Evosina® GP Green

Antibacterial power from lichens

INCI: Propylene Glycol, Sodium Usnate

Cosmetic properties

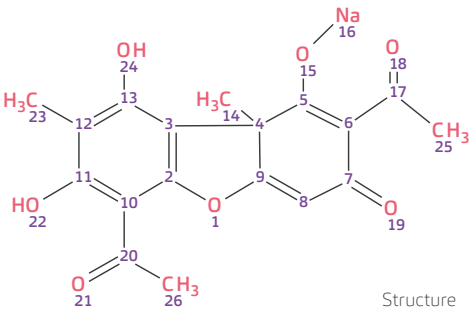
- **Evosina®** (Sodium Usnate) possesses marked antibacterial properties mainly addressed towards gram+ strains and some fungi species (eg Malassezia furfur), resulting perfectly suitable for deodorant, acne prone skin, anti-dandruff and oral care applications.

Naturalness

- **Evosina GP Green** is a 100% natural origin ingredient. Sodium Usnate and propylene glycol are raw materials of vegetable origin, they are respectively obtained from lichen and glycerin from rapeseed and sunflower oils.
- The starting materials and the manufacturing process guarantee a 100% Natural Origin Index according to **ISO 16128**.

Origin and structure

- Usnic acid is a lichenic acid present in a wide number of species and varieties of lichens including genus Usnea, Cladonia, Cetraria and Parmelia.
- Several lichens have been used in the past in traditional medicine for making infusions and extracts. In particular, in ancient China and Arabia the use of Usnea lichen extracts for the treatment of cutaneous infections is documented.
- Usnea barbata, vulgarly called "olds man's beard", for its wide diffusion and being a not protected lichen species, represents the primary source for the industrial production of usnic acid.
- Usnic acid possesses strong antibacterial properties probably associated to its peculiar chemical structure.
- However, its poor solubility profile in most of the solvents regularly used by the cosmetic industry, narrows its use in cosmetic products.
- The salification of usnic acid with sodium salts lead to an improved solubility, maintaining the same activity profile. The resulting active ingredient is denominated **Evosina®** (Sodium Usnate).



Structure of Sodium Usnate

Notes for formulator

Physical state: Liquid
INCI name: Propylene glycol, Sodium Usnate
Suggested percentage: 0.1 - 1%

Evosina® GP Green can be added in emulsion during the cooling process under stirring. It can be also used in most of detergent systems, incorporating the specialty at the end of the process before making pH adjustments.

Efficacy studies

Evosina® efficacy has been tested on different Gram⁺ strains.
The in-vitro average MIC of **Evosina®** (Sodium Usnate) turned out 5 ppm, lower than the value found for Usnic acid (10 ppm).

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

MIC values of **Evosina®** (Sodium Usnate) vs Gram⁺ strains

Evosina® (Sodium Usnate) turned out very effective towards Propionibacterium acnes as well.

Strain tested	MIC
» Propionibacterium acnes	0.01%

MIC of **Evosina®** (Sodium Usnate) vs Propionibacterium acnes

Evosina® GP Green also showed a good antimicrobial power towards Malassezia furfur.

Strain tested	MIC
» Malassezia furfur	0.1%

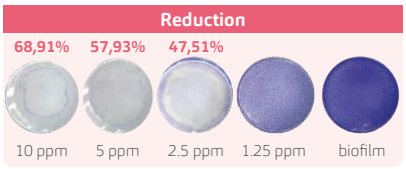
MIC of **Evosina® GP Green** vs Malassezia furfur (P. Ovale)

Evosina® GP Green efficacy was also tested towards a typical pathogenic microorganism of the oral cavity, showing a very low MIC against Streptococcus mutans, one of the main strains involved in biofilm formation and tooth decay.

Strain tested	MIC Concentration (in ppm)		
	...	5	2,5*
» S. mutans	-	-	-

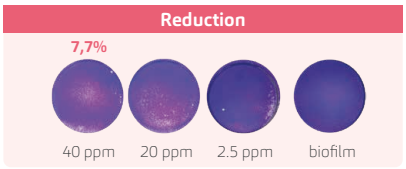
MIC of **Evosina®** (Sodium Usnate) vs S. Mutans
* ≃ 0.01% Evosina® GP Green

Already at the lowest concentration, **Evosina® GP Green** revealed an important inhibitory action against S. mutans biofilm formation.



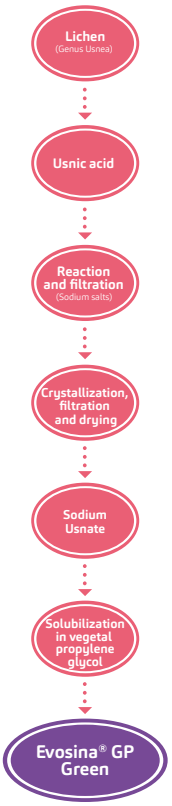
Inhibition efficacy (MBIC) of **Evosina®** (Sodium Usnate). Zoom of individual wells under stereomicroscope.

At higher concentration, **Evosina® GP Green** also manifested a certain eradication power.



Eradication efficacy (MBEC) of **Evosina® GP Green**. Zoom of individual wells under stereomicroscope

Process



Applications

- **Evosina® GP Green** thanks to its marked and specific antimicrobial profile can be considered an effective natural alternative for deodorant, acne prone skin and anti-dandruff cosmetic products as well as for different oral care applications.
- A range of suggested formulations incorporating **Evosina® GP Green** includes: deodorant sprayable solution, intimate hygiene detergent formulation, sprayable deodorant cream, acne prone skin creams and lotions, anti-dandruff shampoo, foot deodorant creams and powders, toothpastes and mouthwashes.
- **Evosina® GP Green** is listed by **Cosmos** as natural derived ingredient and therefore can be used in certified natural cosmetic products.

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