



VARIATI 1926

Evosina[®] 100

Evosina[®] GP Green

variati.it



**Cosmetic
Division**

Evosina®

Origin

In a wide number of species and varieties of lichens including genus *Usnea*, *Cladonia*, *Cetraria* and *Parmelia*, we can find **USNIC ACID** a characteristic molecule, belonging to the family of lichenic acids, possessing strong antibacterial properties and present at concentrations ranging from 0.5 to 2%.

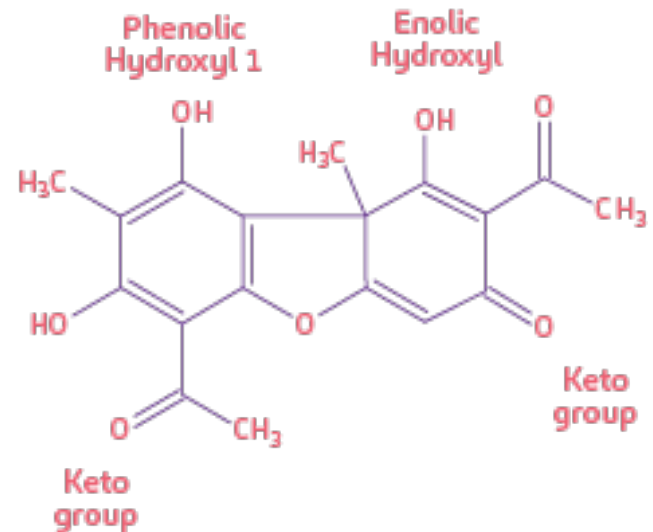


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Usnic Acid: properties & chemical structure

Different experimental evidences have reported a significant decrease of the antibacterial activity in compounds where the hydroxyl groups had been esterified, acetylated or otherwise substituted.

The maximum activity profile is probably related to maintaining the structure integrity of the usnic acid molecule, including its salts.



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Sodium Usnate

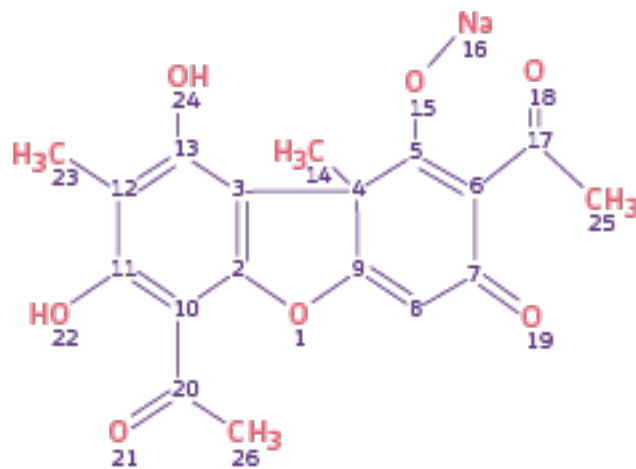


To overcome the poor solubility of Usnic Acid, Variati research developed **Evosina®**, the sodium salt derivative, which shows a better solubility together with an identical strong activity profile.

	Antibacterial properties	Solubility
Usnic acid	● ● ●	●
Evosina® (Sodium Usnate)	● ● ●	● ●

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Sodium Usnate: chemical structure



The sodium salt derivative has been obtained salifying usnic acid on the most reactive hydroxyl oxygen on position 15.

The salification process allows to save the basic molecular di-benzo-furan-dione structure, therefore maintaining intact all the anti-microbial properties.

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Specialties

Evosina® has been developed in two versions:

- » **Evosina® 100**,
in powder form, glycol free
- » **Evosina® GP Green**,
in vegetal origin propylene glycol solution.

Both products are certified by **green standards** (Cosmos)

Sodium
Usnate
from lichen

100% plant
derived
ingredients

Propylene
glycol from
rapeseed and
sunflower oils

Renovable
sources

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Application fields

Deodorant

Antidandruff

Acne

Oral care

Evosina®

Efficacy study: antibacterial properties

In order to experimentally confirm the bacteriostatic properties, **Evosina®** has been firstly *in vitro* tested on different Gram⁺ bacteria strains such as *Staph. aureus* and *Staph. epidermidis*, that typically inhabit human skin.

The average MIC results of about 5 ppm (0.0005%), lower than the value found for Usnic Acid itself (10 ppm), confirm for **Evosina®** (Sodium Usnate) the same activity profile of its parent molecule.

Gram ⁺ Strain tested	MIC (in ppm)			
	20	10	5	2
Staphylococcus aureus	-	-	+	+
Staphylococcus Epidermidis	-	-	-	-
K. Rhizophila	-	-	-	-
S. Pyogenes	-	-	-	+
Bacillus cereus	-	-	-	-
B. Spizizenii	-	-	-	-
Enterococcus hirae	-	-	+	+

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Bacteria and body odours

The effective control of the resident bacteria proliferation within some critical body areas, like the underarm, it is considered a correct and physiological method to avoid “bad odor” formation, such deriving from the degradation process made by the bacteria population, present on the skin surface, on apocrine sweat.



Such process leads to the formation of chemical compounds having a low molecular weight and therefore volatile (*e.g. short chain acids and aldehydes*) which are perceived in the ambient as “bad odour”.

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Efficacy studies: counteracting body odor

From studies in literature, *Staph. epidermidis* and *Corynebacterium tuberculostearicum* turned out the most frequently strains isolated from plugs of human volunteers and related to the body odor*.



Strain tested	MIC
<i>Staphylococcus epidermidis</i>	2 ppm
<i>Corynebacterium tuberculostearicum</i>	2 ppm

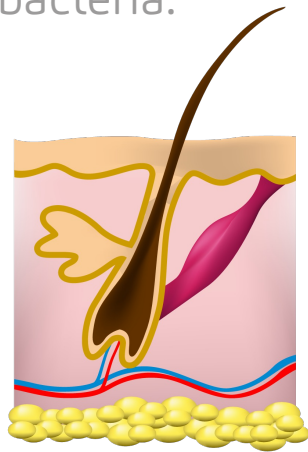
MIC value of **Evosina® 100** towards bacteria typically involved in body odours.

As for *S. epidermidis*, **Evosina® 100** revealed the same very low MIC value (2 ppm) also against *C. tuberculostearicum*, confirming its strong selective antibacterial properties and turning out an effective natural alternative for deodorant cosmetic products.

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Efficacy studies: balancing acne prone skin

Acne can be described as a disorder of the pilosebaceous unit, also characterized from a skin microflora imbalance. Propionibacterium acnes is a Gram⁺ resident bacteria of the skin's follicles, mostly involved in this skin discomfort, together with further bacteria, such as Staph. epidermidis and Corynebacteria.



Evosina® 100 showed a very low MIC value also against P. acnes.

Strain tested	MIC
Propionibacterium acnes	0.01%

MIC value of **Evosina® 100** towards Propionibacterium acnes

Evosina® controls the excess of bacteria proliferation while favors a full reset of the skin microbiota balance.

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Efficacy studies: anti-dandruff & dermatitis (*in vitro*)

Evosina[®] showed very high potential in counteracting dandruff and dermatitis



Strain tested	MIC
Malassezia furfur	0.1%

MIC value of Evosina[®] GP Green towards Malassezia furfur

Evosina[®] GP Green showed a very **low MIC** result towards Malassezia furfur (P. Ovale) a genus of fungi naturally found on the skin surface and responsible of these annoying discomforts.

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Efficacy studies: anti-dandruff (*in vivo* - rinse off)

Evosina® reduces dandruff and redness, restoring sebum balance of the scalp



Evosina® GP Green showed very good results in reducing:

- » **dimension and number of scales**
- » **intensity and area of redness**

and improving:

- » **sebum balance**

of both dry and greasy dandruff scalp.

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Efficacy studies: fighting oral pathogenic strains

Evosina® GP Green shows very low MIC values towards *Streptococcus mutans* and *Porphyromonas gingivalis*, typical pathogenic microorganisms of the oral cavity mainly involved in bacteria biofilm formation, tooth decay, periodontal diseases and halitosis.

Strain tested	MIC
<i>S. mutans</i>	2.5 ppm
<i>P. gingivalis</i>	1.25 ppm

MIC value of **Evosina® (Sodium Usnate)** towards typical oral strains

Evosina® GP Green showed very high potential in counteracting bacteria that typically colonize mouth and are responsible of tooth decay and halitosis



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Formulation

Suggested formulations with **Evosina®** include:

- Deodorant roll-on
- Sprayable deodorant cream and solution
- Intimate hygiene products
- Acne-prone skin treatments
- Anti-dandruff shampoo
- Toothpastes and mouthwashes

Suggested dosage:

- » 0.01 - 0.02% **Evosina® 100**
- » 0.1 - 1% **Evosina® GP Green**

Evosina® 100 and
Evosina® GP Green are
both suitable for natural
cosmetic products



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Notes for formulator

Evosina® 100 and **Evosina® GP Green** can be both used in cosmetic formulation, taking into account the below simple suggestions

- » **Detergent systems:** incorporating **Evosina®** specialties at the end of the process before reducing pH at the value needed.
- » **Emulsions: adding the specialties** during the cooling process under stirring.

NB

Before adding in formulation, **Evosina® 100** must be pre-solubilized in solvents, such as alcohol, glycerin, propylene glycol, butylene glycol. Depending on the solvent chosen, the solubility range can vary between 0.5 - 2%.



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Formulation examples

Soothing antidandruff shampoo

A	Sodium Laureth Sulfate, Aqua	25
B	Evosina® GP Green	0.5
C	Avogelia® DS	5
D	Cocamidopropyl Betaine, Aqua	6
E	Aqua	qs
	PEG-120 Methyl Glucose Dioleate	1
	Glycerin	2
F	Preservante / Preservatives	0.5
G	Lactic Acid	qs

Procedure:

Combine ingredients of phase A
Combine ingredients of phase B and heat to 40°C
Add B to phase A under low stirring
Add C,D, E, F under low stirring
Adjust pH

Technical specification:

pH = 5.3 - 5.6

Antidandruff shampoo evogreen

A	Aqua	qs
	Glycerin	2
	Guar Hydroxypropyltrimonium Chloride	1
B	Sodium Lauroyl Sarcosinate	15
	Coco-Glucoside, Glycerol Oleate	2
	Aqua	10
C	Cocamidopropyl Betaine	5
D	Evosina® GP Green	0.5
E	Triethanolamine	qs
F	Citric acid	qs
	Preservatives	qs

Procedure:

Combine ingredients of phase A
Prepare phase B heating in water
Add phase B to phase A under slow stirring
Add phases C, D and preservatives
Add E up to pH around 8
Adjust pH with F

Technical specification:

pH = 5.8 - 6.0

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Formulation examples

Eva intima

A	Lauroyl Sarcosinate	12
B	Evosina® 100	0.01
	Glycerin	2
C	Avogelia® DS	5
	Parfum	0.2
D	Aqua	qs
	PEG-120 Methyl Glucose Dioleate	2
E	Cocamidopropyl Betaine	6
F	CI 14720	qs
G	Citric acid	qs
Preservatives		qs

Procedure:

Combine ingredients of phase B, heating to 45-50° C
Add B to A
Mix phase C and add to A+B
Combine ingredients of phase D, heating to 45-50° C
Add E to phase D maintaining hot temperature until complete solubilization
Add D + E to the previous mix
Add color and preservatives, then adjust pH with G

Technical specification:

pH = 5.2 - 5.7

Aloe&Chamomile Intimate cleanser

A	Sodium Cocoamphoacetate	10
	Decyl Glucoside	10
	Lauramidopropyl Betaine	11
B	Aqua	qs
	Betaine	2
	PEG-120 Methyl Glucose Dioleate	3
C	Parfum	0.3
	PPG-26-Butheth-26, PEG-40 Hydrogenated Castor Oil	1.5
	Glycolisat of Chamomile (Propylene glycol, Aqua, Anthemis nobilis extract)	1
D	Aloe Vera Whole Leaf Gel 2X (Aloe Barbadensis Leaf)	5
E	Evosina® GP Green	1
F	Lactic Acid	qs
Preservatives		qs

Procedure:

Combine ingredients of phase A
Combine ingredients of phase B
Add phase B to phase A under slow stirring
Combine ingredients of phase C
Combine ingredients of phase D
Add C, D and preservatives to the previous mix
Adjust pH with F

Technical specification:

pH = 5.0 - 5.5

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Formulation examples

Deodorant spray no gas

A	Aqua	36
	Evosina® GP Green	0.5
	Fucogel 1,5P (Biosaccharide Gum-1)	1
B	Alcohol	qs
C	PPG-26-Butheth-26, PEG-40 Hydrogenated Castor Oil	2.5
	Menthyl PCA	0.4
	Perfume	qs
D	Lactic acid	qs

Procedure:

Prepare phases A, B and C
Add C to B, then to A
Adjust pH with D

Technical specification:

pH = 5.8 - 6.0

Deo roll on

A	Aqua	qs
B	Steareth-21	2
	Steareth-2	2.5
	Coco-Caprylate/Caprate	3.5
C	Triethyl Citrate	3
	Evosina® 100	0.02
	Glycerin	2
	Lactic Acid	qs

Procedure:

Combine ingredients of phase B.
Heat phases A and B to 70-75° C.
Add phase B to phase A under stirring.
Cool down and add phase C under stirring.
Adjust pH with D.

Technical specification:

pH: 4.0 - 4.5

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Formulation examples

Skin perfection cream

A	Aqua	qs
	Avogelia® NF	7
	Cetearyl Alcohol	6
	Glyceryl monostearate	2
	Vegetable Petrolatum L25 (Caprylic/Capric triglyceride, Triolein)	2
B	Glycerin	2
	Evosina® 100	0.05
C	Acqua demin.	qs
	Vari® Silk P	0.5
Preservatives and perfume		qs

Procedure:

Combine ingredients of phase A
Heat to 70-75° C under stirring
At 30° C add phases B, C, preservatives and perfume

Technical specification:

pH = 6.0 - 6.50

Skin perfection cream GP

A	Aqua	qs
	Avogelia® NF	7
	Glycerin	1.5
	Cetearyl Alcohol	6
	Glyceryl monostearate	2
	Vegetable Petrolatum L25 (Caprylic/Capric triglyceride, Triolein)	2
B	Evosina® GP Green	0.5
C	Acqua demin.	qs
	Vari® Silk P	0.5
Preservatives and perfume		qs

Procedure:

Combine ingredients of phase A
Heat to 70-75° C under stirring
At 30° C add phases B, C, preservatives and perfume

Technical specification:

pH = 6.0 - 6.50

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Specifications

	Evosina® 100	Evosina® GP Green
INCI name	Sodium Usnate	Propylene Glycol*, Sodium Usnate
Appearance	powder	liquid
Color	yellow	yellow - light brown
Active fraction	80-100%	1.8 – 2.2%
ISO 16128	100% Natural Origin Index	100% Natural Origin Index

* From vegetal origin

Safety**

Not irritant and non-sensitising.

**For any detail, please refer to the technical dossier



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