Functional Characterization Of Sugarcane Hsp70 And Its Interaction With Hsp40 And SHsp17.2.

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INTRODUCTION: The Hsp70 family assists protein folding in the cell by nucleotide-controlled cycles of substrate binding and release by alternating from an ATP-bound state in which the affinity for substrate is low to an ADP-bound state in which the affinity for substrate is high. MATERIAL AND METHODS: In the present work we describe spectroscopic (circular dichroism and intrinsic fluorescence) and functional (western blot, measurement of ATPase activity and refolding of β-galactosidase) characterization of a sugarcane 70 kDa heat shock protein, SsHsp70. RESULTS AND DISCUSSION: Recombinant SsHsp70 was pure and folded and both ADP and ATP had a large effect on its thermal stability. The chaperone was functional: its ATPase activity was stimulated by the co-chaperone Hsp40 and its capability to refold a model substrate was measured in the presence of a small heat shock protein (SsHsp17.2). Furthermore, the presence of SsHsp70 in sugarcane extracts was detected showing that the chaperone was constitutively expressed. CONCLUSIONS: Sugarcane has gained worldwide interest due to its potential to produce ethanol as an alternative energy source and this work contributes to the knowledge of general physiological and biochemical aspects of sugarcane, especially those related to stress tolerance.

Keywords: ATPase activity, chaperone activity, Hsp70, protein folding, sugarcane.

Supported by: FAPESP and CNPq.