AN INVESTIGATION OF THE FLAVONOIDS OF SCUTELLARIA POLYODON. I.

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From the flowers of the herb Scutellaria polyodon Jur., family Labiatae, we have isolated about 2% of flavonoids (on the weight of the dry raw material).

The flavonoids were obtained by the extraction of the freshly-gathered raw material with 96% ethanol and with hot water, with subsequent acidification of the aqueous extract to precipitate the glucuronosides of the flavonoids. Paper chromatography showed that the flowers contained four flavone compounds.

Substance I formed pale yellow crystals with R_f 0.31 (30% CH_3COOH), mp 312° C (decomp., from methanol), $[\alpha]_D^{20}$ −138°. The UV spectrum ($\lambda_{max}^{CH_3OH}$ 333 and 280 mμ and $\lambda_{min}^{CH_3OH}$ 305 and 250 mμ) show that hydroxyl groups are present at $C_{(5)}$ and $C_{(4')}$. The IR spectrum of the substance exhibits absorption bands at (cm^{-1}) 3395 (hydroxy group), 1664, (carbonyl group of a γ-pyrone), 1610, 1584, and 1510 (aromatic system), and 837 (substituent in position 4') [1, 2].

Hydrolysis for 8 hr with Kiliani's mixture gave scutellarein with mp 330–335° C (decomp.). UV spectrum: $\lambda_{max}^{CH_3OH}$ 338, 286 mμ and $\lambda_{min}^{CH_3OH}$ 305, 255 mμ.

Paper chromatography of the hydrolysate after neutralization with sodium carbonate showed the presence of β-D-glucuronic acid (revealed by means of a butanolic solution of p-anisidine). Thus, substance I is scutellarein 7-β-D-glucuronoside.

Substance II, accompanying substance I, was isolated by fractional crystallization from the combined substances. IR spectrum, cm^{-1}: 3384 (hydroxyl group), 1740 (ester bond), 1665 (carbonyl group), 1615, 1584, 1510 (aromatic system), and 834 (substituent in position 4'). Hydrolysis yielded scutellarein, β-D-glucuronic acid, and a phenolic hydroxyacid characterized provisionally by color reactions and its R_f value as sinapic acid. In the glucuronoside it is apparently attached to the glucuronic residue, since the UV spectrum of this substance in the presence of reagents is similar to that of scutellarein.

Substance III with R_f 0.58 [butan-1-ol–CH_3COOH–H_2O (4 : 1 : 5) system], bright yellow crystals, was isolated by the concentration of the aqueous ethanolic extracts from the fresh flowers. According to IR and UV spectroscopy, it contains a methyl group in the flavone nucleus and a free hydroxyl group on carbon atom 5.

Substance IV is scutellarein.

REFERENCES

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