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Microbial Load, Prevalence and Antibiotic Resistance of Microflora Isolated from the Ghanaian Paper Currency Note: A Potential Health Threat

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Abstract : This study examined the microbial flora contamination of the Ghanaian paper currency notes and antibiotic resistance in Ejura Municipal, Ashanti Region, Ghana. This is a descriptive cross-sectional study designed to assess the profile of microflora contamination of the Ghanaian paper currency notes and antibiotic-resistant in the Ejura Municipality. The research was conducted in Ejura, a town in the Ejura Sekyeredumase Municipal of the Ashanti region of Ghana. 70 paper currency notes which were freshly collected from the bank, consisting of 15 pieces of GH ¢1, GH ¢2, and GH ¢5, 10 pieces of GH ¢10 and GH ¢20, and 5 pieces of GH ¢50, were randomly sampled from people by exchanging their money in usage with those freshly secured from the bank. The surfaces of each GH¢ note were gently swabbed and sent to the lab immediately in sterile Zip Bags and sealed, and tenfold serial dilution was inoculated on plate count agar (PCA), MacConkey agar (MCA), mannitol salt agar (MSA), and deoxycholate citrate agar (DCA). For bacterial identification, the study used appropriate laboratory and biochemical tests. The data was analyzed using SPSS-IBM version 20.0. It was found that 95.2 % of the 70 GH¢ notes tested positive for one or more bacterial isolates. On each GH¢ note, mean counts on PCA ranged from 3.0 cfu/ml ×105 to 4.8 cfu/ml ×105. Of 124 bacteria isolated. 36 (29.03 %), 32 (25.81%), 16 (12.90 %), 20 (16.13%), 13 (10.48 %), and 7 (5.66 %) were from GH¢1, GH¢2, GH¢10, GH¢5, GH¢20, and GH¢50, respectively. Bacterial isolates were Escherichia coli (25.81%), Staphylococcus aureus (18.55%), coagulase-negative Staphylococcus (15.32%), Klebsiella species (12.10%), Salmonella species (9.68%), Shigella species (8.06%), Pseudomonas aeruginosa (7.26%), and Proteus species (3.23%). Meat shops, commercial drivers, canteens, grocery stores, and vegetable shops contributed 25.81 %, 20.16 %, 19.35 %, 17.74 %, and 16.94 % of GH¢ notes, respectively. There was 100% resistance of the isolates to Erythromycin (ERY), and Cotrimoxazole (COT). Amikacin (AMK) was the most effective among the antibiotics as 75% of the isolates were susceptible to it. This study has demonstrated that the Ghanaian paper currency notes are heavily contaminated with potentially pathogenic bacteria that are highly resistant to the most widely used antibiotics and are a threat to public health.

Keywords : microflora, antibiotic resistance, staphylococcus aureus, culture media, multi-drug resistance
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