RANUNCULIN AND ANEMONIN FROM HELLEBORUS ABCHASICUS

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We have investigated the roots and rhizomes of Helleborus abchasicus A. Br. for their content of lactones of γ-hydroxyvinylacrylic acid, ranunculin, and anemonin. For this purpose, the freshly comminuted plant material was extracted with water containing 2% of nitric acid. The lactones were adsorbed from the extract with carbon, and then eluted with 50% ethanol. After the solvent had been distilled off, a dark yellow viscous residue was obtained which was chromatographed on a column of silica gel and eluted with ethanol. The fractions were monitored by paper chromatography in a butan-1-ol–ethanol–water (7 : 2 : 2) system as proposed by Ruijgrok [1, 2] and in a butan-1-ol–pyridine–water (4 : 1 : 1) system. The Legal-Gadamer reagent was used.

The first fractions, after repeated recrystallization, yielded faintly yellowish acicular crystals with mp 152–154° C. On a paper chromatogram a single spot with R_f 0.72 appeared at the level of authentic anemonin. UV spectrum: λ_{max} 215 mμ. A mixture gave no depression of the melting point.

The subsequent fractions yielded rectangular crystals with mp 138–141° C, $[\alpha]_D^{21}$ −80° (c 1.65, water). On a paper chromatogram a spot was found with R_f 0.20 in the region of a standard sample of ranunculin. UV spectrum: λ_{max} 210 mμ. A mixture gave no depression of the melting point.

Consequently, the isolated substances are pure anemonin and ranunculin.

By paper chromatographic analysis, the fatty oil of Helleborus abchasicus was found to contain anemonin, the total steroid saponins of the plant to contain ranunculin, and the total glycosides to contain ranunculin and a second substance, with R_f 0.494, giving reactions of ranunculin derivatives.

This is the first time ranunculin and anemonin have been isolated from Helleborus abchasicus.

REFERENCES

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