



Fig. 1. Virions and genome organization of a typical caulimovirus, CaMV. The virus particles of CaMV (left) are isometric and about 50 nm in diameter (the subunits are schematic and are not a true representation). The DNA genome of CaMV is a circular double-stranded DNA of 8 kbp with three site-specific discontinuities (small closed circles). One of these (top of map) is in the DNA (–)-strand and is adjacent to the sequence homologous to the host tRNA that primes CaMV DNA synthesis by reverse transcription of 35S RNA. The other two gaps are in the (+)-strand adjacent to sequences controlling initiation of (+)-strand DNA synthesis. The genome has six major open reading frames (inner closed arrows), for which protein products have been identified. Gene I encodes a protein involved in cell-to-cell spread, gene II specifies the aphid transmission factor, the gene III product is a DNA-binding protein associated with virions, gene IV encodes the major CP, gene V specifies the viral polymerase (reverse transcriptase and RNase H), and the gene VI product is an apparently multifunctional protein involved in transactivating viral protein synthesis, and in sequestering virions in inclusion bodies; it is also a major pathogenic determinant of symptom development. There are two major viral transcripts: 35S RNA, which probably serves two roles, one as a replication template and another as a viral mRNA; and 19S and 35S promoters (P19 and P35), respectively.

all members of the group comprising a 13- to 16-base element complementary to the 3' end of host methionyl initiator tRNA at the origin of viral replication. In fact, this sequence seems to be conserved in most plant genetic elements utilizing a reverse transcription strategy. Other regions of homology among caulimoviruses reside in parts of the CP and polymerase genes.

Symptoms produced in plants by CaMV infections vary, depending on the virus isolate and host species. Typical CaMV isolates in highly susceptible hosts, such as *Brassica rapa* (e.g., turnip), cause local lesions when inoculated