

FaWRKY11 transcription factor positively regulates resistance to *Botrytis cinerea* in strawberry fruit

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Abstract

Plant WRKY transcriptional factors play an important role in responses to biotic and abiotic stresses and are involved in a wide range of resistance strategies against pathogen attacks. The present study investigated the functional role of *FaWRKY11* in the regulation of defense responses to *B. cinerea* in strawberry fruit (*Fragaria ananassa* Duch. cv. Benihoppe). As strawberry fruits ripened and developed, *FaWRKY11* expression levels gradually decreased and were closely related to the severity of *B. cinerea*. Transient transformation was conducted to overexpress and silence *FaWRKY11* in strawberry fruits, which were later analyzed upon *B. cinerea* inoculation. The results indicated that 5 days following infestation with *B. cinerea*, the tissue damage of the fruits with overexpressed *FaWRKY11* was significantly alleviated. The disease incidence was significantly lower than that of the control. Conversely, the degree of damage suffered by the silenced fruit tissue increased to a certain extent, and the disease incidence was slightly higher than that of the control. The results revealed the positive regulatory function of *FaWRKY11* in the resistance of strawberries against *B. cinerea*. Once the *FaWRKY11* gene was overexpressed and silenced, the expression levels of the genes related to *B. cinerea* of the fruit were regulated to diverse extents. The most significant variations were observed in the expression levels of transcription factors related to disease resistance, and also in genes related to metabolism of phytohormones. Our study inferred that the *FaWRKY11* might regulate the resistance of strawberries against *B. cinerea* through regulating some disease-resistance transcription factors and metabolic genes. Our study demonstrated the regulatory mechanism of *FaWRKY11* regarding the defense in strawberries against *B. cinerea*.