

Pomological Features, Nutritional Quality, Polyphenol Content Analysis, and Antioxidant Properties of Domesticated and 3 Wild Ecotype Forms of Raspberries (*Rubus idaeus* L.)

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Abstract: The raspberry (*Rubus idaeus* L.) is an economically important berry crop that contains many phenolic compounds with potential health benefits. In this study, important pomological features, including nutrient content and antioxidant properties, of a domesticated and 3 wild (Yayla, Yavuzlar, and Yedigol) raspberries were evaluated. Also, the amount of total phenolics and flavonoids in lyophilized aqueous extracts of domesticated and wild ecotypes of raspberry fruits were calculated as gallic acid equivalents (GAEs) and quercetin equivalents (QE). The highest phenolic compounds were found in wild Yayla ecotype (26.66 ± 3.26 GAE/mg extract). Whilst, the highest flavonoids were determined in wild Yedigol ecotype (6.09 ± 1.21 QA/mg extract). The antioxidant activity of lyophilized aqueous extracts of domesticated and wild ecotypes of raspberry fruits were investigated as trolox equivalents using different *in vitro* assays including DPPH[•], ABTS^{•+}, DMPD^{•+}, and O₂⁻ radical scavenging activities, H₂O₂ scavenging activity, ferric (Fe³⁺) and cupric ions (Cu²⁺) reducing abilities, ferrous ions (Fe²⁺) chelating activity. In addition, quantitative amounts of caffeic acid, ferulic acid, syringic acid, ellagic acid, quercetin, α -tocopherol, pyrogallol, p-hydroxybenzoic acid, vanillin, p-coumaric acid, gallic acid, and ascorbic acid in lyophilized aqueous extracts of domesticated and wild ecotypes of raspberry fruits were detected by high-performance liquid chromatography and tandem mass spectrometry (LC-MS-MS). The results clearly show that p-coumaric acid is the main phenolic acid responsible for the antioxidant and radical scavenging activity of lyophilized aqueous extracts of domesticated and wild ecotypes of raspberry fruits.

Keywords: antioxidant activity, pomological features, radical scavenging, raspberry, *Rubus idaeus*