

First Report of Rice yellow mottle virus on Rice in Burundi

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Disease Notes

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Since the mid-1980s, rice cultivation has expanded rapidly in Burundi to reach approximately 50,000 ha in 2011. In 2007, leaf mottling, reduced tillering, and stunting symptoms were observed on rice at Gatumba near Bujumbura, causing small patches in less than 10% of the fields. *Rice yellow mottle virus* (RYMV, genus *Sobemovirus*), which has seriously threatened rice cultivation in Africa (1) and was recently described in the neighboring Rwanda (3), was suspected to be involved because of similar symptoms. To identify the pathogen that caused the disease in Burundi, a survey was performed in the major rice-producing regions of Burundi and Rwanda. Six locations in Burundi and four in Rwanda were investigated in April and October 2011. Disease incidence in the fields was estimated to be $15 \pm 5\%$. Symptomatic leaves of 24 cultivated rice plants were collected and tested by double antibody sandwich-ELISA with polyclonal antibodies raised against the RYMV isolate Mg1 (2). All tested samples reacted positively. Four isolates were inoculated on susceptible *Oryza sativa* cultivar IR64 (2). The typical symptoms of RYMV were reproduced 7 days after inoculation, whereas the noninoculated controls remained healthy. Total RNA was extracted by the RNeasy Plant Mini kit (QIAGEN, Hilden, Germany) from 12 samples. The RYMV coat protein gene was amplified by RT-PCR with primers 5'CGCTCAACATCCTTTTCAGGGTAG3' and 5'CAAAGATGGCCAGGAA3' (3). The



sequences were deposited in GenBank (Accession Nos. HE654712 to HE654723). To characterize the isolates, the sequences of the tested samples were compared in a phylogenetic tree including a set of 45 sequences of isolates from Rwanda, Uganda, western Kenya, and northern Tanzania (2,3). Six isolates from western Burundi, namely Bu1, Bu2, Bu4, Bu7, Bu10, and Bu13 (Accession Nos. HE654712 to HE654716 and HE654718), and the isolate Rw208 (HE654720) from southwestern Rwanda, belonged to strain S4-Im previously reported near Lakes Malawi and Tanganyika. They fell within the group gathering isolates from the western Bugarama plain of Rwanda (3). The isolates Bu16 (HE654719) and Bu17 (HE654717) from Mishiha in eastern Burundi belonged to strain S4-lv previously reported around Lake Victoria. However, they did not cluster with isolates from the eastern and southern provinces of Rwanda. They were genetically more closely related to isolates of strain S4-lv from northern Tanzania. Overall, the phylogeography of RYMV in Burundi and Rwanda region was similar. In the western plain of the two countries, the isolates belonged to the S4-Im lineage, whereas at the east of the two countries at midland altitude, they belonged to the S4-lv lineage. The presence of RYMV in Burundi should be considered in the future integrative pest management strategies for rice cultivation in the country.

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