

## Reaction of Sweet Pepper Genotypes to Anthracnose, Cercospora Leaf Spot, and Powdery Mildew

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### ABSTRACT

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Of 298 genotypes of *Capsicum* spp. evaluated, 16 were resistant and 6 moderately resistant to anthracnose, 6 were resistant and 13 moderately resistant to powdery mildew, and 8 were resistant to Cercospora leaf spot. *Capsicum microcarpum* was resistant to powdery mildew and Cercospora leaf spot. Hungarian Wax (*C. annuum*) was resistant to both anthracnose and Cercospora leaf spot; PI 288982 (*C. annuum*) was moderately resistant to both powdery mildew and anthracnose.

Three diseases, powdery mildew caused by *Leveillula taurica* (Lév.) Arn., Cercospora leaf spot caused by *Cercospora capsici* Cooke, and anthracnose caused by *Colletotrichum capsici* (Syd.) Butler and Bisby reduce yield and quality and limit the production of sweet pepper (*Capsicum annuum* L.) and chillies in India. Because the pattern of rainfall is

unpredictable, chemical control measures are not effective. In view of this, the available germ plasm of sweet pepper was screened against these diseases to locate sources of resistance for use in a breeding program.

### MATERIALS AND METHODS

In the first week of June in 1973, 1974, and 1975, 298 entries of sweet pepper of various species and inbred lines were transplanted separately for tests against anthracnose and Cercospora leaf spot. Seedlings were planted 40 cm apart in rows spaced 50 cm apart. Transplanting for powdery mildew evaluation was done in December 1973 and 1974. Each plot consisted of 10 plants. California

Wonder, a susceptible check, was transplanted every 10 rows.

Plants were inoculated when they were 40 days old and showed vigorous growth. Powdery mildew spores (inoculum from diseased leaves) were dusted on all plants. For Cercospora leaf spot, diseased leaves were macerated in water and a spore suspension (25-30 spores per milliliter) was sprayed with a Gator sprayer (Model GR 10, American Spring & Pressing Works Pvt. Ltd., Bombay, India). Anthracnose inoculum was prepared by harvesting *Colletotrichum capsici* spores from 1-wk-old cultures grown on potato-dextrose agar and suspending 20-25 spores per milliliter of water. The isolate used originated from a single spore from infected leaves and fruits collected from the institute research farm at Hessaraghatta, Bangalore. Plants were inoculated in the evening and then flood irrigated immediately.

Observations were recorded every 15 days until the fruiting stage. Anthracnose and Cercospora leaf spot infections were rated as: R = resistant, no symptoms; MR = moderately resistant, one to five spots per leaf with a yellow halo; MS = moderately susceptible, 6-10 spots per

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**Table 1.** Sweet pepper exhibiting resistant or moderately resistant reactions to anthracnose, Cercospora leaf spot, and powdery mildew

Resistant	Moderately resistant
<b>Anthracnose</b>	
<i>Capsicum annuum</i> cultivars Artakis, August, Chinese Giant, Yolo-Y, Hungarian Wax, Sparton Emerald, Pimiento Paprika, Wonder Top, Malaquetta, Paprika, Kalinkov-805, D-103, Ukrainskij Gorkij, Zlaten Medal <i>C. sinensis</i> var. <i>panca</i> <i>C. fasciculatum</i>	<i>C. annuum</i> cultivars Chinese Giant, Floriyis, PI 288982, Kurtovoska Kapija, Szentesi, Moldova-118
<b>Cercospora leaf spot</b>	
<i>C. annuum</i> cultivars California Wonder, Canape F <sub>1</sub> , Hungarian Wax, Mogidas Cruzes-2, Pazardziska Kapija, Soroksari, Merrimack Wonder <i>C. microcarpum</i>	None
<b>Powdery mildew</b>	
<i>C. microcarpum</i> <i>C. pendulum</i> , var. <i>mono</i> var. <i>sertaozinho</i> <i>C. pubescens</i> <i>C. longistilicum</i>	<i>C. annuum</i> cultivars World Beater, Mammoth Prizetaker, Local Hirehalli, Florida Breeding, 1063-2 Bull Nose, Pimiento Ambato Maggif, Midway, Spanish Long, PI 159252, PI 288982, Chilli Long <i>C. pendulum</i>

leaf with a yellow halo; S = susceptible, 11–20 spots per completely yellow leaf; and HS = highly susceptible, complete defoliation. Powdery mildew was rated as: R = resistant, no symptoms; MR = moderately resistant, trace to 10% leaf area affected; MS = moderately susceptible, 11–20% leaf area affected; S = susceptible, 21–50% leaf area affected; and HS = highly susceptible, 51% or more area affected.

## RESULTS AND DISCUSSION

Infection was noted after 4–6 days for powdery mildew and after 8–10 days for anthracnose and Cercospora leaf spot.

The resistant and moderately resistant reactions of different genotypes are presented in Table 1. Of the 298 entries tested, 16 were resistant and six were moderately resistant to anthracnose. Six entries resistant to powdery mildew belonged to four *Capsicum* spp. other than *C. annuum*. No cultivar was resistant, but many of the 13 moderately resistant entries are cultivated. Only eight genotypes showed resistance to Cercospora leaf spot. The other lines were either susceptible or highly susceptible to anthracnose, Cercospora leaf spot, and powdery mildew.

No entry was resistant to all three

pathogens, although *C. microcarpum* was resistant to powdery mildew and Cercospora leaf spot, and Hungarian Wax (*C. annuum*) was resistant to anthracnose and Cercospora leaf spot. PI 288982 (*C. annuum*) was moderately resistant to both powdery mildew and anthracnose. Some breeding lines, although developed from a common cultivar, showed differential reactions to the same pathogen. Chinese Giant (*C. annuum*), received from different sources, was resistant as well as moderately resistant to anthracnose. Similarly, *C. pendulum* cultivars received from different sources exhibited both resistant and moderately resistant reactions to powdery mildew. Such a differential reaction may be attributed to differences in the genetic architecture of the genotype obtained from different sources. These lines were otherwise homozygous for other horticultural traits.

Kadu et al (1) reported the reaction of different chilli cultivars to anthracnose and did not find any sources of resistance. Singh et al (2) reported resistance to anthracnose in NP Hybrid, Kashmir Yellow, and Kalyanpur-2 chillies. However, we have identified additional sources that can be used to develop cultivars resistant to these diseases. Details on the genotypes we tested can be obtained from the Division of Vegetable Crops, Indian Institute of Horticultural Research, Bangalore-560 080, India.

## ACKNOWLEDGMENT

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