

INFLUENCE OF A FATTY ACID DESATURASE ON PLANT-APHID INTERACTIONS

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We report here that disruption of function of the ω -3-fatty acid desaturase FAD7 in tomato reduces host suitability for aphids. The *spr2* mutation, which eliminates function of FAD7 and dramatically decreases the foliar content of trienoic fatty acids, also causes a decrease in host preference, survival and fecundity of the potato aphid, *Macrosiphum euphorbiae*. Monitoring of aphid feeding behavior by the direct-current electrical penetration graph (DC-EPG) technique indicates that ingestion from the phloem is inhibited on *spr2* plants, suggesting that resistance in this mutant may be due to factors localized in the phloem. Aphid resistance in *spr2* also requires the plant hormone salicylic acid, and NONEXPRESSOR OF PATHOGENESIS-RELATED PROTEINS1 (NPR1), a positive regulator of many salicylate-dependant defenses. These results suggest that fatty acid desaturase activity in plants negatively regulates phloem-limited salicylate-dependant defenses against aphids. The potential implications of plant fatty acid profiles for aphid nutrition will also be discussed.