PHENOLIC COMPOUNDS OF *Amaranthus cruentus*

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Phenolic compounds of various plants are widely used in medicine [1]. Both traditional medicinal plants such as calendula, daisy, etc., and various other plants that have gained popularity in the last few years, for example, clover, maple, and hawthorn, are sources of phenolic substances.

Amaranthus cruentus L. (bloody amaranth) is used in folk medicine in many countries [2, 3]. We determined the quantitative content of total phenolic compounds in amaranth and developed a method to isolate and purify them in order to evaluate the prospects of using this plant for practical preparation of phenolic compounds.

We previously observed the valuable medicinal substance rutin in aqueous alcoholic extracts of amaranth [4]. Studies of the composition of the extracts have been reported and showed that ~40% of the total dry substances consists of phenolic compounds and makes up 3.5-4.5% of the total dry weight in amaranth. This makes it a new promising source for the preparation of natural phenolic compounds.

The degree of purity is important in determining the biological activity of phenolic compounds. For amaranth, the purification of the phenolic extracts is complicated by the presence of large quantities of free amino acids and inorganic compounds. We tested various methods for determining phenolic compounds in order to maximize the removal of side products during the process. As a result, we developed a method for the isolation of total phenols of amaranth combined with the simultaneous removal of side products and other impurities. The degree of extraction of phenols reaches 90%. The method is based on the transfer of phenolic compounds from the aqueous alcoholic extracts into aqueous solution and subsequent isolation and purification. The total phenols are very soluble in aqueous alcohol and slightly soluble in water.

The general method for isolating amaranth phenols: raw material (200 g, dry green mass) is extracted with alcohol (2.09 L, 70%). The solvent is removed under vacuum to give an aqueous residual that is acidified with conc. HCl (20 mL) and extracted with butanol. The extract is treated with aqueous KOH (16 g, 200 mL). The alkaline solution is acidified with HCl (20 mL) until the pH is 2 and extracted with butanol. The butanol extract is washed with water and concentrated until dry. Yield of phenolic compounds, 8.0 g (4.0%).

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