Quality analysis of commercially available selected bottled drinking water samples in Jaffna district

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Abstract

Bottle water is a great beverage choice for hydration and refreshment because it's consistent quality, safety, and convenience. Quality of safe drinking water refers to physicochemical and microbiological parameters that meet the WHO (World Health Organization) guidelines of national standards. Therefore, this study was aimed to evaluate the quality of selected bottled drinking water samples available in Jaffna District, Sri Lanka. Randomly selected ten different brands of bottled drinking water samples were collected from bottled drinking water selling shops. For the quality analysis, water samples from two batches were tested for physiochemical (pH, Electrical conductivity, Total Dissolved Solids, Total Suspended solids, Turbidity, Color, Odor, Taste, iron, Nitrate, Nitrite, Sodium, Potassium, Total Hardness, Magnesium, Calcium, Alkalinity, and Chloride) and Microbiological (Total bacterial Count) parameters. The results of the above samples were compared with the SLS (Sri Lankan Standards) recommended level to ensure the quality of the drinking water samples. All samples' pH values varied between the ranges of 6.9 - 9.61, whereas electrical conductivity values varied between 12.58 - 202.58 µS/cm and total alkalinity and turbidity values varied between the ranges of 93.33 - 203.33 mg/L and 0.215 - 0.321 NTU, respectively. Further, total dissolved solids, sodium, total suspended solids, potassium, iron, hardness, magnesium, chloride, and calcium content of all studied water samples were 2.491 – 99.678 mg/L, 0.5 – 17.25 ppm, 0 mg/L, 0.270 – 1.50 mg/L, and 0 - 0.681 mg/L, 5.01 – 10.73 mg/L, 1.1-2.06 mg/L, 37.86 – 62.71 mg/L, and 1.96 – 17.79 mg/L, respectively. Moreover, nitrite and nitrate values for water samples varied between 0 to 0.0038 mg/L and 0.683 to 2.983 mg/L, respectively. All studied water samples were colourless, tasteless, and odourless for organoleptic analysis. Total microbial count varied between 0 and 13 CFU. According to the results, it is obvious that bottled drinking water has good quality for the selected samples. Among all samples studied for the physicochemical parameters, obtained value for bottled drinking water showed less than SLS permitted level. However, in the case of microbial quality, some samples were showed colonies for both batches. Therefore, this study concluded that proper sanitation practices need to be followed in respective bottled water producing industries to ensure safe drinking water for all.

Keywords: Bottled water, Chemical parameters, Microbial count, Physical parameters, Water quality

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