DISEASE NOTES

First Report of *Turnip yellows virus* on Oilseed Rape in Serbia

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Oilseed rape (*Brassica napus* L.) is one of the most important oil crops and is grown on the third-largest growing area in the world compared with other oil crops. Due to its high seed-oil and protein content, oilseed rape is grown for the production of vegetable oil and as biofuel (Wang et al. 2011). In May 2014, oilseed rape plants showing virus-like symptoms including leaf yellowing and reddening of margins followed by leaf distortion were observed on approximately 20% of field plants in the Crvenka location (West Bačka District, Serbia). Leaves from 20 symptomatic plants were collected and tested for the presence of common oilseed rape viruses *Turnip yellows virus* (TuYV), *Cauliflower mosaic virus*, and *Turnip mosaic virus,* using commercial double-antibody sandwich (DAS)-ELISA diagnostic kits (Loewe Biochemica, Sauerlach, Germany). Commercial positive and negative controls were included in each ELISA. TuYV was serologically detected in all collected samples, whereas neither of the other viruses was detected. In aphid transmission tests, nymphs of *Myzus persicae* (Sulzer) were allowed to feed on the leaves of the sampled oilseed rape plant (114-TuYV) for an acquisition period of 1 day and then 5 to 7 aphids were transferred to three plants of each *Capsella bursa-pastoris* and *Physalis floridana* for a 4-day inoculation access period. All inoculated *C. bursa-pastoris* plants exhibited leaf reddening and stunting, while all inoculated *P. floridana* plants showed a

mild interveinal chlorosis 5 weeks postinoculation (wpi). In the same manner, the virus was successfully transmitted to *B. napus* 'Banaćanka' that reacted with a mild yellowing symptom 6 wpi. Infection was confirmed by ELISA. For further confirmation of TuYV infection, total RNAs were extracted from all 20 naturally and three artificially infected oilseed rape plants using a RNeasy Plant Mini Kit (Qiagen, Hilden, Germany) and analyzed by conventional reverse transcription (RT)-PCR. A 780-bp fragment of TuYV P0 gene was amplified with the OneS RT-PCR kit (Qiagen) using primers TuYVorf0F and TuYVorf0R (Wilson et al. 2012). Total R extracted from healthy oilseed rape leaves as well as RNase-free water were used as n controls in RT-PCR. Amplicons of the expected size were obtained from all symptomati oilseed rape plants assayed, whereas no amplification products were observed in the controls. After purification with QIAquick PCR Purification Kit (Qiagen), the RT-PCR product derived from one selected isolate, 114-TuYV, was sequenced directly in both directions and deposited in GenBank (Accession No. KR351306). The consensus maximum parsimony tree constructed with MEGA 5 (Tamura et al. 2011) using P0 gene sequences of TuYV, *Beet western yellows virus*, *Beet chlorosis virus*, and *Cucurbit aphid-borne yellows virus* isolates available in GenBank revealed that Serbian TuYV isolate, 114-TuYV, resided in the cluster with the known TuYV isolates (Wilson et al. 2012). To our knowledge, this is the first report of natural occurrence of TuYV on oilseed rape in Serbia. Oilseed rape is an important crop in Serbia, with export value over 15 million USD in 2011 (FAO 2015). The presence of this potentially harmful virus could have drastic economic impact on the production of oilseed rape in Serbia as well as other susceptible *Brassica* species.

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