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Regulation of floral terpenoid emission and biosynthesis in sweet basil (*Ocimum basilicum*)

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Past studies have focused on the composition of essential oil of *Ocimum basilicum* leaves, but data on composition and regulation of its aerial emissions, especially floral volatile emissions are scarce. We studied the chemical profile, within-flower spatial distribution (sepals, petals, pistils with stamina and pedicels), diurnal emission kinetics and effects of exogenous methyl jasmonate (MeJA) application on the emission of floral volatiles by dynamic headspace collection and identification using gas chromatography-mass spectrometry (GC-MS) and proton transfer reaction mass spectrometry (PTR-MS). We observed more abundant floral emissions from flowers compared with leaves. Sepals were the main emitters of floral volatiles among the flower parts studied. The emissions of lipoxygenase compounds (LOX) and monoterpenoids, but not sesquiterpene emissions, displayed a diurnal variation driven by light. Response to exogenous MeJA treatment of flowers consisted of a rapid stress response and a longer-term acclimation response. The initial response was associated with enhanced emissions of fatty acid derivatives, monoterpenoids, and sesquiterpenoids without variation of the composition of individual compounds. The longer-term response was associated with enhanced monoterpenoid and sesquiterpenoid emissions with profound changes in the emission spectrum. According to correlated patterns of terpenoid, emission changes upon stress, highlighted by a hierarchical cluster analysis, candidate terpenoid synthases responsible for observed diversity and complexity of released terpenoid blends were postulated. We conclude that flower volatile emissions differ quantitatively and qualitatively from leaf emissions and overall contribute importantly to *O. basilicum* flavor, especially under stress conditions.

Biography

Jiayan Ye is on the study of plants volatile emission and regulation by the biotic stresses. She tries to establish a quantitative dose-response model of the induced volatile emission from a wide range of plants by the exogenous treatment of the MeJA treatment, fungus infection and insect infestation.

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