

MS Imaging of small metabolites in Fruits

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Abstract

MS Imaging of large molecules, e.g. proteins and lipids, have been reported with MALDI. On the other hand, few works have been done on mapping the small molecules by MALDI imaging. This is mainly due to the high chemical noise background interference in the low mass region caused by chemical matrices. DESI Imaging, however, could be complementary to MALDI in that sample can be analyzed directly without matrices.

A large group of small metabolites are of considerable physiological and morphological importance in plants, e.g. flavonols involve in plant defense against environmental stresses and organic acids are one of important factors for fruit quality, but knowledge of their precise functions is limited due to insufficient characterization of their spatial responses.

In this communication we will discuss methodological details about MS imaging of small metabolites in apple and grape in terms of sample preparation, imaging methods, and other experimental concerns by using MALDI [1] and DESI source coupled with a high resolution/accurate LTQ-Orbitrap mass spectrometer. Finally, we will describe the spatial distributions of flavonols and organic acids in apple and grape, respectively.

References

[1] P. Franceschi, Y. Dong, K. Strupat, U. Vrhovsek, F. Mattivi: Combining intensity correlation analysis and MALDI imaging to study the distribution of flavonoid glycosides in Golden Delicious apples. *J. Exp. Bot.*, 63, 1123-1133 (2012).

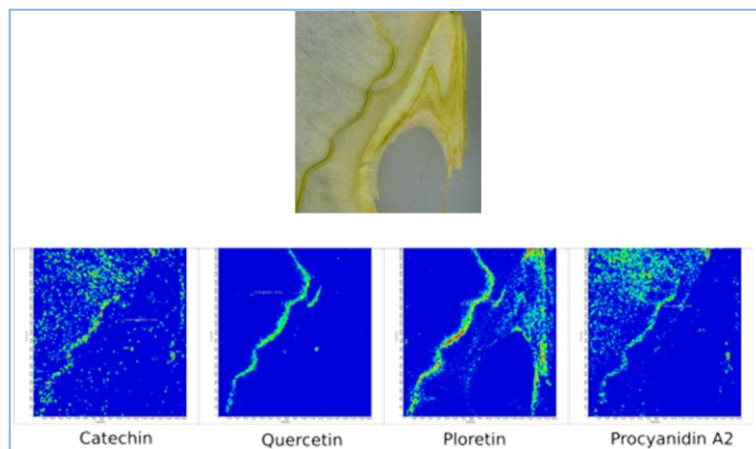


Figure 1. MALDI Imaging of flavonols in apple

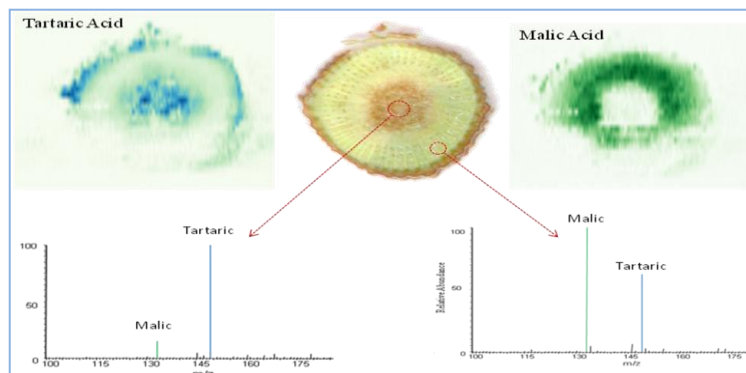


Figure 2. DESI Imaging of organic acids in grape