The effects of *Fusarium graminearum* on Sivers and duodena of rats

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*Fusarium* species are filamentous fungi that commonly cause plant diseases. Recently, *Fusarium* species have emerged as opportunistic fungal pathogens in the immuno-compromised human host, including patients with leukaemia, cancer or AIDS. *Fusarium graminearum* frequently isolated from cereal grains produces mycotoxins. The contamination of food with mycotoxins has been associated with outbreaks of human and animal mycotoxicoses. In this study, we aimed to examine the possible harmful effects of *F. graminearum* on the liver and duodenum of mammals. For this work, 8 female Sprague-Dawley rats (30-day-old) were used. An isolate of *F. graminearum* (ED 40) from corn kernels was cultured on an autoclaved rice medium (200 g rice and 120 ml distilled water) in a 1-L flask. Flasks containing this medium were kept at room temperature (24°C) for 2 weeks, and then transferred to an incubator at 10°C for 2 weeks. The inoculated substrate was dried and ground to the consistency of flour, before to be used to feed rats of experimental group (n:5). The animals of experimental group were fed with a 1:1 mixture of the inoculated rice and a complete rat diet. However, control animals (n:3) were fed with non-inoculated mixture. The animals were maintained under standardized conditions of light (12 hour on/12 hour off) and temperature (22±2°C), with tap water. After 14 days, all rats were killed by cervical dislocation. Their livers and duodena were removed promptly. The tissue samples for light microscopy were fixed in Bouin's solution, dehydrated in ethanol and routinely embedded in paraffin. Paraffin sections (5-6 μm in thickness) were stained with Haematoxylin-eosin and Periodic acid Schiff, and examined in an Olympus BH-2 light microscope. The tissue specimens for electron-microscopy were fixed in 3% glutaraldehyde in 0.2 M phosphate buffer, postfixed in 2% phosphate-buffered osmium tetroxide, dehydrated in acetone, and embedded in Araldite CY 212. Semi-thin sections were stained with toluidine blue. Ultra-thin sections were stained with uranyl acetate and lead citrate, and examined in a Jeol 100 SX electron microscope. In the experimental group, some hepatocytes with dense eosinophilic cytoplasm and a small heterochromatic nucleus were observed among normal hepatocytes. In the liver samples of this group, it was seen venous congestion, many mitotic figures, more Kupffer cells than in those of control group and leukocyte infiltration in some spots. In the electron-microscope, some hepatocytes with quite electron dense cytoplasm, a pyknotic nucleus and many secondary lysosomes were determined. Particularly in the hepatocytes from outer zone of hepatic lobules, quite well-developed smooth endoplasmic reticulum and vacuolar structures were observed. Interstitial edema, many mast cells and numerous eosinophilic granulocytes were seen in the lamina propria of duodenum from experimental group. In conclusion, it was thought that *F. graminearum* was toxic to the duodenum and the liver of rats, and caused the cells degeneration in the liver.

References

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