

## Comprehensive metabolite profiling of onion bulbs (*Allium cepa*) using liquid chromatography coupled with electrospray ionization quadrupole time-of-flight mass spectrometry

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Onion (*Allium cepa*) represents one of the most important horticultural crops and is cultivated under different climatic conditions nearly worldwide. Beside other species of the genus *Allium*, in particular onion represents a vegetable with good storage ability and a versatile application potential. Onion bulbs are used in different forms as food and spice in many dishes in almost all cultural areas and can be processed into a wide range of products which are used for seasoning and flavoring of food. In addition, onion has been recognized as a medical plant since ancient times and represents a rich source of putative health-promoting phytochemicals.

Onion bulbs accumulate a diverse set of primary and secondary metabolites, which define their nutritional, sensory and technological properties. Relevant compound classes of the onion metabolome include fructooligosaccharides, amino acids and derived peptides, S-substituted cysteine derivatives and derived peptides, flavonoids, phenylpropanoids and saponins. To comprehensively profile these mostly polar and semi-polar metabolite classes an analytical approach on basis of (U)HPLC/ESI-QTOFMS and two chromatographic methods was developed and validated. Because of the enzymatic turnover of S-alk(en)ylcysteine sulfoxides which is activated upon tissue disruption in onion, a novel extraction method for fresh onion tissue with low-temperature quenching was established. In addition, chromatographic and mass spectral data of more than 120 metabolites was assembled in the course of this work.

On the poster, details regarding the developed analytical scheme, the extraction method, the identified metabolites and method validation data will be presented. The developed protocols were exemplarily applied to compare the metabolite profiles of six onion cultivars by targeted and non-targeted approaches.