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SOURCES OF RESISTANCE TO TURCICUM LEAF BLIGHT OF MAIZE CAUSED BY *EXEROHILUM TURCICUM* (PASS) LEONARD & SUGGS.

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Ninety four genotypes of maize were tested against Turcicum leaf blight disease at Kalimpong under field condition by the whorl inoculation method during 1984-86. Four genotypes, namely Philippine DMR-1, Philippine DMR-Comp, Virendra and Ganga-5 were found resistant, eight genotypes were moderately resistant, whereas twenty nine genotypes were moderately susceptible. All other genotypes were either susceptible or highly susceptible in disease reaction. Variation in the disease reaction observed within the same genotype at different locations might be due to differences of environment or different races of the pathogen for screening.

INTRODUCTION

Leaf blight caused by *Exserohilum turcicum* is one of the major diseases of maize under Indian condition The disease is found to be prevalent in the Himalayan region, Peninsular India and Bihar. It is the most serious disease in the Kalimpong hills of the Sub Himalayan region of West Bengal. The disease may cause appreciable damage to the standing crop resulting high loss in yield under favourable condition. It is also prevalent at Kalyani and its surrounding areas in the plains of West Bengal.

Most of the recommended cultivars like A-de-Cuba, Kisan, Vijay and Kalimpong yellow are showing progressive susceptible reaction to this disease at Kalimpong condition which may pose a threat to maize cultivation in this area in the near future. The present study was, therefore, undertaken to locate the sources of resistance from the available germplasm from India and other countries.

MATERIALS AND METHODS

Ninetyfour genotypes of maize, originating from different countries of the word were evaluated for resistance to Turcicum leaf blight at Maize Research Station, Kalimpong during the kharif season of 1984—86. The germplasm was supplied by the Project Coordinator (Maize), Cumming's Laboratory, Indian

Agricultural Research Institute, New Delhi-12. The seeds were planted by the second week of May in two rows plots each of five meter length containing twenty plants with two replications. Normal agronomic practices were followed and no plant protection measure was under taken.

The whorl inoculation method by using infected leaf powder as described by Sharma (1982) was followed to inoculate the standing plants of about 30 to 45 cm high. The inoculum was prepared from the infected maize leaves collected from the maize experimental plot at Kalimpong. The inoculation was repeated four times at weekly interval. Adequate controls were kept by keeping uninoculated plants. The disease was rated visually on the basis of 1 to 5 scale, as described elsewhere in details (Payak and Sharma, 1982a), consisting of five broad categories designated by different index from 1 (very slight infection) to 5 (very heavy infection). The measurement was based on the number of lesions present on a leaf and their subsequent spread. Thus all the plants in a variety were affixed with a particular disease index and the average per plant was calculated. Finally, the type of disease reaction in a variety was determined (Kaiser, 1983).

RESULTS AND DISCUSSION

The genotypes differed greatly in their reaction to this disease with the average grade ranging from resistant to highly snsceptible as presented in Table 1. Among the varieties tested four varieties, namely Philippine DMR-1, Philippine DMR-Comp, Virendra and Ganga-5 were resistant, while eight varieties, namely African tall, Pratap Comp (J-54), EVA (MDR-2) 76, MCU-204, MCU-216, MCU-314, VL-20 and VC-80 were moderately resistant. Among the important varieties Kisan, NLD Comp, Tarun, Vikram, Bracaticas (Y), Bracaticas (W), Comp A53-54, Cuba-11J_1 (Arr_2), CIMMYT bulk-5, Philippine DMR-5, MCU-501, MCU-508, Pop-61, Philippine DMR-2, Sona Recon-11, U.K. Bulk, VC-69 and VC x (Eto x Tuxp. br_2) were moderately susceptible, whereas, varieties A-de-Cuba, Ageti-76, Auti-Auti (High alt. Comp), Super-1 Comp, Vijay, MCU-507, VL-42 and VL-47 were susceptible and Auli Comp, Diara, Hunius, Safeda, Basant-3, J_1 (Arr_2) original, VL-41 and VL-54 were higely susceptible in their reaction to this disease. Singh (1982), and Payak and Sharma (1982b) have also reported resistant reaction of Philippine DMR-1, Philippine DMR-Comp and in some released varieties including Virendra and Ganga-5, but Philippine DMR-5 reported resistant, was moderately susceptible in the present study. Further, the two released varieties Kisan and Vijay showing resistance under Kalyani condition were found moderately susceptible to susceptible under Ralimpong condition. These differences in disease reaction may be attributed to the differences in the environment or different races of the pathogen used for

Table 1. *Reaction of different genotype of maize to Turcicum leaf blight*

Reaction	Genotype
Resistant	Philippine DMR-1, Philippine DMR-Comp, Virendra, Ganga-5.
Moderately resistant	African tall, Pratap Comp (J-54), EVA (MDR-2) 76, MCU-204, MCU-216, MCU-314, VL-20, VC-80.
Moderately susceptible	Kisan, NLD Comp, Tarun, Vikram, Bracaticas (Y), Bracaticas (W), Comp, A 53-54, Cuba-II J (Arr_2), CIMMYT bulk-5, Philippine DMR-5, EV (MDR-1) 76. H-251, H-405, Hunius x J-603 Ru-80-3, J-2006, J_1 (Arr_2) KFS-3, L-19, LG-16, M-9, MCU-501, MCU-508 MCU-78-1022, P-6875, Pop-61, Philippine DMR-2, Sona Recon-II, U. K. bulk, VC-69 VC-80 x (Eto x Tuxp-br_2).
Susceptible	A-de-Cuba, Ageti-76, Auli-Auli (High alt. Comp), Super-1 Comp, Vijay, D-823, Early white, FH-4001-5 x Hunius (ZFS_2) Ru-80-3, J-660, J-1006, KMR-35, Kalyani Pool-1, L-16, MCU-507, NLD-DFP-106, Pool-7, VL-42, VL-71.
Highly susceptible	Auli Comp, Balanced Canadian Comp, Diara, Hunius, Navin Comp (J-54), Safeda, VL-16 Comp, Blanco Theobromina, Basant-30 Comp A 51-54, Comp A 52-53. Diara EV (IFS-3) x EH-400175, Ru-80-35, Diara (ZFS-3), Diara (MFS-4), D-765, D-816, G-25, G-40, H-265, Hunius (QFS8) F_2F, J 305, J 2017, J 2018, J 3017, J 3018, J_1 (Arr_1) Original, MCU,-78 2034, NLD (Recon), R-4, (Syn P 200 x Kisan) Hunius 27, (Syn P 200 x Kisan) Hunius U-37, (Syn P 200 x Kisan) x Hunius U-42, VL-41, VL-54.

screening. From the present study it is also clear that there are different levels of resistance to Turcicum leaf blight available in the maize germplasm. The wide range in the disease reaction and the continuous nature of variation to both Turcicum and Maydis leaf blights of maize have been also reported by several workers (Jenkins and Robert, 1952 ; Pate and Harvey, 1954 ; Handoo, 1969). This resistance as observed in the present study can bc further exploited by the breeders and pathologists for the development of new varieties.

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