

Distinctive® Phytostem Lilac

INCI: Maltodextrin, Syringa vulgaris (Lilac) Leaf Cell Culture Extract

October 13, 2010 rev.

Plant Tissue Culturing

In recent years, researchers have successfully developed active ingredients through *plant tissue culturing*. Many medicinal, nutritional and cosmetic active ingredients have been enhanced through this technology.

Resources of Nature, in partnership with global leaders in this field, can now selectively harvest cells from a plant, allowing the utilization of even the most rare plant species without harm. These cells are specially cultivated to generate cultures rich in plant stem cells and complex compounds. These specifically designed plant cell cultures act as nature-made liposomes and are fully compliant with the skin, perfect for delivering their contents of powerful antioxidants and cell regenerating molecules.

Up until recently, harvesting these highly active cells had been extremely difficult and expensive. Through advances in the most specialized processing technologies, they are now available in quantities feasible for commercialization for cosmetic applications as "**Distinctive® Phytostem Cell Ingredients**".

Compared to standard botanical extraction methods, this highly sustainable, eco-friendly technology provides higher purity products with up to 1000 times the active molecule concentrations, and because of their highly controlled production techniques, Distinctive® Phytostem Cell Ingredients meet and exceed Certified Organic and Bio-Eco Cosmesi guidelines.



Recognized for its attractive and highly recognizable, sweet-smelling clusters of pink, purple or white flowers, the lilac is best known for its use in gardens throughout Europe and North America. The common lilac, also known as *Syringa vulgaris*, is a hardy deciduous shrub originating from southeastern Europe.

In addition to its popularity as ornamental plant, the lilac has been known throughout history for its medicinal properties; its leaves and fruit, tonic and used to control fever, disease and skin disorders. The extract of the lilac contains the defense molecule verbascoside (also known as acteoside). This highly studied phenylpropanoid functions to protect the plant against physical, environmental and microbial harm.

Recent studies have revealed that verbascoside is highly effective in humans as a cellular protectant with great potential as a nutritional supplement and for topical skincare applications.

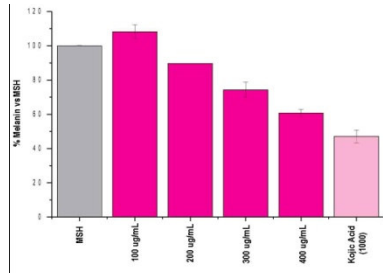
Distinctive® Phytostem Lilac is a cell culture extract titrated in verbascoside. By selecting the highest verbascoside-producing cell strains from the lilac and carefully controlling the plant cell culture, we are able to produce this highly active molecule in much higher concentrations and with greater purity than by using standard extraction techniques.

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|--------------------|----------------|------------------------|-------------------------|--------------------|
| ◆ Anti-Acne | ◆ Anti-Oxidant | ◆ Anti-Inflammatory | ◆ Collagenase Inhibitor | ◆ Anti- Malassezia |
| ◆ Sebum Regulating | ◆ Protective | ◆ Tyrosinase Inhibitor | ◆ Anti-Erythema | ◆ Anti-Aging |

Distinctive® Phytostem Lilac

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ANTI-TYROSINASE ACTIVITY



Lilac 10 produces a significant reduction (~40%) at 400 ug/mL, of the melanin synthesis in cultured melanocytes. This is comparable to the inhibition of ~50% reached by the positive reference standard (1000 ug/mL kojic acid).

SEBUM REGULATING ACTIVITY



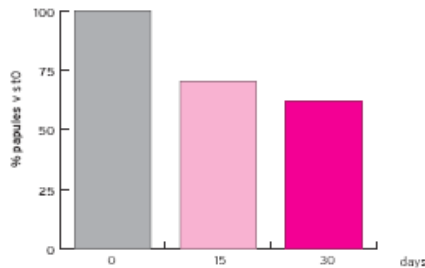
Effective against 5 α -reductase, enzyme involved in sebum production. Inhibits 5 α -reductase, especially type II, more efficiently than Serenoa repens alcoholic extract, a common benchmark for this type of activity.

ANTI-ACNE ACTIVITY (Clinical Test Results)

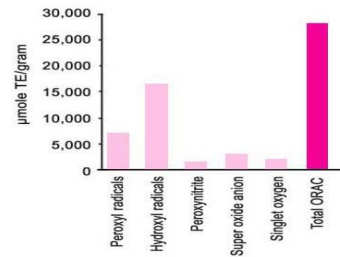


Distinctive® Phytostem Lilac 10 reduces acneic lesions by 40% after just 30 days of treatment and provides a significant reduction in inflammation and pigmentation.

% PAPULES



ANTI-OXIDANT ACTIVITY



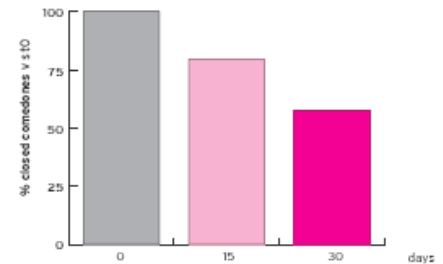
Distinctive® Phytostem Lilac quenches all free radical species to offer total protection anti-aging function.

ANTI-ACNE ACTIVITY (Clinical Test)

Protocol:

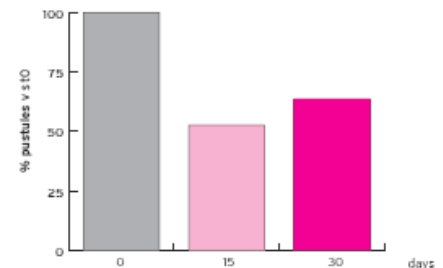
- Evaluation of 29 volunteers (15-25 years old) affected by papulopustular (12) and comedonal (17) acne
- Cream containing 1% Distinctive® Phytostem Lilac 10 applied twice daily for 30 days
- Count of acneic lesions (closed comedones, open comedones, papules, pustules) on the face at 15 and 30 days
- Instrumental evaluation: skin hydration, colour, TEWL, sebum (Data not shown)

% CLOSED COMEDONES



Reduction of the number of comedones (open and closed) in 93% of patients.

% PUSTULES



Reduction of the number of papules/pustules in 81% of patients.

Distinctive® Phytostem Lilac

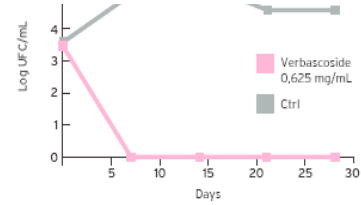
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ANTI-ACNE ACTIVITY

Material Tested	Dilution	MIC (ug/ml)	%
Lilac 50	1:16	625	0.06
Triclosan	1:8	400	0.04
Salicylic Acid	<1:4	>2000	>0.2

Distinctive® Phytostem Lilac 50 was found effective against *P. acnes* at low use levels (0.06%). Method confirmed by spectrophotometry at 425nm with BioRad 3550-UV microplate reader.

ANTI-MALASSEZIA FURFUR ACTIVITY



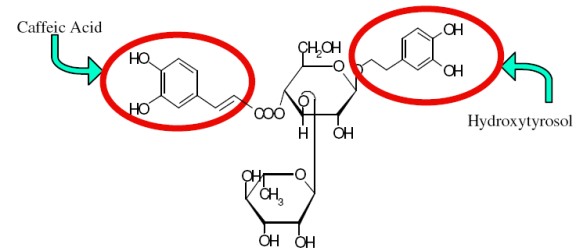
Verbascoide is a strong inhibitor of *Malassezia furfur* yeast growth with a MIC (Minimum Inhibitory Concentration) of 0.625 mg/mL.

ANTI-INFLAMMATORY ACTIVITY



Verbascoide shows a strong anti-inflammatory activity since it induces a dose-dependent decrease of the expression of the pro-inflammatory chemokine IL-8 on primary cultures of human keratinocytes stimulated by TNF-α.

VERBASCOIDE



Phenylpropanoids are Caffeic acid derivatives.

TYPICAL PROPERTIES

Composition

Appearance
Solubility
Preservatives
Aflatoxins
GMO
Pesticides
Microbiology
Packaging
Storage
Shelf Life

DISTINCTIVE® PHYTOSTEM LILAC 10

Syringa vulgaris (Oleaceae) cell culture extract titrated at 10% of verbascoide and maltodextrin
Amber-colored powder
Freely soluble in water (Eur. Ph. 5th Edition)
Absent
Absent
Absent
Absent
Total microbial count: Bacteria < 100 CFU/g
1 kg
Store the product in the original, well closed container, in a cool, dry area and protected from light
24 months

DISTINCTIVE® PHYTOSTEM LILAC 50

Syringa vulgaris (Oleaceae) cell culture extract titrated at 50% of verbascoide and maltodextrin

FORMULATION GUIDELINES

DISTINCTIVE® PHYTOSTEM LILAC 10

Use Level: 0.5 – 1.0 %
Suitable for O/W emulsions, serum, creams, gels... Introduce during the cooling phase. pH ≤4.5
Compatible with alpha hydroxy acids and beta hydroxy acids, including salicylic acid

DISTINCTIVE® PHYTOSTEM LILAC 50

Use Level: 0.1 – 0.2 %

SAFETY

Safety tested for both cosmetic and nutritional applications

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