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REVISED PHYTOCHEMICAL STUDY OF ARNEBIA HISPIDISSIMA

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ABSTRACT

Chemical investigations into the constituents of the roots of Arnebia hispidissima have yielded 3 new naphthaquinone which possess antibiotic and anticancerous properties. A flavonoid, characterised as vitexin, has been isolated from the fresh flowers of Arnebia hispidissima.

A dye, commonly known as RATANJOT in Indo-Pakistan medicine, is obtained from the roots of A. hispidissima. Other compounds, alkannin monoacetate, alknannin α-dimethylacrylate. (±) – alkamnin and three new naphthaquinones having antibiotic and anticancerous activities have been reported from its roots 1-4.

Phytochemical studies into the constituents of fresh flowers of A. hispidisshna have been carried out for the first time. A flavonoid, characterised as vitexin, has been isolated.

Results and Discussions

Fresh flowers were exhaustively extracted with ethanol. The solvent was removed under reduced pressure which gave a viscous concentrate. This was distributed into petroleum ether soluble and petroleum ether insoluble fractions. The petroleum ether insoluble fraction was dissolved in methanol and concentrated under reduced pressure to produce a pale yellow crystalline compound. This was identified as a flavonoid by direct comparison (TLC, NMR and melting point) with an authentic sample.

Material

The fresh flowers used in this investigation were collected from the campus of the Institute of History of Medicine and Medical Research, in the months of February and March 1985. The genus and the species *were* confirmed by the department of pharmacognosy.

Experimental

Extraction of the flavonoid: The fresh flowers (500 g) were exhaustively extracted in ethanol at room temperature, keeping the extract for 4 days and shaking it occasionally during the day. Four such extracts were combined together and concentrated under reduced pressure. The viscous concentrate was distributed into petroleum ether (60-80°) soluble and petroleum ether (60-80°) insoluble fractions. The later was dissolved in methanol, filtered, which gave a pale yellow crystalline product.

Identification of the isolated 7avonoid The crystallin: flavonoid was practically insoluble in almost all organic solvents indicating that it was a highly polar compound. This was dissolved in pyridine and precipitated by adding it dropwise in a large volume of ether. The precipitation procedure was repeated several times which gave a TLC pure, single spot, bringht yellow compound imp. 256-258°. It was then chromatographed on a polyamide plate using MeOH, AcOH, H_2O in 90:5:5 ratio as the solvent system. Examination of the plate under UV light showing only one spot thus establishing its homogenity.

Under ordinary conditions the compound (I) could not be hydrolysed. On reaction with hydriodic acid it gave an aglycone nt.p. 300°. The aglycone on treatment with acetic anhydride and pyridine gave an acetate, imp. 180° which was identical with apigenin in all respects.

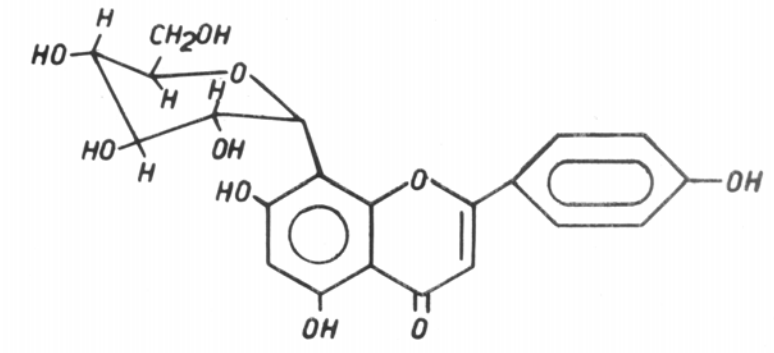

Fig. 1.

The compound (I) was acetylated with acetic anhydride and pyridine in cold and the acetate was isolated as a crystalline compound from methanol, imp. 257°. H NMR (90 MHz, DMSO, TMS): revealed 4 alcoholic acetoxyls. 1.72, 2.02, 1.92, 2.10 and 3 phenolic acetoxyls, δ 2.37 and b 2.4. The aromatic region contained 2 singlets at δ 6.70 (3-H), 6,83 (6-H) and 2 doublets (J = 9 c.p.s.) at 7.45 and 8.14 corresponding to vitexin heptaacetate. Further confirmation was provided by superimposing the I.R. spectra of acetate and authentic sample of vitexin acetate.

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