50th National Congress on Magnetic Resonance
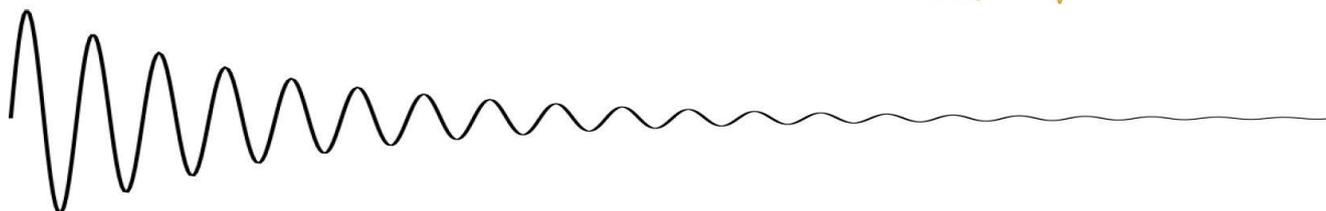
6-8 September 2023

Sapienza Università di Roma
Dip. di Chimica e Tecnologie del Farmaco
Città Universitaria, Building CU019

ISB

SPC

FACOLTÀ DI FARMACIA E MEDICINA
SAPIENZA
Università di Roma
DIPARTIMENTO DI CHIMICA E TECNOLOGIE DEL FARMACO

GIDRM
GRUPPO ITALIANO
DISCUSSIONE RISONANZE MAGNETICHE

in RoMe

50th *NATIONAL CONGRESS*
on MAGNETIC RESONANCE
6-8 September 2023, Roma

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GENERAL INFORMATION

VENUE

Sapienza University of Rome
Department of Chemistry and Technology of Drugs, Building: CU019
Piazzale Aldo Moro 5, 00185 Roma (RM)

INVITED SPEAKERS

The following speakers have agreed to give plenary lectures at the meeting:

Søren Balling Engelsen (University of Copenhagen)

Marco Geppi (University of Pisa)

Mathilde Hauge Lerche (Technical University of Denmark)

Giovanna Musco (IRCCS San Raffaele Hospital, Milano)

Janez Plavec (National Institute of Chemistry, Ljubljana)

Paola Turano, Winner of the GIDRM/GIRM Gold Medal 2023 (University of Florence)

The following speakers have agreed to give lectures at the meeting:

Fabio Arnesano (University of Bari)

Lucia Calucci (ICCOM-CNR, Pisa)

Daniela Delli Castelli (University of Torino)

Valeria Di Tullio (ISPC-CNR, Roma)

Mariapina D'Onofrio (University of Verona)

Moreno Lelli (University of Firenze)

Giuseppe Pileio (University of Southampton)

Valeria Righi (University of Bologna)

NMR-METABOLOMIC STUDIES ON BLUEBERRIES STORED UNDER DIFFERENT CONDITIONS

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Keywords: solution NMR, metabolomics, food.

Improving the fruit quality and prolonging the storage capability are important breeding targets for blueberry fruit [1]. The focus of this study is to discover the metabolomic modifications of blueberry fruits under different storage conditions: regular atmosphere (20 kPa O_2, 0.03 kPa CO_2) and three controlled atmospheres (1 kPa O_2 and 18 kPa CO_2, 7 kPa O_2 and 18 kPa CO_2, 12 kPa O_2 and 18 kPa CO_2). NMR spectroscopy, because of its powerfulness and fastness of the analysis, was applied for this metabolomic study. Fruit of four blueberry cultivars ("Brigitta Blue", "Centurion", "Northland", "Star") were sampled and analyzed at three time points: at harvest, after 21 days and after 42 days of storage under the four aforementioned storage conditions. After the sample homogenization, the juice was firstly extracted and then analyzed with the addition of a buffer for pH and D_2O. The ^{1}H monodimensional experiment was carried out for the spectra acquisition and then 2D experiments helped in the confirmation of the identified compounds [2]. The spectra show a mixture of mostly amino acids and sugars. Metabolomic differences among the samples, determined with both untargeted and targeted approaches, are highlighted by multivariate analysis. Based on the PCA analysis of the fruits, the four cultivars were distinctly clustered. However, differences related to the storage conditions were found to have a lower impact on the fruit metabolic profile than genetic differences.

References

[1] B. Farneti, F. Emanuelli, I. Khomenko, M. Ajelli, F. Biasioli and L. Giongo *Front. Plant Sci.* **11**, 1140 (2020)
[2] A.P. Sobolev, L. Mannina, N. Proietti, S. Carradori, M. Daglia, A.M. Giusti, R. Antiochia and D. Capitani *molecules* **20**, 4088-4108 (2015)