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Screening of bottle gourd germplasms for resistance against powdery mildew under hot arid region of Rajasthan

S K Maheshwari, Dhurendra Singh, B R Choudhary and SK Sharma
Central Institute for Arid Horticulture, Beechwal, Bikaner- 334 006
Presenting author: S K Maheshwari, e-mail: maheshwariskciah@gmail.com

Bottle gourd {*Lagenaria siceraria* (Mol.) Standl.} is a commonly grown vegetable throughout India. It is also grown in Africa, Central America, Ethiopia and other warmer regions of the world. It is suitable for cultivation in dry areas. As a vegetable, it is easily digestible, even by patients (Thamburaj and Singh, 2000). The fruits contain 0.2% protein, 2.9% carbohydrates, 0.5% fat and 11 mg of vitamin C per 100 g fresh weight (Aykroyd, 1963). It is affected by many fungal diseases, of which powdery mildew is one of the most important diseases that quantitative and qualitative losses to the crop. The symptoms appear as small floury patches first on the lower surface followed by upper surface of the leaves. The cheapest, practical and economical control of the disease can be achieved by the genetic stock resistant to the disease (Jadhav & Sharma, 1983). Keeping in view the present study was undertaken with the objective to identify the resistant germplasms of bottle gourd against powdery mildew under hot arid conditions.

Keywords: Bottle gourd, evaluation, germplasm, powdery mildew

Material and methods

A field trial was conducted during *rainy* season of 2011 to screen 17 bottle gourd germplasms such as Pusa Naveen, Pusa Samridhi, Pusa Santushti, Pusa Sandesh, PSPL, Chomu Local, Azad Harit, Panchmahal Local, Arka Bahar, Udaipur Local, Thar Samridhi, Sriganganagar Local, PN-22, DBG-5, DBG-6, Jodhpur Local and IC-567538 against powdery mildew at Central Institute For Arid Horticulture, Bikaner under field conditions. The seeds were sown on 1st July, 2011 in the field in Randomized Block Design at a spacing 50 x 100 cm with three replications. No plant protection measures were taken up. A susceptible variety 'Thar Samridhi' was sown after each five rows of the test germplasms as check. The susceptible variety was also grown around field border. Data on disease incidence and intensity of powdery mildew were recorded on maturity stage of the crop. Disease incidence was calculated on the basis of per cent plant infected. Disease severity was also recorded on the basis of per cent leaf area affected (Singh, *et al.* 2006). The reaction for resistance due to powdery mildew was categorized by using 0- 5 scale (Singh and Gurha, 2007).

Results and discussion

Data presented in Table 1 indicated that range of average disease incidence and disease severity of powdery mildew in bottle gourd was 14.29 to 60.0% and 17.0 to 58.50%, respectively. Germplasm such as Pusa Naveen showed least disease incidence (14.29%) and disease severity (17.0%) followed by Arka Bahar with disease incidence of 16.67% and disease severity of 22.0% which was not statistically at par with each other. Another better performer germplasms were Pusa Santushti, IC-567538, Pusa Sandesh and Sriganganagar Local with disease severity of 23.0, 24.0, 24.80 and 25.0% which were not statistically at par with another. The maximum disease incidence (60.0%) and severity (58.50%) was recorded in genotype PN-22 followed by 'Thar Samridhi' (39.50% severity). The results presented in Table 2 reveal that out of 17 germplasms none was found immune and resistant against powdery mildew. Four varieties such as Pusa Naveen, Pusa Santushti, Pusa Sandesh and Arka Bahar as well as two germplasms (Sriganganagar Local and IC-567538) showed moderately resistant (17.0 to 25.0% disease severity), 10 germplasms were categorized as moderately susceptible having 26.0- 50.0% severity and 01 germplasm like PN-22 (58.5%) proved susceptible category. Singh and Gurha (2007) recorded that only one genotype (OBG 16) of urd bean and 02 of mung bean namely, BPMR 1 and BPMR 115 exhibited resistant against powdery mildew. Maheshwari *et al.* (2012) noticed that six varieties of bottle gourd such as Pusa Naveen, Pusa Samridhi, Pusa Santushti, Pusa Sandesh, PSPL and Arka Bahar showed resistant against *Alternaria* blight.

Conclusion

It is concluded that 04 varieties such as Pusa Naveen, Pusa Santushti, Pusa Sandesh, Arka Bahar and two germplasms (Sriganganagar Local and IC-567538) were found moderately resistant against powdery mildew of bottle gourd.

Table 1. Disease severity in bottle gourd germplasms for resistance against powdery mildew under field conditions.

S. No.	Germplasms	Disease incidence	Disease severity (%)
1.	Pusa Naveen	14.29 * (22.21)	17.0 * (24.34)
2.	Pusa Samridhi	20.0 (26.55)	26.0 (30.66)
3.	Pusa Santushti	25.0 (29.97)	23.0 (28.66)
4.	Pusa Sandesh	20.0 (26.55)	24.80 (29.87)
5.	PSPI	33.33 (35.22)	30.50 (33.52)
6.	Arka Bahar	16.67 (24.05)	22.0 (27.92)
7.	PN-22	60.0 (50.76)	58.50 (49.89)
8.	DBG-6	33.33 (35.24)	30.00 (33.21)
9.	DBG-5	33.33 (35.24)	32.50 (34.76)
10.	Azad Harit	50.0 (44.98)	38.0 (38.06)
11.	Sri Ganganagar Local	25.0 (29.97)	25.0 (30.0)
12.	Udaipur Local	33.33 (35.24)	30.0 (33.21)
13.	Panchmahal Local	25.0 (29.97)	32.0 (34.45)
14.	Thar Samridhi	33.33 (35.24)	39.50 (38.94)
15.	Jodhpur Local	25.0 (29.97)	27.25 (31.47)
16.	IC-567538	20.0 (26.55)	24.0 (29.33)
17.	Chomu Local	50.0 (44.98)	34.50 (35.97)
	CD (0.05)=	**2.97**	**2.99**

*Figures in parenthesis are angular transformed values

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