Deeper understanding of host-dependent long-distance movement of viruses in plants

March 6 2021

Some plant viruses systemically infect plants and cause huge losses in yield though our understanding of how systemic infections occur is largely unknown. A new study from the College of Biological Sciences at China Agricultural University provides extends our understanding of how virus-host interaction determines the systemic spread of a virus in different plant hosts.

Zongyu Gao and colleges were interested in studying *Tobacco necrosis virus-A*, which systemically infects soybean and benth, a close relative of tobacco. Their previous research revealed that coat protein is essential for viral systemic infection and in their latest study they identified three single amino acids within the coat protein that determined systemic infection.

They also found a relationship between these amino acids and their binding affinity to the host-specific Hsc70-2 protein.

"Our study extends the potential role of the host factor Hsc70-2 by demonstrating that Hsc70-2 not only plays a crucial role in sustaining the replication of an icosahedral virus in a specific host but also pinpointed the varied compatibility of orthologous Hsc70-2 from different hosts with the viral CP."

Their study also supports a scenario where the virus evolutionarily diverged in the coat protein to adapt to different hosts, thus ensuring better survival and spread of the virus among different plant hosts. For

more information, read "Tobacco Necrosis Virus-AC Single Coat Protein Amino Acid Substitutions Determine Host-Specific Systemic Infections of *Nicotiana benthamiana* and Soybean."

More information: Zongyu Gao et al, Tobacco Necrosis Virus-AC Single Coat Protein Amino Acid Substitutions Determine Host-Specific Systemic Infections of Nicotiana benthamiana and Soybean, *Molecular Plant-Microbe Interactions®* (2020). DOI: 10.1094/MPMI-07-20-0184-R

Provided by American Phytopathological Society