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TERPENOIDS FROM THE SONCHUS . VI. TUBERIFERINE FROM SONCHUS TUBERIFER SVENT.

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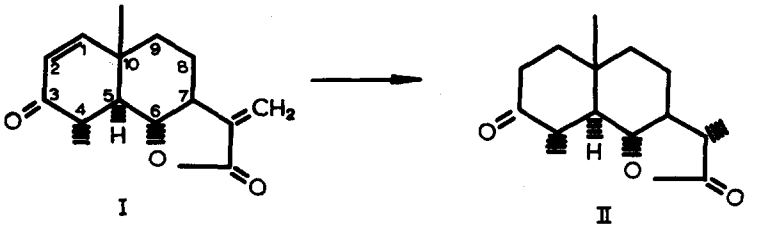
From the roots of the Sonchus Tuberifer Svent (compositae) we have isolated two sesquiterpenic lactones (total yield 0.02% of crude substances), one of them in very small quantity. The more abundant one, Tuberiferine m.p. 160-162º, $[\alpha]_D^{20}$ + 9,2 has the composition $C_{15}H_{18}O_3$. Its IR spectrum (nujol) shows absortions at 1767 cm^{-1} (α-methylene-γ-lactone) 1680 cm^{-1} (α, β insaturated ketone), 3100, 3040, 1625, 1410 and 830 cm^{-1} (two double bands, one of them conjugated with γ -lactone) (1). U.V. λmax. 224 mμ, ε 11.300.

The N.M.R. spectrum is in full accord with this; it shows the characteristic features associated with the presence of the α-methylene-γ-lactone: a pair of one proton doublet τ 4.55 and 3,88 (J = 3 cps). It shows also another pair of one proton doublet τ 4.10 and 3.25 (J = 9.9 cps, - C - C = C - $\overset{|}{C}$ -) τ 6.02 (triplet, 1 H, J = 10 cps, lactone - CH-O-), τ 8.33 (singulet 3 H, angular Me) and τ 8.67 (doublet, 3 H, J = 6.8 cps, CH-CH_3).

By hydrogenation, tuberiferine yields a tetrahydroderivative

II m.p. 154-155º, $[\alpha]_D^{20}$ + 27.1º, IR $\nu_{max.}^{nujol}$ 1780 cm^{-1} (γ-lactone) and 1710 cm^{-1} (cyclohexanone), whose properties are identical with the ones of 3-ketosantanolide-A II (2) (m.p., mixed m.p., $[\alpha]_D$, IR superimposable).



I II

This results confirms structure I given for tuberiferine and its stereochemistry at the carbon atoms C_4, C_5, C_6, C_7 and C_{10} (3).

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3. The analysis of all compounds mentionated were satisfactory. The optical rotatios were measured in chloroform. The NMR were performed in Cl_3DC with T.M.S. as standard.