

DISEASE NOTE

FIRST REPORT OF *TURNIP MOSAIC VIRUS* ON *TROPAEOLUM MAJUS* IN BRAZILL.M.L. Duarte¹, M.A.V. Alexandre¹, A.L.R. Chaves¹, A.R.A. Canteli¹, A.F. Ramos¹ and R. Harakava²¹Laboratório de Fitovirologia Fisiopatológica, Instituto Biológico, São Paulo, CEP 04014-002, SP, Brazil²Laboratório de Bioquímica Fitopatológica, Instituto Biológico, São Paulo, CEP 04014-002, SP, Brazil

Tropaeolum majus (Tropaeolaceae), popularly known as garden nasturtium and often confused with *Nasturtium officinale* (Brassicaceae), is widely cultivated in southern and southeastern regions of Brazil as ornamental, medicinal and food plant. *T. majus* plants from São Paulo state showing symptoms of mosaic, blistering and leaf distortion were subjected to biological, serological and molecular tests for virus diagnosis. Inoculations on *Chenopodium* species induced local lesions and reproduced the original symptoms on *T. majus*. Naturally and experimentally infected *T. majus* reacted positively to an antiserum raised against a potyvirus group in DAS-ELISA and against a *Turnip mosaic virus* (TuMV) antiserum in indirect ELISA. Total RNA was extracted from infected *T. majus* leaf, and RT-PCR carried out using primers designed on the sequence of part of the cytoplasmic inclusion region of the potyviral genome (Ha *et al.*, 2008), produced a fragment *ca.* 700 bp in size. The fragment was directly sequenced (GenBank accession No. KJ635891) and its sequence (TuMV-TR02) was similar to that of TuMV isolates NDJ (AB093616) and AI (AB093598) with 78.8 and 92.1% nucleotide identity, respectively. Phylogenetic trees constructed with maximum parsimony, maximum likelihood and neighbor-joining algorithms using the PAUP program were similar. The TuMV-TR02 isolate formed a monophyletic group with isolates from Italy belonging to the basal-B group proposed by Oshima *et al.* (2002). This is the first report of TuMV on garden nasturtium in Brazil.

Ha C., Coombs S., Revill P.A., Harding R.M., Vu M., Dale J.L., 2008. Design and application of two novel degenerate primer pairs for the detection and complete genomic characterization of potyviruses. *Archives of Virology* **153**: 25-36.

Oshima K., Yamaguchi Y., Hirota R., Hamamoto T., Tomimura K., Tan Z., Sano T., Azuhata F., Walsh J. A., Fletcher J., Chen J., Gera A., Gibbs A., 2002. Molecular evolution of *Turnip mosaic virus*: evidence of host adaptation, genetic recombination and geographical spread. *Journal of General Virology* **83**: 1511-1521.

Corresponding author: L.M.L. Duarte

Fax: +55.11.50871793

E-mail: Duarte@biologico.sp.gov.br

Received August 4, 2014

Accepted August 8, 2014

DISEASE NOTE

FIRST REPORT OF PEPPERMINT LEAF SPOT CAUSED BY *ALTERNARIA ALTERNATA* IN IRAND. Moshrefi Zarandi¹, M.M. Aminae², A. Sharzei³ and S. Rezaee⁴¹Department of Plant Pathology, College of Agriculture, Marvdasht Branch, Islamic Azad University, Marvdasht, Iran²Department of Plant Protection, Agricultural and Natural Resources Research Center of Kerman, Kerman, Iran³Department of Plant Pathology, Aburaihan Campus, University of Tebran, Tebran, Iran⁴Department of Plant Pathology, College of Agriculture and Natural Resources, Science and Research Branch, Islamic Azad University, Tebran, Iran

Peppermint (*Mentha piperita*), a herbaceous plant in the family Lamiaceae, is a medicinal herb widely grown in Iran. Symptoms of leaf spot were observed during a survey in peppermint fields of Kerman (southeast Iran) in November 2012. In some fields, more than 40% of the plants showed leaf spots. Samples of infected leaves were surface-sterilized with 0.5% sodium hypochlorite, rinsed with sterile distilled water, cultured onto potato dextrose agar (PDA) and incubated at 25°C. After seven days, dark olivaceous colonies developed which produced profuse golden brown, branched, and septate hyphae, and muriform conidia in long chains on straight and septate conidiophores. Based on the morphological characters, the fungus was identified as *Alternaria alternata* (Simmons, 2007). To confirm identification, DNA was extracted from a single spore isolate. The internal spacer (ITS) region was amplified using the universal primers ITS1 and ITS4 and sequenced. The resulting sequence (560 bp), which showed more than 99% identity with *A. alternata* isolates in BLASTn analysis, was submitted to GenBank (accession No. KM076936). Pathogenicity tests were performed by spraying suspensions of 10⁴ spores per ml on the leaves of healthy peppermint plants. After 10 days, an average of 47.85% of the leaves of inoculated plants showed spots similar to those observed in the field. *A. alternata* has previously been reported as a leaf spot pathogen on peppermint from Poland (Zimowska, 2007) but, to our knowledge, this is its first report on peppermint in Iran.

Simmons E.G., 2007. *Alternaria*: An Identification Manual. APS Press, St. Paul, MN, USA.

Zimowska B., 2007. Fungi colonizing and damaging different parts of peppermint (*Mentha piperita* L.) cultivated in South-Eastern Poland. *Herva Polonica* **53**: 4.

Corresponding author: D. Moshrefi Zarandi

Fax: +98.71.43311172

E-mail: delbar.moshrefi@yahoo.com

Received August 16, 2014

Accepted August 18, 2014