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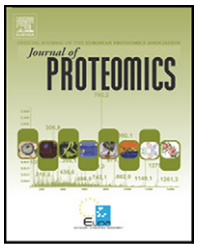

Unadapted and adapted to starvation *Acholeplasma laidlawii* cells induce different responses of *Oryza sativa*, as determined by proteome analysis

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ABSTRACT

For the first time, we studied the phytopathogenicity toward *Oryza sativa* L. of unadapted and adapted to unfavorable environment (starvation) cells of *Acholeplasma laidlawii* PG8 — ubiquitous mycoplasma found in the soil, waste waters, tissues of the highest eukaryotes and being the basic contaminant of cell cultures and a causative agent of phytomycoplasmoses. The features of morphology, ultrastructural organization and proteomes of unadapted and adapted cells of the mycoplasma and infected plants were presented. Using 2D-DIGE and MS, 43 proteins of *O. sativa* L. that were differentially expressed in the leaves of plants cultivated in media with *A. laidlawii* PG8 were identified. The qualitative and quantitative responses of the plant proteome toward adapted and unadapted mycoplasma cells differed. That may be explained by differences in the virulence of the corresponding bacterial cells. Using 2D-DIGE and MS, 82 proteins that were differentially expressed in adapted and unadapted mycoplasma cells were detected. In adapted cells of the mycoplasma, in comparison with unadapted ones, a significant increase in the expression of PNPase — a global regulator of virulence in phytopathogenic bacteria occurred; there was also decreased expression of 40 proteins including 14 involved in bacterial virulence and the expression of 31 proteins including 5 involved in virulence was not detected. We propose that differences in the phytopathogenicity of adapted and unadapted *A. laidlawii* PG8 cells may be related to features of their proteomes and membrane vesicles.

1. Introduction

Acholeplasma laidlawii (class Mollicutes) is a unique mycoplasma from the viewpoint of its adaptation capabilities [1,2]. This mycoplasma is widely distributed in nature, one of the five common species of cell culture contaminants, and is a causative agent of some plant diseases [3–7]. Insects are considered to be mycoplasma vectors toward plants [8]. However, *A. laidlawii* can invade plants through the root system [9]. The ability of *A. laidlawii* to display virulence (infectivity, invasivity, toxigenicity and persistence) toward plants suggests that it can successfully survive unfavorable environment (UFE) such as oxidizing conditions, limited substrate and temperature fluctuations. We found [1,5,10]

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