

Chapter 12

Plant virus: Diversity and ecology

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1 Introduction

Viruses are sub-microscopic infectious particles (virions) made up of protein coat with a nucleic acid core. The genetic information is encoded in their nucleic acid specifically as proteins. A virus may contain a double stranded DNA, a double stranded RNA, a single stranded DNA or a single stranded RNA as their genetic material. Viruses tend to infect diverse group of living hosts including bacteria, plants, animals and human. Among different viruses, plant viruses create great economic loss worldwide. Plant viruses are obligate parasites that rely on the host cell for their survival and replication. Plant viruses are transmitted through two different mechanisms: (1) *Horizontal Transmission*—virus transmitted by an external source, for instance, weather, pruning or plant feeding vectors, (2) *Vertical Transmission*—viruses that are inherited from its parent, i.e., seed-borne infection. The discovery of *Tobacco mosaic virus* during 1890s gave birth to a new field of science, Plant Virology (Desselberger, 2003). Plant virology deals with different aspects of virus infection in plants especially structure of virus, viral genetics, virus-host interactions, viral pathogenesis, epidemiology, host resistance to plant viruses, RNA silencing, etc. Tobacco mosaic virus was first crystallized by Bernal and Fankuchen in 1941. Following which, the full structure of TMV was discovered in the year 1955 by Rosalind Franklin. The discovery of TMV have diverted the focus of researchers towards plant viruses. Thus, by 1935, numerous plant diseases were found to be associated with plant viruses. Francis Holmes described nearly 129 plant viruses in 1939. So far, researchers have focused on plant viruses

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