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37.127 UPTAKE AND METABOLISM OF BACTERIAL HOMOSERINE LACTONE SIGNAL MOLECULES IN PLANTS. **P. Schröder, C. Götz, M. Matucha and A. Hartmann.** *Department of Microbe–Plant Interactions, GSF–Research Centre for Environment and Health, Ingolstädter Landstraße 1, D-85764 Neuherberg, Germany. Email: peter.schroeder@gsf.de*

Bacterial intra- and inter-species communication in the rhizosphere is mediated by diffusible signal molecules. Many Gram-negative bacteria use N-acyl-homoserine lactones (AHLs) as autoinducers in the "quorum sensing" response. While bacterial signalling is well described, the fate of AHLs in contact with plants is much less known. Thus, adsorption, uptake and translocation of homoserine lactones were studied in axenic systems with barley (*Hordeum vulgare* L.) and the tropical legume *Pachyrhizus erosus* L. Losses of AHL due to abiotic adsorption or degradation were tolerable under the experimental conditions. The presence of plants enhanced AHL decline in media depending on the compounds' lipophilicity, and AHLs were traceable in root extracts of plants. Tritium-labelled AHLs were used to determine short-term uptake kinetics. These results indicate substantial differences in uptake and degradation of different AHLs in the selected plant species and shed new light on plant-microbe communication.

37.128 TRACKING THE GROWTH OF PHYTOPATHOGENIC FUNGI AND USE OF DIGITAL IMAGE PROCESSING IN DIAGNOSTICS. **J. Sedlář, M. Sedlářová and J. Flusser.** *Palacký University in Olomouc, Faculty of Science, Department of Botany, Šlechtitelů 11, 783 71 Olomouc-Holice, Czech Republic. Email: michaela.sedlarova@upol.cz*

Aside from molecular markers, microscopic investigation is still an indispensable method for plant disease diagnostics. Mathematical modeling of solid media-based filamentous specimens elongating over time, such as microfungi, was tested. In phytopathology, growth parameters are frequently examined features which are measured in sequence at defined times, leaving the growth pattern as a whole undocumented. Reconstruction of intermediate images from those acquired is possible by means of image warping. In this method, the parameters of the geometric transformation are estimated by means of object tracking based on the morphological skeleton. A second aspect of our work was to test utilisation of automatical digital microimage processing for diagnostics. Microscopical platforms have been previously developed for large-scale data acqusition and analysis to automate sample processing, especially in medical research. A limitation for automatic structure recognition and category selection lies in software specifications, e.g. defined taxonomical features of disease causal agents. A case study was conducted on downy mildews (Peronosporaceae). The work was supported by projects GAUK 148207 (Grant Agency of Charles University in Prague) and MSM 6198959215 (Ministry of Education, Czech Republic).

37.129 THE ROLE OF NITRIC OXIDE IN DEVELOPMENT OF BIOTROPHIC PATHOGENS AND THEIR INTERACTION WITH HOST CELLS. **M. Sedlářová, M. Petřivalský, L. Luhová, M. Hašová, J. Hofman, J. Kočířová and A. Lebeda.** *Palacký University in Olomouc, Faculty of Science, Department of Botany, Šlechtitelů 11, 783 71 Olomouc-Holice, Czech Republic. Email: michaela.sedlarova@upol.cz*

Nitric oxide (NO) is a ubiquitous reactive molecule involved in plant signalling and defence mechanisms. The importance of NO for the initial stages of host-pathogen interactions was compared for three pathosystems (*Lactuca sativa–Bremia lactucae*, *Cucumis* spp. – *Golovinomyces cichoracearum* and *Lycopersicon* spp. – *Oidium neolycopersici*). Distribution of the molecule in host cells and pathogen infection structures was examined by confocal scanning microscopy (Olympus FV1000) using the NO probe DAF-2DA. The strongest accumulation of NO occurred in cells of susceptible *L. sativa* with developed *B. lactucae* haustoria or in *Cucumis* spp. and *Lycopersicon* spp. cells undergoing hypersensitive reaction due to powdery mildew infection. Differing in intensity, the NO signal was also detected in fungal oomycete and pathogen hyphae. For each pathosystem, the effects of several compounds modulating NO metabolism (SNP, PTIO, L-NAME, sodium tungstate, rutin) on pathogen development and host-cell response were studied in detail. During the course of 48 h after inoculation, exogenous application of NO donors and scavengers on host tissues influenced timing and rate of pathogen infection structure formation as well as expression of hypersensitive reaction within host tissues. To summarize, our results showed that NO plays an indispensable role both in host responses to pathogen challenge and in pathogen metabolism during germination and penetration. The work was supported by MSM 6198959215 (Ministry of Education, Czech Republic).

37.130 HOST-PATHOGEN INTERACTION BETWEEN VEGETATIVE AND MYCELIAL PHASE OF *AGARICUS BISPORUS* AND *VERTICILLIUM FUNGICOLA*. **A. Shamshad, A. Clift and S. Mansfield.** *Faculty of Agriculture, Food and Natural Resources, The University of Sydney, NSW 2006, Australia. Email: a.shamshad@usyd.edu.au*

Verticillium fungicola is a casual agent of dry bubble disease, the most common and serious fungal disease of cultivated mushrooms. This disease has been a continuing problem for *A. bisporus* mushroom farmers for many years and has developed world wide resistance against benomyl which belongs to the benzimidazole group of fungicides. To investigate the host-pathogen interaction at the mycelial and sporophore stage, transmission and scanning electron microscopy of the host (*A. bisporus*) and pathogen (*V. fungicola*) was conducted. Transmission electron micrographs showed that the pathogen mycelium grows very close to the host mycelium. Scanning electron micrographs of the necrotic tissue of the diseased mushroom showed clusters of phialospores and hyphae of the pathogen in large numbers.

37.131 GLYCOPROTEINS SECRETED BY GERMINATING SPORES OF *MAGNAPORTHE ORYZAE* DETERMINE SPECIFICITY LIKE A SUPPRESSOR IN RICE PLANT-BLAST INTERACTION. **A. Shinjo, Y. Okamoto, A. Kadoiri, T. Koizumi, T. Arie and T. Teraoka.** *Graduate School of Agriculture, Tokyo University of Agriculture & Technology 3-5-8 Saiwai-cho, Fuchushi, Tokyo, Japan. Email: 50007951016@st.tuat.ac.jp*

In the rice plant-blast interaction, the incompatible reaction is not dependent only on the cultivar, and also the compatible reaction is not dependent only on the pathogenic race. The reaction depends on the combination of the cultivar and the attacking race. Induced resistance and induced susceptibility have been noted in the interaction. Similar effects in a cultivar were triggered by the fluid of germinating spores in some isolates. Novel glycoproteins, which have potential suppressor activity to induce susceptibility and also to enhance the growth of invasive hyphae,