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Czech J. Genet. Plant Breed.

D., Zhu W., Gao C., Zhang J., Fu T.:

Characterization of *S* haplotype in a new self-compatible *Brassica rapa* cultivar Dahuangyoucai

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The most important *Brassica* species, *B. rapa*, is naturally self-incompatible. Self-compatible mutants would be useful for dissecting the molecular mechanism of self-incompatibility (SI), a process that promotes outcrossing by recognizing and refusing self-pollens. The *S* haplotype in a new self-compatible *B. rapa* cultivar, Dahuangyoucai, was characterized for the first time in this study. Sequence analysis of the *S*-locus genes, *SLG* (*S*-locus glycoprotein), *SRK* (*S*-locus receptor kinase) and *SCR* (*S*-locus cysteine-rich protein) revealed that

Dahuangyoucai contained *S* haplotype highly similar to *S-f2*, a non-functional class I *S* haplotype identified in another self-compatible *B. rapa* cultivar, Yellow Sarson. Mutations of *MLPK* (*M*-locus protein kinase) and non-transcription of the male determinant, *SCR*, were observed in this cultivar, which is similar to the situation reported in Yellow Sarson. With respect to the female determinant, *SRK*, no transcript was detected in Yellow Sarson but two fragments were detected in Dahuangyoucai. One fragment was highly similar to *SRK-f2*, but the other fragment was different from the signal factors previously identified in the SI reaction. The results suggest that Dahuangyoucai and Yellow Sarson have the same origin and a similar mechanism of self-compatibility, but diverge after mutations in *SRK*, *SCR* and *MLPK*. Further studying the self-compatibility of Dahuangyoucai might identify novel factors involved in the SI signalling cascade and provide new insights into the mechanisms of SI in Brassicaceae.

Keywords:

Brassica rapa L.; gene expression; *M*-locus protein kinase (*MLPK*); *S*-locus

genes; self-incompatibility

[fulltext]