Plant-plant communication in domesticated tomato : work-in-progress to tease apart defense induction and priming

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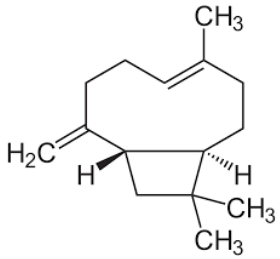
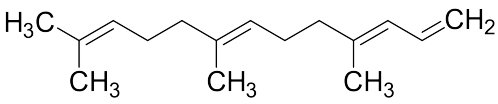
The role of volatile organic compounds (VOC) as vehicle of information between plants has long sparked the imagination of plant ecologists[1]. Currently, "plant-plant communication" expand functional frameworks of plant defense theory from organism to ecosystem functioning[2] and, thereby, opens new avenues for agroecological research[3,4]. For this purpose, we need to better understand the dynamic of two different outputs of plant-plant communication that sometimes remain confused[5], *i.e.* defense induction (immediate response to signalling cues) and defense priming (response occurring after "memorisation" process). Here, we developed an original 2-steps experimental design with time-serie of VOC capture over 5 days to **(i)** track HIPVs released by emitter tomato infested with *Tuta absoluta*, and **(ii)** test separately defense induction and priming in receiver tomato.

β-caryophyllene





(E,E)-4,8,12-Trimethyl-1,3,7,11-tridecatetraene

Our results suggest that the induction of some sesquiterpenoids, like β-caryophylllene and TMTT, could support information transfer between plants, despite counter-selection of constitutive emissions during domestication[6]. Based on VOC profiles of receiver plants, our study points that defense induction is a progressive mechanism which is quickly initiated, even if its intensity increases over 3 days. However, we failed to discriminate receiver plants that are supposed to have kept in memory previous exposure to HIPVs. This suggests that defense priming could have been lost in domesticated tomato. In this context, we would be pleased to discuss our very first results with the Swiss Chemical Society to integrate to the best on-going metabolomic and phytohormonal analyses. Furthermore, we hope to feed our thinking about a research agenda addressing the evolution of defense induction and priming in the plant clade *Solanum* section *Lycopersicon*, including domesticated tomato and wild relatives.

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