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Screening of chrysanthemum varieties/hybrids against *Alternaria alternata*, causing leaf blight of Chrysanthemum

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Abstract
Fungal blights are among the major concern for limiting the cultivation and production of many ornamental and flowering plants. Chrysanthemum is an important cut flower with great export potential. However, it is infected by many pathogens in the protected cultivation. Among these diseases, leaf blight caused by *Alternaria alternata* (Fries.) Keissler is one of the most destructive disease, commonly prevailing in almost all chrysanthemum growing areas and consequently causing accountable quantitative losses (> 80% yield losses) as well as deteriorating the quality of produce. In order to find out source of resistance in chrysanthemum for leaf blight 10 varieties / hybrids which were collected from nurseries in the Latur district and from the Department of Horticulture, P.D.K.V., Akola during 2019-20. Results revealed that, under pot culture condition all 10 chrysanthemum entries expressed a wide range of reactions against *A. alternata*. However, hybrid HyDC-16 and variety Beauty were susceptible, with mean blight intensity of 32.18 and 35.15 per cent, respectively. Red star was resistant (04.50%), Yellow, Salmone and Rivercity were moderately resistant (15.04, 17.20 and 19.40%, respectively) and White probiotic was highly susceptible (55.30%) to chrysanthemum blight. The highest average flower yield / plant was obtained in variety Red Star (84.90 g), followed by Beauty (83.64 g), Royal white (79.95 g), HyDC-16 (78.65 g), IAH- RED (76.13 g), Yellow (75.69 g), White probiotic (75.42 g), Chandani (71.22 g), Salmone (69.82 g) and Rivercity (67.62 g).

Keywords: Blight, *Alternaria alternata*, resistant, susceptible, yield

Introduction
Floriculture is emerging as a potent and profitable agro-industry in several developing countries. International trade of floriculture is increasing day by day and most of the worldwide trade is of cut flowers. Now a days, many growers in developing and under developing countries are usurping on large scale cultivation of floricultural crops to harness the profit. But high cost of production in terms of fertilizers, environment, light control systems, irrigation and plant protection seems to be major bottleneck for marginal farmers. Among the cut flowers, chrysanthemum (*Chrysanthemum indicum* L.) occupies a key position in the floriculture industry and it is the world's second most important floricultural crop after Rose (Kalia, 2015) [5]. It is also called as 'Queen of East' in European countries and commonly called as gul-e-daudi or golden flower autumn queen. Chrysanthemums belong to the Asteraceae (Compositae) family. It is the best dollar earning flower in United States; also grown in India and Maharashtra as a cut flower.

Various biotic diseases are threatening the cultivation and good quality bloom yield of chrysanthemum. Among them, major diseases are leaf blight (*Alternaria alternata*), leaf spot (*Septoria chrysanthemella*), wilts (*Fusarium* and *Verticillium* spp.), root rot (*Pythium* spp., *Phytophthora* spp.), powdery mildew (*Golovinomyces chrysanthemi*), dry root rot (*Rhizoctonia solani*), brown rust (*Puccinia chrysanthemi*), bacterial crown galls (*Agrobacterium tumefaciens*), bacterial blight (*Pseudomonas cichori*), viral stunt, mosaic and nematodes (Pradeepkumar *et al*., 2008) [9]. Among these diseases, leaf blight caused by *Alternaria alternata* (Fries.) Keissler is one of the most destructive disease, commonly prevailing in almost all chrysanthemum growing areas and consequently causing accountable quantitative losses (> 80% yield losses) as well as deteriorating the quality of produce (Arunkumar, 2008; Divyajyothi *et al*., 2018) [1, 4]. Considering the importance of disease in the state efforts were made to screen the different varieties / hybrids in pot culture condition against *Alternaria alternata*.

Materials and Methods

Thirty to thirty five days old seedlings of chrysanthemum (eight varieties and two hybrids), were transplanted in black nursery polythene bags (20 × 30 cm^2), filled with steam sterilized potting mixture of soil: sand: FYM (2:1:1), watered regularly and maintained in screen house. Ten bags / variety or hybrids were maintained. After two weeks of transplanting, these potted chrysanthemum plants were spray inoculated with spore-cum-mycelial suspension of *A. alternata* and during evening covered with transparent polythene bags, overnight. After two weeks of inoculation, the plants begin to express the typical symptoms. Beginning from initiation of the symptoms, a total of four observations (at an interval of two weeks) on disease severity were recorded and average disease severity was computed. Flowers at full bloom were harvested regularly and cumulative flowers yield / plant was calculated.

Based on numerical rating observed, per cent disease intensity (PDI) was worked out applying formula given by Mc-Kinney (1923).

$$PDI = \frac{\text{Summation of numerical rating}}{\text{No. of leaves / plants observed x maximum rating}} X\ 100$$

Based on mean per cent disease intensity the chrysanthemum varieties were categorized as follows. (Arunkumar *et al*., 2011) [2]

Scale	Description
0	No disease symptoms
1	A few spots towards tip covering 10 per cent leaf area.
2	Several dark brown patches covering up to 20 per cent leaf area
3	Several patches with paler outer zone covering up to 40 per cent leaf area
4	Covering up to 40 percent leaf area
5	Complete drying of the leaves or breaking of the leaves from center

Fig 1: Disease rating scale of *Alternaria* blight of chrysanthemum

Results and Discussion

The results (PLATE I, Table 1, Fig- 2) revealed that amongst ten varieties / hybrids screened under pot culture conditions, against leaf blight disease of chrysanthemum. Of the varieties / hybrids, IAH- RED, Chandani and Royal white were moderately susceptible with mean disease severity of 29.15, 26.54 and 28.45 per cent, respectively; HyDC-16 and Beauty were susceptible with mean blight severity of 32.18 and 35.15 per cent, respectively; Red star was resistant with mean blight intensity of 04.50 per cent, Yellow, Salmone and Rivercity were moderately resistant to the disease with mean blight intensity of 15.04, 17.20 and 19.40 per cent, respectively and White probiotic found highly susceptible to the disease with mean blight intensity of 55.30 per cent.

The results (PLATE I, Table 1, Fig- 2) indicated that amongst ten varieties / hybrids screened under pot culture conditions, against leaf blight disease of chrysanthemum. The highest average yield of flowers was found in variety Red Star (84.90 g), followed by Beauty (83.64 g), Royal white (79.95 g), HyDC-16 (78.65 g), IAH- RED (76.13 g), Yellow (75.69 g), White probiotic (75.42 g), Chandani (71.22 g), Salmone (69.82 g) and Rivercity (67.62 g).

Plate 1: Screening of chrysanthemum varieties/ hybrids against *A. alternata*

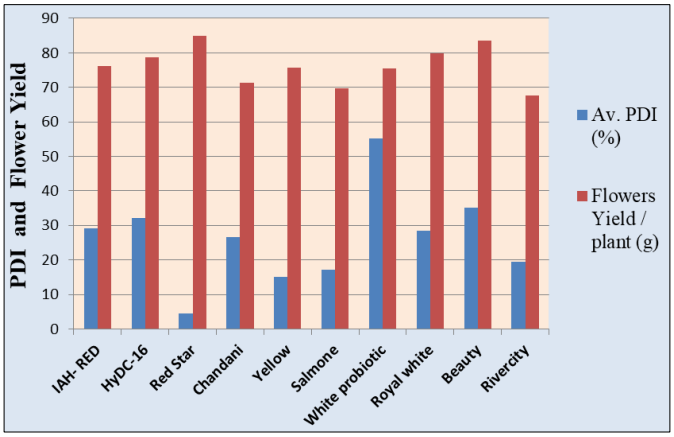

Fig 2: Reactions of chrysanthemum varieties / hybrids against *Alternaria* blight and flower yield

Table 1: Reactions of chrysanthemum varieties / hybrids against *Alternaria* blight and flower yield

Sr. No.	Varieties / Hyb.	Av. PDI*	Reactions	Flower Yield (g/ Plant)
1	IAH- RED	29.15	MS	76.13
2	HyDC-16	32.18	S	78.65
3	Red Star	04.50	R	84.90
4	Chandani	26.54	MS	71.22
5	Yellow	15.04	MR	75.69
6	Salmone	17.20	MR	69.82
7	White probiotic	55.30	HS	75.42
8	Royal white	28.45	MS	79.95
9	Beauty	35.15	S	83.64
10	Rivercity	19.40	MR	67.62

*Average of five Plants
PDI = Per cent disease intensity

These results of the present study were in consonance with the earlier findings of those workers who reported varietal screening for *Alternaria* spp. (Bedi and Singh, 1972; Minuto *et al*., 1997; Sen and Pathania, 1997; Kopacki and Wagner, 2003) [3, 8, 10, 6].

Conclusion

Among varieties/ hybrids screened against *Alternaria* blight of chrysanthemum variety, Red star was resistant to disease.

References

1. Arunkumar GS. Studies on leaf blight of chrysanthemum caused by *Alternaria alternata* (Fr.) Keissler. M. Sc. (Agri.) Thesis, Univ. Agric. Sci., Dharwad, 2008.
2. Arunkumar GS, Kamanna BC, Benagi VI. Management of chrysanthemum leaf blight caused by *Alternaria alternata* (fr.) Keissler under field condition. Pl. Arch., 2011;11(1):553-555.
3. Bedi PS, Singh JP. Leaf blight of rose in the Punjab. Indian Phytopathol. 1972;25(4):480-482.
4. Divyajyothi U, Ekabote Suresh D, Narayanswamy H, Narayanaswamy P, Ravindra H, Satish KM. Evaluation of new fungicide molecules against leaf blight of chrysanthemum caused by *Alternaria* spp. Int. J Curr. Microbiol. App. Sci. 2018;7(7):3884-3890.
5. Kalia R. Effect of different concentrations of auxins on the regeneration of *Chrysanthemum morifolium* plantlets. Int. J Tech. Res. Appl. 2015;3(6):106-107.
6. Kopacki M, Wagner A. Health status of garden mums (*Dendranthema gradndiflora* (Tzvelev) in Lublin region. Sodininkyste. 2003;22:43-45.
7. McKinney. A new system of grading plant diseases. J Agric. Res. 1923;26:195-218.
8. Minuto A, Bertetti D, Garibaldi A. *Alternaria* spp.: a new foliar pathogen of *Dendranthema fructescens* grown as a pot plant. Colture protette. 1997;26:123-125.
9. Pradeepkumar T, Sum B, Jyotibhaskar, Satheesan KN. Management of Horticultural crops. Pub. by IARI, New Delhi, 2008, 440.
10. Sen K, Pathania KS. Field evaluation of chrysanthemum germplasm against leaf spot. Pl. Dis. Res. 1997;12:149-150.