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86/7/14 :

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F₁ 15

1381 82

(H₂ H₁)

(D)

Filip84-48c × Filip93-60c

Filip92-99c × Filip92-67c

Genetic Analysis of Some Agronomic Characters in Chickpea

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Abstract

In this study, inheritance pattern of plant height, pods and seeds/plant, seed yield/plant of chickpea and combining abilities were assessed by evaluating the six lines and their crosses (half-diallel) in a randomized complete block design with three replications at the Agricultural Research Station, Sarabchangaie, Khorramabad during the growing season of 2002-2003. Analysis of variance indicated that there is enough genetic variation for all traits. After achievement of diallel assumptions according to Jinks-Hayman's (1953) approach for all traits, genetic variation was partitioned in additive and non-additive components using the method 2 of Gardner and Eberhart (1966). The results showed that lines and heterosis effects were significant for all traits, indicating the presence of additive and dominance gene action for these traits. Average heterosis for pods and seeds/plant was significant, showing that the mean of the hybrids was significantly different from the mean of the parents and the line heterosis component was significant for all traits, indicating that there were significant differences among hybrid arrays of the different parental lines. The significance of the specific heterosis component, however, indicated that there were hybrid combinations with a high degree of heterosis. Estimate of Baker index revealed that additive gene action was more important in the inheritance of plant height whereas non-additive gene effects were more important for others traits. Estimate of genetic parameters (D, H₁, H₂) according to Hayman's (1954a) approach also indicated that additive variance component for plant height was greater than non-additive variance components while it was less important for others traits. Estimates of narrow-sense heritability were medium for plant height and low for others traits. Wr/Vr graphs reflected partial dominance for plant height and over-dominance for others traits. Estimates of specific combining ability effects showed high degree of heterosis for plant height in the cross Filip92-99c × Filip92-67c and for other traits in the cross of Filip84-48c × Filip93-60c.

Key Words: Chickpea, Combining ability, Gene action, Heritability

(5)
(F₂ F₁) (1954)
(F₂) (1956)
F₁)
(F₂
(2000)
(1989)
(1992)
(1980)
Ilc482c Filip84-48c 6 (1987)
Filip92-67c Filip92-121c Filip92-99c
15 Filip93-60c (1979)
1381 82
()
30 (2001)
(H₂ H₁)
() (D)
()

5

1

(1953)

(1954)

) H₂ H₁ () D
(

(2) (1953)

Dial 98

(1966)

(1978)

(1)

1

2/14	14/72	71/33	24/16	2
21/55**	519/01**	554/47**	21/81*	20
3/14	48/62	47/69	11/29	40
	1	5		** * ns

(1953)		t	2
H ₀ : β=1	H ₀ : β=0	β ± Std. error	
1/16 ^{ns}	2/85*	0/71± 0/2489	
2/64 ^{ns}	3/65**	0/58±0/159	
0/94 ^{ns}	3/53**	0/79 ±0/2232	
1/56 ^{ns}	3/32**	0/68 ±0/2045	
	1	5	** * ns

(H₂ H₁)

(3) (1954)

(H₂ H₁)

1

(D)

(2001)

(D)

1

 H_1 H_2 0/25) $H_2/4H_1$

(2001)

(

F

(2001)

(1954)

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3/5	24/99	34/21	11/09**	D
30/73**	800/66**	831/66**	9/01	H_1
18/55**	717/88**	768/25**	6/96	H_2
11/04	50/03	26/74	5/77	F
1/07	15/67	16/27	2/4	E
2/96	5/66	4/87	0/9	$(H/D)^{1/2}$
0/15	0/22	0/23	0/19	$H_2/4H_1$
0/29	0/13	0/11	0/47	h^2n
			1 5	** *

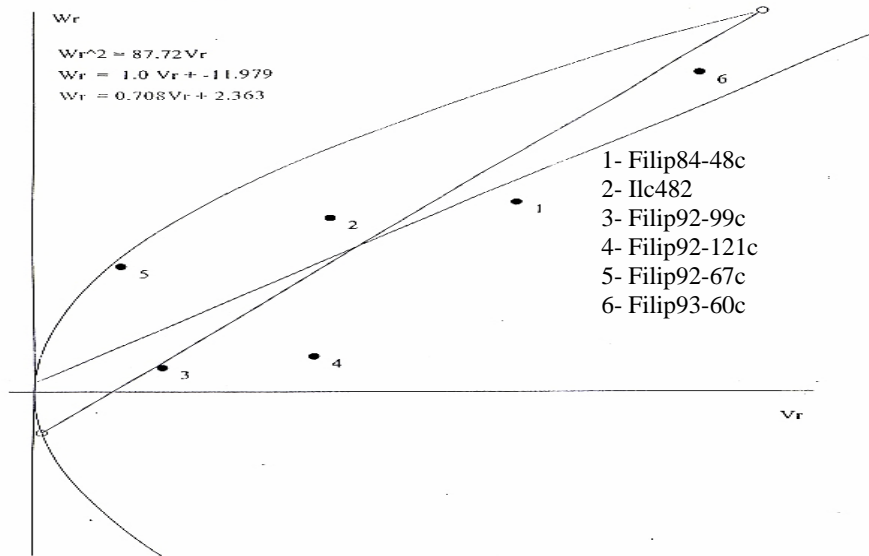
Filip92-67c (1)

Filip93-60c Filip92-121c (2)

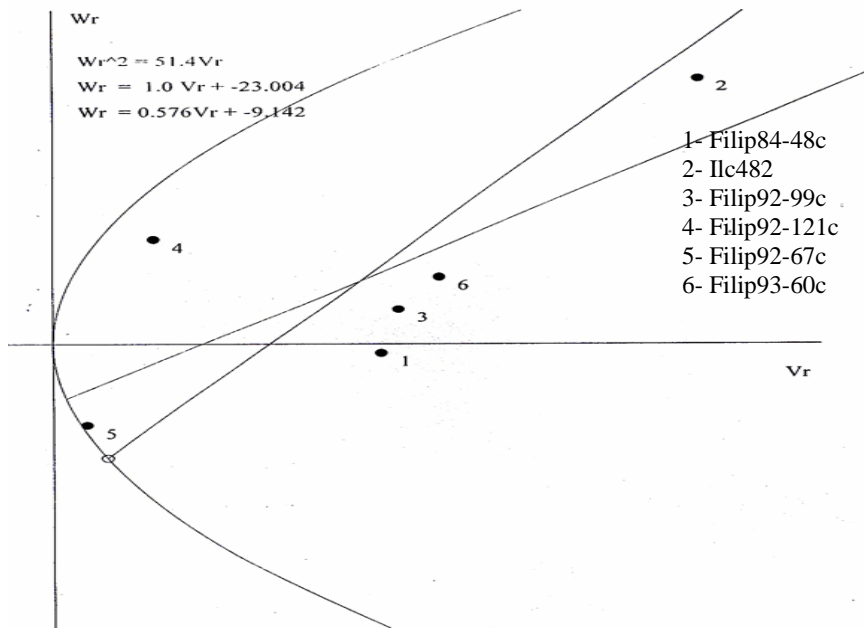
Filip92-121c (3)

(4)

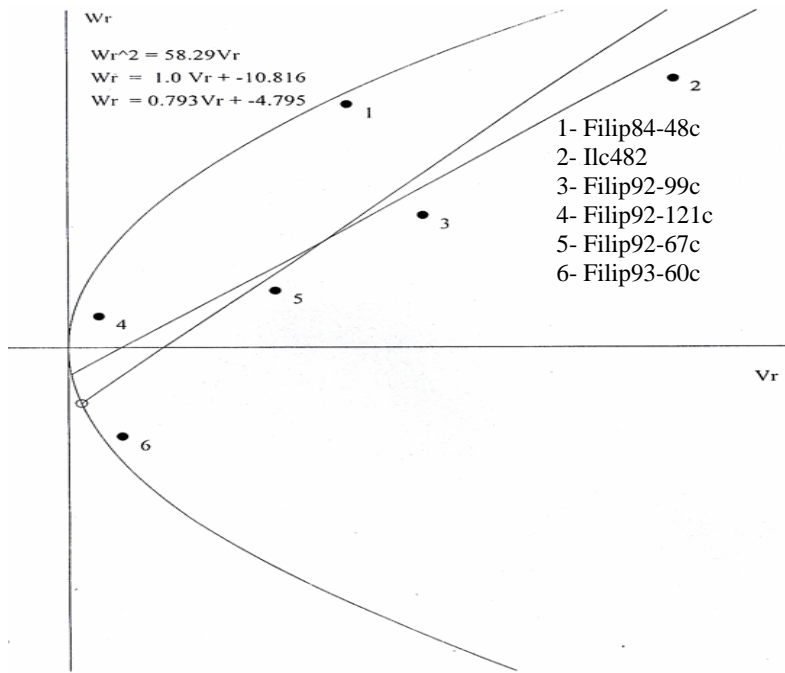
Filip92-99c



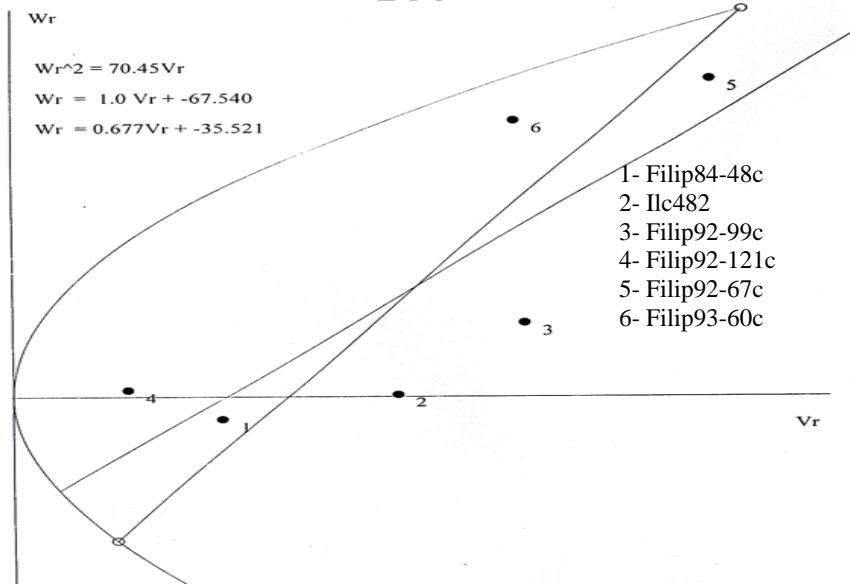
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(4) (1966)

(1978)

	(1381)		
1			(1978)	
			(1992)	
				(1979)
			(1992)	(1979)
	(1381)		(2000)
			(1989)	
				(1980)
		1		
			(1966)	
		(1966)		4

4/93**	79/77**	91/60**	14/68**	5
6/78**	203/55**	215/89**	4/76**	15
0/03	164/95**	311/95**	11/62	1
11/21**	141/59**	131/2**	12/81*	5
70/87**	1077/38**	881/35**	777/91**	9
1/08	16/20	15/89	3/77	40
0/09	0/20	0/18	0/71	
$\sigma^2g / (2\sigma^2g + \sigma^2s) =$				1 5
				** *

Filip93-60c

(5)

Filip92-67c Filip92-99c

Filip84-48c

Filip92-99c

(1966)				5
1/46	4/92	5/5	3/3	Filip84-48c
2/05	2/17	1/79	4/21	Ilc482c
0/27	8/89	11/36	5/73	Filip92-99c
0/12	0/66	8/07	2/8	Filip92-121c
0/14	5/27	3/63	5/9	Filip92-67c
4/05	8/03	3/36	2/20	Filip93-60c

Filip93- Filip92-99c × 67c (6)

Filip84-48c × 60c

Filip92-

6

0/92*	5/43**	8/22**	34/3**	Filip84-48c × Ilc482c
0/27	10/66**	9/44**	3/81**	Filip84-48c × Filip92-99c
2/44**	0/93	1/71	0/8	Filip84-48c × Filip92-121c
2/95**	22**	22/3**	2/38**	Filip84-48c × Filip92-67c
2/45**	24/93**	26/29**	1/55*	Filip84-48c × Filip93-60c
2/05**	8/84**	5/31**	4/4**	Ilc482c × Filip92-99c
0/59	1/25	2/82	3/58**	Ilc482c × Filip92-121c
2/13**	7/5**	7/78**	5/66**	Ilc482c × Filip92-67c
1/58**	18/42**	19/21**	3/34**	Ilc482c × Filip93-60c
1/59**	4/45**	9/79**	1/78*	Filip92-99c × Filip92-121c
1/86**	5/44**	2/16	6/58**	Filip92-99c × Filip92-67c
0/43	11/50**	10/6**	2/28**	Filip92-99c × Filip93-60c
0/88*	5/91**	1/33	3**	Filip92-121c × Filip92-67c
0/87*	10/9**	15/46**	3/85**	Filip92-121c × Filip93-60c
0/06	18/44**	19/11**	2/31**	Filip92-67c × Filip93-60c

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