

## SHORT COMMUNICATION

## Identification of Resistance Source against Shot Hole – A Fungal Disease in Peach (*Prunus persica* L.) Germplasm

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Shot hole disease of stone fruits caused by a fungus *Wilsonomyces carpophilus* Lev. (Adaskaveg *et al.*, 1990) is an important and widespread disease in North-west Himalayan region. It is also known as *Coryneum* blight, California peach blight, fruit spot, winter blight and postular spot. The earlier generic names for this fungus include *Clasterosporium*, *Coryneum* and *Stigmina*. In India, Munjal and Kulshrestha (1968) first reported occurrence of this disease on peach, apricot and almond. Shot hole disease has been reported in lower hills of Kullu valley, areas of Mandi, Solan and Shimla districts of Himachal Pradesh (Gupta *et al.*, 1973b).

The fungus of shot hole produces black fruit like fruiting bodies on the necrotic cankers and twigs. The fruiting bodies produce numerous conidia which are thick walled, ellipsoidal or fusiform which infest buds and twigs of trees during winter. Blight symptoms appear on twigs, leaves and fruits. On twigs small purple and slightly raised pustules appear in late December or early January, which later develops into necrotic canker. The spot on fruits are small, circular, deep purple which appear on peach fruits when they attain almost half size in the middle of May. On leaves dark brown, scattered lesions enlarge rapidly and abscission of the diseased area results in shot hole. The intensity of the infestation become severe when the day temperature rises and occurrence of frequent rains for several months from spring to summer (Gupta *et al.*, 1972-1974). Consequent upon, several holes of 0.1 to 0.3 mm of diameter appear on the peach leaves. Owing to shot hole severity the peach leaves becomes sieved, therefore net photosynthetic leaf area is reduces and translocation of photosynthate from leaves to the fruits may be insufficient.

Present investigation was carried out in the peach block of field gene bank, at National Bureau of Plant Genetic Resources, Phagli, Shimla during

rainy season 2005. Peach block containing 38 accessions of 8 to 15 years of age. The observations on reaction to shot hole infestation were recorded during rainy season 2005 on single plant of each accession, when the disease severity was high. Ten randomly selected leaves from all corners of each accession were taken to record number of holes on the leaves. Then average value was considered to determine the level of susceptibility to shot hole based on 1 to 9 scale as per minimal descriptors of peach published by National Bureau of Plant Genetic Resources, New Delhi (Mahajan *et al.*, 2002). Reaction to shot hole disease (Figures 1 and 2) in 38 peach accessions is presented in Table 1. Three accessions of peach *i.e.* IC 209015, IC 349931 and EC 321412 showed very low susceptibility indicating high resistance to shot hole disease. Five accessions *i.e.*, EC 552645, EC 468323, EC 468324, IC 19398 and IC 20841 showed low symptom against shot hole disease, these accessions were rated as resistant. Nine peach accessions showed tolerance, 12 accessions as susceptible and 9 accessions as highly susceptible.

Meagre information is reported about resistant genotypes for shot hole in peach. Simeone (1985) has



Fig. 1: Peach (EC38736) susceptible to shot hole

Table 1. Reaction to shot hole disease in 38 peach accessions

S.No	Accession	Alternate identity	Disease score	Remark
EC 321412	Nemaguard	1	highly resistant	
EC 552639	Sun Red	7	susceptible	
EC 38737	Kanto 5	9	highly susceptible	
EC 280769	Yum Yung	9	highly susceptible	
EC 552640	Flordasun	7	susceptible	
EC 552641	Co-Smith	9	highly susceptible	
EC 552642	Snow queen	7	susceptible	
EC 174084	Luna	5	tolerant	
EC 27793	July Elberta	7	susceptible	
EC 38736	Nishiki	9	highly susceptible	
EC 468326	Fortuna	5	tolerant	
EC 552645	Early Red Fair	3	resistant	
EC 27791	Stark Early Glo	9	highly susceptible	
EC 552643	Florabella	7	susceptible	
EC 280765	Okubo	5	tolerant	
EC 110858	Stanford	7	susceptible	
EC 312408	May Fair	5	tolerant	
EC 115563	Dixi Red	9	highly susceptible	
EC 280767	Nunomwasi	7	susceptible	
EC 110859	Boyce	5	tolerant	
EC 198817	Summer Glo	9	highly susceptible	
EC 57530	Candor	9	highly susceptible	
EC 313953	Sone peach	7	susceptible	
Red Gold	Red Gold	5	tolerant	
EC 331812	Fire Prince	7	susceptible	
EC 552644	Duke	5	tolerant	
EC 468323	Andross	3	resistant	
EC 468324	Fertilia	3	resistant	
IC 209015	BDJ-341	1	highly resistant	
IC 349931	RSSML-25	1	highly resistant	
IC 349929	RSSML-23	9	highly susceptible	
IC 201914	BDJ-340	7	susceptible	
IC 349928	Shan-e-Panjab	7	susceptible	
IC 349930	S-37	7	susceptible	
IC 19398	BDJ-93-39	3	resistant	
IC 20840	BDJ-188	5	tolerant	
IC 020841	BDJ-206	3	resistant	
IC 19397	BDJ 93-32	5	tolerant	

1: very low or no visible sign of susceptibility; 3: low; 5: intermediate; 7: high; 9: very high

also reported that peach diseases are major production and marketing problems, there have been few reports on significant levels of resistance to most peach infecting

organisms and little information is available about resistance to shot hole (*Stigmina carpophila* (Lev.) Ell. syn. *Coryneum beyerinckii* Oud. Keil and Fogel (1974)

reported that Neemaguard is resistant to bacterial leaf and fruit spot. Ramming and Tanner (1983) reported that Nemaguard a cultivar of peach and its recently released offspring Nemared are the most widely used resistant stocks against nematodes, although Nectared 2 has somewhat resistant to shot hole. Hesse (1975) has also reported that Nemaguard is resistant to root-knot nematode *Meloidogyne incognita* and *M. javanica*. Therefore, the accession EC 321412 (Nemaguard) has dual advantage of resistance for shot hole and nematode as well. EC 321412 (Nemaguard) was introduced at this station from USA during mid eighties, it has large size fruit (average fruit length 62.8mm,



Fig. 2: Peach (IC209015) resistant to shot hole

average fruit width 58.9 mm and average fruit weight 111g) with high productivity status. Other two peach accessions IC 209015 and IC 349931 are indigenous collections showed high level of resistance against shot hole disease have medium size fruits (average fruit weight 66.4g and 49.4g respectively) and productivity status (high and low respectively). These three peach accessions (EC 321412, IC 209015 and IC 349931) can be utilized in crop improvement programme.

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