

# Priming of defense systems and upregulation of MYC2 and JAZ1 genes after botrytis cinerea inoculation in methyl Jasmonate-treated strawberry fruits

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Several attempts have been made to study the effects of methyl jasmonate (MeJA) on plants in the past years. However, the comparative effects of the number and phenological time of MeJA applications on the activation of defense systems is currently unknown in strawberries. In the present research, we performed three field treatments during strawberry (*Fragaria x ananassa* ?Camarosa?) fruit development and ripening which consisted of differential MeJA applications at flowering (M3), and the large green (M2 and M3) and red ripe (M1, M2, and M3) fruit stages. We also checked changes in gene expression related to plant defense against *Botrytis cinerea* inoculation post-harvest. In M3 treatment, we observed an upregulation of the anthocyanin and lignin contents and the defense-related genes, encoding for chitinases,  $\beta$ -1,3-glucanases and polygalacturonaseinhibiting proteins, after harvest (0 hpi), along with the jasmonate signaling-related genes FaMYC2 and FaJAZ1 at 48 h after *B. cinerea* inoculation (48 hpi) during postharvest storage. Although we did not find differences in gray mold incidence between the MeJA treatments and control, these results suggest that preharvest MeJA treatment from the flowering stage onwards (M3) primes defense responses mediated by the upregulation of different defense-related genes and retains the upregulation of MYC2 and JAZ1 at 48 hpi. © 2020 by the authors. Licensee MDPI, Basel, Switzerland.

Anthocyanin

Defense genes

Fragaria x ananassa

Gray mold

Jasmonate pathway

Lignin

Methyl jasmonate applications

Necrotrophic fungi