

Extended Abstract

Influence of Soil Fertilization with Plant Waste on the Phytochemical Composition of Some Medicinal Plants [†]

Adriana Florina Popescu ^{1,2,*}, Cristina Luntraru ¹, Miruna Neagu ¹, Alexandru Suciu ¹ and Zoltán Marosy ³

¹ Hofigal Export Import SA, No. 2 Intrarea Serelor Street, District 4, 042124 Bucharest, Romania; cristina.luntraru@hofigal.eu (C.L.); miru.an@yahoo.com (M.N.); alexandru.suciu287@gmail.com (A.S.)

² Doctoral School of Biophysics and Medical Physics, Faculty of Physics, University of Bucharest, No. 405 Atomistilor Street, 769231 Bucharest, Romania

³ Ecological University of Bucharest, Quality Assurance Department, No. 1G Vasile Milea Boulevard, District 6, 061341 Bucharest, Romania; marosy.zoltan@gmail.com

* Correspondence: adrianaflorinabira@yahoo.com

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Agricultural activities generate a large amount of crop residue that can create environmental problems, such as occupying vast areas and often being a source of pathogenic microorganisms. However, this plant waste can be a potential source of organic carbon and other major macronutrients (nitrogen, phosphorus, and potassium (NPK)) that are essential for plant growth. Given this background and the fact that Hofigal is a major producer of dietary supplements and medicinal plants and produces an important amount of plant waste from plant processing, its researchers aimed to study the influence of soil fertilization with plant waste on the phytochemical composition and growth of some medicinal plants.

For this purpose, we selected three medicinal plants (French marigold (*Tagetes patula* L.), marigold (*Calendula officinalis* L.), and lavender (*Lavandula angustifolia* Mil.)), which were cultivated from organic certified seeds. The experiment was carried out in a 300 m², with 100 m² for each plant divided into two sections of 50 m² each: one fertilized with plant waste (Sample) and the other one unfertilized (Control). Prior to conducting the study, the plant waste was converted into compost over a three-year period. The soil quality was tested for major macronutrients (NPK) and pH levels for both the Control and the Sample.

The difference in growth between plants cultivated on fertilized soil versus the ones on unfertilized soil was visually observed. Regarding the phytochemical composition of the three studied plants (in the Control and Sample), they were harvested during the flowering period and analyzed for total polyphenols, total tannins, and antioxidant activity. Volatile oils from dry French marigold and marigold flowers and fresh lavender flowers were also determined. The phytochemical composition was higher for all analyzed compounds, as shown in Figure 1.

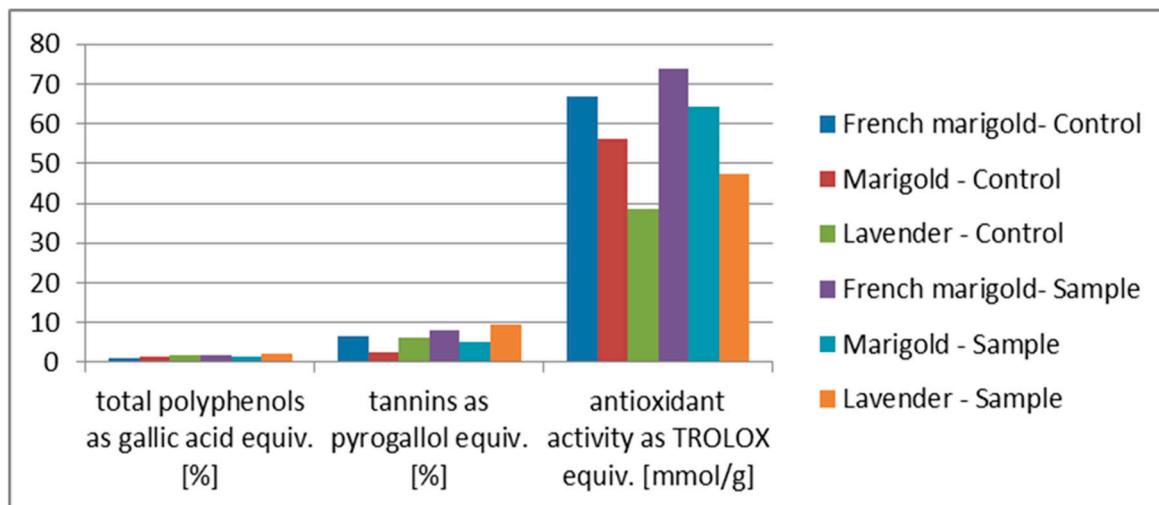


Figure 1. Chemical analysis of sample and control plants.

During the experiments, it was observed that the studied plants were healthier as they grew in the fertilized soil, and their productivity also increased. The quantity of French marigold flowers increased from approximatively 460 g to 940 g, marigold increased from 280 g to 570 g, and lavender increased from 640 g to 1530 g.

A soil analysis revealed that the pH value decreased from 7.8 in the unfertilized soil to 7.1 in the fertilized soil, which was beneficial for the growth of the selected species. Regarding the major macronutrients, the nitrogen, phosphorus, and potassium contents were higher in the Sample group. The phytochemical composition was higher for all analyzed compounds.



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