A BACTERIOLOGIC INVESTIGATION ON

SUDANESE COINS IN KHARTOUM NORTH ROVINCE

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ABSTRACT

The objective of this study was to examine the extent of bacterial contamination of the most used coin denominations of the Sudanese currency.

A total of 72 coins of three different denominations (10, 20, and 50 SD) in circulation inside Khartoum North province were randomly studied for bacterial contamination. Sources of samples collection were groceries, cafeterias, bus drivers and elementary schools pupils during the period from February 2006 to August 2006. Samples were cultivated on appropriate media and identification of isolated bacteria was accomplished by conventional methods.

Results showed that all tested coins, except one, had bacterial growth, 84 (92%) were Gram positive bacteria while only 7 isolates (8%) were Gram negative bacteria. The predominant genus isolated was Bacillus which constituted 90.1% of the total bacteria and included B. cereus, B. mycoides, B. thuringiensis, B. subtilis, B. pumilus, B. licheniformis, and others. The other bacteria identified were Staphylococcus epidermidis and Escherichia coli (2.2%), Citrobacter freundii and Klebsiella pneumoniae (1.1%). The frequency of bacterial isolation from different sources was 20.9% for groceries, 19.8% for cafeterias, 26.4% for bus drivers and 32.9 % for elementary schools. The rate of bacterial isolation was the same for all coin denominations.

For Bacillus spp subjected to antibiotic sensitivity test all isolates were sensitive to tetracycline, chloramphenicol, erythromycin and gentamycin. All Bacillus cereus group showed resistant to penicillin, ampicillin and cloxacilin. For streptomycin, all of them were sensitive except two isolates of B. licheniformis one was resistant and the other was intermediate.
الخلاصة

هدفت هذه الدراسة إلى تحديد مدى التثول البكتيري في فنات العملة المعدنية السودانية الأكثر تداولًا.

تم جمع عينة من ثلاث فنات مختلفة في فترة من فترات 10، 20 و 50 دينار بحري ناقصة من البكتريا بالإضافة إلى الكابترات وتحليل مدارس الأساس في الفترة من فبراير 2006 إلى أغسطس 2006م. زرعت العينات في الظروف المزرعة المناسبة وعرفت البكتيريا باستخدام الاختبارات الكيميائية.

أظهرت نتائج الدراسة أن جميع الفنات المعدنية ملوثة بالبكتيريا عدا واحدة وحلًا على 91 عزلة من بينها 84% (82%) موجبًا بينما 7 فقط (8%) كانت سلبية لحصبة جرام البكتيريا من جنس باليسين كانت الأكثر تكرارًا (90.1%) من بين العزلات وشملت الباليسين سيرس، باليسين ميكوديز، باليسين ثيرينجنس، باليسين س. بتليس، باليسين ميليس، باليسين لشيفرمز.. الخ) بالإضافة إلى أنواع أخرى من البكتيريا منها استيف ابينيرمز وباشيريا كولي (2.2) زتروباكتر فرنسا وكيسيلا نيموني (1.1%).

أوضحت الدراسة أن معدل عزل البكتيريا من المصادر المختلفة هو 20.9% للبقالات، 19.8% للكابترات، 26.4% لسانتي الحافلات و 32.9% لتلاميذ مدارس الأساس.

معدل عزل البكتيريا في جميع فنات العملاء كان متباينًا.

أظهرت نتائج اختبار الحساسية للمضادات الحيوية، أن كل أنواع الباليسين حساسة للتتراسكلين، كلازاميسين، كلورامفينيكول، إيروثروماسين وجينتاماسين بن. كل مجموعة الباليسين سيرس كانت مقاومة للفنات، أميسين وكوكرا ماسين. أما بالنسبة للاستريتوماسين، فجميع الباليسين كانت حساسة له ما عدا اثنين في باليسين لشيفرمز.
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CONCLUSION

- This study concluded that coins from all sources investigated were contaminated with bacteria in particular *Bacillus* spp including *B. subtilis*, *B. pumilus*, *B. cereus*, *B. licheniformis*, *B. mycoides* and others. On the other hand Gram negative bacteria were also found but as lesser contaminants, *Pseudomonas* spp and *E. coli*.

- Coins obtained from elementary schools showed the highest rate of bacterial contamination followed by bus drivers.

- All coins denominations showed the same rate of contamination.
RECOMMENDATIONS

In view of the results of the present investigation, the following is recommended:

• It is advisable to isolate the selling and money-collecting activities to prevent the potential of cross contamination.

• Regular disinfection of currency deposited in banks by ultraviolet light or formalin vapors.

• Improvement of personal hygiene by always washing hands with soap to limit infection.

• The possibility of getting infected by improper handling of currency is a potential hazard especially among children, who are known to swallow coins accidentally or just keep them in mouth while playing. Therefore, health awareness must be primarily directed towards children in the school itself through cartoons, stickers and other audio visual aids.

• As bacteria found in coins relative to other researches on paper notes were far less, it is recommended that most used denomination of paper notes as in 100 SD and 200 SD should be replaced by coins.

• Further studies would be required to provide complete picture about the extent of bacterial contamination of coins as well as its role in spreading diseases.