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ANTHOCYANS OF *Phytolacca americana*

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The flora of Azerbaidzhan is rich in useful plants, including medicinal and food plants and others, and one of these is common pokeberry, *Phytolacca americana*, L., fam. Phytolaccaceae, L. Various organs of this plant are widely used in medicine and the food industry [1, 2]. In spite of its valuable medicinal and food properties, common pokeberry has been little studied.

There are various reports in the literature on the composition of pokeberry anthocyans. According to Chumbalov and Mukhamed'yarova [3], ripe pokeberries contain cyanidin derivatives (chrysanthemin), while Piattelli and Minale [4] have shown the presence of a betacyanin. However, Britton [5] has reported the presence of derivatives of both betacyanins and cyanidin in the berries. Judging from the distribution of anthocyans and betacyanins in the vegetable kingdom, this is unlikely. We have investigated the composition of the anthocyans of *Ph. americana* gathered in the Sheki-Zakatal'skaya zone of Azerbaidzhan. The fresh ripe berries (100 g) were pressed out and the residue was extracted with water containing 1% of HCl. The juice and the extract were combined and were kept in the cold for 24 h, after which the precipitate that had deposited was centrifuged off. A total pigment preparation was obtained by column chromatography. The extract was deposited on a column containing the adsorbent silica gel equilibrated with 1% HCl, and elution was carried out with the same solvent. The fractions containing all the pigments were dried in vacuum at 30°C, giving 6 g of a total pigment preparation.

Individual pigments were isolated by column chromatography. The column was filled with a suspension of cellulose powder in the butan-1-ol-acetic acid–water (4:1:2) system, and the same mixture was used for elution. On the chromatogram we detected four clearly separated zones: I) red-violet; II) yellow; (III) violet: IV) yellow. The eluates of the main pigments were concentrated in vacuum to 10-15 ml and were subjected to further purification by partition chromatography on paper. Paper strips containing a pigment were cut into small pieces and extracted with distilled water, after which the extract was filtered, its pH was brought to 3.0 with HCl solution, and it was concentrated in vacuum. The residue was dried in a desiccator over $CaCl_2$. The red pigment isolated in this way consisted of a dark violet powder with a metallic luster (substance **1**). The second pigment was obtained in the same way in the form of an amorphous yellow powder (substance **2**).

The individual compounds were identified spectrophotometrically from their absorption maxima and by the paper chromatography of the products of acid and alkaline hydrolysis in various systems with authentic specimens. The spectral analysis showed that substance (**1**) had an absorption maximum at 537 mμ and substance (**2**) one at 478 mμ in water. The sugar residue and the aglycon of substance (**1**) were identified chromatographically and spectrophotometrically with markers and in a comparison with the literature [6]. Thus, on chromatography of the hydrolysate, spots corresponding to betanidin (R_f 0.18, λ_{max} 545 mμ) and glucose were detected.

On the basis of the results of chromatographic, spectral, and chemical analyses, substance (**1**) was identified as betanin (betanidin 5-O-β-O-glucoside) and substance (**2**) as a betaxanthin. The third, violet, pigment proved to be betanidin.

Chromatographic analysis of extracts from various organs (leaves, stems, and flowers showed that they all contained isobetanin, as well as betanin, betanidin, and a betaxanthin. Not one of the pokeberry organs analyzed contained cyanidin derivatives.

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