Chapter-III

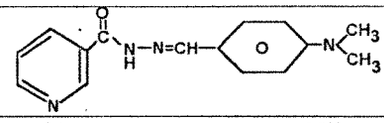
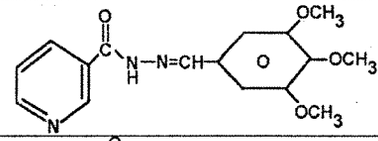
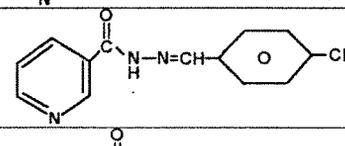
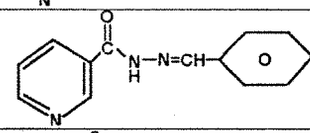
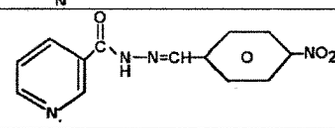
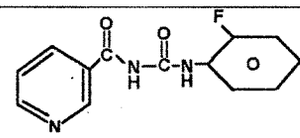
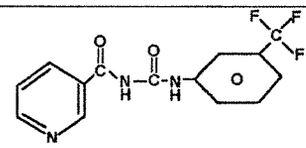
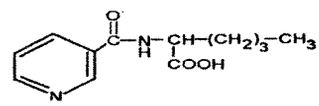
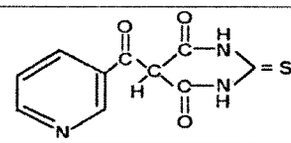
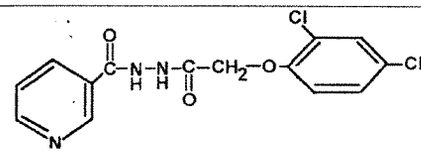
Results and Discussion

Result and Discussion

A) Synthesized Nicotinic acid derivatives:

The synthesized nicotinic acid derivatives have been used for bioassay, using following serial numbers

Table-2: structures of the compounds with Sr.Nos.

Sr. No	Nicotinic acid derivatives
1a.	
2b.	
3c.	
4d.	
5e.	
6f.	
7g.	
8h.	
9i.	
10j.	
11k.	Imidachloprid
12l.	Blank

B) Insecticidal Bio-assay :

i] *Myzus persicae* (Tobacco aphid):

The process of bioassay was performed by two techniques that is on the live plant and by using thin film technique. Treatment 1a to 11k showed the percentage mortality more than 50%, while control showed that the minimum mortality as compared to other treatments. The standard compound used was 11k imidacloprid which showed highest mortality as compare to other treatments.

The treatment of 1a, 2b, 3c, 4d, 5e, 6f, 8h, 9i and 10j gave satisfactory results. After comparing the results by both the techniques, the compounds 1a, 2b, 3c, 6f and 9i gave spectacular results against sucking pest.

Table -3: Mortality data of *Myzus persicae* on Tobacco plant

Sr. No	Mortality count									% Mortality								
	24 hours			48 hours			72 hours			24 hours			48 hours			72 hours		
	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm
1a	5.0	6.0	5.0	14	17	11	21	20	19	17	20	17	47	57	37	70	67	63
2b	2.0	4.0	3.0	8.0	10	12	14	17	23	7.0	13	10	27	40	40	47	57	77
3c	4.0	8.0	2.0	10	19	7.0	18	26	16	13	27	7.0	33	63	23	60	87	53
4d	3.0	2.0	1.0	8.0	9.0	5.0	18	17	13	10	7.0	3.0	27	30	17	60	57	43
5e	6.0	3.0	1.0	16	8.0	5.0	26	15	13	20	10	3.0	53	27	17	87	50	43
6f	1.0	7.0	6.0	6.0	14	23	12	21	25	3.0	23	20	20	47	77	40	70	83
7g	7.0	5.0	2.0	11	9.0	5.0	19	18	12	23	17	7.0	37	30	17	63	60	40
8h	4.0	4.0	6.0	10	10	9.0	18	14	15	13	13	20	33	33	30	60	47	50
9i	4.0	2.0	5.0	13	11	15	20	19	24	13	7.0	17	43	37	50	67	63	80
10j	3.0	2.0	2.0	9.0	8.0	6.0	16	14	17	10	7.0	7.0	30	27	20	53	47	57
11k	11	4.0	3.0	19	16	29	27	18	30	37	13	77	63	53	97	90	60	100
12l	4.0	2.0	0.0	8.0	6.0	00	11	9.0	4.0	10	7.0	00	-	17	-	-	27	-

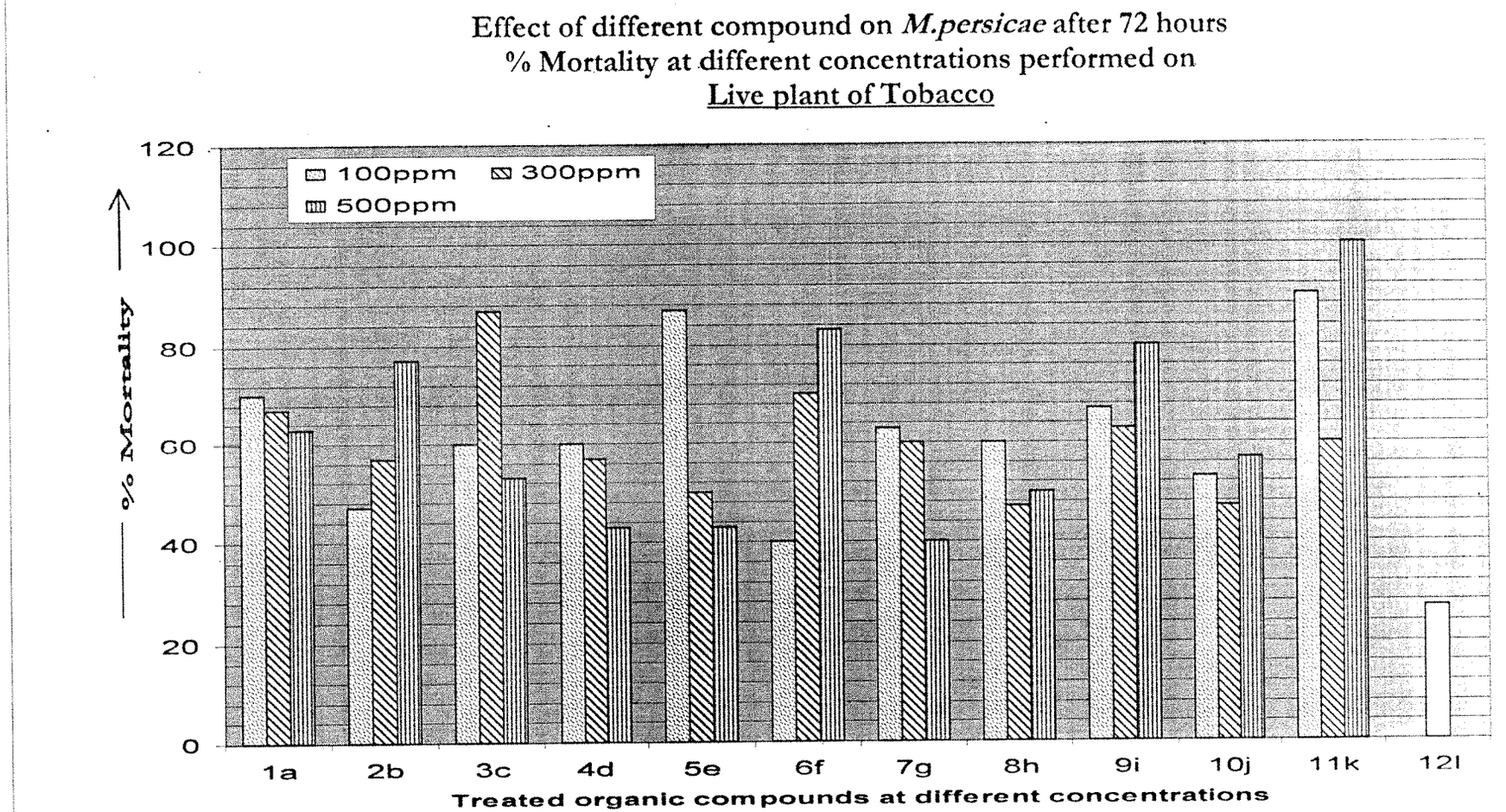

Effect of different compound on *M.persicae* after 72 hours
% Mortality at different concentrations performed on
Live plant of Tobacco
100ppm
300ppm
500ppm
% Mortality
120
100
80
60
40
20
0
1a
2b
3c
4d
5e
6f
7g
8h
9i
10j
11k
12l
Treated organic compounds at different concentrations

Fig.-31

Table 4: Mortality data of *Myzus persicae* by Thinfilm technique.

Sr. No	Mortality Count									% Mortality								
	24 hours			48 hours			72 hours			24 hours			48 hours			72 hours		
	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm
1a	10	9.0	15	16	11	20	17	14	25	33	30	50	53	37	67	57	47	83
2b	15	15	10	12	17	15	16	18	17	17	50	33	40	57	50	53	60	57
3c	10	13	6.0	13	16	11	15	20	15	33	43	20	43	53	37	50	67	50
4d	8.0	15	11	10	20	12	16	27	14	27	50	37	33	67	40	53	90	47
5e	5.0	10	17	11	24	22	13	26	26	17	33	57	37	80	73	43	87	87
6f	25	16	16	28	21	24	30	24	28	83	53	53	93	70	80	100	80	93
7g	3.0	4.0	5.0	13	11	13	15	14	16	10	13	17	43	37	43	50	47	53
8h	14	12	5.0	26	19	18	29	23	23	47	40	17	87	63	60	97	77	77
9i	14	13	9.0	18	21	16	23	26	19	47	43	30	60	70	53	77	87	63
10j	13	6.0	15	20	9.0	20	24	11	24	43	20	50	67	30	67	80	37	80
11k	20	22	28	27	23	30	30	29	30	67	73	93	90	77	100	100	97	100
12l	3.0	-	-	6.0	-	-	9.0	-	-	10	-	-	20	-	-	30	-	-

Effect of different compounds on *M.persicae* after 72 hours
% Mortality count at different concentrations performed by
thin film tecknick.

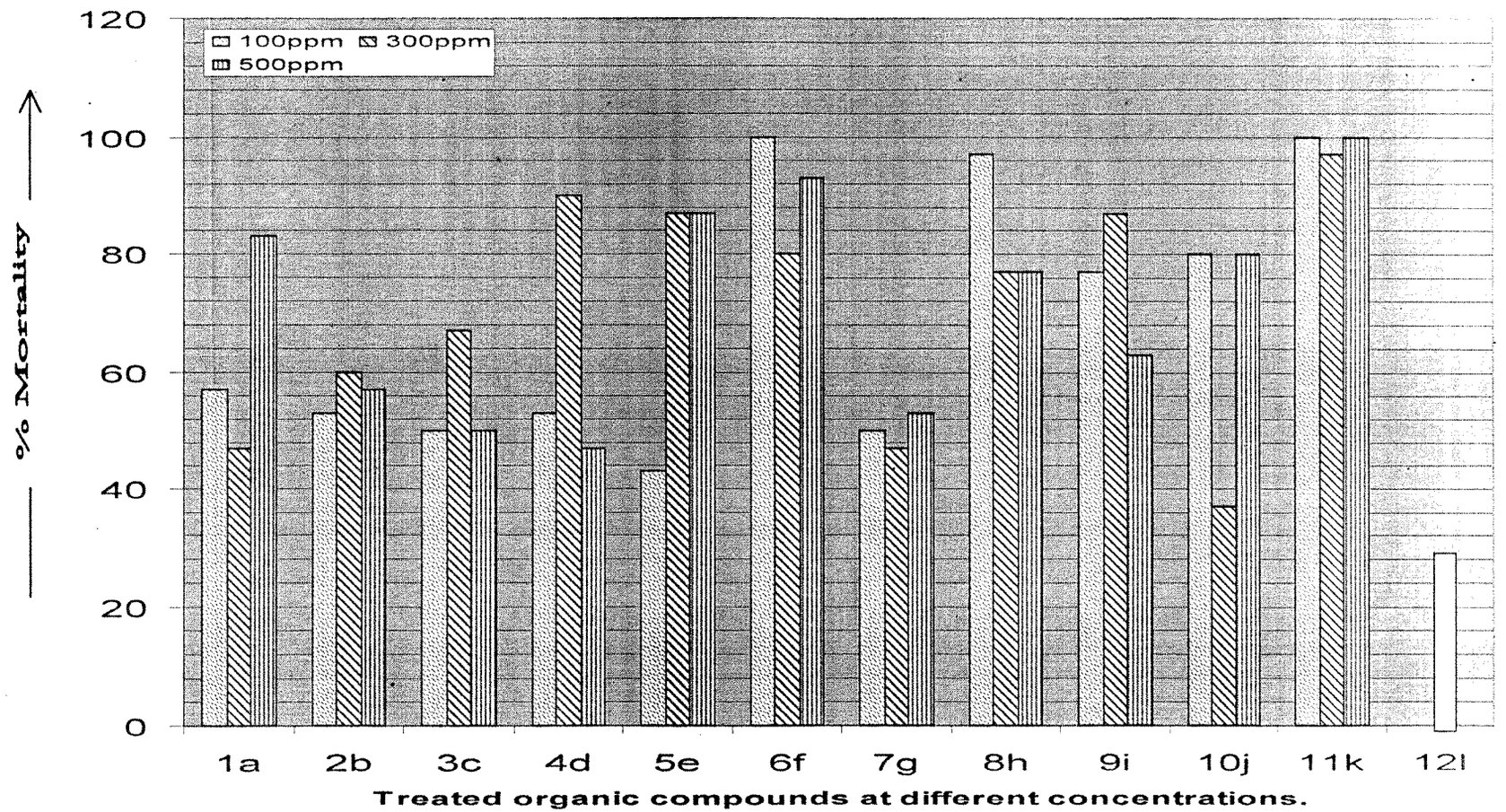


Fig.-32

ii] ***Helicoverpa armigera:***

The process of bioassay performed on *Helicoverpa armigera* of synthesized organic compound (1a to 10j) along with control of the solvent acetone (12l). The treatment 1a to 11k showed that the moderate to good insecticidal activity, has been shown by compounds 2b, 3c, 4d, 5e, 6f, 7g, 8h, 9i and 10j in weight as compare to other treatments these weight losses. It was observed compound the compounds serial nos. 6f and 8h exhibited a promising larvicidal activity, are recommend lead compounds to control Heliothis.

Table No-5: Number of Moribund larvae of *H. armigera* after treatment.

Sr. No	Number of Larvae Loss in weight									% of Larvae Loss in weight								
	2 days			4 days			6 days			2 days			4 days			6 days		
	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm
1a	-	4.0	1.0	1.0	5.0	1.0	6.0	6.0	5.0	-	40	10	10	50	10	60	60	50
2b	1.0	-	4.0	1.0	1.0	5.0	7.0	9.0	7.0	10	-	40	10	10	50	70	90	70
3c	-	-	-	3.0	1.0	1.0	9.0	8.0	8.0	-	-	-	30	10	10	90	80	80
4d	3.0	-	-	5.0	-	-	9.0	5.0	7.0	30	-	-	50	-	-	90	50	70
5e	1.0	-	2.0	2.0	-	4.0	8.0	8.0	10	10	-	20	20	-	40	80	80	100
6f	-	-	-	1.0	-	1.0	10	9.0	10	-	-	-	10	-	10	100	90	100
7g	1.0	2.0	-	1.0	2.0	2.0	8.0	9.0	8.0	10	20	-	10	20	20	80	90	80
8h	-	1.0	2.0	-	3.0	5.0	8.0	10	10	-	10	20	-	30	50	80	100	100
9i	-	-	1.0	1.0	2.0	1.0	9.0	9.0	6.0	-	-	10	10	20	10	90	90	60
10j	4.0	-	-	5.0	2.0	1.0	9.0	8.0	5.0	40	-	-	50	20	10	90	80	50
11k	4.0	1.0	1.0	4.0	2.0	5.0	9.0	10	9.0	40	10	10	40.0	20	50	90	100	90
12l	1.0	2.0	-	1.0	2.0	-	1.0	2.0	-	10	20	-	10	20	-	10	20	-

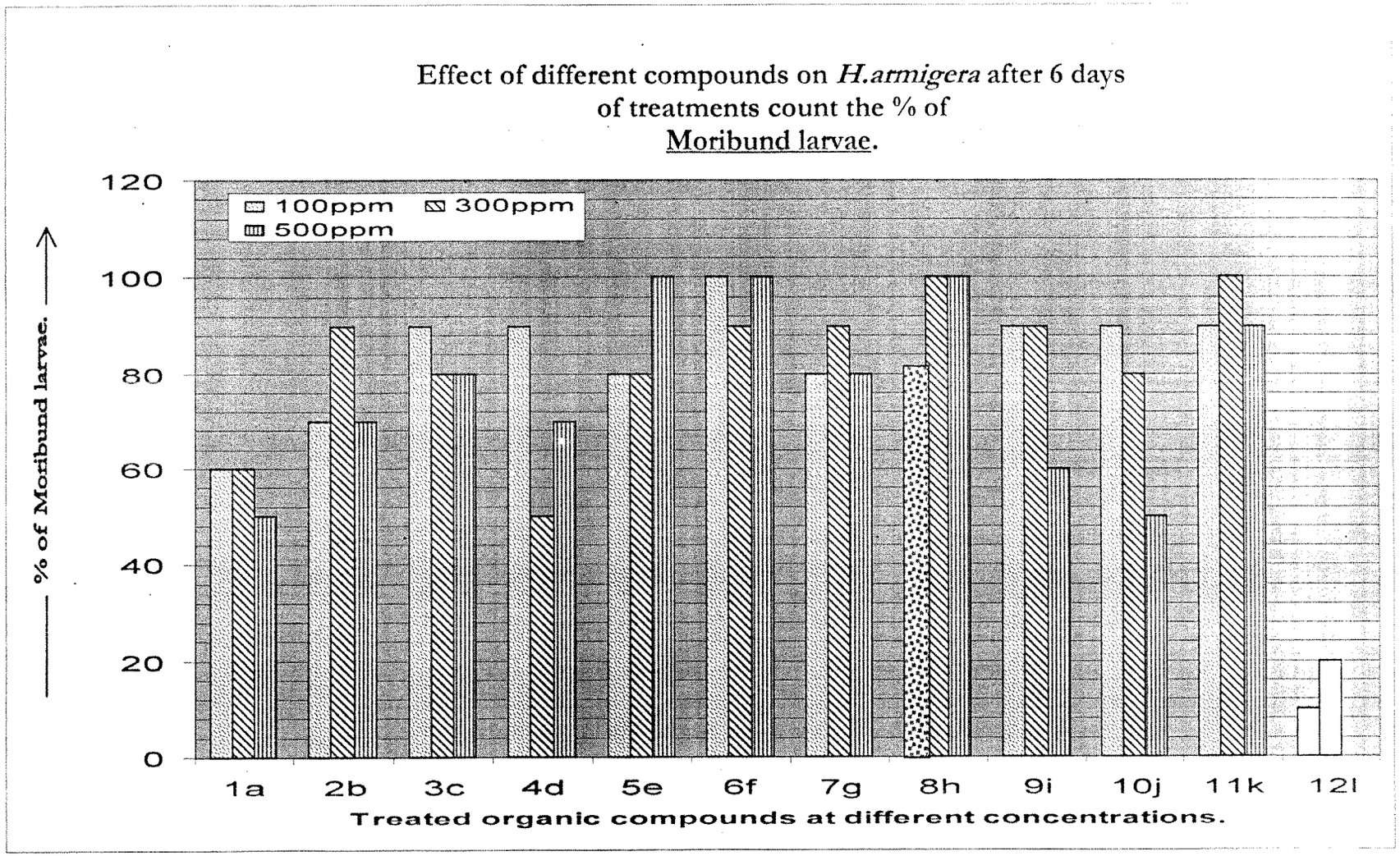

Effect of different compounds on H.armigera after 6 days of treatments count the % of Moribund larvae.
100ppm
300ppm
500ppm
120
100
80
60
40
20
0
% of Moribund larvae.
1a
2b
3c
4d
5e
6f
7g
8h
9i
10j
11k
12l
Treated organic compounds at different concentrations.

Fig.-33

iii] *Sitophilus zeamay* (Maize weevil):

The process of bioassay of compound 1a to 10j was performed on maize weevil *Sitophilus zeamay*, along with a standard insecticide imidacloprid (11k). The control of the solvent used was acetone. After a treatment promising results were taken at an interval of 8 and 16 days. The compounds 2b, 3c, 4d, 5e, 6f, 8h, 9i were compared with standard insecticide imidacloprid (11k). The results are found comparable with the compound 3c and 4d for control of stored grain pest *sitophilus zeamay*. Hence, can be recommand for the control of stored grain pest.

Table -6: Mortality data of *Sitophilus zeamay.*

Sr. No	Mortality Count						% Mortality					
	8 days			16 days			8 days			16 days		
	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm	100 ppm	300 ppm	500 ppm
1a	8.0	9.0	28	15	20	36	16	18	56	30	40	72
2b	26	17	22	29	25	32	52	34	44	58	50	64
3c	8.0	28	27	11	39	37	16	56	54	22	78	74
4d	17	27	28	29	35	36	34	54	56	58	70	72
5e	7.0	15	16	19	30	24	14	30	32	38	60	48
6f	13	6.0	26	24	8	32	26	12	52	48	16	64
7g	25	11	11	36	18	20	50	22	22	72	36	40
8h	8.0	18	19	23	24	32	16	32	33	46	48	64
9i	15	17	17	28	22	27	30	34	34	56	44	54
10j	6.0	20	15	14	20	33	12	40	30	28	40	66
11k	22	34	42	30	34	44	44	68	82	60	68	88
12l	10	13	11	17	17	16	20	26	22	34	34	32

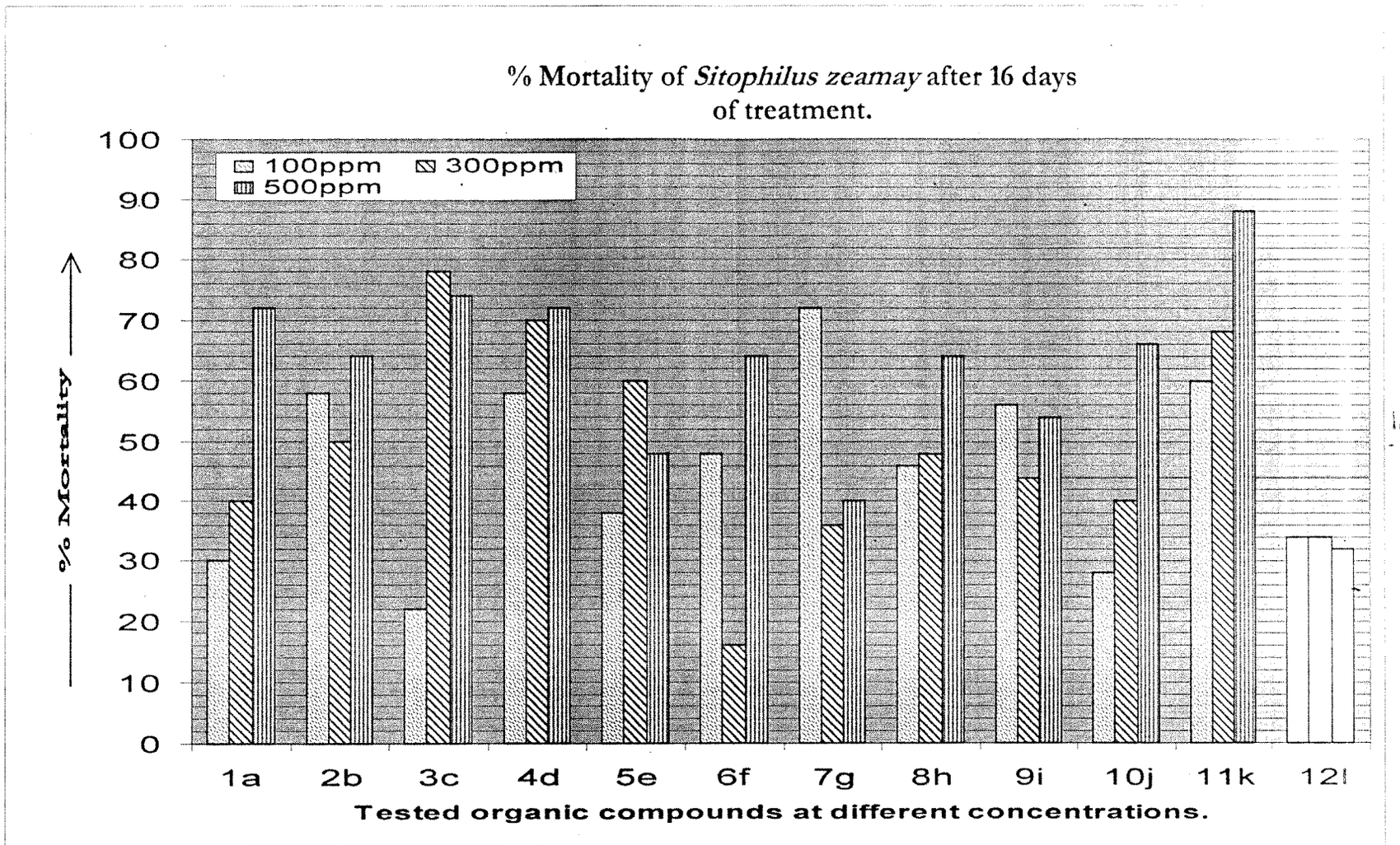

% Mortality of *Sitophilus zeamay* after 16 days of treatment.
100ppm
300ppm
500ppm
% Mortality
100
90
80
70
60
50
40
30
20
10
0
1a
2b
3c
4d
5e
6f
7g
8h
9i
10j
11k
12l
Tested organic compounds at different concentrations.

Fig.-34

C) Antimicrobial Bioassay :

i] Antifungal bioassay :

In antifungal testing was carried out against *Aspergillus niger* and it was observed that all the compounds showed better antifungal property as compared with the control. The zones of inhibition (in mm.) were most prominently recorded for the compounds 3c, 7g, 8h, 9i and 10j and compared with a standard insecticide imidacloprid.

Table -7: Zone of Inhibition by *Aspergillus niger*

Sr. No	Zone of Inhibition in mm. after 48 hours.		
	100ppm	300ppm	500ppm
1a	5.0	5.0	6.5
2b	4.0	5.5	5.5
3c	7.5	8.0	8.6
4d	5.5	4.5	6.0
5e	4.5	7.5	6.0
6f	5.5	8.5	6.0
7g	9.5	6.5	9.5
8h	9.0	9.5	5.5
9i	5.5	8.5	10.5
10j	6.0	9.5	9.0
11k	6.5	6.5	8.0
12l	4.0	4.0	-

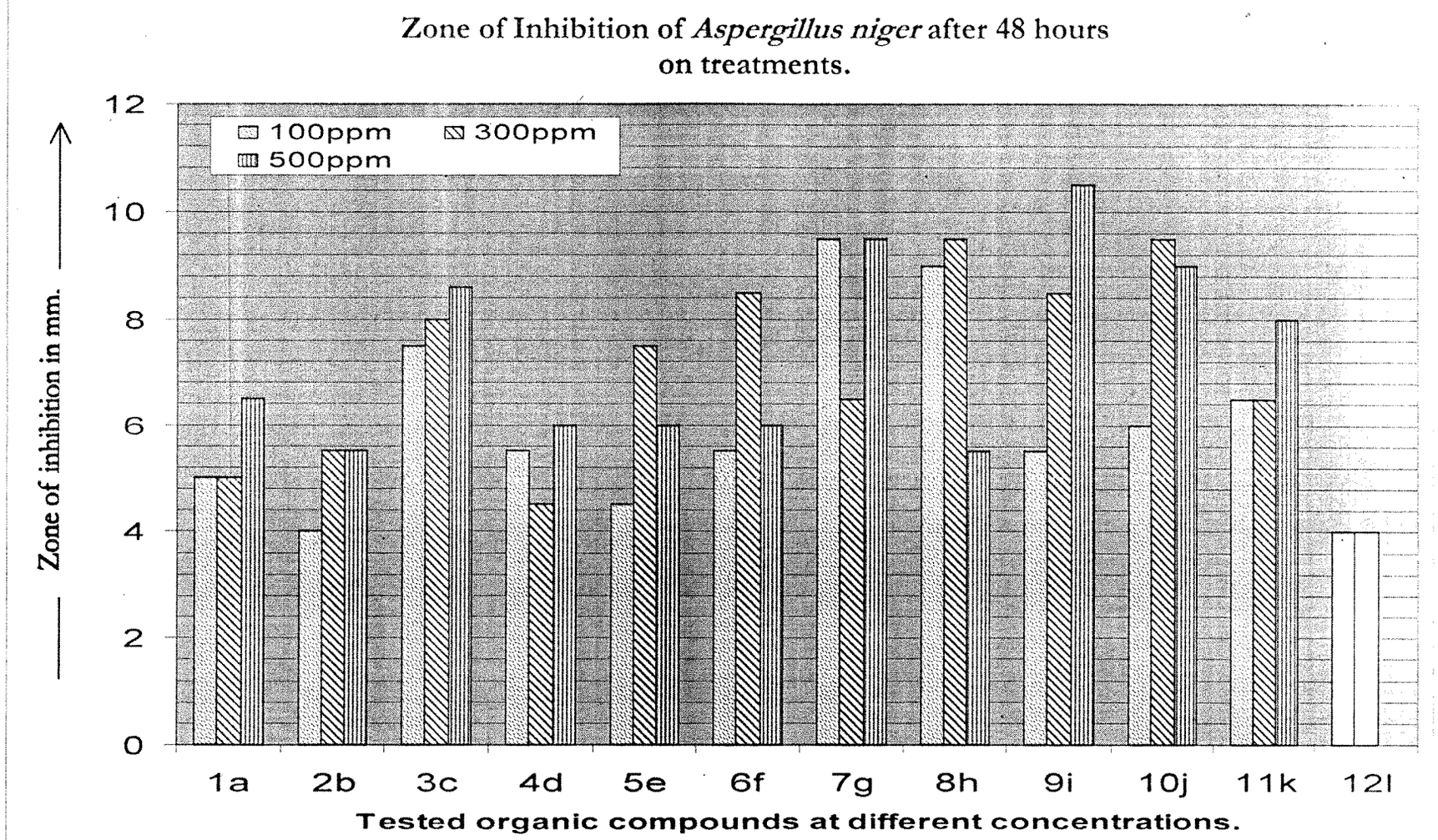

Zone of Inhibition of *Aspergillus niger* after 48 hours on treatments.
100ppm
300ppm
500ppm
Zone of inhibition in mm.
0
2
4
6
8
10
12
1a
2b
3c
4d
5e
6f
7g
8h
9i
10j
11k
12l
Tested organic compounds at different concentrations.

Fig.-35

Fig- 36: Treatment 3c showed zone of inhibition.

Fig- 37: Treatment 7g showed zone of inhibition.

Fig- 38: Treatment 8h showed zone of inhibition.

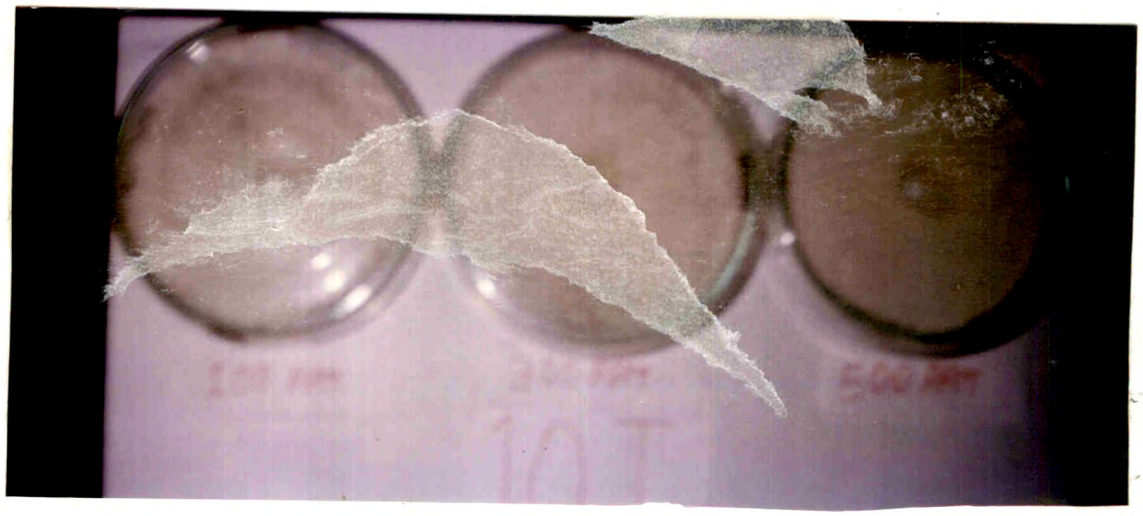


Fig- 39: Zone of inhibition of compound 9i.

Fig- 40: Zone of inhibition of compound 10j.

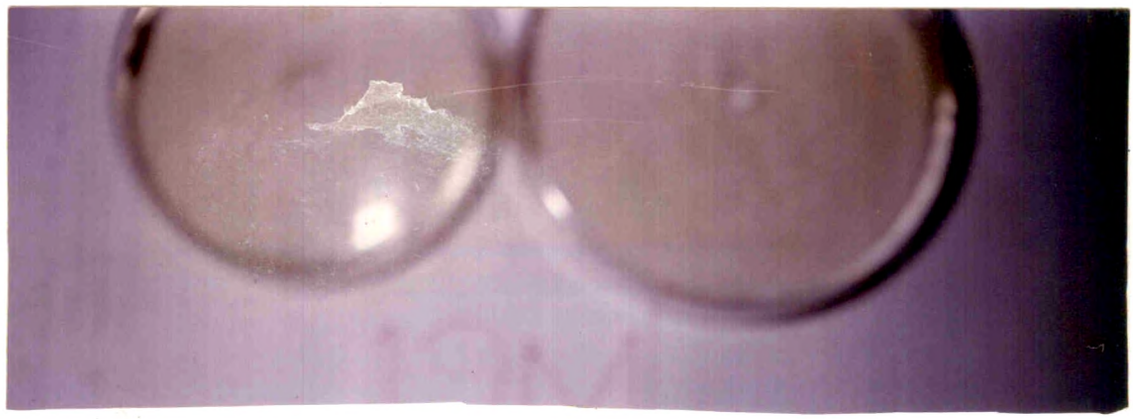


Fig- 41: Zone of inhibition of control of the solvent acetone 12l.

ii] Antibacterial bioassay:

In antibacterial testing was assayed on *Pseudomonas flurous.* The compounds 3c, 4d, 5e, 6f, 7g and 10j exhibited prominent antibacterial activity as compared to control and are of agricultural importance as pesticides.

Table -8: Zone of Inhibition by *Pseudomonas flurous.*

Sr. No	Zone of Inhibition in mm. After 24 hours		
	100ppm	300ppm	500ppm
1a	4.0	4.5	6.5
2b	3.0	3.5	3.5
3c	5.0	10.5	10.0
4d	8.5	8.5	15.5
5e	3.5	6.0	9.5
6f	6.0	10.5	9.5
7g	3.5	4.5	11
8h	5.5	4.0	3.0
9i	3.0	6.0	5.0
10j	3.0	9.0	5.5
11k	4.5	6.5	3.0
12l	-	3.0	-

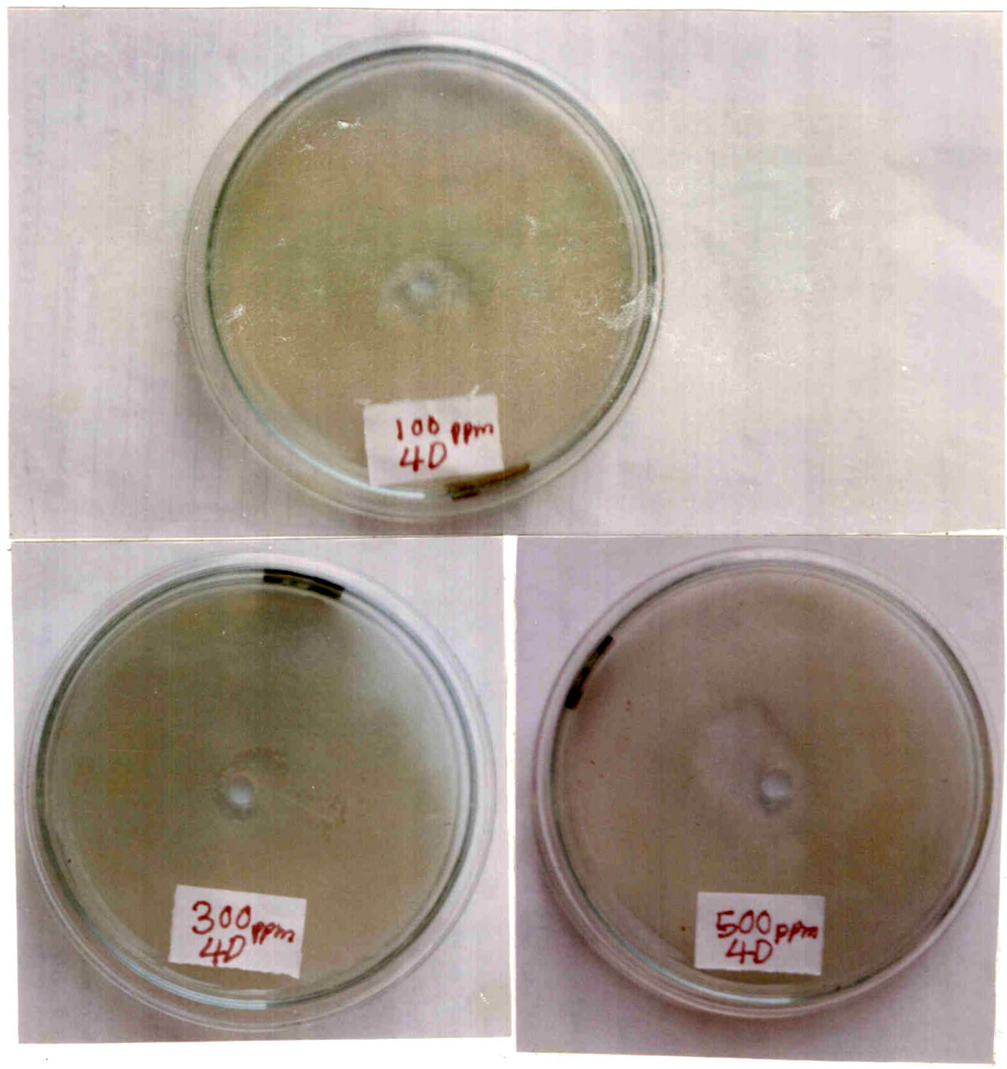


Fig- 42 : Zone of inhibition of compound 4d.

Fig- 43 : Zone of inhibition of control of the solvent acetone.

Zone of inhibition by *Pseudomomas flurous* after 24 hours of treatment.

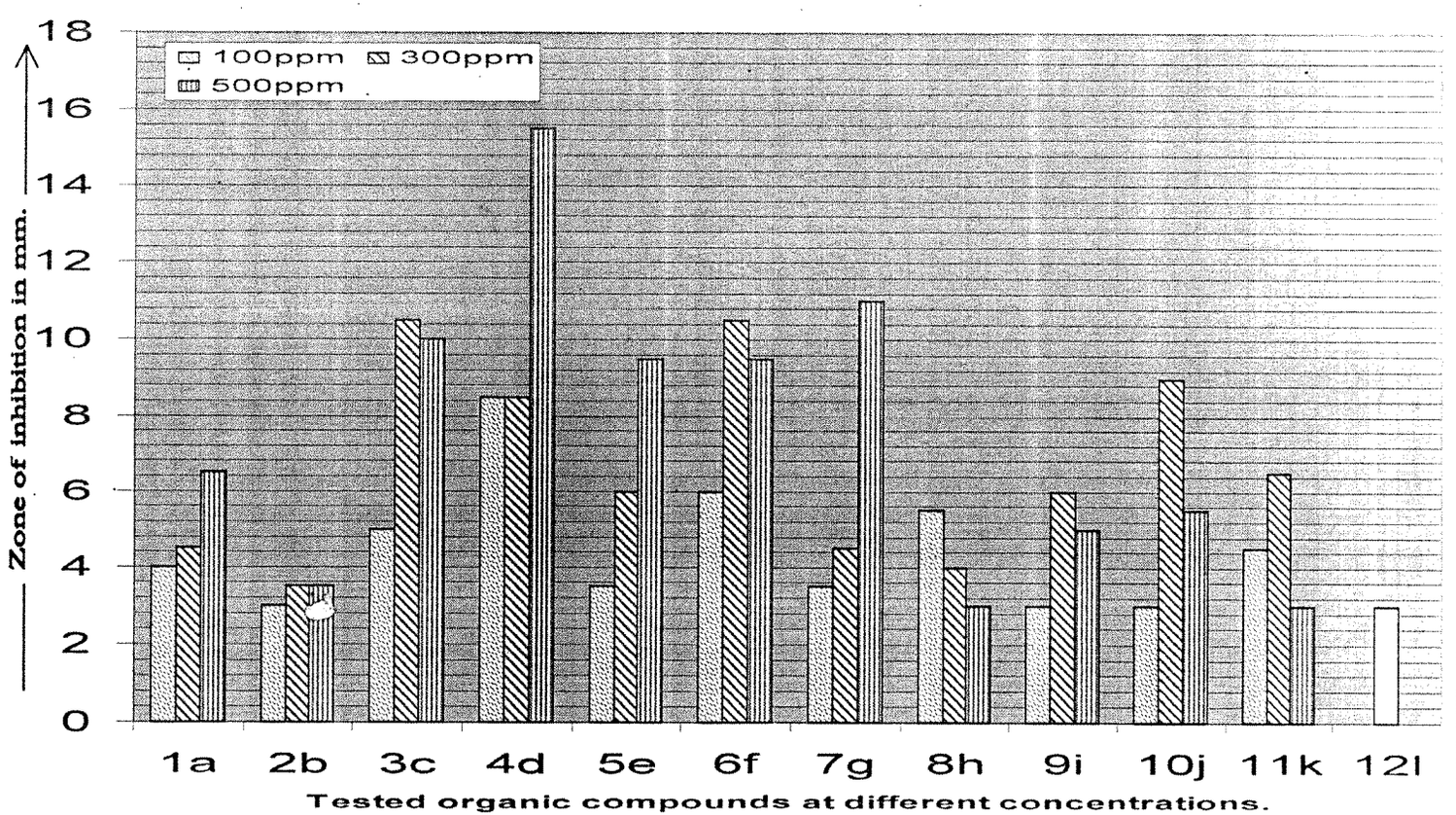


Fig.-44