

# DNA methylation mediated by melatonin was involved in ethylene signal transmission and ripening of tomato fruit

Shuangshuang Shan, Zhiqiang Wang, Huili Pu, Wenhui Duan, Hongmiao Song, Jiangkuo Li, Zhengke Zhang and Xiangbin Xu

Scientia Horticulturae 291: 110566. (2022)

---

## Abstract

Melatonin (MT) as an evolutionarily highly conserved molecule plays an exceptional role in plants. In the present study, the regulation mechanism of the DNA methylation of CpG islands of ethylene signaling genes induced by MT on postharvest ripening of tomato fruit was studied. The ripening of tomato fruit was significantly promoted by the 0.5 mM MT treatment, as revealed by the appearance color, the lycopene, total soluble solids and vitamin C content of the fruit. In the MT treated fruit, the DNA methylation levels of CpG island of *SIACS10* and *SIERF-A1* were decreased, and the DNA methylation level of CpG island of *SICTR1* was increased. In addition, MT treatment increased the expression level of *SIACS10*, *SLEIN3*, *SIERF-A1* and *SLERT10*, inhibited the expression level of *SICTR1*, and by which the ethylene signaling might be activated and the ripening was promoted. The effect of MT on the DNA methylation of CpG islands of genes involved in ethylene signaling may contribute to the ripening of tomato fruit. The present study provided valuable information for understanding the essential role of DNA methylation in the postharvest ripening of tomato fruit.