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**Assessment of Hygiene Practices and Water Quality of Commercial Reverse Osmosis Water Filtration Units in Anuradhapura Town Sri Lanka**

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**Abstract**

The demand for commercially filtered Reverse Osmosis (RO) water has risen sharply in urban Sri Lanka due to increasing awareness of water quality and health concerns. In Anuradhapura town, nearly 100 small-scale RO units currently operate along major roads, supplying water to local residents. This study evaluated the physicochemical properties and hygiene practices of 50 selected RO units, distributed evenly across the town, over a twelve-month period from September 2024 to August 2025. Monthly sampling was carried out on Sunday mornings to ensure consistency and reflect routine consumption patterns. Water samples were analyzed for pH, Total Dissolved Solids (TDS), and temperature, while hygiene assessments focused on floor and ceiling cleanliness, tank coverage, bottle-washing procedures, RO membrane maintenance, and overall environmental conditions. All results were compared with National Water Supply and Drainage Board (NWSDB) potable water standards. Findings revealed that most water samples had pH values between 5.0 and 6.0, indicating mild acidity, with only a few units showing slightly higher pH levels of 6.0-7.0. TDS values were generally below 20 mg/L, demonstrating very low mineral content, which could affect long-term dietary mineral intake. Morning water temperatures ranged from 29 °C to 33 °C. Hygiene assessments showed widespread deficiencies. Only 12 units had properly tiled floors, and many ceilings were dusty or covered with spider webs. The majority of storage tanks were left uncovered, leading to dust accumulation. RO membranes were seldom cleaned or replaced according to recommended schedules. Poor bottle-cleaning practices were documented in 15 units, and routine tank disinfection was largely absent. Surrounding environments were often cluttered with dust and waste, increasing the risk of contamination. Only one unit practiced mineral re-addition, which resulted in comparatively higher and more acceptable pH and TDS levels. Overall, the study revealed significant non-compliance with national potable water standards and highlighted potential risks such as microbial contamination, corrosion related to low pH, and mineral deficiencies. The results underscore the need for stronger regulatory oversight, mandatory hygiene protocols, proper maintenance of RO systems, and regular water quality monitoring. This year-long assessment provides a critical baseline for improving the safety, quality, and reliability of commercial RO water in Anuradhapura, contributing to better public health outcomes.

**Keywords:** *Commercial reverse osmosis water, Physicochemical parameters, Hygiene, Water quality monitoring*