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Antioxidant Activity and Phenolic acids Compounds in Different Parts of Potato Tubers

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Objectives

Evaluate content and distribution of Chlorogenic acid(CGA), Caffeic acid(CFA) and Ferulic acid(FA) compounds determine the correlation between antioxidant activity and concentration of the same phenolic compounds among a diverse group of potato varieties.

Materials and Methods

1. Materials: 19 potato varieties were obtained from KPGR
2. Method: Antioxidant activity was measured by DPPH and contents of CGA, CFA and FA were measured by HPLC in the different potato parts.

Results and Discussion

The results showed RC50 of antioxidant activity values of 19 clones ranged from 32.4 μ l to 246.8 μ l, in the 2001 year trial. "Bora Valley" showed the highest antioxidant activity, and other variety was followed by "Rose Valley", "Gogu Valley", "Songee Valley" and "Golden Valley".

Table1. Antioxidant activities in different parts of tubers in potato varieties grown in 2002.

Tissue	Bora Valley	Rose Valley	Gogu Valley	Songee Valley	Golden valley
Cortex	22.61a	60.3a	76.1a	81.8a	97.1a
Pith	75.2d	204.3d	252.4c	251.4d	300.4c
perimedullary	33.3c	200.6c	251.3c	200.6c	300.2c
Whole	28.3b	74.4b	84.9b	92.6b	107.1b

¹⁾: RC50(μ l) measured with DPPH methods; Means are significantly different at the P<0.05 level in the Duncan's Multiple Range Test.

Five varieties have the greatest antioxidant activity in the cortex tissue, followed by the perimedullary and pith tissue. Only "Bora Valley" had low RC50 value in perimedullary and pith tissue, 75.23 μ l and 33.27 μ l respectively, while the other cultivars were higher than 200 μ l (Table1). The different tissues of potato tubers also varied in contents of phenolic compounds. The contents of CGA, CFA and FA in cortex of all cultivars were higher than those of the other two sections, and the contents of CGA, CFA, and FA in each part of "Bora Valley" were higher than those of other cultivars. It considered between RC50 values and content of individual phenolic compounds relationship that has closely correlation. The regression coefficients between RC50 values and CGA, CFA and FA contents in cortex tissue were 0.808, 0.864, and 0.980. The correlation coefficients between RC50 values and CGA, CFA, and FA contents in whole tuber were 0.881, 0.912, and 0.974.

The potato not only has CGA, CFA, and FA of phenolic acid as an antioxidant substance but also has vitamin C and the other phenolic acid that is a known antioxidant substance. This study could not evaluate the effect of vitamin C from potato samples, because vitamin C may be oxidized during the sampling period. and about the other antioxidant activity of phenolic acid contents must be studying in future.

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