COUMARINS OF THE ROOTS OF HERACLEUM ANTASIATICUM

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It is known [1] that the fruit of the endemic species Heracleum antasiaticum Manden, which grows in the Caucasus, contains sphondin, pimpinellin, isopimpinellin, bergapten, isobergapten, and angelicin (substance 5).

The present paper gives the results of a study of the furocoumarins of the root of this plant. The coumarins were isolated by a procedure described previously [2]. Four substances were isolated in the individual crystalline state, three of them being identified as sphondin $C_{12}H_8O_4$, mp 190–192° C, R_f 0.10; psoralen $C_{11}H_6O_3$, mp 139–140° C, R_f 0.14; and angelicin $C_{11}H_6O_3$, mp 138–140° C, R_f 0.29 [the R_f values given are for the petroleum ether–formamide system].

The fourth substance, $C_{21}H_{22}O_4$, mp 96–97° C, R_f 0.79, on acid hydrolysis formed 5, 8-dihydroxypsoralen $C_{11}H_6O_5$, mp 239–242° C, which was converted by methylation into isopimpinellin $C_{13}H_{10}O_5$, mp 149–150° C, R_f 0.15. The physicochemical properties and reaction products of this substance show that it was cnidicin, 5, 8-diisopentenyloxypsoralen, previously found only in Cnidium dubium [3]. Psoralen and cnidicin have not previously been detected in plants of the genus Heracleum.

Paper chromatography in the petroleum ether–formamide system yielded small amounts of isopimpinellin (R_f 0.15), bergapten (R_f 0.21), isobergapten (R_f 0.41), and pimpinellin (R_f 0.44).

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GLYCOFLAVONOIDS OF GLYCYRRHIZA GLABRA

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In a study of the individual compounds of Glycyrrhiza glabra L., we have attempted to investigate the flavonoids of the epigeal part of this plant.

In a quantitative analysis by two-dimensional paper chromatography we found about ten substances of flavonoid nature in the herb collected in the flowering phase. The flavonoids were separated on polyamide sorbent to give in the individual state substance A with the composition $C_{21}H_{20}O_{10}$, mp 262–264° C (ethanol–water), $[\alpha]_D$ +55.0° (c 0.2; methanol), R_f 0.59–0.61 (15% acetic acid); giving an acetate $C_{35}H_{34}O_{17}$, mp 165–167° C, $[\alpha]_D$ −32.4° (c 0.05; acetone). Substance A underwent no decomposition on enzymatic hydrolysis with emulsin and yeast α-glucosidase, while acid hydrolysis led to the formation of a new compound A–2, $C_{21}H_{20}O_{10}$, mp 263–265° C (alcohol–water), $[\alpha]_D$ −15.0° (c 0.1; methanol), R_f 0.25–0.27 (15% acetic acid); giving an acetate $C_{35}H_{34}O_{17}$ with mp 256–257° C (alcohol), $[\alpha]_D$ −70.1° (c 0.05; acetone).

From the results of a spectroscopic investigation in the UV region using ionizing and complex-forming reagents [1], both substances were shown to be flavone derivatives with free phenolic groups in positions 5, 7, and 4'.