

**EFFECT OF LIQUID HANDWASH ON SOIL BACTERIAL FLORA**

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Frequent use of liquid handwash as a preventive measure against COVID-19 raises concern about its toxic effects on the soil microbiota. This study aimed to investigate the effect of four selected handwash products on soil bacteria over time. Composite soil samples were spiked with selected handwash at two different concentrations (12.5 and 25.0 ml kg<sup>-1</sup>). It was assumed that nearly 25-50 persons wash their hands on 1 kg of soil, and 0.5 ml was taken as the volume that one person uses per wash when taking from a dispenser. Handwash samples were diluted before soil spiking, and one soil sample (300 g) was used for each concentration. A control soil sample was maintained without spiking, and all samples were incubated at room temperature (27 °C). Soil bacterial counts of each sample were obtained after the 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup>, and 28<sup>th</sup> days using the pour plate method. After a serial dilution, 10<sup>-6</sup> to 10<sup>-10</sup> dilutions were plated in triplicate on nutrient agar, incubated at room temperature for 24 h, and bacterial counts were taken. The relative growth of test samples based on Colony-Forming Units per gram of soil (CFU g<sup>-1</sup>) was calculated. A repeated measures ANOVA was conducted to evaluate the null hypothesis that there is no change in the bacterial count with handwash concentrations in all products over time. There was significant evidence to reject the null hypothesis, and it was revealed that handwash concentrations had a significant effect on bacterial growth (p<0.05) in all products. The posthoc pairwise comparison revealed significant differences between each concentration and time (p<0.05). A decreasing pattern of bacterial counts was observed when handwash concentration and time increased. This may be due to the collective toxic effect of ingredients present in tested handwash products on soil bacterial flora.

**Keywords:** COVID – 19, Liquid handwash, Soil, Soil bacteria