

reduced efficacies of these products. In addition, there is an increasing body of evidence that the use of copper products is environmentally damaging due to harmful effects on plants and soil. Nevertheless, in European organic agriculture copper-based products are the main agents used against bacterial diseases in vegetable and fruit production systems. Recently, the use of copper compounds has been restricted by regulations of the European Community (Directive 2009/128/EC). The limited number of existing products requires effective alternatives, which adhere to organic farming principles. We examined the bactericidal effects of licorice extract and a new control release formulation against the main bacterial targets in organic agriculture practice. We tested its efficacy on the model plant *Arabidopsis* as well as numerous crop plants using different patho-systems.

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Assessment of biological control agents against *Gnomoniopsis smithogilvyi* (syn. *castanea*), the fungus causing chestnut brown rot and canker. M. CONTI¹, J. CROVADORE¹, B. COCHARD¹, R. CHABLAIS¹, M. JERMINI², F. LEFORT¹. ¹Plants and pathogens Group, Institute Land Nature Environment, hepia, University of Applied Sciences and Arts Western Switzerland (HES-SO), 150 route de Presinge, 1254 Jussy, Switzerland. ²Agroscope, Cadenazzo Research Centre, A Ramél 18, 6593 Cadenazzo, Switzerland. E-mail: francois.lefort@hesge.ch

In vitro challenge tests were carried out between *Gnomoniopsis smithogilvyi* and seven antagonistic bacterial strains and nine fungal strains. Two genotypes of *G. smithogilvyi* from Geneva (GE1) and Ticino (TI1) were used during these tests. These *in vitro* challenge tests allowed selection of five fungal and three bacterial strains, which demonstrated strong inhibitory activity on growth of *G. smithogilvyi*. These were: *Trichoderma harzianum* B05, *T. harzianum* F1, *T. hamatum*, *T. aureoviride* and *T. asperellum*; and *Pseudomonas putida*, *Bacillus amyloliquefaciens* Ba4 and *B. amyloliquefaciens* Ba2. These organisms were retained for biological control experiments on chestnut scions. Batches of eight chestnut scions were inoculated with each fungal or bacterial antagonists by

soaking them for 48 h at room temperature in bacterial or fungal suspensions in water. The scions were transferred individually into glass culture tubes and placed in a climatic chamber for 3 weeks. to allow a uniform endophytic growth of the antagonists. A suspension of *G. smithogilvyi* conidia was then applied to the scions of all modalities. and half of the control scions. The development of fructifications on bark of the scions, and the condition of the scions, were observed before and after inoculation, for a total duration of 6 weeks. Most of the organisms did not reduce disease *in vivo*, but the bacterial strain *P. putida* UASWS0946 and the fungal strain *T. hamatum* UASWS1405 totally inhibited the growth of *G. smithogilvyi* and *C. parasitica*.

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Preliminary characterization of the bioactive metabolites produced by *Ascochyta lentis* var. *lathyri*, responsible for a grasspea disease. A. BOARI¹, A. CIMMINO, A. EVIDENTE², A. INFANTINO³, M. MASI, M.C. ZONNO¹, and M. VURRO¹. ¹Institute of Sciences of Food Production, National Research Council, via Amendola 122/O, 70126 Bari, Italy. ²Department of Chemical Sciences, University of Naples "Federico II", Complesso Universitario Montesant'Angelo, via Cinthia 4, 80126, Naples, Italy. ³Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria, Centro di ricerca per la patologia vegetale, Via C.G. Bertero 22, 00156 Rome, Italy. E-mail: evidente@unina.it

Ascochyta lentis var. *lathyri* causes necrotic lesions on leaves and stems of grasspea (*Lathyrus sativus* L.) plants, recently described for the first time in Italy. This fungus was not pathogenic to seedlings of nine other leguminous species, including lentil (*Lens culinaris* Medik.). For this reason, and in consideration of its morphological characteristics, the fungus was considered a pathogenic, and morphological variant, of *Ascochyta lentis* (pathogenic to lentil), despite genetic similarities. Considering, (a) the increasing interest for the cultivation of grasspea as a source of protein and genetic resistance to diseases; (b) the known capability of the genus *Ascochyta* to produce biologically active secondary metabolites; and (c) the potential of comparative metabolic analysis to