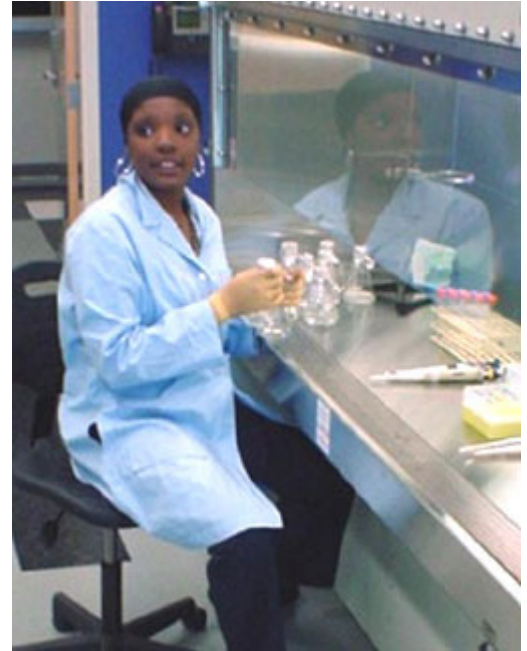




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Evaluation of a Silane Quaternary Ammonium Salt as an Antimicrobial Fabric Treatment

Antimicrobial agents are used to kill or limit growth of microorganisms. AEGIS Microbe Shield™, an antimicrobial agent composed of a silane quaternary ammonium salt, is featured for its durability and efficacy against both gram-negative and gram-positive bacteria. This research studied the effectiveness of the antimicrobial agent as a treatment for cotton fabric. Cotton fabric samples were coated with the antimicrobial agent, then tested against three species of bacteria. The samples were shaken in a bacterial solution to allow contact with the microbes, and the number of viable bacteria were counted. The data were compared to the numbers of bacteria with untreated fabric. This research reveals that the antimicrobial agent reduced the numbers of bacteria exposed to the treated cotton fabric.



2004 SLSTP Research

The following hyperlinks lead to descriptions of research conducted by undergraduate college students participating in NASA's Spaceflight and Life Sciences Training Program at Kennedy Space Center during the summer of 2004.

- Plant Health Evaluation
- Coastal Vegetation Dynamics
- Bacterial Spore Survivability
- Zooplankton Communities
- Fixation Tube Biocompatibility
- Interactive Plant Database
- Nutrient Delivery Systems
- Land Surface Model
- Hypobaric Conditions
- Burn Management
- Life Support Salad Crops
- Composting Space Refuse
- Microbial Communities
- VOC Production
- Controlling Bacteria In Spac
- Plant Outreach Database

Research

The three types of bacteria were *Escherichia coli*, *Staphylococcus epidermidis*, and *Bacillus subtilus*. For each test, the bacteria were grown in Tryptic Soy Broth (TSB) for eighteen hours at room temperature. The bacteria were diluted in 0.003M KH_2PO_4 to 72 percent transmission using a Vitek Colorimeter. For testing, the bacteria were diluted 1:1000 to 1.5×10^5 cfu/mL. Then, 50mL aliquots of the diluted bacteria were distributed into sterile 250mL flasks.

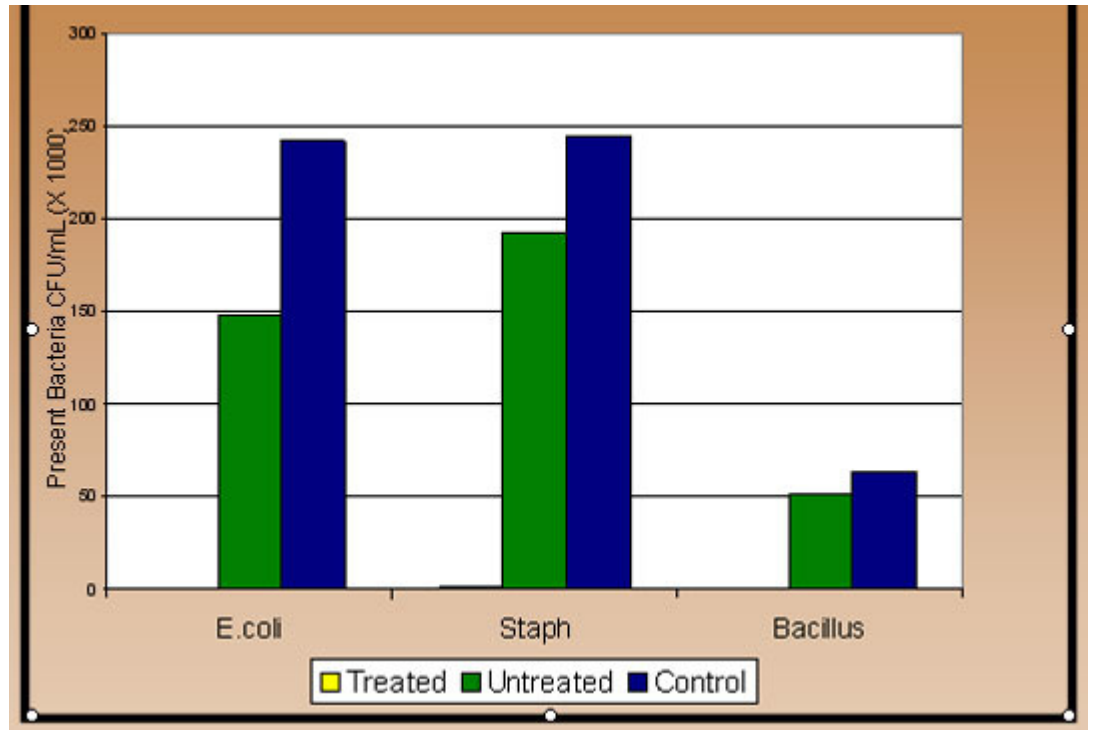
The number of bacteria were determined by the pour plate method using Tryptic Soy Agar (TSA). The control was plated at "0" contact time. The nine flasks were agitated in a reciprocal shaker at 120 RPM. After one hour, all bacteria samples were plated and incubated for 24 hours at 35 °C.

Pathogen Testing
Florida Scrub-Jay
Evapotranspiration Rates
Growth Characteristics
Antimicrobial Treatment
Bacterial Dynamics
Sediment Concentrations
Reporter Gene Analyses



Results

It was discovered that the antimicrobial agent did exhibit the ability to kill the three species of bacteria.



Above: Comparison of all pure cultures used with and without the antimicrobial agent.

Acknowledgements

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[Click here to download](#) a printable Microsoft PowerPoint version of this research.





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