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**Suhail Altaf**  
Division of Plant Pathology,  
SKUAST-K Shalimar,  
Jammu and Kashmir, India

**TR Rather**  
Division of Plant Pathology,  
SKUAST-K Shalimar,  
Jammu and Kashmir, India

**Sajad Ahmad Rather**  
Division of Plant Pathology,  
SKUAST-K Shalimar,  
Jammu and Kashmir, India

**Shaheen Kousar**  
Division of Plant Pathology,  
SKUAST-K Shalimar,  
Jammu and Kashmir, India

**NA Khan**  
Division of Plant Pathology,  
SKUAST-K Shalimar,  
Jammu and Kashmir, India

**Correspondence**  
**Suhail Altaf**  
Division of Plant Pathology,  
SKUAST-K Shalimar,  
Jammu and Kashmir, India

## Status of entomosporium leaf and fruit spot disease of pear (*Pyrus communis* L.) in Kashmir valley

**Suhail Altaf, TR Rather, Sajad Ahmad Rather, Shaheen Kousar and NA Khan**

### Abstract

An extensive survey of pear orchards in Anantnag, Pulwama and Budgam districts of Kashmir Valley during the months of July-August, 2014 was undertaken to record the status of the disease. During the survey, the disease was predominantly observed on leaves than on fruit with varying degrees of incidence and intensity. On leaves the disease incidence and intensity ranged from 37.78 to 60.00 and 16.55 to 35.93 percent respectively, while, on fruit it ranged from 17.33 to 34.48 and 8.44 to 24.68 percent respectively. The survey conducted in all the three districts reveals that the disease was present in varying degrees of incidence and intensity at all the surveyed areas of the valley. Among the different districts surveyed, on an average the highest leaf and fruit spot incidence of 50.34 and 26.22 percent, respectively, and intensity of 28.44 and 17.33 percent was observed in district Budgam, followed by district Pulwama with an average leaf and fruit disease incidence of 41.47 and 21.98 percent, and intensity of 20.17 and 12.39 percent, respectively. Minimum leaf and fruit spot incidence of 38.69 and 20.88 percent, and intensity of 20.17 and 12.39 percent, respectively, was recorded in district Anantnag. The prevalence of the disease at all the surveyed locations is indicative of the congenial environmental conditions of Kashmir valley for disease development. The higher disease incidence and intensity in district Budgam could probably be attributed to mono crop culture, as the district is leading one in the valley with maximum area under pear cultivation compared to other districts. Moreover, the occurrence of old pear orchards with aged trees in district Budgam seems to have cumulative effect of disease development in these orchards.

**Keywords:** Pear, survey, disease, Kashmir

### Introduction

Pear (*Pyrus communis* L.) is one of the important pome fruits grown throughout the world. Pear is of great economic significance in Kashmir valley after apple, having good taste and flavor. Globally pear is cultivated over an area of 1580 thousand hectares, with an annual production of 22.5 million tonnes. The major producers being China, Italy, USA, Spain, Argentina, Republic of Korea, Turkey, Germany, Japan and South Africa (Anonymous, 2009) [2]. In India its cultivation is mainly confined to temperate regions of North particularly in the states of Jammu and Kashmir, Punjab, Haryana, Himachal Pradesh, Uttar Pradesh and also in some parts of South over an area of 279 thousand hectares, with an annual production of 317 thousand metric tonnes (Anonymous, 2009a) [3]. Of this area and production, Jammu and Kashmir State accounts for about 4.73% (13.21 thousand hectares) area and 18.36% (58.21 thousand metric tonnes) production, respectively (Anonymous, 2012) [4]. The productivity of pear in Kashmir valley is very low compared to other parts of the world owing to many biotic and abiotic factors inflicting huge economic losses, despite the fact that the agro-climatic conditions of the valley are ideally suited for its cultivation.

Losses though differing in magnitude have been reported by different countries. Birmingham (1932) [5] reported that fruits and leaves of pear plantation were seriously attacked by the disease which caused huge losses in fruit yields. Anderson (1946) [1] reported complete mid-summer defoliation by the disease leaving only small sized unripe fruits on trees. Mendoza and Ortiz (1984) [8] observed 100% foliage infection in June - July and 30 percent fruit infection in November, besides pre-mature defoliation, bloom decrease in following year and fruit cracking which increased with fruit development. Considerable losses in pear yield due to the disease have also been observed in central black sea region (Ishchenko *et al.*, 1983) [7].

## Methods and Materials

The present investigations were conducted in the Division of Plant Pathology, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir (SKUAST-K), Shalimar, Srinagar. To record the status of Entomosporium leaf and fruit spot disease of pear in Kashmir valley, extensive survey was carried in three districts viz., Anantnag, Pulwama and Budgam during 2014 in the months of July to August 2014. In each district, three locations were selected and one orchard in each of the three (villages) taken to represent a location. Six trees were randomly selected from each orchard and 100 leaves and 100 fruits from each tree around the

canopy were randomly examined for assessing the incidence and intensity of the disease. Percent disease incidence was calculated using the formula:

$$\text{Percent disease incidence} = \frac{\text{Number of diseased leaves/fruits}}{\text{Total number of leaves/fruits examined}} \times 100$$

The percent disease intensity on leaves and fruits was calculated after rating the level of disease on 0-5 scale of Horsfall and Hueberger (1942) [6] adopted by Zargar (1995) [9] as described below:

Category	Numerical value	Criterion
I	0	Disease free
II	1	1-5 spots on leaf/fruit
III	2	6-10 spots on leaf/fruit
IV	3	11-25 spots on leaf/fruit
V	4	26-50 spots with or without coalescing
VI	5	Above 50 spots with or without coalescing

Percent disease intensity was calculated using the formula

$$\text{Percent disease intensity} = \frac{\sum (n \times v)}{N \times G} \times 100$$

Where,

$\Sigma$  = Summation

n = Number of diseased leaves/fruits in each category;

v = Numerical value of each category;

N = Total number of leaves/fruits examined; and

G = Maximum numerical value

## Results and Discussion

In the present investigations, an extensive survey of pear orchards in Anantnag, Pulwama and Budgam districts of Kashmir Valley during the months of July-August, 2014 was undertaken to record the status of the disease. The survey conducted in all the three districts reveals that the disease was present in varying degrees of incidence and intensity at all the surveyed areas of the valley. Highest disease incidence and intensity of 50.34 and 28.44 percent, respectively on leaves and 26.22 and 17.33 percent, respectively on fruits was observed in Budgam district, while, minimum disease incidence and intensity of 38.69 and 20.17 percent, respectively on leaves and 20.88 and 12.39 percent, respectively on fruits was observed in Anantnag district.

### On leaves

The data presented in Table 1, Fig. 1 reveals that among the different locations surveyed, maximum disease incidence and intensity of 63.00 and 35.93 percent, respectively, was observed at Chaari Sharief in Budgam district, while minimum disease incidence and intensity of 34.49 and 16.55 percent, respectively, was observed at Bijbehara in Anantnag district. In district Pulwama average disease incidence and intensity irrespective of cultivars, was highest at Shadimarg with 47.23 and 27.05 percent respectively, followed by Nawa (39.42 and 21.48%) and least at Pampore (37.78 and 18.31%) respectively, with an overall disease incidence and intensity irrespective of locations of 41.47 and 22.28 percent respectively. In district Anantnag the average disease incidence and intensity was highest at Kanalwan with 42.10 and 22.47 percent respectively, followed by Achabal (39.49

and 21.50%) with least at Bijbehara 34.49 and 16.55 percent respectively, with an overall disease incidence and intensity of 38.69 and 20.17 percent respectively. Similarly, in district Budgam the average disease incidence and intensity was highest at Chaari Sharief with 63.00 and 35.93 percent respectively, followed by Beerwah (45.44 and 26.03%) and least, at Khan Sahab (42.60 and 23.37%) respectively, with an average disease incidence and intensity of 50.34 and 28.44 percent, respectively. The mean disease incidence and intensity at all the locations, irrespective of cultivars was 43.50 and 28.44 percent, respectively.

### On fruits

Regarding the fruit disease, similar trend of results was observed. The data presented in Table 2, Fig. 1 reveals maximum disease incidence and intensity of 34.48 and 24.68 percent, respectively at Chaari Sharief of Budgam district. While, minimum disease incidence and intensity of 17.33 and 8.44 percent, respectively at Pampore of Pulwama district. In district Pulwama average disease incidence and intensity irrespective of cultivars, was highest at Shadimerg (26.28 and 15.16%), respectively, and least at Pampore (17.33 and 8.44%) respectively, with an overall disease incidence and intensity of 21.98 and 11.75 percent respectively. In Anantnag district the average disease incidence and intensity was highest at Achabal (25.44 and 14.22%) respectively, and least at Bijbehara (18.20 and 09.64%) respectively, with an overall average disease incidence and intensity of 20.88 and 12.39 percent respectively. Similarly in district Budgam the disease incidence and intensity was highest at Chaari Sharief (34.48 and 24.68%) respectively, and least at Beerwah (21.52 and 16.58%) respectively, with an overall disease incidence and intensity of 26.22 and 17.33 percent respectively. The mean fruit disease incidence and intensity at all the locations irrespective of cultivars was 23.02 and 13.82 percent respectively.

Mendoza and Ortiz (1984) [8] observed 100 percent foliage infection and 30 percent fruit infection in New Jersey. Under Kashmir conditions, Zargar (1995) [9] reported the disease prevalence with an incidence and intensity of 74.69 and 41.92 percent, respectively. From the above discussion it may be concluded that the higher disease incidence and intensity in district Budgam could probably be attributed to mono crop culture, as the district is leading one in the valley with

maximum area under pear cultivation compared to other districts. Moreover, the occurrence of old pear orchards with

aged trees in district Budgam seems to have cumulative effect of disease development in these orchards.

**Table 1:** Incidence and intensity of Entomosporium leaf spot disease of pear, (*Entomosporium maculatum* Lev.) at different locations of Pulwama, Anantnag and Budgam districts of Kashmir valley

District	Location	Percent disease incidence (*)	Percent disease intensity (*)
	Pampore	37.78	18.31
Pulwama	Newa	39.42	21.48
	Shadimarg	47.23	27.05
	Mean	41.47	22.28
	95% C.I	37.73-46.05	17.94-25.44
	Achabal	39.49	21.50
Anantnag	Kanalwan	42.10	22.47
	Bijbehara	34.49	16.55
	Mean	38.69	20.17
	95% C.I	35.00-42.40	18.82-22.69
	Chaari sharief	63.00	35.93
Budgam	Beerwah	45.44	26.03
	Khansahib	42.60	23.37
	Mean	50.34	28.44
	95% C.I	43.88-56.82	24.59-32.29
	Overall Mean	43.50	23.63
	95% C.I	40.64-46.62	21.59-25.66

\*Mean of 1800 leaves from 18 trees

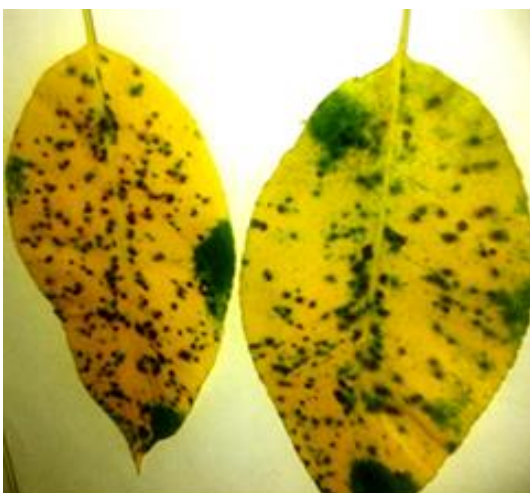
Observations recorded during July-August, 2014

**Table 2:** Incidence and intensity of Entomosporium fruit spot disease of pear, (*Entomosporium maculatum* Lev.) at different locations of Pulwama, Anantnag and Budgam districts of Kashmir valley

District	Location	Percent disease incidence (*)	Percent disease intensity (*)
	Pampore	17.33	8.44
Pulwama	Newa	22.33	11.66
	Shadimarg	26.28	15.16
	Mean	21.98	11.75
	95% C.I	15.05-24.05	10.05-12.23
	Achabal	25.44	14.22
Anantnag	Kanalwan	19.00	13.32
	Bijbehara	18.20	9.64
	Mean	20.88	12.39
	95% C.I	19.22-27.38	9.95-16.05
	Chaari sharief	34.48	24.68
Budgam	Beerwah	21.52	16.58
	Khansahib	22.66	17.44
	Mean	26.22	17.33
	95% C.I	21.42-36.34	15.21-19.44
	Overall Mean	23.02	13.82
	95% C.I	20.72-27.10	11.22-16.42

\*Mean of 1800 fruits from 18 trees

Observations recorded July-August, 2014



Leaf yellowing



Mid-summer defoliation

## References

1. Anderson HW. Pear diseases and their control. Transactions Illinois Horticulture Society. 1946; 80:285-291.
2. Anonymous. Food and Agriculture Organization Statistics. Food and Agriculture Organization of United Nations, Rome, Italy, m 2009. (<http://www.fao.org/corp/statistics/en/>).
3. Anonymous Indian Horticulture database; Area and production statistics. Ministry of Agriculture and cooperatives, Government of India, New Delhi, 2009a. ([http://nhb.gov.in/area%20\\_production.html](http://nhb.gov.in/area%20_production.html)).
4. Anonymous. Area and production under major Horticulture crops in Jammu and Kashmir. Directorate of Horticulture Statistics, Government of Jammu and Kashmir, 2012.
5. Birmingham WA. Two fungus diseases of the loquat. Agricultural Gazette of New South Wales. 1932; 43:863-867.
6. Horsfall JG, Hueberger. Measuring magnitude of defoliation disease of tomato. Phytopathology. 1942; 32:226-32.
7. Ishchenko LA, Yakolev SP, Dzhigadlo EN. The inheritance of resistance in pear to leaf blight under conditions of natural and artificial infection. *Mikologiya Fitopatologia*. 1983; 17:218-22.
8. Mendoza HA, Ortiz DT. Identification and evaluation of disease problems in pear (*Pyrus communis*) in El Ejido Ocoaxtepec., Ocuituco, Morelos. *Agrociencia Mexico*. 1984; 56:9-18.
9. Zargar SA. Studies on biology and management of fruit spot disease of pear (*Pyrus communis*) caused by *Entomosporium maculatum*. M.Sc. Thesis submitted to Sher-e-Kashmir University of Agricultural Sciences and Technology Kashmir, 1995, 41p.