**CHARACTERISTICS OF A PHARMACEUTICAL EFFLUENT AND ITS PHYSICO-CHEMICAL**

**VARIABLES IN MINNA, NIGER STATE. NIGERIA**

Adama, S .B1., Auta.Y.I1., Adamu, M. Z1., Chukwuemeka,V.I1.,Mohammed,Y.M1. and Paiko,

Y.B2

Department of Animal Biology, Federal University of Technology, Minna.

Department of Chemistry, Ibrahim Babangida University, Lapai, Niger State.

Corresponding Author: auta.iliya@futminna.edu.ng

**ABSTRACT**

There is persistent deterioration in environmental water quality and a loss of biodiversity habitats in the surrounding community due to the Industrial effluents, wastes and emissions containing toxic and hazardous substances most of which can be detrimental to human health and Biodiversity. The physico-chemical and heavy metals evaluation of effluent from a pharmaceutical industry Located in Minna Niger State were determined to find out the impact on the environment. The physico-chemical parameters assessed includes pH, Total Dissolve Solids (TDS), Electrical Conductivity Using (Hanna microprocessor pH/EC/TDS meter), Dissolve Oxygen (DO) using Dissolve Oxygen Analyser, model JPB-607, Air temperature, Total hardness(TH), Total Alkalinity(TA), Biological Oxygen Deman.d(BOD), Chemical Oxygen Demand(COD), Nitrate, Phosphate, carbon (IV) oxide, chloride Using Titration Method and water temperature Using a Mercury in glass Thermometer. Heavy metals Studied include: copper, Iron, Lead and Manganese. Physico-chemical Parameters were determined using standard methods, while heavy metal levels were determined using Atomic Absorption Spectroscopy (AAS) (Spectra AA Varian 400 plus). All data were analyzed using two-way ANOVA. The results indicates that pH Ranged (3.09-3.57) was acidic among the Stations, Total Alkalinity (38.29-124.57mg/l), Total Hardness (70.14-481.14mg/l), Biological Oxygen Demand (2.9-411.OOmg/l), Chemical Oxygen Demand (8.21-22.15mg/l), Phosphate (2.8-9.19mg/l). All the results were above the acceptable standard set by World Health Organisation (WH0.2011), While, Nitrate (5.23-29.75mg/l) and Chloride (28.22-107.69mg/l) fell below the acceptable limit set by Nigerian Industrial Standard (N.1.8,2015) and (WHO,2011). AIso the concentration of heavy metals obtain from sediment sample are Lead (0.14-0.86mg/l), Iron (139-214mg/l), copper (0.53-1.28mg/l) and Manganese(0.21-6.07mg/i) and in wastewater are Lead (0.14-0.86mg/l), Iron (0.51-3.53mg/l), copper (0.25-1.38mg/l) and Manganese (0.29-1.90mg/l) respectively, the level of heavy metals analysed are all above the WHO permissible limit, except copper in both cases which was below the standard. This study reveals the need for enforcing adequate effluent treatment methods before their discharge to surface water and sediment to reduce their potential environmental hazards on the community and damage to the entire ecosystem.

**Keywords:** Characteristics, Pharmaceutical, Effluents, Physico-Chemical Variables