

World Congress on

## ENVIRONMENTAL TOXICOLOGY AND HEALTH

July 11-12, 2018 Sydney, Australia

**Physicochemical parameters and planktonic diatoms as indicators of toxicity in surface water body, Nairobi Dam, Kenya**

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Clean air, water and food are natural God given gifts to all humans and also to all micro and macro-organisms inhabiting on this living planet. If one of these necessities is contaminated with chemicals more than the tolerance level(s) become toxic and create serious health problems for life. Water quality of any natural or manmade aquatic ecosystem mainly depends on the type(s), density and frequency of organism's species composition, growth, productivity, distribution and stratification; seasonal water level fluctuations, flow rate, number of inlets and outlets with volume of water; interactions between biological, physical, geology; types of chemical(s) contamination, their characteristics and anthropogenic activities within surroundings of freshwater resource(s). Planktonic species and physicochemical parameters were studied within Nairobi Dam at five selected sampling stations (S1 to S5) during dry season from June to September 2017. There are 15 genus which are *Amphora*, *Aulacoseira*, *Closterium*, *Cyclotella*, *Cymbella*, *Diatoma*, *Fragillaria*, *Gomphocymbella*, *Navicula*, *Nitzschia*, *Peridinium*, *Pinnularia*, *Stephomodiscus*, *Surillela* and *Synedra* composed of 23 planktonic species. Out of four species of the genus *Nitzschia*, three species *N. lucastris*, *N. palea*, *N. recta* together with *Cymbella cistula* and *Diatoma hiemale* have 100% frequency and well adapted within wide range of high nutrient levels in all samples but *Nitzschia subacicularis* appeared with 60% frequency. Other five genus with two species each are *Aulacoseira ambigua*, *A. schroidera*; *Cyclotella ocellata*, *C. kutzinghiana*; *Diatoma elongatum*; *D. hiemale*; *Fragillaria aethiopic*; *F. longissimi*; *Synedra cunningtonii*, *S. ulna* but another nine genus with single species are *Amphora ovaris*, *Ceratium sp.*, *Gomphocymbella beccari*, *Peridinium sp.*, *Cymbella cistula*, *Navicula granatum*, *Pinnularia viridis*, *Stephomodiscus astraca* and *Surillela ovalis*. Mean monthly values of selected physicochemical parameters are: temperature  $25.44 \pm 0.63$  °C, flow rate  $2.38 \pm 0.07$  km/h, pH  $8.36 \pm 0.13$ , dissolved oxygen  $2.95 \pm 0.6$  mg/L, electrical conductivity  $671.43 \pm 222.2$   $\mu$ s/cm, Turbidity  $113.13 \pm 13.86$  NTU, carbonates  $146.91 \pm 25.64$  mg/L, total nitrogen  $654.97 \pm 214.6$   $\mu$ g/L, total Phosphorus  $990.95 \pm 27.24$   $\mu$ g/L, Sulfates  $12.51 \pm 0.82$  mg/L and chlorides  $10.31 \pm 0.83$  mg/L. Study revealed that only pH, dissolved oxygen and carbonates show significant difference ( $p \leq 0.05$ ) in Nairobi Dam water but rest of physicochemical levels of conductivity, turbidity, total nitrogen, total phosphates, sulfates and chlorides are higher than recommended levels in drinking water according to EU, WHO and Kenya Bureau of Standards (KEBS). Based on the results, it is concluded that water is hard and due to high nitrogen level it limits the oxygen carrying capacity of red blood cells and infants may suffer with methemoglobinemia (blue baby syndrome) health problem and even noncarbonated hardness due to presence of high levels of  $Cl_2$ ,  $SO_4$  and  $NO_3$ , the water of the dam is slightly toxic. Therefore, without proper municipal water treatment system, it must not be supplied to human population, for animal drinking and should not be used even for aquaculture. During field observations, color, odor, presence of planktonic species, their density and frequency should be used as bio-indicator for quick water quality assessment of freshwater ecosystem(s).

**Biography**

Shyam Manohar is a Professor of Environmental Science at Kenyatta University, Kenya and has obtained his PhD (1974) from Institute of Science, University of Bombay He has completed his BSc majoring in Botany, Chemistry and Zoology, MSc (Botany) from University of Meerut, India and was a Senior Scientific Officer at Indian Council of Agricultural Research (ICAR), New Delhi. He has conducted research on floristic and phyto-sociological studies of the north and south arid and semi-arid regions of India.

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