

Assessing the Diversity of Parasites and Microbes in Fish from Selected Fish Farms in Uasin Gishu County

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Abstract

Fish farming plays a crucial role in food security and economic development, yet bacterial and parasitic infections threaten productivity and fish health. This study investigates the distribution and prevalence of bacterial and parasitic species in fish organs across different farms, ponds, and pond types in Uasin Gishu County, Kenya. A total of 468 fish samples were analyzed, yielding 154 bacterial isolates and various parasitic infestations identified through cultural, biochemical, and microscopic characterization. The Kruskal-Wallis test revealed significant differences ($p \leq 0.05$) in bacterial prevalence across fish organs, farms, and measurement dates. Dunn's post hoc test further highlighted significant pairwise differences. The results revealed significant differences ($p \leq 0.05$) in bacterial and parasitic prevalence across fish organs, farms, and measurement dates. *Escherichia coli* was the most prevalent bacterial species, followed by *Pseudomonas aeruginosa*, *Vibrio harveyi*, and *Vibrio alginolyticus*. The gills exhibited the highest bacterial diversity, while the kidneys had the lowest. Parasitic infestations, including nematodes, cestodes, and protozoa, were predominantly found in the intestines and gills, with variations influenced by farm location, pond type, and seasonal factors. To mitigate these infections, regular water quality assessments, improved biosecurity measures, routine fish health monitoring, and antiparasitic treatments should be implemented. Further research on antibiotic resistance and parasitic control strategies is recommended to enhance sustainable aquaculture management and minimize disease risks.

Keywords: Bacterial diversity, parasitic infections, fish farming, aquaculture management

Author: MUTAI, Edwin (University of Eldoret)

Co-authors: Prof. NGEIYWA, Moses (University of Eldoret); Prof. LITI, David (University of Eldoret)

Presenter: MUTAI, Edwin (University of Eldoret)

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