

Electron Microscopy of Cells Infected with Narcissus Mosaic Virus

(Accepted 28 June 1971)

The particles of narcissus mosaic virus (NMV) are rod-shaped with a modal length 548 to 568 nm. (Fig. 1), and morphologically similar to those placed in the potato virus X (PVX) group by Brandes (1964). However, its inclusion in this group is uncertain, because it seems unrelated serologically to any other virus in the group (Brunt, 1966). PVX produces some characteristic cytological effects, so that sections of leaves of *Nicotiana clevelandii* infected with NMV were examined in the electron microscope to see whether they resembled

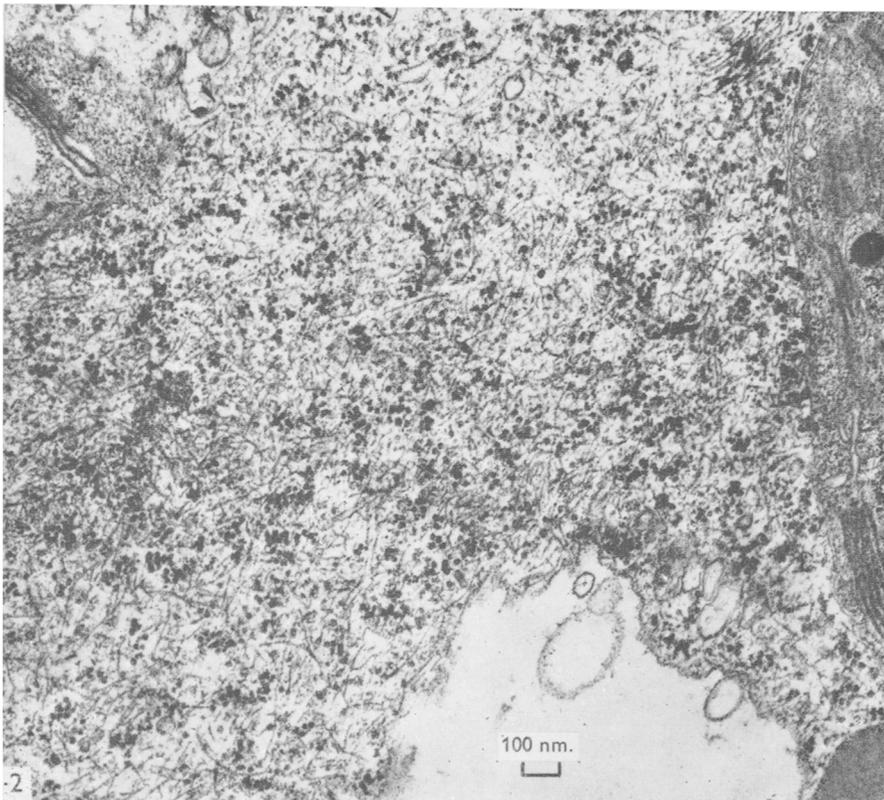
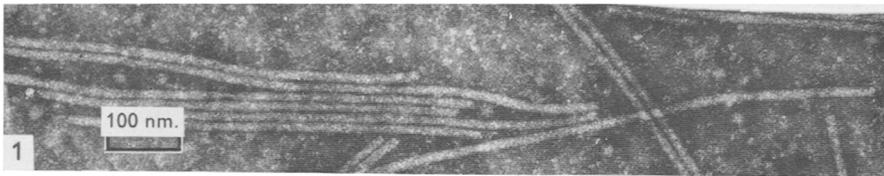


Fig. 1. NMV in negative stain (PTA).

Fig. 2. Cytoplasm of a *Nicotiana clevelandii* leaf cell infected with NMV.

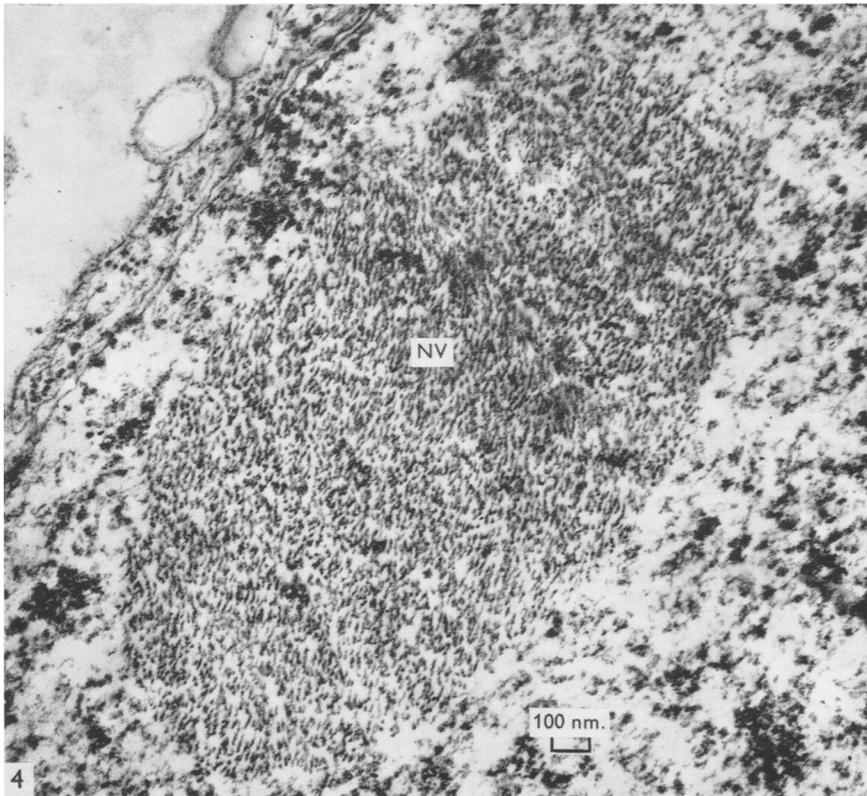
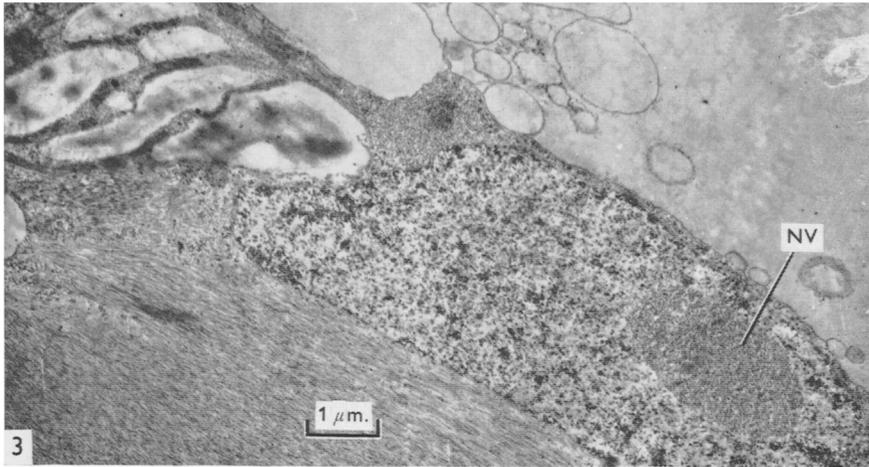


Fig. 3. A leaf cell of *Nicotiana clelandii* infected with NMV showing a cluster of virus particles within the nucleus (NV) and densely packed virus particles in the cytoplasm.

Fig. 4. A leaf cell nucleus of *Nicotiana clelandii* containing a cluster of NMV particles (NV).

cells infected with PVX. They did not, and in contrast showed a strikingly different distribution of virus particles.

The sections were of systemically infected leaves, picked 3 weeks after the lower leaves of *N. clevelandii* plants had been mechanically inoculated with NMV. The pieces of leaf were fixed and embedded in Epon, as described by Milne (1970). Thin sections, mounted on uncoated grids, were stained in Reynolds' lead citrate for 1 min. and examined in a Siemens Elmiskop 1 A operating at 60 kV.

Fig. 2 shows a typical area of cytoplasm containing virus particles. As in cells infected with PVX (Kikumoto & Matsui, 1961), there were areas where the virus was densely packed (Fig. 3), but neither cytoplasmic lamellae (characteristic of PVX (Borges & Ferreira, 1968)) nor other cytoplasmic inclusions were found in any of the sections examined. However, many cells infected with NMV had virus particles clustered within their nuclei (Figs 3 and 4), something not reported with PVX. Indeed, similar aggregations of virus particles within the nucleus seems only to have been reported in plants infected with two other rod-shaped viruses—tobacco mosaic (Esau & Cronshaw, 1967) and barley stripe mosaic (Gardener, 1967), both unrelated to PVX. Hence, nothing in these observations suggests that NMV is related to PVX.

I thank Dr A. A. Brunt (Glasshouse Crops Research Institute, Littlehampton, Sussex) for supplying the inoculum of NMV.

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(Received 14 June 1971)