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Disease Status and Yield Losses Due to Wet Bubble Disease (*Mycogone pernicios*) Associated with the Cultivation of White Button Mushroom at Different Mushroom Units of Kashmir Valley

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Abstract: Wet bubble disease of white button mushroom (*Agaricus bisporus*) is the main constraint in the speedy development of this crop in the valley. The pathogen of this disease, is *Mycogone pernicios*, which result either in the partial or total failure of the crop. The aim of the present study was to check the status and yield losses due to wet bubble disease of white button mushroom (*Agaricus bisporus*) at Mushroom Research and Training Centre of the SKUAST of Kashmir. In the present study, disease incidence, disease intensity and yield losses due to the pathogen were recorded in important mushroom units of Kashmir division, in order to check the frequency of prevalence of wet bubble disease. The survey revealed that wet bubble disease was prevalent in all mushroom growing districts in the range of 33.0 to 67.0%. With the overall mean disease incidence of 9.09% over years in three districts, the disease incidence was more (10.55-14.25%) in spring than in autumn season (3.61-8.05%). Similarly, the overall disease intensity was 17.82% over the years in these districts with more (16.86-28.31%) in spring than in autumn season (9.81-15.46%). The% yield loss over the years due to the disease ranged from 13.53 -22.41% with maximum loss reported in district Pulwama and minimum in district Srinagar. With an overall yield loss of 16.97% over the years, the loss was highest (15.88-26.01%) in spring than in autumn season (8.63-14.92%). The fungal pathogen constantly associated with the disease was established as *Mycogone pernicios*. The pathogen produced typical and characteristic symptoms of wet bubble disease.

Key words: Spring, disease incidence, districts, maximum, pathogen, symptoms

INTRODUCTION

Mushrooms are used as an excellent source of food with great nutritional value, as they contain minerals, vitamins and nutritive compounds such as proteins and polysaccharides and have a low fat content (Manzi *et al.*, 1999; Mattila *et al.*, 2000). Mushroom fruiting bodies are also appreciated as a delicacy as they are palatable and tasty. Mushrooms have huge medicinal importance as well.

In the present scenario of economy, it has opened up new vistas of export earnings. Present world production is around 16 million tonnes. Among commercially cultivated mushrooms, *Agaricus bisporus* (Lange). Imbach popularly known as White button mushroom or European mushroom is extensively cultivated throughout the world. Its large scale production is centered in Europe (mainly western part), North America (USA, Canada) and Southeast Asia (China, Korea, Indonesia, Taiwan and India) (Tewari, 2003).

The production of white button mushroom accounts for 35 to 45% of total world production. In India, the annual production of mushrooms is estimated to be around 1,20,000 metric tonnes with 85% of this production being of button mushrooms (Anonymous, 2010). India in 90's, gained an increase in commercial production of white button mushroom and several high-tech export oriented farms were setup with foreign technology collaborations. But still the small farms contribute to the major share of mushroom production. Of late, much emphasis is being laid in production of mushrooms in the state of Jammu and Kashmir, where 79,277 spawn bottles for laying about 150,000 trays/poly bags were distributed in 2009-2010 and about 5051.61 quintals mushroom harvested under Rashtriya Krishi Vikas Yojna (RKVY) alone (Anonymous, 2011).

The main constraints in the speedy development of this crop in the valley to the cottage level industry are mushroom diseases. The crop is infested by a number of fungal, bacterial and viral pathogens which result either in

the partial or total failure of the crop or to the least deteriorates the quality of the produce. Mushroom growers in the Jammu and Kashmir State, usually carry out the practice of mushroom growing in the rooms of their residential houses. In certain cases, specially built mushroom houses without any environmental control system and without the provision of compost pasteurization, have also been used for the cultivation. The increase in the number of mushroom production units without the facilities of pasteurization coupled with the year round cultivation lead to the growth in the populations of a few fungal and bacterial pathogens, thus posing a serious threat in the profitable production of this crop. Major fungal diseases viz., dry bubble, wet bubble and cobweb are responsible for inflicting varying degree of crop losses in mushroom farms (Bhatt and Singh, 2002; Singh *et al.*, 2010). Among these wet bubble disease (*M. perniciosa*) causes extensive damage by bringing soft rot or decay of whole fruiting body. If not controlled well in time, the pathogen causes havoc damaging the entire crop. The disease is most prevalent in India in temperate areas although few reports are available from subtropics as well (Sharma and Kumar, 2000; Bhatt and Singh, 2000). The disease is characterized by the development of whitish mouldy growth of mycelium on portions of fruit bodies. It spreads covering the entire cap eventually reducing the sporophore to a foul smelling white mass (Garcha, 1978). If the pathogen infects mushroom before the differentiation of stipe and pileus, the scleroderoid masses are formed, whereas infection after differentiation results in the production of thickened stipe with deformation of gills (Smith, 1924). Wet bubble infected fruit bodies were often found to be infected by various types of bacteria around day 6 of infection and this bacterial infection was the actual cause of death of mushrooms which occurred around day 10 of infection (Fletcher *et al.*, 1995; Umar *et al.*, 2000).

Keeping in view the destructive nature of the disease on growing mushrooms crop, especially in temperate climatic conditions of the valley, the studies were taken to ascertain status for the Wet bubble disease of *Agaricus bisporus* and its yield losses in important mushroom growing areas of Kashmir.

MATERIALS AND METHODS

Survey of the mushroom units located in three districts viz., Srinagar, Budgam and Pulwama, of Kashmir Division was conducted in both spring and autumn crop seasons of 2008 and 2009, to ascertain the status of wet bubble disease (*Mycogone perniciosa*) of white button mushroom, *Agaricus bisporus* (Lange) Imbach. Nine

representative locations/mushroom farms were randomly selected in each district for assessing the disease incidence, disease intensity and yield losses. The frequency of prevalence of wet bubble disease was recorded on the basis of the number of mushroom units infected out of the total units surveyed, as per the method adopted by Singh and Sharma (2000).

Disease incidence: For working out the disease incidence for each mushroom farm, the number of infected bags/trays out of the total number of bags/trays observed was recorded and the % disease incidence was calculated by the formula, given by Fletcher *et al.* (1983):

$$\text{Disease incidence} = \frac{\text{No. of infected trays/bags}}{\text{Total No. of trays/bags}} \times 100$$

Disease intensity: For working out the disease intensity, the number of healthy and infected sporophores in each randomly selected tray/bag in a farm was counted and categorized on the following 0-5 scale (Table 1).

The percentage of the disease intensity was calculated using the formula:

$$\text{Disease incidence(\%)} = \frac{\Sigma \text{disease score}}{\text{Total No. of observations} \times \text{maximum grade value}} \times 100$$

Yield Loss: From each infected mushroom farm surveyed, yield obtained was recorded and the percent yield loss due to disease was calculated using the following formula given by Van Zaayen and van Adrichem (1982):

$$\text{Percent yield loss} = \frac{\text{Expected yield} - \text{Yield obtained}}{\text{Expected yield}} \times 100$$

Where:

Expected yield = Total No. Fruit bodies formed × Average weight of healthy fruit body

Yield obtained = No. of healthy fruit bodies × Average weight of healthy fruit body

During the survey, diseased material (sporophores along-with infected casing soil) was collected in paper

Table 1: The scale for calculating the disease intensity of infected sporophores

Grade	No of infected sporophores (%)
0	0
1	1-5
2	6-10
3	11-25
4	26-50
5	More than 50

bags/containers and kept in a refrigerator at (2-5°C) for further studies. Diseased samples were also preserved in Formalin Acetic Acid alcohol (FAA) solution for microscopic examinations.

RESULTS

Status of wet bubble disease: Survey for ascertaining the status of wet bubble disease of white button mushroom was conducted in three districts-Srinagar, Budgam and Pulwama-of Kashmir Division in both spring and autumn crop seasons of the year 2008 and 2009. In each district, nine mushroom farms were randomly selected for assessing the disease incidence, disease intensity and yield losses.

Disease incidence: Data presented in Table 2, reveals that wet bubble disease on white button mushroom was prevalent during both the years (2008 and 2009) and its prevalence ranged from 33 to 67% in mushroom farms in

the three districts. The disease was most prevalent (67%) in district Budgam followed by that (56%) in district Pulwama, whereas district Srinagar exhibited the least disease prevalence (33%). On an overall basis, the disease incidence was more in spring (12.75%) than in autumn (5.22%) season. It was highest (11.07%) in district Pulwama and the lowest (7.27%) in district Budgam. The overall mean disease incidence over the years in all the three districts was 9.09%. The disease incidence observed in spring seasons of the year 2008 and 2009 revealed maximum incidence of 14.10-14.25% in district Srinagar and Pulwama, while as minimum incidence of 10.55% was recorded in district Budgam. In spring 2008, wet bubble incidence was maximum (66.67%) in Bandzoo Pulwama and Saidpora Srinagar (60%) followed by that in Batapora Pulwama (34%) and Mehjoornagar Srinagar (28.75%). Whereas, in 2009 spring the disease was more in Batamaloo (60%) and Mehjoornagar (56%) in Srinagar followed by Bandzoo (36.67%) in Pulwama district.

The disease incidence observed in Autumn seasons of the year 2008 and 2009 revealed maximum incidence of 8.05% in district Pulwama followed by minimum 3.99 and 3.61% recorded in district Budgam and Srinagar. In Autumn 2008, wet bubble was maximum (44%) in Batapora Pulwama followed by 43.5 and 25.71% in Parigam and Batpora, respectively, of the same district, whereas in Autumn 09 the disease incidence was maximum (17.5%) in Batamaloo Srinagar followed by that in Mehjoornagar Srinagar (13.75%) and Saidpora, Harwan (12.0%). The minimum disease incidence of 6 to 8% was recorded in Parigam and Batapora village of Pulwama district.

Disease intensity: The data presented in the Table 3, reveals that the intensity of wet bubble disease ranged from 0.0 to 83.0% in 2008 and 2009 at different mushroom farms in the three districts. On an overall basis, the disease intensity was more (22.58%) in spring than in autumn (12.18%) season. It was the highest (21.86%) in district Budgam and the lowest (13.33%) in district Srinagar. The overall mean disease intensity in all the three districts was 17.82%.

The average disease intensity observed in spring seasons of the year 2008 and 2009 was maximum in district Budgam (28.31%) and Pulwama (22.59%) and minimum in district Srinagar (16.86%). In 2008 spring, wet bubble intensity was maximum (56.67-66.67 %) in Parigam and Bandzoo areas of Pulwama district. It was followed by Batpora Pulwama, Saidpora Srinagar and Zaloowa and Sonarkalipora villages of district Budgam with the intensity recorded as (46.67-50.00%). In 2009 spring, the maximum disease intensity was recorded (80.00-83.33%) in Mehjoornagar Srinagar and Parnewa Budgam. It was

Table 2: Incidence of wet bubble disease of white button mushroom at different mushroom units of district Srinagar, Budgam and Pulwama during 2008 and 2009

Location/unit surveyed	Wet bubble incidence (%)						Overall Mean
	Spring			Autumn			
	2008	2009	Mean	2008	2009	Mean	
Srinagar							
Saidpora	60.00	035.00	47.50	11.00	12.00	11.50	29.50
Brain	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Batmaloo	16.67	60.00	38.33	5.83	17.50	11.60	24.99
Zainakote	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nishat	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mehjoornagar	28.75	56.25	42.50	5.00	13.75	9.37	2.59
Botakadal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Harwan	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amdakadal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	11.71	16.80	14.25	2.42	4.80	3.61	8.93
Budgam							
Pakherpora	19.00	20.00	19.50	3.00	9.00	6.00	12.75
Zaloowa	13.50	22.00	17.75	6.50	8.50	7.50	12.62
Parnewa	11.33	26.66	18.99	4.67	0.00	2.33	10.66
Shamsabad	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sonarkolipora	10.50	18.00	14.25	5.50	8.50	7.00	10.62
Arigam	14.00	15.00	14.50	4.50	7.00	5.75	10.12
Kanir	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surasyar	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bandepora	8.30	11.65	9.97	5.30	9.50	7.40	8.68
Mean	8.51	12.59	10.55	3.27	4.72	3.99	7.27
Pulwama							
Parigam	13.50	19.00	16.25	43.50	6.00	24.75	20.50
Ladoo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Batapora	34.00	14.00	24.00	44.00	8.00	26.00	25.00
Midoora	0.00	12.85	12.85	0.00	0.00	6.42	9.63
Batpora	24.28	20.00	22.14	25.71	0.00	12.85	17.49
Bandzoo	66.67	36.67	51.67	5.00	0.00	2.50	27.08
Achhan	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tral	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tandwal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	15.38	11.39	14.10	13.13	1.50	8.05	11.07
Grand Mean	11.87	13.59	12.75	6.27	3.67	5.22	9.09

Table 3: Intensity of wet bubble disease of white button mushroom at different mushroom units of district Srinagar, Budgam and Pulwama during 2008 and 2009

Location/unit surveyed	Percent disease incidence						
	Spring			Autumn			Overall Mean
	2008	2009	Mean	2008	2009	Mean	
Srinagar							
Saidpora	46.67	60.00	53.33	33.33	26.66	29.99	41.66
Brain	0.00	0.0	0.0	0.0	0.0	0.00	0.00
Batmaloo	23.53	63.33	43.33	26.67	26.67	26.67	35.00
Zainakote	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nishat	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mehjoornagar	30.00	80.00	55.00	13.33	50.00	31.66	43.33
Botakadal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Harwan	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amdakadal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	11.13	22.59	16.86	8.14	11.48	9.81	13.33
Budgam							
Pakherpora	43.33	50.00	46.66	26.67	20.00	23.33	34.99
Zaloowa	46.67	66.33	56.50	33.33	23.33	28.33	39.91
Parnewa	40.00	83.33	61.66	23.33	0.00	11.66	36.66
Shamsabad	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sonarkolipora	50.00	60.00	55.00	33.33	36.67	35.00	45.00
Arigam	23.33	46.66	34.99	20.00	26.67	23.33	29.16
Kanir	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surasyar	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bandepora	36.67	23.33	30.00	18.33	16.67	17.50	23.75
Mean	26.67	29.96	28.31	17.22	13.70	15.46	21.86
Pulwama							
Parigam	56.67	46.67	51.67	50.00	20.00	55.00	43.33
Ladoo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Batapora	43.33	53.33	48.33	30.00	33.33	31.67	39.99
Midoora	0.00	33.33	16.66	0.00	0.00	0.00	8.33
Batpora	46.67	43.33	45.00	33.33	0.00	16.67	30.83
Bandzoo	66.67	16.67	41.67	36.67	0.00	18.33	30.00
Achhan	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tral	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tandwal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	23.70	21.48	22.59	16.67	5.92	11.29	16.94
Grand Mean	20.49	24.67	22.58	14.01	10.36	12.18	17.82

followed by Saidpora and Batmaloo Srinagar and Zaloowa Budgam, where disease intensity of (60.00-60.33%) was recorded. The disease intensity observed in autumn seasons of the year 2008 and 2009 revealed maximum intensity of 11.29 to 15.46% in district Pulwama and district Budgam and minimum intensity of 9.81% in district Srinagar. In autumn 2008, wet bubble intensity was maximum (50%) in Parigam Pulwama followed by that in Saidpora Srinagar, Zaloowa and Sonarkalipora Budgam and Batapora Pulwama (33.33%). In autumn 2009, the disease intensity was maximum (50%) in Mehjoornagar Srinagar followed by that in (36.67%) Sonarkalipora of district Budgam. The minimum disease intensity (20.00 %) was recorded in Parigam village of Pulwama district.

Yield loss: Data presented in the Table 4, reveals that the extent of yield loss due to wet bubble disease ranged from 11.33 to 65.00% in different mushroom growing units in the three districts of the valley. On an overall basis, the yield loss was the highest (21.08%) in spring than in

Table 4: Yield loss of white button mushroom inflicted by wet bubble disease at various mushroom units of district Srinagar, Budgam and Pulwama during 2008-2009

Location/unit surveyed	Yield loss (%)						
	Spring			Autumn			Overall Mean
	2008	2009	Mean	2008	2009	Mean	
Srinagar							
Saidpora	53.33	60.67	57.00	55.00	49.00	52.00	54.50
Brain	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Batmaloo	27.54	42.67	35.10	24.33	17.50	20.91	28.00
Zainakote	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nishat	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mehjoornagar	49.75	52.00	50.87	28.67	27.00	27.83	39.35
Botakadal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Harwan	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amdakadal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	14.51	17.26	15.88	12.00	10.39	11.19	13.53
Budgam							
Pakherpora	23.00	34.67	28.83	11.33	9.00	10.16	19.49
Zaloowa	30.67	45.00	37.83	16.67	20.33	18.50	28.16
Parnewa	40.00	27.67	33.83	18.67	0.00	18.67	26.25
Shamsabad	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sonarkolipora	15.16	34.00	24.58	18.50	12.00	15.25	19.91
Arigam	28.67	36.67	32.67	8.00	14.67	11.33	22.00
Kanir	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surasyar	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bandepora	40.00	28.83	34.41	24.58	18.67	21.62	28.01
Mean	19.72	22.98	21.35	9.97	7.29	8.63	14.99
Pulwama							
Parigam	65.00	54.67	59.83	43.67	24.00	33.83	46.83
Ladoo	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Batapora	50.29	49.67	49.98	37.00	40.67	38.83	44.40
Midoora	0.00	35.00	35.00	0.00	0.00	0.00	35.00
Batpora	51.67	48.33	50.00	25.67	0.00	25.67	37.83
Bandzoo	38.67	40.00	39.33	36.00	0.00	36.0	37.66
Achhan	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tral	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tandwal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	22.84	25.29	26.01	15.81	7.18	14.92	22.41
Grand Mean	19.02	21.84	21.08	12.59	8.28	11.58	16.97

autumn season (11.58%). It was the highest (22.41%) in district Pulwama followed by that (14.99%) in district Budgam and the lowest (13.53%) in district Srinagar. The overall mean yield loss over the years in all the three districts was 16.97%. The yield loss observed in spring seasons of the year 2008 and 2009 revealed maximum yield loss of 21.35 to 26.01% in district Budgam and Pulwama and minimum yield loss of 15.88% in district Srinagar. In 2008 spring, the yield loss due to wet bubble disease was maximum (65%) in Parigam Pulwama followed by that (50.00-53.33%) in Batpora Pulwama and Saidpora Srinagar, whereas in spring 2009 the yield loss was maximum (60.67%) in Saidpora Srinagar followed by that (52.00-54.67%) in Mehjoornagar Srinagar and Parigam Pulwama. The% yield loss observed in Autumn seasons of the year 2008 and 2009 revealed maximum yield loss of 11.19 to 14.92 in districts Srinagar and Pulwama and a minimum of 8.63% in district Budgam. In autumn 2008, the% yield loss due to wet bubble was maximum (55.00%) in Saidpora Srinagar which was followed by (43.67%) recorded in

Parigam Pulwama. The minimum yield loss of (11.33%) was recorded in Pakherpora Budgam. In autumn 2009, the yield loss was maximum (49.00%) again in Saidpora Srinagar, which was followed by (40.67%) in Batapora Pulwama. The minimum (9.00%) yield loss was recorded in Pakherpora location of district Pulwama.

DISCUSSION

Wet bubble disease is a severe impediment in the profitable cultivation of white button mushroom (*Agaricus bisporus* L.). It is incited by an important and cosmopolitan fungal pathogen, *Mycogone perniciosa* Magn which is responsible for frequent crop failures in Kashmir valley. It was The disease was found prevalent in varying proportions in all the districts and locations across seasons indicating thereby the presence of the mycoparasite inoculum in abundance in the valley throughout the year. This confirms the observation made by Kaul *et al.* (1978), who reported this disease for the first time in the Jammu and Kashmir state in 1978 from Pinglin area of Pulwama. It was also observed during the present surveys that the wet bubble disease incidence was more in spring season compared to that in autumn season. These observations are in partial agreement with the results of Sinden (1971), Hsu and Han (1981) and Singh and Sharma (2000). Sinden (1971) reported that the onset of pathogen-favourable environmental conditions relating to temperature and high relative humidity outside mushroom production houses seem to promote *M. perniciosa* growth and proliferation in contaminated spent compost, casing materials and wild *A. bisporus*. Hsu and Han (1981) and Singh and Sharma (2000) reported that optimum temperature for mycelial growth, sporulation and conidial germination of *M. perniciosa* was 25°C.

Like other diseases, the wet bubble of button mushrooms is also identified by the manifestations of certain characteristic symptoms. Two main types of symptoms were observed during the present studies- infected sporophores and brown tumorous undifferentiated sclerodermoid masses, which resulted due to infection at different stages in the development of sporophores. These results are in agreement with the results of with the results of the earlier workers, Smith (1924) and Hsu and Han (1981) recognized two main symptom types, infected sporophores and sclerodermoid masses, Hsu and Han (1981) also reported that the infected sporophores are recognized by two types of symptoms, one is a tumorous form arising as a result of infections of pin heads and the other is a malformation arising as a result of infection at a later stage of sporophore development.

CONCLUSION

Survey of the mushroom farms in Srinagar, Budgam and Pulwama districts of Kashmir valley during 2008 and 2009, indicated that maximum wet bubble prevalence of 67.0% was recorded in district Budgam. It was followed by 56.0% in district Pulwama, whereas the least disease prevalence of 33.0% was exhibited in the district Srinagar. The overall mean disease incidence ranged from 7.29 to 11.07% in three districts with maximum incidence in district Pulwama and minimum in district Budgam with the overall mean disease incidence of 9.09% over years in three districts, the incidence was more (10.55-14.25%) in spring than (3.61-8.05%) in Autumn season. Similarly, the overall mean disease intensity ranged from 13.33 to 21.86% in the three districts with maximum intensity in districts Budgam and minimum in district Srinagar. With an overall mean disease intensity of 17.82% over years in these districts, the disease intensity was more 16.86 to 28.31% in spring than in autumn (9.81-15.46%) season. The yield loss due to the wet bubble disease ranged from 13.53 to 22.41% with maximum loss reported in district Pulwama and minimum in district Srinagar. With an overall yield loss of 16.97% over years, the loss was highest 15.88 to 26.01% in spring than in autumn (8.63-14.92 %) season.

It is believed that the frequent incidence of mould disease including that of wet bubble disease in Kashmir valley and the resultant crop failure of maximum frequency, owing to lack of knowledge to effectively and efficiently manage the disease led to abandoning of its cultivation in early eighties. The mycoparasite parasitizes the fruit bodies/sporophores and/or growing mycelium and causes variable yield losses depending upon the stage of infection, amount of inoculum and the prevailing ecological factors inside the production rooms. Therefore, the present study was carried out to establish the status of the disease and the resultant yield losses due to it, which include the pre-requisites for deciding at the adoption of disease management practices and form the basic components of decision making in integrated disease management. The objective was achieved by undertaking surveys of three predominant mushroom growing districts *viz.*, Srinagar, Budgam and Pulwama of Kashmir valley during the present study.

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