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Dietary Parsley Seed Mitigates Methomyl-Induced Impaired Growth Performance, Hemato-Immune Suppression, Oxidative Stress, Hepato-Renal Damage, and Pseudomonas aeruginosa Susceptibility in Oreochromis niloticus

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The present experiment investigated the potential protective role of parsley (Petroselinum crispum) seedmeal (PSM) in alleviating methomyl (MET)-adverse impacts on growth, whole-body composition, hematological indicators, hepatorenal function, immune response, oxidative status, and disease resistance to Pseudomonas aeruginosa. For this purpose, 225 healthy Nile tilapia (Oreochromis niloticus) were allotted into five groups (45 fish/group in triplicate). One group was reared in clean water and fed a non-supplemented basal diet, while the other groups were exposed to 20.39 _g L□1 MET and fed a non-fortified basal diet or basal diets supplemented with 0.5, 1.0, or 2.0% of PSM for 60 days. The obtained data revealed significantly lower weight gain, feed intake, and specific growth rate, but higher feed conversion ratio and decreases in crude protein, lipid, and ash contents in the MET-exposed fish. Anemia, leukopenia, lymphocytopenia, and esonipenia were also obvious. Furthermore, MET-exposed fish had significantly higher serum levels of hepatic enzymes and renal damage products. Nevertheless, there was a significant depletion of enzymatic and non-enzymatic antioxidants and increased malondialdehyde, myeloperoxidase, and tumor necrosis factor-_ levels in MET-exposed fish. The MET exposure significantly depressed lysozyme activity, nitric oxide, complement3, acetylcholinesterase activity, total proteins, globulin, and albumin levels in O. niloticus serum. Furthermore, pathological alterations in the liver and kidney were noted. The relative percentage of survival rate in MET-exposed fish was dramatically reduced on day 14 post-challenge with P. aeruginosa. The inclusion of PSM, on the other hand, greatly alleviated most of the MET-related negative effects. Taken together, the dietary intervention with PSM has a promising role in alleviating MET-deleterious impacts, rendering parsley seeds a viable aqua feed additive for O. niloticus.

Biography

Samah is a lecturer of clinical pathology, faculty of veterinary medicine, Benha University, Egypt. She get the Distinguished International Student Award of China (2020) awarded by the Chinese Government and Scientific Excellence Award (2020 & 2021) awarded by Benha University, Egypt. She has been participating in many research projects in the field of antioxidants, hematology, biochemistry, polymer science, pharmaceutical science, and nanotechnology.