

This study was funded by "FESR Competitività regionale 2007/2013" and "FSE Occupazione 2007/2013" programs.

# CHARACTERISATION OF PHENOLIC COMPOUNDS IN DIFFERENT LOCAL APPLE VARIETIES FROM AOSTA VALLEY BY LC-MS/MS

SABINA VALENTINI<sup>1,2</sup>, MONICA CHASSEUR<sup>1,2</sup>, ALESSANDRO ALBERTO CASAZZA<sup>3</sup>, ANTONELLA SADO<sup>1,2</sup>, LAURA THEDY<sup>1,2</sup>, DANIELA PALMIERI<sup>4</sup>, PATRIZIA PEREGO<sup>3</sup>, DOMENICO PALOMBO<sup>4</sup>, ANDREA BARMAS<sup>1,2</sup>

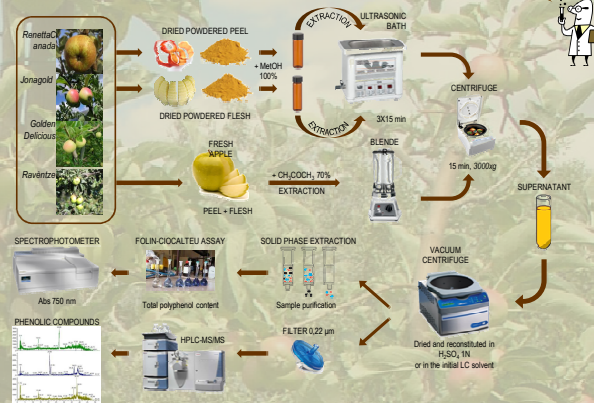
<sup>1</sup> Institut Agricole Régional, rég. La Rochère 1/A, 11100 Aosta, Italy, <sup>2</sup> Unità di Ricerca "NUTRALP VDA", <sup>3</sup> Department of Civil, Chemical and Environmental Engineering, University of Genoa, Via Opera Pia, 15, 16145 Genoa, Italy, <sup>4</sup> Vascular and Endovascular Unit, Laboratory of Clinical and Experimental Vascular Biology, DISC, University Hospital IRCCS San Martino, Largo Rosanna Benzi 8, 16132 Genoa, Italy  
E-mail: [s.valentini@iaraosta.it](mailto:s.valentini@iaraosta.it)

## INTRODUCTION

Apple polyphenols have substantial antioxidant capacity, and may reduce the risk of degenerative disorders including cardiovascular disease. Ancient and more recent apple cultivars cultivated in local areas have so far been largely unexplored and might represent an important source of phenolic compounds due to the characteristics of the environment where they grown. In this work, the phenolic profile in the flesh and peel of four ancient and more recent apple varieties (*Raventeze*, *Renetta Canada*, *Jonagold* and *Golden Delicious*) from Aosta Valley was studied by LC-MS.

## RESULTS

## MATERIALS & METHODS



## MORE RESULTS

fig. 1

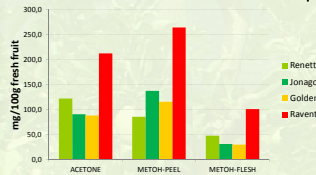


fig. 2

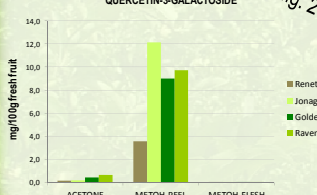


fig. 3

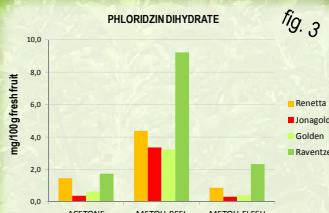


fig. 4

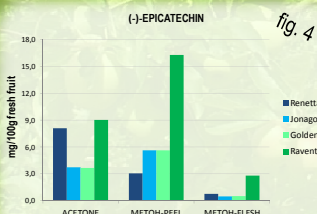


fig. 5

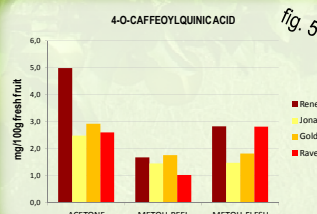
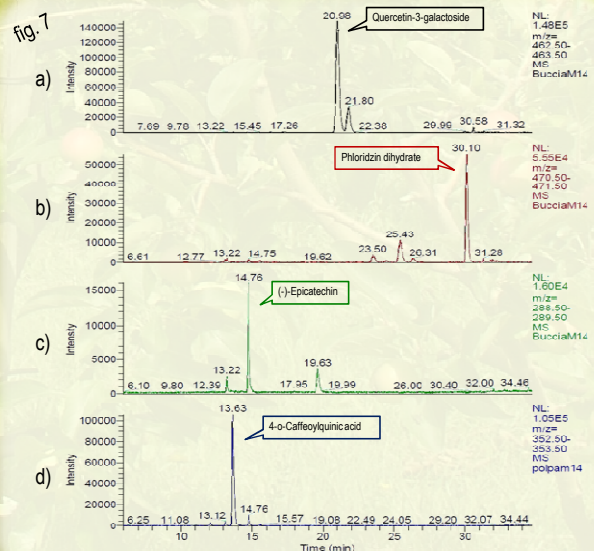
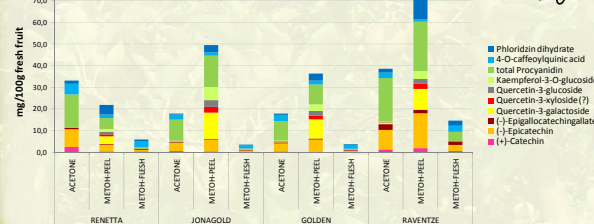


fig. 6



## CONCLUSIONS

This preliminary study suggests that apples, especially ancient varieties, are an important source of antioxidant compounds and there is a variation in polyphenol levels within fruit and between cultivars. In fact these compounds, except for phenolic acids, are more concentrated in the peel, and more ancient cultivars have the highest concentration of polyphenols. Our research is continuing with the characterization of one of the apple processing product, typical of Aosta Region (cider), and the assessment of the ability of extracts from apple flesh and peel preventing cardiovascular diseases.

Figure 6 shows the main polyphenolic compounds identified by LC-MS/MS in all the apple varieties studied. *Raventeze* methanolic extract have the highest amount of these compounds according with Folin-Ciocalteu analysis.

Figure 7 shows the LC-MS chromatograms of phenolic compounds more concentrated in the peel (a, b, c) and flesh (d) of *Raventeze* cultivar.

## ACKNOWLEDGEMENTS

Special thanks to Maley srl and Ottin Elio ss, partners of "Unità di Ricerca NUTRALP VDA" for providing many of the samples analyzed in this study.