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We have previously reported a study of the polyphenols of the leaves of various species of sumac cultivated in Uzbekistan [1]. In the present paper we give the results of an investigation of the catechins of the stems of two species of sumac, *Rhus glabra* and *Rh. typhina*.

To isolate the catechins we used the ethyl acetate treatment of an aqueous-acetone (70%) extract of the stems of *Rh. glabra* that had previously been treated with chloroform. After the ethyl acetate extract had been dried with sodium sulfate and had been concentrated, the total polyphenols were precipitated with a fivefold volume of hexane. The total material isolated, unlike the polyphenols of sumac leaves, gave a positive reaction with the vanillin reagent, which showed its catechin nature.

Chromatography of the total material obtained on paper (Filtrak) in the butan-1-ol-acetic acid-water (40:12:28) system and treatment of the chromatograph with a 1% solution of vanillin in concentrated hydrochloric acid showed that it contained four catechins and one substance with a yellow color ( $R_f$  0.78).

To separate the polyphenolic complex, we used the column chromatography in silica gel. The eluents were moistened diethyl ether, ether-ethyl acetate (1:1), and ethyl acetate. The separation was monitored by the qualitative reaction with the vanillin reagent and by paper chromatography. The catechins were eluted in the main by ether. The fractions enriched with a particular catechin were combined and, after concentration, rechromatographed. In this way we succeeded in isolating two catechins, which, after recrystallization from water were identified from their physicochemical indices (melting points,  $R_f$  values in various solvent systems, UV, IR, and PMR spectra, and specific rotations), and also from the results of a study of the products of alkaline decomposition in comparison with authentic samples of catechins, as (+)-catechin and (-)-epicatechin. From their chromatographic behavior in various solvent systems, the other two catechins corresponded to (+)-gallocatechin and (-)-epigallocatechin.

A comparative study of the qualitative compositions of the catechins of the stems of the two species of sumac was made with the aid of two-dimensional paper chromatography (solvent systems: 1) butan-1-ol-acetic acid-water (40:12:28), and 2) 6% acetic acid). The results show that the stems of *Rh. glabra* contained (-)-epicatechin, (+)-catechin, (+)-gallocatechin, and a very small amount of (-)-epigallocatechin, the main catechin being (-)-epicatechin. In addition to the catechins found in *Rh. glabra*, the stems of *Rh. typhina* contained (-)-epicatechin gallate. The amount of (+)-gallocatechin was fairly small, while (-)-epigallocatechin was not detected at all.

Thus, the catechins from the stems of two species of sumac have been studied for the first time and it has been shown that they differ both in composition and amount.

## LITERATURE CITED

1. S. M. Mavlyanov, Sh. Yu. Islambekov, A. K. Karimov, A. K. Karimdzhano, A. I. Ismailov, and E. A. Gnatchenko, Abstracts of Lectures at the Vth All-Union Symposium on Phenolic Compounds. Chemistry Section [in Russian], Tallin (1987), p. 56.

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