

Occurrence of pepper yellow vein in the Netherlands

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Since the increase in cultivation of sweet pepper (*Capsicum annuum*) on rockwool substrates virus-like yellow vein symptoms in the leaves have been more frequently observed. As no symptoms developed after mechanical inoculation of various test plants or by grafting of pepper plants the phenomenon was ascribed to a nutritional disorder ('substrate disease') or insecticide damage. Fletcher et al. (1987) have recently reported similar symptoms on peppers in the U.K. which they called yellow vein. These symptoms were shown to be transmissible by an *Olpidium* sp. This report stimulated research into the cause of the virus-like yellow vein symptoms found on peppers in the Netherlands (Fig. 1).

Tops of a plant showing symptoms identical to those described by Fletcher et al. (1987) were used as scions and grafted onto sweet pepper plants cv. Tisana at the 8-10 leaves stage. After six weeks the side shoots of the grafted plants started to develop yellow vein symptoms. Roots of the affected plants, which contained typical, stellate resting spores of the chytrid fungus *Olpidium brassicae* were air-dried together with attached pieces of rockwool. This root material was rubbed to powder and 12 g was mixed with c. 1.2 l of sterilized, light sandy soil. Six sweet pepper seedlings were planted into this soil mixture and these developed yellow vein symptoms within four weeks. Their roots contained resting spores and mature zoosporangia of *O. brassicae*. A zoospore suspension was prepared by rinsing root pieces in a flat-bottomed glass tube with 8 ml of tap water and then removing the root pieces again. Five out of six sweet pepper seedlings, which were left standing overnight with their roots in this zoospore suspension and were planted in sterilized soil, developed yellow vein symptoms within four weeks. The type of symptoms and the mode of transmission by grafting and by *O. brassicae* strongly suggested that the disease agent involved was identical to that reported by Fletcher et al. (1987). Also, as found in the U.K., the visibly affected plants did not contain virus particles when examined by electron microscopy.

For zoospore inoculations a sample of infected roots, previously checked for release of zoospores, was immersed for 24 hours in an aerated nutrient solution in a glass container together with the roots of seedlings to be infected. For inoculation with resting

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Fig. 1. Yellow vein symptoms in pepper cv. Tisana.

spores 0.1-0.2 g of powder, prepared from dried, infected roots was applied on the soil around the hypocotyl of potted seedlings.

Nine to fifteen seedlings of each of five *Capsicum* species were inoculated with zoospores. Symptoms appeared in all 10 plants of the ornamental pepper *C. annuum* cv. Fiery Festival, all 15 plants of *C. baccatum* P.I. 260549, 7 out of 9 plants of *C. chacoense* P.I. 260429, all 9 plants of *C. chinense* P.I. 159236 and 9 out of 15 plants of *C. frutescens* cv. Tabasco. Another batch of *C. baccatum* seedlings, which for comparison were simultaneously inoculated with resting spores, also developed symptoms in all 12 plants used, although at a slower rate than with the zoospore inoculation. Mean incubation periods with zoospore and resting spore inoculations were 23.5 and 28.2 days, respectively. Symptoms in *C. chacoense* were mild and appeared only after five weeks. Symptoms were most severe in *C. chinense*, where yellowing of the veins was accompanied by leaf distortion. Plants with and without symptoms were found to contain *O. brassicae* in the roots. In a further experiment *Solanum villosum* was inoculated with resting spores and developed mild, vein clearing symptoms after three weeks. By back-inoculation with zoospores from affected *S. villosum* plants yellow vein symptoms were reproduced in sweet pepper plants.

Work is in progress to establish the host range of the pepper yellow vein agent and the specificity of its transmission by *O. brassicae*.

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Samenvatting

Voorkomen van geelnervigheid bij paprika in Nederland

Het verschijnsel van geelnervigheid bij paprika (*Capsicum annum*) kon door verenting en met de schimmel *Olpidium brassicae* worden overgebracht. Hierdoor bleek de ziekte identiek te zijn met een eerder in Engeland gemelde ziekte. Door inoculatie met zoösporen of rustsporen van *O. brassicae* werden ook symptomen verkregen in *C. baccatum*, *C. chacoense* en *C. frutescens*. *S. villosum* bleek een waardplant te zijn voor het geelnervigheidsagens, waarbij zwakke nerfchlorosen werden waargenomen.

References

Fletcher, J.T., Wallis, W.A. & Davenport, F., 1987. Pepper yellow vein, a new disease of sweet peppers. *Plant Pathology* 36: 180-184.