



2nd SCIENTIFIC CONFERENCE

**FOR CRITICAL ENVIRONMENTAL ISSUES OF
THE WESTERN BALKAN COUNTRIES**

BOOK OF ABSTRACTS

October 28th to 30th, 2021, Faculty of Agriculture, Goce Delčev University, Štip,
Republic of North Macedonia



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ORGANIZERS:

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Republic of North Macedonia

WBAA-Western Balkan Alumni Association

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DETERMINATION OF QUALITY AND ANTIOXIDANT ACTIVITY OF TRADITIONAL HOMEMADE FRUIT VINEGARS PRODUCED WITH DOUBLE SPONTANEOUS FERMENTATION

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Abstract

The quality and antioxidant potential of six traditional homemade vinegars produced using traditional methods was object of this study. The physicochemical characterization of vinegars produced from apple (*Malus domestica*), raspberry (*Rubus idaeus*), blueberry (*Vaccinium myrtillus*), blackberry (*Rubus fruticosus*), rose hip (*Rosa canina*) and persimmon (*Diospyros kaki*), was performed by measuring the ethanol content, total acidity, pH and dry matter in different vinegar production steps throughout a double spontaneous fermentation process, i.e., without any addition of yeasts or acetic acid bacteria. A spontaneous fermentation of fruits for vinegar production encompasses initially an alcoholic fermentation for 24 days, where fructose, glucose and sucrose, as most abundant sugars, are broken down into carbon dioxide (CO₂) and ethanol as main metabolic compounds, as well as other metabolic by-products and volatile compounds in trace amounts. The highest total phenolic compounds were measured by vinegar produced from rose hip (20.2 mg of gallic acid/mL) while the lowest concentration was determined for apple vinegar (0.29 mg of gallic acid/mL). The results from total phenolic compounds were in strong correlation with the antioxidant capacity. In this way, the use of traditional processes for the production of fruit vinegars proved to be very promising in terms of producing differentiated vinegars and, concomitantly, reaching high levels of health-promoting antioxidant capacities.

Keywords: homemade vinegars, double fermentation, quality, total phenolic content, antioxidant activity