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NOTE

Synthesis and Growth Promoting Effect of Chlorosubstituted 4-Aroylpyrazolines on Some Vegetable Crops

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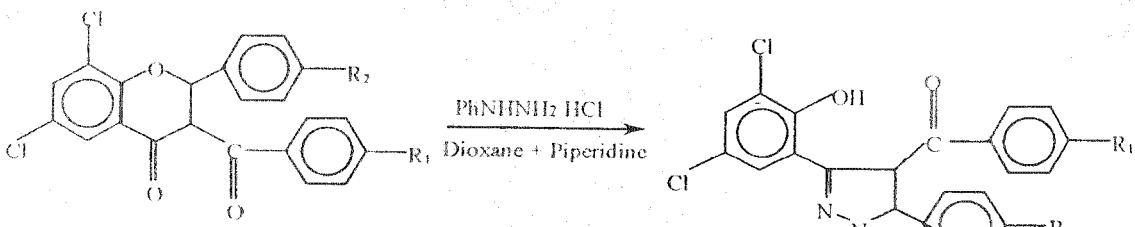
In the present study, the synthesis and growth promoting effect of 4-aroylpyrazolines on vegetable crops, namely, cluster bean, alibanam, lady's finger and sorrel were undertaken.

Key Words: 4-Aroylpyrazolines, Cluster bean, Alibanam, Lady's finger, Sorrel.

The newly synthesized chlorosubstituted pyrazolines were assayed for their growth promoting effects on cluster bean, alibanam, lady's finger and sorrel with predetermined periodicity.

A mixture of 3-aroylflavanone (0.01 mol) and phenylhydrazine hydrochloride ($PhNHNH_2 \cdot HCl$) (0.02 mol) in dioxane (20 mL) containing a few drops of piperidine was refluxed for 2.5 h. After cooling, the reaction mixture was acidified with dil. HCl (1 : 1). The solid product thus obtained was crystallized from ethanol-acetic acid mixture to get 4-aroylpyrazolines. It gives colouration with neutral $FeCl_3$ solution and dissolve in NaOH indicating thereby the presence of free phenolic-OH group.



(1a-d) (2a-d)

$R_1, R_2 = H, —OCH_3$

The spectral analysis of the compund **(2a)** is as under:

IR (nujol, cm^{-1}): 3100–3000 ν(OH), 1615 ν(C=N), 1265 ν(=C—N), 1050 ν(C—O), 680 ν(C—Cl); UV-Vis ($CHCl_3$) showed λ_{max} 395 nm corresponding to $n \rightarrow \pi^*$ transition; PMR ($CDCl_3$) showed 3.70 δ (S, 3H, Ar-OCH_3), 5.20 δ (d, 1H, CH-C), 6.80–7.60 δ (m), 10.70 δ (S, Ar-OH).

The beds of black cotton soil of 2.5 × 2.5 m size were prepared on an open field. The seeds of all four species under examination were sown in these beds

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separately by conventional method[1–5]. The plant beds were irrigated as and when required with tap water. The plants from each bed were divided into two groups A and B. The group A plants were kept unsprayed and termed as control group whereas the plants from group B termed as treated group B. The treated group plants were sprayed with the compound being tested. The seeds of group B were also treated with test compounds before sowing to screen their growth promoting effects. The spraying solutions of synthesized pyrazolines in dioxane (0.01 dilution) were sprayed thrice at fortnightly intervals (15, 30, 45, 60, 75 and 90 d).

All the field experiments were conducted to compare the treated plants of group B with the plants from control group A. The samples were taken at 15, 30, 45, 60, 75 and 90 d after sowing corresponding to early vegetative, late vegetative, pod filling and pod maturation stages. The plants were carefully examined and the number of leaves and heights of shoots were recorded.

TABLE-1
EFFECT OF 3-(2-HYDROXY-3,5-DICHLOROPHENYL)-4-ANISOYL-5-(4-METHOXYPHENYL)-1-PHENYL-Δ^2-PYRAZOLINE

Productivity of observation (in days)	Cluster bean				Lady's finger				Sorrel				Alibanam			
	Shoot height		No. of leaves		Shoot height		No. of leaves		Shoot height		No. of leaves		Shoot height		No. of leaves	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T
15	5	8	6	9	5.5	7	8	11	3.5	5	2	2	9	15	11	15
30	9	13	11	16	16	19	13	22	6	8.5	7	8	27	40	19	28
45	14	17	21	30	22	31	21	29	14	17.5	14	18	55	67	29	41
60	23	28	29	39	29	39	32	42	20	28	24	31	74	94	40	62
75	31	39	41	52	39	47	43	51	28	35	29	39	51	118	65	102
90	44	52	47	58	54	60	51	62	49	49	34	45	116	138	78	132

TABLE-2
EFFECT OF 3-(2-HYDROXY-3,5-DICHLOROPHENYL)-4-BENZOYL-1,5-DIPHENYL-Δ^2-PYRAZOLINE

Periodicity of observation (in days)	Cluster bean				Lady's finger				Sorrel				Alibanam			
	Shoot height		No. of leaves		Shoot height		No. of leaves		Shoot height		No. of leaves		Shoot height		No. of leaves	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T
15	6	9	8	9	7	10	7	11	3.5	5	3	5	13	18	12	17
30	9	16	14	19	19	24	14	25	5.5	9	7	10	22	31	19	26
45	16	23	25	31	24	37	24	32	13	16	16	18	38	55	32	43
60	25	31	30	43	33	42	35	46	22	29	27	34	54	77	44	67
75	29	37	39	57	42	49	47	53	30	38	31	42	73	102	72	85
90	40	49	45	62	59	64	54	69	37	52	35	48	103	122	92	130

TABLE-3
EFFECT OF 3-(2-HYDROXY-3,5-DICHLOROPHENYL)-4-BENZOYL-5-(4-METHOXYPHENYL)-1-Δ^2-PYRAZOLINE

Periodicity of observation (in dsys)	Cluster bean				Lady's finger				Sorrel				Alibanam			
	Shoot height		No. of leaves		Shoot height		No. of leaves		Shoot height		No. of leaves		Shoot height		No. of leaves	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T
15	4	7	5	9	7	10	5	8	3.5	4.5	3	4	17	24	15	22
30	11	17	14	19	15	18.5	15	23	5	6	7	9	40	73	33	52
45	16	28	18	31	22	24	20	28	15	17	17	25	81	123	72	102
60	28	33	35	43	29	32	33	48	22	29	28	39	116	177	83	134
75	33	44	47	57	42	45	43	54	31	37	33	45	152	205	98	175
90	36	47	51	62	50	57	52	69	38	52	41	55	193	170	115	198

TABLE-4
EFFECT OF 3-(2-HYDROXY-3,5-DICHLOROPHENYL)-4-ANISOYL-1,5-DIPHENYL-Δ^2-PYRAZOLINE

Periodicity of observation (in days)	Cluster bean				Lady 's finger				Sorrel				Alibanam			
	Shoot Heigh		No.of Leaves		Shoot Heigh		No.of Leaves		Shoot Heigh		No.of Leaves		Shoot Heigh		No.of Leaves	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T
15	4	11	8	12	6	9	7	13	4	6	4	4	18	20	13	16
30	15	18	14	19	12	17	15	22	6	9	6	9	25	27	22	29
45	21	30	21	33	21	27	25	31	16	19	16	19	41	48	30	47
60	29	37	31	44	28	41	30	43	21	27	28	33	49	62	49	71
75	37	43	45	59	40	52	48	61	31	40	31	42	61	71	57	87
90	52	57	51	68	55	58	57	68	39	61	36	48	70	88	72	118

Efforts have been made to investigate and analyze the convergence and divergence of the effects of test compounds on the morphology of plants under investigation. When the first comparison of morphological character was made between those of treated and controlled group plants, it was interesting to note that all the treated plants exhibited remarkable shoot growth and considerable increase in the number of leaves as compared to the untreated ones.

When all the treated plants were compaired among themselves it was distinctly observed that the change which is dominant in *sorrel* than *cluster bean*, *Alibanam* and *Lady's finger*. In the intial stage, vegetative growth is gradually increase but after two weeks it's shoot upto a considerable extend in *sorrel*.

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