

## Fruit rot (*Alternaria alternata*) and Sources of Resistance in Ber Germplasm under Arid Conditions

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Ber (*Zizyphus mauritiana* Lam.) is an important fruit crop of semi-arid and arid regions. Among the biotic stresses, diseases like powdery mildew (Pareek and Vishal Nath, 1996) and leaf spots (Verma *et al.*, 1992) were reported to limit the productivity and quality of fruits. However, recently the fruit rot caused by *Alternaria alternata* was observed as one of major diseases of ber under arid conditions. Detailed information about the disease, pathogen survival and the reactions of ber germplasm against this major disease are presented.

A fungus was isolated from rotten fruits and identified as *Alternaria alternata*, based on the standard description by Webster (1979) and Hawksworth *et al.* (1996). Infected tissues were cut into 2-5 mm pieces and surface sterilized using 0.1% sodium hypochlorite, washed in sterile deionized water and placed over oat meal agar medium (40 g oat, 15 g agar, 1000 ml distilled water) supplemented with 1000 ppm streptomycin sulphate in sterile petri plates. Plates were incubated at  $25 \pm 2^\circ\text{C}$  for a week. Mycelial colonies from infected tissues were reisolated, purified and identified. Pathogenicity of the fungus was also confirmed by reinoculation in healthy fruits of some commercial genotypes like Gola, Umran, Seb and Kaithali.

Ber genotypes in our germplasm repository were evaluated, based on the natural incidence

of fruit rot, as per the standard procedures. Disease symptoms were observed during November to February 1997-98. One tree in each of the 3 replications was evaluated in a randomized block design. In each replication, 50 fruits were randomly selected from all portions of the tree and incidence was observed (Pareek and Vishal Nath, 1996). The per cent fruit infection was rated according to McKinney's (1923) formula by following 0-5 scale.

A good variation in disease reactions of different genotypes was recorded. Out of 123 genotypes evaluated, 31 were resistant, 34 moderately susceptible, 30 susceptible and 14 highly susceptible. Fourteen genotypes were not evaluated due to no fruiting or the fruit number was inadequate (Table 1). Complete mortality and dropping of fruits were noticed in all the susceptible genotypes. Appearance of 4-5 infection flecks in these types resulted in shedding of fruits, while in case of resistant genotypes fruits could attain the maturity stage even with partial infection. However, pulp content in both types of fruits was poor, discolored with disintegrated tissues. In very rare cases like Sanuar 6, Panthani and Narikeli, infection started from the base and progressed upwards. The interrelationship between fruit fly infestation and subsequent infection of *A. alternata* is under investigation. The spurt of defence mechanisms in the resistant genotypes in response to pathogen attack

Table 1. Fruit rot reactions in ber germplasm

Kind of reactions	No. of genotypes
Resistant	31
Moderately susceptible	34
Susceptible	3
Highly susceptible	14

might be one of the reasons for the infection. In case of susceptible types pathogen might have overcome the host defence reactions that resulted in severe dropping of fruits after the pathogen infection and proliferation.

Earlier results on the varietal reactions against *A. alternata*, as leaf spot pathogen in ber, showed the susceptibility in all commercial cultivars. Some cultivars like Popular gola, Govindagarh special, ZG-3, Illaichi and Dandan were found moderately susceptible. The only genotype Villaiti was found to be resistant. Pareek and Vishal Nath (1996) reported that *A. alternata* as leaf spot pathogen under various agroclimatic conditions (leaf spot in Jobner, Jodhpur and Hisar; leaf and fruit spot in Rahuri). Jat *et al.* (1977) found that the incidence of fruits rot due to these pathogens varied from 2 to 15.3%. In our screening, genotypes like ZG-2, Sua, Mundia murhera, Noki,

Katha, Kaithali, Mundia, Kali, Kakrala gola, Foliso Alwari and ZG-3 were highly susceptible. However, the resistant genotypes identified in the present study may be useful as donors in amelioration of ber varieties through breeding programmes.

## References

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