

Efficiency of Water-Purifying devices used in homes and industries

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ABSTRACT:

The use of water-purifying devices are gaining popularity, as many homes and industries are using them to treat water for dinking. However, most of the users do not know much about the performance/efficiency of these devices, hence this investigation. Efficiency of water-purifying devices were evaluated to determine their efficiencies in treating water consumed by people. Raw water samples from groundwater source, borehole (a major source of drinking water) in Owerri, Nigeria were treated using commonly used water treatment devices: resin ion-exchanger, sand-bed filter, activated carbon filter, micron filter, reverse osmosis membrane filter, ozonator, and UV-sterilizer. The resulting purified water samples were labeled, and each were subjected to physical, chemical and bacteriological analyses using APHA (2006) water analysis method. Raw water (control) sample had pH value of 6.7 while the pH values of treated water samples fell within 6.9 – 7.1. Turbidity value of control sample was 6.0 NTU with other samples recording 4.0 NTU and below. Total heterotrophic bacteria count and total coliforms counts of the raw water sample were 4.0×10^2 CFU/ml and 2.2×10^2 CFU/100ml respectively, but were below 2.5×10^2 CFU/ml and 1.9×10^2 CFU/100ml respectively in some of the treated samples, and nil in others. The overall efficiency of the treatment devices were of the order: Reverse osmosis membrane filter (76.25%) > UV-sterilizer (72.24%) > micron filter (65.85%) > Ozonator (62.97%) > Activated carbon filter (51.86%) > Resin ion-exchanger (46.67%) > Sand-bed filter (43.55%). This implies that not all water treatment devices used in homes and indutries are efficient enough to yield qualitative drinking water for unsuspecting users.

Keywords:

Efficiency, Water-purifying, Potable water, Devices, Homes.