

## NEW TOMATO GEMINIVIRUSES IN MIXED INFECTIONS IN BRAZIL.

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Geminivirus-associated diseases are becoming one of the most important constraints in tomato production in Brazil. Leaf samples with symptoms such as mottling, mosaic, distortion and curling were collected in commercial fields from two different regions of the State of Pernambuco. Dot blot hybridization with heterologous probe consisting of full-length DNA-A components of BGMV-Br and BGMV-GA showed positive reaction, indicating geminivirus infection. PCR using degenerate primer pairs PAL1v1978/PAR1c715 and PAL1v1978/PAR1c496, which specifically amplify part of the component A of whitefly-transmitted geminiviruses, amplified a fragment of approximately 1.4 and 1.1 kb, respectively. Fragments obtained from one plant of each location were cloned and partially sequenced. Sequence comparison of the N-terminal region of the CP gene, which closely represents the variability of the virus genome, divided the clones into three distinct groups. Sequences of clones from group TGV-PE1 (5 clones), were 95 to 100% identical, indicating that they were clones of the same virus. Sequence of group TGV-PE2 (1 clone) was 83 to 85% identical to TGV-PE1, and group TGV-PE3 (1 clone) was 68% and 74% identical to TGV-PE1 and TGV-PE2, respectively, indicating that these two sequences possibly represent two different viruses, distinct from each other and from TGV-PE1. When compared with homologous regions of different New World whitefly-transmitted geminiviruses, TGV-PE1 was most closely related to BGMV-GA (74 to 85%) and BGMV-PR (73 to 85%); TGV-PE2 had highest identities with SqLCV (78%) and BGMV-GA and BGMV-Br (74%). TGV-PE3 greatest sequence identities were with BGMV-Br (72%) and PYMV and CdTV (68%). These results suggest at least three novel geminiviruses associated to tomato plants in the State of Pernambuco. Furthermore, these viruses are present in mixed infection, since TGV-PE1 and TGV-PE2 are present in a single plant from Petrolina (western part of the State) and TGV-PE1 and TGV-PE3 are present in one the sample from Pesqueira (eastern part) reflecting the complexity of the situation of tomato geminiviruses in Brazil.