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PP30. Hydrodistillation versus microwave-assisted hydrodistillation of sage herbal dust: kinetics, chemical profile and bioactivity

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Essential oils are gaining attention from the academic and industrial communities due to numerous biological activities and a broad spectrum of applications. With the arrival of the "green era", there was a need to reduce the production of waste materials and to make better use of natural resources. Due to the ever-increasing market of functional foods, the search for new natural, bioactive components is a hot topic on which a lot of research effort is being focused currently and biorefinery has recently emerged as a promising approach which could lead towards a sustainable concept of production. Therefore, the aim of this work was the valorization of sage herbal dust which is being generated as a by-product from filter tea factories. Conventional hydrodistillation (HD) and microwave-assisted hydrodistillation (MWHD) were applied for the essential oil recovery. The influence of heating (205 and 410 W) and microwave irradiation (90, 180, 360, 600 and 800 W) power on distillation kinetics and the chemical profile of the essential oils was evaluated. Empirical mathematical models were used for the modeling of process kinetics. The chemical profile was evaluated by HPTLC and GC-MS and monoterpenes (camphor, α-thujone, and eucalyptol), sesquiterpenes (viridiflorol) and diterpene polyphenols (epirosmanol) were the most abundant compounds identified. The high antioxidant capacity of the obtained essential oils, determined by the DPPH assay, suggested that sage herbal dust could be successfully utilized as a raw material for essential oil recovery.

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