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## Microwave assisted extraction-solid phase extraction for high-efficient and rapid analysis of monosaccharides in plants

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### Abstract

Monosaccharides are the fundamental composition units of saccharides which are a common source of energy for metabolism. An effective and simple method consisting of microwave assisted extraction (MAE), solid phase extraction (SPE) and high performance liquid chromatography-refractive index detector (HPLC-RID) was developed for rapid detection of monosaccharides in plants. The MAE was applied to break down the structure of the plant cells and release the monosaccharides, while the SPE procedure was adopted to purify the extract before analysis. Finally, the HPLC-RID was employed to separate and analyze the monosaccharides with amino column. As a result, the extraction time was reduced to 17 min, which was nearly 85 times faster than soxhlet extraction. The recoveries of arabinose, xylose, fructose and glucose were 85.01%, 87.79%, 103.17%, and 101.24%, with excellent relative standard deviations (RSDs) of 1.94%, 1.13%, 0.60% and 1.67%, respectively. The proposed method was demonstrated to be efficient and time-saving, and had been applied to analyze monosaccharides in tobacco and tea successfully.

**Keywords:** Monosaccharide; Microwave assisted extraction; Rapid sample pretreatment; High performance liquid chromatography

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