TITLE: CHANGES IN *PARACOCCIDIOIDES BRASILIENSIS* AS A RESULT OF ZINC DEPRIVATION

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ABSTRACT:
Zinc is one of the main micronutrients for all organisms due to its catalytic and structural role in proteins, in addition to acting as a component of transcription factors. One of the defense mechanisms used by the host includes the sequestration of metals used in fungal metabolism, such as iron and zinc. There are several mechanisms that maintain the balance in intracellular zinc supply, including metal binding to metallothioneins and storage in intracellular compartments, in addition to transport into and out of the cell. MicroRNAs are effector molecules of responses between pathogen and host, favoring or preventing infection in many microorganisms. Although host cells have a series of defense strategies to fight pathogenic fungi, these pathogens can invade the host and establish an infection. The present work has as general objective to identify proteomic and transcriptomic adaptations in *P. brasiliensis* during zinc deprivation. Proteomic analysis was performed by high performance liquid chromatography and mass spectrometry. From a total of 374 proteins, after statistical analysis, a total of 216 differentially regulated proteins were identified, considering minimal changes ≥ and ≤ 1.5. Of the total regulated proteins, 136 were induced and 80 down-regulated. Proteomic data, indicate a remodeling of metabolism in this fungus in order to survive the zinc deficit. Proteins related to beta oxidation, pentose pathway and heat shock response were induced. Proteins down-regulated have zinc in their structure, like alcohol dehydrogenase. Transcriptional analyzes, revealed an increase in gene expression that encodes the high-affinity zinc transporter (ZRT2), evidencing the role of this transporter in metal homeostasis. Regarding to microRNA 20 were identified, three of which were differentially regulated. Among the target genes that are possibly regulated by these microRNAs are elements of zinc homeostasis such as ZRT1, ZRT3 and COT1 transporters. Furthermore, transcription factors that have zinc in their structure are targets of these miRNAs. The data suggest that *P. brasiliensis* undergoes metabolic remodeling to survive zinc deprivation and that miRNAs may be part of this shift.

Keywords: Zinc; PROTEOMICS; TRANSCRIPTOMICS; miRNA

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