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Poster Abstract – C.48

PLANT RESPONSE TO HERBIVOROUS AND PHLOEM-FEEDER PESTS: A STUDY OF DEFENSE GENES IN TOMATO

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The future goal of crop biotechnology is to engineer a durable, multimechanistic resistance to different pests through an understanding of the diversity of plant responses to insect attack. Plants produce several defensive compounds in response to pests. Some of these chemicals have a direct effect on pest metabolism (direct defence), while others, including the so called Volatile Organic Compounds (VOC), indirectly increase plant resistance; for instance VOCs represent specific cues for predators and parassitoids, the natural enemies of the pests, to locate the infested plant. Therefore, the study of induced responses against insects and of the genes controlling their expression is of great interest to understand plant biology and ecological relations and holds great promises for modern agricultural practices.

In order to study the gene controlling plant resistance to pests with different feeding mechanisms, we studied in tomato the expression of defence genes in response to phloem-feeders and herbivores. The aphid *Macrosiphum euphorbiae* was used as phloem-feeder for its importance in the tomato agroecosystem. To mimic the attack of chewing insects, we used transgenic tomato plants that were transformed to constitutively express the tomato prosystemin gene as these plants in the absence of damage caused by larvae, accumulate defense proteins in very similar amounts compared with that from damaged control plants (McGurl et al., PNAS: 1991, 21: 9799)**.**

The results of the expression analysis, carried out by SYBR-Green Real Time PCR, indicated that, aphid infestation and herbivory activate shared defensive pathways, as *TomLoxD*, key member of the octadecanoid pathway, has an higher level of expression in response to both kind of pests. Furthermore, plant response to different insects is also specific, as for instance, herbivores induces some indirect defence genes (*i.e.: Hpl*, responsible of production of C6 volatiles, and *GCS*, producing terpenoids), while aphids activates genes of the fungal resistance pathways (*Pti4*, and *P4*).