Axel O. Ramirez-madera

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**EDUCATION**

University of Wisconsin–Madison

2011-16: Ph.D. in Plant Breeding and Plant Genetics

Minor in Plant Pathology

Dissertation: *“Spontaneous polyploidization, different haplotypes at the zym locus and reactions to zucchini yellow mosaic virus in cucumber (Cucumis sativus)”*

Major Advisor: Dr. Michael J. Havey

University of Puerto Rico–Mayagüez

2006-09: M.S. in Agronomy

Thesis: *“Response of common bean (Phaseolus vulgaris) to Rhizobium inoculation and nitrogen fertilization*”

Major Advisor: Dr. James S. Beaver

University of Puerto Rico–Mayagüez

2002-06: B.S. in Agronomy

**EMPLOYMENT**

***Pest Control and Irrigation Project Manager*** *(Dow AgroSciences R&D in Santa Isabel, Puerto Rico, Sep 2009-Sep 2011)*

Project Management areas:

1. Control of weeds, pest diseases and insects in soybean, maize and sunflower of 150-ha of field plots
2. Plan irrigation and fertigation itineraries for soybean, maize, sunflower, and cowpea cover crop
3. Collaborate with other project leaders such as plant breeders, field biologists, technicians, as well as farm and station managers
4. Manage a group of 3 technicians and 50 employees ages ranging from 18-50 years old to implement the agricultural practices
5. Accomplishments:
   1. Decrease the amount of sprayed pesticides from 5-7 weekly to 2-3 a week
   2. Switch from applying pesticide of harsh chemistry (such as Organophosphate and Carbamate) to more environmentally sound treatments such as the fungus *Beauveria bassiana*, soap and oils that were effective against white flies, thrips, aphids, and other pest insects. After reducing pesticides and incorporating biological practices there was a measurable reduction of pests and an emergence of populations of beneficial predatory insects (lady bugs, green lacewings, among others) and pollinators (bees)
   3. Protect the soil from erosion by incorporating cowpea as cover crop during the fallow period and before planting corn, which resulted in applying less nitrogen fertilizer, improving soil N and organic matter contents
   4. Establish crop rotations between corn and soybean every year, which contributed to a more sustainable agricultural system

**Research**

***Post-Doctoral Fellow*** *(UW-Madison, Wisconsin, May 2016-present)*

Research Areas:

1. Genome-wide association studies (GWAS) in cucumber
   1. Recreate the cucumber collection and represent diversity by using high-throughput genomic information (genotyping by sequencing [GBS] and Re-sequencing) and large scale and historical phenotypic data of traits for plant ontology (all traits throughout development), particularly disease resistance, adaptability to environmental stresses such as drought, cold and heat, fruit quality and yield, among many others
   2. Define market classes and geographical distribution of cucumber by using Structure software and cluster analysis in R statistical package, as well as to explain evolution and domestication
2. Quantitative trait loci (QTL) mapping of fruit growth rate in cucumber
   1. Understand the functionality and genetic basis responsible for how fast a cucumber fruit can grow, a trait that is highly important for cucumber industry
   2. Identify candidate genes, propose a genetic model for the physiological mechanism and ultimately provide molecular tools for cucumber breeders that can be utilized in their programs for hybrid development with the potential of higher yields and less irrigation

***Ph.D.*** *(UW-Madison, Wisconsin, Sep 2011-May 2016)*

Research Areas:

1. Analyses of the undesirable trait spontaneous polyploidy in cucumber
   1. Identify associated genetic and environmental factors by studying recombinant inbred lines (RILs) of cucumber produced across different environments, ploidies of field and greenhouse-grown plants at leaf stages were determined using flow cytometry
   2. Accomplishments:
      1. Provide evidence of endoreduplication and polysomaty in cucumber, and that it is an ongoing and dynamic process
   3. Recommend that cucumber farmers and breeders rogue plants based on relative height and leaf serration to remove possible polyploids
2. Fine-mapping of zucchini yellow mosaic virus (ZYMV) resistance gene in cucumber
   1. Develop cucumber recombinant inbred lines (RILs) segregating for ZYMV resistance for narrowing the zym locus by genotyping using SSR markers and polyacrylamide gel electrophoresis (PAGE)
3. Different haplotypes at the candidate gene for ZYMV resistance
   1. Sequence the ZYMV resistance gene from three independent sources of resistance of cucumber germplasms by using PCR sequencing and SnapGene software
   2. Accomplishments:
      1. Find haplotypes for this candidate gene, which resulted in the same amino acid variant
      2. Document that independently identified and introgressed sources of ZYMV resistance in cucumber possess the same genetic basis and undesirable genetic uniformity exists in cucumber for potyvirus resistance that could potentially be overcome by the viruses

***M.S. Research*** *(UPR-Mayagüez, Puerto Rico, Aug 2006-May 2009)*

Research areas:

1. Evaluation of common bean germplasm and its adaptation to low nitrogen fertilization and *Rhizobium* inoculation

***B.S. Research*** *(UW-Madison, Summer 2005 and UPR-Mayagüez, Aug 2004-May 2005)*

Research areas:

1. “Subcellular localization of the SUNN protein in *Medicago truncatula*”, Principal Investigator: Dr. Jean-Michel Ané (UW)
2. “Dairy compost application and its effect on growth of *Zoysia* turfgrass”, Principal Investigator: Dr. Elide Valencia (UPR)

**publications and scientific presentations**

**Main Publications**

* **Ramírez-Madera, A.O.** and Havey, M.J. 2017. Different Haplotypes Encode the Same Protein for Independent Sources of ZYMV Resistance in Cucumber. HortScience (*accepted*)
* **Ramírez-Madera, A.O.**, Miller, N.D., Spalding, E.P., Weng, Y., and Havey, M.J. 2017. Spontaneous polyploidization in cucumber. Theoretical and Applied Genetics 130:1481–1490. doi:10.1007/s00122-017-2903-7
* Belay, D.K., Huckaba, R.M., **Ramirez, A.**, Rodrigues, J.C.V., and Foster, J.E. 2012. Insecticidal control of *Bemisia tabaci* (Hemiptera: *Aleyrodidae*) transmitting Carlavirus on soybeans and detection of the virus in alternate hosts. Crop Protection 35, 53-57
* Dorcinvil, R., **Ramirez, A.**, Sotomayor, D., and Beaver, J.S. 2009. Performance of dry bean lines in a low N soil in Puerto Rico. Annual Report of the Bean Improvement Cooperative. Vol. 52, 124-125

**Main Oral Presentations**

* “Efectos ambientales en la producción de semilla sobre la tetraploidía espontánea en pepino (*Cucumis sativus* L.)” presented at the LX Annual Meeting of the “Programa Cooperativo Centroamericano para el Mejoramiento de Cultivos y Animales” (PCCMCA initials in Spanish) and published an Abstract in the Memoirs in Guatemala City, Guatemala (May 4-7, 2015).
* “UW-Madison Plant Breeding & Plant Genetics Program” presented to the laboratory of Dr. Jinfeng Chen Lab, Nanjing Agricultural University, China (May 19, 2014).

**TEACHING**

**Biometry and Statistics**

* Teach discussion session for the graduate-level course Applications in ANOVA (Agro 772), Instructor: Dr. Michael Casler, UW-Madison (Spring 2015)
* Teach laboratory and discussion sessions for the graduate-level course Biometry (AGRO 5005), Advanced Biometry (AGRO 6600), and Mentor of the Biometry Laboratory, Instructor: Dr. Raúl Machiavelli, UPR-Mayagüez (2007-09)

**Plant Physiology**

* Lead laboratory and discussion sessions on Physiological Principles of Crop Production (CFIT 4005) for undergraduate students, Instructor: Dr. Winston de la Torre, UPR-Mayagüez (2006-07)

**outreach, service, and leadership**

* 2015: Planning Committee and Speaker, Latinos in Agriculture Leaders Conference, Grapevine, TX (March 23)
* 2014: President of Plant Sciences Graduate Student Council (PSGSC), http://psgsc.wisc.edu/
* 2012-16: SciMed GRS Peer Mentoring Committee
* 2011-16: SciMed Outreach Events, https://scimedgrs.wisc.edu/outreach.php

**international**

* Midwest and Tropical Agriculture and Conservation field trip to Guatemala (January 4-16, 2015)
* Caribbean Council for Higher Education in Agriculture (CACHE) Student and Professor Exchange Program, Dominican Republic (Summer 2004)
* Community service work in La Paz, El Salvador (Summer 2003)
* Youth leadership and development work in Santo Domingo, Dominican Republic (Summer 2001)

**AWARDS, Fellowships and grants**

**Awards**

2015: Honorable Mention List for the Dissertation Competition of the Ford Foundation Fellowship

2015: Latinos in Agriculture Leaders Conference, Planning Committee and Speaker

2015: American Association of Hispanics in Higher Education (AAHHE) Graduate Fellowship

2014: Latinos in Agriculture Leaders Conference Student Travel Scholarship

**Fellowships**

2015: Science and Medicine Graduate Research Scholars (SciMed GRS) Fellowship

2013 and 2014: Gabelman-Seminis Distinguished Fellowship in Plant Breeding and Plant Genetics

2011: SciMed Graduate Research Scholars Fellowship

**Grants**

Agency: National Wildlife Federation (NWF) Campus Ecology Fellowship Program

Title: Developing an environmental friendly project for UPR-Mayagüez

Funding Period: Oct 2009-Dec 2010

Amount: $5000.00

**LAnguage And technical skills**

* Language skills: Bi-lingual (Spanish and English), basic proficiency of French (1 year of classes)
* Computer knowledge in statistical packages such as SAS, R and Infostat
* Knowledge on SnapGene, Genome Compiler and Integrative Genomics Viewer (IGV) to find SNPs and genomic variants

**ACADEMIC AND PRoFESSIONAL MEMBERSHIPS**

* 2017-Present: American Society of Horticultural Science
* 2014-Present: National Association of Plant Breeders
* 2007-Present: Agronomy, Crops and Soil Science Society of America

**references**

* *Dr. Michael J. Havey* (PhD Advisor)

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* *Dr. Randy M. Huckaba* (Dow Supervisor)

Field Biologist at Dow AgroSciences

8677 Barrett Ridge Road

Wake Forest, NC 27587

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* *Dr. James S. Beaver* (MS Advisor)

Department of Crops and Agroenvironmental Sciences

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