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First report of *Rice yellow mottle virus* in rice in Malawi

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In April 2014, several rice fields in Dedza District in Malawi showed diseased *Oryza sativa* plants with an incidence of 20-30%. The disease caused leaf yellowing and mottling, delayed flowering and plant stunting. These symptoms suggested the presence of *Rice yellow mottle virus* (RYMV, genus *Sobemovirus*), the main viral pathogen of rice in Africa. Subsequently, a survey was conducted in Karonga (2 sites), Khanta Bay, Nkhotakota and Dedza Districts, four major rice growing regions in Malawi. Symptomatic leaves were collected randomly on *Oryza sativa* variety Kilombero. Back-inoculations were performed using three selected samples and the RYMV susceptible rice variety IR64 (five healthy seedlings per sample). Typical yellow mottling symptoms appeared on all inoculated plants within 10 days after inoculation. The five samples collected from the fields and the back-inoculated plants reacted positively when tested by Double Antibody Sandwich-Enzyme Linked Immuno Sorbent Assay (DAS-ELISA) with a polyclonal antiserum raised against an RYMV isolate from Madagascar (Fargette et al, 2002), indicating for the first time the presence of the virus in Malawi. Total RNA was extracted by the RNeasy Plant Mini kit (Qiagen). The 720-bp coat protein (CP) gene was specifically amplified in diseased plants with reverse transcription (RT)-PCR with the primers 5'CTCCCCACCCATCCCGAGAATT3' and 5'CAAAGATGGCCAGGAA3' (Pinel et al, 2000). The sequences were deposited in GenBank (Accession Nos. KP274893- KP274897). The sequences showed 96-99% nucleotide identity between each other. They shared 97.5% mean nucleotide identity with isolates of strain S4-Im (for instance Tz8 AJ511797), the most prevalent strain near Lake Malawi. Since its first description near Kisumu in Kenya in 1966, RYMV has been reported in most rice growing countries of West and West-Central Africa. In East Africa, the virus was reported in Tanzania and Madagascar in 1990s, then in the neighboring countries (Uganda, Rwanda, Burundi and Democratic Republic of Congo) in 2006-2012. The recent discovery of the virus in the Federal Democratic Republic of Ethiopia (Rakotomalala et al, 2014) and now in Malawi showed that RYMV is widely distributed in East Africa and in some countries of Southern Africa. More investigations are needed in order to understand the pathways of RYMV spread and to estimate the impacts of virus on rice cultivation in the region.

References:

- D. Fargette et al. Arch Virol. 147 :583, 2002
- A. Pinel et al. Arch Virol. 145 : 1621, 2000
- M.R. Rakotomalala et al. Plant Dis. 98 : 1449, 2014.