CHARACTERIZATION OF A VIRUS INDUCING MOSAIC IN CARROT 
(Daucus carota var. sativa L.)

ABSTRACT

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ABSTRACT

The thesis embodies characterization of a virus isolate infecting carrot (Daucus carota var. sativa) tentatively called Carrot Yellow Mosaic Virus (CYMV). A review of literature of viruses infecting umbelliferae has been given. The results have been discussed with particular reference to viruses affecting carrot.

The diseased plants of carrot were stunted, leaves slightly curled and had yellow mosaic symptoms. The virus was transmitted through sap inoculation to plants distributed in 10 families. The virus was not transmissible through the seeds of infected plants, and seven aphids viz. Aphis craccivora, A. gossypii, A. nymphae, Acyrthosiphon pisum, Brevicoryne brassicae, Macrosiphonella sp. and Myzus persicae failed to transmit the virus by any mode of transmission. It did not produce visible symptoms in Brassica rapa cv. Purple Top White, Centaurea moschata, Coriandrum sativum, Petroselinum hortense, Raphanus sativus and Stellaria media, but was recovered on back inoculation to Chenopodium amaranticolor. CYMV had thermal inactivation point between 55 and 60°C, ageing in vitro of 102 hours at room temperature (8-18°C) and dilution end point between $10^{-4}$ and $10^{-5}$.

Purification schedule included clarification of sap with 10% butanol and 2% triton X 100, PEG precipitation followed by differential centrifugation. Further purification was achieved through rate zonal density gradient centrifugation in sucrose. Examination of the tubes after density gradient centrifugation
revealed a single light scattering zone 21 - 24 mm below the meniscus. The virus particles had maximum UV absorption at 258 nm and minimum UV absorption at 238 nm. Electron microscopy of the negatively, stained (with 2% uranyl acetate) purified virus revealed long flexuous particles measuring 950x21 nm. CYMV was found to be moderately immunogenic (titre 1:1024). It did not show any serological relationship with tobacco mosaic, potato virus Y, celery mosaic (type strain, parsley strain and poison hemlock strain), parsnip mosaic and turnip mosaic viruses.

This virus isolate is not identical to any carrot virus reported so far, however, it resembles in several respects to carrot latent virus (CLV), though it differs from CLV in not being carried through the seed of infected plants. CYMV may be a distinct strain of CLV. Tentatively for the present isolate, the name carrot yellow mosaic virus (R/*, */*, E/E, S/*) is suggested.