Metals and metalloids are essential cellular components in trace amounts that play various roles in biochemical processes in organisms. There are reports that selenium has antioxidant function, being an essential trace element and non-toxic at low concentrations, but it is toxic at high levels. Unlike animals, in Saccharomyces cerevisiae, Se is not essential for this organism, being an adequate organism to study the effects of Se in cells. Arsenic is a highly toxic metalloid and its exposure induces oxidative stress causing damage to cellular biomolecules, cell death and various diseases, including cancer. This study investigated the effects of the incorporation of these metalloids in cells of Saccharomyces cerevisiae and determined the role of selenium in arsenic-induced oxidative stress. The cells were previously supplemented with 0.1 mM Se, and later they were incubated with 2 mM As. It was determined the incorporation of selenium and arsenic and biomarkers of oxidative stress such as lipid peroxidation, total sulfhydryl, and the type of cell death using acridine orange, ethidium bromide and DAPI. The results showed that selenium reduced in 31% the incorporation of As. The damage to lipids caused by the interaction of selenium with arsenic increased 45%, and the amount of SH residues decreased 27% when compared to the damage caused only by arsenic in these cells. The presence of selenium inhibited the induction of apoptosis causing a higher death rate of by necrosis. The results showed that selenium had no antioxidant effect in cells treated with arsenic, being a pro-oxidant substance in this case.

Keywords: Arsenic, oxidative stress, Saccharomyces cerevisiae, selenium.

Supported by: CDTN/CNEN.