Root exudome: the hidden world of plant communication

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Belowground plant-plant communication has received little attention when compared to what has been observed aboveground, particularly when studying the emission and perception of volatile organic compounds. Nonetheless, recent evidence suggests that plants can also interact via underground communication, mediated by root exudates. For example, the neurotransmitter L-DOPA, released belowground by broad bean roots upon aphid attack, has been demonstrated to induce in conspecific neighbouring plants the release of specific volatile organic compounds aboveground which are attractive for the aphid parasitoid [1]. Now, whether similar chemically mediated interactions are widespread in nature remains to be assessed. Preliminary observations using tomato plants, show that herbivore attack also alters the composition of root exudates whose activity in terms of conspecific induction is currently being investigated. To date, the study, characterization, and role or root exudates in plant communication is still largely unexplored, but, when confirmed, it could offer novel tools for the sustainable protection of cultivated plants [2] [3].

[1] P.Cascone, J. Vuts, M.A. Birkett, S. Dewhirst, S. Rasmann, J.A. Pickett,E. Guerrieri, *Ecology Letters*, **2023**, *26,* 460-469.
[2] E. Guerrieri, S. Rasmann, *Science*, **2024**, *69*, 500-510.
[3] E. Guerrieri, S. Rasmann, *Ent. Gen.,* **2024**, *44,* 1081-1090