



COMPOST VS. SUBSTRATES: A PHYSICOCHEMICAL INSIGHT INTO ORGANIC SOIL AMENDMENTS

KOMPOST VS. SUPSTRATI: FIZIKALNO-KEMIJSKI UVID U ORGANSKE POBOLJŠIVAČE TLA



Hana Bekan¹, Lucija Jovanović^{2*}, Ivana Peraga³, Nediljka Vukojević Medvidović⁴

¹University of Rijeka, Faculty of Medicine, Braće Branchetta 20, 51000 Rijeka, Croatia

²University of Split, Faculty of Natural Sciences and Mathematics, Ruđera Boškovića 33, 21000 Split, Croatia

³School of Natural Science, Matice hrvatske 11, 21 000 Split, Croatia

⁴University of Split, Faculty of Chemistry and Technology, Ruđera Boškovića 35, 21000 Split, Croatia

*luce.jovanovic304@gmail.com

INTRODUCTION

Composting is a biological process of organic matter decomposition that enables nutrient recycling and enhances soil quality. In practical applications, compost is often combined with other materials to create substrates tailored to specific plant needs. The aim of this study was to compare the physicochemical parameters of commercial Agro compost with two commercial substrates: Blumenerde and Orchideenerde.

EXPERIMENTAL PART

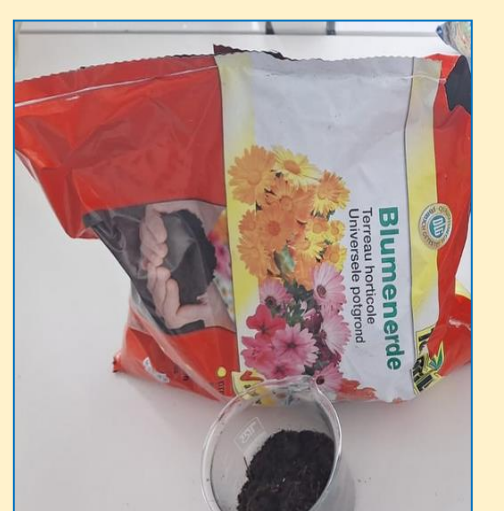
Commercial Agro compost and two soil substrates were analyzed on different physical and chemical parameters: electrical conductivity, pH value, moisture content, dry matter content, volatile matter content and carbon content. The visual and sensory description of the compost and substrate was also tested, with regard to pleasant earthy or rotten smell, color and texture (coarse, fine, loose).



a)



b)



c)

All analysis were performed by using Standard methods.

Fig. 1. a) Commercial Agro compost; b) Commercial Blumenerde soil substrate; c) Commercial Orchideenerde soil substrate

RESULTS AND DISCUSSION

Visual and sensory analysis revealed that Agro compost is dark in color, has a light texture, and a mild earthy scent. Blumenerde soil is also dark in color with a light texture, and its aroma is a blend of soil and compost. In contrast, Orchideenerde soil features a darker hue with visible white particles, a coarser texture, and a very subtle earthy fragrance. The results of the physicochemical characterization of the compost and substrate samples are compared below.

Analysis of pH and electrical conductivity results of compost and substrate

Analysis of the results of moisture content, dry matter, volatile matter and carbon content of compost and substrate

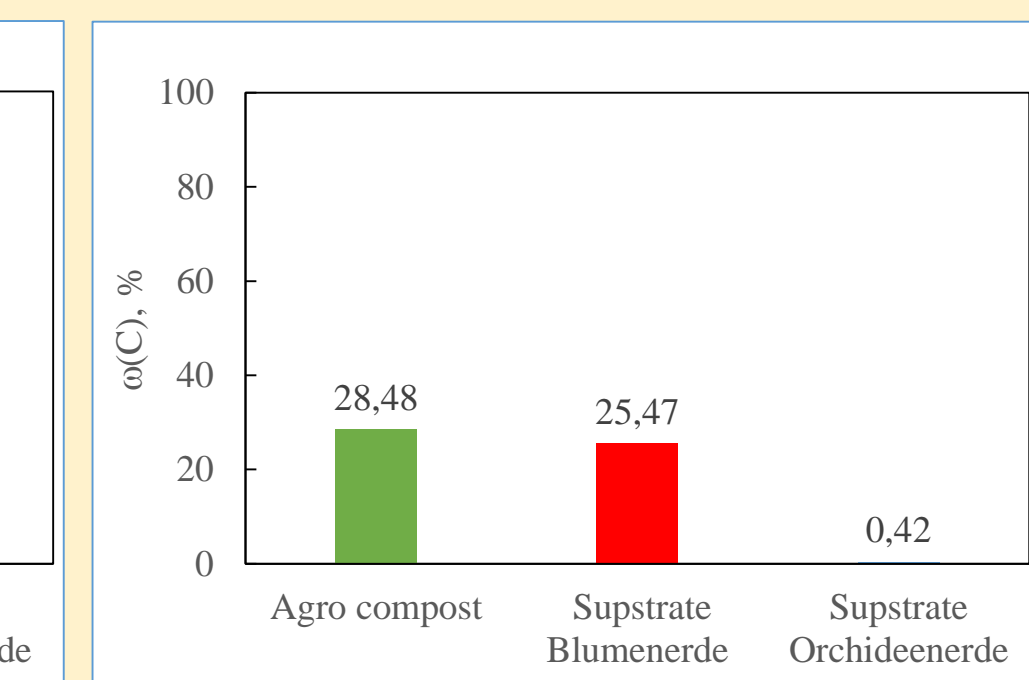
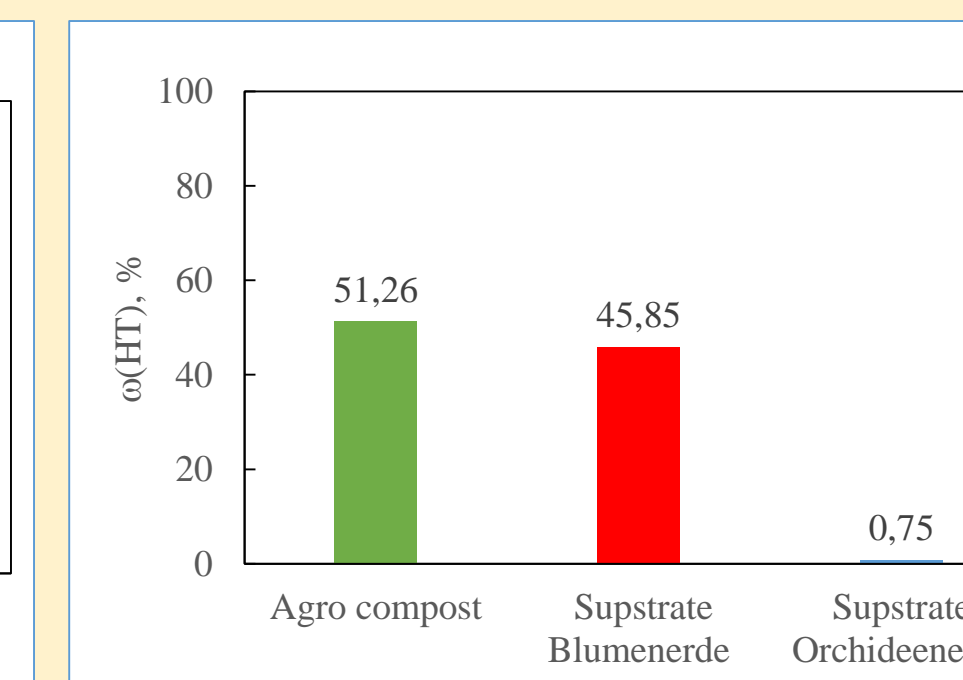
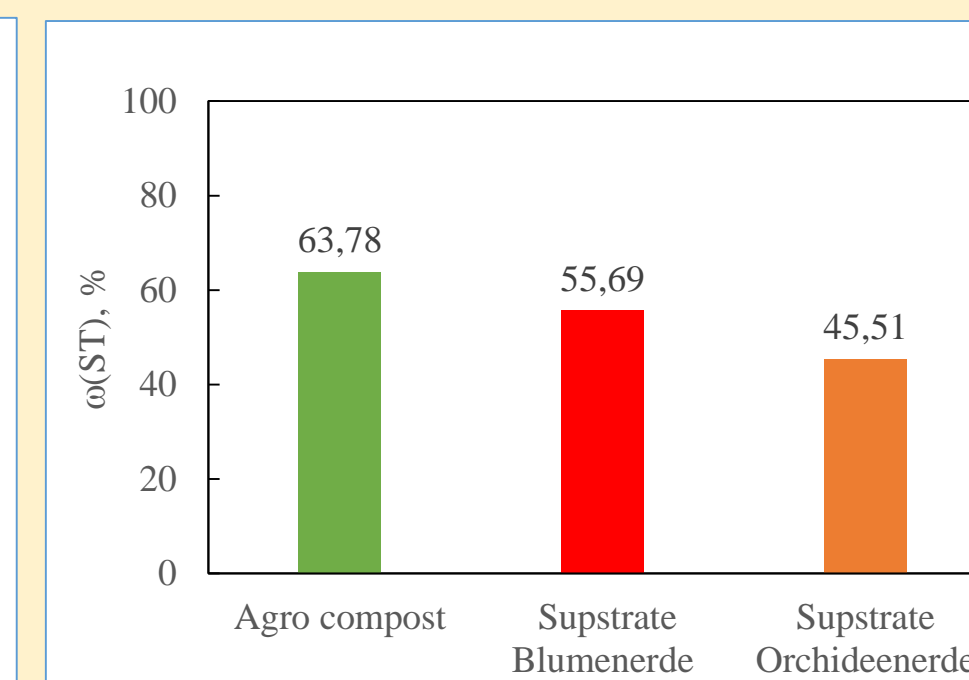
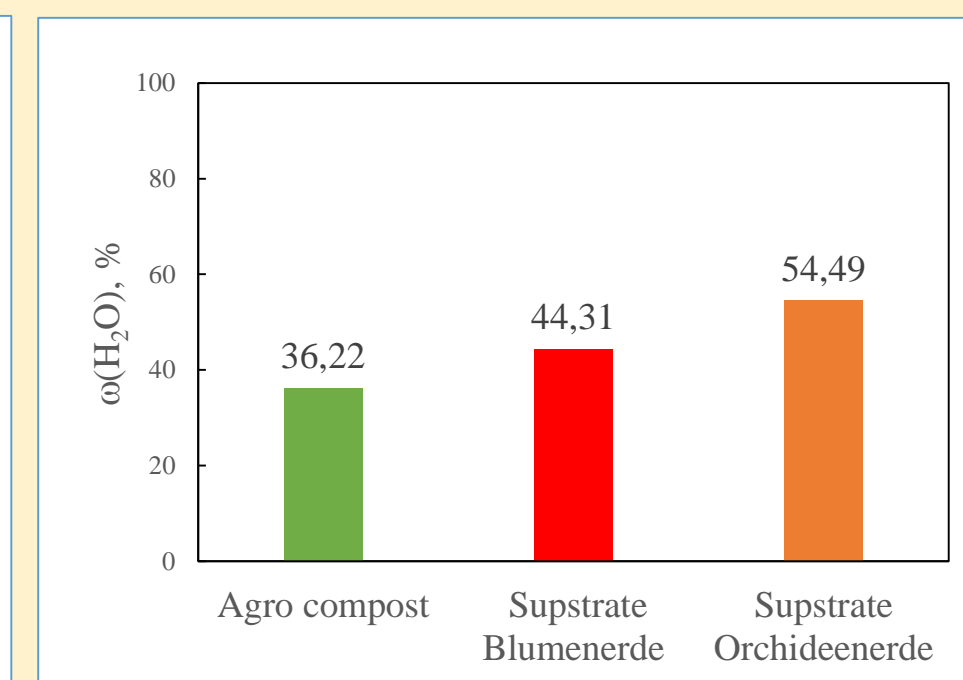
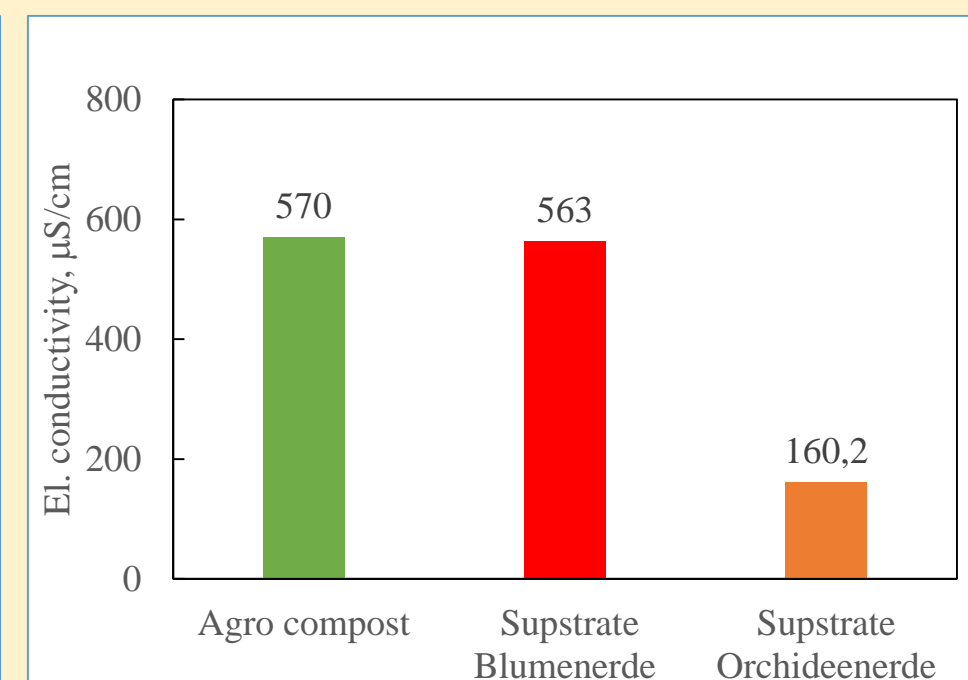
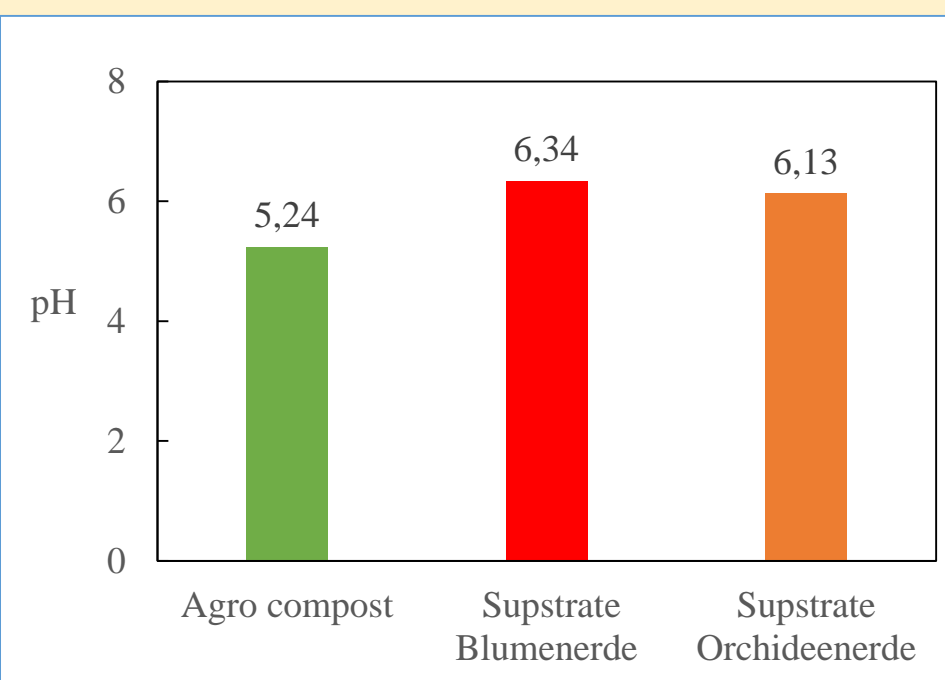


Fig. 2. Comparison of pH and el. conductivity results in compost and substrate samples

Figure 3. Comparison of the results of determining moisture content, dry matter, volatile matter and carbon content in compost and substrate samples.

Despite the fact that Agro compost and Blumenerde share similar characteristics in terms of color, texture, and odor, substrate Blumenerde exhibits a slightly higher pH value (6.34 vs. 5.24) and greater moisture content (44.31% vs. 36.22%), while electrical conductivity, volatile matter content, and carbon content are comparable.

In contrast, Agro compost and substrate Orchideenerde differ significantly in structure, composition, and odor intensity. The substrate has a higher pH value (6.13 vs. 5.24) but significantly lower electrical conductivity (160.2 vs. 570 μS/cm), indicating a lower salt content. Substrate Orchideenerde has a higher moisture content (54.49% vs. 36.22%) and a notably lower proportion of volatile matter (0.75% vs. 51.26%) and carbon (0.42% vs. 28.48%).

CONCLUSION

The significant differences in key physicochemical parameters between commercial compost and substrates highlight the importance of selecting the appropriate material for specific agricultural and horticultural needs. Further research should focus on optimizing these materials for different growing environments to maximize plant performance.

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