

LEAD TOXICITY IN FOCUS: PROTECTIVE EFFECTS OF *AGARICUS BISPORUS*  
IN *CAENORHABDITIS ELEGANS*.

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**INTRODUCTION:** Lead (Pb) exposure is one of the most underestimated yet significant threats to global public health, being associated with reproductive disorders, neurotoxicity, and increased oxidative stress. It is estimated that Pb is responsible for approximately 1.5% of global annual deaths around 900,000 fatalities according to data from the CDC and international health agencies. Given the scarcity of effective and natural strategies to counteract its effects, edible mushrooms such as *Agaricus bisporus* have gained attention for being natural sources of antioxidant compounds and potential metal-chelating agents, with possible protective effects against heavy metal toxicity.

**OBJECTIVE:** To evaluate whether *Agaricus bisporus* can attenuate Pb-induced reproductive, neurotoxic, and oxidative stress-related effects in the *Caenorhabditis elegans* experimental model. **MATERIAL AND METHODS:** Worms from the N2 strain (for bioassays) and CL2166 strain (for fluorescence analysis) were synchronized and exposed from the L1 larval stage to Pb (100 µM), *A. bisporus* (Ab) (100 mg/mL), or a combination of both (Pb+Ab) for 72 hours. The following parameters were evaluated: total number of eggs laid, embryonic and larval lethality (n = 10/group); body length and motility of adult worms and their offspring (n = 20/group); and *gst-4* gene expression via GFP fluorescence in the CL2166 strain (n = 20/group). All experiments were performed in triplicate. Data were analyzed using ANOVA followed by Tukey's post hoc test (p < 0.05). **RESULTS AND CONCLUSION:** Pb exposure significantly reduced egg production (-54%), increased embryonic (+37%) and larval lethality (+5%), and impaired growth and motility in both parental worms and their progeny. Co-exposure with *A. bisporus* increased egg output, decreased lethality rates, and restored body length across both generations. However, motility impairment was not reversed. Regarding oxidative stress, the CL2166 strain showed a marked increase in *gst-4* fluorescence following Pb exposure, which was significantly reduced in the presence of *A. bisporus*. These findings indicate a protective effect of *A. bisporus* against Pb-induced reproductive toxicity and oxidative stress, supporting its potential as a natural agent for mitigating heavy metal toxicity.

**Keywords:** Alternative animal models; *Agaricus bisporus*; *Caenorhabditis elegans*; Lead.