

# Shinorine

- A natural, soluble anti-photoageing ingredient -

Proprietary technology using *Streptomyces* (N-STePP™) made it possible to produce shinorine - a natural anti-photoageing ingredient, with high efficiency. Process patent<sup>1</sup> granted in Japan.

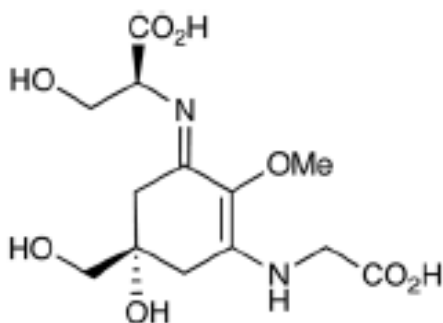


Figure 1 Structure of Shinorine

## 【What is Shinorine】

Shinorine (Figure1) is one of the rare natural mycosporine-like amino acids (MAAs) from nature that has the highest absorbing potential of ultraviolet (UV). Because it shows highest absorption at UV-A range which is the main reason that causes skin ageing (blemishes, wrinkles and dullness), application in skin anti-ageing shows great potential and is triggering much interest from industry. In nature, shinorine can only be obtained from limited resources such as red algae and cyanobacteria at trivial amounts.

## 【Characteristics】

### 1. High UV-A Absorption

Shinorine covers wide range of ultraviolet (280nm-360nm), especially has maximal absorption at UV-A2 range (320-340nm), at which the existing chemical UV filters do not cover sufficiently (Figure 2). The UV arrays at UV-A range is said to likely reaches to the ground yearly round and penetrates through window glasses, therefore exerts great impact on skin photoageing. The coverage by shinorine could be expected to protect skin from such.

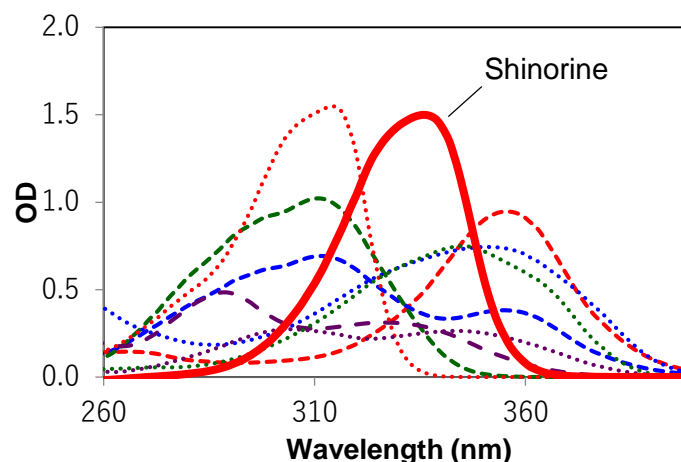


Figure 2 UV absorption spectra of shinorine and common UV filters

### 2. Water Solubility

Shinorine is highly water-soluble, therefore is user-friendly in cosmetic formulations.

### 3. Anti-ageing Effect

UV arrays damage skin cells and stimulates the loss of collagen and elastin thus causes wrinkle accumulations. Shinorine is known to prevent and reduce such happening<sup>2</sup>. Scientific data has also shown shinorine to stimulate the biosynthesis of collagen in skin cells<sup>3</sup>, supporting its anti-ageing function. In summary, reports on the physiological activities of mycosporine-like amino acids including shinorine is increasing and these ingredients are becoming more and more popular.

## 【References】

1. Method for producing mycosporine-like amino acid using microbes. Japanese Patent, No. 5927593 (2016)
2. Sung-Suk Suh et al., Anti-inflammation activities of mycosporine-like amino acids (MAAs) in response to UV radiation suggest potential anti-skin ageing activity. *Marine Drugs* (2014) 12: 5174-5187
3. Japanese Patent applications, No. 2017-88525 (2017)

The NAGASE R&D CENTER is committed to developing processes for efficiently producing a wide range of compounds with proprietary fermentation technologies.