decreases, because of which the relative amount of β- + γ-tocopherols increases. The decrease in the amount of α-tocopherol is connected with its lower resistance to the oxidizing action of the alkali.

The main products of the oxidation of tocopherols are tocopherol p-quinones. The relatively large amount of tocopherols in the tar is due to the fact that, in the distillation of the fatty acids, the tocopherols do not volatilize together with the fatty acids but remain in the still residue. The decrease in the relative amount of α-tocopherol in the tar is connected with the action of the temperature in the distillation process.

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FLAVONOIDS OF Campanula maleevii

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In a phytochemical study of the epigeal part of Campanula maleevii Fed. (Maleev's bellflower), collected in the flowering period in Krasnodar krai, village of Nebug, flavonoid compounds were detected by paper chromatography.

The air-dry raw material (200 g) was comminuted and extracted with methanol. The methanolic extracts were concentrated to small volume diluted with water, and extracted with chloroform. On cooling, the purified aqueous extract deposited a greenish-yellow precipitate (2.9 g) consisting of an unpurified compound of flavonoid nature. After repeated recyrstallization from 40% ethanol, the substance of the precipitate had mp 187-189°C, $[\alpha]_D^{24}$+ 1.9° (c 0.5; methanol) and it gave a full acetate with mp 113-115°C, $[\alpha]_D^{24}$–64.3° (c 0.59; chloroform). From the results of acid and enzymatic hydrolysis and IR, UV, and PMR spectroscopy, the flavonoid isolated was identified as quercetin 3-O-rutinoside, or rutin. Rutin has been isolated previously from the epigeal part of Campanula glomerata L. [1] and C. oblongifolia (C. Koch) Charadze [2], for which it was likewise the dominating compound.

Chromatography on polyamide of the total extract with elution by water–ethanol mixtures gave, in addition to rutin, another flavonol glycoside, identified as quercetin 3-O-β-D-glucoside (isoquercitrin). The amount of rutin determined by a chromato-spectrophotometric method was 1.47% (98% of the total flavonoids), and the amount of isoquercetrin 0.03%. Chlorogenic acid was also detected in the plant.

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