

Kunjeti, S.G.; Donofrio, N.M.; Marsh, A.G.; Meyers, B.C.; and Evans, T.A. 2010. Gene expressions of effectors in downy mildew of lima bean pathogen, *Phytophthora phaseoli* Phytopathology 100:S66.

Lima bean is an important legume crop for the state of Delaware. This crop is susceptible to two oomycete pathogens, *Phytophthora phaseoli* and *P. capsici*, causing downy mildew and pod blight of lima bean, respectively. In this study we have identified several genes in *P. phaseoli* orthologous to effector genes in *P. infestans*, a close relative of *P. phaseoli*. To initially identify these effector genes, the Illumina next-generation sequencing platform was used for profiling the transcripts of plant-grown and plate-grown *P. phaseoli*. Full-length sequence analysis of three RxLR effector genes showed 97, 94, and 91 percent identity to amino acid sequences of PITG_17063, PITG_15039, and PITG_04074 genes of *P. infestans*, respectively. In addition, two elicitors showed 96 percent identity to the amino acid sequences of the INF1 and INF4 genes of *P. infestans*. The above five effector genes were validated by performing in-planta RT-PCR. The two elicitors INF1 and INF4 were over-expressed in plant-grown when compared to plate-grown tissue in both *P. phaseoli* and *P. infestans* whereas only INF1 was expressed in plant-grown *P. capsici*. A phylogenetic analysis of all five effector genes from other oomycete pathogens confirmed a close relationship of *P. phaseoli* and *P. infestans* for all the corresponding effector genes. Currently, we are performing functional characterization of these effector genes, which will help us gain a better understanding of this pathosystem and will serve as a basis for future research.