SHORT COMMUNICATIONS

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CHEMICAL STUDIES ON SISYMBRIUM SOPHIA (SYN. DESCURAINIA SOPHIA)

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Sisymbrium sophia, which is commonly available in Peshawar, is reputed[1] to be useful for various ailments. The plant has a pungent odour when rubbed and an acrid biting taste. These qualities have been attributed[1] to the presence of a volatile alkaloid in the plant. However, no work seems to have been done on the whole plant, except for a recent report[2] on the isolation of isorhamnetin from the defatted seeds of the plant. Therefore, a systematic investigation of the whole plant of *Sisymbrium sophia* was undertaken and as a result we have been able to isolate three crystalline compounds from it: a flavonoid, m.p. 305° (dec.), found to be identical with isorhamnetin[2] by mixed m.p. of the original compound and its acetate with those of authentic samples; β-sitosterol, m.p. 139–140°C and an alcohol, helioscopiol[3], m.p. 75–76°C.

Experimental

Fresh plant (5.0 kg) was cut into pieces and percolated with ethyl alcohol (4 gallons) at room temperature. The alcoholic extract was concentrated under reduced pressure to a semisolid residue. The thick residue was extracted repeatedly with solvent oil (mixture of hydrocarbons, boiling range 60–145°C), ethyl acetate and chloroform, respectively. The chloroform fraction was discarded.

Isolation of β-Sitosterol.—The solvent oil extract after concentration to a small volume was chromatographed on a column of alumina (100 g, May & Baker) and eluted with the same solvent, about 500 ml of the eluate were collected which were discarded. The column was then eluted with acetone and two fractions of 100 ml each were collected. The acetone fractions were concentrated and the residue crystallized from ethyl alcohol to give white, crystalline solid, m.p. 139–140°C. The compound gave positive tests for sterols and was identified as β-sitosterol (lit. m.p. 139–140°) by mixed m.p. with an authentic sample.

Isolation of Isorhamnetin.—The ethyl acetate extract was decolorized with charcoal, filtered, concentrated under reduce pressure. The yellow product obtained after cooling was crystallized from acetic acid giving yellow-grey needles, m.p. 305° (dec). The compound gave positive tests for flavonoids and was identified by mixed m.p. with an authentic sample as isorhamnetin (lit.,[2] m.p. 305° dec.).

The compound was acetylated with acetic anhydride and sodium acetate. The product was crystallized from acetone and methanol, m.p. 200–202°C (lit.[2] m.p. for tetraacetyl derivative of isorhamnetin 200–202°C). The NMR ($CDCl_3$) spectrum of the acetylated product also showed the presence of four acetyl groups at 8.32, 7.88 and 7.83τ.

Isolation of Helioscopiol.—The fresh plant after percolation with alcohol was soxheleted with petroleum ether (60–80°). The extract was charcoaled, filtered, concentrated and kept in refrigerator. An oily product was obtained, which crystallized from acetone to give an amorphous compound, m.p. 75–76°C. This could be acetylated to give white needles, m.p. 56–57°C.

The compound was identified to be helioscopiol[3] (isolated from *Euphorbia helioscopia*)[3] by the mixed m.p. of the two.

References

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2. M.S.Y. Khan, Curr. Sci., **36,** 206 (1967).
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