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NEW DISEASE REPORT

First report of *Mercurialis* latent virus infecting courgette in France

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Email: cecile.desbiez@inrae.fr**KEYWORDS**

cucurbit, ilarvirus

In autumn 1999, leaf mosaic and flower deformation were observed in courgette (*Cucurbita pepo*) in Brittany, northwestern France. The plants had underdeveloped stamens with reduced pollen production. A leaf sample from the diseased plant, designated Bret1, tested negative with DAS-ELISA for cucumber mosaic virus, cucurbit aphid-borne yellows virus, papaya ringspot virus, prunus necrotic ringspot virus, squash mosaic virus, watermelon mosaic virus, zucchini yellow mosaic virus, and stolbur phytoplasma species, but reacted moderately with a tobacco streak virus (TSV, ilarvirus) antiserum (Sanofi, France). Spherical particles, c. 30 nm in diameter, were observed by transmission electron microscopy (Figure 1).

A diseased leaf sample was used for mechanical inoculation of courgette, cucumber, melon, tomato, *Chenopodium amaranticolor*, *C. quinoa* and *Nicotiana benthamiana*. Inoculated courgette plants developed leaf mosaics and flower deformations similar to the original sample (Figure 2–3). *Chenopodium amaranticolor* and *C. quinoa* developed chlorotic local lesions and a systemic mosaic with leaf deformations. The other inoculated plant species remained asymptomatic. Systemic infection was detected using the TSV antiserum in courgette, cucumber, *C. amaranticolor*, *C. quinoa* and *N. benthamiana*. Attempts to transmit the virus by seed or pollen, common amongst ilarviruses, to courgette were unsuccessful, partly because pollen production was much reduced and no seeds were obtained.

RT-PCR with primers Ilar2F5 and Ilar2R9 (Untiveros *et al.*, 2010), resulted in a 320-nucleotide (nt) fragment; its sequence was 98% identical to that of grapevine angular mosaic virus, a tentative ilarvirus first detected in Greece in grapevine (Girgis *et al.*, 2009), which has recently been observed in *Mercurialis annua* in Switzerland and renamed Mercu-

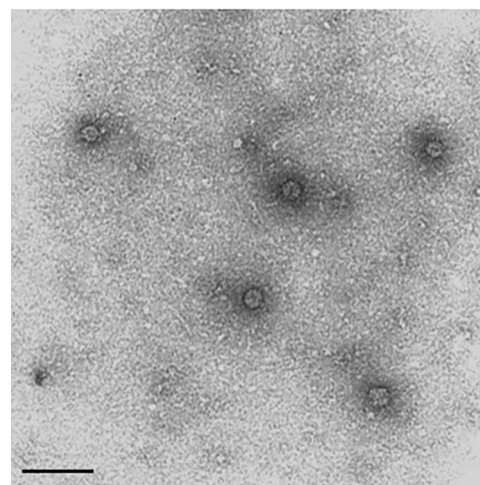


FIGURE 1 Virus particles observed using transmission electron microscope in infected courgette leaf extracts negatively stained with ammonium molybdate. The grids were coated with a tobacco streak virus antiserum. Bar = 100 nm.

rialis latent virus (MeLaV) (Mahillon *et al.*, 2024). Total RNA extracted from the Bret1 sample was sent for small RNA sequencing (Fasteris, Switzerland; Verdin *et al.*, 2017). The reads were assembled *de novo* with CLC Genomic Workbench v7 (Qiagen, Germany), and mapped to MeLaV reference sequences (GenBank Accession No. PP002153-155) with Geneious 8.1.9 (Biomatters, New Zealand). The complete sequence (PQ014403-405) had a typical ilarvirus organisation with

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FIGURE 2 Leaf discolouration in courgette plant mechanically inoculated with *Mercurialis latent virus*.



FIGURE 3 Abnormal flower with misshapen stamens and reduced pollen production in a mechanically inoculated courgette plant.

three RNAs of 3357 nt, 2924 nt and 2267 nt, encoding one or two proteins each. The nt sequence of isolate Bret1 was >99 % identical to sequences of a MeLaV isolate from Switzerland (collected in 2021 from *M. annua*, PP002153-155), two isolates from the Netherlands (1991, *Passiflora tripartita*, PP002147-149; and 2017, courgette, PP002141-143), and one isolate from Spain (2018, courgette, PP002144-146)

(Mahillon *et al.*, 2024). The nucleotide identity with other ilarviruses was <70%. This demonstrates that Bret1 is an isolate of MeLaV, and that MeLaV was present in France in courgette in 1999.

This is the first report of MeLaV in France. The virus has not been detected in recent high-throughput sequencing from crops or weeds from France (data not shown) and has not emerged as a pathogen so far. The infection observed in France in 1999, and possibly those in the Netherlands and Spain, may have resulted from transmission from neighbouring weeds or crops by pollen-feeding insects. MeLaV, sporadically infecting wild and cultivated hosts in Europe and causing severe symptoms in zucchini, may emerge as a significant pathogen and has the potential to cause important losses in favourable conditions.

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