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Exploring free and glycosidic forms of triterpenoids in cuticular waxes and tissues of chokeberry and blackberry leaves

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Various forms of triterpenoids (e.g., free, esters and glycosides) differ in polarity and solubility in water, and as a consequence in localization in cells, tissues and whole plant organs, as well as in their functions. The aim of the study was to investigate the occurrence of various forms of triterpenoids in cuticular waxes and remaining tissues of leaves of two plants from family Rosaceae: chokeberry and blackberry. It was confirmed that the chosen plants differ significantly in distribution of triterpenoids between cuticular waxes and internal tissues of leaves. In chokeberry triterpenoids occur mainly in the free form in the surface waxes, where they probably constitute the "first line of chemical defense". In blackberry the "second line of defense", i.e. accumulation of saponins in internal tissues, predominates. The total content of free forms of triterpenoids in chokeberry (the chloroform wax extract and diethyl ether extract of remaining tissues) accounted for approximately 3878 mg per one gram of fresh weight, while the glycosidic forms (methanol extract) for 454 mg. For blackberry leaves, the total content of free forms of triterpenoids was almost six times lower while the glycosidic forms was almost two times higher than in chokeberry. The obtained results provided the new data on triterpenoid profiles in both studied plants.

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