



S.E. Stevens, Jr. and Robert Boor  
Department of Molecular and Cell Biology  
The Pennsylvania State University  
University Park, Pennsylvania 16802

The purpose of this project was to determine the effects of silver-coated thread on the indigenous population of microorganisms in the shoes worn by diverse people. Interest in the project developed from our previous studies, from which we found that silver-coated thread was remarkably inhibitory to the growth and reproduction of several human pathogenic bacteria. We reasoned that silver-coated thread incorporated into insertable shoe pads or the textile lining of shoes might be inhibitory to bacteria and other microorganisms found in those shoes worn by people. As most foot odors result from the metabolic products of microorganisms growing on the human foot or in the shoe itself, use of silver-coated thread in shoes might also dramatically reduce these odors.

Various sizes of Dr. Scholl's Air-Pillo® Double Comfort Insoles (foot pads) were purchased commercially. A lightweight cloth woven with silver-coated thread was pressure laminated to the bottom surface of the footpad for the right foot. A non-silver containing cloth of the same weight was pressure laminated to the bottom surface of the foot pad for the left foot and served as the experimental control.

At the beginning of each experimental test, both the left and right shoes of nine volunteers were swabbed in the area of the "ball of the foot" with cotton swabs previously soaked in a solution of physiological saline. Each swab was immediately dropped into 4.5 ml of physiological saline solution and vigorously mixed for 30 seconds. The resulting mixture was seriously diluted in brain heart infusion (BHI) broth and each dilution was plated in BHI agar in Petri dishes. Each plate was then incubated at 37°C (the physiological temperature of people) for 48 hours. The total number of colonies from each dilution plate was counted and used to determine the number of microorganisms present in the undiluted sample. After seven days of simultaneous wear of both control and silver containing foot pads the above procedure was repeated. The total number of microorganisms at time zero and at seven days wear were compared (see Figure 1).

The number of microorganisms in the control shoe (left foot pad without silver-coated cloth) increased by an average of 11.8% during seven days of wear while the number of microorganisms in the test shoe (right foot pad containing silver-coated cloth) decreased by an average of 88%. A subjective test of odor indicated a greatly diminished odor in the right shoe. Obviously, the presence of silver in the right shoe of the volunteers greatly diminished the total count of microorganisms and their associated odors.



S.E. Stevens, Jr. and Robert Boor  
Department of Molecular and Cell Biology  
The Pennsylvania State University  
University Park, Pennsylvania 16802

Figure 1

