

DISEASE NOTE

**FIRST REPORT OF HYBRIDIZATION
BETWEEN TWO *FORMAE SPECIALES*
PUCCINIA STRIIFORMIS f. sp. *HORDEI*
AND *PUCCINIA STRIIFORMIS* f. sp.
TRITICI IN IRAN**

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During 2012-2013, yellow rust samples from barley, wild barley (*Hordeum morinum*) and wheat from different provinces of Iran were used to inoculate Afzal (barley cultivar) and Morocco (wheat cultivar), susceptible to all *Puccinia striiformis* f. sp. *hordei* (*Psb*) and *Puccinia striiformis* f. sp. *tritici* (*Pst*) isolates, respectively. The isolates were identified as *Psb* or *Pst* based on virulence on barley or wheat differential seedlings, respectively (Chen *et al.*, 1995). In order to study the genetic diversity, we used 18 isolates representative of different pathotypes from different hosts. The genetic diversity was assessed using five simple sequence repeat (SSR) markers and by examining intergenic spacer 1 (IGS1) region. A total of 14 genotypes were identified within the studied isolates, of which eight genotypes related to *Psb* and six genotypes related to *Pst*. The multiplied fragments of some SSR loci, in particular RJ2N, showed that some isolates have alleles in common with isolates of *Psb* and *Pst*. Dendrograms were generated using virulence and markers data. Clustering analysis showed groups related to their hosts: isolates infecting only wheat, isolates infecting only barley; isolates infecting both wheat and barley differential genotypes; and isolates infecting only wild grasses with some overlaps. The groups infecting both barley and wheat differentials (based on virulence data) and having some SSR alleles in common with *Psb* and *Pst*, appeared to be hybrid group between two *formae speciales*. Before this report, Cheng and Chen (2009) and Holtz *et al.* (2014) had reported hybridization between two *formae speciales*.

Chen X.M., Line R.F., Leung H., 1995. Virulence and polymorphic DNA relationships of *Puccinia striiformis* f. sp. *hordei* to other rusts. *Phytopathology* **85**: 1335-1342.

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DISEASE NOTE

**FIRST REPORT OF COLEUS BLUMEI
VIROID IN MALAYSIA**

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Plectranthus scutellarioides (synonym: *Coleus blumei*) is a popular home garden plant in Malaysia. It is susceptible to infection of six variants of coleus blumei viroid (CbVd) (genus *Coleviroid*; family *Pospiviroidae*). A total of 49 samples from cultivars Saturn and Dipt in Wine showing symptoms such as dwarfing, faded color and reduction in leaf size were collected from commercial nurseries and residential areas from different states in Malaysia from February to June 2016. Total nucleic acid was extracted from the leaves and tested by RT-PCR using three sets of primers: CbVdR/CbVdF, CbVd5F/CbVd5R (Hou *et al.*, 2009) and CbVd-1F/CbVd-1R (Chung and Choi, 2008). Altogether 39 out of 49 samples were positive to CbVd (primers CbVdR/CbVdF) (250-300 bp), CbVd-1 (primers CbVd-1F/CbVd-1R) (249 bp) and CbVd-5 (primers CbVd5F/CbVd5R) (274 bp). The amplicons of 249 bp and 274 bp from CbVd-1 and CbVd-5 specific primers, respectively, were cloned into pCR 2.1 TOPO[®] vector. Sequence analysis of both the 249 nt and 274 nt clones revealed 99-100% identity to CbVd-1 clone 1 (GenBank accession No. DQ178399.1) and CbVd-5 clone 1 (FJ151370.1) from China, respectively, thus confirming the presence of CbVd-1 (MF176948-51) and CbVd-5 (MF176952-55) in all the tested samples. CbVd-1 and CbVd-5 were found together in both cultivars without particular symptom correlation. The cultivation of *P. scutellarioides* in Malaysia is mainly through imported seeds, which could explain the transmission of CbVd in Malaysia. To the best of our knowledge, this is the first report of CbVd-1 and -5 in Malaysia.

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