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ABSTRACT BOOK

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P27. MASS SPECTROMETRY-BASED METABOLIC SCREENING OF KALE SEEDS AND SPROUTS

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Vegetables belonging to the *Brassicaceae* family (cabbage, cauliflower, broccoli, Brussels sprouts) give health benefits for the presence of active components such as polyphenols, flavonoids, vitamins E and C and glucosinolates, all with antioxidant and anti-inflammatory properties. These molecules can be identified and quantified by mass spectrometry and recently by "Ambient Mass Spectrometry" which consists of sample analyses in its "natural state", eliminating or limiting extraction and purification steps.

The present study is aimed at identification, structural characterization and semi-quantitative analysis of polar metabolites in *Brassica oleracea* var. *acephala* (black cabbage) in seeds, sprouts and young leaves by using mass spectrometry, tandem mass spectrometry and high-resolution mass spectrometry.

The experiments have been carried out by using electrospray ionization in "ambient" conditions, without a separation system, by direct infusion of the analytes into the ion source, coupled to an ion trap and an Orbitrap analyzer for high-resolution measurements.

A pool of polar metabolites belonging to glucosinolates, hydroxycinnamic acids and galactolipids have been identified together with their variations in seeds and in different developmental stages of plantlets. Our determinations demonstrated that kale have a consistent amount of compounds with well known positive properties on health and high antioxidant activity. Sprouts in particular have higher nutritional value than mature leaves.

For this reason, regular consumption of kale sprouts should be encouraged to obtain sufficient assumption of antioxidants.

The reported experimental approach, rapid, sensitive, specific and efficient can be extended to the study of metabolome of other biological systems and it is particularly effective for evaluating variations of metabolites based on age, development, environmental stimuli and pathological states of an organism.