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Program and Abstracts

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methodologies. Affinity chromatography studies were used to investigate putative interactions between cleaved surface proteins and extracellular matrix. **Results** We were able to identify cleavage sites in 391 *M. pneumoniae* proteins representing 56% of the predicted proteome, demonstrating that proteolytic processing is similarly ubiquitous in *M. pneumoniae* . Unlike observations in *M. hyopneumoniae*, we did not observe non-canonical removal of initiating methionine (iMet) residues and we attribute this to a difference in repertoire and/or specificity of aminopeptidases between the two species of Mycoplasma. 160 proteins were identified on the surface of *M. pneumoniae* by two orthogonal methods, and over 80% of these (134 proteins) are targeted extensively by proteolysis. Surface-localised proteins MG040 (P75062) and L-lactate dehydrogenase (P78007) are offered as examples of novel processing events identified in this study. We also show putative interactions between cleavage fragments of molecules important to extracellular matrix function using affinity chromatography. **Conclusion** Widespread targeted proteoloysis was identified in two phylogenetically distant species of Mycoplasma that colonise different mammalian host species. The proteoforms produced by proteolysis are localised on the cell surface of both species and may play a role in host-pathogen interactions, biofilm formation and immune evasion. Similar findings have been observed in a recent study of *Spiroplasma citri*, as well as the medically important Gram positive pathogen *Staphylococcus aureus.* Our data, suggest that proteolytic processing may be a fundamental mechanism required to generate proteoforms on the surface of bacterial pathogens.

Keywords: Proteolysis, Surfaceome, Pathogenesis, Proteomics

44 TRANSCRIPTIONAL PROFILING OF PHYTOPLASMA INFECTED PLANTS TREATED WITH PLASMA ACTIVATED WATER (PAW)

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Background. Phytoplasmas are insect-transmitted plant pathogenic prokaryotes, associated with severe diseases in agronomic important crops. Management of these diseases has mainly focused on insect vector chemical control and on infected plant rouging. There is therefore a strong need for effective and friendly control strategies for phytoplasma-associated diseases and the possibility to use plasma activated water (PAW) as sustainable and effective method to them was therefore evaluated. PAW is produced by treating distilled water with atmospheric pressure plasmas, inducing the production of reactive oxygen and nitrogen species (RONS) and pH reduction. PAW has good potential for bacterial decontamination, degradation of organic compounds and was shown to positively affect plant growth. **Methods.** Sterile deionized water (SDW) was exposed to a nanosecond pulsed dielectric barrier discharge, operating in ambient air for 10 min treatment with a peak voltage of 19 kV and a pulse repetition frequency of 1 kHz, which induced production of nitrates, nitrites and peroxides, and a pH decrease. Phytoplasma infected and healthy periwinkles micropropagated shoots were exposed to PAW for about 25 minutes and gene expression studies were then performed. The theses used were: shoots treated with PAW, Fosetyl aluminum (as positive control) and SDW (as negative control), with an exposition of about 25 minutes. Nine shoots for each thesis were then collected at 6 different times after treatment and stored at -80°C. Quantitative RT-PCR analyses were carried out to determine the expression level of genes involved in the plant defense response. Parallel experiments were carried out treating grapevine plants in vineyards previously tested for the phytoplasma presence. Treatments were performed for three years injecting into the plant vascular tissues 10-20 ml of PAW or sterile distilled water (as control) on each selected plant for a total of 60 plants (40 with phytoplasmas and 20 without phytoplasmas). **Results.** Overexpression of selected genes involved in the phytoalexin metabolism was detected in the periwinkles micropropagated shoots treated with PAW in comparison with the shoots treated with Fosetyl-Al and distilled water. In the field trials, in a relevant number of cases, the PAW-treated symptomatic plants showed reduction of symptoms, while the SDW-treated and untreated plants did not show symptom reduction. No phytotoxicity was observed in the PAW treated grapevine and periwinkle plants. **Conclusion.** The results obtained showed the capability of PAW to enhance plant defence mechanisms and, as demonstrated in the field trials, confirmed its ability to improve the health status of the treated plants.

Keywords: Phytoplasma, plasma activated water, gene expression, grapevines, periwinkles