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STUDIES ON SEED GERMINABILITY OF *CELOSIA ARGENTEA* L

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ABSTRACT

The seeds of *Celosia argentea* usually fail to germinate under slightest droughty conditions. To find out the germinability of the seed, various concentrations of phyto hormones, chemicals, moisture requirements, light and involvement of sphermosphere microorganisms on seed germination of *Celosia argentea* has been studied.

Keywords: Dormancy, Seed Germination, Soil Moisture, GA_3, *Celosia argentea* L.

INTRODUCTION

Germinability in freshly collected seeds

The seeds of *C.argentea* are dormant and in general they will not germinate earlier than 12 months of dry storage in laboratory conditions. Mechanical as well as chemical scarification with concentrated sulphuric acid could not break the seed dormancy and initiate germination. Even under the continuous washing with water for 24 hours there was no germination, which is an Indication for the probable absence of water soluble inhibitors. 16% seeds were germinated with 60^0C hot water and 97% seeds were germinated with 0.35N HCl [1].

The seeds were not germinating in lab conditions, but it may germinate easily in the natural fields. It was initiated to explore the involvement of sphermosphere microorganisms. But the seeds germinated in the concentrations of 0.35N Hcl under laboratory conditions. But in nature *Aspergillus niger*, *Fusarium solani*, *Penicillium notatum* will help by lowering the soil pH and initiate germination [2].

C.argentea seeds germinated best at 75% soil moisture regime. The moisture requirements of these seeds suggest supplementation of natural precipitation with irrigation to maintain the required soil moisture for best seedling emergence and growth [3]. The priming of cocks comb seeds at 100% relative humidity level at 45^0C is better treatment to increase the percentage of germination, germination speed & decrease the time to get 50% germination. The results also suggest that this led to possible repair of cell membrane damage during treatment [4].

In the laboratory, germination was stimulated by light, but imbibing seeds in dark for 14 days followed by exposure to light for another 14days resulted in maximum germination (84%). Similarly, germination in the laboratory was greater for seeds that had been after-ripened in moist soil at 5 or 10 cm deep (81% germination) than seeds after –ripened on the soil surface (33% germination).[5] IAA, IBA, NAA & Inositol did not show any effect on the seed germination of *C.argentea*. But significant percentage of germination was recorded in the seeds treated with GA_3, under laboratory conditions (50ppm).

Several bacteria, actinomycets and fungi are known to produce gibberellins or gibberellin-like substances. The bacterial genera are *Arthrobacter*, *Azospirillum*, *Azatobacter*, *Bacillus*, *Brevibacterium*, *Flavobacterium*, *Pseudomonas* and *Rhizobium*. The fungal genera "Capable of Producing the Plant growth regulators are *Alternaria*, *Aspergillus*, *Fusarium*, *Gibberella*, *Penicillium*, *Rhizopogon*, *Rhizopus and Sphaceloma*[6]. GA_3 is extracted from fungal cultures [7]. *Aspergillus niger*, *Fusarium solani*, *Penicillium notatum* from the spermosphere and *Alternaria alternata* was isolated from the phylloplane of *Celosia argentea* L [8]. So they might be release the gibberellins or gibberellin-like substances into the soil for germination [9]. Many writers have implied that GA3 stimulates seed germination via amylase activity.

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Figure 1. Sphermosphere fungi of *Celosia argentea* L.

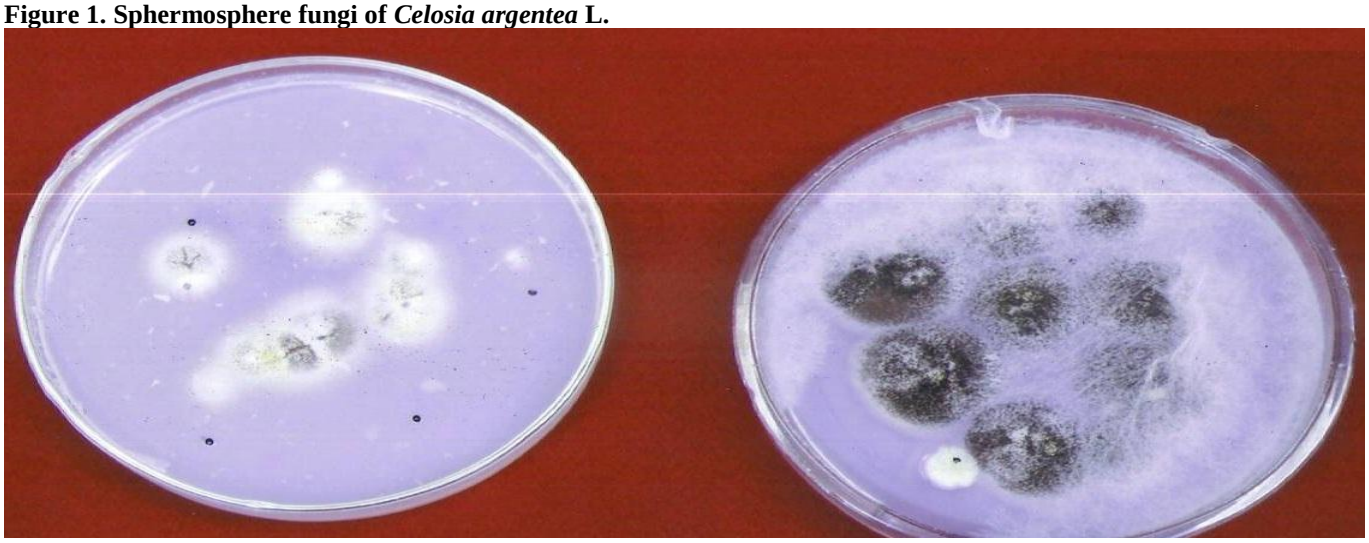
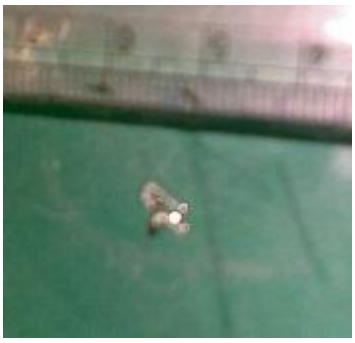


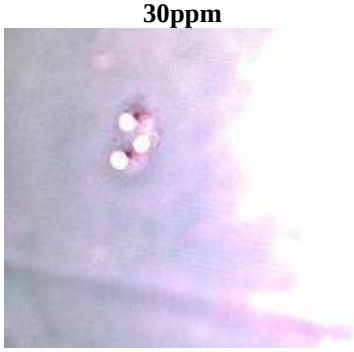
Figure 2.The effect of Gibberellic acid (GA_3) on *C.argentea* seed germination



30ppm

50ppm

60ppm



80ppm

90ppm

250ppm

Table 1. Percent germination of *Celosia argentea* seeds after 24 hours incubation.

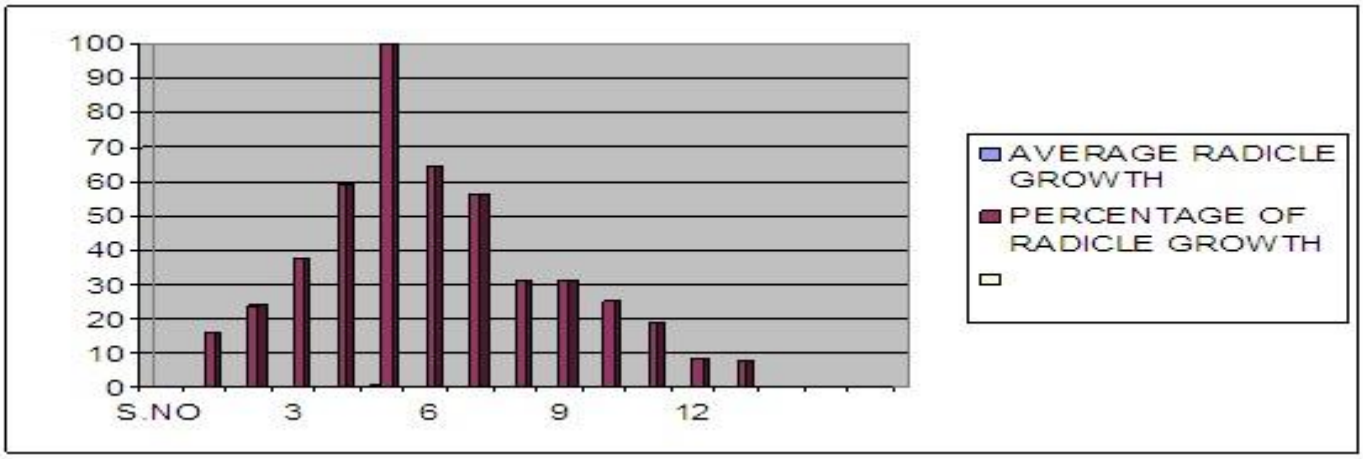
S.No	Treatment	% seeds germination
1	Tap water	0
2	Hot water (60^0C)	16
3	0.1N HCl	0
4	0.3N HCl	30
5	0.35N HCL	97
6	0.1N H_2SO_4	0

*Average of 100 seeds of three replicates.

Table 2. Effect of gibberellic acid (GA_3) on seed germination of *Celosia argentea* L.

S.No	Treatment / Concentration (PPM)	Average radicle growth	Percentage of radicle growth
1	10	0.2	16.09
2	20	0.3	24.13
3	30	0.466	37.54
4	40	0.733	59.00
5	50	1.24	100
6	60	0.8	64.36
7	70	0.7	56.32
8	80	0.38	31.11
9	90	0.38	31.14
10	100	0.31	25.47
11	250	0.23	18.77
12	500	0.10	8.58
13	1000	0.1	8.04
14	1500	0.00	-

Figure 3. the effect of GA_3 on seed germination of *Celosia argentea* L.



CONCLUSION

From the results obtained, it was clear that the seeds of *Celosia argentea* possess multi factorial germination and it has seed coat dormancy & embryonic dormancy.

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