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Abstract

Comparison between the Chemical Profiles of Hydrosols and Essential Oils of French Lavender, Geranium, and Basil

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The essential oil production process consists of distilling plant parts with water, where steam removes the volatile components from the material. Condensing this steam from the extraction results in the formation of two phases, an organic (essential oil) and an aqueous (hydrosol). Hydrosols or floral waters are not true solutions but dispersions with water as the continuous medium.1 Although they are market products, there is no regulation regarding their quality control, and there is a lack of compositional studies. Thus, this work aims to study the relationships between the chemical compositions of the two products that have the same raw material. Commercial samples of essential oil and hydrosol from French Lavender (Lavandula dentata), Geranium (Pelargonium graveolens), and Basil (Ocimum basilicum) were kindly provided by Haje Organic Inputs. The organic components of the hydrosols (HL) were obtained through partitioning with 250 ml of hydrosol and 30 ml (3x) of petroleum ether. The ether was then evaporated with the aid of a rotary evaporator, and the resulting extract was dried with Na2SO4 and weighed. The hydrosol extracts and essential oils were analyzed by GC-FID and GC-MS.2 It was noted that only compounds with oxygenated functions were present in the HL, similar to those in the EO, varying only in isomerism or oxidation degree. The substances composing the EOs were divided into two groups called hydrocarbons (HC) and oxygenated (OXI), and the fraction each composed of the oils was calculated. The results were 21.30% HC and 78.16% OXI for French Lavender, Geranium 8.54% HC and 80.32% OXI, and for Basil was 51.22 HC and 48.33 OXI. And the percentage of organic components in each HL is 0.0072%, 0.0138%, and 0.0223%, respectively. It is observed that the OXI fraction content of the oil does not influence the yield of the HLs, as Lavender and Geranium oils show a high OXI percentage and low recovery yield. It can be concluded that the HLs are heterogeneous samples, that the oxygenated function substances are the only ones present in their composition, and that they originate from the corresponding essential oil. The yield is not determined by the chemical composition, but it is pointed out to be due to operational factors of the production. The results prove that essential oils and hydrosols from the same plant do not always have corresponding chemical compositions. Therefore, in some cases, they should not be applied with the same therapeutic purpose.

Keywords: Floral water; Organic composition; Active ingredients in hydrosols.

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