

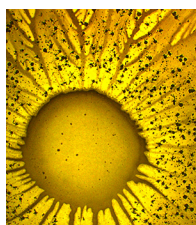


AMERICAN
SOCIETY FOR
MICROBIOLOGY

Applied and Environmental
Microbiology®

CONTENTS • APRIL 2020 • VOLUME 86, NO. 7

COVER IMAGE



Cover photograph: Biomineralization by the environmental isolate *Bacillus licheniformis* DSM110489 grown on solid minimal media supplemented with calcium acetate. The agar was inoculated with a droplet of liquid culture and photographed with a dissecting microscope after 1 to 2 weeks of incubation. Calcium carbonate crystals resulting from microbially induced calcite precipitation are visible as black specks throughout the area of bacterial growth. (See related article at e02739-19.) (Copyright © 2020 Reeksting et al. CC-BY 4.0.)

SPOTLIGHT

Articles of Significant Interest in This Issue

e00273-20

MINIREVIEW

Thermophilic Degradation of Hemicellulose, a Critical Feedstock in the Production of Bioenergy and Other Value-Added Products

e02296-19

Isaac Cann, Gabriel V. Pereira, Ahmed M. Abdel-Hamid, Heejin Kim, Daniel Wefers, Boniface B. Kayang, Tamotsu Kanai, Takaaki Sato, Rafael C. Bernardi, Haruyuki Atomi, Roderick I. Mackie

ENVIRONMENTAL MICROBIOLOGY

DNA Stable-Isotope Probing Delineates Carbon Flows from Rice Residues into Soil Microbial Communities Depending on Fertilization

e02151-19

Yali Kong, Yakov Kuzyakov, Yang Ruan, Junwei Zhang, Tingting Wang, Min Wang, Shiwei Guo, Qirong Shen, Ning Ling

In-Depth Profiling of Calcite Precipitation by Environmental Bacteria Reveals Fundamental Mechanistic Differences with Relevance to Application

e02739-19

Bianca J. Reeksting, Timothy D. Hoffmann, Linzhen Tan, Kevin Paine, Susanne Gebhard

Functional *Bacillus thuringiensis* Cyt1Aa Is Necessary To Synergize *Lysinibacillus sphaericus* Binary Toxin (Bin) against Bin-Resistant and -Refractory Mosquito Species

e02770-19

Nathaly Alexandre Nascimento, Mary Carmen Torres-Quintero, Samira López Molina, Sabino Pacheco, Tatiany Patrícia Romão, Antonio Pereira-Neves, Mario Soberón, Alejandra Bravo, Maria Helena Neves Lobo Silva-Filha

A Pathway for Degradation of Uracil to Acetyl Coenzyme A in *Bacillus megaterium*

e02837-19

Di Zhu, Yifeng Wei, Jinyu Yin, Dazhi Liu, Ee Lui Ang, Huimin Zhao, Yan Zhang

Deciphering the Bifidobacterial Populations within the Canine and Feline Gut Microbiota

e02875-19

Giulia Alessandri, Christian Milani, Leonardo Mancabelli, Giulia Longhi, Rosaria Anzalone, Gabriele Andrea Lugli, Sabrina Duranti, Francesca Turroni, Maria Cristina Ossiprandi, Douwe van Sinderen, Marco Ventura

Nutrient Level Determines Biofilm Characteristics and Subsequent Impact on Microbial Corrosion and Biocide Effectiveness

e02885-19

Silvia J. Salgar-Chaparro, Katerina Lepkova, Thunyaluk Pojtanabuntoeng, Adam Darwin, Laura L. Machuca

A Quorum Quenching Bacterial Isolate Contains Multiple Substrate-Inducible Genes Conferring Degradation of Diffusible Signal Factor e02930-19

Huishan Wang, Lisheng Liao, Shaohua Chen, Lian-Hui Zhang

***Akkermansia muciniphila* Prevents Fatty Liver Disease, Decreases Serum Triglycerides, and Maintains Gut Homeostasis** e03004-19

Sejeong Kim, Yewon Lee, Yujin Kim, Yeongeun Seo, Heeyoung Lee, Jimyeong Ha, Jeeyeon Lee, Yukyung Choi, Hyemin Oh, Yohan Yoon

ENZYMOLGY AND PROTEIN ENGINEERING

Engineering of Cyclodextrin Glycosyltransferase Reveals pH-Regulated Mechanism of Enhanced Long-Chain Glycosylated Sophoricoside Specificity e00004-20

Ruizhi Han, Jie Ni, Jieyu Zhou, Jinjun Dong, Guochao Xu, Ye Ni

Two New Unspecific Peroxygenases from Heterologous Expression of Fungal Genes in *Escherichia coli* e02899-19

Dolores Linde, Andrés Olmedo, Alejandro González-Benjumea, María Estévez, Chantal Renau-Mínguez, Juan Carro, Elena Fernández-Fueyo, Ana Gutiérrez, Angel T. Martínez

EVOLUTIONARY AND GENOMIC MICROBIOLOGY

Dissemination of Quinolone-Resistant *Escherichia coli* in the Norwegian Broiler and Pig Production Chains and Possible Persistence in the Broiler Production Environment e02769-19

Håkon Kaspersen, Camilla Sekse, Eve Zeyl Fiskebeck, Jannice Schau Slettemeås, Roger Simm, Madelaine Norström, Anne Margrete Urdahl, Karin Lagesen

FOOD MICROBIOLOGY

Competitive Exclusion Is a Major Bioprotective Mechanism of Lactobacilli against Fungal Spoilage in Fermented Milk Products e02312-19

Solvej Siedler, Martin Holm Rau, Susanne Bidstrup, Justin M. Vento, Stina Dissing Aunsbjerg, Elleke F. Bosma, Laura M. McNair, Chase L. Beisel, Ana Rute Neves

Viable but Nonculturable *Escherichia coli* O157:H7 and *Salmonella enterica* in Fresh Produce: Rapid Determination by Loop-Mediated Isothermal Amplification Coupled with a Propidium Monoazide Treatment e02566-19

Lu Han, Kaidi Wang, Lina Ma, Pascal Delaquis, Susan Bach, Jinsong Feng, Xiaonan Lu

Role of Cecal Microbiota in the Differential Resistance of Inbred Chicken Lines to Colonization by *Campylobacter jejuni* e02607-19

Cosmin Chintoan-Uta, Trong Wisedchanwet, Laura Glendinning, Abi Bremner, Androniki Psifidi, Lonneke Vervelde, Kellie Watson, Mick Watson, Mark P. Stevens

GENETICS AND MOLECULAR BIOLOGY

The Cell Wall Integrity Pathway Contributes to the Early Stages of *Aspergillus fumigatus* Asexual Development e02347-19

Marina Campos Rocha, João Henrique Tadini Marilhano Fabri, Isabelle Taira Simões, Rafael Silva-Rocha, Daisuke Hagiwara, Anderson Ferreira da Cunha, Gustavo Henrique Goldman, David Cánovas, Iran Malavazi

Ferrous-Iron-Activated Transcriptional Factor AdhR Regulates Redox Homeostasis in *Clostridium beijerinckii* e02782-19

Bin Yang, Xiaoqun Nie, Youli Xiao, Yang Gu, Weihong Jiang, Chen Yang

GEOMICROBIOLOGY

- Interactions between Biotite and the Mineral-Weathering Bacterium *Pseudomonas azotoformans* F77** e02568-19
Yuan-Li Wang, Li-Jing Sun, Chun-Mei Xian, Feng-Lian Kou, Ying Zhu, Lin-Yan He, Xia-Fang Sheng

INVERTEBRATE MICROBIOLOGY

- Phylosymbiosis across Deeply Diverging Lineages of Omnivorous Cockroaches (Order Blattodea)** e02513-19
Kara A. Tinker, Elizabeth A. Ottesen

METHODS

- The ZKIR Assay, a Real-Time PCR Method for the Detection of *Klebsiella pneumoniae* and Closely Related Species in Environmental Samples** e02711-19
Elodie Barbier, Carla Rodrigues, Geraldine Depret, Virginie Passet, Laurent Gal, Pascal Piveteau, Sylvain Brisse

MICROBIAL ECOLOGY

- Short-Term Stable Isotope Probing of Proteins Reveals Taxa Incorporating Inorganic Carbon in a Hot Spring Microbial Mat** e01829-19
Laurey Steinke, Gordon W. Slysz, Mary S. Lipton, Christian Klatt, James J. Moran, Margie F. Romine, Jason M. Wood, Gordon Anderson, Donald A. Bryant, David M. Ward

PHYSIOLOGY

- Promiscuous Enzymes Cause Biosynthesis of Diverse Siderophores in *Shewanella oneidensis*** e00030-20
Sijing Wang, Huihui Liang, Lulu Liu, Xinhang Jiang, Shihua Wu, Haichun Gao
- GlnR Negatively Regulates Glutamate-Dependent Acid Resistance in *Lactobacillus brevis*** e02615-19
Luchan Gong, Cong Ren, Yan Xu
- Sml1 Inhibits the DNA Repair Activity of Rev1 in *Saccharomyces cerevisiae* during Oxidative Stress** e02838-19
Rui Yao, Pei Zhou, Chengjin Wu, Liming Liu, Jing Wu
- Freshwater Cyanobacterium *Synechococcus elongatus* PCC 7942 Adapts to an Environment with Salt Stress via Ion-Induced Enzymatic Balance of Compatible Solutes** e02904-19
Yajing Liang, Mingyi Zhang, Min Wang, Wei Zhang, Cuncun Qiao, Quan Luo, Xuefeng Lu

PUBLIC AND ENVIRONMENTAL HEALTH MICROBIOLOGY

- Site-Specific Profiling of the Dental Mycobiome Reveals Strong Taxonomic Shifts during Progression of Early-Childhood Caries** e02825-19
Lauren M. O'Connell, Ryan Santos, Garrett Springer, Robert A. Burne, Marcelle M. Nascimento, Vincent P. Richards
- Aspergillus fumigatus* Mitochondrial Acetyl Coenzyme A Acetyltransferase as an Antifungal Target** e02986-19
Yuanwei Zhang, Wenfan Wei, Jialu Fan, Cheng Jin, Ling Lu, Wenxia Fang

ERRATUM

Erratum for Oliveira et al., “K2 Capsule Depolymerase Is Highly Stable, Is Refractory to Resistance, and Protects Larvae and Mice from *Acinetobacter baumannii* Sepsis”

e00333-20

Hugo Oliveira, Ana Mendes, Alexandra G. Fraga, Alice Ferreira, Andreia I. Pimenta, Dalila Mil-Homens, Arsénio M. Fialho, Jorge Pedrosa, Joana Azeredo