

# Physicochemical and Bacteriological Analysis of Wawan Dam Rafi Water, Karaftai, Kazaure Local Government Area at the Early and Late Rain Fall

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**Abstract:** *Water quality is crucial for human well-being and existence, but its availability remains a challenge in underdeveloped and developing countries. The demand for quality water in urban cities in Nigeria has increased due to limited public water supplies. This study conducted physicochemical and bacteriological analysis of Wawan Rafi Dam water during early and late rain fall. Results showed fluctuating temperature and pH levels, high dissolved ion concentrations, and within WHO permissible levels. Turbidity, nitrate, and phosphate levels were also found. Heavy metal concentrations were higher during the early rain fall compared to the late rain fall. However, zinc levels did not exceed the maximum permissible level. Manganese, Co, Pb, and Cu concentrations varied between 0.05 to 0.15 mg/L and 0.01 to 0.05mg/L, respectively. Gram staining identified two bacteria from Wawan Rafi Dam water: E. coli and E. cloacea. E. coli had a rod shape, motile, variable capsule, non-sporing, and flagellated appearance, while E. cloacea had straight rod-like cells bound in clusters with few laterally inserted flagella with pili and mucoid material and numerous bubbles on the surface. DNA sequencing analysis revealed that MA1 merged with Escherichia coli and MA2 merged with Enterobacter cloacea. All two strains showed sensitivity to gentamycin, chloramphenicol, erythromycin, and Ciprofloxacin. E. Cloacae and E. coli showed high resistance to trimethoprim and ampicillin, while E. cloacea was sensitive to trimethoprim and ampicillin. These findings contradict the belief of Karaftayi people who believe the water has medicinal properties.*

**Keywords:** Water Quality, Early and Late Rain Fall, Heavy Metals, Bacteriological Analysis and Physicochemical Analysis