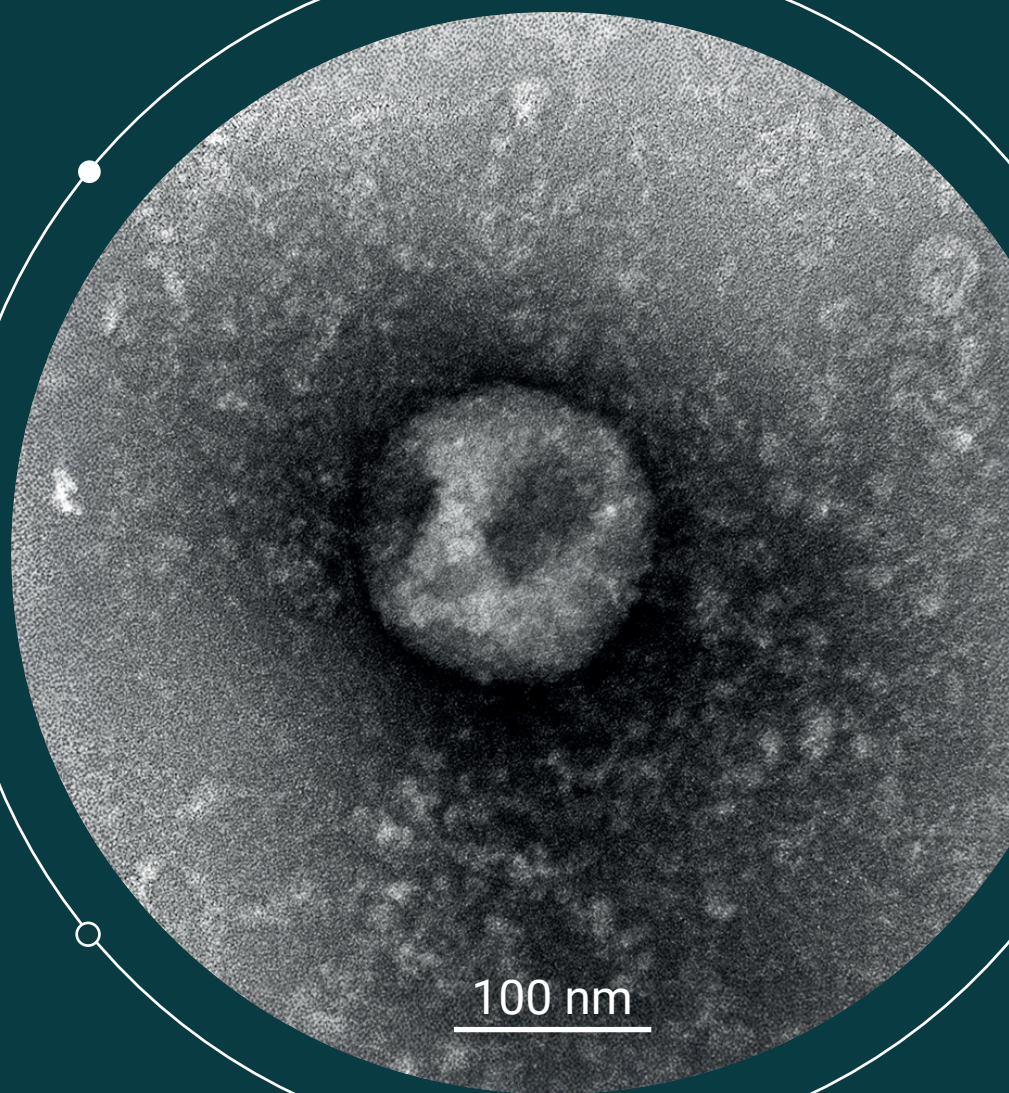
At ABResearch, we use our Natrise Exosome biotechnology to produce **plant exosomes from Chaste tree suspension plant cell cultures**.

Our Chaste tree plant exosomes have **concentration standards of 2.0×10^{11} exosomes/litre** and a size of **between 50 and 160 nanometres**.

SIZE
50 – 160 nm

CONCENTRATION
 2.0×10^{11}

Viewing with a transmission
electron microscope



100 nm

RECOMMENDED USE

Our plant-derived Chaste tree exosomes can be used in cosmetic formulations designed for **sensitive skin prone to impurities**. Especially in cosmetic products with **anti-inflammatory properties**, ideal for reddened or irritated skin.

FUNCTIONAL TESTS

- Anti-inflammatory capacity
- Toxicity
- Antioxidant power
- Protection against oxidative stress
- Cell regeneration
- Collagen production

ANTI-INFLAMMATORY CAPACITY

In-vitro tests were carried out to evaluate the anti-inflammatory capacity of our plant-derived Chaste tree exosomes. For this purpose, we measured the levels of the inflammatory cytokines interleukin-6 (IL-6) and TNF- α .

To induce inflammation, control cells and cells pre-treated with Chaste tree exosomes were stimulated with an inflammatory cocktail.

IL-6

The measurement of interleukin-6 showed that our plant-derived Chaste tree exosomes, at a 1% dilution, have a **strong anti-inflammatory effect**.



TNF- α

The TNF- α test also confirmed the **anti-inflammatory capacity** of our plant-derived Chaste tree exosomes at a 1% dilution.



ABSENCE OF TOXICITY

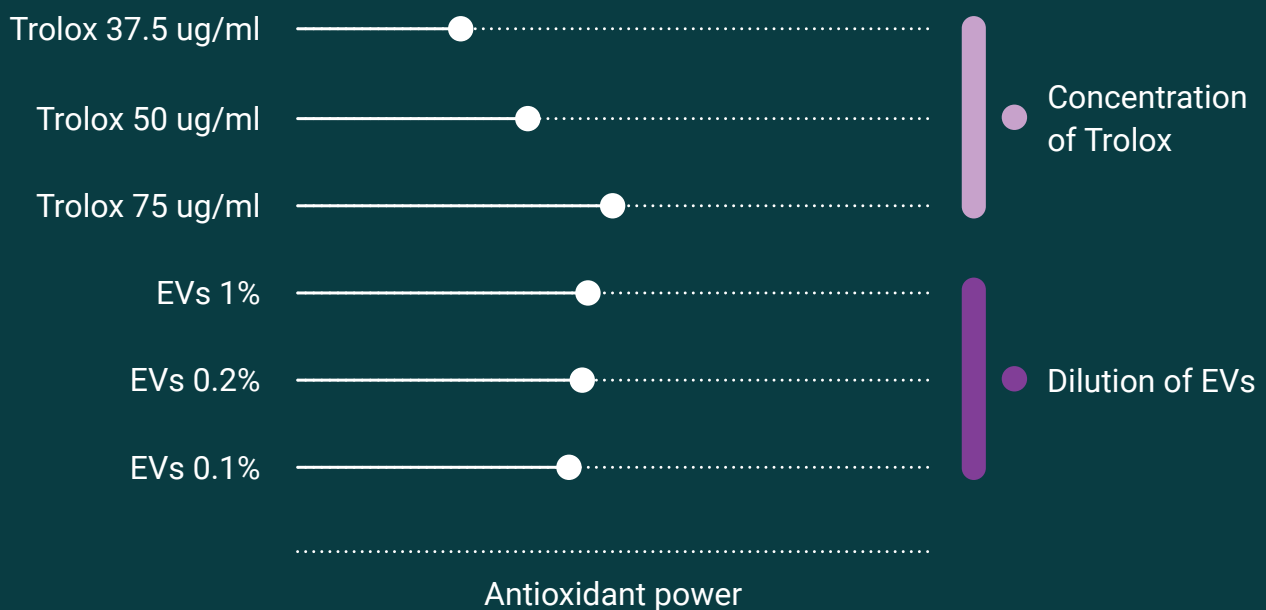
In-vitro tests we conducted on keratinocyte and fibroblast cell models confirmed that **our plant-derived Chaste tree exosomes are non-toxic**. Our plant-derived Chaste tree exosomes were considered at increasing dilutions of 1%, 0.2% and 0.1%.

ANTIOXIDANT POWER

We carried out *in-vitro* tests to assess the effective antioxidant power of our plant-derived Chaste tree exosomes.

DPPH test

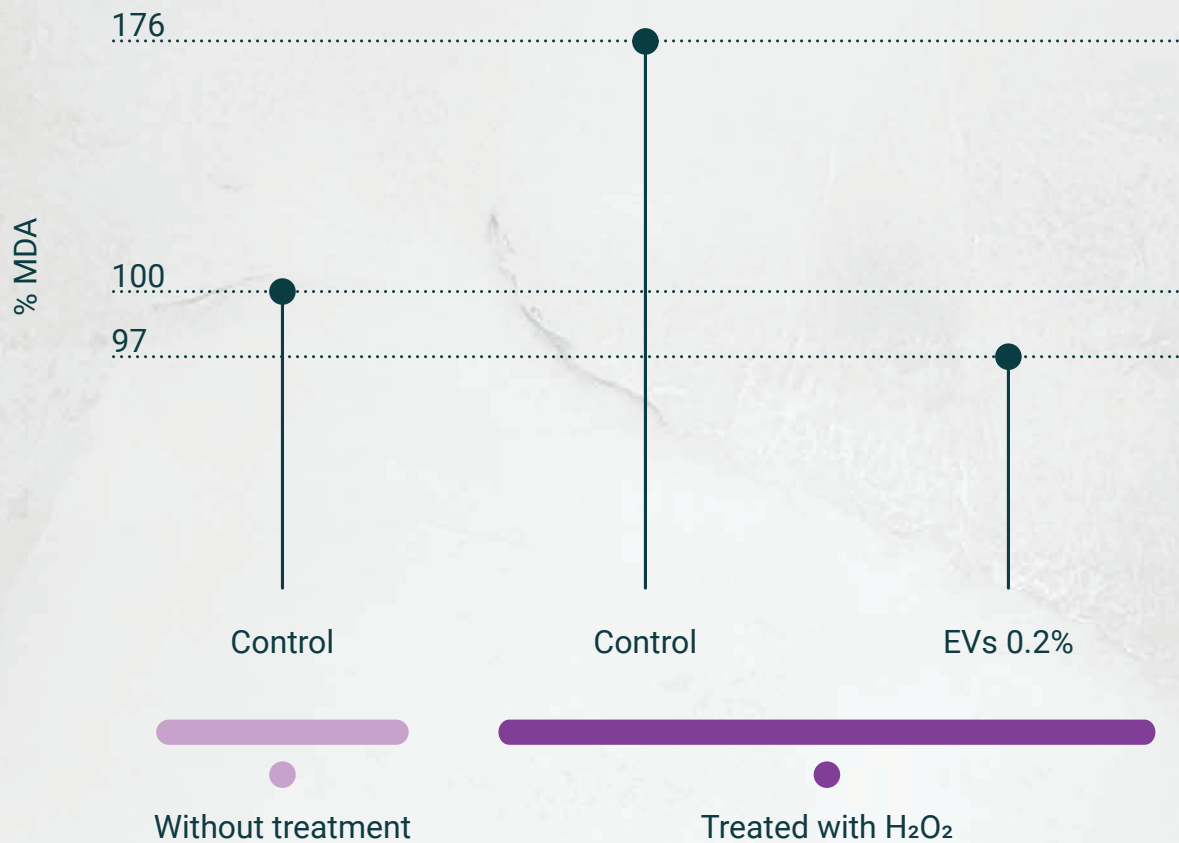
The comparison test with Trolox (Vitamin E) showed that **our plant-derived Chaste tree exosomes exhibit a high antioxidant capacity** even when diluted to the final concentration of 1% or 0.2%.



MDA test

We evaluated the degree of lipid peroxidation by measuring the level of malondialdehyde, the marker of oxidative stress in lipids. The cells were subjected to oxidative stress induced by hydrogen peroxide.

The MDA test has confirmed the **antioxidant capacity of our plant-derived Chaste tree exosomes, capable of protecting cells from damage by free radicals.**

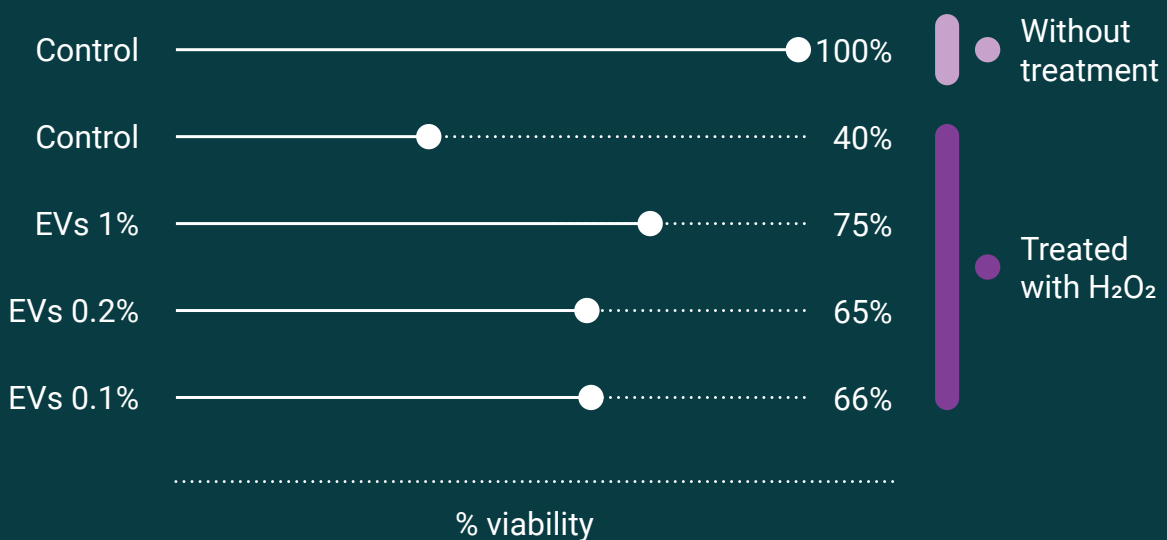


PROTECTION AGAINST OXIDATIVE STRESS

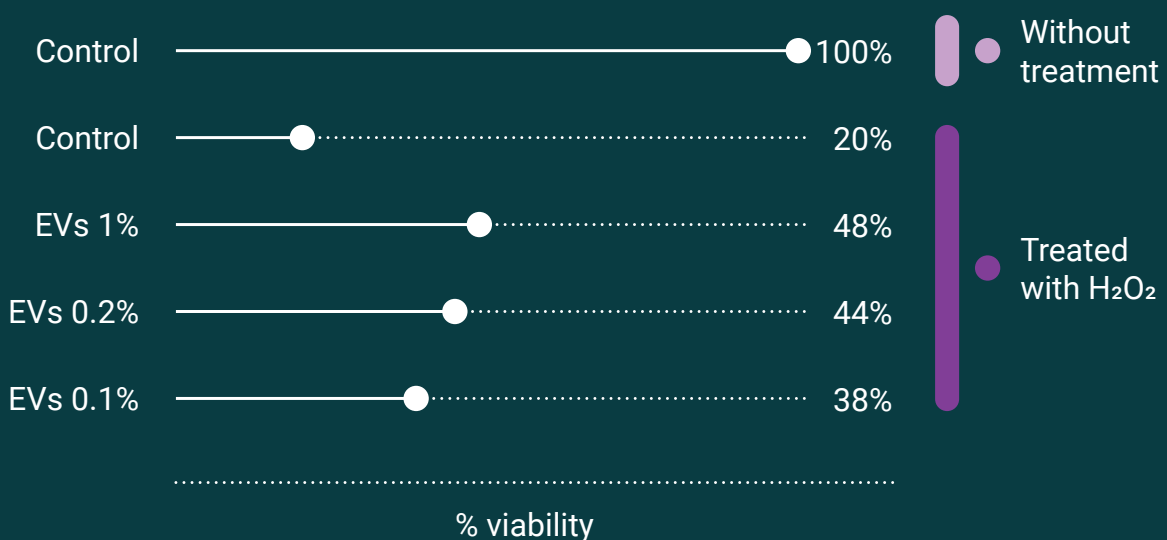
Through *in-vitro* cell survival tests, we evaluated the ability of our plant-derived Chaste tree exosomes to protect cells from oxidative stress. Hydrogen peroxide was used to induce a condition of oxidative stress on the cells for 2 and 24 hours.

The results showed that **our plant-derived Chaste tree exosomes maintained high cell viability both in cases of acute oxidative stress (2-hour treatment) and prolonged stress (24-hour treatment).**

MTT test (2 hours)



MTT test (24 hours)



CELL REGENERATION

Using the scratch test technique, we evaluated the ability of our plant-derived Chaste tree exosomes to promote cell regeneration.

The test showed that our **Chaste tree exosomes can enhance natural skin regeneration**. After 48 hours, the repopulated surface area was greater in the samples containing cells and exosomes than in the cell-only sample.

46%

Control

86%

EVs 1%

75%

EVs 0.2%

CUT

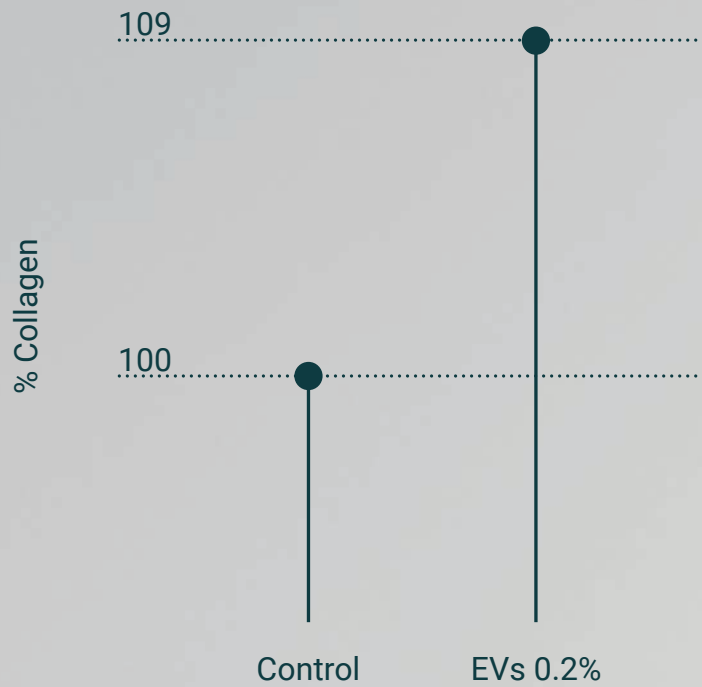
Microscope vision

**48 HOURS WITH
EXOSOMES 1%**

**48 HOURS
WITHOUT
EXOSOMES**

COLLAGEN PRODUCTION

In-vitro test on collagen production revealed that our plant-derived Chaste tree exosomes stimulated **collagen production** by approximately +10% in cells, compared to the comparison sample.



● **Product**

Plant-derived Chaste tree exosomes (*Vitex agnus-castus*)

● **Product name**

EVin VITEX

● **Field of application**

Ingredient for B2B cosmetic applications

● **Suggested claims**

For sensitive skin prone to impurities | Anti-inflammatory properties

● **Size of exosomes**

50 - 160 nanometres

● **Concentration standards**

2.0×10^{11} exosomes/litre

● **Recommended usage level**

0.2 - 1%

● **Technology**

NATRISE EXOSOME Platform (plant cell suspension cultures)





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