

Analysis of the Presence of Pathogenic Bacteria on the Hand Touch Surfaces in Public Buses at the Colombo Central Bus Station, Sri Lanka

M. R. Heiyanthuduwa^{1*}, W.A.R. Dilshan¹, L.A.C.P.L. Arachchi¹, H.K.D. Silva¹,
M.R.M. Rujath¹, S.A.P. Ravinath¹, D.N.A.W. Samarakoon¹, N.P.P. Liyanage²

¹*Department of Biomedical Sciences, KIU, Battaramulla, 10120, Sri Lanka*

²*Department of Animal Science, Uva Wellassa University, Badulla, 90000, Sri Lanka*

**heiyanthuduwamr@gmail.com*

Public buses play a major role in public transportation in urban areas like Colombo as it is one of the busiest and most crowded cities in Sri Lanka. Hand-touched surfaces such as door handles and handrails can be contaminated with several pathogenic microorganisms due to high passenger capacity, a lack of cleaning procedures, and inconsistent hygiene practices. This study aimed to detect the presence of *Escherichia coli* and *Staphylococcus aureus*, and to quantify the total bacterial count (TBC) to assess the level of bacterial contamination in swab samples collected from the surfaces of selected public buses at Colombo Central Bus Station, Sri Lanka. A total of 40 samples were collected from door handles and handrails of 20 selected public buses. All samples were analyzed using standard microbiological procedures, including culturing on selective media, Gram staining and biochemical tests, to identify the pathogenic bacteria. Total Bacterial Count (TBC) was determined by using the serial dilution and plate count methods. And colony-forming units (CFU) were calculated to quantify the level of bacterial contamination on the surfaces of public buses. The results indicated significant bacterial growth on all 40 samples, with some pathogenic bacterial species, including *Escherichia coli* (06 isolates), *Staphylococcus aureus* (23 isolates), *Klebsiella* spp. (09 isolates), Coagulase-negative *Staphylococcus* spp. (12 isolates), *Enterobacter* spp. (03 isolates) and *Corynebacterium* spp. (02 isolates). The average CFU value was 5.14×10^6 CFU/cm², and the standard deviation was 2.23×10^6 from 40 collected samples. The average bacterial load on door handles and handrails were $5.70 \pm 1.84 \times 10^6$ CFU/cm² and $4.59 \pm 2.48 \times 10^6$ CFU/cm², respectively. Statistical analysis revealed no significant difference between the contamination levels of door handles and handrails ($p > 0.05$). The results of this study highlight the poor hygienic conditions in public buses in Colombo. Also, presence of these organisms indicates more community-acquired infections can be transmitted. These findings suggest that requirement for better hygiene practices, public awareness campaigns, and frequent disinfection procedures to mitigate microbial risks. Although our study had a limited sample size and represents small part of transportation system in the city, these findings draw attention to public health issues that national authorities should consider seriously.

Keywords: Bacterial contamination, public buses, pathogenic bacteria, public health risk, hand touch surfaces