



## **Germplasm Evaluation Of Chrysanthemum For Resistance Tolerance To Thrips Incidence**

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### **ABSTRACT**

*In order to find best suited resistant/ tolerant Chrysanthemum variety for the growing region and also to get to know the affinity between chrysanthemum flower colour and aphid incidence, 15no. of germplasm collections (5 red flowered, 5 white and another 5 yellow coloured) were screened at Floricultural Research Station Hyderabad. The data collected on mean number of thrips present per 10 flowers/plant in 10 plants revealed that there were significant differences among cultivars in terms of thrips incidence. The overall mean thrips population calculated from all the observations on the 15 germplasm accessions tested, maximum thrips population was recorded on Raichur (yellow flowered) and lowest on Redstone (Red flowered). It was also observed that maximum thrips population was recorded on all the five yellow varieties and least in four red varieties and one white variety showing a distinct colour preference by thrips.*

**KEY WORDS :** *Chrysanthemum plants, Thrips, Screening, Color preference.*

Received 01.08.2017

Revised 10.08.2017

Accepted 30.08.2017

### **INTRODUCTION**

Floriculture in India is still in its infancy. Raising of flowers for commercial purpose is still limited to progressive gardeners around big cities. The aesthetic sense of people to decorate their home and hearth with flowers, is increasing day by day. As the demand for fresh flowers is on the increase, more and more area is being brought under floriculture, ornamental trees and shrubs etc.. Chrysanthemum (*Chryos* - golden, *anthos* - flower) ranks second to rose among top ten cut flowers in the world trade of flower crops preferred particularly for its range of shapes and size of flower, brilliant color tones and long lasting flower life (Brahma, 2002). In India it has been recognized as one among the five commercially important flower crops (Janakiram *et al.*, 2006). The quality of these flowers is affected by many insects and diseases causing economic loss to the growers. Hence it is imperative to know something about the pests which despoil and damage these plants and methods to combat the same (Butani, 1974). Pest control measures on floricultural crops including chrysanthemums should achieve near complete eradication because very low to zero damage is required for their commercial value (de Kogel *et al.*, 1998). Thrips are one of the important insect pests that damage chrysanthemum flowers. Thrips are ubiquitous because of their prominent dispersive behavior and ability to colonize many hosts in a wide range of habitats. The tropics and subtropics are the most suitable regions for thrips survival, although some thrips species also thrive in temperate regions (Mound, 2004).

Keeping in view screening of 15 no. of germplasm collection against thrips incidence was carried out to know the best suited resistant/ tolerant variety for the growing region and efforts were being made to draw an affinity between thrips incidence and colour of the chrysanthemum flower.

### **MATERIALS AND METHODS:**

Relative incidence of thrips were recorded fortnightly on 15 promising cultivars among the germplasm collection at Floricultural Research Station, ARI, Rajendranagar, Hyderabad

Three different coloured cultivars i.e. yellow, white and red were selected for evaluating the relative incidence of thrips. The fifteen cultivars selected are listed in Table 1.

**Table 1. Cultivars selected for evaluation of relative incidence of aphids**

5 yellow flowered cultivars	5 white flowered cultivars	5 Red flowered cultivars
CO-3 Geethanjali Poonam Aparjitha Raichur	PAU-B-107 IIHR-6 Kadapa local Ratlam Selection White	Redgold Akitha Jaya Priya Red stone

Each cultivar was transplanted on July 17<sup>th</sup> 2013 in 4 rows, each row of length 3m and intra row spacing of 20 cm. The spacing between rows was 30 cm. All the recommended agronomic practices were adopted except insecticidal sprays. Number of thrips present on ten flowers per each plant was collected and likewise data of ten randomly selected plants of each cultivar was recorded at the time of flowering.

### RESULTS AND DISCUSSION:

The data on the mean thrips population is recorded for 10 flowers/plant in 10 plants is presented in Table 2. The data revealed that there were significant differences among cultivars in terms of thrips incidence. The thrips population ranged between zero to 36.1 thrips/10plants on the first date of observation, among the cultivars the lowest thrips population was recorded on Kadapa local population ranging between 0 to 30.8 thrips/10 plants corresponding to starting to peak infestation followed by Redstone (0 to 29.1 thrips/10 plants) and Redgold (8 to 35.8 thrips/10 plants) and similarly the highest population of thrips was recorded in cultivar Raichur, in which population ranged between 2.8 to 96.1. Next higher population was recorded in CO-3 (2.2-82.5 thrips/10 plants), Poonam (2.5-82.2 thrips/10 plants) and Geethanjali (2.2-79.2 thrips/10 plants) and remaining cultivars recorded moderate thrips count ranging between 24.0 to 74.2 thrips/10 plants. (Table 2)

The overall mean thrips population calculated from all the observations on the cultivars revealed that the genotype Redstone recorded lowest thrips count 14.06/10 plants) closely followed by Kadapa local (14.80 thrips/10 plants) which were on par with each other. The next lower population of thrips was recorded on cultivars Akitha (19.59 thrips/10 plants), Redgold (20.91 thrips/10 plants) and Priya (20.98 thrips/10 plants) which were on par with each other. The cultivars Jaya and IIHR 6 recorded mean thrips population of 24.46 and 25.36 and both were on par with each other. The maximum thrips population was found in Raichur (53.28) closely followed by Poonam (48.06) and CO-3 (46.71) which were on par with each other and with Geethanjali (41.61). The cultivars Ratlam selection, White, PAU B 107 were found to be on par with each other in terms of thrips count per 10 plants and the mean population count was 30.48, 30.61 and 30.91 thrips/10 plants, respectively.

The top five cultivars which recorded highest thrips population were yellow flowered, and among the five cultivars which recorded least thrips count four were red coloured and only one cultivar was white flowered (Table 2). By observing the results it can be inferred that yellow flowered cultivars were most susceptible followed by white flowered cultivars for thrips incidence. The results obtained in the present study are in corroboration with the study of Ramireddy and Janakiram (2010) who reported that the incidence of thrips would be maximum on yellow flowered followed by white flowered cultivars and least on red flowered cultivars. Three species of thrips were observed on chrysanthemum germplasm collections of which *Frankliniella occidentalis* (Pergande) was the predominant species followed by *Frankliniella schultzei* (Trybom) and *Thrips palmi* Karny in the ratio of 63:28:9 the incidence of thrips was at peak during flowering period.

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**Table 2. Performance of different genotypes of chrysanthemum against thrips during kharif 2013-14.**

Genotype	Average number of Thrips present per 10 plants on									Mean
	1-Nov	16-Nov	1-Dec	16-Dec	1-Jan	16-Jan	1-Feb	16-Feb	1-Mar	
	105 DAT	120 DAT	135 DAT	150 DAT	165 DAT	180 DAT	195 DAT	210 DAT	230 DAT	
CO-3 (Yellow)	31.6 (5.709)	56.2 (7.563)	62.2 (7.949)	48.9 (7.064) <sup>a</sup>	71.6 (8.52)	82.5 (9.138)	43.9 (6.701)	21.3 (4.721)	2.2 (1.788)	46.71 (6.469) <sup>h</sup>
PAU B 107 (White)	16.1 (4.135)	36.7 (6.14)	38.0 (6.244)	31.6 (5.709) <sup>a</sup>	48.0 (7)	59.1 (7.752)	30.7 (5.63)	16.3 (4.159)	1.7 (1.643)	30.91 (5.292) <sup>e</sup>
Redgold (Red)	8.2 (3.033)	16.3 (4.158)	26.0 (5.195)	32.0 (5.744) <sup>a</sup>	35.8 (6.066)	35.3 (6.025)	21.2 (4.711)	13.4 (3.794)	0 (1)	20.91 (4.399) <sup>c</sup>
Geethanjali (Yellow)	29.8 (5.55)	50.2 (7.155)	45.1 (6.789)	41.3 (6.502) <sup>a</sup>	67.8 (8.294)	79.2 (8.955)	38.7 (6.301)	20.2 (4.603)	2.2 (1.782)	41.61 (6.112) <sup>a</sup>
IHR 6 (White)	0 (1)	31.1 (5.665)	28.3 (5.413)	29.1 (5.485) <sup>a</sup>	46.8 (6.914)	52.7 (7.328)	23.4 (4.939)	15.1 (4.011)	1.7 (1.642)	25.36 (4.81) <sup>d</sup>
Akitha (Red)	7.0 (2.827)	21.2 (4.711)	23.1 (4.908)	16.9 (4.231) <sup>a</sup>	34.7 (5.974)	38.5 (6.284)	21.1 (4.7)	12.4 (3.66)	1.4 (1.545)	19.59 (4.253) <sup>b</sup>
Poonam (Yellow)	33.0 (5.831)	59.0 (7.745)	55.1 (7.49)	54.4 (7.443) <sup>a</sup>	76.0 (8.775)	82.2 (9.121)	46.8 (6.913)	23.5 (4.949)	2.5 (1.866)	48.06 (6.557) <sup>h</sup>
Kadapa local (White)	0 (1)	0 (1)	17.8 (4.335)	15.9 (4.11) <sup>a</sup>	29.0 (5.477)	30.8 (5.639)	26.5 (5.243)	12.4 (3.66)	0.8 (1.337)	14.80 (3.73) <sup>a</sup>

*(contd.....)*

Jaya (Red)	13.3 (3.78)	32.1 (5.752)	27.8 (5.367)	21.4 (4.731) <sup>a</sup>	38.1 (6.252)	49.4 (7.099)	22.9 (4.888)	13.8 (3.846)	1.3 (1.515)	24.46 (4.729) <sup>d</sup>
Aparjitha (Yellow)	26.2 (5.214)	43.7 (6.685)	41.0 (6.481)	43.0 (6.633) <sup>a</sup>	74.2 (8.671)	71.5 (8.515)	29.1 (5.484)	19.2 (4.491)	1.9 (1.701)	38.87 (5.915) <sup>f</sup>
Ratlam selection (White)	21.3 (4.722)	38.8 (6.309)	34.0 (5.915)	31.4 (5.692) <sup>a</sup>	48.7 (7.05)	55.5 (7.517)	26.9 (5.281)	15.6 (4.074)	2.1 (1.747)	30.48 (5.253) <sup>e</sup>
Priya (Red)	10.9 (3.449)	25.1 (5.106)	21.3 (4.722)	18.7 (4.438) <sup>a</sup>	29.0 (5.477)	42.3 (6.58)	26.9 (5.282)	13.3 (3.78)	1.3 (1.505)	20.98 (4.395) <sup>c</sup>
Raichur (Yellow)	36.0 (6.082)	62.5 (7.968)	57.9 (7.673)	54 (7.416) <sup>a</sup>	78.7 (8.927)	96.1 (9.854)	66.4 (8.209)	25.1 (5.108)	2.8 (1.949)	53.28 (6.897) <sup>i</sup>
White (White)	19.7 (4.548)	36.5 (6.124)	31.3 (5.682)	25.9 (5.186) <sup>a</sup>	41.5 (6.519)	61.4 (7.899)	39.2 (6.34)	18.2 (4.381)	1.8 (1.673)	30.61 (5.267) <sup>e</sup>
Redstone (Red)	0 (1)	0 (1)	21.0 (4.69)	18.3 (4.393) <sup>a</sup>	25.4 (5.136)	29.1 (5.485)	22.0 (4.795)	10.7 (3.42)	0 (1)	14.06 (3.65) <sup>a</sup>
F-test	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig
SE(d)	0.054	0.075	0.071	0.047	0.046	0.027	0.045	0.075	0.094	0.049
C.D(P=0.05)	0.117	0.163	0.154	0.102	0.100	0.059	0.097	0.162	0.204	0.105

Figures in parantheses are  $\sqrt{x+1}$  transformed values.

Figures in columns followed by the same letter are not significantly different at 5% level

#### CITATION OF THIS ARTICLE

Saicharan M, V. Anitha, Lalitha Kameshwari and D. Srilatha- Germplasm Evaluation Of Chrysanthemum For Resistance Tolerance To Thrips Incidence. Bull. Env. Pharmacol. Life Sci., Vol 6 Special issue 1, 2017: 504-506