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Rice lesion mimic mutants and proteome analysis of *spl6* in rice

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Rice spotted leaf (*spl*) mutants spontaneously form lesions on leaves in the absence of pathogenic infection and lead to death of the localized cells. Small and reddish-brown lesions were initiated in groups on the leaf blade and finally formed parallel lines along the midrib of *spl6* leaf. Thylakoid membranes of mesophyll chloroplasts were damaged in non-spotted sections, whereas, chloroplasts were absent in the mesophyll cells of the *sp* sections of the mutant, indicating, lesion formation of the *spl6* mutant might be caused by oxidative burst. Proteome analysis revealed that 159 protein spots were expressed differentially among wild type and mutant, whereas, 40 protein spots have not been existed on the mutant. Protein disulfide isomerase (PDI), transketolase, thioredoxin peroxidase (TPX), ATP synthase, RuBisCO-L and RuBisCO-ACS were not identified in the mutant but were abundant in the wild type. Especially, the absence of TPX and PDI might be the cause of the failure to protect cells against oxidative burst resulting in degradation of the thylakoid membranes and leading to programmed cell death and lesion development.

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Over-expression of *ABF3* enhances tolerance to cold stress in transgenic bottle gourd and watermelon rootstock

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Unfavourable environmental stresses are major limiting factors of plant productivity. Plants perceive and respond adaptively to such abiotic stress conditions, and the adaptive process is controlled mainly by phytohormone, consequently changing in gene expression pattern. Transcriptional regulator *ABF3* (Abscisic acid response element Binding Factor 3) mediating the ABA-responsive gene expression plays important roles in drought and temperature tolerance. Here, we report the successful transformation of bottle gourd and watermelon rootstock (gongdae) with *ABF3* using *Agrobacterium tumefaciens*-mediated transformation system. Several T₀ plants of bottle gourd and watermelon rootstock were self-pollinated and T₁ seeds were germinated. T₁ seedlings of bottle gourd and watermelon rootstock as well as non-transformed control were treated under 10°C and 4°C for 3-7 days. We found that T₁ transgenic progenies over-expressed *ABF3* showed tolerance to low temperature stress condition.

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