

Title: **Determination and characterization of arsenosugars in edible algae by LC-MS**

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Date: June 2019

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Nowadays, the **algae** are pretty present in the food. In the marine environment, these algae can bioaccumulate arsenic (**As**) compounds which are dissolved in the environment. The toxicity of As is different in function of its structure and valence so, not all the arsenic compounds are harmful for the human health, but a diary control is necessary to know the concentration and type of arsenic compounds which are in the edible algae. The **arsenosugars** are the arsenic compounds which are in major proportion in the algae and there is few information about its toxicity.

Previous studies have already proposed methods for the analysis and determination of the arsenic compounds present in the algae. Generally, the most used method is **HPLC** inductively coupled plasma mass spectrometer (**ICP-MS**). A recent type of liquid chromatography is **HILIC** which allows to analyse polar compounds, since it has a stationary phase relatively polar and uses a mobile phase, rich, generally, in acetonitrile. The arsenosugars present in the algae are pretty polar compounds and, the main goal of this work will be to study if this new type of liquid chromatography allows to separate and characterize the arsenosugars quickly and unequivocally.

Using the HPLC-ESI-TOF system and two types of HILIC columns (**HILIC-Z and HILIC-Amide**) the parameters are optimized to a good separation of the arsenosugars obtained from extracts of edible algae. The HILIC-Z column is selected for the later **characterization** of the arsenosugars in the system HPLC-ESI-**Orbitrap**. With this equipment, the sulfonate sugar can be characterized, but the phosphate and sulfate sugar cannot due to problems of intensity of the signal related to a low concentration.

Keywords: algae, As, arsenosugars, HPLC, ICP-MS, HILIC, TOF, HILIC-Z, HILIC-Amida, characterization, Orbitrap