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Advantages of Using Natural Deep Eutectic Solvents (NADES) for Obtaining Functional Additives for Food Production

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In recent decades, there has been a growing public interest in natural sources of biologically active molecules, and an increasing number of people are showing a tendency to use natural products in treatment as well as nutrition. Natural bioactive compounds in food preparations can play a multiple role, above all they can be powerful antioxidants with the ability to protect the body from free radical attacks, have a beneficial effect on strengthening the immune system, prevent many diseases and protect the body from premature aging. In addition to these effects on the body, the incorporation of bioactive compounds, such as polyphenols, has a beneficial effect on the quality of food. This is closely related to their antimicrobial potential, which affects the sustainability and durability of the product. Plants are a significant source of polyphenols and are obtained in significant quantities by extraction from plant material. However, bearing in mind that food products require high standards in its production and extracts with specific caractersistics, the extraction technique for this pupose should be choosen carefully. Withal, the food industry faces the challenges of sustainable production that will affect all aspects of life (economic, social and environmental) by the creation of food solutions to meet the socio-economic needs and interests of citizens, while eliminating or significantly reducing harmful impacts on the environment and natural resources. NADES solvents are the latest generation of green solvents. They can be formulated exclusively from natural ingredients such as sugars, amino acids, organic acids, etc. Which makes them edible, biodegradable and completely safe to use. Moreover, they offer „ready-to-use" extracts, which means that they can be directly incorporated in food withought purification. In the frame of this work, extraction of polyphenols from Sambucus ebulus L. was done by three different NADES solvents prepared in the following manner: (N1) glycerol: betaine (2:1), (N2) betaine:glucose (1:1), (N3) glycerol:fructose (4:1). The ingreadiants were mixed with usig magnetic stirrer until a transparent stable liquid was obtained. Obtained liquid NADES solvents were used for the extraction and obtained extract were characterized in terms of their chemical composition as well as biological potential, in the first place antioxidant and antiradical ability. In the same time, extraction was performed using conventional (referent) technique and the obtained results were compared. The obtained results clearly showed an advantage of NADES extracts in terms of biological and chemical characteristics, but also in the stability, which justifies their further use in functional food production.

Keywords: NADES solvent, green extraction techniques, bioactive ingredients.

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