

TRITERPENES FROM *LAVANDULA CANARIENSIS*

J.L. BRETON FUNES* and I. JAUDENES RUIZ DE ATAURI

Instituto de Productos Naturales Orgánicos, CSIC, La Laguna, Tenerife, Canary Islands, Spain

The genus *Lavandula* (Labiatae) is represented in the Canary Islands (1) by three endemic species: *L. canariensis* Mill., *L. pinnata* L., relatively abundant in the archipelago, and *L. minutolli* Bolle, found in restricted areas.

The results obtained in the phytochemical inspection of the first of the above-mentioned species are presented in this brief communication.

L. canariensis does not contain essential oils. Steam distillation afforded a series of linear fatty acids having C₁₀-C₁₆ carbon atoms. The nonvolatile part is made up of even acids of C₁₀ to C₂₆, mainly palmitic acid and, in a smaller amount, the odd acids having C₁₁ to C₂₅. These substances were characterized by ms and gc (2,3). Several triterpenic acids: ursolic, oleanolic, 2 α ,3 β -dihydroxyursolic, 2 α ,3 β ,19 α ,2 β -tetrahydroxyursolic, α - and β -amyrins, and the sterol, sitosterol-3 β -D-glucoside, were isolated and identified. All these compounds are commonly found in the genus *Lavandula*, with the exception of 2 α ,3 β -dihydroxyursolic acid (4,5) and 2 α ,3 β ,19 α ,23-tetrahydroxyursolic acid, recently isolated from *Epilobium hirsutum* (6).

EXPERIMENTAL

GENERAL EXPERIMENTAL PROCEDURES.—Melting points were determined on a Kofler block and are uncorrected. The ms spectra were recorded with Hewlett Packard 3930-A and VG Micromass ZAB-2F spectrometers. The ¹H-nmr spectra were measured using Perkin-Elmer R-12 and R-32 spectrophotometers. Gc was carried out using a Hewlett-Packard model 5710-A gas chromatograph. Ir spectra were run on a Perkin-Elmer model 681.

PLANT MATERIAL.—*L. canariensis* was collected in the zone of San Marcos, Icod, island of Tenerife. A voucher specimen was deposited in the Herbarium of the Department of Botany, Faculty of Biology, University of La Laguna (TFC 19.973).

EXTRACTION AND ISOLATION.—The finely cut, fresh plant (root, thallus, and leaves) (250 g) was extracted with *n*-hexane and later with EtOH. The solvent was evaporated and the residue steam distilled. The nonvolatile part had a positive Liebermann-Burchard reaction and was chromatographed on a column of Si gel. The combined fractions from *n*-hexane and EtOAc afforded a mixture of fatty acids and a further mixture of triterpenes and steroids that were acetylated and rechromatographed. The purity of the isolated substances was measured by tlc. Identification was made by ¹H-nmr and ms in the case of the triterpenes (7) and by direct comparison with authentic samples whenever possible. Full details of the extraction and isolation are available from the major author.

ACKNOWLEDGMENTS

We thank Professor de Pascual Teresa, University of Salamanca, for the ¹H-nmr and ms spectra of 2 α ,3 β ,19 α ,23-tetrahydroxyursolic acid.

LITERATURE CITED

1. D. Bramwell and Z. Bramwell, "Flores Silvestres de las Islas Canarias," Excmo. Cabildo Insular de Gran Canaria, Pittman-Press, Bath, 1974, p. 206.
2. H. Budzikiewicz, C. Djerassi, and D.H. Williams, "Mass Spectrometry of Organic Compounds," Holden Day, San Francisco, 1967, p. 214.
3. G.R. Walker, "Biochemical Applications of Mass Spectrometry," Wiley, New York, 1972, p. 211.
4. A.T. Glen, W. Lewrie, J. McLean, and M. El-Garbi Younes, *J. Chem. Soc.*, 510 (1967).
5. J.L. Bretón, A.G. González, and G. de León, *Anales de la Real Sociedad Española de Fís. y Quím.*, **66B**, 293 (1970).
6. J. de Pascual Teresa, B. Corrales, and M. Grande, *Anal. Quím.*, **75**, 135 (1969).
7. H. Budzikiewicz, J.M. Wilson, and C. Djerassi, *J. Am. Chem. Soc.*, **85**, 3688 (1963).

Received 7 October 1985