

Mamatha Hanumappa, Ph.D.

Project Specialist, Specialty and Ethnic Crops
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Executive Summary

- Skilled Ph.D. professional with diverse work experience in agroecology, agricultural and environmental sciences, bioinformatics, climate change adaptation, data science, functional genomics, natural resource management, plant biotechnology and urban agriculture.
- Multi-sectoral experience in research, education and community outreach.
 - Managing over \$1.25 million in research and outreach funds.
 - Research: Conducting research to promote climate resilient crops; collaborating on food-energy-water nexus as sustainable practice for urban agriculture; collaborating in geospatial analysis of urban agriculture potential in DC.
 - Teaching: Teach graduate level courses in agroecology and climate change, and conduct free certificate courses in related topics for community members to aid workforce development.
 - Outreach: State Coordinator of 2 U.S. Department of Agriculture grant programs.
 - Coordinator of Professional Science Masters' Program in CAUSES-UDC.
- International working experience in India, USA, Japan and S Korea.
- Prepared two well-received reports as consultant for The World Bank:
 - "Toward integrated disaster risk management in Vietnam: recommendations based on the drought and saltwater intrusion crisis and the case for investing in longer-term resilience" (Published in English and Vietnamese, 2017).
 - "Improving Agricultural Productivity and Farmers' Income in Northern Kazakhstan; Lessons from Agricultural Development in Canadian Prairies" (to aid stakeholder discussions, 2017).
- Worked in top ranked universities and institutions, including RIKEN (Japan) and Carnegie Institution for Science (U.S.).
 - Authored several high-impact journal publications; one article accessed over 7,600 times (on WikiPathways for plants, published in the journal Rice in 2013).
 - Curated and created protein interaction pathway in seed development in rice (hosted on WikiPathways in 2012, accessed over 38,000 times).
 - Authored book chapter on genetic improvement of heat tolerance in plants (2009).
 - Primary contributor on patented invention to genetically modify flower color (2006).
- Invited to present joint keynote address at Agri India [Meet 8 - Agri Hackathon](#), organized by the Government of India. 5-March-2021. Topic: Future of Food: Challenges and Opportunities.

Professional Experience

08/2018 – current Project Specialist, Specialty and Ethnic Crops, University of the District of Columbia (UDC), Washington, DC.

My position integrates my interest in agroecology and climate smart agriculture with UDC's focus on urban agriculture and urban sustainability with overarching goals of improving food security and mitigating climate change, and the DC government's goals of increasing green-economy jobs and small

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businesses, and bringing locally-grown and nutritious food to DC residents. The aim is to sustainably increase [specialty crop](#) production, productivity and farmers' income, with overall objectives of improving nutrition security and adapting to a changing climate. In this role, I coordinate research, teaching, cooperative extension/community outreach.

- Principal Investigator on research project to promote climate resilient crops for urban agriculture, funded by National Institute for Food and Agriculture.
Title of project: Evaluation of Cultural Practices for Two New Ethnic Crops, *Chenopodium album* L. and *Basella alba* L.
- Co-Principal Investigator on research project to promote sustainable production practices for urban agriculture, funded by National Institute for Food and Agriculture.
Title of project: Food-Energy-Water (FEW) Nexus: Using Rainwater Harvesting and Solar Energy for Next Generation Urban Farming Practices
- Teach graduate level course in agroecology and climate change, and conduct free certificate courses in related topics for community members to aid workforce development.
- Coordinator and Principal Investigator of two U.S. Department of Agriculture grant programs in Washington, DC.
 - Managing over \$1.25 million in grant funds since 10/2018.
 - Specialty Crop Block Grant Program-Farm Bill ([SCBGP](#)-FB): Administered by the USDA with the objective of enhancing competitiveness of specialty crops. I oversee the administration and management of the grant in DC. Funded projects relate to urban food production and marketing, community supported agriculture, developing school gardens for food and education, and climate change adaptation.
 - Sustainable Agriculture Research and Education program ([NESARE](#)): The goal of this project was to align Northeast SARE's mission of outcome-focused professional development (PD) projects on needs- and interest-based topics with UDC's focus on urban agriculture and urban sustainability to improve the quality of life and economic opportunity of DC communities. The objective was to train DC residents in sustainable urban farming including business management. I completed my term as coordinator on 30-Sep-2020.

11/2016 – 04/2018 Consultant, The World Bank, Washington, DC.

- Prepared a comprehensive report on Integrated disaster risk management in Vietnam (East Asia and Pacific) and a technical note on Agriculture in Kazakhstan (Europe and Central Asia).

07/2015 – 03/2016 Scientific Data Curator, Rancho BioSciences, San Diego, California.

- Human genome variation analysis; creation of knowledge base for human microbiome.

12/2014 – 07/2015 Seed Technologist, Turf Tech, Corvallis, Oregon.

- Seed quality testing and certification per USDA guidelines.

11/2012 – 01/2014 Science Writer and Data Curator, Illumina-NextBio, Santa Clara, California.

- Curate human disease related genome-wide association data from published literature.

10/2009 – 09/2012 Senior Research Associate, Oregon State University, Corvallis, OR.

- Study plant developmental phenomenon like photomorphogenesis and seed development in rice and other cereals; Conduct experiments on salt tolerance in rice to study gene expression patterns. Guided several undergraduate students in work-study program. Yielded 2 highly accessed research publications.

09/2005 – 10/2009 Research Fellow, University of Missouri, Columbia, MO.

- Soybean Genomics: develop drought, heat and cold tolerant varieties through

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genetic engineering; guide undergraduate student interns. Yielded one article in high-impact journal.

- 05/2004 – 09/2005** NIH Research Fellow, Carnegie Institution for Science, Stanford, CA.
- Study the genetic mechanisms underlying meristem development and leaf polarity and position establishment in plants.
- 03/2003 – 03/2004** Research Associate, Colorado State University, Fort Collins, CO.
- Study the interaction of pre-mRNA splicing factors in plants. These splicing factors are genes and proteins that ensure proper gene transcription.
- 08/2000 – 10/2002** Research Fellow, Kumho Life and Environmental Sciences, Kwangju, Korea
- Metabolic engineering of anthocyanin pathway to modulate flower color in petunia. The novel method used to rationally modulate flower color yielded a technically sound article and an international patent.
- 02/1998 – 10/1999** Post-doctoral Researcher, RIKEN, Wako, Saitama, Japan.
- Genetic analysis of the tomato B1 and B2 phytochromes for differences and similarities in their gene structure and function to understand how they regulate growth, development and reproduction in response to light quality, daylength and seasons.
- 01/1993 – 12/1997** Graduate Teaching and Research Assistant, University of Maryland College Park, MD, USA.
- Independently taught several undergraduate and graduate level courses in horticulture, plant propagation and landscape architecture.
- 02/1991 – 05/1992** Agricultural Extension Officer, Karnataka State Department of Agriculture, Bangalore, India.
- Worked in project funded by the Danish International Development Agency (DANIDA), focused on agricultural technology transfer and information dissemination on good agricultural practices to farmers, specifically women farmers.

Academic Qualification

- Ph.D. – University of Maryland, College Park, MD, USA
*Phytochrome characterization of a photoperiod insensitive mutant in barley, *Hordeum vulgare* L.*
- MS (Horticulture) – University of Agricultural Sciences, Bangalore, India
*Studies on the problem of fruit set and its improvement in *Gloriosa superba* L.*
- BS (Horticulture) – University of Agricultural Sciences, Bangalore, India

Academic Honors

- Fulbright Global Scholar Award to Kazakhstan, 2021-2022
- Selected by Indian Agricultural Scientists' Recruitment Board (post-MS). National Ranking: 8
- Selected for the position of Horticulturist by Indian Railways (post-MS). National Ranking: 1
- Qualified in Govt. of India National Eligibility Test for the post of Assistant Professor (post-MS).
- ICAR Competitive Fellowship (MS Horticulture). National Ranking: 2
- ICAR Merit Scholarship (BS Horticulture).

Professional Development

- **IT Skills:** Certified in online teaching (Blackboard/Kaltura), SAP HANA, C, C++ , Java, Visual Basic, Geographic Information System.

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- **Workshops Completed:** Professional Food Manager (UDC).
Bioinformatics (J Craig Venter Institute, MD, USA).
Professional Food Manager Course, UDC
Bioinformatics workshop: Oregon State University
Bioinformatics workshop: J Craig Venter Institute, Rockville, MD
- **Others:**
 - Served on and chaired search/interview committees to recruit staff, project specialists and farm personnel.
 - Peer-reviewed journal manuscripts.
 - Provided technical guidance to work-study interns, technicians and graduate students.
 - Edited needs assessment report on typhoon Damrey damage in Vietnam, The World Bank.
 - Provided consultancy service to human genomics companies in scientific data curation.
 - More than 35 poster and oral presentations at domestic and international conferences in plant biology and agricultural sciences.
 - Invited lectures on abiotic stress biology. Bangalore University, Bangalore, India (2013, 2014).

Invited Speaker

- 2021 Science Talk, Caravan of Knowledge, Kazakhstan. Topic: STEM in Agriculture. 21-Oct-2021.
- 2021 Guest lecture in ENST100- International Crop Production: Its Issues and Challenges in the 21st Century. University of Maryland at College Park. 8-April-2021.
- 2021 Agri-India Meet, March 5, 2021. Organizer: Indian Council of Agricultural Research, Ministry of Agriculture, Government of India. Topic: Future of Food: Challenges and Opportunities for Youth.
- 2021 International Virtual Conference on Advances in Agricultural and Food Sciences, Jan 16-20, 2021. Organizers: Sharda University, India and Murdoch University, Australia. Topic: Future of Food: Challenges and Opportunities.
- 2014 Oxford College, Bangalore University, Bangalore, India
- 2013 Vijaya College, Bangalore University, Bangalore, India

Service to the Community

- Knowledge Development at Upgrademe, Inc., Santa Clara, California
 - Volunteered in a project to create plant and animal biology study material and question banks for high school students.
- Volunteer at DeafLEAD, a non-profit crisis intervention agency in Columbia, Missouri.
- Friendly visitor at an Assisted Living Home in Palo Alto, California.

Peer Reviewed Publications

1. Posadas, BB, Hanumappa M, Niewolny K, Gilbert JE (2021) Design and Evaluation of Crowdsourcing Agriculture Mobile Application for Lambsquarters, Mission LQ. *Agronomy*. 11(10):1951.
2. Taylor, JR, Hanumappa M, Miller L, Shane B, Richardson ML (2021) Facilitating Multifunctional Green Infrastructure Planning in Washington, DC through a Tableau Interface. *Sustainability*. 13(15):8390.
3. Posadas, BB., Hanumappa, M., and Gilbert, JE. 2020. Early Development and Design of Crowdsourcing Agriculture Mobile Application for Lambsquarters. [CLEI Electronic Journal](#). 23(2): 1-18.
4. Posadas, BB., Hanumappa, M., and Gilbert, JE. 2019. Opinions concerning crowdsourcing applications in agriculture in D.C. [CLHC '19: Proceedings of the IX Latin American Conference on Human Computer Interaction](#) September 2019 Article No.: 3; 1–4.
5. Baca, AC., Dzung HN., Srivastava, JP., Hanumappa, M., Wilderspin, IF., Chinh, NC., Kerblat,

- Y., and Brendan MHC. 2017. Toward integrated disaster risk management in Vietnam: recommendations based on the drought and saltwater intrusion crisis and the case for investing in longer-term resilience. Washington, D.C.: World Bank Group.
<http://documents.worldbank.org/curated/en/206661510254884285>
6. *Fox, SE., *Geniza, M., *Hanumappa. M., Naithani, S., Sullivan, C., Preece, J., Tiwari, VK., Elser, J., Leonard, JM., Sage, A., Gresham, C., Kerhornou, A., Bolser, D., McCarthy, F., Kersey, P., Lazo, GR., and Jaiswal, P. 2014. De Novo Transcriptome Assembly and Analyses of Gene Expression during Photomorphogenesis in Diploid Wheat *Triticum monococcum*. [PLOS ONE](#) 9(5): e96855 (*equal contribution).
 7. Hanumappa, M., Preece, J., Nemeth, D., Elser, J., Bono, G., Wu, K., and Jaiswal, P. 2013. WikiPathways for plants: a community pathway curation portal and a case study in rice and arabidopsis seed development networks. [Rice](#) 6(1):14. 1040.
 8. *Srivastava, GP., *Hanumappa, M., Kushwaha, G., Nguyen HT., and Xu, D. 2011. Homolog-specific PCR primer design for profiling splice variants. [Nucleic Acids Research](#) 39(10); e69 (*equal contribution).
 9. Ali, GS., Prasad, KVSK., Hanumappa, M and Reddy, ASN. 2008. Analyses of in vivo interaction of two spliceosomal proteins using FRAP and BiFC. [PLOS ONE](#) 3(4): e1953.
 10. Hanumappa, M., Choi, G., Ryu, S., and Choi, G. 2007. Modulation of flower color by rationally designed dominant-negative chalcone synthase. [Journal of Experimental Botany](#) 58(10); 2471-78.
 11. Husaineid, SSH., Kok, RA., Schreuder, MEL., Hanumappa, M., Cordonnier-Pratt, M-M., Pratt, LH., van der Plas, LHW., and van der Krol, AR. 2007. Overexpression of homologous phytochrome genes in tomato: exploring the limits in photoperception. [Journal of Experimental Botany](#) 58(3); 615-626.
 12. Hanumappa, M., Pratt, LH., Cordonnier-Pratt, M-M., and Deitzer, GF. 1999. A photoperiod insensitive barley line contains a light-labile phytochrome B. [Plant Physiology](#) 119(3); 1033-1040.
 13. Mamatha, H., Farooqi, AA., and Joshi, SS. 1992. Studies on floral biology in *Gloriosa superba* L. *Crop Research* 5(1); 85-89.
 14. Mamatha, H., Farooqi, AA., Joshi, SS., and Prasad, TG. 1992. Pollen studies in *Gloriosa superba* L. *Crop Research* 5(1); 92-97.
 15. Mamatha, H., Farooqi, AA., and Prasad, TG. 1992. Influence of source size on vegetative and reproductive growth of *Gloriosa superba* L. *Crop Research* 5(2); 260-265.

Book Chapter

Hanumappa, M., and Nguyen, HT. 2009. "Genetic Approaches toward Improving Heat Tolerance in Plants". In *Genes for Plant Abiotic Stress*. Ed: Jenks MA and Wood AJ. [Wiley-Blackwell](#). Ames, Iowa, USA. pp 221-260.

Patent

Genetic sequences encoding dominant-negative chalcone synthase and uses therefore

Inventors: Mamatha Hanumappa, Goh Choi and Giltso Choi.

Assignee: Korea Kumho Petrochemical Co Ltd. ([US Patent # 7049427](#); granted May 23, 2006); KR20020087927 (Korea); EP1394248 (Europe); JP2004065209 (Japan).

Non- refereed Publications

1. Shanna White and Mamatha Hanumappa. 2021. The sleeping seed: An overview of dormancy and treatments for optimal seed germination. Fact sheet 013.
2. Mamatha Hanumappa and Richard Boateng. 2020. Easy and Healthy Recipes with Malabar spinach. University of the District of Columbia, Washington, DC. Fact Sheet 010.
3. Mamatha Hanumappa and Richard Boateng. 2020. Easy and Healthy Recipes with Lambsquarters. University of the District of Columbia, Washington, DC. Fact Sheet 011

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4. Mamatha Hanumappa. 2019. Malabar spinach (*Basella alba*) is a Nutritious and Ornamental Plant. University of the District of Columbia, Washington, D.C. Fact Sheet 004.
5. Mamatha Hanumappa. 2019. Lambsquarters (*Chenopodium album*) is a Nutrient-Packed Edible Weed. University of the District of Columbia, Washington, D.C. Fact Sheet 005.
6. Mamatha Hanumappa. 2019. Sometimes, the farmers at the Van Ness farmers market are UDC researchers. [Forest Hill Connection](#) (local online magazine), 26-July-2019.
7. Mamatha Hanumappa and Jitendra P Srivastava. 2017. "Improving Agricultural Productivity and Farmers' Income in Northern Kazakhstan; Lessons from Agricultural Development in Canadian Prairies." Technical Note prepared for Agriculture Global Practice, The World Bank. May 2017.
8. Mamatha Hanumappa. 2013. Flowering time in *Arabidopsis* and *Oryza sativa*. Mar-2013. <http://www.wikipathways.org/index.php/Pathway:WP2312> and 2178.
9. Mamatha Hanumappa. 2012. Seed Development in *Oryza sativa*. 27-Aug-2012. <http://www.wikipathways.org/index.php/Pathway:WP2199>.
10. Preece, J., Hanumappa, M., and Jaiswal, P. 2012. Pathway GeneSWAPPER. V0.3. Jan-2012. <http://jaiswallab.cgrb.oregonstate.edu/software/PGS>.