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Comparative Analysis of the Trophic Status, Length-Weight Relationship, Gastro-somatic Index and Bioaccumulation of Trace Metals in Wild and Captive *Clarias gariepinus*

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Biotechnological Approaches to Sustainable Development Goals

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Abstract

Assessing morphometrics and trace metal bioaccumulation in fishes helps determine water pollution and any potential harm that may result, both on the species population and the consumer. This study aimed to compare the gastrointestinal morphology, trophic status and bioaccumulation susceptibilities of *Clarias gariepinus* from wild and captive sources. The morphometrics were assessed to determine the length-weight relationship, trophic status and feeding intensity of the sampled fishes. Trace metals were analysed in the intestine using a Perkin Elmer 3110 model Atomic Absorption Spectrophotometer (AAS) and recorded in mg/kg wet weights. The gastro-somatic index was determined to ascertain the feeding rate and food availability in the different environments, with 50% being the benchmark. The wild catfishes had the highest and lowest gastrointestinal index (36.53% and 24%) mediated by the captive (29.29%). The logarithmically transformed data of the length-weight relationship of the captive fish showed growth exponent “*b*” of 3.2, indicating positive allometry, and the wild showed growth exponent “*b*” of 2.2 and 1.6, indicating negative allometry. The trophic status of the fish was in the order of wild < captive < wild. The gastro-somatic indices and general growth allometry were also in the order of wild > captive > wild. The results of the trace metal concentration were in this order: Fe > Zn > Mn > Cu > Cr > Cd. The study showed that *C. gariepinus* is sensitive to changing conditions, and aquacultural practices adopted in the fish farm are vital for the sustainability of catfish production.

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