

We have studied the phenolic compounds in the epigeal part of *Linum usitatissimum* (common flax, varieties Svetoch and L-1120) in the "Christmas tree" phase by the method of systematic analysis [1]. The dry fixed material was treated with purified and acidified diethyl ether in the cold, this extracting the free phenolic compounds, which consisted of phenolcarboxylic acids and esculetin. The first fraction was separated by two-dimensional ascending paper chromatography in the solvent systems isopropanol-ammonia-water (10:1:1) and 5% CH₃COOH. The dry residue was treated with 70% ethanol, leading to the isolation of the labile bound phenolic compounds (phenolcarboxylic acid esters and glycosides, flavone glycosides, and hydroxycoumarin glycosides). The second fraction was treated in the same way in the solvent isobutanol-acetic acid-water (4:1:5) and 10% CH₃COOH. The residual plant mass was subjected to acid hydrolysis (2 N H₂SO₄). The liberated firmly bound phenolcarboxylic acids were extracted with diethyl ether and separated in a similar way to the free fraction. By this method, more than 50 phenolic compounds have been detected in common flax.

The phenolic compounds were identified by the fluorescence of their spots in UV light, by qualitative reactions, by selective precipitation with lead salts, by the products of their acid and alkaline hydrolysis, by their UV spectra and the bathochromic shifts of the maxima with a number of ionizing and complex-forming additives [2], by their solubilities, by their capacity for forming cis and trans isomers, and by chromatographic comparisons with authentic samples.

Phenolcarboxylic Acids. More than 20 individual substances were detected. Caffeic, p-coumaric, p-hydroxybenzoic, ferulic, vanillic, and syrenic acids were identified. The same acids were found in the hydrolyzed fraction, but their amount was considerably greater than in the free phenolcarboxylic acids. Among them ferulic, p-coumaric, and p-hydroxybenzoic acids predominated.

Flavone Glycosides. The presence of more than 14 C-glycosides of luteolin and apigenin was shown. Among them we identified orientin, homoorientin, vitexin, and saponaretin. The other flavonoids are apparently O-glycosides. C-glycosides have recently been detected in flax of South American origin [3]. There are no flavonols in flax. Flavone glycosides have been detected in all the organs of common flax with the exception of the roots. Their maximum accumulation is found in the period of the complete formation of the leaves (end of budding - beginning of flowering).

Esters and Glycosides of Phenolcarboxylic Acids. About 15 compounds of this type were isolated. Chlorogenic, neochlorogenic, and 4-caffeoylquinic acids were identified. Caffeic, p-coumaric, ferulic, sinapic, and unidentified benzoic acids are components of the remaining complex phenols. Esters of caffeic acid and flavone glycosides are the main phenolic compounds of fiber flax, and they accumulate in considerable amounts (1-6%) in the flowers, stems, and leaves.

Hydroxycoumarins. The small group of phenolic compounds of common flax is represented by esculin and esculetin. They are found mainly in the leaves of common flax and only in traces in the receptacle and stem. The content of hydroxycoumarins is low (about 0.05%).

LITERATURE CITED

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