Development of Diagnostic Tools Against Important Quarantine Viruses of Peanut

S.R.A.S DERANIYAGALA* and S. BAG, Department of Plant Pathology, The University of Georgia, 2360 Rainwater Rd, Tifton, GA 31793, S.P.TALLURY, USDA-ARS, Griffin, GA 30223, A. ROY, USDA-APHIS PPQ, Beltsville, MD 20705 and H.K.SUDINI, ICRISAT, Hyderabad, India 502324

Virus diseases limit crop production and threaten agricultural sustainability worldwide. Increased globalization and widespread movement of agricultural products may allow introduction of viruses and their vectors to new geographical regions, causing disease outbreaks with serious consequences. There are various quarantine regulations established to lower the chances of an imported article carrying a pest or pathogen of quarantine significance. Preventing the entry of exotic pathogens into a new region relies in part on precise detection of the pathogens. Peanut is a major crop in the southeastern United States. Therefore, it is important to prevent the introduction of new viruses to maintain regional sustainability. This research presented is aimed at developing precise, reproducible, and economical diagnostic tools for detecting exotic peanut viruses, Groundnut bud necrosis Orthotospovirus (GBNV), Peanut clump virus (PCV) and Indian peanut clump virus (IPCV). Freeze-dried plant tissues of different isolates of GBNV and IPCV were obtained from ICRISAT-India under a USDA-APHIS permit. Specific primers were designed to target conserved regions of the coat protein gene (N), movement protein gene (MP) and Triple Gene Block genes (TGB) of the three viruses. Total RNA was used for RT-PCR to amplify the targeted gene segments followed by sequencing to confirm the virus identity. SYBER-Green-based RT-qPCR tools were developed and standardized for N, MP and TGB genes along with plant genes as controls. Further, research is underway to develop one-step multiplex RT-qPCR to detect the simultaneous detection of these quarantine pathogens.