

UNRAVELING THE DYNAMICS OF HOST SPECIFICITY AND RESISTANCE RESPONSE TO POTATO VIRUS Y, AND IMPLICATIONS FOR CROP MANAGEMENT

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Potato virus Y (PVY, *Potyvirus yituberosi*), a virus of the family *Potyviridae*, is one of the most economically important plant pathogens worldwide, severely affecting solanaceous crops such as potato, tomato, pepper, and tobacco. Its rapid evolution, high genetic variability, and ability to overcome resistance genes pose significant challenges for disease control and crop management. Despite ongoing efforts, key aspects of PVY-host interactions remain poorly understood, hindering the development of effective resistance strategies. This study aimed to characterize PVY isolates obtained from different host plants, including sweet pepper, potato, and tomato, to evaluate their infectivity, adaptation, and potential impact on resistance screening programs. By performing cross-inoculation assays in multiple plant species and cultivars, we observed substantial differences in infectivity and adaptation among PVY isolates, emphasizing the crucial role of isolate selection in resistance evaluations. Resistance trials in commercial cultivars of tomato and pepper, as well as in wild *Solanum* spp. accessions, revealed generalized susceptibility, contradicting prior assumptions about the effectiveness of certain resistant genotypes. These results highlight the complex nature of PVY-host interactions and the necessity of revising current breeding strategies. Understanding the specificity and adaptability of PVY isolates is fundamental for designing more robust resistance sources and refining breeding programs tailored to the viral populations circulating in Brazil. Our findings reinforce the urgency of monitoring PVY diversity and spread to improve disease management and secure sustainable crop production.

Palavras-chave: Host range; Resistance screening; *Potyvirus*

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