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A Comparative Study on The Bactericidal Properties of Metallic and Polymeric Vessels on Potable Water Storage

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Different types of utensils have been used for cooking, storage, ceremonies since ancient era of mankind. Practices such as the storage of Ganges water in brass or copper utensils in accordance with ancient texts of Ayurveda in India or the addition of copper coins in water canteens by Second World War Japanese soldiers to keep the water sanitary have been documented, indirectly pointing at the bactericidal activity of copper. Contact killing describes the process of killing of bacteria by direct exposure on metallic surfaces such as copper or copper alloys. In contrast, bacterial cells can survive for days on surfaces of stainless steel, glass, or plastics. Current study deals with a comparison of antibacterial property of storage vessels made up of Copper, Bronze, Stainless-steel, Glass, Plastic. Known volume of sterile water samples was taken in sterilized vessels to which of the 100µL standardized bacterial suspension was inoculated. Four bacterial cultures used in present study includes *Bacillus, E. coli, Staphylococcus, Proteus*. After inoculation, the vessels were gently rotated to ensure uniform distribution of the bacterial suspension. The inoculated vessels were kept at room temperature. Water samples were drawn at intervals of 24 hr,48 hr,72 hr and spread on to nutrient agar plates to determine the bacterial load. Each sample was analyzed in duplicates. The plates were incubated at 37°C for 24 hours, and colony-forming units (CFUs) were counted. Based on the data from present study, copper and bronze significantly reduced the bacterial cells and plastic vessels harbor more bacterial cells.

Keywords: Antibacterial property, Contact killing, Colony forming Units

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