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SCREENING OF ECOLOGICALLY ORIENTED NATURAL DEEP EUTECTIC SOLVENT (NADES) FOR ISOLATION OF BIOACTIVE COMPOUNDS FROM *Solidago virgaurea*

Sanja VOJVODIĆ^{1*}, Danica BOŽOVIĆ¹, Milica AĆIMOVIĆ², Zoran ZEKOVIĆ¹, Branimir PAVLIĆ¹

¹ University of Novi Sad, Faculty of Technology, Pharmaceutical engineering

² Institute of Field and Vegetable Crops Novi Sad

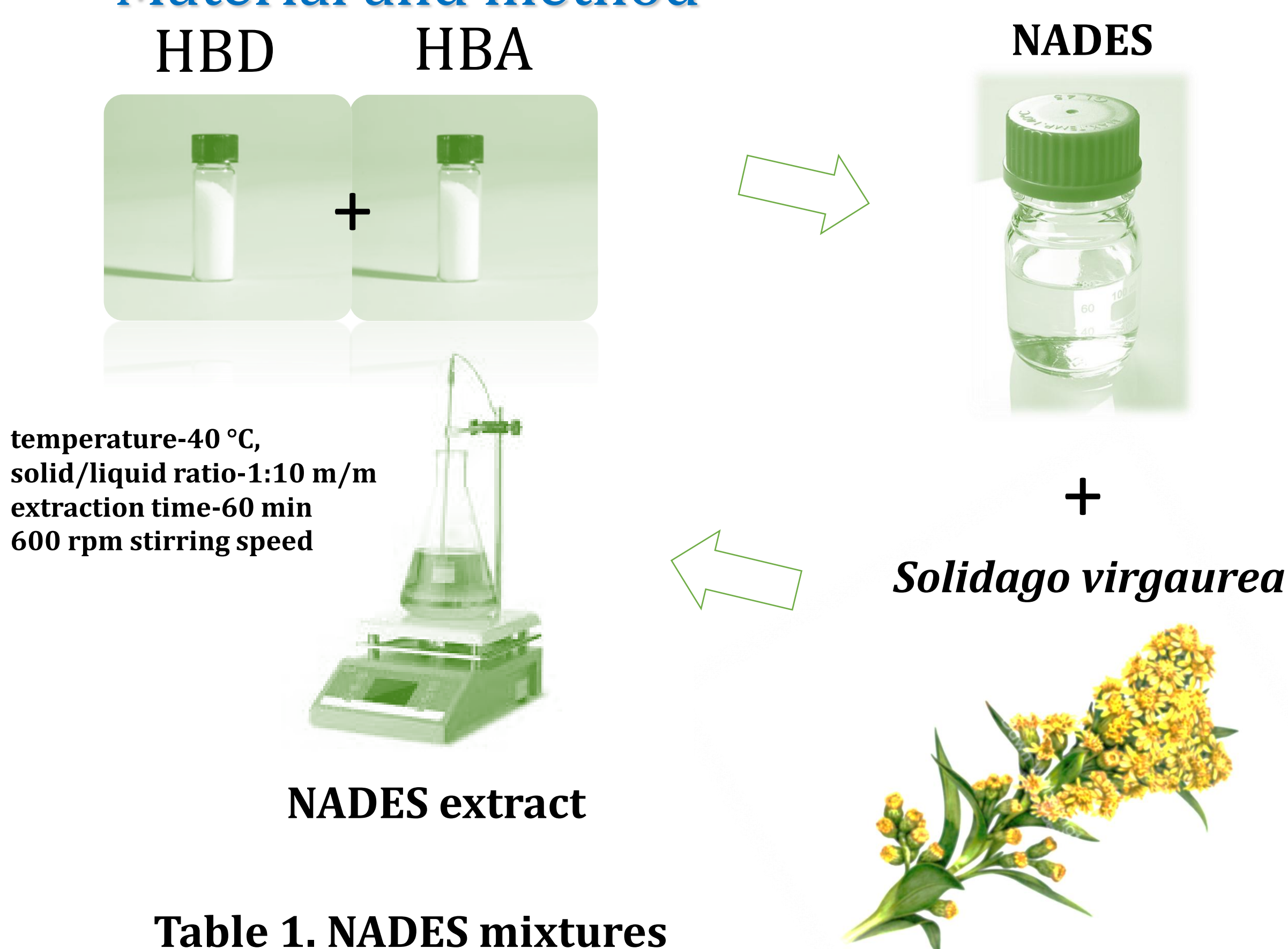
* Corresponding author: sanja.milosevic@uns.ac.rs

Abstract: In this research, the main focus was on utilizing an under-researched plant from the Asteraceae family for the preparation of environmentally friendly extracts that could be safely commercialized.

• Introduction

European goldenrod (*Solidago virgaurea*) from Asteraceae family is an under-researched plant with a promising bioactive potential. *S. virgaurea* is traditionally used for the treatment of kidney disorders and diabetes, urinary tract infections, allergies and gastrointestinal disorders due to presence of numerous bioactive compounds (flavonoids, phenolic acids, terpenes, saponins, polysaccharides, and essential oil). Antioxidant, analgesic, anti-inflammatory, antibacterial, and diuretic effects of goldenrod have been documented. Natural deep eutectic solvent (NADES) extraction as an eco-friendly technique was used for obtaining high-quality extracts. This simple extraction uses non-toxic solvents with creating minimal waste streams and pollution. The main goal of this research was to investigate the most appropriate NADES in regard to the highest content of phenolic compounds (TP) and antioxidative capacity through ability to neutralize DPPH radicals.

• Material and method



• Results and discussions

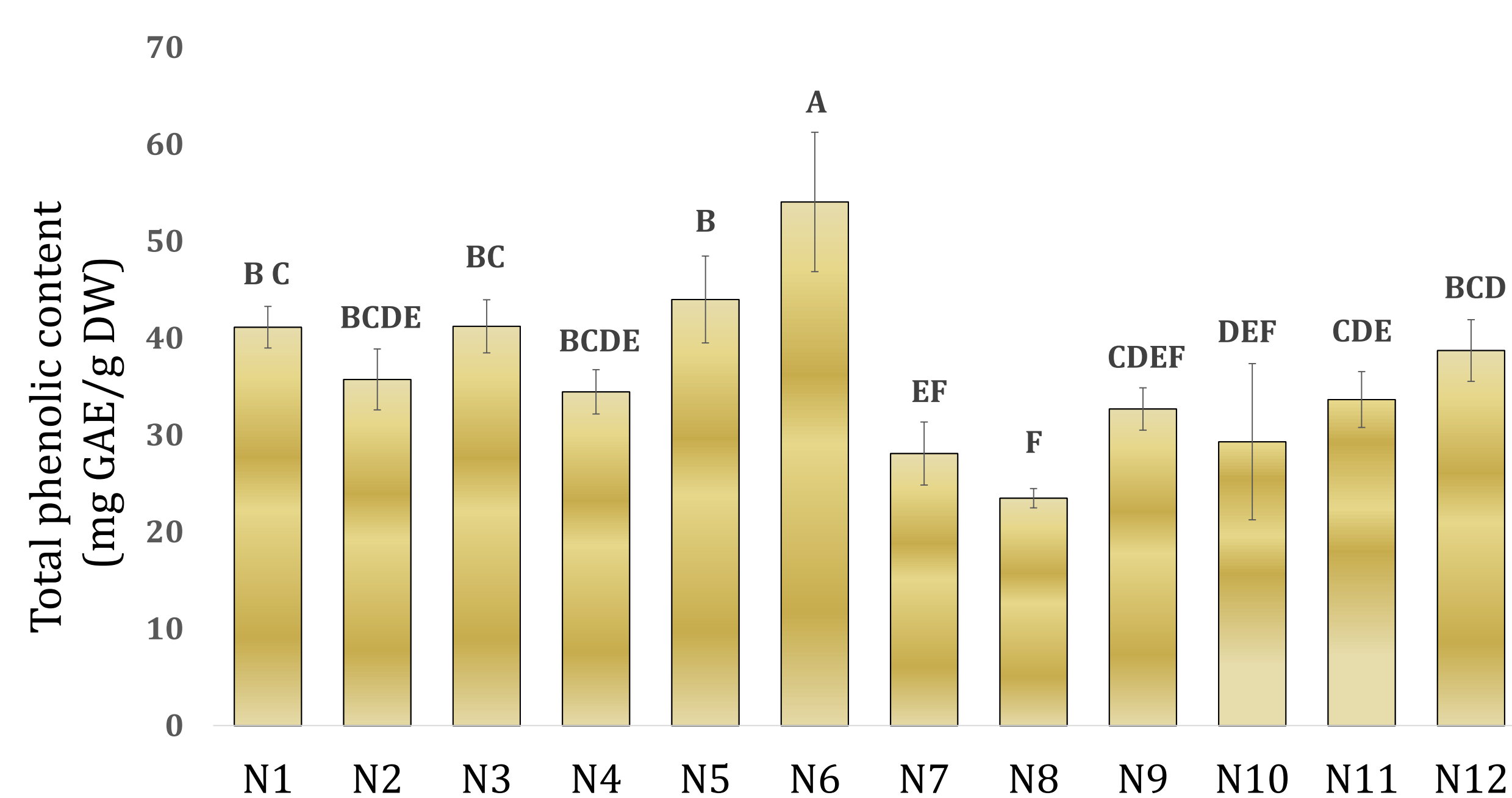


Figure 1. The effect of different NADES mixtures on total phenolic content of *S. virgaurea* NADES extracts. Results are expressed as mean $\pm$ standard deviation (SD) and different letters represent statistically significant differences ($p < 0.05$)

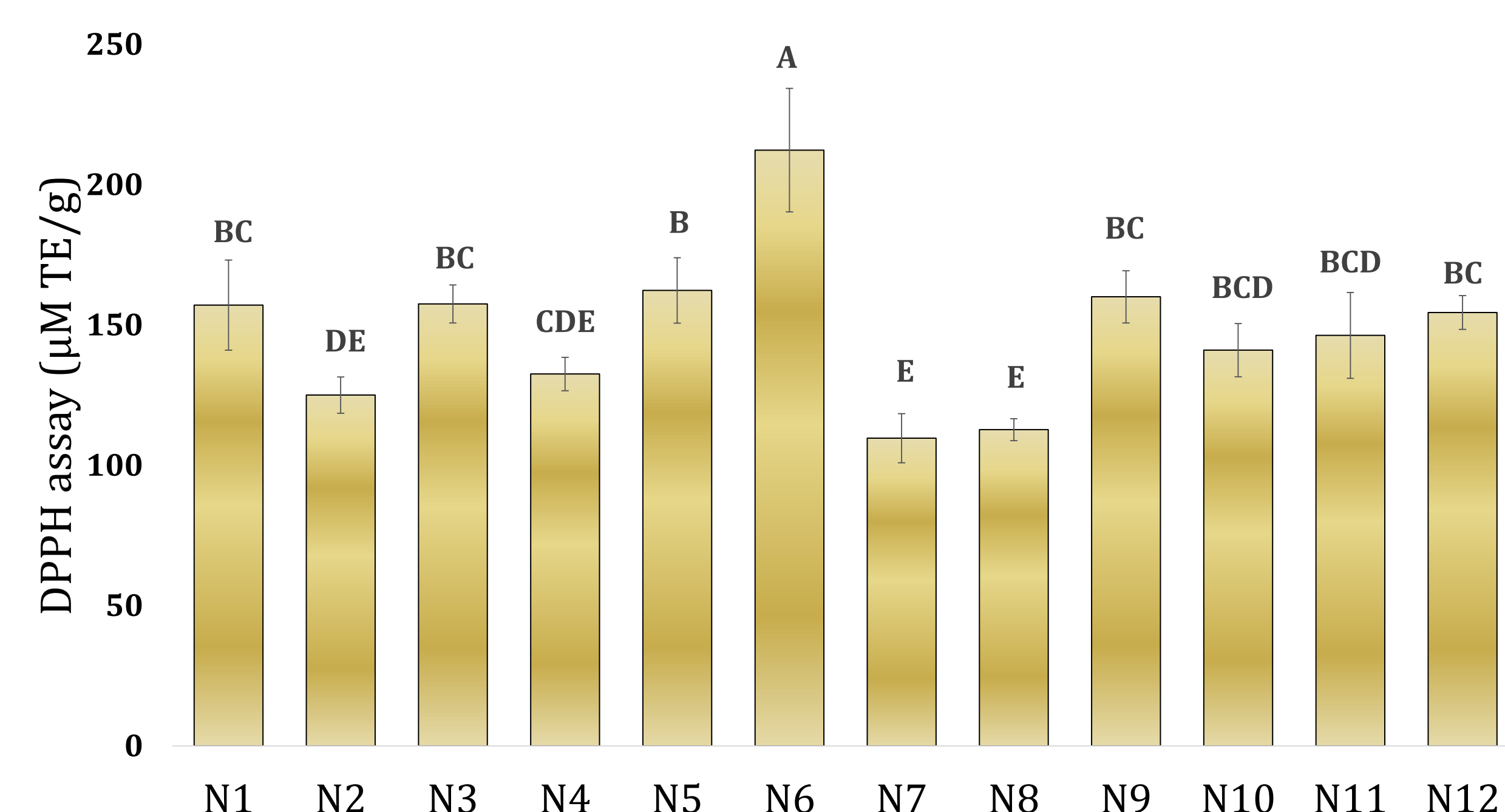


Figure 2. The effect of different NADES mixtures on DPPH assay of *S. virgaurea* NADES extracts. Results are expressed as mean $\pm$ standard deviation (SD) and different letters represent statistically significant differences ($p < 0.05$)

• Conclusions

Results showed that NADES mixtures highly effected on TP content and ability to neutralize DPPH radicals, ranging from 23.48-54.05 mg GAE/g DW and 109.65-212.29 μ M TE/g DW, respectively. Solvent mixture of choline chloride and malonic acid, with a molar ratio 1:1 (N6) provided the highest content of TP and antioxidant activity. NADES mixture made of choline chloride and citric acid, with a molar ratio 1:1 (N5) also expressed statistically significant results. Therefore, two NADES mixtures enabled the high isolation of polyphenols and antioxidants from *S. virgaurea*. In this way, it was confirmed that under-utilized *S. virgaurea* represented a highly valuable raw material for isolation of phenolic compounds with strong antioxidant capacity. Therefore, further optimization of NADES extraction will be necessary in order to obtain as high as possible contents of bioactives from this highly potent plant.

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