Genetic Analysis of Bolting Tendency in Beta vulgaris ssp. maritima

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Abstract:

Beta vulgaris ssp. maritima is a facultative perennial species exhibits large intraspecific variation in vernalization requirement. Bolting tendency is a complex character governed by various environmental cues and multiple genetic factors. A panel of B. vulgaris ssp. maritima accessions collected from the Mediterranean costs revealed significant variations in bolting time. Three F2 populations derived from crosses between six annual beet accessions were analyzed for bolting behavior. Two F2 segregated populations, i.e., Bvm127 and Bvm128 exhibited phenotypic segregation ratios of 3 : 1 early bolting and late bolting which is expected for dominant-recessive inheritance of a monogenic trait. Meanwhile, the phenotypic segregation ratio for early bolting: late bolting in the F2 population Bvm125 did not deviate significantly from 63 : 1, indicating a polygenic inheritance of bolting tendency in Beta vulgaris ssp. maritime. Broad sense heritability for bolting tendency ranged from 0.58 to 0.74.

Keywords:

Beta vulgaris, sugar beet, bolting, flowering, floral transition

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