

# First Report of *Turnip mosaic virus* on Watercress in Brazil

H. Costa<sup>1</sup>; J. A. Ventura<sup>1</sup>; A. S. Jidão<sup>2</sup>; J. A. M. Rezende<sup>2</sup> and A. P. O. A. Mello<sup>2</sup>

<sup>1</sup>INCAPER, 29052-010 Vitória, ES, Brazil; <sup>2</sup>Departamento de Fitopatologia e Nematologia, ESALQ/USP, 13418-900 Piracicaba, SP, Brazil

Watercress (*Nasturtium officinale* L.), a member of the family Brassicaceae, is consumed mainly as salad. Medicinal properties have also been attributed to this species. In Brazil, watercress is grown mainly by very small farmers. The crop is primarily seed propagated and growers can harvest several times per year in an established planting. Very few diseases have been reported in this crop worldwide. In Brazil, watercress infection by *Cauliflower mosaic virus* (CaMV) (3), *Cucumber mosaic virus* (CMV) (1), and an unidentified potyvirus (2) were previously reported. In January 2009, 80% of watercress plants, cv. Gigante Redondo, exhibiting severe mosaic, leaf size reduction, and plant stunting were observed in a crop in Marechal Floriano Municipality, State of Espírito Santo, Brazil. Preliminary leaf dip analysis by transmission electron microscopy revealed the presence of potyvirus-like particles. Sap from five infected plants reacted in plate-trapped antigen (PTA)-ELISA with polyclonal antiserum against *Turnip mosaic virus* (TuMV), but not with antiserum against CMV. Both antisera were produced in the Plant Virology Laboratory, ESALQ/USP. Mechanically inoculated watercress plants developed similar systemic mosaic symptoms. The virus was also transmitted to *Nicotiana benthamiana*, which exhibited severe mosaic and stunting. The presence of TuMV on these inoculated plants was confirmed by PTA-ELISA and reverse transcription (RT)-PCR. Total RNA extracted from infected and healthy watercress and infected *N. benthamiana* was analyzed by RT-PCR using specific pairs of primers flanking the coat protein gene of TuMV. Degenerated anti-sense (5'-t/caaccctt/gaacgcca/cagt/ca-3') and sense (5'-gcaggtgaa/gacg/acttgat/ca/qc-3') primers were designed after analysis to an alignment

of the nucleotide sequences for five isolates of TuMV available in the GenBank (Accession Nos. NC\_002509, D10927, EU680574, AB362513, and D88614). One fragment of 838 bp was amplified from samples in the infected plants, but not in the healthy controls. Two amplicons were purified and directly sequenced in both directions. Comparisons of the 731-bp consensus nucleotide sequence (Accession No. HM008961) to several other isolates of TuMV revealed 94 to 95% identity in the coat protein region. To our knowledge, this is the first report of TuMV in watercress in Brazil. Management of the disease should include propagation by seeds instead of vegetative parts of the plants and rouging of diseased plants to prevent mechanical transmission during successive harvestings.

**References:** (1) A. J. Boari et al. *Fitopatol. Bras.* 25:438, 2000. (2) A. J. Boari et al. *Fitopatol. Bras.* 27:S200, 2002. (3) M. L. R. Z. C. Lima et al. *Fitopatol. Bras.* 9:403, 1984.