

## Accepted Manuscript

Effect of selenite and selenium nanoparticles on lactic bacteria. A multi-analytical study

María Palomo-Siguero, Ana M<sup>a</sup>. Gutiérrez, Concepción Pérez-Conde, Yolanda Madrid

PII: S0026-265X(16)00011-4  
DOI: doi: [10.1016/j.microc.2016.01.010](https://doi.org/10.1016/j.microc.2016.01.010)  
Reference: MICROC 2395

To appear in: *Microchemical Journal*

Received date: 4 November 2015  
Revised date: 18 January 2016  
Accepted date: 18 January 2016

Please cite this article as: María Palomo-Siguero, Ana M<sup>a</sup>. Gutiérrez, Concepción Pérez-Conde, Yolanda Madrid, Effect of selenite and selenium nanoparticles on lactic bacteria. A multi-analytical study, *Microchemical Journal* (2016), doi: [10.1016/j.microc.2016.01.010](https://doi.org/10.1016/j.microc.2016.01.010)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



**Effect of selenite and selenium nanoparticles on lactic bacteria. A multi-analytical study.**

María Palomo-Siguero, Ana M<sup>a</sup> Gutiérrez, Concepción Pérez-Conde and Yolanda Madrid\*.

Departamento de Química Analítica. Facultad de Ciencias Químicas. Universidad Complutense de Madrid. 28040 Madrid.

**Abstract**

The effect of selenite and chitosan-modified SeNPs (CS-SeNPs) on *Lactobacillus bulgaricus* was evaluated through a multianalytical approach based on flow cytometry and transmission electron microscopy (TEM), and high performance liquid chromatography (HPLC) on line coupled to inductively coupled plasma mass spectrometry (ICP-MS) to investigate both lactic bacteria viability in presence of selenium compounds and transformation of selenium compounds once accumulated by the bacteria. For this purpose, *L. bulgaricus* were grown at 37 °C for 24, 48 and 72 h in presence of 1 and 10  $\mu\text{g Se}\cdot\text{mL}^{-1}$  of selenium as CS-SeNPs and  $\text{Na}_2\text{SeO}_3$ . No significant differences in bacteria cell viability between selenium-enriched and control bacteria were observed when adding 1  $\mu\text{g Se}\cdot\text{mL}^{-1}$  either as Se(IV) or CS-SeNPs. In contrast, bacteria viability decreases when increasing selenium concentration up to 10  $\mu\text{g Se}\cdot\text{mL}^{-1}$  being this effect more accused when selenium was supplemented as selenite. Under these conditions SeNPs killed approximately 20% of *Lactobacillus* after 24 hours of exposure while the percentage increase up to 60% of bacteria when 10  $\mu\text{g Se}\cdot\text{mL}^{-1}$  as selenite was applied. Transmission electron microscopy (TEM) images show that CS-SeNPs readily enter in the bacteria cells preserving membrane integrity and therefore causing no cellular damage. Results from HPLC-ICPMS indicate that most of the CS-SeNPs in the culture media were transformed by the bacteria to organo

Download English Version:

<https://daneshyari.com/en/article/7641827>

Download Persian Version:

<https://daneshyari.com/article/7641827>

[Daneshyari.com](https://daneshyari.com)