

RESPONSE OF SEVERAL PEPPER CULTIVARS TO INOCULATION WITH XANTHOMONAS
CAMPESTRIS pv. VESICATORIA

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Introduction

Field experiments carried out in Israel demonstrated a limited control of bacterial scab of pepper by copper compounds; only a slight decrease in disease development was obtained (1, 2). It was of interest to test different pepper cultivars, used commercially in Israel, for their resistance and susceptibility to Xanthomonas campestris pv. vesicatoria (XCV).

Methods

Pepper plants cvs Ma'or (export fresh market), Zahov Naharia, Gamba, Zohar (local fresh market), Bikura, Odem (industrial cultivars), Orly (hot picked cultivar) and Paprica-Shany (spice cultivar) were planted in the open field in brown alluvial soils (Vertisols) in Yizreel Valley, in Terra rosa soils (Rhodoxeralfs) in Bet-Netofa Valley and in pots containing 600 g brown-red degrading sandy soil (Haploxeralfs) of Rehovot in the greenhouse. Inoculum pressure was obtained by infection of seeds and soils by four successive spray inoculations and by placing diseased susceptible plants adjacent to the tested cultivar. All these treatments were performed under partial mist conditions for 12 days. Growth conditions, inoculum preparation, plant inoculation, mist chamber and assessment of disease index (D.I.) were as previously described (2, 3).

Results and Discussion

Artificially-inoculated pepper cultivars grown in a controlled environment and inoculated under partial mist conditions differed in susceptibility to bacterial scab (Fig. 1c). Ma'or was the most susceptible whereas Paprica-Shany was the most resistant. The same relative susceptibilities and resistance were exhibited by these cultivars when tested under field conditions in two regions differing in their climatic conditions. By following the disease index (D.I.) of the inoculated plants during the growing season it was found that disease increased at a constant rate in the susceptible cultivar (Ma'or) whereas in the other cultivars tested the rate of disease development either decreased or remained constant (Fig. 1a,b). In addition it was observed that the foliage of the susceptible cultivar Ma'or in fully-grown plants was much denser than that of the most resistant cultivar Paprica-Shany. Thus Ma'or may have provided a better microclimate for disease development. In a greenhouse experiment the cultivars Paprica-Shany and Ma'or were inoculated under an inoculum pressure. The D.I. of the resistant cultivar was 1.74 ± 0.15 as compared with 2.45 ± 0.3 for the susceptible one. Thus no endogenous resistance was found and the relative field resistance of Paprica-Shany was maybe due to its less dense foliage at the mature growth stage which provided a less favourable environment for the pathogen proliferation. The resistance of Paprica-Shany, and other breeding lines of paprica, should be further tested. A breeding programme for resistance to bacterial scab is needed.

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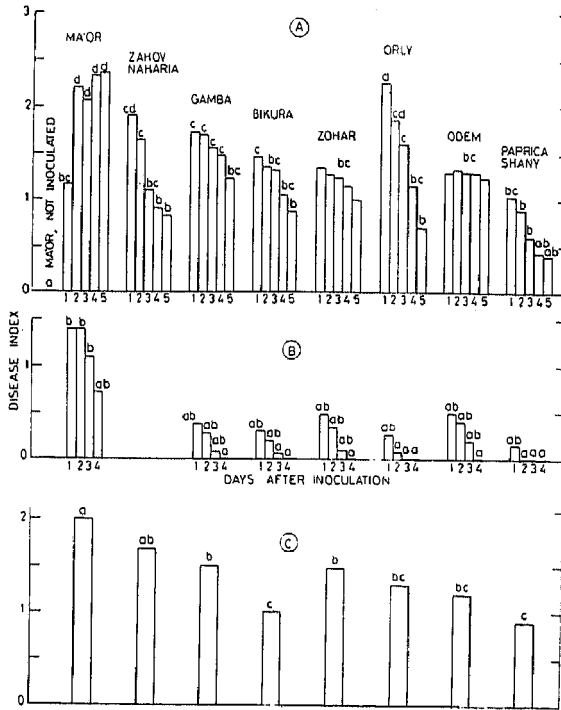


Fig. 1. Development of bacterial scab of pepper in various pepper cultivars in (A) Yizreel Valley; (B) Bet-Netofa Valley and (C) under partial mist conditions in the greenhouse. Disease development was assessed 46 (1), 53 (2), 60 (3), 67 (4) and 74 (5) days after inoculation (A); after 65 (1), 72 (2), 79 (3) and 86 (4) days (B) and after 14 days (C). Histograms followed by different letters in each sub-figure (separately) differ significantly at $P = 0.05$.

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