Title Combining ability for superoxide dismutase, peroxidase and catalase enzymes in cabbage head (*Brassica oleracea* var. *capitata* L.)

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Citation Scientia Horticulturae, Volume 122, Issue 2, 17 September 2009, Pages 195-199

Keywords Antioxidant; Superoxide dismutase (SOD); Peroxidase (POX); Catalase (CAT); General- and specific-combining ability (GCA and SCA); Cabbage

Abstract

Antioxidant enzymes have been touted as beneficial for enhancing the fitness, preventing disorders, and mitigating the effects of aging and senescence. Our objective was to evaluate combining ability of superoxide dismutase, peroxidase, and catalase activity in cabbage head. Head samples were frozen immediately in liquid nitrogen and placed at −80 °C for assay. Less than unity values of $\sigma^2_{gca}/\sigma^2_{sca}$ ratio for all three enzymes indicated predominance of non-additive gene action. The parents CMS-GA and Red Cabbage excelled as good general combiners for all antioxidants and indicated the value and need for multiple crossing. The crosses CMS-GA × Red Cabbage, CMS-GA × C-2, 83-2 × AC-204, 83-2 × EC-490174, 83-2 × AC-1021, Pride of Asia × C-4, and Pride of Asia × AC-1019 showed significant specific combining ability, which could be exploited through heterosis breeding. The hybrid combinations with high *per se* performance and favorable SCA estimate and involving at least one of the parents with high GCA estimate could be useful to increase the abundance of favorable alleles for enhancing the antioxidants in cabbage head.