# Fig Mosaic

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**This project was initiated in summer of 2005. We have applied for a second years funding to continue efforts along the lines described here, and have applied for funding from other agencies.**




**There is not much definitive work on fig mosaic. Results suggest that the causal agent is transmitted by the fig mite, *Eriophyes ficus*.**

**There are reports of various fig-associated viruses, but none have been characterized, or shown to be the causal agent of FM.**

**We tried to get a BARD grant with Israel collaborators, it was not funded.**

**We are still in consideration for a MERC grant, with collaborators from Palestine and Israel, we will hear in May.**

**We also applied for additional funds from the USDA Germplasm Resources program.**

**We are focussed now on identifying the virus(es) in California figs and assessing the similarity/differences from different regions.**

**Detection and identification of viruses associated with fig mosaic is an important part of fig production and maintenance.**

## OBJECTIVES:

1. **Identification and characterization of the causal agent associated with Fig Mosaic Disease.**

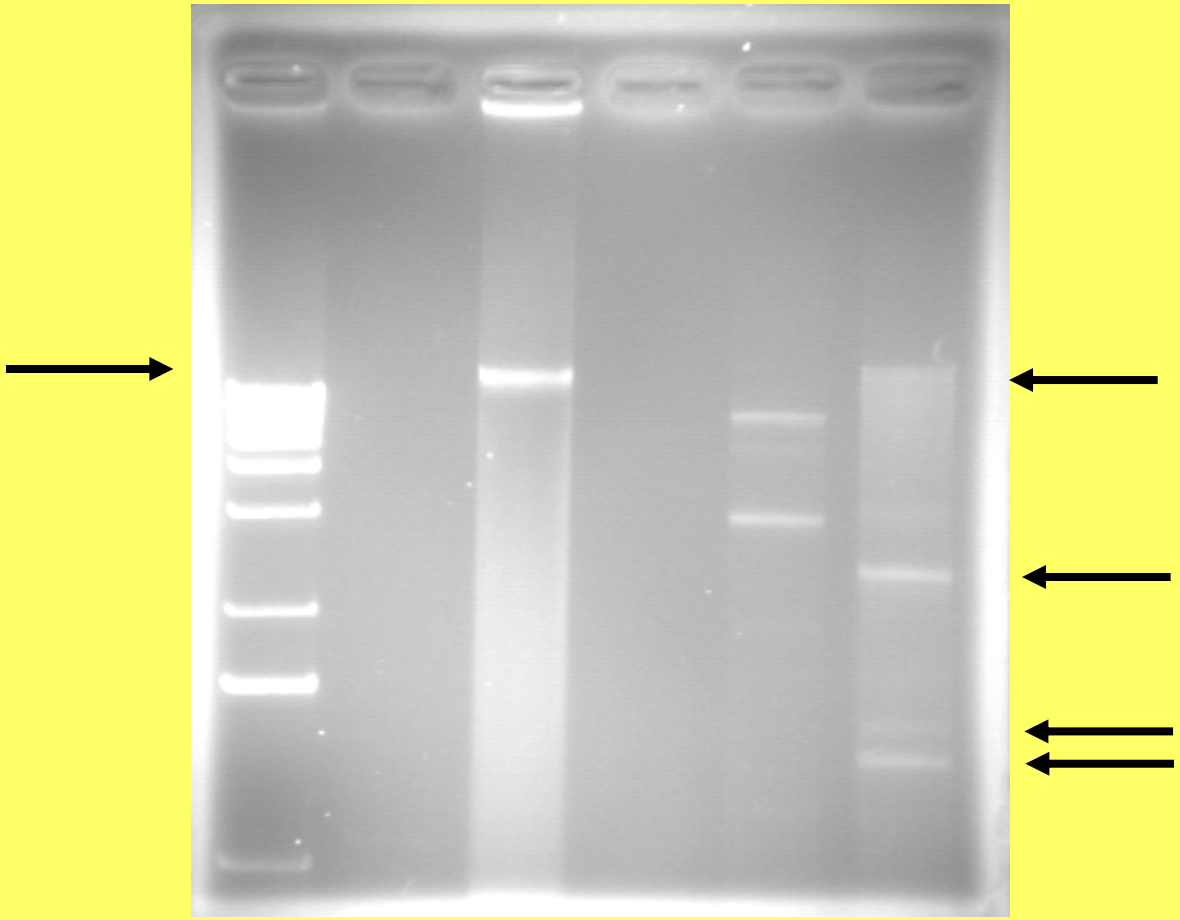
2. **Determine the role and incidence of the fig mosaic virus(es) in California figs.**

**We used the following fig cultivars that used for dsRNA extraction in order to identify specific RNAs that may be associated with FM.**

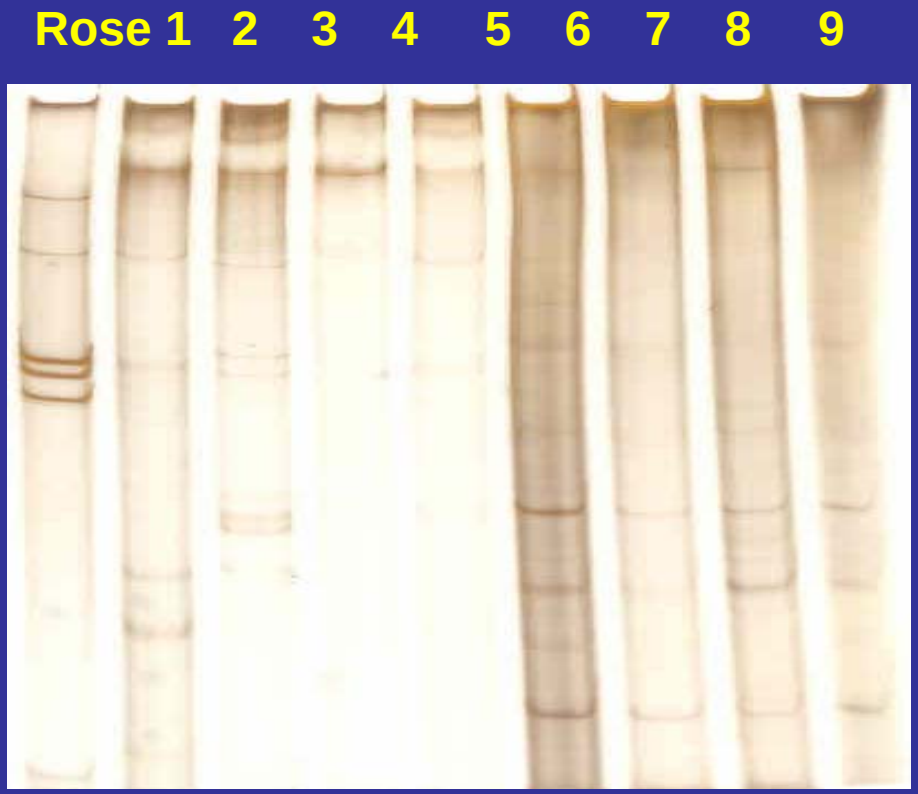
1. **Caprica St Jean**
2. **Caprica Osborn Prolifig**
3. **Carica Genoa**
4. **Carica Caprio**
5. **Carica Flanders**
6. **Carica Genoa**
7. **Carica Aked**
8. **Carica Yellow Neche's**
9. **Carica Adriatic**
10. **Carica Ischiablack**
11. **Carica Santa Cruz White**
12. **Hybrid selection 341**

**We extracted and purified double-stranded RNAs from 6 different FMV-affected figs. All showed very similar dsRNA patterns (lane 3).**

**1 2 3 4 5 6**



**Greater resolution suggests that in addition to the same dsRNA species, some different RNAs may be in different samples. There may be more than one virus.**

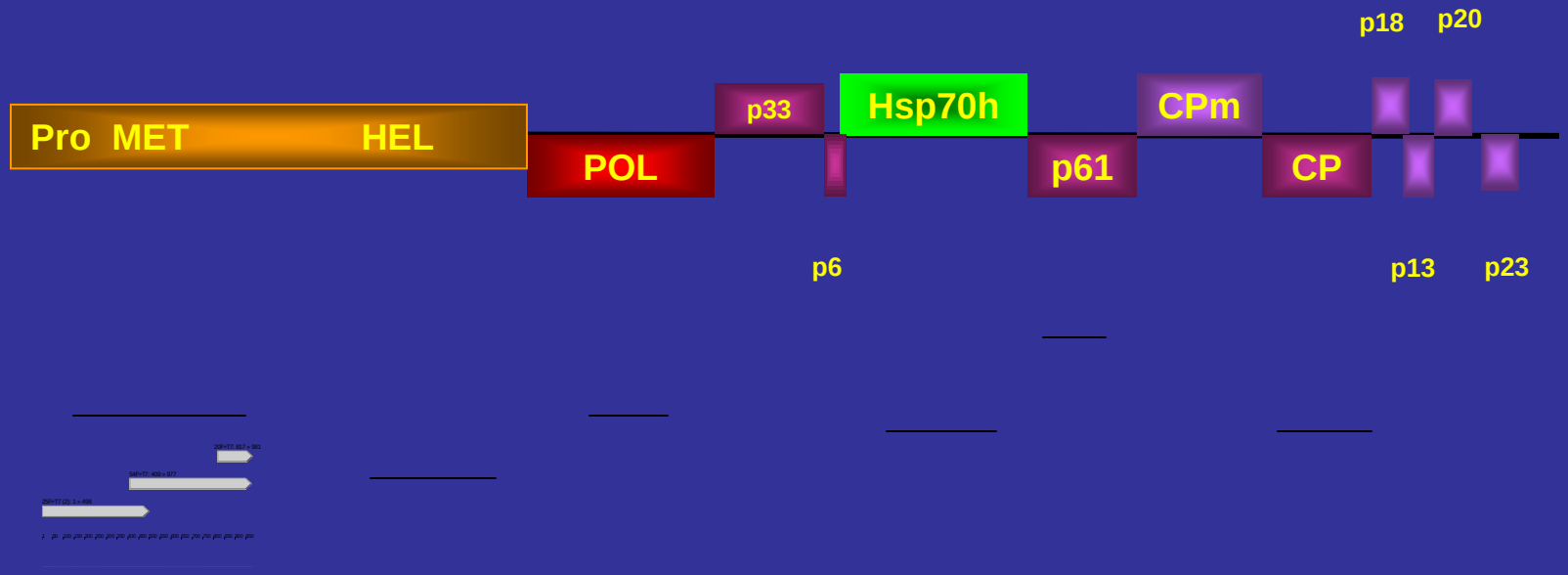



dsRNAs electropheresed through 6% polyacrylamide gel and stained with silver nitrate

# cDNA cloning & sequence analysis

- **dsRNA was used as template for cDNA synthesis.**
- **cDNA was synthesized by using random primers and Oligo(dT).**
- **288 cDNA clones were screened, 144 were sequenced.**
- **Sequence data were analyzed using BLAST search programs of the NCBI.**
- **So far we have identified one virus and have significant sequence data.**

**We have identified nucleotide sequence for a virus that is a member of the virus family *Closteroviridae*. This family includes important viruses such as *Citrus tristeza virus* and *Beet yellows virus*, both of which are aphid-transmitted!**




**Schematic representation of the genome organization of CTV is above**

**Our virus shows some significant identity to a sequence from Italy for a virus called *Fig Leaf Mosaic-Associated Virus*.**

# RT-PCR detection

- **Primers were designed from positively identified clones.**
- **Total RNA from the virus-infected plants were used as templates.**
- **RT-PCR was performed to test the specificity of each pairs of primers.**
- **We can specifically detect FLMaV in figs.**

# Seed germination

- **Seed of six fig cultivars, so far no germination.**
- **Tissue culture media and sterile filter paper.**
- **Obtained seedlings of two hybrids from Malli Aradhya of the USDA Germplasm repository.**
- **Testing them by RT-PCR**

## Some questions so far.

**Closteroviruses don’t typically cause mosaic symptoms.**

**Closteroviruses are transmitted by aphids, whiteflies or mealybugs, none are yet known to be mite-transmitted.**

**We don’t as yet know if the virus we found is the causal agent of FM, or if other viruses are involved.**

**We are finishing the genomic RNA sequence and testing for similarity/variability among other affected figs.**

# Next Year

- **Research objectives:**

- **<u>Objective 1.</u> To finish the genomic characterization of FLMaV.**

- **<u>Objective 2.</u> To determine the role and incidence of FLMaV in California figs.**