

Abstract

# Effect of *Origanum vulgare* Subsp *hirtum* Essential Oil on Metabolite Profile of *Solanum tuberosum* <sup>†</sup>

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**Abstract:** Essential oils are intensively studied in recent years as promising bio-herbicides. A strong inhibitory activity on seed germination and phytotoxic effect on seedling growth have been reported for *Origanum vulgare* subsp *hirtum* (Link) Ietswaart essential oil. It has also been found that the phytotoxic effect is weaker in the treatment of plants at a more advanced stage in their development. Thus, when treating potato plants with a height of 30–40 cm with aqueous solutions of essential oil, the effect comes down to the appearance of single spots on the leaves, which does not disturb the growth of the plants. In the present study, the metabolic profiles of healthy leaves of control potato plants and leaves with spots formed as a result of processing with aqueous solutions of *Origanum vulgare* subsp *hirtum* essential oil, were comparatively analyzed. The metabolite analysis was made by GC/MS. Potato plants were treated with concentrations of essential oil—5 and 10  $\mu\text{L}/\text{mL}$ . The leaves were collected 7 days after treatment. Metabolites representatives of basic groups of substances—amino acids, organic and phenolic acids, mono- and disaccharides were identified. In the damaged leaves, a higher content of monosaccharides—fructose and glucose, pyroglutamic acid and amino acids—proline, serine, aspartic acid, was found compared to control leaves. A less differences were found in terms of the accumulation of chlorogenic, ferulic, and quinic acids, sucrose. The results presented complement the knowledge of a plant reaction to abiotic stress.

**Keywords:** GC/MS; potato; phytotoxi

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