



Expression divergence of FRUITFULL homeologs enhanced pod shatter resistance in *Brassica napus*

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ABSTRACT. To improve pod shatter resistance in the important oilseed crop *Brassica napus*, the phenotypic diversity of *B. napus* was tested using 80 *B. napus* varieties for pod shatter resistance by a random impact test. Among these varieties, R1-1 was identified as resistant, while R2, 8908B was susceptible to shatter. To understand the molecular basis for this phenotypic difference based on the candidate gene approach, *B. napus* FRUITFULL (*FUL*) homologs were identified and characterized. Two *FUL* loci in the A and C genomes of *B. napus* were identified. In the susceptible variety, both *BnaA.FUL* and *BnaC.FUL* were expressed in the same tissues. However, the expression level of *BnaC.FUL* differed in varieties with different pod shatter resistance. In the most resistant variety, R1-1, only *BnaA.FUL* was expressed, while *BnaC.FUL* was silenced. Therefore, the functional divergence and differing expression

of *BnaX.FUL* homeologs may significantly affect phenotypic variation, which is an important consequence of allopolyploid evolution. This expression level divergence may be useful for selecting pod shatter resistant lines through marker-assisted selection in *B. napus*-breeding programs.

Key words: Allopolyploid evolution; Expression divergence; *FUL* homeolog; Oilseed rape; Pod shattering