

## Dynamics of Bacterial Contamination and Oral Health Risks Associated with Currency Notes and Coins Circulating in Kampala City

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**Abstract :** In this paper, paper notes and coins were collected from general public in Kampala City where ready-to-eat food can be served, in order to survey for bacterial contamination. The total bacterial number and potentially pathogenic organisms loading on currency were tested. All isolated potential pathogens were also tested for antibiotic resistance against four most commonly prescribed antibiotics. 1. The bacterial counts on one hundred paper notes sample were ranging between  $6 \times 10^9$  /cm<sup>2</sup>, the median was 141 / cm<sup>2</sup>, according to the data it was much higher than credit cards and Australian notes which were made of polymer. The bacterial counts on sixty coin samples were ranging between  $2 \times 10^8$  /cm<sup>2</sup>, much less than paper notes. 2. Coliform (65.6%), E. coli (45.9%), S. aureus (41.7%), B. cereus (67.7%), Salmonella (19.8%) were isolated on one hundred paper notes. Coliform (22.4%), E. coli (5.2%), S. aureus (24.1%), B. cereus (34.5%), Salmonella (10.3%) were isolated from sixty coin samples. These results suggested a high rate of potential pathogens contamination of paper notes than coins. 3. Antibiotic resistances are commonly in most of the pathogens isolated on currency. Ampicillin resistance was found in 60% of Staphylococcus aureus isolated on currency, as well as 76.6% of E. coli and 40% of Salmonella. Erythromycin resistance was detected in 56.6% of S. aureus and in 80.0% of E. coli. All the pathogens isolated were sensitive to Norfloxacin, Salmonella and S. aureus also sensitive to Cefaclor. In this paper, we also studied the antimicrobial capability of metal coins, coins collected from different countries were tested for the ability to inhibit the growth of E. sakazakii, S. aureus, E. coli, L. monocytogenes and S. typhimurium. 1) E. sakazakii appeared very sensitive to metal coins, the second is S. aureus, but E. coli, L. monocytogenes and S. typhimurium are more resistant to these metal coin samples. 2) Coins made of Nickel-brass alloy and Copper-nickel alloy showed a better effect in anti-microbe than other metal coins, especially the ability to inhibited the growth of E. sakazakii and S. aureus, all the inhibition zones produced on nutrient agar are more than 20.6 mm. Aluminium-bronze alloy revealed weak anti-microbe activity to S. aureus and no effect to kill other pathogens. Coins made of stainless steel also can't resist bacteria growth. 3) Surprisingly, one cent coins of USA which were made of 97.5% Zinc and 2.5% Cu showed a significant antimicrobial capability, the average inhibition zone of these five pathogens is 45.5 mm.

**Keywords :** antibiotic sensitivity, bacteria, currency, coins, parasites

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