

TEGO® Natural Madecassoside

Let nature revitalize your skin

Intended use

Active ingredient for cosmetic applications

Benefits at a glance

- Improve collagen synthesis to enhance skin recovery
- Increase natural moisture factors for skin calming effects

INCI (PCPC Name)

Madecassoside

Chemical and physical properties (not part of specifications)

Appearance	White Powder
Actives matter	>90%
Usage level	0.1 – 0.5%

Properties

TEGO® Natural Madecassoside is a highly refined triterpenoid saponin from the *Centella Asiatica* (also known as *Gotu kola*) plant. This Ayurvedic ingredient has been traditionally used to treat inflammation after it was discovered that tigers would roll in the herb to treat their wounds¹. One main component, madecassoside, is targeted for its ability to target collagen and inflammation-related skin conditions.

¹ What Is Tiger Grass? – L'Oréal Paris. (Date NA). L'Oréal Paris. <https://www.lorealparisusa.com/beauty-magazine/skin-care/skin-care-essentials/what-is-tiger-grass.aspx>

Scientific literature summary

Through extensive literature review, several studies illustrating cosmetic application value for this material have been identified and summarized below:

Madecassoside shows an increase in collagen synthesis for skin renewal

Phytotherapy research : PTR, 28(8), 1117–1124.

Madecassoside is enriched from *Centella asiatica*, a traditional herb used for treatment of skin lesions and dermatoses. This study conducted a review of the known literature sources pertaining to *Centella asiatica*, and, the results pertaining to madecassoside are expounded on below:

In vitro experiments showed that *C. Asiatica* extract promoted collagen synthesis specifically with collagen types I and III, which both play an important role in natural wound healing processes. *In vivo* experiments indicated that broad *C. Asiatica* extract increased cellular proliferation and collagen synthesis following skin wounding. This extract led to an increase in collagen content and tensile strength which allowed the wound to epithelialize faster with a higher rate of wound contraction. Further, another *in vivo* study found the madecassoside was the key active ingredient from *C. Asiatica* involved with burn wound healing through its specific antioxidant effects and enhancement of collagen synthesis. The key indicators (reduced glutathione and hydroxyproline) of collagen synthesis were found to be elevated after madecassoside treatment of burned skin.

Madecassoside reduces acne-induced inflammation

Bioscience, biotechnology, and biochemistry, 83(3), 561–568.

Madecassoside alleviates inflammation associated with *P. Acnes* and provides increased skin moisturization. *P. Acnes* bacteria can result in skin inflammation via activation of Toll-like receptor (TLR)-2, which, in turn, secretes pro-inflammatory cytokines that disrupt skin homeostasis. Further, various other extrinsic and intrinsic factors can affect skin hydration which further throws off skin homeostasis. *Centella Asiatica* extract has shown *in vivo* benefits with improving moisturization and anti-inflammatory effects to improve skin homeostasis, yet, the

active components are not entirely understood. Now, madecassoside, a pentacyclic triterpenoid extracted from *Centella Asiatica*, was investigated *in vitro* for the potential benefits this component has with improving *P. acnes* related skin inflammation and hydration.

Madecassoside at 250 µm and 500 µm was found to significantly inhibit IL-1β release by *P. Acnes*-stimulated cells as well as suppress the *P. Acnes* inflammatory response. Further, madecassoside upregulated Aquaporin-3 which plays a critical role in skin hydration by facilitating water/glycerol transportation. Further, an increase in major cornified envelope components (LOR and IVL) showed an enhancement of the skin barrier and associated decrease in skin moisture loss. Last, madecassoside showed upregulation of hyaluronic acid with ROS inhibition to serve as another skin moisturization pathway.

SimDerma Findings

A multi-parametric *In vitro* platform that includes over 20 targets laboratory assays to better characterize single ingredient indicators and match with skin claims. A summary of applicable positive results for this ingredient are expressed below:

- With use of TEGO® Natural Madecassoside, positive influence (+ ≥ **20% activity**) is detected.
- From the assay targets – there is a positive indication for wounding healing (k) (++).
- When targets are paired to the claims, we see positive correlation to anti-inflammation, moisturization, skin barrier repair, atopic skin relief, anti-acne and skin regeneration.

Formulation Hints

Recommended usage concentration: 0.1 – 0.5%

Solubility: soluble in water.

Preparation of emulsions: TEGO® Natural Madecassoside is added to the water phase and the emulsion is prepared in the usual way.

Applications

- Body Care
- Eye Care
- Face & Neck Care
- Natural Cosmetics

Recommended usage concentration

TEGO® Natural Madecassoside has been shown to be safe for use in cosmetics with a wide range usage level. The recommended usage level ranges from 0.1 – 0.5%

Hazardous Goods Classification

Please refer to our material safety data sheet for information concerning

- Classification and labelling according to regulations for transport and for dangerous substances
- Protective measures for storage and handling measures in case of accidents and fire
- Toxicity and ecological efficient

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Literature Citations

1. Bylka, W., Znajdek-Awiżeń, P., Studzińska-Sroka, E., Dańczak-Pazdrowska, A., & Brzezińska, M. (2014). *Centella asiatica* in dermatology: an overview. *Phytotherapy research : PTR*, 28(8), 1117-1124. <https://doi.org/10.1002/ptr.5110>
2. Shen, X., Guo, M., Yu, H., Liu, D., Lu, Z., & Lu, Y. (2019). *Propionibacterium acnes* related anti-inflammation and skin hydration activities of madecassoside, a pentacyclic triterpene saponin from *Centella asiatica*. *Bioscience, biotechnology, and biochemistry*, 83(3), 561-568. <https://doi.org/10.1080/09168451.2018.1547627>

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