

## A novel uptake pathway allows plants to perceive volatiles with closed stomata

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Plants can perceive and respond to volatile organic compounds (VOCs) from their environment [1, 2]. VOCs are generally thought to be taken up by open stomata, thus severely limiting VOC perception under stress [3-5]. Here, we asked how plants may overcome this sensory limitation. We took advantage of the fact that the Crassulacean acid metabolism (CAM) plant *Kalanchoë laxiflora* opens its stomata at night and closes them during the day to assess the role of stomatal and non-stomatal VOC uptake independently of photosynthesis [6]. We find that 80% of the highly conserved green leaf volatile (Z)-hexenyl acetate is taken up by stomata, while 20% is taken up through a novel, non-stomatal pathway. The pathway shows a preference for lipophilic VOCs. Neither hydathodes nor residual stomatal conductance can account for non-stomatal uptake. We find that the non-stomatal pathway is sufficient for *K. laxiflora* to perceive exogenous VOCs and activate its defenses. Together, these results reveal a previously unrecognized route for volatile uptake and demonstrate how plants can perceive airborne chemical cues with closed stomata.

### References

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