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**Isolation, identification and safety evaluation of OTA-detoxification strain *Pediococcus acidilactici NJB421* and its effects on OTA-induced toxicity in mice.**

Jiangyu Tang1\*, Liuwen Yin2, Zhiyong Zhao3

\*lead presenter

1 [tangjiangyu@stu.njau.edu.cn](mailto:tangjiangyu@stu.njau.edu.cn), College of Veterinary Medicine, Nanjing Agricultural University, Nanjing, Jiangsu, China

2 College of Veterinary Medicine, Nanjing Agricultural University, Nanjing, Jiangsu, China

3 Institute for Agro-food Standards and Testing Technology, Shanghai Academy of Agricultural Sciences, Shanghai, 201403, China

**Abstract:**

**Background/Objective:** Ochratoxin A (OTA) is a potent mycotoxin found in many foods and feeds, posing a health risk to animals and humans. Biodegradation of OTA is considered the best approach for OTA detoxification, and many single bacteria and fungi capable of detoxifying OTA are isolated. However, research on the isolates’ safety and the alleviating toxic effects *in vivo* are scarce. The present study aims to isolate OTA-degrading probiotics from nature samples and evaluate their safety and protective effects in mice.

**Methods:** In our present study, a new OTA-degrading strain *Pediococcus acidilactici NJB421* (*P. acidilactici NJB421*) was isolated from fresh cow manure using nutrient-deficient medium. The OTA-detoxification bacteria were characterized using 16S rDNA gene sequencing. Then the strain was used to intragastric C57/BL mice for safety evaluation and protective evaluation. At the end of the experiment, blood samples and organ tissues were collected from mice euthanized by CO2 inhalation. Frozen liver, kidney and ileum samples were used for T-AOC and MDA levels and gene mRNA levels analysis. Tissues fixed with 4% paraformaldehyde solution were used for histopathology evaluation.

**Results:** *P. acidilactici NJB421* exhibited a degradation rate of OTA at 48.53% for 48 h, and exhibits high temperature resistance, acid tolerance, 0.3% bile salt tolerance and 1.4% trypsin resistance. The safety evaluation results in C57BL/6 mice showed that *P. acidilactici NJB421* at 2×108 CFU/per mice has no abnormalities in body weight, organ indices, ALT, AST and ALP activities, BUN, CREA and TP contents. In addition, the results of the protective evaluation in C57BL/6 mice showed that *P. acidilactici NJB421* could rescue OTA-induced decreased body weight, organ index and small intestinal length. Meanwhile, *P. acidilactici NJB421* could reduce the OTA-induced elevation of serum biochemical parameters levels and mRNA levels of α-SMA, Vimentin, TGF-β in liver and kidney and ZO-1, Occludin, Claudin-1 in ileum, and mRNA levels of IL-6, IL-1β, TNF-α in liver, kidney and ileum.

**Conclusion:** These results provide a new OTA-degradation strain that is safe and has protection against OTA poisoning. *P. acidilactici NJB421* emerges as a promising candidate for OTA detoxification, offering new avenues for livestock protection and food safety enhancement.

**Keywords:** Ochratoxin A; Biodegradation; Pediococcus acidilactici; Detoxification; Mice