

First Report of *Turnip mosaic virus* in Horseradish in Brazil

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RESUMO

Primeiro relato do *Turnip mosaic virus* em raiz-forte no Brasil

Este trabalho relata a primeira ocorrência do *Turnip mosaic virus* (TuMV) em plantas de raiz-forte (*Armoracia rusticana* G. Gaertn., B. Mey. & Scherb.) provenientes de cultivos comerciais no Estado de São Paulo. Até então, este vírus somente havia sido descrito em espécies do gênero *Brassica* no Brasil.

Horseradish (*Armoracia rusticana* G. Gaertn., B. Mey. & Scherb.) is a vegetatively propagated perennial plant grown as an annual crop. Among the viruses already reported on this species (Pound, J. Agricult. Res. 77:97. 1948; Hickman & Varma, Plant Pathology 17:26. 1968), *Turnip mosaic virus* (TuMV) is considered one of the most common pathogens of horseradish. TuMV is a *Potyvirus* with filamentous particles ca. 720 nm, sap-transmissible to a wide host range and transmitted by aphids in a non-persistent manner. In species of Brassicaceae it induces mottling, black necrotic spots, ringspots and mosaic. Symptoms of TuMV in horseradish include foliar mottling, mosaic or ring spots, dark streaks on the petioles and root discoloring, which results in an undesirable product (Horwitz *et al.*, Plant Disease 69:246. 1985). Here we described the occurrence of TuMV on horseradish in Brazil. Sap from horseradish leaves showing chlorotic ringspots, mottling, mosaic and necrosis (Figure 1) was used in biological and serological tests, and electron microscopy. *Chenopodium amaranticolor*, *C. quinoa*, *Nicotiana clevelandii*, *N. megalosiphon*, *N. sylvestris*, *N. tabacum* 'White Burley' and 'Samsun' developed necrotic local lesions, while *N. glutinosa* and *Brassica oleraceae* showed systemic chlorotic spots, mosaic and necrosis. *Chenopodium murale*, *Datura stramonium* and *Gomphrena globosa* did not show any symptoms. The electron microscope observations of foliar extracts revealed flexuous particles ca. 720 x 13 nm, and in foliar ultra-thin sections pin-wheels, scrolls and lamellar aggregates were recognized. In immunomicroscopy tests (decoration), using specific antiserum against TuMV, particles appeared surrounded by a densely stained halo (Figure 2). The original leaf samples and inoculated *N. glutinosa* plants reacted positively in PTA-ELISA with a polyclonal antiserum against TuMV. Under our conditions, TuMV types I and II have already been reported in *Brassica oleraceae* (Colariccio *et al.*, Summa Phytopathologica

26:455. 2000); however, to our knowledge, this is the first report of TuMV infecting horseradish in South America, more specifically in São Paulo State, Brazil.

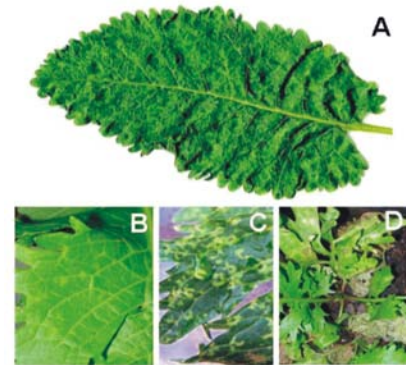


FIG. 1 – Foliar symptoms of *Turnip mosaic virus* (TuMV) on naturally infected horseradish; **A**, mosaic; **B**, chlorotic ringspots at the initial stage of infection; **C**, chlorotic ringspots; **D**, necrosis at the final stage of infection.



FIG. 2 – **A**, Electron micrographs of flexuous filamentous particles, about 720 nm long, strongly decorated with specific antiserum against *Turnip mosaic virus* (TuMV), note a dense halo surrounding particles; **B**, Dense lamellar aggregates, scrolls and pin-wheel are observed in ultra-thin section of an infected horseradish mesophyll cell. Bars = 200 nm

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