

CHEMICAL CONSTITUENTS OF *ACHILLEA SANTOLINOIDES*

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Achillea santolinoides Lagasca (Compositae) is a perennial dwarf shrub found on waste ground in south-eastern Spain (Lorca, Murcia). This plant is studied here for the first time from a chemical point of view.

The volatiles content of the aerial parts was 0.17%. The main component of this fraction was camphor (90%). This high value is unusual, inasmuch as camphor concentrations in the essential oils of other Achilleae are lower than 50% (1-3). Camphene, α -pinene, and 1,8-cineole were also found in this fraction, in concentrations lower than 3%.

From an Et₂O extract of the aerial parts, a fraction with saturated straight-chain esters was obtained by column chromatography. The esters, with an even number of carbon atoms between 42 and 60, were characterized by ms. Those occurring in the greatest concentration were the esters with 44, 46, 48, 50, and 52 carbon atoms. From the mass spectra, the acid part of the esters was deduced to consist of the even fatty acids from C₁₆ to C₃₀. By saponification of these esters, an acid fraction was obtained from which the derived methyl esters were identified by gc. The even members of the saturated fatty acid series, from C₁₆ to C₃₀, were present, and the acids with 16, 20, 22, and 24 carbon atoms were present in the greatest concentration.

The fraction of alcohols afforded by the saponification was analyzed by ms and contained the even members of the saturated chain alcohols from C₂₀ to C₃₂, with the C₂₄ and C₃₀ alcohols in the greatest concentration.

The following flavonoids were also isolated by column chromatography: artemetin (4,5), 5-hydroxy-6,7,3',4'-tetramethoxyflavone (6), and eupatorin (6).

EXPERIMENTAL

PLANT MATERIAL.—The plant was collected in May 1978 in Lorca (Murcia), Spain. A voucher specimen (MA 204049) was deposited in the Herbarium of the Royal Botanical Garden of Madrid.

EXTRACTION AND SEPARATION.—The volatile fraction was obtained by the microdistillation technique of Godefroot *et al.* (7) using 2 g of fresh plant. Oil yield (0.17%) was calculated by gc, using naphthalene as an internal standard. Oil components were identified by gc/ms.

Dried and finely powdered aerial parts of the plant were extracted with Et₂O in a Soxhlet apparatus. The extract was chromatographed on a silica gel column. Elution with *n*-hexane afforded a fraction with the saturated straight chain esters; and with a mixture of *n*-hexane-EtOAc, the following flavonoids were obtained: artemetin, 5-hydroxy-6,7,3',4'-tetramethoxyflavone, and eupatorin.

Full details of the isolation and identification of the compounds are available on request to the senior author.

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