EVALUATION OF ANTIOXIDANT ACTIVITY IN SACCHAROMYCES CEREVISIAE CELLS OF DIFFERENT CLASSES OF MOLECULES PRESENT IN HONEY AND PROPOLIS

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Introduction and objectives: Functional foods contain bioactive compounds with the ability to prevent diseases and eliminate free radicals, protecting the organism against intracellular oxidative stress. Honey and propolis extracts have antioxidant activity, and several of their constituents have been identified and isolated. The objective of this study is to evaluate and compare antioxidant activities of different classes of compounds found in honey and propolis extracts.

Materials and methods: To test cellular tolerance against hydrogen peroxide, cells were cultured until first growth phase (1.0 mg mL⁻¹). Then, a corresponding volume at 20 mg of cells were incubated in liquid medium for 1 hour in 6 different media: cells pre-incubated with syringic acid; chlorogenic acid; morin; and rutin (in the concentration of 1.5 mM each); negative (not stressed) and positive controls. These compounds were selected according to their EC₅₀ values in vitro assay (DPPH). All samples were subsequently incubated with hydrogen peroxide (1.0 mM) for 1 hour excepting the negative control. After incubation, the cells were harvested, washed and proceeded to assay the cell viability, lipid peroxidation and mitochondrial dysfunction.

Results and conclusions: Only the cells treated with chlorogenic acid obtained increased tolerance to hydrogen peroxide (2-fold increase). While the analysis of mitochondrial dysfunction resulted in no improvement after treatment with any of the substances, lipid peroxidation decreased significantly in the presence of syringic acid when compared to the positive control (138.44±2.89 to 121.40±4.11 pmol MDA/mg protein), but not the level of negative control (95.74±15.04 pmol MDA/mg protein). The previous incubation with syringic acid showed no increase in cell viability, but it was observed protection against damage to the cellular plasmatic membrane. Therefore, other assays to characterize the intracellular stress are needed to define what classes of substances are responsible for the antioxidant properties of honey and propolis.

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