RETASTE Conference Abstracts
RETASTE-NOV-1482-In-person Poster
Rethymno, September 16-18, 2026
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DOI:10.5281/zenodo.23678217

Identification of Major Phenolic Compounds in Apple-Based Mixed Pomaces

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Abstract

Apple pomace is one of the most abundant by-products of the juice industry and represents a valuable source of phenolic compounds with potential applications in functional foods. Apple is frequently used as a base ingredient in mixed fruit and vegetable juices, while celery has become an increasingly popular component due to its distinctive sensory properties and perceived health benefits. Consequently, mixed apple-based pomaces may contain a diverse range of bioactive phenolics originating from different plant materials. In this work, phenolic constituents in two different types of apple-based mixed pomaces were analysed using LC-MS. The samples were obtained as by-products from a medium-scale domestic juice producer and further processed into stable powders with extended shelf life using a recently optimized technological procedure. MIX-1 contained apple pomace with celery, cucumber, kale, spinach, parsley, lettuce, and ginger, while MIX-2 consisted of apple pomace with celery, fennel, arugula, and ginger. Both samples exhibited typical phenolic profiles reflecting the composition of the juice mixtures. The main quercetin derivatives were characteristic for apple pomace, whereas apigenin and luteolin derivatives, particularly apiin, were distinctive of celery. Other detected phenolics could also be associated with specific ingredients present in the mixtures. These findings indicate that selected phenolic compounds may serve as potential markers for the presence of apple and celery in mixed juice products. Furthermore, the identification of individual bioactive constituents is an important step in assessing the potential health-promoting properties of these by-products and provides a valuable basis for future biological and nutritional investigations.

Keywords: apple pomace, mixed vegetable pomace, phenolic compounds, LC-MS, functional ingredients

Acknowledgments: This research was supported by the Science Fund of the Republic of Serbia, 7439 GRANT No, From Waste to Food and Soil Enrichment—minimizing waste by applying circular economy in fruits/vegetables processing industry—WasteBridge