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Evaluating Water Quality and Organo-Pesticide Contamination in *Oreochromis niloticus* (Nile Tilapia) in Wawan Rafi and Dambo Dam, Kazaure, Jigawa State:

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Abstract: *The study investigated the presence of freshwater pollutants and their effects on Oreochromis niloticus(nile tilapia) in the Wawan Rafi and Dambo Dams of Kazaure, Jigawa State. The water samples were found to be within the World Health Organization's permissible guideline for temperature and dissolved oxygen levels. The mean value of temperature, dissolved oxygen (DO), and conductivity (EC) ranged between 23.13±0.8 and 28.25±0.7, 6.5-8.5mg/l, 7.347±0.3, 145.6±16 and 158.3±6.1. The mean turbidity obtained from all stations was far higher than the 5 NTU (Nephelometric turbidity unit) value recommended by the WHO, indicating that the water samples were more turbid than needed. Total dissolved solids content (TDS) levels in the water samples were above the WHO's recommended level, but TSS's mean values fell below the WHO's recommended limits of 450-2000mg/L. Mean hemoglobin levels varied between 6.230 g/dL and 7.570 g/dL, with low levels likely due to heavy metals altering hemoglobin's properties. The study found that Oreochromis niloticus had mean red blood cells (RBC) ranging from 1.180x1012/mL to 1.45x1012/mL, and mean white blood cells (WBC) ranging from 153.100 x 109/mL to 167.67 x 109/mL. The mean corpuscular hemoglobin concentration was unaffected by blood volume and the number of blood cells. The data suggests that Oreochromis niloticus has a unique cellular structure and composition. Heavy metals in water can significantly impact the life and lifespan of aquatic organisms, including fish and aquatic invertebrates. The average mean value of Lead (Pb) in the water sample falls above the World Health Organization (WHO) recommended level of 0.01mg/l in all stations. Chromium levels are higher than the WHO permitted chromium level of 0.05mg/L, which can affect fish organs like gills and liver. Zn levels are lower than the WHO permissible level of 3 mg/L. The fish concentration of heavy metals analyzed in both Wawan Rafi and Dambo Dam had a highest value of Pb (mg/L) 0.1550±0.0, Cr (mg/L) 0.14205±0.0, Zn (mg/L) 1.7750±0.0, Cu (mg/L) 0.5400±0.,Cd (mg/L) 0.07850±0.0, and Ni (mg/L) 0.0475±0.0which are within permissible limit except for Pb, which is slightly higher than the recommended level. Various organo-pesticide were also detected in fish and water samples of both Wawan Rafi and Dambo Dam of which long-term exposure may lead to bioaccumulation in food chains, posing a threat to human health through dietary exposure. Recommendations include proper waste treatment, strict enactment of government policies on pesticide use, waste disposal, and proper sanitation around water sources. Further studies should focus on oxidative stress enzymes on Oreochromis niloticus in the study area.*

Keywords: Heavy Metals, *Oreochromis niloticus*, freshwater pollutants, Physicochemical Parameters and Toxic Effects.

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