
Alex Muremi Fulano, B.Sc., M.Sc., Ph.D.

Curriculum Vitae

Personal Data

Title: Dr. Position: Lecturer Department: Agricultural Science and Technology (AST) Area of Specialization: Plant Pathology, Molecular Microbiology Contact Address: P.O. Box 43844 Nairobi 00100 Email: fulano.alex@ku.ac.ke	
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Professional Statement

As a researcher and lecturer specializing in Plant Pathology and Molecular Microbiology, I am deeply committed to advancing sustainable agricultural practices. My research explores the intricate interactions between plants and microbes, aiming to develop environmentally friendly solutions for pest and disease management. I am passionate about mentoring students and fostering collaborative research, which not only supports their growth but also contributes to addressing global agricultural challenges. I believe in the transformative power of science to promote innovative, sustainable practices in agriculture.

Important web links

Google Scholar: <https://scholar.google.com/citations?hl=en&user=IeWCYMQAAAAJ>

Sustainability: https://www.mdpi.com/journal/sustainability/special_issues/frontiers_sustainable_agricultural_crop_production

ORCID: <https://orcid.org/0000-0002-9703-1318>

Education

2023 Post Doctorate in Molecular Biology, University of Wyoming, United States

2020 Ph.D. Plant Pathology. Nanjing Agricultural University, China.

2016 M.Sc. Crop Protection. University of Nairobi, Kenya.

2014 B.Sc. Agriculture (Crop Protection Major), First Class Honors, University of Nairobi, Kenya.

Professional/Skill Enhancement Training Attended

2025: Good Financial Grant Practice, Virtual Academy Training Program, African Population and Health Research Center (APHRC)

2022: Grant Writing Training - John D. Robertson, Ph.D. Managing Member Grant Writers' Seminars & Workshops, University of Wyoming

2022: Non-degree seeking student, University of Wyoming, Course undertaken - Applied Scanning Electron Microscopy

2022: American Society of Microbiology Early Career Symposium

Pieces of Written Analysis

Postdoctoral Research Associate: Project: **Listeria-plant biofilms**. **Link**: Listeria-plant biofilms | National Agricultural Library (usda.gov)

Doctoral: Dissertation: **Functional insights into flagella biogenesis genes in a non-flagellated biocontrol bacterium, *Lysobacter enzymogenes* OH11.**

Link: <https://paper.njau.edu.cn/hotdoclist.action?pagenum=20&pager.offset=7900>

Master: Thesis: **Management of pests and diseases in snap beans by use of microbial antagonists and plant extracts.**

Link: <http://erepository.uonbi.ac.ke/handle/11295/98262#>

Bachelor: Special Project: **Assessment of seed quality using purity and germination tests for farm saved and market sourced seeds in Bungoma East Sub-county.**

Work Experience

Academic and research work

2025 (Current)- Lecturer, Department of Agricultural Sciences and Technology, School of Agriculture and Environmental Sciences, Kenyatta University Kenya.

2024 - Administrator and Project Manager, Kenya National Academy of Sciences (KNAS), Nairobi, Kenya.

Achievements: Successfully developed and submitted project proposals, securing a \$20,000 grant from IAP for a study on the impact of declining sugarcane and fish production on East African agricultural economies. Planned and coordinated the Transport Governance Symposium, effectively bringing together key industry stakeholders to discuss and address pressing transportation issues. Enhanced the visibility of the Kenya National Academy of Sciences (KNAS) by leading a complete redesign of the website, improving both design and content to better engage stakeholders and the public. Collaborated with management to strengthen existing partnerships and facilitate the execution of Memoranda of Understanding (MoUs), reinforcing the Academy's collaborative efforts and advised management on the infusion of essential skills and competencies within the secretariat, contributing to an overall improvement in operational efficiency and effectiveness.

2021 - Current Assistant Guest Editor, Journal: Sustainability, Special Issue: Frontiers in Sustainable Agricultural Crop Production, MDPI.

Achievements: Extensively curated impactful research, elevated visibility for self and collaborators, established robust networks, gained valuable experience, made substantial scholarly contributions, received recognition for scholarly work, championed open access initiatives, and fostered interdisciplinary collaboration after having 13 articles published so far.

2021 - 2023, Postdoctoral Research Associate. Involved in research and teaching (Molecular Microbiology and Host-Microbe Interactions) Department of Molecular Biology, University of Wyoming, Laramie, WY, United States of America.

Achievements: Developed a *Listeria*-plant biofilm model that involves incubation of the wood coupons or pieces of fresh fruits and vegetables to mimic contamination. We identified plant-based compounds that can inhibit biofilm formation by *Listeria monocytogenes*, a major food-borne pathogen (**See publications and applied patent**). Further developed a C-diGMP reporter and gene expression reporter for downstream studies.

Mentoring undergraduate and graduate students in research projects related to molecular microbiology.

2020 - 2021 and 2015 - 2017 Part-time Lecturer units of Microbiology; Weed Science; Weed Science and Management; Environmental Management and Protection, Department of Plant Science and Crop Protection, University of Nairobi, Nairobi, Kenya. Instructor units Introduction to Microbiology; Basics of Research Methods and Communication for Diploma in Crop Protection, University of Nairobi.

Achievements: Taught, examined, and graded diploma, undergraduate and postgraduate students who attended classes both online and classroom; created innovative teaching materials such

as interactive online modules and took them through laboratory practicals; supervised diploma and undergraduate research project in weed science.

2021 Part-time Lecturer unit of Plant-Pathogen Interactions; Principles of Crop Improvement; Crop Pests and Diseases, School of Agriculture and Environmental Sciences, Kenyatta University, Nairobi, Kenya.

Achievements: Taught, examined and graded both undergraduate and postgraduate students. Created lecture notes tailored to crop Pests and Diseases unit for M.Sc. Dryland Agriculture. Improved lecture manuals for Plant-Pathogen Interactions; Principles of Crop Improvement;

2016 - 2017 Research Associate, bioprospecting of microbial and botanicals in management of pests and diseases. Research project at Kenyatta University, Kenya.

Achievements: Guided 7 students to develop their research proposals and protocols for extensive fieldwork, laboratory analysis, and bioassays to evaluate the efficacy of these organisms against specific crop pests and pathogens. I approved their preliminary assays as I transitioned to Ph.D studies. For eight months I prepared technical progress reports required by the funder. Three of them acknowledged me in their thesis.

Consultancy experience

2025 - Project and Editorial Service Provision on Honorarium terms, Kenya National Academy of Sciences

2024 - Environmental stewardship and sustainability consultancy: Developing Environmental, Health and Safety Policy and Self Environmental Audit, National Research Fund (NRF).

2014 - 2017 Consultant Pesticide Efficacy Trials, Upper Kabete Campus Pesticide Efficacy Unit, University of Nairobi, VickAgriCare, Kikuyu Town, Kenya.

Awards and Certificates of Excellence

2023 The Rocky Mountain Branch of the ASM award, Postdoctoral Fellow Poster Presentation, Third Position, University of Colorado Anschutz Medical Campus, Denver, Colorado, USA.

2022 The Rocky Mountain Branch of the ASM award, Postdoctoral Fellow Talk Presentation, First Position, University of Wyoming, Laramie, USA.

2020 Certificate of Honour for being excellent in both studies and behaviour, second semester (Nanjing Agricultural University)

2014 Awarded M.Sc. Scholarship by the University of Nairobi, Kenya.

Research Interests

Molecular Mechanisms of Pathogen Interaction; Microbiome Interactions; Food Safety; Phytosanitary; Integrated Disease Management

Publications

A) Patent

Gomelsky, M. Elbakush, A. and **Fulano, A.M** (2024). Materials and methods for inhibiting, preventing, and dispersing biofilms, United States, University of Wyoming, 20240390249

<https://www.freepatentsonline.com/y2024/0390249.html>

B) Papers in scientific peer reviewed journals

1. Yang, L., Jia, S., Sun, S. Wang, L., Zhao, B., Zhang, M., Yin, Y., Yang, M., **Fulano, A.M.**, Shen, X., Pan, J., and Wang, Y. (2024). A pyocin-like T6SS effector mediates bacterial competition in *Yersinia pseudotuberculosis*. *Microbiology Spectrum*. e0427823. doi: 10.1128/spectrum.04278-23
2. Muthomi, J., Mbugua, B., Wagacha, M., and **Fulano, A.** (2024). Management of bean root rots by intercropping and legume diversification. *SVU-International Journal of Agricultural Sciences*, 6(1), 155-167. doi: 10.21608/svuijas.2024.258635.1329
3. Zhang, M., Yang, M., Zhang, X., Li, S., Wang, **Fulano, A.M.**, Meng, Y., Shen, X., Huang, L., and Wang, Y., (2024). Two-component signaling system RegAB represses *Pseudomonas syringae* pv. actinidiae T3SS by directly binding to the promoter of *brpRS*. *Journal of Integrative Agriculture*.<https://doi.org/10.1016/j.jia.2024.09.028>
4. Elbakush, A.M., **Fulano, A.M.**, Gomelsky M. (2023). Lignan-containing maple products inhibit *Listeria monocytogenes* biofilms on fresh produce. *Frontiers in Microbiology*, Sec. Food Microbiology. doi.org/10.3389/fmicb.2023.1258394
5. **Fulano A.M.**, Elbakush A.M, Chen, L-H. and Gomelsky, M. (2023). The *Listeria monocytogenes* exopolysaccharide significantly enhances colonization and survival on fresh produce. *Frontiers in Microbiology*, Sec. Food Microbiology. 14:1126940. doi: 10.3389/fmicb.2023.1126940
6. Lengai, G.M.W., **Fulano, A.M.**, and Muthomi, J.W. (2022). Improving access to export market for fresh vegetables through reduction of phytosanitary and pesticide residue constraints. *Sustainability*, 14, 8183. <https://doi.org/10.3390/su14138183>
7. **Fulano, A.M.**, Lengai, G.M.W., and Muthomi, J.W. (2021). Phytosanitary and technical quality challenges in export fresh vegetables and strategies to compliance with market requirements: case of smallholder snap beans in Kenya. *Sustainability*, 2021, 13, 1546. <https://doi.org/10.3390/su13031546>

8. **Fulano, A.M.**, Shen, D., Zhang, E., Shen, X., Chou, S., Minamino, T., Puopolo, G., and Qian, G. (2020). Functional divergence of flagellar type three system: a case study in a non-flagellated, predatory bacterium. *Computational and Structural Biotechnology Journal*, 18 3368–3376. <https://doi.org/10.1016/j.csbj.2020.10.029>
9. **Fulano, A.M.**, Shen, D., Kinoshita, M., Chou, S., and Qian, G. (2020). The homologous components of flagellar type III protein apparatus acquired a novel function to control twitching motility in a non-flagellated biocontrol bacterium. *Biomolecules*, (5): E733. <https://doi.org/10.3390/biom1005073310>
10. Han, S., Yang, M., **Fulano, A.M.**, Lin, L., Chou, S., and Qian, G. (2020). Coordination of cyclic di-GMP and 4-hydroxybenzoic acid in regulating antifungal antibiotic biosynthesis in *Lysobacter enzymogenes*. *Phytopathology Research*, 2 (11). <https://doi.org/10.1186/s42483-020-00053-y>
11. Lin, L., Zhou, M., Shen, D. Han, S., **Fulano, A.M.**, Chou, S., and Qian, G. (2020). A nonflagellated biocontrol bacterium employs a PilZ-PilB complex to provoke twitching motility associated with its predation behavior. *Phytopathology Research*, 2(12). <https://doi.org/10.1186/s42483-020-00054-x>
12. Muthomi J.W., **Fulano, A.M.**, Wagacha J.M., and Mwang'ombe A.W. (2017). Management of snap bean insect pests and diseases by use of antagonistic fungi and plant extracts. *Sustainable Agriculture Research*, 6(3). ISSN 1927-050X E-ISSN 1927- 0518 Published by Canadian Center of Science and Education
13. **Fulano, A.M.**, Muthomi, J.W., Wagacha J.M., and Mwang'ombe A.W. 2016. Antifungal activity of local microbial isolates against snap bean pathogens. *International Journal of Current Microbiology and Applied Science*, 5 (12): 112-122. doi: <http://dx.doi.org/10.20546/ijcmas.2016.512.013>
14. **Fulano, A.M.**, Muthomi J.W, Wagacha J.M, Mwang'ombe A.W, (2016). Use of antagonistic microbials and plant extracts to manage diseases in snap beans. *Special Edition for Nairobi Innovation Week*. Partnerships for Innovations that Truly Impact People and Society.
15. Muthomi J.W., Lengai G.M.W., **Fulano, A.M.**, Wagacha J.M., Narla R.D., and Mwang'ombe, A.W. (2016). Biopesticide-based IPM systems to reduce synthetic pesticide residues in vegetables for niche market access by small holder growers. In: 5th Biennial RUFORUM Conference. Cape Town, South Africa.
16. **Fulano, A.M.**, Muthomi J.W., Wagacha J.M., Mwang'ombe A.W. Efficacy of antagonistic fungal isolates in management of diseases in snap beans. In: 5th Biennial RUFORUM Conference. Cape Town, South Africa; 2016.

C) Selected publications in peer review conference proceedings

- 1) **Fulano, A.M.**, Elbakush, A.M., and Gomelsky, M. (2022). The unknown *Listeria*-plant biofilms. ASM Conference on Biofilms, Charlotte, NC, USA.
- 2) Elbakush, A.M., **Fulano A.M.**, and Gomelsky, M. (2022). Natural inhibitors of listerial exopolysaccharide biofilms. ASM Conference on Biofilms, Charlotte, NC, USA.
- 3) **Fulano, A.M.**, Muthomi, J.W., Wagacha, J.M., and Mwang'ombe A.W. (2016) efficacy of seed dressers and botanicals in management of French bean pests. Third international research Conference. Chuka University, Kenya
- 4) **Fulano, A.M.**, Muthomi, J.W., Wagacha, J.M., and Mwang'ombe A.W. (2016). Enhancing competitiveness of French beans in the export market by overcoming phytosanitary and quality challenges. International Phytosanitary Conference, 2016, Kenya.
- 5) **Fulano, A.M.**, Muthomi, J.W., Wagacha, J.M., and Mwang'ombe A.W. (2016). Efficacy of antagonistic fungal isolates in management of diseases in snap beans. The Fifth African Higher Education Week and RUFORUM Biennial Conference, Cape Town, South Africa.

Professional Society Membership and Linkage

- American Society for Microbiology
- U.S. Exchange Alumni

Referees

- I. Prof. James W. Muthomi, Department of Plant Science and Crop Protection, University of Nairobi, Nairobi 0100 GPO (Kenya). james.muthomi@uonbi.ac.ke;
- II. Prof. Department of Molecular Biology, University of Wyoming, Laramie, WY(USA). gomelsky@uwyo.edu;
- III. Prof. Dickson Andala, National Research Fund, P.O. Box 26036-00100, Nairobi, Kenya. Prof. Ratemo W. Michieka, Kenya National Academy of Sciences, 4618-00100, Nairobi-Kenya;
- IV. Prof. Guoliang Qian, College of Plant Protection (Laboratory of Plant Immunity, Key Laboratory of Integrated Management of Crop Diseases and Pests), Nanjing Agricultural University, Nanjing 210095, P.R. China. Email: glqian@njau.edu.cn
- V. Prof. Joseph Gweyi, Department of Agricultural Sciences and Technology, Kenyatta University, gweyi.joseph@ku.ac.ke;