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Title.
Spatial and temporal variations in the Physicochemical parameters and abundance of macro invertebrate in Gurara reservoir, Kaduna state

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Abstract

The spatial and temporal variations in the Physico-chemical parameters and the abundance of macroinvertebrates in Gurara Reservoir, Kaduna State were evaluated monthly for 6months from February-July,2018 using standard water sampling and modified kick sampling techniques, respectively. From the results, the water temperature ranged from 25.6-29.1℃, Air temperature ranged from 23.7-32.9℃, pH ranged from 8.8-9.8, Electrical Conductivity ranged from 37-114µS/cm, Total Alkalinity ranged from 24-44mg/L, BOD ranged from 1.0-2.2mg/L, DO ranged from 2.0-4.8mg/L in all the stations. A total of 1801individual species of macro-invertebrates in 12 families from 3 orders were collected from 3 stations during the research. The most dominant species are Melanoides tuberculata, followed by Corbicula nitens and Union mancus. The abundance of macro invertebrate was high during the dry season than raining season. The marginal high nutrient levels (Phosphate and nitrate) obtained at these stations during wet season are indication that the water body is stressed with organic input and increased high levels of

anthropogenic activities. This study revealed that macroinvertebrate communities responded to changes in habitat quality of the reservoir.

Keywords: Spatio-temporal variations, Gurara reservoir, macroinvertebrates, Physico-chemical parameters, anthropogenic activities

1.Introduction The assessment of water quality in freshwater ecosystems has over the years been through the measurement of physicochemical variables; but such measurements alone cannot provide ecological information in its totality. This is because taxon respond differently to a variety of pollutants and are able to provide an indication of water quality over varying time periods [6,17]. Water is the most indispensable requirement for all living organisms and any alterations in water quality may be detrimental to the survival of organisms. Water of adequate purity which is the life blood of our species, is of vital importance to the existence of life [23]. Water resources are declining day by day at a fast rate due to rapid urbanization and population load. This important source of life has been polluted to a point of crisis [22]. When waste from different sources is discharged without proper treatment into water the physical, chemical and biological characteristics of water are altered in such a way that they are not useful for the purpose for which they are intended [16]. Increasing water pollution causes not only the change of water quality but also threatens human health and the balance of aquatic ecosystems, the development of the economy, and social prosperity. Assessing the ecological status of rivers, creeks and streams is a fundamental and increasingly important water management issue worldwide [5]. The physicochemical characteristics of water is important determinant of the aquatic system; their characteristics are influenced by climatic vegetation and general composition of water. Healthy growth of organisms in water body is determined by dissolved oxygen, hardness, turbidity, alkalinity, nutrients, temperature, etc. Conversely, parameters like biological oxygen demand (BOD), and chemical oxygen demand (COD) indicate pollution level of a given water body.19