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A Antioxidant Activities of Yellow Corn (*Zea mays* L.) Inbreds from Three Different Geographic Locations

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[Introduction]

Antioxidant compounds found in corn kernels are mainly polyphenols including flavonoid, vitamins, carotenoids, and so forth. In this study, yellow kernels lines were used for analyzing antioxidant activity in which effects of anthocyanin were withdrawn. The effects of carotenoids on the antioxidant activity were investigated which would provide useful information for corn biofortification since the most of corn produced in the world are yellow or white.

[Materials and Methods]

We used 34 corn inbreds adapted from three different locations, East Asia, Southern Asia, and subtropical region and 11 F1 hybrids from the inbreds to investigate antioxidant activities of yellow corn. Antioxidant activities were measured with three different methods; ABTS, DPPH, and polyphenol contents. In addition, total flavonol and carotenoids contents were measured.

[Results and Discussion]

In the loading plot of PCA, Flavonol, DPPH, ABTS, and polyphenol contents showed similar directions, whereas carotenoid showed a different direction. The inbred lines from three different locations were dispersed randomly in the score plot showing little effect of geographic location on the level of antioxidant activity. Vietnamese lines are generally more diverse from their positions in the score plot. Korean lines are placed cross to the center and KS and CML lines have less variation among individuals than Vietnamese lines. Carotenoid contents are significantly different among samples where Vietnamese lines showed higher amount than Korean lines ($P < 0.05$) and CMLs ($P < 0.001$). Correlation coefficient of the different method for measuring antioxidant activities showed high correlation coefficient. DPPH and ABTS showed high correlation coefficient with polyphenol content (0.667 and 0.806, respectively) rather than flavonoid content (0.444 and 0.243, respectively). Relatively a weak correlation was observed between the methods for antioxidant activities with carotenoid contents. In addition, the a^* (green/red) and b^* (blue/yellow) color values of the kernels can be indicators for carotenoid contents and polyphenol contents, respectively.

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