Soil and Water Sciences Graduate Student Exit Seminar

Speaker: Marcos de Moraes  
Ph.D. Degree Candidate

Advisor: Dr. Max Teplitski and Dr. George Hochmuth

Title: Functional and Comparative Genomic Analysis of Salmonella enterica in Tomatoes

Date: Monday, November 28th

Time: 3:00 pm – 4:00 pm

Location: McCarty Hall D, Room G001

Human enteric pathogens, such as Salmonella and verotoxigenic E. coli, are increasingly recognized as causes of gastroenteritis outbreaks associated with the consumption of fruits and vegetables, and persistence on plants represents an important part of the life cycle of these pathogens. Our objective in this study was to create and validate an avirulent Salmonella surrogate strain and determine Salmonella sv. Typhimurium (ubiquitous) and sv. Newport (associated with vegetables) genetic requirements for colonization of tomato fruits. Our results indicated a limited role of the virulence determinants for food industry related conditions, and we constructed a Salmonella strain that fulfills the requisites to be used as a surrogate to safely model Salmonella behavior, helping to improve practices for the food industry. The transposon insertion sequence analysis in Salmonella sv. Typhimurium revealed a distinct plant-associated set of genes with limited overlapping with the genes required for Salmonella virulence in animals or phytopathogens. Salmonella sv. Newport shared the same metabolic functional requirements for colonization of tomatoes identified in sv. Typhimurium. Although, a new gene with unknown function (papA) with limited distribution to sv. Newport was required by this serovar for persistence in tomato, showing that serovars diverge in how to colonize this host. This study revealed that Salmonella colonization of plants is a complex process. It is influenced by Salmonella serovar, and it requires a unique set of metabolic functions, suggesting that this pathogen is adapted to use plants as alternative hosts. Moreover, we provided the first avirulent Salmonella surrogate strain constructed and validated for the development of safer practices by the food industry.

For our off-campus students, off-campus faculty, and on-campus students who cannot attend, this seminar can be viewed via live this link: Marcos de Moraes. In addition, all seminars are archived for viewing at http://soils.ifas.ufl.edu/academics/seminars.shtml