Saluenolide A, A Novel Eremophilanolide from Senecio saluenensis

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Abstract: From Senecio saluenensis, a novel eremophilanolide Saluenolide A was isolated. Its structure was elucidated by 2D-NMR technique and X-ray diffraction.

Keywords: Sesquiterpene, eremophilanolide, Senecio, X-ray, cytotoxicity.

The crude petroleum ether extract of Senecio saluenensis showed 78% inhibition to KB cell on 100 µmol/L1. Nine known compounds and a new eremophilanolide, saluenolide A (I) was isolated from this extract.

Saluenolide A (I) showed 22 carbon resonances, combined by DEPT data and the molecular ion peak exhibited at m/z 340, the molecular formula of I could be deduced as C22H30O8. Three typical methyl signals at δ 1.92 (br s), 1.24 (s) and 0.95 (d, J=6.8 Hz) suggested that this compound is an eremophilanolide2,3. Considering the presence of three esteric carboxylic resonances at δ 170.9, 170.3 and 165.4, two ester moieties exist in the molecule. Scrutiny on the 1H and 13C-NMR spectra disclosed the existence of an acetoxy group as well as a senecioyl in the molecule. Two hydroxyls appeared at δ 5.09 and 3.86 could be exchanged by D2O. One olefinic proton appeared at δ 5.67 (br s) could be assigned as H-2 in the senecioyl moiety. Two oxygen-bearing methines exhibited at δ 5.72 (br s, H-3) and 4.85 (d, J=2.4 Hz, H-6). Furthermore, the ketal carbon resonance at δ 103.1 indicated the presence of the 8-hydroxy-8,12-olide moiety2.

Another hydroxyl should locate at C-10, since this oxygen-bearing carbon signal appeared at δ 74.2. The HMBC as well as the NOESY experiment revealed the presence of a 3β-acetoxy group and a 6β-senecioyl moiety. The absolute stereochemistry of I was finally disclosed by X-ray diffraction experiment utilized a Mo atom initiation. I was evaluated for its inhibitory activity against the growth of HL-60, A-549 and KB cell lines in vitro with IC50 values of 5.6 × 10^{-5}, 4.8 × 10^{-5} and 6.1 × 10^{-4} mol/L, respectively.
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References

1. F. Guéritte, (ICSN, CNRS, France) personal communications.

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