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Inhibition of germination and seedling growth by red light and chloramphenicol in *(Helianthus annus)* Linn

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Abstract
The effect of the Inhibition of germination and Seedling growth of red light and Chloramphenicol in helianthus. The light is one of them are negative photoblastic on germination percentage and Seedlings growth on sunflower observed the effect of red light and Chloramphenicol. Significant suppression of radical growth was also recorded is all cases the aromatic. Substance present in the rind may be responsible for the Inhibitary action.

Keywords: *helianthus annus,* chloramphenicol

Introduction
Numerous environmental factors effect seed germination and seedling growth, light is one of them. Sunflower seeds are negative photoblastic. To observe the effect of red light and chloramphenicol on germination percentage and seedling growth in sunflower, *Helianthus annus* Linn, var EC-68414, the following experiment was performed.

Materials and Method
The seeds were obtained from 'Tarai Development Corporation G.B. Pant University of Agriculture and Technology, Nainital (U.P.)'. The healthy seeds were surface sterilized with 0.1 percent $HgCl_2$ solution, and then were imbibed in different solutions of chloramphenicol ranging from 10 to 1000 ppm. The seeds were plated on filter paper moistened with respective solutions. Corresponding control and 10 replicates of each set were maintained in sterile distilled water. One set of experiment was placed in continuous light, given by an electric red bulb of 60 watts at a distance of one metre. The other set was carried in complete dark. The temperature at the experimental place was 25 $\pm$ 2°C (*i.e.* room temperature). The observations were recorded after eight days. Only radicle emergence was taken the criterion of seed germination.

Results and Discussion
Maximum germination and best seedling growth was recorded in Control dark and least germination with poorest growth of seedling was in illuminated seeds treated with 1000 ppm chemical. Red light and chemical both have inhibitory effects. The Table depicts that there was progressive inhibition with increasing observation was that red light and chemical were rendered ineffective when the treated seeds were exposed to far red light.

It is well known that the promotion of germination by chloramphenicol or by light in '*Lattuce sativa*', a positive photoblastic seed, is dependent on phytochrome system (Black and Richardson, 1965; Borthwick *et al.*, 1954). Light and chemical both convert R-phytochrome to F-phytochrome and accumulation of F-phytochrome is responsible for promoting germination. The effects of light and chemical are nullified if the seeds are exposed to far red light, this is because of the fact that accumulated F-phytochrome is now being converted to R-phytochrome (Borthwick *et al.*, 1952).

In the present study, the seeds are negative photoplastic, Red light and chloramphenicol individually and combinedly inhibit germination percentage and seedling growth. Both the factors are responsible for accumulation of F-phytochrome which result directly or indirectly to the inhibition of germination process. When seeds are treated together with red light and chemical, increase in inhibition is probably due to their additive effects. The inhibitory effects of red light and chemical are rendered ineffective when the treated seeds are exposed to far light, the reason for may be this that the accumulated R-phytochrome, responsible for inhibition in negative photoblastic seed is biochemically converted to F-phytochrome (Borthwick *et al.*, 1952). F-photochrome in this case promotes the process (es) leading to germination.

Table 1: Synergistic effect of chloramphenicol with light and dark on germination percentage and seedling growth of Sunflower 'Helianthus annus Linn var. EC-68414'

Treatments	Light			Germi- nation %	Dark	
	Germi-nation %	Seeding length (cm)*			Seeding length (cm)*	
		Hypo.	Radicle		Hypo.	Radicle
Control	40	3.5	4.0	100	4.0	9.0
10 ppm	40	2.0	2.5	92	4.5	4.0
50 ppm	45	2.5	2.5	84	4.0	3.5
100 ppm	40	2.0	2.5	80	3.5	2.5

200 ppm	44	2.5	3.0	80	3.5	2.5
300 ppm	30	2.0	2.0	77	3.0	2.5
400 ppm	22	1.5	2.0	64	2.5	2.5
500 ppm	25	1.5	2.0	60	2.5	2.0
750 ppm	20	1.0	1.0	61	2.0	2.5
1000 ppm	10	0.5	0.5	43	1.5	0.5

***** Length of hypocotyle and radicle are average of ten replicates.

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