

The cells are Gram-positive, non-motile, cocci, in tetrad arrangement and clusters. Spore formation is not observed. The colonies are beige in color and convex with a glossy surface. The organisms are aerobic chemoheterotrophic in nature. They do not reduce nitrate to nitrite. They show no anaerobic growth and do not ferment glucose. They are gelatin-liquefying and esculin hydrolyzed. Catalase and β -galactosidase are produced. The cells use D-glucose, D-mannose, D-mannitol, D-maltose, N-acetyl-glucosamine, and malate. Tests show that the

cells do not assimilate the following compounds: L-arabinose, gluconate, capric acid, adipic acid, phenyl acetic acid, or citrate. Growth occurs at 15 to 45 °C and at pH 6–9. The optimal growth temperature and pH are 25 °C and 7, respectively.

No species of *Tetrashpaera* has ever been isolated from airborne samples. Previous discoveries have come from soil and activated sludge samples. As other species of this genus have demonstrated enhanced biological phosphorus removal activity, further tests are required to determine if this newly

discovered species would have bioremediation applications.

This work was done by Shariff Osman, Christine Moissl, Naofumi Hosoya, and Kasthuri Venkateswaran of the Biotechnology and Planetary Protection Group at Jet Propulsion Laboratory; Ariane Briegel of Caltech; Masataka Satomi of the National Research Institute of Fisheries Science, Fisheries Research Agency-Japan; and Shanmugam Mayilraj of MTCC Institute of Microbial Technology-India for NASA's Jet Propulsion Laboratory. For more information, contact iaoffice@jpl.nasa.gov. NPO-45092

Chamber for Aerosol Deposition of Bioparticles

Standard coupons can be covered with reproducible areal concentrations of bioparticles.

NASA's Jet Propulsion Laboratory, Pasadena, California

The laboratory apparatus shown in the figure is a chamber for aerosol deposition of bioparticles on surfaces of test coupons. It is designed for primary use in inoculating both flat and three-dimensional objects with approximately reproducible, uniform dispersions of bacterial spores of the genus *Bacillus* so that the objects could be used as standards for removal of the spores by quantitative surface sampling and/or cleaning processes. The apparatus is also designed for deposition of particles other than bacterial spores, including fungal spores, viruses, bacteriophages, and standard micron-sized beads. The novelty of the apparatus lies in the combination of a controllable nebulization system with a settling chamber large enough to contain a significant number of test coupons. Several companies market other nebulizer systems, but none are known to include chambers for deposition of bioparticles to mimic the natural fallout of bioparticles.

The nebulization system is an expanded and improved version of commercially available aerosol generators that include nebulizers and drying columns. In comparison with a typical commercial aerosol generator, this system includes additional, higher-resolution flowmeters and an additional pres-



This **Bioparticle-Deposition Chamber** is sized to fit on a laboratory bench and to fit within a standard class-II biological safety cabinet.

sure regulator. Also, unlike a typical commercial aerosol generator, it includes stopcocks for separately controlling flows of gases to the nebulizer and drying column.

To maximize the degree of uniformity of dispersion of bioaerosol, the chamber is shaped as an axisymmetrical cylinder and the aerosol generator is positioned centrally within the chamber and aimed upward like a fountain. In order to mini-

mize electric charge associated with the aerosol particles, the drying column is made of aluminum, the drying column is in direct contact with an aluminum base plate, and three equally spaced ^{210}Po anti-static strips are located at the exit end of the drying column. The sides and top of the chamber are made of an acrylic polymer; to prevent accumulation of electric charge on them, they are spray-coated with an anti-static material. During use, the base plate and the sides and top of the chamber are grounded as a further measure to minimize the buildup of electric charge.

This work was done by Roger Kern and Larry Kirschner of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

In accordance with Public Law 96-517, the contractor has elected to retain title to this invention. Inquiries concerning rights for its commercial use should be addressed to:

*Innovative Technology Assets Management
JPL*

*Mail Stop 202-233
4800 Oak Grove Drive
Pasadena, CA 91109-8099
(818) 354-2240*

E-mail: iaoffice@jpl.nasa.gov

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