Bacterial Contamination of Indian Currency Notes (Rupee)

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Paper currency is used repeatedly in exchange for goods and services,¹ and this is why the circulation of paper currency from one individual to another potentially spreads microorganisms. If these currencies are contaminated by pathogenic bacteria, the rate of infectious diseases will continue to rise.

Various microorganisms have been isolated from money worldwide including developed countries. *Bacillus* sp., and *Staphylococcus aureus* have been identified as common contaminants isolated from paper currency.² However, other organisms like, *Micrococcus* sp., *Corynebacterium* sp., *Vibrio cholerae*, *Mycobacterium tuberculosis* and members of the family *Enterobacteriaceae* have been isolated from currency too. Pathogenic microbes like *S. aureus*, *Escherichia coli*, and *Klebsiella*, *enterobacter* have been isolated from the US coins and paper bills currencies.³ This study was aimed at isolating and identifying the level of contamination of the Indian currency notes by microbial pathogens and to identify the possible associated risk factors in the study area.

From February to March 2012, a total of 30 currency notes consisting of five notes of each of INR.5 and INR.10 denominations, was collected from three sources (i.e., public transport conductors, fish vendors, and vegetable vendors) in Vellore city, Tamilnadu, India. The currency notes were collected with hands covered with sterile plastic gloves and were placed immediately into sterile polythene bags and labeled accordingly. The samples were transported immediately to the laboratory for analysis.

All of the 30 notes studied were contaminated with bacteria. The culture from the collected Indian paper currency yielded 21 isolates representing eight different types of bacterial species viz *E. coli*, *Proteus mirabilis*, *Vibrio* sp., *S. aureus*, *Pseudomonas* sp., *Salmonella* sp., *Bacillus* sp., and *Klebsiella* sp. We found common occurrence of some bacteria isolated from currency notes regardless of their sources; those included *E. coli*, *Vibrio* sp., *S. aureus*, and *Pseudomonas* sp.; other isolates such as *P. mirabilis* and *Klebsiella* sp. were found in a limited number of colonies.

In the present study, isolation of Gram positive as well as Gram negative bacteria from Indian currency notes confirmed that currency might be playing an important role, as a vector, in the transmission of pathogenic bacteria in the community. The pathogenic or potentially pathogenic bacteria found on these Indian currency notes, namely *E. coli*, *S. aureus*, *Bacillus* sp., *Klebsiella* sp., *Salmonella* sp., *Pseudomonas* sp., *P. mirabilis* and *Bacillus* sp. may cause a wide variety of diseases from food poisoning, wound and skin infections, respiratory and gastrointestinal

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problems to life threatening diseases such as meningitis and septicemia.

Considering our findings, it seems that disinfection of currency in banks by ultraviolet light, supersonic and chemicals means, would decrease the risk of transmission of infection. Replacement of the traditional methods of trading with electronic money transactions would of course be another good solution for the problem.

Conflicts of Interest: None declared.

References


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