Records of Agricultural & Food Chemistry
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MEETING ABSTRACT OP

Molecular response of selected olive cultivars to abiotic stress

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Cite This: *Rec. Agric. Food. Chem.* 2026, 6(SI), e26033817

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Abstract: Climate projections for the future indicate that the Mediterranean basin is considered a hot spot for climate change while a recent study identified southern Italy, the Iberian Peninsula and Greece as highly vulnerable. Among the abiotic stresses causing severe damages to agricultural production and affects almost 16% of agricultural production areas worldwide is waterlogging. This is a hypoxic, low oxygen stress where part of the plant is submerged underwater. Waterlogging stress affects overall growth and productivity. Extreme rainfall was observed in Greece in early September of 2023. The hypoxic response is governed by an energy shift towards anaerobic respiration facilitated by pyruvate decarboxylase (PDC) and alcohol dehydrogenase (ADH). In this study, the response of olive cultivars to waterlogging was investigated at the molecular level emphasizing in two cultivars, Kalamon and Lefkolia. Lefkolia is considered tolerant to abiotic stress an particularly in salinity while Kalamon might be considered sensitive to abiotic stress. These cultivars were exposed to short- and long-term waterlogging stress in the greenhouse. We applied LC-MS/MS to identify and quantify protein expression in both roots and leaves at three different time points. This quantitative approach might provide an insight into the molecular mechanisms regulating abiotic response in Olea europeae. Moreover, an immunolocalization approach was used to characterize the spatial and temporal expression of cell wall glycoproteins in response to waterlogging.

Keywords: Olive, waterlogging, proteomics, fermentation pathway, Arabinogalactan proteins, cell wall

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Received: March 02, 2026
Revised: March 28, 2026
Accepted: March 30, 2026
Published: April 26, 2026
Presented in 11th Olive Oil and Table Olive Congress, April 25–26, 2026, Heraklion, Crete, Greece
Copyright © 2026. Published by ACG Publications.
ACG Publications
http://doi.org/10.25135/rfac.2603.3817
Rec. Agric. Food. Chem. 2026, 6(SI):e26033817
EISSN: 2792-0763