

OrgTrace – No difference found in bioactive compounds of organic and conventional crops

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Introduction

Secondary plant metabolites, like carotenoids, flavonoids, phenolic acids and polyacetylenes, are bioactive compounds with presumably beneficial health effects. Contents in plants are affected by e.g. Plant nutrient availability, climate, and pathogen infection.

Objectives

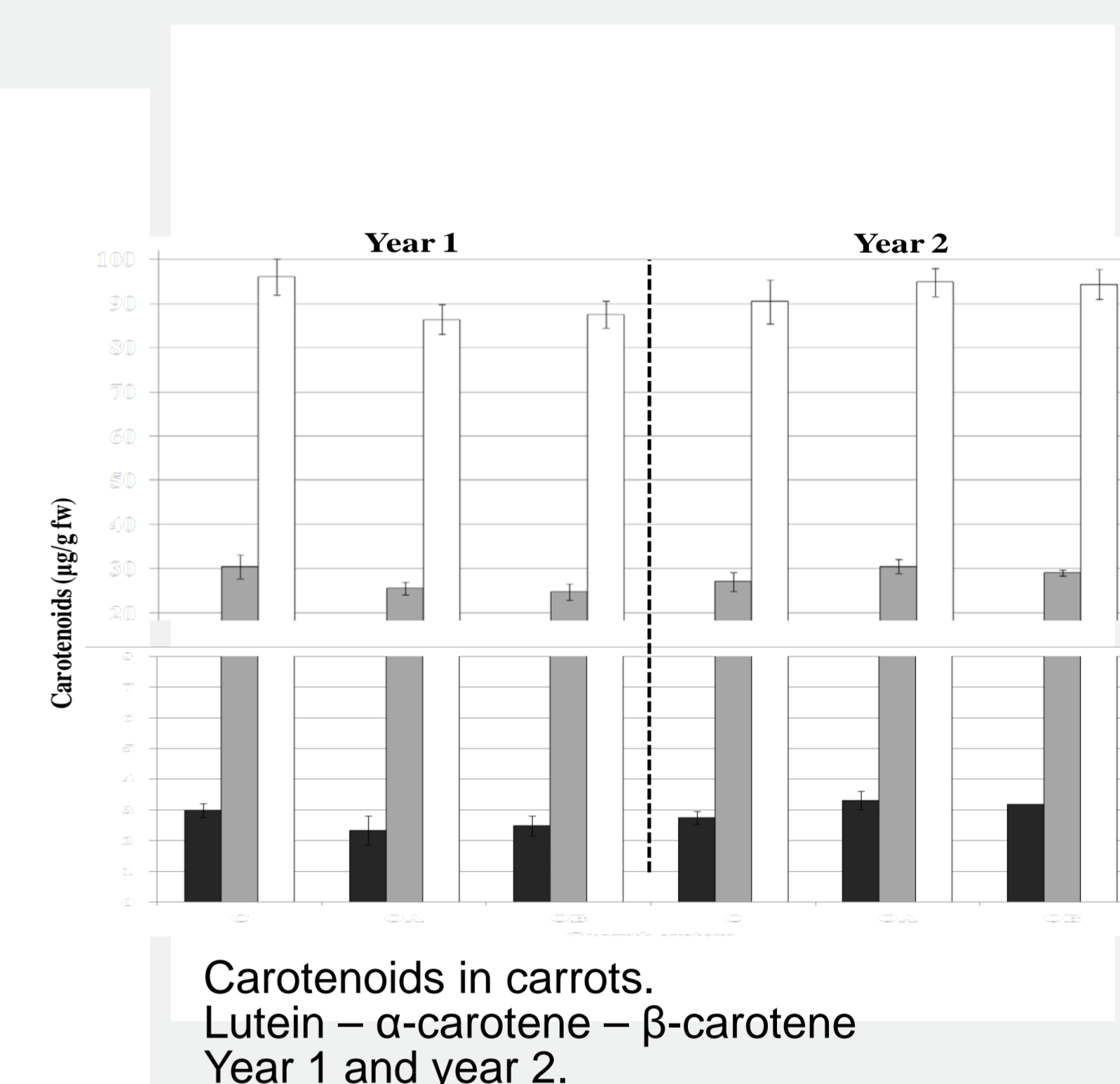
The objectives of our study was to compare the content of selected carotenoids, flavonoids, phenolic acids, and polyacetylenes in organically and conventionally grown carrots, onions, and potatoes. And to evaluate if the ability of the crops to synthesize selected secondary metabolites is systematically affected by growth systems across different growth years as well as geographic locations (soil types).

Study design

Carrots, onions, and potatoes were cultivated in two-year field trials in three different geographical locations, comprising one conventional (C) and two organic agricultural systems (OA relying on import of animal manure, and OB based on the use of cover crops). The crops were harvested at the same day for all systems, and representative sampling ensured.



PLE (Pressurized Liquid Extraction) - for extraction of flavonoids and phenolic acids before analysis.



Analyses

The edible parts of the crops were freeze-dried for analysis, homogenized, and stored at 20 °C in nitrogen atmosphere, protected from light and oxygen during entire sample preparation. The bioactive compounds were extracted by optimized methods, and further identified and quantified by LC-MS-MS analyses.

Results

No systematic effects of growth system, year or location was found on contents of the selected secondary metabolites - carotenoids, flavonoids, phenolic acids, and polyacetylenes - in the carrots, onions or potatoes.

References:

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