# ANTHOCYANS OF CERTAIN BELGOROD PLANTS

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A previously developed method [1] can in several minutes without additional workup determine unacylated anthocyans in extracts of flower petals or fruit. We present results of an investigation of anthocyans from several plants collected in 2002-2003 in Belgorod district: *Securigera varia* (L.) Lassen, *Nonea pulla* (L.), *Mahonia aquifolium* (Pursh) Nutt., *Vitis vinifera* L. (Isabelle variety), and *Cosmos bipinnatus* Cav..

TABLE 1. Relative Area of Anthocyan Peaks, %

| Aglycon | Glycoside in the 3-position | *Vitis vinifera* | | | *Securigera varia* | *Nonea pulla* | *Cosmos bipinnatus* | *Mahonia aquifolium* | *Oxycoccus palustris* |
|---|---|---|---|---|---|---|---|---|---|
| | | Red | Blue | Isabella variety | | | | | |
| Dp | Gala | | | | 4.8 | | | | 0.8 |
| | Glu | 7.1 | 2.9 | 29.2 | | 31.2 | | 34.4 | 0.3 |
| | Rut | | | | | | | 17.0 | |
| | Ara | | | | | | | | 0.2 |
| Cy | Gala | | | | 6.1 | | | | 20.9 |
| | Glu | 25.7 | 0.7 | 11.7 | | 1.5 | 11.6 | 21.0 | 2.3 |
| | Rut | | | | | | 60.5 | 3.5 | |
| | Ara | | | | | | | | 20.1 |
| Pt | Gala | | | | 10.3 | | | | 0.6 |
| | Glu | 5.2 | 7.0 | 28.6 | | 59.3 | | 6.9 | 0.4 |
| | Rut | | | | | 1.4 | | 8.1 | |
| | Ara | | | | | | | | 0.6 |
| Pn | Gala | | | | 8.0 | | | | 30.0 |
| | Glu | 51.1 | 7.2 | 2.6 | | 1.4 | 1.9 | 2.0 | 6.9 |
| | Rut | | | | | | 25.9 | | |
| | Ara | | | | | | | | 14.1 |
| Mv | Gala | | | | 55.0 | | | | 1.7 |
| | Glu | 9.5 | 78.8 | 23.4 | | 2.3 | | 0.5 | 0.4 |
| | Rut | | | | | | | 4.7 | |
| | Ara | | | | | | | | 0.4 |
| Remaining | | 1.5 | 3.4 | 4.5 | | 3.0 | | | |
| Σ | D | 21.8 | 88.7 | 81.2 | 70.1 | 92.8 | | 71.6 | 5.6 |
| | C | 76.8 | 7.9 | 14.3 | 14.1 | 2.9 | 100 | 26.5 | 94.4 |
| $\alpha^{Me}$, % | | 62.5 | 92.7 | 44.1 | 83.2 | 34.8 | 27.8 | 16.2 | 54.8 |

Dp = delphinidin; Cy = cyanidin; Pt = petunidin; Mv = malvidin; Gala = galactoside; Glu = glucoside; Rut = rutinoside; Ara = arabinoside; D = the sum of delphinidin, petunindin, and malvidin glycosides; C = the sum of cyanidin and peonidin glycosides. $\alpha^{Me}$ is the degree of methylation of the OH group in ring B (except 4′-OH), %.

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The proposed method is relative. Therefore, specimens containing a set of identical glycosides of various aglycons represent an especially interesting find. In this sense, the set of pigments from crown vetch (*S. varia*) is interesting. The principal ones are 3-galactosides of delphinidin-type (delphinidin, petunidin, and malvidin) and cyanidin-type (cyanidin and peonidin) anthocyans. The aglycons were separated into two series based on a study of grape anthocyans, which consist mainly of the 3-glucosides of these five aglycons. However, an investigation of the pigments from imported grape found that peonidin (methylation product of cyanidin) and cyanidin dominate the dark-red varieties; malvidin, petunidin, and delphinidin, the dark-blue ones, the first two compounds being methylation products of delphinidin (Table 1). Therefore, the arbitrary use of color characteristics in the English-language literature (red instead of blue [2, 3]) is justified only for a particular extract. The anthocyans from vetch, *N. pulla*, and *M. aquifolium* under this classification should be considered as delphinidin derivatives; those from *C. bipinnatus* and cranberry (collected in Arkhangelsk District in 2002), cyanidin derivatives.

Dark blue Isabelle grape anthocyans (delphinidin type) grown under conditions of Belgorod District have a relatively low degree of methylation of the ring B hydroxyl.

## REFERENCES


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