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Poster Communication Abstract – PH.15

THE TOMATO PEPTIDE SYSTEMIN ELICITS DEFENSE RESPONSES IN *SOLANUM MELONGENA* AND *VITIS VINIFERA* CONFERRING PROTECTION AGAINST *BOTRYTIS CINEREA*

APRILE A.M., MOLISSO D., COPPOLA M., CHIAIESE P., RAO R.

Department of Agricultural Sciences, University of Naples "Federico II", Portici (Italy)

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The well known problems of toxicity and environmental pollution due to the use of pesticides have led to the urgent need to develop more sustainable tools for pest control. The growing knowledge of plant signaling pathways has encouraged the possibility of using elicitors of plant defense responses as an effective new bio-based strategy for crop protection. Systemin is an 18-amino acid peptide of tomato plants known as endogenous amplifier of innate immunity. Upon pest attack, systemin interacts with a leucine-rich repeat receptor kinase, the systemin receptor SYR, triggering local and systemic defense responses. Its exogenous supply confers protection against a broad spectrum of biotic/abiotic threats by inducing the transcription of defense-related genes. However, little is known about systemin sensing in heterologous plants despite it has been recently shown that ortholog of SYR are present in several plant species, including eggplant and grapevine plant. In the present study we demonstrated that the tomato peptide is perceived by the taxonomically close species Solanum melongena and in the more distant species Vitis vinifera and conferred protection against the necrotrophic fungus Botrytis cinerea. The observed disease tolerance is associated with the increase of total soluble phenolic content, the activation of antioxidant enzymes and the up-regulation of defence related genes in peptide-treated plants. In vitro bioassays showed that systemin does not have a direct antimicrobial effect, indicating that it protects these two important crops through the activation of their immune systems. In conclusion, tomato systemin induces resistance against B. cinerea indicating that the two species perceive the non-self-peptide and activate the defence and the antioxidant machineries. These results open novel perspective in the use of plant peptides in crop protection. From an applied perspective, the exogenous delivery of plant signaling peptides may offer a useful contribution for the reduction of chemical pesticide in field.