Plant volatiles mediated host selection in Leafminers: Behavioral responses of *Liriomyza cicerina* to chickpea volatiles

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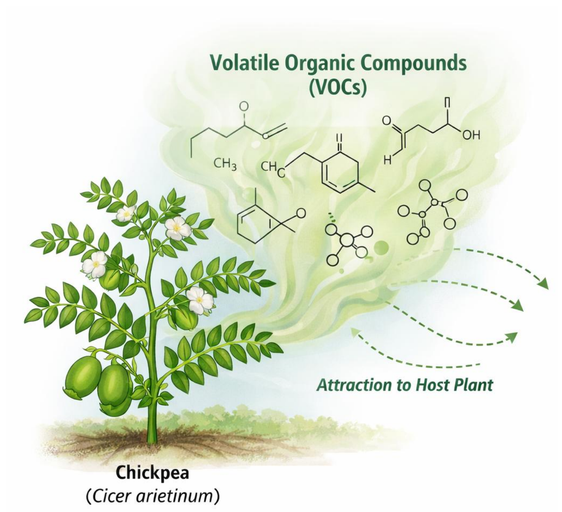
Introduction



Chickpea
(*Cicer arietinum*)

Volatile organic compounds (VOCs) are airborne plant-emitted chemicals that ensure the interactions of the organism with its environment

Leafminer
(*Liriomyza cicerina*)

Chickpea (*Cicer arietinum* L.) is a major pulse crop in semi-arid regions, valued for its high nutritional content and its contribution to soil fertility.

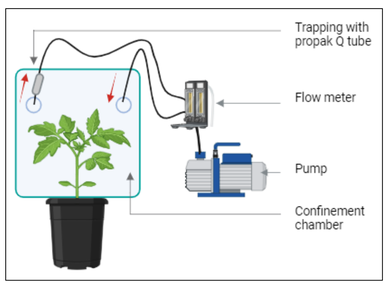
Leaf miner, Liriomyza cicerina (Diptera: Agromyzidae), is one of the most damaging insect pests of chickpea.

Plant-emitted VOCs play a central role in leafminer host location and behavior. This study investigates how chickpea plant health status and genotype influence VOC composition and *L.cicerina* attraction, supporting the development of VOC-based sustainable pest management strategies.

Materials and Methods

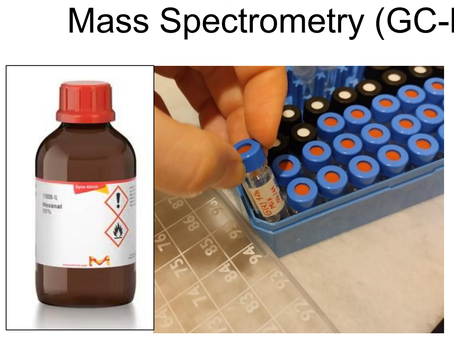
- Adult leafminer collections from chickpea field

- Chickpea planting and infestation



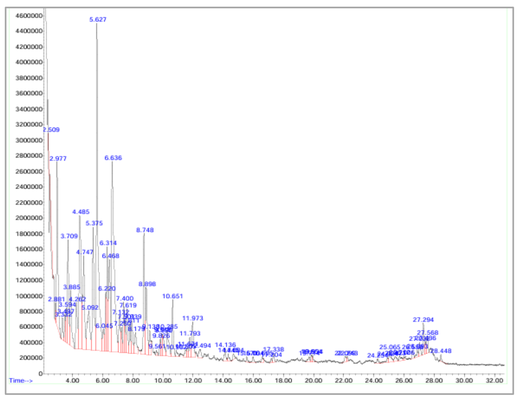
- Dynamic headspace collection of VOCs from healthy and infested chickpea plants

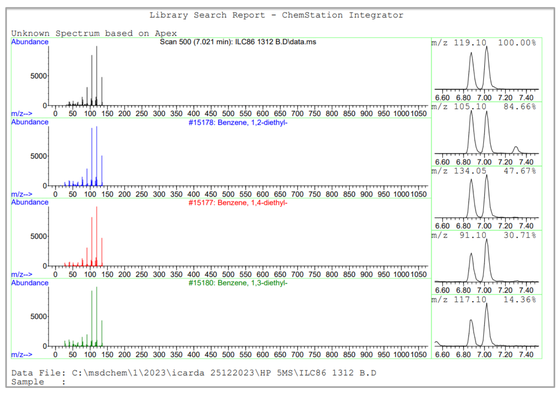
- VOCs identification using Gas Chromatography coupled to Mass Spectrometry (GC-MS)



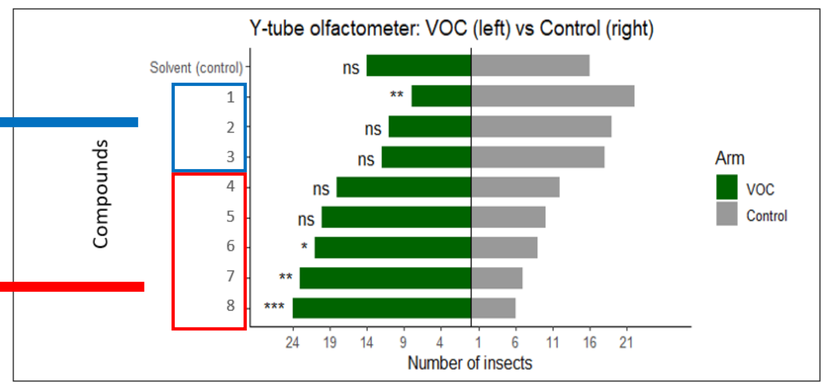
- Y-tube olfactometer bioassays were used to evaluate the olfactory response *of L.cicerina* to individual chickpea volatiles and VOC blends

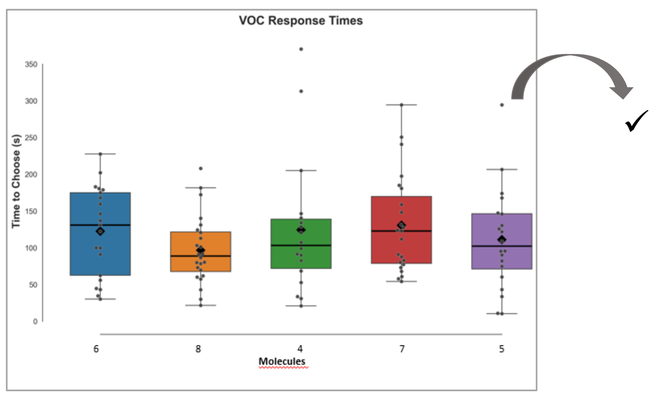
Results





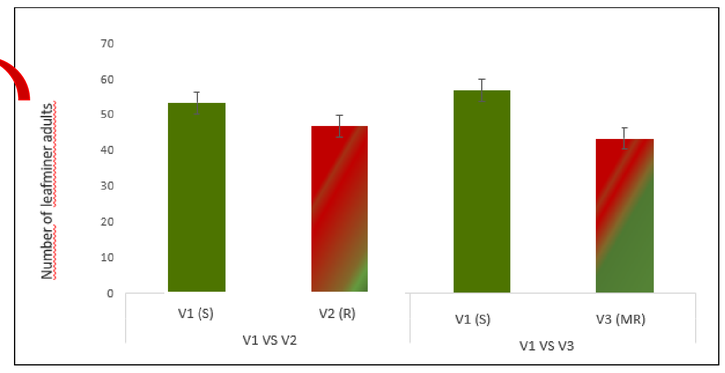
✓ Identification of VOCs belonging to different chemical families (alcohols, aldehydes, esters, etc.)

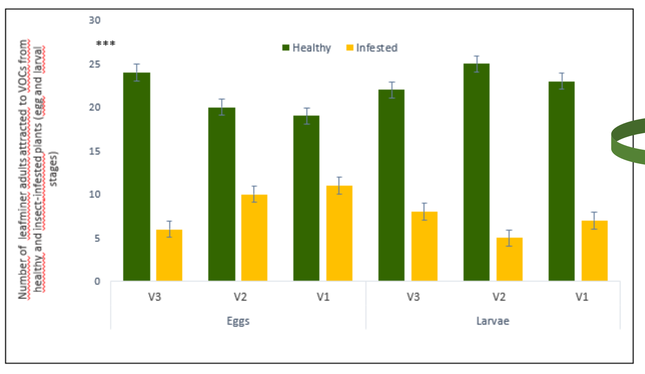




✓ Molecule 8 elicited the strongest attraction and shortest response time

✓ *L. cicerina* adults tended to prefer VOC blends emitted by the susceptible variety (V1)





✓ *Leafminers* were more attracted to VOCs emitted by healthy chickpea plants than to those released from plants infested by *L. cicerina* eggs and larvae

Conclusion

Volatile Organic Compounds emitted by chickpea plants play a central role in host selection by the leafminer *Liriomyza cicerina*. Exploiting attractive and repellent VOCs offers practical tools for the development of VOC-based traps and push–pull strategies to support sustainable pest management

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