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LECZNICZY WPLYW EKSTRAKTÓW ZIOŁOWYCH W ZAPOBIEGANIU DYSFUNKCJI WĄTROBY WYWOŁANEJ AFLATOKSYNĄ B1 U ŚWIŃ JAKO MODELU ZWIERZĘCEGO (IN VIVO)

IMPACT OF MEDICINAL HERB EXTRACTS IN THE PREVENTION OF LIVER DYSFUNCTION CAUSED BY AFLATOXIN B1 IN PIG AS AN ANIMAL MODEL (IN-VIVO)

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BACKGROUND

Liver dysfunction caused by aflatoxin B1 (AFB1) contamination remains a significant concern in both human and animal health, prompting the search for safe and effective hepatoprotective agents. *Andrographis paniculata* (andrographolide), *Silybum marianum* (silymarin), and *Curcuma longa* (curcumin) are promising medicinal herbs with documented antioxidant, anti-inflammatory, and liver-protective properties.

MATERIALS AND METHODS

The study involved 154 weaned piglets (5–6 weeks old), divided into multiple treatment groups exposed to AFB1 and/or herbal extracts. Biological samples (liver, blood, organs) were collected post-mortem and preserved for multi-layered analysis. Cell lines from human and pig hepatocytes were also used for parallel *in vitro* experiments. A three-stage feeding experiment was conducted: (1) AFB1 dose titration, (2) administration of herbal extracts alone, and (3) combined AFB1 + herbal extract exposure. Molecular assessments include transcriptomics, proteomics, metabolomics, hematological and biochemical profiling, histopathology, and gene expression analyses (e.g., CYP1A1, NRF1, NEAT1).

RESULTS AND DISCUSSION

Initial analyses reveal that AFB1 significantly increases liver enzyme activity (AST, ALT) and reduces growth performance in pigs. Early transcriptomic data indicate upregulation of genes involved in oxidative stress and xenobiotic metabolism (e.g., CYP1A1, NRF1) in both *in vivo* and *in vitro* conditions.

CONCLUDING REMARKS

This project highlights the therapeutic potential of *A. Paniculata*, *Silymarin*, and *Curcumin* in the prevention of aflatoxin-induced hepatotoxicity. Results support the translational relevance of the pig model and open avenues for herbal strategies in food safety and liver disease management.

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