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NOTE

A Triterpenoid from *Moringa pterygosperma*

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A triterpene is isolated direct from the hexane extract of the bark of *Moringa pterygosperma*. This is identified as leupol.

Key words: Triterpenoid, *Moringa pterygosperma*, Leupol.

Moringa pterygosperma is a small or medium sized tree found wild in the sub Himalayan tract and also cultivated through out India[1]. It is known under the common name 'Sahinjan'. It belongs to family Moringaceae. It has been extensively used in the Ayurvedic system of medicine. The roots of the plant are carminative, stomachic, cardiac tonic and used in paralytic conditions and intermittent fever, also useful as rubefacient in rheumatism, in spasmodic affections of the bowls. The fruit is recommended in disease of liver and spleen, also in tetanus and paralysis. The poultice of leaves is used in reducing glandular swelling[2]. Several workers[3, 4] reported the presence of sterol and a triterpenoid in the bark of the plant. The hexane extractive yielded β-sitosterone and octacosanoic acid in addition to β-sitosterol[5].

Plant Material: The bark of *Moringa pterygosperma* was collected from the Ayurvedic garden of Benaras Hindu University and identified by the centre of advance study in botany, Benaras Hindu University, Varanasi.

Extraction, isolation and purification of the compound: The shade dried coarse powder of bark of the stem of *Moringa pterygosperma* was extracted with 100% petroleum ether following procedure of soxhlet extraction. The extractive gave positive test for the presence of terpenoids with Liebermann-Burchard Reagent (LBR). The yield of the total hexane extract was 2.71 per cent. Hot 100% hexane containing 0.40% triterpenoid.

Triterpenoid: Pure needle shaped white crystals were obtained from petroleum ether extract of *Moringa pterygosperma* in 100% chloroform which were washed from 100% petroleum ether. Crystals are hygroscopic in nature. The TLC of above fraction in 5% methanol in chloroform showed single spot by spraying Liebermann-Burchard reagent (LBR), R_f value of the fraction was 0.76 in eluents mentioned above. TLC of the same fraction was 30 : 20 chloroform : ethyl acetate media also showed a single violet colour spot by spraying

Liebermann-Burchard reagent and R_f value was 0.78. Yield of the crystal is 0.40 per cent.

Analytical Techniques: The melting point was determined using a Perfit melting point apparatus and was uncorrected. IR spectra was recorded on a Perkin Elmer model 783 spectrophotometer. ^1H NMR and ^{13}C NMR spectra were recorded on FT-NMR spectrometer (90 MHz) in $CDCl_3$ using TMS as an internal standard and the chemical shifts were determined in ppm values (δ) from TMS as internal standard. The mass spectra were recorded on a JEOL JMS D 300 spectrometer with accelerating potential of 3 KV and an ionization potential of 30 ev. The UV spectra were recorded on Carry-23 spectrophotometer, The mass spectrum was obtained at 70 eV. All the spectra were performed at the Department of Medicinal Chemistry, Central Drug Research Institute, Lucknow, India. Glindia's silica gel was used for thin layer chromatography and column chromatography. The TLC spots were visualized by spraying Liebermann-Burchard reagent and iodine developer wherever applicable.

The isolated compound was obtained as white shiny crystal direct from petroleum ether extract of the bark of the *Moringa pterygosperma*, m.p. 225–30°C, R_f 0.76 (5% methanol in chloroform) and R_f 0.78 (30 : 20 chloroform : ethyl acetate). It gave violet colour with Liebermann-Burchard reagent,[6] suggesting it to be a triterpene. The molecular formula of the compound obtained was $C_{30}H_{50}O$ (M^+ 426) on the basis of mass spectrum. It is soluble in benzene, chloroform, ethyl acetate and methanol. Strong characteristic —OH absorption bands were obtained in 3400–3220 and 1640 cm^{-1} of olefinic double bond in IR spectrum of the isolated compound.

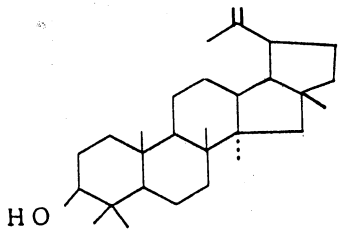
^1H NMR spectrum in $CDCl_3$ displayed a number of signals. The chemical shifts together with their splitting pattern and probable assignments are given in Table-1.

TABLE-1

^1H NMR SPECTRAL DATA OF THE ISOLATED COMPOUND

Chemical shift and scale	Proton count	Splitting pattern	Probable assignments
0.75			
0.80			
0.85	6 × 3 H	each singlet	6 × —CH_3
0.93			
0.95			
1.05			
1.25 to 1.60	—	—	Methylene and methine protons
1.70	3 H	Doublet	—C=C—CH_3
4.57	1 H	Multiplet	H—C—OH
4.70	2 H	Multiplet	C=CH_2

The interpretation of the chemical shifts of ^1H NMR of isolated compound in favour of the structure represented below.



On acetylation with pyridine and acetic anhydride the compound gave colourless crystals of acetate of isolated compound (m.p. 230–35°C). The molecular peak at m/z 426 in mass spectrum shows $M^+C_{30}H_{50}O$. The base peak at m/z 411 is probably due to loss of methyl units from the parent molecule. Another peak at m/z 408 is due to loss of one water molecule. Other base peaks at m/z 218, 207, 203 and 189 are probably due to the fragmentation of isolated compound. Spectral data of isolated compund tallies exactly with the reported data of the lupeol and also identified by direct comparison with authentic sample[7, 8] This is the first report of the occurrence of this triterpene in the plant *Moringa pterygosperma*.

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