



ARE PUBLIC LIBRARY BOOKS CONTAMINATED BY BACTERIA?

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Abstract—The microbial flora on the surfaces of 15 books obtained from a public library and from 15 books obtained from a family household were studied. *Staphylococcus epidermidis* was recovered from 4 of the library books and 3 of the family household books. The number of organisms per page was between one to four. This data illustrates the safety of using library books, as they do not serve as a potential source of transmission of virulent bacteria.

Bacteria Books *Staphylococcus epidermidis* Contamination

Microorganisms are known to spread in the community through direct and indirect routes [1]. One of the indirect modes of dissemination of bacteria is through fomites. Spread of bacteria has been shown to occur through fomites such as cloth, bed linen, toys, paper money and newspaper [1-3]. Library books have long been suspected as a possible means for bacterial spread in the community. However, the role of books as a source for bacterial transfer in the community has not been studied.

This study was designed to investigate whether public library books can serve as a reservoir and a potential source of bacterial spread in a community. As there are no established methods to define the level of bacterial contamination of books, the techniques used were only semi-quantitative.

Fifteen library books for children were loaned from a public library in Washington, DC on January 26, 1993. The library was located next to an elementary public school and was frequently visited by children of that school.

The books studied were popular children's books that were frequently loaned for reading. They were taken out between 8-12 times within the past 6 months and the last time they were all returned was 3-7 days prior to the day of the study. Fifteen similar children's books that were present at the author's home and were not used for at least 1 year served as control.

The entire first page of the book was swabbed by sterile cotton swabs that were previously dipped in sterile saline. The swabs were immediately plated on 5% sheep blood and MacConkey's agar plates and these were incubated at 37°C for 48 hours at 5% CO₂. The number of organisms on each plate was enumerated. The organisms were identified using conventional methods [4].

Bacterial growth was noticed only on blood agar plates in 4 samples obtained from library books and 3 samples from home books (Table 1). The organisms were identified as *Staphylococcus epidermidis* and the number of colonies per plate varied between 1-4.

This study illustrates the safety of using library and home books, as under normal use they are not a potential source of spread of virulent bacteria. Although the library books we

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Table 1. Microorganisms isolated from pages of 30 books*

	Sample no.	Public library books (n = 15)	Non-public library books (n = 15)
Number of books with organisms isolated		4	3
Number of colonies per plate in culture-positive samples	1	1	2
	2	2	4
	3	2	2
	4	3	

*Data from 23 specimens of books which did not show bacterial growth is not shown.

studied were frequently used, they did not serve as a reservoir for virulent organisms such as *Staphylococcus aureus* and *Streptococcus pyogenes*. This may be due to the dryness and lack of nutritional factors on book surfaces. It is possible, however, that bacteria can survive on book surfaces for a short period of time and under these circumstances can serve as a potential source of bacterial spread in the community. The only bacteria that was isolated, *S. epidermidis*, is a known member of skin flora [5], and is not considered to be a virulent organism in the immunocompetent host.

Although this data demonstrated the lack of numerous bacteria on the surfaces of library book pages, further studies are needed to evalu-

ate the ability of microorganisms to survive in this environment.

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