

High resistance to rice yellow mottle virus in two cultivated rice cultivars is correlated with failure of cell to cell movement*1

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Abstract

Rice yellow mottle virus (RYMV) accumulation in protoplasts and whole plants was investigated in two highly resistant cultivars, Tog5681 (*Oryza glaberrima*) and Gigante (*Oryza sativa*). Three susceptible cultivars, i.e. one *O. glaberrima* Tog5673 and two *O. sativa* (IR64, *Ac.* 2428), and a partially resistant cultivar (Azucena) were used as control. After inoculation, accumulation of coat protein (CP) and viral RNA were monitored on protoplasts, inoculated leaves, sheaths of inoculated leaves and newly infected leaves by serological and Northern blot analysis. Viral RNA accumulated to a similar extent in protoplasts from all cultivars studied. In contrast, three distinct *in planta* behaviors were noted. In susceptible plants (IR64, Tog5673 and *Ac.* 2428), there was high CP and RNA accumulation at 5 d.p.i. in whole plants, suggesting that cell to cell and vascular movements occurred before 5 d.p.i. in inoculated leaves. The second behavior concerned Azucena, which showed a delay (around 7 d.p.i.) of viral accumulation in inoculated leaves. The third behavior involved the highly resistant cultivars Tog5681 and Gigante. CP and viral RNA were not detected in these cultivars. The comparison of viral accumulation in protoplasts and plants suggested that resistance of the highly resistant cultivars Tog5681 (*O. glaberrima*) and Gigante (*O. sativa*) was not due to the inhibition of virus replication but rather to the failure of cell to cell movement.

Author Keywords: Rice yellow mottle virus; *Oryza sativa*; *Oryza glaberrima*; virus movement; resistance; Sobemovirus

*1 Abbreviations used in text: BMV, bromo mosaic virus; CaMV, caulimo mosaic virus; CP, coat protein; ORFs, open reading frames; PVY, potato virus Y; RYMV, rice yellow mottle virus.

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