COMPARATIVE PROTEOMICS OF *Corynebacterium pseudotuberculosis* BIOVAR *ovis* UNDERGOING OXIDATIVE STRESS

CARVALHO, C. S.[1]; MEYER, R.[1]; AZEVEDO, V.[3]; CASTRO, T. L.[1]; SEYFFERT, N.[2]

[1]INSTITUTO DE CIÊNCIAS DA SAÚDE, UNIVERSIDADE FEDERAL DA BAHIA, BAHIA, BA (R. REITOR MIGUEL CALMON, CANELA, CEP 40213-300, SALVADOR - BA, BRAZIL)
[2]INSTITUTO DE BIOLOGIA, UNIVERSIDADE FEDERAL DA BAHIA, BAHIA, BA (R. BARÃO DE JEREMOABO, 668 - ONDINA, CEP 40170-115, SALVADOR - BA, BRAZIL)
[3]INSTITUTO DE CIÊNCIAS BIOLÓGICAS, UNIVERSIDADE FEDERAL DE MINAS GERAIS, MINAS GERAIS, MG (AV. PRESIDENTE ANTÔNIO CARLOS, 6627 - PAMPULHA, CEP 31270-901, BELO HORIZONTE - MG, BRAZIL)

Corynebacterium pseudotuberculosis biovar *ovis* is a Gram-positive, facultative anaerobic pathogen, and the agent of Caseous Lymphadenitis in small ruminants. This disease causes abscess in superficial lymph nodes and internal organs, compromising animal health and productivity. *C. pseudotuberculosis* resists to different environmental stresses, such as the oxidative stress present within the host phagocytic cells. Bacteria modulate gene expression to survive and overcome the toxicity of reactive oxygen species. In this study, we submitted *C. pseudotuberculosis* to oxidative stress and isolated its cytoplasmic proteins for differential two-dimensional electrophoresis. As result, 22 protein spots were differentially expressed between control and oxidative stress conditions. 19 spots were upregulated and 3 downregulated when *C. pseudotuberculosis* was submitted to oxidative stress. 15 proteins were successfully identified using MALDI-TOF. Among the upregulated proteins are transaldolase and superoxide dismutase, both directly involved in oxidative stress response. Additional proteins known to support stress resistance and bacterial survival were upregulated, such as inorganic pyrophosphatase, which is essential for protein, RNA and DNA synthesis, and peptidyl-prolyl cis-trans isomerase, which modifies bacterial transmembrane and secreted proteins to evade host immune defenses. D-alanine-D-alanine ligase was also upregulated under oxidative stress. This enzyme plays an initial role in the synthesis of peptidoglycan, the major constituent of bacterial cell wall. Among the downregulated proteins were iminopeptidase and phenazine inducing protein, the latter being involved in quorum-sensing systems. Further investigation on the proteins reported in this study is necessary to elucidate their specific roles in the pathogenesis of *C. pseudotuberculosis*.

Keywords: Proteomics, *Corynebacterium pseudotuberculosis*, Oxidative stress.

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