Further Studis on *Salvia Coccinea* Linn

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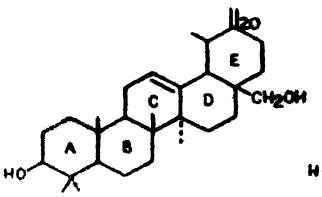
IN a previous communication[1], we reported the isolation of a minor triterpene, m. p. 210-12° from the petroleum ether (60-80°) extract of *Salvia coccinea* Linn. (Fam : *Labiate*). On further investigatio in petroleum ether (60-80°) extract of *S. coccinea* Linn, yields another triterpene-B (0.005%), m.p. 232-34° along with triterpene-A m.p. 210-12°. The triterpene-A crystallises from benzene-petroleum ether mixture, m.p. 210-12°, the elemental analysis of which indicates the molecular formula, $C_{30}H_{48}O_2$ (M^+, 440). It imparts yellow colour with tetranitromethane and responds positive to Libermann-Burchardt test for triterpene. Its IR spectrum showed bands at ν_{max}^{KBr} 3390 (broad, hydroxyl), 1649 (unsaturation) and 885 cm^{-1} (exocyclic methylene).

That the triterpene-A contains an exocyclic methylene is evident from the NMR spectrum (a doublet of two protons in the regions 4.55 and 4.76 δ) and also from the ozonolysis of the acetate of triterpene which affords formaldehyde, characterized as its dinitrophenylhydrazone.

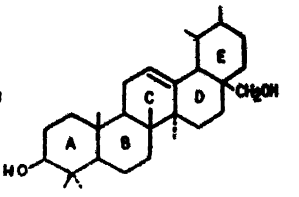
The NMR spectrum of the triterpene-A in addition to the presence of an exocyclic methylene also shows peaks at δ 0.75-1.60 (methyl and methylene protons), around 3.52δ (dd, 2H, J=10 Hz,-CH_2OH) and a broad multiplet for one proton centered at 5.15 δ for a vinylic proton. The mass fragmentation pattern of the compound is typical of Δ^{12}-ursene type of triterpene[2]. The mass spectrum of the triterpene-A exhibits peaks at m/e 440 (M^+), 409 (M^+-CH_2OH) 232 (retro Diels-Alder fragmentation), 207 (M^+-232 H), 201 (232-CH_2OH), 189 (double hydrogen transfer from retro Diels-Alder fragment to form a highly conjugated allylic cation or 207-H_2O) and a peak at m/e 133 (201-C_8H_8).

In conformity with the Δ^{12}-ursene skeleton, triterpene-A acetate on catalytic hydrogenation in glacial acetic acid with Adams catalyst afforded a product which on repeated chromatographies gave uvaol diacetate[3,4], m.p. 156-158° as one of the products. This diacetate on hydrolysis with 6% ethanolic KOH, furnished a compound, $C_{30}H_{50}O_2$ (M^+ 442), m.p. 230-32° identified as uvaol[3,4] (II) by m.m. p. determination, Co-I. R. and Co-T. L. C. with the authentic specimen of uvaol.

All the above data show that the triterpene-A is dehydrouvaol (I), the location of exocylic methylene at C_{20} is being ascertained from the pronounced loss of 68 mass units (C_5H_8) from the fragment ion at m/e 201, giving rise to an intense peak at m/e 133 in the mass spectrum because the presence of exocyclic methylene at C_{20} presumably facilitates the double allylic cleavage[2] in the ring E.



(I)



(II)

Triterpene-B, m.p. 232-34° was found to have molecular formula, $C_{30}H_{50}O_2$ (M^+ 442). Its mass spectrum exhibits peaks at m/e 411, 234, 207, 203, 189 besides the molecular ion peak at m/e 442. It forms a diacetate, m.p. 156-58° and was found to be identical with dihydro derivative of triterpene-A [M uvaol (II)] by m.m.p. determination, Co-T.L.C. and Co-I.R. with authentic sample of uvaol.

The chloroform and alcoholic extracts of *Salvia coccinea* on chromatography over Brockmann alumina in the usual way afforded only β-sitosterol.

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Coumarins from the umbels of *Prangos pabularia* Lind

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PRANGOS pabularia Lindl. (Umbelliferae) is very rich in coumarins[1]. The roots and fruits are reported for their medicinal value[1]. The plant grows