

Determination of scytonemin by UHPLC-MS/MS in extracts of an intertidal cyanobacterial mat community and in *Nostoc sp.*

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Abstract

There is a variety of cyanobacteria located in Canary Islands in the intertidal flat of the coast that presents a photoprotective molecule called scytonemin. Scytonemin is a yellow-brown pigment of the sheath of many cyanobacterias that protect them from the UV-A radiations, making easier the colonization of areas with big radiation [1]. This compound is capable of absorb up to 90% of the radiation and is accumulated in the extracellular region of the organism. Scytonemin could be more than 5% of the dry weight of the cyanobacterias [2]. Oxidized scytonemin could be reduced to dihydroscytonemin using hydrogen sulfide or sodium sulfite. Both compounds have been determinate in this study

The cyandobacteria *Nostoc sp.* Strain BEA1032B was isolated by the Banco Español de Algas (BEA) and was cultivated at 20°C in a growth chamber under a photon irradiance of 100 $\mu\text{mol m}^{-2} \text{s}^{-1}$. A brown extract was obtained after a Soxhlet extraction with acetone followed by rotary evaporation. This extract was redissolved with dimethylsulfoxide (DMSO) and acetonitrile (20:80 v/v) to determine the presence of oxidized and reduced scytonemin using an ultra-high performance liquid chromatography system coupled to a mass spectrometer of triple quadrupole (UHPLC-MS/MS).

In this study, all parameters involved in the detection of both compounds such as cone voltage, capillary voltage, source temperature or desolvation gas flow were optimized. At the optimum detection conditions, parent and daughter ions of both compounds were determined by direct injection of the diluted extract and after that, they were separated by UHPLC using a C18 column. After the chromatographic separation, the relative concentrations of both metabolites were calculated.

References

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2. U. Karsten, J. Maier, F. Garcia-Pichel. Seasonality in UV-absorbing compounds of cyanobacterial mat communities from an intertidal mangrove flat. *Aquat. Microbiol. Ecol.* (1998) 16, 37-44.