

#47: Evolution of nonpathogenic persistent plant viruses in pepper  
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Plant viruses can have different lifestyles. Most well studied viruses are acute viruses that cause disease in their host by rapid replication. Acute viruses can infect hosts systemically and are transmitted vertically and horizontally. On the other hand, plant persistent viruses are widespread in both commercially relevant crops and wild plants, replicating in their hosts for many generations without causing any visible disease. Movement between plant cells and transmission through grafting has not been observed in persistent viruses. They are distributed to all host cells through host cell division, and vertically transmitted via the gametes to seeds at rates close to 100%. The roles of plant persistent viruses have not been studied thoroughly, while their very long-term relationships with their hosts, and their vertical transmission suggest beneficial interactions with their hosts. Peppers are perennial plants, native to South America, and as domesticated plants human selection accelerated their evolution. Two persistent viruses, Bell pepper endornavirus and Pepper cryptic virus 1, have been reported from peppers. Studies on plant acute viruses shown that plant virus populations are genetically heterogeneous, and the distribution of these variants in the population may change over time and in different hosts. Since plant persistent viruses are in their host for a long time, understanding their evolution can shed light on the evolution of viruses. To investigate the evolution of these persistent viruses in peppers, dsRNA was extracted from over one hundred peppers leaves, including different cultivars of *C. annuum*, *C. chacoense*, *C.chinense*, and *C.baccutum*. The presence of these viruses was tested by RT-PCR using the specific primers for their RNA dependent RNA polymerase. The nucleotide sequence of the RT-PCR products determined and the phylogeny of these two viruses in different peppers have been analyzed.