Isolation of β-Sitosterol and Ursolic Acid from *Morinda Citrifolia* Linn.

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Morinda citrifolia Linn (Rubiaceae) is cultivated in the gardens as an ornamental plant. Its various parts are reputed to possess medicinal properties. The leaves of this plant are used internally as tonic, febrifuge, against wounds and ulcers, whereas their extract is employed externally against gout[1]. Chemical investigation of the leaves have earlier yielded a protein and essential amino acids[2].

In the present reinvestigation, the fresh leaves of *Morinda Citrifolia* Linn. (2 kg.) was percolated with alcohol for 1 week. The residue obtained on evaporation of the solvent from the extract was divided between water and ethyl acetate. On concentration of the ethyl layer, a crystalline greenish yellow solid settled down which was filtered. On recrystallisation from methanol, white, shiny crystals were obtained. This compound was identified as ursolic acid through spectroscopic studies and comparison of melting points of the compound as well as its derivatives.

The ethyl acetate filtrate was evaporated and chromatographed on a column of silicas gel. The substance eluted with benzene-ethyl acetate (85:15) crystallised from ethanol. This compound, which gave a positive Liebermann-Burchard test was identified as β-sitosterol.

With benzene-ethyl acetate a further quantity of ursolic acid was eluted.

Ursolic Acid

m.p. 286° (lit. m.p. 291°)[3], *i.r:* 3400-3500 cm^{-1} (OH), 1680 (COOH); *mass spectrum:* m/e 456 (M^+) 248 (retro-Diels Alder fragment a)[4], 297 (fragment b)[4], 203 (a -COOH).

Acetate: Prepared with acetic anhydride and pyridine m.p. 289-90° lit.[3] m.p. 289-92°, *mass spectrum;* M^+ peak at m/e 490 *methyl ester* obtained on treatment with diazomethane m.p. 170° lit.[3] m.p. 173°. *mass spectrum;* M^+ at m/e 470.

Acetate of methyl ester: Prepared through acetylation (acetic anhydride + pyridine) of the above compound 235° undepressed on admixture with an authentic sample of acetyl ursolic acid methyl ester. The i.r. spectra of the two samples were identical.

β-Sitosterol

m.p. 140-41° (lit.[3] m.p. 136-37°), *i.r:* (KBr) 3400-3500 cm^{-1} (OH) *Mass Spectrum;* m/e 414 (M^+), 399 (M^+ -CH_3), 396 (M^+ -H_2O) 381, 329, 303, 273.

Acetate: Prepared with acetic anhydride and pyridine m.p. 132-134° lit.[3] m.p. 134°, M^+ at m/e 456.

Benzoate: Prepared with benzoyl chloride and pyridine. m.p. 163-64° lit.[3] m.p. 164-6°.

There was no depression in melting point on admixture with an authentic sample of β-Sitosterol. The i.r. spectra of the isolated and authentic samples were also superimposable. The mass spectral peaks also correspondent to those given in literature[5].

References

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