

# Planta Medica

## Two *Olea europea* extracts reduce deleterious effects in a model of neurotoxicity: involvement of the endoplasmic reticulum

Jessica Maiuolo, sonia bonacci, Francesca Bosco, Lorenza Guarnieri, Stefano Ruga, Antonio Leo, Rita Citraro, Salvatore Ragusa, Ernesto Palma, Vincenzo Mollace, Giovambattista De Sarro.

Affiliations below.

DOI: 10.1055/a-2353-1469

Please cite this article as: Maiuolo J, bonacci s, Bosco F et al. Two *Olea europea* extracts reduce deleterious effects in a model of neurotoxicity: involvement of the endoplasmic reticulum. *Planta Medica* 2024. doi: 10.1055/a-2353-1469

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**This study was supported by** #NEXTGENERATIONEU (NGEU) and funded by the Ministry of University and Research (MUR), #NEXTGENERATIONEU (NGEU) funded by the Ministry of Univ. and Research (MUR), National Recovery and Resilience Plan (NRRP) – (DN.1553 11.10.2022), MNESYS (PE0000006), European Commission's FESR FSE 2014-2020, POR CALABRIA FESR AZIONE 1.5.1 Nuova Piattaforma di Farmacologia Integrata e Tecnologie Avanzate

### Abstract:

Prolonged exposure to lead has been recognized as harmful to human health as it may cause neurotoxic effects including mitochondrial damage, apoptosis, excitotoxicity, and myelin formation alterations, among others. Numerous data have shown that consuming olive oil and its valuable components could reduce neurotoxicity and degenerative conditions. Olive oil is traditionally obtained from olive trees; this plant (*Olea europaea* L.) is an evergreen fruit tree.

In this manuscript two extracts have been used and compared: the extract from the leaves of *Olea europaea* L., (OE), and the extract derived from OE but with a further sonication process (s-OE). Therefore, the objectives of this experimental work were as follows: 1) To generate an innovative extract; 2) To test both extracts on a model of neurotoxicity of human neurons induced following lead exposure; and 3) To study the mechanisms behind lead-induced neurotoxicity.

The results showed that the mechanism involved in the neurotoxicity of lead included dysfunction of the cellular endoplasmic reticulum, which suffered oxidative damage. In addition, in all experiments s-OE was more effective than OE, having greater and better effects against lead-induced damage, and being dissolved in a smaller amount of EtOH that promotes its sustainability.

### Corresponding Author:

Dr Jessica Maiuolo, School of Pharmacy, Magna Graecia University of Catanzaro, 88100, Catanzaro, Italy, Department of Health Sciences, Catanzaro, Italy, maiuolo@unicz.it

**Contributors' Statement:** J.M., S.B., and G.D. have conceptualized and designed the manuscript; J.M., F.B., S.R. have collected and produced data; J.M. and L.G. have interpreted data; J.M., and A.L. dealt with the statistical analysis; A.L., R.C., E.P., V.M., and S.R. have participated in the original draft preparation and curated the manuscript; J.M. and G.D. have written, revised, and supervised the manuscript.

### Affiliations:

Jessica Maiuolo, School of Pharmacy, Magna Graecia University of Catanzaro, 88100, Catanzaro, Italy, Department of Health Sciences,

Catanzaro, Italy

sonia bonacci, School of Pharmacy, Magna Graecia University of Catanzaro, 88100, Catanzaro, Italy, Department of Health Sciences,,  
Catanzaro, Italy

Francesca Bosco, School of Medicine and Surgery, Magna Graecia University of Catanzaro, 88100, Catanzaro, Italy, Department of  
Health Science, Catanzaro, Italy

[...]

Giovambattista De Sarro, System and Applied Pharmacology@University Magna Grecia, Science of Health Department, School of Medi-  
cine, Magna Graecia University of Catanzaro, Catanzaro, Italy, Catanzaro, Italy



This article is protected by copyright. All rights reserved.

Accepted Manuscript

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.

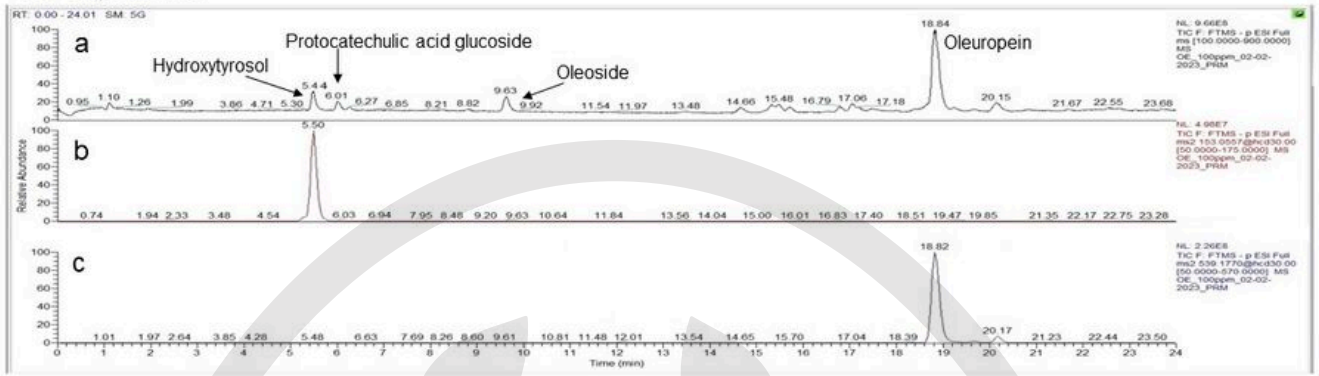




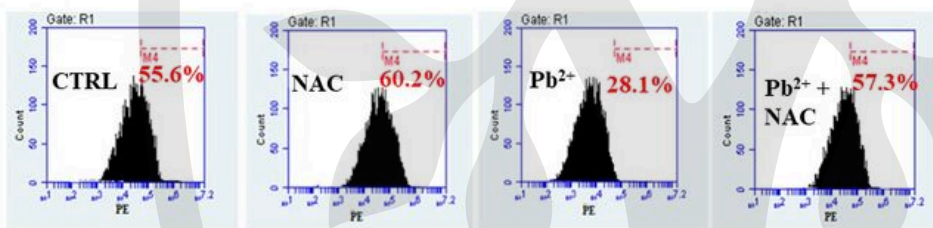
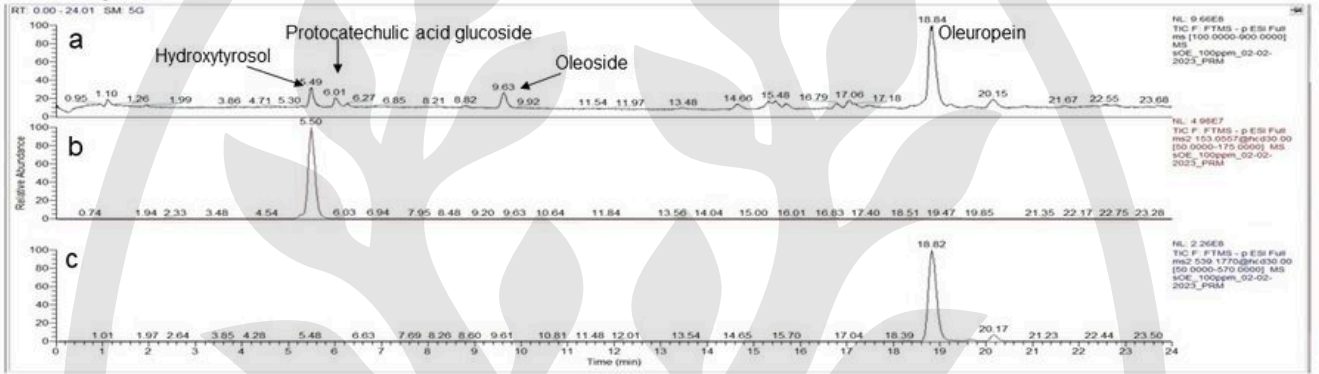




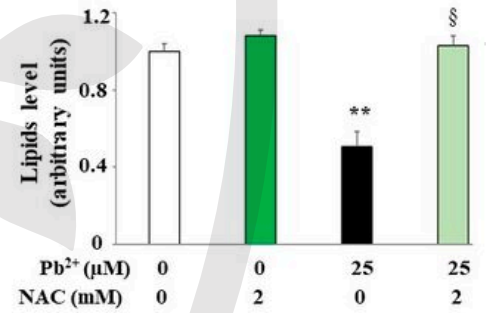

### OE dry extract



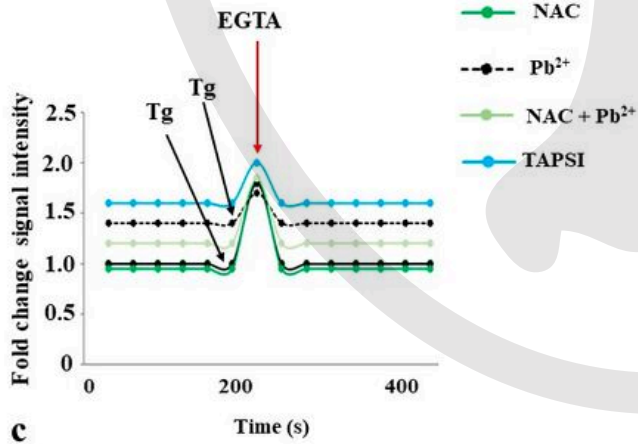
### s-OE dry extract



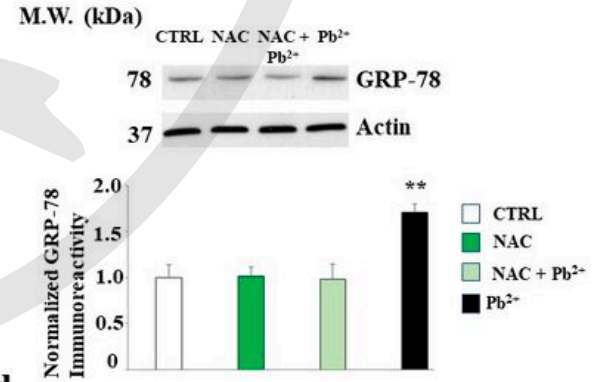
**a**



**b**



**c**



**d**

