



ISSN : 0973-7057

Effect of constant and alternating temperature of seed germination and early seedling growth of *Celosia cristata* L. & *Celosia argenticola* L.

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Received : 23rd November, 2017 ; Revised : 28th December, 2017

Abstract : Seed germination involves complex range of biochemical, physiological, ecological and morphological events, which are seen in ecological context. Temperature duration affects the seed germination. Therefore a choice of correct condition of temperature for seed germination is widely called for. The present paper deals with the effects of constant and alternating temperature of seed germination of *Celosia cristata* L. & *Celosia argenticola* L.

Keywords : Germination, Biochemical, Physiological, Ecological, Morphological, Complex, Temperature, Seed.

INTRODUCTION

Celosia argenticola L. and *Celosia cristata* L. both belongs to family Amaranthaceae. *Celosia argenticola* is a common weed, which is found in cultivated field such as river bank and open places throughout India and Ceylon. The plant is also used as a pot herb, which is eaten by cattles. The seeds are considered efficacious in diarrhoea. It is useful in blood disease and for cleaning the vision and for the disease of eye on the other hand.

Celosia cristata is cultivated for ornamental purposes; the plants are also eaten as pot herb. It is said to yield as a strong flexible fiber, which is useful for rope making. Fatty oil is called celosia oil, which is obtained from the seeds of the plant. The plant yields vetarine, nitrogen containing anthocyanin. Investigations have been made to compare the

germination of two species with a view to understand on germination percentage and early seedling growth by the role of constant and alternating temperature.

Varying alternate temperature: -

Optimum germinability was tested under the following regimes.

- 1) 08 hours at 15°C and 30 °C for 16 hours.
- 2) 12 hours at 15°C and 30 °C for 12 hours.
- 3) 16 hours at 15°C and 30 °C for 08 hours.
- 4) Optimal temperature was taken as control in this case also.

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Proceedings of 7th International Conference on -"Global Scenario of Life Science, Agriculture, Nursing & Medical Research for the Welfare of Rural & Urban Folk(GOSLANRUF, 3-5 December, 2017)" held at METAS College of Nursing, Ranchi, Jharkhand & Organised jointly by MSET-ICCB & METAS.

Table 1. Effect of constant and alternating temperature on germination and early seedling growth of *Celosia argentia* and *Celosia cristata*

Harvest Treatment	Initial time log (days)		Time spread		Percentage of germination (%)		
	Species	C.A	C.C	CA	CC	CA	C.C
15°C		2	2	4	3	52	54
20°C		2	1	4	3	65	68
25°C		2	1	4	3	70	85
30°C		2	2	3	3	82	95
35°C		2	1	4	3	80	85
40°C		2	2	4	4	15	18
45°C		-	-	-	-	-	-
A		2	2	3	3	80	82
B		2	1	4	4	82	85
C		2	1	4	3	85	96

C.A = *Celosia argentia* ; C.C = *Celosia cristata*

A= 8h at 15°C + 16h at 30°C

B= 12h at 15°C + 12h at 30°C

C= 16h at 15°C + 8h at 30°C

Table 2.

Harvest Species	Radical (m cm) after 96 hours		Seedling fresh wt (mg) after 96 hours		
	Treatment	C.A	C.C	C.A	C.C
15°C		3.0	2.5	12	40
20°C		5.0	3.5	22	52
25°C		6.1	5.0	25	60
30°C		7.0	5.5	28	70
35°C		6.0	4.5	30	65
40°C		2.2	1.5	10	25
45°C		-	-	-	-
A		4.0	3.5	20	58
B		7.0	5.5	29	65
C		5.0	3.1	22	20

RESULTS & DISCUSSION

Seeds of two species of celosia germinated in the temperature range of 15°C to 40 °C, Above 40°C, no seed germination were observed in the species. There were 82 and 95% germination on at 30 °C in *Celosia argentia* and *Celosia cristata* respectively within 1 and 2 days of showing. Minimum germination percentage 15% and 18% were

observed at 40°C in both the species. Radical length varied from 7 cm to 5 cm in C.A and C.C but fresh weight of seedling varied from 30 mg to 65 mg in *Celosia argentia* and *Celosia cristata* respectively.

Alternating temperature (16 hr at 15°C and 8 hr at 30°C) never increased germination percentage compared to the corresponding constant temperature, maximum radical length 7 cm and 5 cm and fresh weight 29 mg and 65 mg were observed at the alternating temperature (12 hr at 15°C and 12 hr at 30°C) for *Celosia argentia* and *Celosia cristata* respectively (table1 and 2)

From the result it is evidenced both species of *Celosia* seeds germinated across all temperature regimes (15°C to 40°C). Such a broad temperature response would allow germination of seed to occur from early winter season to late winter season in Bihar. Further, it is worth noting that the two species of *Celosia* displayed identical behavior with early seedling growth being maximum at 30°C. However, *Celosia argentia* had comparatively bigger radicals. Germination were little influenced the components of the alternating temperature regime.

REFERENCES

1. Daubemire, R.F 1974 plant and Environment(3rd ed.)John Wiley and Sons, New York.
2. Evans, G.C.1972. The quantitative analysis of plant growth Blackwell scientific publication, Oxford.
3. Pandey, B.N and Goel,R.K 1984, Studies on the germination of seeds of some seasonal forms of Alysicorpous spp at different temperature. Proc. Recent Trends Bot. Rec,pp , 239- 244
4. Praveen Sharma, Galividya sagar, Surender singh, Santosh ghule, 2010,"Antidiarrhoeal of leaf extract of *Celosia argentia* in experimentally induced diarrhea in rats, International association of Plant Taxonomy, pp.41-48.
5. Saritha P, 2010, Effect of Phytohermenes on seed germination of *Celosia argentia* L. Ph.D. Thesis Sri Vankateswara University, Tirupati.
6. Saritha P and Sreevamulu,2013" Spermosphere micro organism of *Celosia argentia* L. and its relationship with germination studie" Intl. J.life science & pharm res.

