

Hyoscyamus niger, a useful local lesion host for a mosaic virus in *Hippeastrum*

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Hippeastrum mosaic virus (HMV) occurs naturally in *Hippeastrum hybridum* plants (Amaryllidaceae), which show mosaic symptoms in the leaves (Brants and van den Heuvel, 1965).

In dip preparations of mosaic-diseased *Hippeastrum* plants Iwaki (1967) and Brants, Fokkema and de Bode (1970) have found flexuous rods with mean lengths differing from 600–800 nm, which have all been ascribed to HMV.

Gomphrena globosa has been used as a bioassay host for qualitative and quantitative work with HMV, in spite of the fact that it has not been possible to infect *Hippeastrum* with sap from *Gomphrena globosa* leaves bearing local lesions induced by HMV (Brants and van den Heuvel, 1965). Brants et al. (1970) pointed out that sap expressed from mosaic-diseased *Hippeastrum* plants did not always induce local lesions in *Gomphrena globosa*, whereas in some cases local lesions were induced in these test plants after inoculation with sap from *Hippeastrum* plants without symptoms.

Francki (1967) has mentioned that caution is required when using *Gomphrena globosa* for diagnostic purposes, as the intensity of illumination under which the plants are grown influences very markedly the appearance of virus-induced local lesions, and under high light intensities spontaneous lesions can be produced.

Sap expressed from 13 mosaic-diseased *Hippeastrum* plants was tested on carborundum-dusted leaves of *Gomphrena globosa* and *Hyoscyamus niger* plants. Only 7 out of 13 of the inoculated *Gomphrena* plants showed more or less distinct local lesions, whereas all the inoculated *Hyoscyamus niger* plants showed chlorotic local lesions 7 days after inoculation, without subsequent systemic infection (Fig. 1). In another experiment sap expressed from each of 100 mosaic-diseased *Hippeastrum* plants induced local lesions in leaves of *Hyoscyamus niger* test plants. These lesions did not occur when *Hyoscyamus niger* plants were inoculated with sap from healthy *Hippeastrum* plants.

Dip preparations, made according to the method of Brandes (1957) from leaves of three mosaic-diseased *Hippeastrum* plants, contained flexuous rods of 648–772 nm. Similar particles were detected in dip preparations made of *Hyoscyamus niger* leaves showing chlorotic local lesions after inoculation with sap from these *Hippeastrum* plants. No such particles were found in dip preparations of healthy *Hippeastrum* and *Hyoscyamus* plants.

Fig. 1. *Hyoscyamus niger* leaf with chlorotic local lesions caused by sap from a mosaic-diseased *Hippeastrum* plant.



Fig. 1. Blad van een *Hyoscyamus niger* plant met chlorotische lokale lesies na inoculatie met sap van een mozaïekzieke *Hippeastrum*-plant.

Young healthy *Hippeastrum* seedlings showed mosaic symptoms six weeks after inoculation with sap from *Hyoscyamus niger* leaves bearing local lesions induced by sap from mosaic-diseased *Hippeastrum* plants. Therefore it was concluded that *Hyoscyamus niger* is useful as a test plant for a virus inducing mosaic symptoms in *Hippeastrum*. This virus seems to be identical with HMV, in spite of the fact that no local lesions were induced in *Gomphrena globosa* using sap from *Hyoscyamus niger* leaves bearing local lesions induced by this virus.

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Samenvatting

Hyoscyamus niger, een goede toetsplant voor een mozaïekvirus in *Hippeastrum*
Bladeren van *Hyoscyamus niger* planten vertoonden chlorotische lokale lesies 7 dagen na inoculatie met sap van mozaïekzieke *Hippeastrum*-planten. Met sap van *Hippeastrum*-planten zonder mozaïeksymptomen werd geen reactie verkregen. In dooppreparaten gemaakt van chlorotische lesies in *Hyoscyamus*-bladeren en van bladeren van *Hippeastrum* planten met mozaïeksymptomen werden draadvormige virusdeeltjes van 648–772 nm aangetroffen. Het virus kon met sap geperst uit geïnoculeerde *Hyoscyamus*-planten weer op gezonde *Hippeastrum*-planten worden overgebracht.

References

- Brandes, J., 1957. Eine elektronenmikroskopische Schnellmethode zum Nachweis faden- und stäbchenförmiger Viren, insbesondere in Kartoffeldunkelkeimen. *NachrBl. dt. PflSchutzdienst, Stuttg.* 9:151–152.
- Brants, D. H. & van den Heuvel, J., 1965. Investigation of *Hippeastrum* mosaic virus in *Hippeastrum hybridum*. *Neth. J. Pl. Path.* 71:145–151.
- Brants, D. H., Fokkema, N. J. & de Bode, R., 1970. Further identification of *Hippeastrum* mosaic virus. *Neth. J. Pl. Path.* 76:171–173.
- Francki, R. I. B., 1967. Effect of high light intensities on spontaneous and virus-induced local lesions in *Gomphrena globosa*. *Phytopathology* 57:329.
- Iwaki, M., 1967. Viruses causing mosaic diseases of *Amaryllis* in Japan. *Ann. phytopath. Soc. Japan* 33:237–243.

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