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International Conference on
Toxicology and Risk Assessment
March 20-21, 2019 Frankfurt, Germany

Effect of Ochratoxin A-Added Red Wine on Markers of Oxidative Stress in *Caenorhabditis elegans*

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Consumption of red wines has increased over the last years in function of their sensorial and functional properties, most of them associated to the considerable concentrations of phenolic compounds. In addition to phenolic compounds, grapes and therefore wines may contain toxic secondary metabolites denominate mycotoxins. The main mycotoxin found in grapes and their derivatives is ochratoxin A (OTA). Presence of bioactive compounds in food may contribute to an improvement in metabolism of *C. elegans* or may exacerbate the negative response of contaminants such as OTA. Therefore, the aim of this work was to evaluate the influence of OTA addition on red wine on survival rate and reactive oxygen species (ROS) generation, using the nematode *Caenorhabditis elegans (C. elegans)*. *Cabernet Sauvignon* red wine OTA-free and OTA-added (1, 2 e 4 $\mu g \cdot L^{-1}$) were used in this study. Survival rate and ROS generation was determined using 2500 and 1500 worms exposed to samples for 30 minutes, respectively. Number of surviving worms was verified 24 hours after red wine samples exposure to OTA. ROS generation was evaluated by dichlorofluorescin (DCF) assay. ROS generation was lower in nematodes exposed to OTA-added red wine ($p \leq 0.05$) independent of OTA concentration, when compared to OTA-free red wine (mean of OTA-added red wine = 34.43 ± 1.75 vs. 46.98 ± 1.64; % of control group). This effect may be related to the activation of antioxidant defense system in *C. elegans* metabolism by OTA. On the other hand, OTA-added red wine showed a tendency to reduce nematodes survival ($p > 0.05$) at concentrations of 2 and 4 $\mu g \cdot L^{-1}$ when compared to OTA-free red wine (83.60 ± 5.14 and 83.94 ± 5.20 vs. 100 ± 4.9; % of control group, respectively). This response regarding the survival of *C. elegans* in the presence of OTA-added red wine may be associated with a reduction in OTA-induced oxidative stress resistance. This is the first study evaluating OTA effects on oxidative stress markers, as well as, its effect on red wine antioxidant potential using the *C elegans* alternative model. Our results showed that the presence of OTA in red wine affects survival and ROS generation in *C. elegans* and further studies are needed to understand the antioxidant defenses mechanisms involved.

Biography:

Professor Paula Rossini Augusti holds a degree in Pharmacy and Biochemistry-Food Technology from the Federal University of Santa Maria (2005), a Master's Degree in Toxicological Biochemistry from the Federal University of Santa Maria (2007) and a PhD in Biological Sciences-Biochemistry from the Federal University of Rio Grande do Sul (2010). She is currently a professor in the Department of Food Science at the Federal University of Rio Grande do Sul (UFRGS) and advisor in the Graduate Program in Food Science and Technology (PPGCTA) at the same university. Professor Paula has experience in Food Toxicology, Nutrition, Oxidative Stress and Antioxidants.