

CHEMICAL COMPOSITION OF EFFLUENTS PRODUCED BY THE MEDICINAL PLANTS STEAM DISTILLATION, CASE STUDY ALBANIA

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Abstract

Environmental pollution is an important issue nowadays. Sustainable development is an important challenge to the national economies. Local industries such as aromatic and medicinal plants steam distillation industry are causing a huge impact in this matter by discharging enormous amounts of effluents. Albania as a Mediterranean country, belonging to Dinarides own a diverse flora. Collection of wild medicinal plants as well as cultivation are becoming the second biggest exporting commodity. Medicinal plants, as raw material, and the steam distillation industry recently is exporting thousands of tons of plants and essential oil. Industrial water effluents produced during steam distillation contain a wide range of organic compounds as well as inorganic compounds. Due to the specificity of the steam distillation units, located in remote areas, or non-urban areas, the effluents usually are discharged to surface waters. The aim of this research was evaluation of the potential for reuse of the hydrolates.

In this work, hydrolates produced by common sage (*Salvia officinalis* L.) have been studied. Liquid-liquid extraction was employed for the isolation of chemical constituents followed by the application gas-chromatography mass-spectrometry (GC-MS) technique for their identification.

Common sage hydrolates were estimated to contain up to 0.2% phytochemicals, volume-to-volume. GC-MS analysis of the extracts revealed the presence of a range of: terpenes, monoterpene alcohols, aldehydes, oxygen-containing heterocycles, as well as esters: amyl cinnamyl alcohol, anise alcohol, benzyl alcohol, cinnamyl alcohol, citronellol, coumarin, eugenol, farnesol, geraniol, amyl cinnamal, citral, hexyl cinnamal, hydroxycitronellal, isoeugenol, hydroxyisohexyl 3-cyclohexene carboxaldehyde, benzyl benzoate, benzyl cinnamate, benzyl salicylate, methyl-2-octynoate, and alpha-isomethylionone. The main constituents were found to be limonene, and linalool.

In conclusion, proved to be valuable resource for the cosmetic industry this hydrolates need to go further processing for isolation, as added values, as well as minimizing bacteriostatic activity to surface waters.

Key words: Environmental pollution, Medicinal plants, Hydrolat, Steam distillation, Essential oils.