Decline in glutathione per… and cytoplasmic catalases by lindane may cause an increase of reactive oxy… ecies in *Saccharomyces cerevisiae*

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Lindane or gamma 1α,2α,3β,4α,5α,… ılorocyclohexane is an organochlorine insecticide, persistent in soils and aquifers, lipophilic, chemically… hemically inert that accumulates along the human food chain. It is commonly used on a wide variety … n warehouses, in public health to control insect-borne diseases, and (with fungicides) as a seed treatme… ne is also presently used in lotions, creams, and shampoos for the control of lice and mites (scabies) … s. Several chemicals as lindane, toxic for aquatic organisms, birds and mammals have been in the new… , since the European Union intend to ban it. Therefore it is urgent to clarify the toxicological mechanism… compound in eukaryotic cells. Thus the main purpose of this work was to evaluate the effects of lind… ıe wine wild-type *Saccharomyces cerevisiae* UE-ME$_3$ of Alentejo musts, Portugal, a unicellular eukar… ınism, described as resistant to the presence of pesticides or metals.

Cells at mid-exponential phase wer… ted in YEPD medium with 2 % (w/v) glucose and incubated during 72 h in a water bath with orbital sha… 8 ºC, in the absence or in presence of 5 and 50 µM lindane. Samples from each treatment were used to … owth curves, wet weight and to prepare post-12000 g supernatant, used for determination of reactive … ecies (ROS) [1] by fluorimetry and alkaline phosphatase (ALP) [2], glutathione peroxidase (GPx) [3], … -dependent glutathione peroxidase (Se-GPx) [3] and cytoplasmic catalase (CAT T) [4] activities as w… let for determination of peroxisomal catalase (CAT A) [4] activities by spectrophotometry.

The results show that lindane inhib… growth of *S. cerevisiae* UE-ME$_3$, causing a decrease in the biomass produced along 72 h, as well as cel… from 24 h of assay. On the other hand, was detected an increase in the ROS content of post-12,000 *g*… of cells exposed to 5 µM lindane and post-12000 *g* supernatant of cells subjected to any exposure co… eventually conditioned by a decline in GPx and CAT T activities, which has become the detoxificati… lrogen peroxide less effective. The increase in the CAT A activity without significant changes in the … Se-GPx activities justified, in part, the increase in ROS levels of S. cerevisiae exposed to lindane, as w… loss of cell viability due to inadequate response of glutathione cycle or cells signaling pathways that ass… ıiosynthesis.

Keywords: organochlorine; gluthation… se; yeast

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