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Broad bean wilt virus-1 (BBWV-1) in pepper: optimization of a mechanical-inoculation procedure and screening of *Capsicum* spp. material

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Broad bean wilt virus-1 (BBWV-1) (Fabavirus, Comoviridae) has a worldwide distribution and a wide host range including several vegetable crops. It is aphid-transmitted in a non-persistent mode. It has been found infecting open-field pepper-crops with variable incidences in Argentina, France, Italy, Morocco, Bulgaria, Slovenia and Spain, frequently inducing mild mosaic on leaves, and mosaic, discolouring and distortion on fruits. No genetic resistance to BBWV-1 has been described on pepper. In order to screen for potential sources of resistance on pepper, and given that experimental mechanical-transmission of BBWV-1 often produces irregular responses on inoculated plants, we analyzed the effect of inoculation conditions on the reactions of pepper ‘Yolo Wonder’ and ‘Doux des Landes’ and other indicator species to a Spanish isolate of BBWV-1 (Ben). Different combinations of growth temperature, light intensity, stage of pepper plants, pH and source of inoculum were assayed in climatic chamber, and some of them also in greenhouse. Optimal conditions for inoculation of BBWV-1 on pepper were found on climatic chamber: plants with 2-6 true leaves, grown at 25 °C and 80 PAR (Photosynthetic Active Radiation, $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$). Inoculum propagated on pepper was suitable for screening *Capsicum* material. However, *Physalis floridana*, *Petunia hybrida* and *Ocimum basilicum* were better for biological characterization of BBWV-1 isolates on indicator hosts. Fourteen accessions of *Capsicum* spp. were evaluated by mechanical inoculation with the isolate Ben once or twice in simultaneous experiments in climatic chamber and in greenhouse. All plants of every accession were found susceptible to BBWV-1 in climate chamber experiments. However, some plants of accessions ‘Serrano Criollo de Morelos-334’ and ‘Perennial’ did not show evidence of virus infection in greenhouse experiments.

In order to clarify this behaviour, some of these plants were self-pollinated, and seven ‘Perennial’ and six ‘SCM-334’ progenies were inoculated (10 plants / progeny) twice in greenhouse conditions. Again, some symptomless plants of both cultivars were observed, which were self-pollinated. Thirty progenies of ‘Perennial’ and five of SCM-334 were inoculated (15 plants/progeny) in climatic chamber (25 °C and 80 PAR). All plants showed viral symptoms, which appeared 5-6 days after inoculation, being more visible on SCM-34 plants. We concluded that tested material was not resistant. However, it could exist some tolerance or other mechanism to explain the different behaviour in greenhouse conditions between both cultivars and the susceptible ones.