

MARCO ENRIQUE MECHAN LLONTOP, Ph.D.

Keegstra Postdoctoral Fellow

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EDUCATION

- 2019 Ph.D. in Plant Pathology, Physiology and Weed Sciences, Virginia Polytechnic Institute and State University, VA, USA
Advisor: Dr. Boris A. Vinatzer
- 2011 B.S. in Biological Sciences, Universidad Nacional Pedro Ruiz Gallo, Lambayeque, Peru.

APPOINTMENTS

- 2020-present Post-doctoral fellow, Great Lake Bioenergy Research Center, Michigan State University, East Lansing, MI.
Advisor: Dr. Ashley Shade (PI), Dr. John Mullet (Co-PI)
- 2014-2019 Graduate Research Assistant, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA.
Department of Plant Pathology, Physiology, and Weed Science.
- 2013-2014 Research Assistant, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA.
Department of Plant Pathology, Physiology, and Weed Science.
- 2011 Post-baccalaureate Research Assistant, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA.
Department of Plant Pathology, Physiology, and Weed Science.

PUBLICATIONS

Manuscripts published, accepted, under revision, or in-preparation.

1. **M.E. Mechan-Llontop**, J. Mullet, and A. Shade. 2023. Genome-assembled bacterial collection of the sorghum aerial root mucilage microbiota. *Microbiology Resource Announcements*. **Submitted**.
2. **M.E. Mechan-Llontop**, J. Mullet, and A. Shade. 2023. Genome-assembled bacterial collection of the sorghum epicuticular wax microbiota. *Microbiology Resource Announcements*. **Submitted**.
3. M.Y. Chou, T.B. Andersen, **M.E. Mechan-Llontop**, N. Beculheimer, A. Sow, N. Moreno, A. Shade, B. Hamberger, and G. Bonito. 2023. Terpenes modulate bacterial and fungal growth and sorghum rhizobiome communities. *Microbiology Spectrum*. **Accepted**.
4. **M.E. Mechan-Llontop**, J. Mullet, and A. Shade. 2023. Phyllosphere exudates select for distinct microbiome members in sorghum epicuticular wax and aerial root mucilage. *Phytobiomes Journal*. <https://doi.org/10.1094/PBIOMES-08-22-0046-FI>
5. J. Colovas, A.F. Bintarti, **M.E. Mechan-Llontop**, K. Grady, and A. Shade. 2022. Do-it-yourself mock community standard for multi-step assessment of microbiome protocols. *Current Protocols*, 2, e533. doi: [10.1002/cpz1.533](https://doi.org/10.1002/cpz1.533)
6. G. Bonito, M. Chou, M.A. Cregger, J.L. Field, H. Garcia-Martin, A.C. Howe, J.L. Labbé, **M.E. Mechan-Llontop**, T.R. Northern, A. Shade, and T.J. Tschaplinski. 2022. Frontiers and opportunities in bioenergy

crop microbiome research networks. *Phytobiomes Journal* 6:2, 118-126. <https://doi.org/10.1094/PBIOMES-05-21-0033-MR>

7. K.C. Failor, H. Liu, **M.E. Mechan-Llontop**, S. LeBlanc, N. Eckstain-Levi, P. Sharma, A. Reed, S. Yang, L. Tian, C. Lefevre, N. Menguy, L. Du, C.L. Monteil, and B.A. Vinatzer. 2021. Ice nucleation in a Gram-positive bacterium isolated from precipitation depends on a polyketide synthase and non-ribosomal peptide synthetase. *ISME J* 16, 890–897. <https://doi.org/10.1038/s41396-021-01140-4>
8. **M.E. Mechan-Llontop**, L. Tian, P. Sharma, L. Heflin, V.A. Bernal-Galeano, D.C. Haak, C.R. Clarke, and B.A. Vinatzer. 2021. Experimental evidence pointing to rain as a reservoir of tomato phyllosphere microbiota. *Phytobiomes Journal* 5:4, 382-399. <https://doi.org/10.1094/PBIOMES-04-21-0025-R>
9. F.R. Aguilar-Gamboa, L.A. Salcedo-Mejia, L.M. Serquen-Lopez, **M.E. Mechan-Llontop**, P.O. Tullume-Vergara, H. Silva-Diaz, and J.P. Cardenas. 2021. Genomic Sequences and Analysis of Five SARS-CoV-2 Variants Obtained from Patients in Lambayeque, Peru. *Microbiology Resources Announcements* 10:e01267-20. <https://doi.org/10.1128/MRA.01267-20>
10. **M.E. Mechan-Llontop**, K. Hurley, L. Tian, V.A. Bernal-Galeano, H.K. Wildschutte, S.C. Marine, K.S. Yoder, and B.A. Vinatzer. 2020. Exploring rain as source of biological control agents for fire blight on apple. *Frontiers in Microbiology*. <https://doi.org/10.3389/fmicb.2020.00199>
11. **M.E. Mechan-Llontop**, P. Sharma, M. Aguilera-Flores, S. Yang, J. Pollock, L. Tian, C. Huang, L. Heath, S. Rideout, S. Li, and B.A. Vinatzer. 2019. Strain-level identification of bacterial tomato pathogens directly from metagenomic sequences. *Phytopathology*. <https://doi.org/10.1094/PHYTO-09-19-0351-R>
12. **M.E. Mechan-Llontop**, L. Tian, V. Bernal-Galeano, E. Reeves, M.A. Hansen, E. Bush, and B.A. Vinatzer. 2019. Assessing the potential of culture-independent 16S rRNA microbiome analysis in disease diagnostics: the example of *Dianthus gratianopolitanus* and *Robbsia andropogonis*. *European Journal of Plant Pathology*. <https://doi.org/10.1007/s10658-019-01850-8>
13. Y. Vasebi, **M.E. Mechan-Llontop**, R. Hanlon, D.G. Schmale III, R. Schnell, and B.A. Vinatzer. 2019. Comprehensive characterization of an aspen (*Populus tremuloides*) leaf litter sample that maintained ice nucleation activity for 48 years. *Biogeosciences*. <https://doi.org/10.5194/bg-16-1675-2019>
14. C.L. Monteil, R. Cai, H. Liu, **M.E. Mechan-Llontop**, S. Leman, D.J. Studholme, C.E. Morris, and B.A. Vinatzer. 2013. Nonagricultural reservoirs contribute to emergence and evolution of *Pseudomonas syringae* crop pathogens. *New Phytologist*. <https://doi.org/10.1111/nph.12316>

AWARDS

2022	Early Career Award. International Phytobiomes Conference – CO, USA
2022	2022 MTRAC AgBio Innovation Challenge the Principal Investigator’s Concept Paper \$5,000.00 (Exploration Award) .
2020	Keegstra Postdoctoral Fellowship of the Great Lakes Bioenergy Research Center
2019	Virginia Tech, Translational Plant Science - Travel award
2018	Virginia Tech, Graduate Research Development Program – (\$1000 Research award)
2018	21 st Penn State Plant Biology Symposium - Travel award
2016	XVII IS-Molecular Plant-Microbe Interaction-Travel award
2016	Virginia Tech, Translational Plant Science - Travel award
2016	Virginia Tech, Graduate Students Assembly -Travel award

INVENTION DISCLOSURES

1. A collection of putative plant-beneficial bacteria enriched and isolated from energy sorghum aerial root mucilage. Code: TEC2023-0077

2. A collection of putative plant-beneficial bacteria enriched and isolated from energy sorghum epicuticular wax. Code: TEC2023-0075
3. Two phyllosphere bacterial isolates from bioenergy sorghum (SORGH_AS_0189 and SORGH_AS_0191) with closest known relative *Pseudomonas koreensis* Ps 9-14. Code: TEC2022-0054

CONFERENCE AND MEETING PRESENTATIONS

Oral Presentations

1. **Mechan-Llontop M.E.**, Mullet J., and Shade A. Phyllosphere exudates select for distinct microbiome members in sorghum epicuticular wax and aerial root mucilage. International Phytobiomes Conference, Denver, CO, USA. September 13th-16th, 2022. Oral presentation. Session Name: Exploring Interactions Within Phytobiomes.
2. **Mechan-Llontop M.E.**, Mullet J., and Shade A. Stress-specialized phyllosphere exudates select for distinct microbiome members in sorghum epicuticular wax and aerial root mucilage. 11th International Symposium on Leaf Surface Microbiology, Davis, CA, USA. July 17th-21st, 2022. Oral presentation. Session name: Exciting 'New' Phyllosphere Habitats.
3. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2022. Stress-specialized phyllosphere exudates select for distinct microbiome members in sorghum epicuticular wax and aerial root mucilage. GLBRC Annual Science Meeting. May 18th, 2022. *Oral presentation*. Wisconsin.
4. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2022. The microbiome of sorghum phyllosphere mucilage and wax: A role for host resilience? Microbiology and Molecular Genetics Department - WiPS seminar. 21 February 2022. *Oral presentation*. Michigan State University.
5. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2021. The microbiome of sorghum phyllosphere mucilage and wax: a role for host resilience?. 2021 Ecological Society of America Annual meeting. August 5th, 2021.
6. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2021. Unraveling the link between the phyllosphere microbiome and sorghum resilience. 2021 GLBRC Annual Science Meeting. May 11th, 2021.
7. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2021. Investigating the Interplay between the Phyllosphere Microbiome, Epicuticular Wax, and Root Mucilage on Sorghum Resilience to Water and Nitrogen Limitation. Plant-Resilience Institute Brown Bag meeting. February 15th, 2021.
8. **Mechan-Llontop M.E.**, Mullet J., Shade A. 2020. Exploring the functional diversity of the sorghum phyllosphere microbiome. Virtual GLBRC sustainability meeting "Scaling-up Ecological Bioenergy Research". Plant-microbe-metabolite interactions session. October 6th, 2020.
9. **Mechan-Llontop M.E.**, Mullet J., Shade A. 2020. Investigating the interplay between the phyllosphere microbiome, epicuticular wax, and aerial root mucilage on sorghum resilience. Virtual GLBRC sustainability meeting "Scaling-up Ecological Bioenergy Research". Plenary session. October 5th, 2020.
10. **Mechan-Llontop M.E.**, Sharma P., Li S., Vinatzer B.A. 2019. Using the Oxford Nanopore Technologies MinION sequencer for rapid plant pathogen diagnosis. The American Phytopathological Society Potomac Division meeting. Rehoboth Beach, DE.
11. **Mechan-Llontop M.E.**, Tian L., Sharma P., Vinatzer B.A. 2019. The rain microbiome: A source of the plant leaf microbiome? Translational Plant Science Symposium. Virginia Tech, VA.
12. **Mechan-Llontop M.E.**, Sharma P., Pollock J., Rideout S., Li S., Vinatzer B.A. 2018. Using the Oxford Nanopore Technologies MinION sequencer for rapid bacterial tomato pathogen diagnosis. The Tomato Disease Workshop. Chincoteague Island, VA.
13. **Mechan-Llontop M.E.** and Vinatzer B.A. 2018. Control of Fire-blight on apple with locally isolated rain-borne bacteria. The American Phytopathological Society Potomac Division meeting. Ocean City, MD.

14. **Mechan Llontop, M.E.**; Tian, L.; Bernal-Galeano, V.; Reeves, E.; Hansen, M.A, Bush, E. and Vinatzer, B.A. (2018). An exploration of 16S rRNA next generation sequencing for plant disease diagnostics. Translational Plant Science Symposium. Virginia Tech, VA.
15. **Mechan-Llontop M.E.** and Vinatzer B.A. 2016. Investigating the role of rain as source of the tomato leaf microbiome. The American Phytopathological Society Potomac Division meeting. Richmond, VA.
16. **Mechan-Llontop M.E.**, Monteil C.L. and Vinatzer B.A. 2016. Two effector genes may reveal new insights in *Pseudomonas syringae* pathogenicity. Translational Plant Science Symposium. Virginia Tech, VA.

Poster Presentations

1. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2022. Stress-specialized phyllosphere exudates select for distinct microbiome members in sorghum epicuticular wax and aerial root mucilage. GLBRC Annual Science Meeting. 18 May 2022. *Poster*. Wisconsin.
2. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2022. Role of the Phyllosphere microbiome in Sorghum Resilience. Genomic Science Program-Annual PI Meeting. 18 February – 2 March 2022. *Virtual Poster*
3. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2022. Role of the Phyllosphere microbiome in Sorghum Resilience. Great Lakes Bioenergy Research Center Sustainability Meeting. 14-16 February 2022. *Virtual poster*
4. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2022. Role of the Phyllosphere microbiome in Sorghum Resilience. Department of Energy Annual Review of Great Lakes Bioenergy Research Center Year 4. 19-21 January 2022. *Virtual Poster*
5. **Mechan-Llontop M.E.**, Mullet J., and Shade A. 2021. Investigating the Interplay between the Phyllosphere Microbiome, Epicuticular Wax, and Root Mucilage on Sorghum Resilience to Water and Nitrogen Limitation. DOE 2021 Biological System Sciences Division Principal Investigator’s meetings. February 22nd, 2021.
6. **Mechan-Llontop M.E.**, Tian L., and Vinatzer B.A. 2018. The rain microbiome: A source of the plant leaf microbiome? Poster presented at the International Phytobiomes conference, Montpellier, France.
7. **Mechan-Llontop M.E.**, Tian L., and Vinatzer B.A. 2018. The rain microbiome: A source of the plant leaf microbiome? Poster presented at the 21st Penn State Biology Symposium: Wild & Tamed Phytobiomes, University Park, PA.
8. **Mechan-Llontop M.E.**, Tian L. and Vinatzer B.A. 2017. Investigating the role of rain as source of the tomato leaf microbiome. Translational Plant Science Symposium. Virginia Tech, VA.
9. **Mechan-Llontop M.E.**, Tian L., Failor K.C., Clarke C.R. and Vinatzer B.A. 2016. Investigating the role of rain as source of the tomato leaf microbiome. XVI IS-MPMI International congress. Portland, OR.
10. **Mechan-Llontop M.E.**, Clarke C.R., Monteil C.L., Haak D. and Vinatzer B.A. 2015. Genome-informed searches for new sources against the tomato pathogens *P. syringae* pv. tomato and *R. solanacearum* American Phytopathological Society annual meeting, Pasadena, CA.

TEACHING

Year	Course	Role
2018	PPWS2004- Mysterious mushrooms and molds	Teaching assistant
2016	PPWS4114- Microbial Forensics and Biosecurity	Teaching assistant

MENTORING

1. Maisie Smith. May 2022 - July 2022.
2022 GLBRC Summer Undergraduate Research Program (SURP). Screening of mucilage-associated bacteria for their potential on growth promotion of bioenergy Sorghum.

2. Max Kessler. January 2022 – April 2022.
PLUS-Phase I of the Biologie/Biochemie program (Heinrich-Heine-University Düsseldorf, Germany).
Plant-microorganism interactions for plant growth promotion and bacterial genomic sequencing and annotation.
3. Logan Heflin. May 2019 - July 2019.
2019 Summer Undergraduate Research Program (SURP) Virginia Tech.
4. Kelly Hurley. September 2016 – December 2017.
Virginia Tech Undergraduate Researcher.

SERVICE AND LEADERSHIP

Ad hoc manuscript reviews

Phytobiomes Journal
PeerJ

University service

2022	Virtual GLBRC Sustainability Meeting “Future Directions”. Organizer of the Plant-microbe interactions concurrent session.
2017-2018	President: Translational Plant Sciences - Graduate Student Organization
2016	Translational Plant Sciences - Discussion group coordinator.
2016	Treasurer: Translational Plant Sciences - Graduate Student Organization

Society service

2017 - 2019	Organizer of the Annual symposium in Science and Technology, Lambayeque, Peru
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