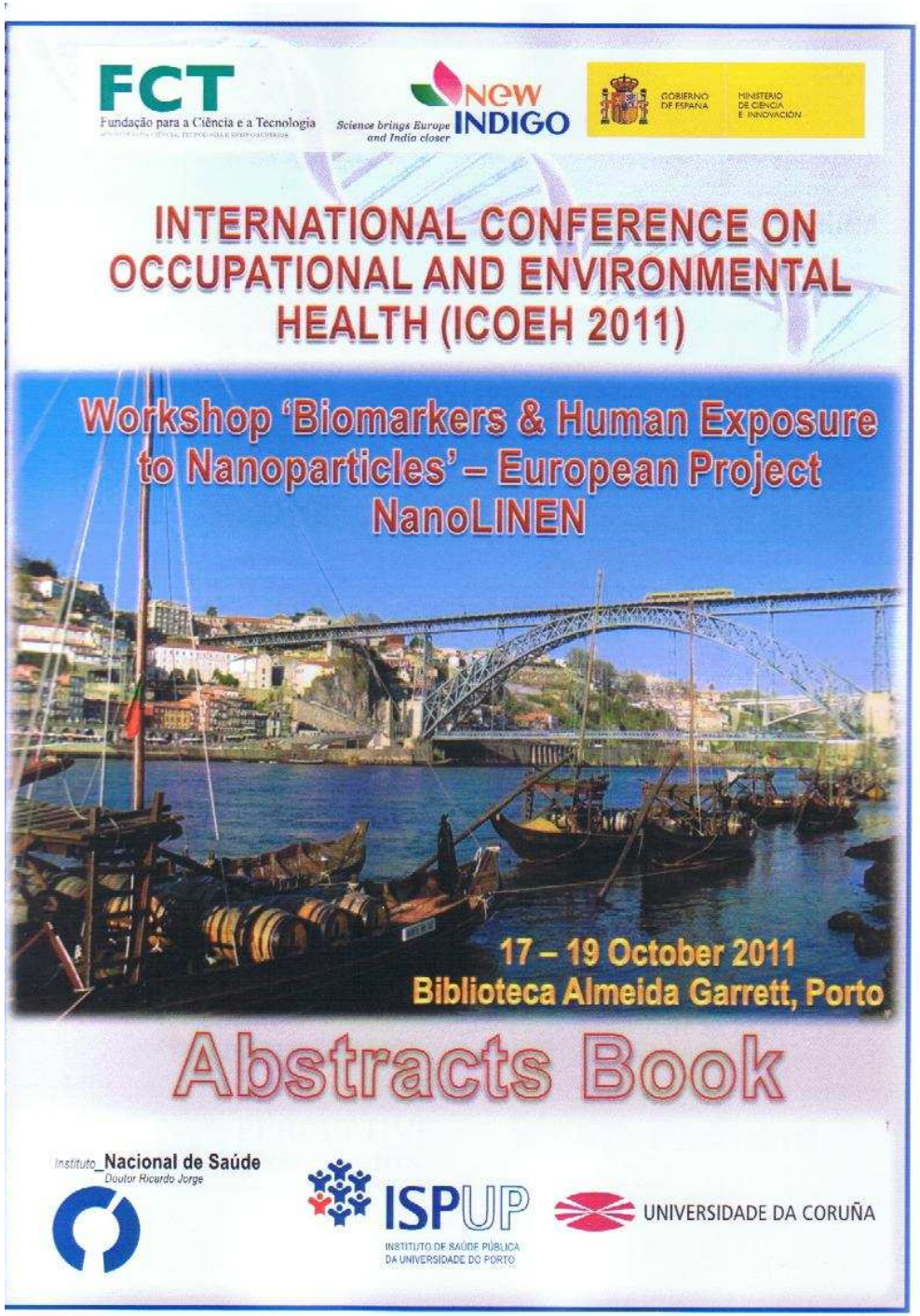

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Saccharomyces cerevisiae UE-ME3 A WILD-TYPE STRAIN OF ALENTEJO, PORTUGAL REVEALS AN ADAPTIVE RESPONSE TO PHENYLUREA HERBICIDE ISOPROTURON

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Introduction: The phenylurea isoproturon (IPU), 3-(4-isopropylphenyl)-1,1-dimethylurea, widel used as an active compound of several herbicides, is absorbed by the roots and leaves, where acts at the level of electron transport chain of chloroplast, behaving as an inhibitor c photosynthesis. In plants exerts its toxic action mainly by competing with plastoquinone and in thi context with the D1 protein of photosystem II present in the tilacoidal membrane. Therefore, th presence of IPU in the eukaryotic cells can generate ROS and consequently oxidative stress. Th European Union has listed IPU as one of the 33 special substances that threaten the earth surfac because it exhibits low water solubility and chemical/biological degradation. So it can accumulate in soils as waste and therefore persists in biological systems for long periods. In addition, it may b involved in triggering of serious illnesses like cancer. In spite of this, it is urgent to fin microorganisms and methods which would help to eliminate the environmental contaminations c this phenylurea.

Objectives: The main purpose of this study was to evaluate the response to IPU by wine wild-typ *Saccharomyces cerevisiae* UE-ME3, deposited in the collection of Enology Laboratory of Universit of Évora, Portugal, grown in the YEPD medium.

Materials and Methods: *S. cerevisiae* UE-ME3 at mid-exponential phase was inoculated in YEPD medium or YEPD-IPU, with 100 µM isoproturon, and incubated in a water bath with orbital shake at 28 Celsius degree during 72 h. Samples from each culture were used to obtain growth curve and to prepare post-12000 g supernatant, used for determination of protein and antioxidan capacity by the 2,2-diphenyl-1-picryl-hidrazil (DPPH) method, and also used for determination c malonaldehyde (MDA), glutathione (GSH) and glutathione disulfide (GSSG) level as well a glutathione reductase (GR), glutathione peroxidase (GPx), glucose-6-phosphate dehydrogenas (G6PD), catalase T (CAT T), catalase A (CAT A), alcohol dehydrogenase (ADH), malic enzym (NADP-ME) and lactate dehydrogenase (LDH) enzymatic activities, by fluorescence an spectrophotometry.

Results: The growth profile of *S. cerevisiae* UE-ME3 show an adaptative response to IP exposition, mainly in terms of cell viability (cfu). The glutathione system seems to depends on GS content and GR activities increase when the *S. cerevisiae* UE-ME3 grown in YEPD. The result reveal an increase of ADH and LDH enzyme activities, particularly higher in case of alcoh dehydrogenase activity. In the other hand, the presence of IPU triggered the GSSG, MDA an DPPH antioxidant level, as well as the CAT T, CAT A GPx, G6PD and NADP-ME enzyme activitie suggesting a strong antioxidant reply of this strain to IPU, probably coupled to NADH regeneratio The marked transition of reducing-oxidant status induced by IPU in *S. cerevisiae* can eventuall result from an increase of peroxisomal metabolism.

Conclusion: Having in account the good survival and antioxidant/energetic effects of IPU on wil type strain *S. cerevisiae* UE-ME3, we infer that this eukaryotic microrganism have an adaptiv response to this phenylurea, being a good candidate to be used in biorremediation approaches.