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A TOTAL SYNTHESIS OF (±) - SEMPERVIROL ACETATE.

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The isolation and structural determination of Sempervirol (I), a novel diterpenoid phenol, having a rearranged "abietane" skeleton; has been reported (1) very recently by Mangoni and Caputo. The assigned structure (I) has been further confirmed through a total synthesis* of racemic sempervirol and its acetate (II), We wish to report a new stereoselective total synthesis of (±)- sempervirol acetate (II).

(±)-Methyl O-methyl-12-acetyldesoxypodocarpate (III), previously reported by us (2) was converted to the alcohol (IV), m.p. 138-139° in a quantitative yield through reaction with methylmagnesium iodide. Hydrogenolysis of IV over palladium-charcoal in the presence of a catalytic quantity of perchloric acid gave V, m.p. 98-99°; $\nu_{max}^{CHCl_3}$ 1725 cm^{-1},1382 cm^{-1} and 1378 cm^{-1}. The ester was reduced with lithium aluminium hydride in boiling tetrahydrofuran to the semi-solid alcohol (VI), which was oxidised with chromic acid-sulphuric acid in acetone(at 10-15°), and the crude aldehyde (VII), $\nu_{max}^{CHCl_3}$ 1715 cm^{-1}, was directly converted to the hydrocarbon (VIII), b.p. 140-145° (bath)/0.3 mm.; $\nu_{max}^{CHCl_3}$ 1610 cm^{-1}, 1498 cm^{-1}, 1385cm^{-1} and 1378 cm^{-1} through Huang-Minlon reduction(3). The hydrocarbon(VIII) was

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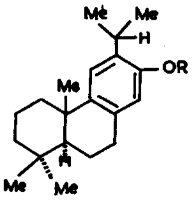
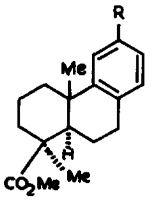
*Professor Mangoni has kindly forwarded us a copy of a part of their manuscript of this synthetic work communicated to Gazz. Chim. Itali. Their method of synthesis is, however, completely different from our synthetic route.

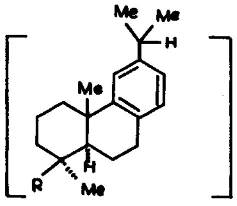
subjected to Friedel-Crafts acylation (2) with acetyl chloride in nitrobenzene in the presence of aluminium chloride at room temperature, and the resulting product on purification through chromatography over alumina afforded a single ketonic product IX, b.p. 150-155° (bath)/0.3 mm.; λ^{EtOH}_{max} 253mμ (log ε 3.97) and 295 mμ (log ε 3.21); $\nu^{CHCl_3}_{max}$ 1678 cm^{-1}, 1387 cm^{-1} and 1365cm^{-1}. It gave a single orange *2:4-dinitrophenylhydrazone*, m.p. 205-206°. The



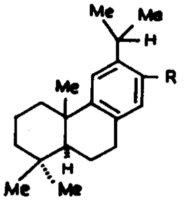
I, R = H
II, R = COMe



III, R = COMe
IV, R = C(Me)$_2$ OH
V, R = i-Pr



VI, R = CH$_2$OH
VII, R = CHO



VIII, R = H
IX, R = COMe

ketone (IX) on oxidation with a chloroform solution of perbenzoic acid in the presence of toluene-*p*-sulphonic acid afforded (±)-sempervirol acetate (II) as a colourless glass in excellent yield. It was purified through chromatography over silicagel followed by straight tube distillation, b.p. 155-160° (bath)/0.3 mm. Its infrared spectrum in CCl_4 was identical with the spectrum of the optically active sample of II, a copy of which was kindly provided by Professor Mangoni.

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