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Ethylene and jasmonic acid play a synergistic role in the tomato fruit susceptibility to Botrytis

Abstract:

Ethylene and jasmonic acid are plant hormones involved in the interaction between fruits and pathogens. Although the role of both plant hormones in abiotic stress responses is recognized, the putative interaction among them and its influence in the resistance against undesirable biotic interactions is still unknown. To study the role of ethylene and jasmonic acid in the susceptibility of tomato fruit to B. cinerea, the Never ripe (Nr) and jasmonic acid insensitive1-1 (jai1-1) tomato mutants were used, which are insensitive to ethylene and jasmonic acid, respectively. Ripe tomato fruits from wild type (WT), Nr and jai1-1 mutants were treated or not with 1-methylcyclopropene (1.0µL L-1), an inhibitor of the ethylene receptor. Immediately after treatment, fruit were inoculated with B. cinerea (105 spores mL-1) and stored for six days at 25°C and relative humidity of 85%. Fruit susceptibility was represented here as incidence and severity; and the progression of the disease by lesion diameter. The results show that inhibition of ethylene receptor decreases susceptibility to Botrytis only in the wild type fruit. The incidence and severity in the ethylene insensitive mutant was not influenced by the treatment with ethylene inhibitor, however in the jasmonic acid insensitive mutant, the inhibition of ethylene receptor intensified the increase in incidence and severity of Botrytis and the lesion diameter. On the contrary, disease progression appears to be dependent on the sensitivity of fruit tissue to ethylene and jasmonic acid. These results indicate that ethylene and jasmonic acid act synergistically in the susceptibility of tomato fruit to Botrytis cinerea.

Biography

Dr. Sestari has experience in Plant Physiology, with an emphasis on Post-Harvest Physiology. He is currently investigating the hormonal regulation of fruit ripening and fruit tolerance to biotic and abiotic stresses.