

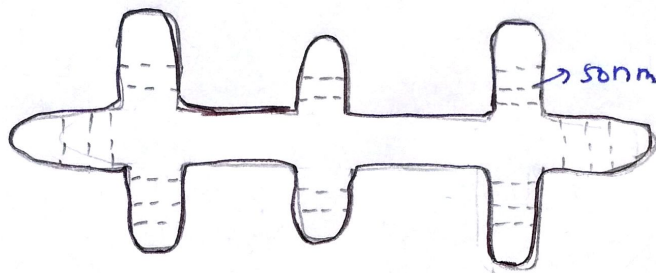
Structure and Multiplication of

**VIROID**

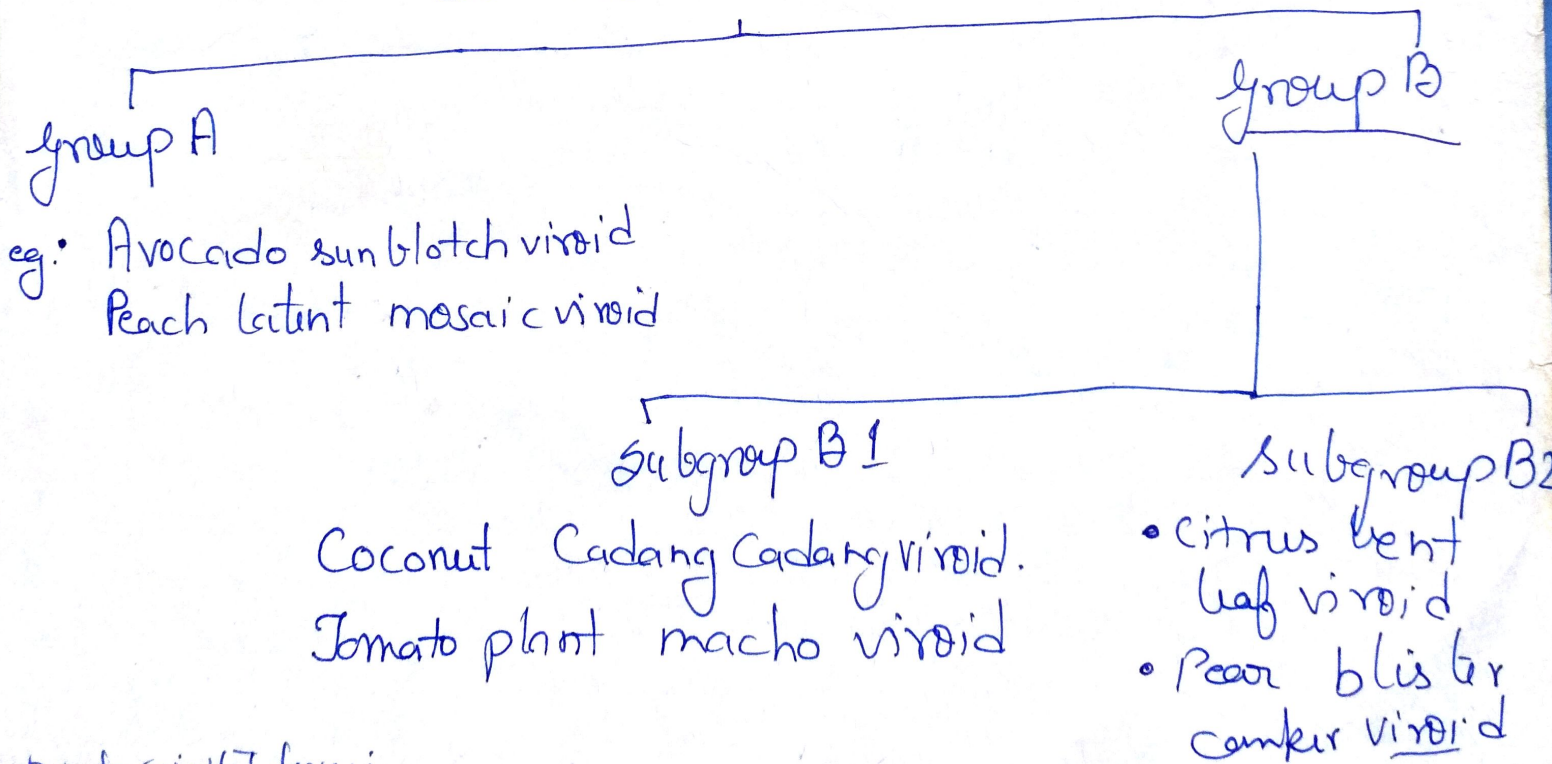
Viroids are small, circular, single stranded RNA molecules that cause several infectious plant diseases. They are circular molecules of RNA [between 246 - 375 bp of nucleotides] which has some double-stranded regions, with molecular weights between

Circular molecule of RNA  
246 - 375 bp of nucleotide

107,000 & 127,000

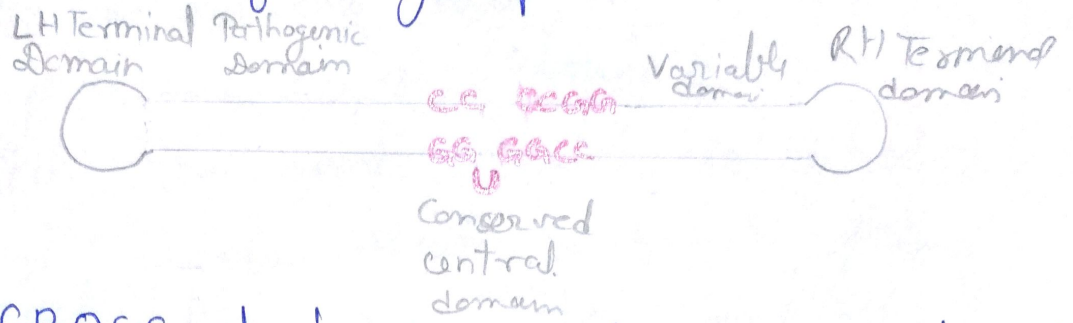


25 different viroid sequences have been determined & numerous variants identified



- potato spindle tuber vi
- Chrysanthemum stunt
- " - chlorotic mottle
- citrus exocortis, cucumber spindle

The structure of a group B viroid.



H.J. GROSS et al. sequenced the nucleotide sequence of the Potato spindle tuber virus (PSTV) in 1973. It consists of 359 ribonucleotides & is characterised

by intramolecular base pairings that lend stability to the structure. They are organized in a sequence of helices separated from each other by loops. The resulting structure resembles a dumbbell with an axis ratio of 1:20. Several more viruses have been sequenced in the meantime. All of them have structures similar to that of the PSTV. They are ~240-380 nucleotides long and all of them have dumbbell structure.

The fact that a central portion of the molecule that is responsible for the pathogenicity of the viroids is structurally conserved is especially interesting. →

multiplication

**ROTA**

Viroids multiply even at relatively high temperatures (about 35°C). Most likely, they have adapted to their host plants that have so far strictly been found to inhibit tropical, subtropical & continental climates. The viroids are localized within the chromatin fraction of the nucleus. The DNA-dependent RNA-polymerase II & I use the viroids as templates and produce strands that again serve as templates for the synthesis of the +ve strand (E. SPIESMACHE et al., 1985)

Circular pathogenic RNA are replicated by a rolling circle mechanism in vivo.

Group A viroids probably replicate via a symmetric rolling circle mechanism.

whereas Group B viroids probably use an asymmetric mechanism.

viroids do not encode any pathogen-specific peptides but nonetheless

the subviral pathogens replicate autonomously & spread in the plant by recruiting host proteins via functional motifs encoded in their RNA genome.

During the past couple of years considerable progress has been made towards comprehending how viroids interact with their hosts.

