



Assessment of Physicochemistry, Periphyton Species Composition, Diversity and Biomass of Asu River Southeast, Nigeria

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Abstract: The physicochemistry, periphyton species composition, diversity and biomass of river Asu were assessed for nine months from October, 2013 to June, 2014. The study was to determine seasonal variability in the water quality and periphyton of the river due to the ecological and domestic role to the riparian communities. The parameters measured showed that air (36.60°C) and water temperatures (33.70°C) were higher in the dry season at stations A and B. Total dissolved solids (49.00 mg l^{-1}) and conductivity ($96.00\text{ }\mu\text{S cm}^{-1}$) were higher in the wet season at station B. pH ranged from 5.00 to 7.00. Dissolved oxygen, carbon (iv) oxide, transparency, depth and flow rate varied from $3.60\text{-}8.70\text{ mg l}^{-1}$, $5.20\text{-}19.08\text{ mg l}^{-1}$, $0.10\text{-}0.80\text{ m}$, $0.29\text{-}7.90\text{ m}$ and $0.50\text{-}3.00\text{ m s}^{-1}$, respectively. Nitrate ranged from 0.10 mg l^{-1} to 0.70 mg l^{-1} . Phosphate was higher (0.40 mg l^{-1}) at station A in the wet season. Ammonia nitrogen varied from 0.40 mg l^{-1} to 0.75 mg l^{-1} . Carotenoid (2.90 mg g^{-1}) and chlorophyll a (2.30 mg g^{-1}) were higher at stations B and A in the dry and wet season, respectively while percentage ash content ranged from 1.00-15.00. Ninety (90) species of periphyton belonging to six (6) divisions and forty eighty (48) families were identified. Bacillariophyta was the most abundant (68 %) and diverse group in both wet and dry season. Chlorophyta had the highest biomass accumulation with Cladophora contributing the highest biomass. Seasonal variation in periphyton abundance and diversity were significant). Canonical correspondence analysis (CCA) showed that nitrate, phosphate, flow rate, water temperature, ammonia nitrogen, transparency, depth and pH influenced the abundance, diversity and biomass of periphyton in Asu River most. Hence, regular monitoring of anthropogenic activities around the river is recommended to maintain the water quality.

Keywords: Asu River, Nigeria, Periphyton, Water quality
