

Introduction to Plant Virology

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1. Introduction

Methods developed for plant virology have been of central importance to other branches of plant pathology. Fungal and bacterial pathogens were recognized and characterized in some detail by 1880, but it was not until after the turn of the century that viral pathogens were identified, and considerably later before they were clearly defined. The requirement to work with viruses at the subcellular level drove technology to develop new tools for their study. Since the 1930s, researchers in the field of plant virology have contributed greatly to universally applicable methodologies. Because plant viruses are simple in structure and easy to purify, they are now ideal candidates for molecular studies.

Methods developed and used in plant virology can be very roughly separated into four major categories. Prior to 1930, most studies concentrated on cataloging plant virus diseases and on virus transmission. The period from about 1930 to 1960 was characterized by studies on elucidating the nature of viruses and developing methods for virus purification. From the 1960s to the early 1980s, physicochemical characterization of plant virus protein and nucleic acid components and examination of viral genetics by recombination and chemical mutagenesis experiments were at the vanguard of plant virology. Finally, since the advent of recombinant DNA technology in the early 1980s, researchers studying plant viruses have adapted the numerous methods developed in other related fields to accumulate information rapidly on viral genome organization, expression, and gene function.

Several recent references provide more thorough discussion of specific plant virus topics: The third edition of Matthews' classic text (*1*) offers an even-handed discussion of many topics in the field, from genome organizations to epidemiology. The three-volume *Encyclopedia of Virology* (*2*) covers all of the