

FLEXIBLE FILAMENTOUS VIRUS STRUCTURES FROM FIBER DIFFRACTION

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Filamentous plant viruses make up almost half of plant virus genera, with hundreds of individual species recognized. Two of the largest families, the *Potyviridae* and the *Flexiviridae*, have some morphological similarities, but have major physical, chemical, and biological differences, and have generally been considered to be unrelated. We have obtained fiber diffraction data from a number of viruses from these two families, particularly from narcissus mosaic virus, a potexvirus from the family *Flexiviridae*, and soybean mosaic virus, a potyvirus from the family *Potyviridae*. Potexvirus data are from oriented sols; potyvirus data are from fibers dried under high humidity. The data include the first well-ordered data ever obtained for the potyviruses and the best-ordered data from the potexviruses. Analysis of these data allows us to determine the symmetry of the viruses accurately for the first time, suggests a much closer relationship between the two families than had hitherto been suspected, and in conjunction with cryo-electron microscopy, offers the promise of high resolution structure determination. Supported by grants from the NSF (MCB-0235653) and the USDA (2003-01178).