



Abstract

A Green Approach for Isolation of Phytochemicals from Lamiaceae Plants [†]

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Abstract: Deep eutectic solvents (DESs) are now widely recognized as a new class of ionic liquid analogues and have large-scale usage as green solvents. Due to their superior characteristics compared to traditional organic solvents, DESs are increasingly being used. The aim of the work was to examine the effectiveness of DES extractants of phenolic compounds from monocomponent teas from plants of the Lamiaceae family produced at the Institute for the Study of Medicinal Plants, “Dr. Josif Pančić”. Ten samples of herbal drugs (basil, thyme, savory, oregano, sage, thyme, mint, lavender, rosemary, and lemon balm) were tested. Extraction was performed with two types of DESs (a mixture of menthol and methylsalicylate (1:1) and a mixture of menthol and dodecanoic acid (2:1)), as well as microwave and traditional extraction. The content of phenolic acids and flavonoids in the tested preparations was determined using high-performance liquid chromatography (HPLC). Menthol–methylsalicylate and menthol–dodecanoic acid mixtures showed significant efficiency in the isolation of quercetin and naringenin from herbal drugs, while the effectiveness of the menthol–methylsalicylate mixture stands out in the isolation of chlorogenic acid and cinnamic acid from all samples, as well as rosmarinic acid from basil. The concentration of quercetin ranged from 0.2035 to 0.7543 mg/g of the drug for the menthol–methylsalicylate mixture, and from 0.1189 to 0.2025 mg/g of the drug for the menthol–dodecanoic acid mixture. In this study, an environmentally friendly, economical, and efficient extraction based on menthol and methylsalicylate, and also menthol and dodecanoic acid, was applied. Based on the results presented, DESs may be useful in the isolation of target compounds from plants. This research represents an excellent basis for further research and testing of other green solvents as new extractants.

Keywords: DES; green solvents; phenols; flavonoids; extraction



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