



First report of a tospovirus in a commercial crop of Cape gooseberry in Brazil

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Viruses from the genus *Tospovirus* (family *Bunyaviridae*) are widespread in the Americas, where the following species have been reported: *Tomato chlorotic spot virus* (TCSV), *Tomato spotted wilt virus* (TSWV), *Groundnut ringspot virus* (GRSV), *Chrysanthemum stem necrosis virus* (CSNV), *Zucchini lethal chlorosis virus* (ZLCV), *Impatiens necrotic spot virus* (INSV), *Iris yellow spot virus* (IYSV) (Jones, 2005), *Alstroemeria necrotic streak virus* (ANSV), *Melon severe mosaic virus* (MeSMV) and *Bean necrotic mosaic virus* (BeNMV) (Ciuffo *et al.*, 2009; Hassani-Mehraban *et al.*, 2010; Oliveira *et al.*, 2011).

This work describes the identification of a virus isolated from a commercial crop of Cape gooseberry (*Physalis peruviana*) in October 2009 in Santa Maria, State of Rio Grande do Sul, Brazil. The disease was identified in a 5 ha cultivated area, where 100% of the plants were showing symptoms of stunting, mosaic, necrosis and foliar distortion (Fig. 1). Spherical particles measuring 80-100 nm in diameter were observed by electron microscopy, giving the initial evidence that a tospovirus might be involved in the disease. Sap from the infected leaves of five different Cape gooseberry plants were inoculated on healthy indicator plants: *Petunia hybrida* and *Chenopodium amaranticolor* reacted with local lesions; *Datura stramonium*, *Solanum gilo*, *S. lycopersicum*, *S. nigrum*, *Physalis angulata*, *P. floridana* and *P. peruviana* (Fig. 1) displayed systemic symptoms. Host reactions were typical for those caused by tospoviruses and symptoms on *Physalis* species reproduced those observed in the original samples. Testing by plate trapped-ELISA, a positive reaction was only obtained from all five samples using anti-TCSV antiserum (Embrapa, CNPH, Brazil). Negative ELISA results were obtained using antiserum against four other tospoviruses: *Tomato spotted wilt virus*, *Groundnut ringspot virus*, *Impatiens necrotic spot virus* and *Chrysanthemum stem necrosis virus*. RT-PCR was performed using primers designed to conserved regions of the tospoviral S RNA (Eiras *et al.*, 2001). This generated 440 bp DNA fragments, whose sequence revealed a high degree of nucleotide identity with TCSV isolates from Argentina (98-99%) and Brazil (93-95%). Alignment of the partial coat protein nucleotide sequences showed that the *Physalis* TCSV isolate (GenBank Accession No. JQ034525) clustered with other TCSV isolates, sharing a clade with Argentinean isolates (Fig. 2).

Cape gooseberry is a fruit crop of great nutritional and economic value, which has gradually gained acceptance in international markets, due to its flavour and medicinal properties. In Brazil, it was introduced as a

commercial crop into small farms in southern Brazil (Rufato *et al.*, 2008). To our knowledge, this is the first report of natural occurrence of TCSV in commercial crops of Cape gooseberry. To date the disease is restricted to Rio Grande do Sul State. Further epidemiological studies are necessary for understanding the spread of TCSV into this relatively new introduced crop in Brazil.

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Figure 1

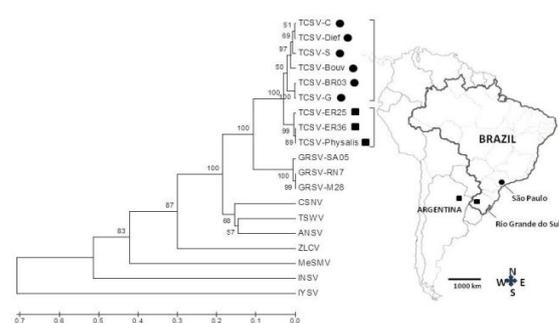


Figure 2

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