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Effect of different botanical extracts on germination and vigour on chilli (*Capsicum annum* L.)

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Abstract

The experiment was conducted in Seed science Post Graduate Laboratory, Department of Genetics and Plant Breeding, SHUATS, Allahabad, U.P. during (2016), in order to standardize the best method of priming specific to chilli. From the present investigation the different priming treatment showed significant effect on seed germination and seed vigour parameters. Priming with Coconut water (3%) increased the germination (%) and seed vigour in Chilli. Coconut water(3%) exhibited high mean value for Seedling characters like seed germination percentage (85.5%), germination energy (46 %), Speed of germination(16.0), root length (5.125cm), shoot length(5.625cm), seedling length (10.8), seedling fresh weight (2.0gm) and seedling dry weight (0.023gm), seed vigour index I (929.2) and seed vigour index II (1.988), in compared with other treatments.

Keywords: Chilli, hydro priming, bio priming, coconut water, cow urine

Introduction

Chilli (*Capsicum annum* L.) is an important spice crop and belongs to the family solanaceae. It is usually a glabrous, woody sub shrub. Chilli is widely cultivated throughout warm temperate, tropical and subtropical countries and it is native to tropical South America or Mexico. It was introduced to India during 17th century by Portuguese.

Chilli or hot pepper is an indispensable spice essentially used in every Indian cuisine due to its pungency, spice taste, appealing odour and flavours. Chilli fruits are rich source of vitamin C, A and E.

In India, Chilli is grown all over the country under varying agro-climatic zones but area of riped dry chilli is concentrated in southern states. In India, the area under this crop is 287 thousand hectares with an annual production of 3406 thousand MT with productivity of 2.1 kg ha⁻¹ (National Horticulture board 2017). India alone contributes about 50 per cent of world production, out of which 90 per cent is used for domestic consumption and only six per cent is exported to other countries like USA, Bangladesh, Nepal and Mexico.

The general purpose of seed priming is to hydrate partially the seed to a point where germination processes are initiated but not completed. Most priming treatments involve imbibing seed with restricted amounts of water to allow sufficient hydration and advance of metabolic processes, but preventing the protrusion of the radicle. Treated seeds usually would exhibit rapid germination when they absorb water under field conditions (Ashraf and Foolad, 2005)

Botanical seed treatment is extracted from naturally occurring sources based on botanical ingredients. It is a liquid formulation, it has synergistic effect on early and uniform seed germination and enhance tolerance to pest and disease during early crop stage. Biofertilizers are biologically active products microbial inoculants of bacteria, algae and fungi (Gurusinghr, 2001) [2]. Microbes are effective in inducing plant growth as they secrete plant growth promoters (Auxins, Abscisic Acid, Gibberellic Acid, Cytokines, and ethylene) and enhance seed germination and root growth (Hattis *et al.*, 2001).

The leaf extract such as Neem leaf extract, Pongam leaf extract, Curry leaf extract, Ocimum leaf extract, Moringa leaf extract, contains active compounds viz. Azardichtin etc. act as anti fungal, antibacterial agents and promotes growth of seeds.

Materials and Methods

The laboratory experiments were conducted in the Department of Genetics and Plant Breeding, (Naini Agricultural Institute), Sam Higginbottom University of Agriculture Technology & Sciences, Allahabad, Uttar

Pradesh, India, Year 2017-18 to find out "Effect of different Botanical extracts on Germination and vigour of Chilli *Capsicum annum* L.) seed" The details of materials used and methods followed during the course of investigation are described in this ahead.

Table 1: Treatment Details

S. No	Treatment	Treatments Detail
1	T ₀	Control
2	T ₁	Distilled water
3	T ₂	Neem leaf extract @ 3% for 6 hrs
4	T ₃	Tulasi leaf extract @ 3% for 6 hrs
5	T ₄	Pongamia leaf extract @ 3% for 6 hrs
6	T ₅	Moringaleaf extract @ 3% for 6 hrs
7	T ₆	Curry leaf extract @ 3% for 6 hrs
8	T ₇	Cow urine @ 3% for 6 hrs
9	T ₈	Coconut water @ 3% for 6 hrs
10	T ₉	Azotobacter @ 3% for 6 hrs
11	T ₁₀	Pseudomonas flourescens@ 3% for 6 hrs
12	T ₁₁	Azospirillum @ 3% for 6 hrs

Results and Discussion

Table 2: Analysis of variance for 10 seedling characters in chilli

S. No.	Characters	Mean sum of squares	
		Treatments (d.f.=11)	Error (d.f.=36)
1	Germination percentage	46.083**	0.853
2	Germination Energy	236.699**	8.555
3	Speed of germination	10.452**	0.098
4	Root length	2.042**	0.272
5	Shoot length	1.387**	0.118
6	Seedling length	5.719**	0.287
7	Seedling fresh weight	0.062**	0.008
8	dry weight of seedling	3.267**	1.759
9	Seed vigour index I	63011.832**	2127.008
10	Seed vigour index II	0.388**	0.014

** Significant at 5% and 1% level of significance, respective

Table 3: Mean performance of chilli for 10 seedling characters

S. No	Treatments	Germination (%)	Germination Energy	Speed of germination	Root Length (cm)	Shoot Length (cm)	Seedling Length (cm)	Fresh Weight of Seedling (gm)	Dry Weight of Seedling (g)	Seed Vigour Index I	Seed Vigour Index II
1	T ₀	73.500	22.000	10.550	2.935	4.000	6.960	1.650	0.015	511.62	1.102
2	T ₁	82.500	28.000	12.975	3.100	4.775	7.900	1.745	0.016	651.75	1.361
3	T ₂	82.500	34.000	13.040	4.025	5.245	9.300	1.825	0.018	767.35	1.507
4	T ₃	85.000	42.000	15.265	4.425	5.175	9.825	1.880	0.022	835.37	1.875
5	T ₄	83.500	42.000	13.535	3.775	5.775	9.475	1.825	0.018	790.92	1.502
6	T ₅	82.000	36.000	12.605	3.875	5.000	8.925	1.845	0.017	731.92	1.477
7	T ₆	82.250	37.000	12.790	4.550	4.775	9.400	1.815	0.02	773.20	1.647
8	T ₇	85.500	46.000	16.035	5.125	5.625	10.865	2.035	0.023	929.22	1.988
9	T ₈	87.500	51.000	16.225	5.300	6.150	11.500	2.150	0.024	1005.9	2.277
10	T ₉	83.750	40.000	13.905	3.975	5.950	9.980	1.865	0.019	835.80	1.591
11	T ₁₀	84.750	37.000	14.540	4.650	5.325	9.775	1.875	0.017	828.30	1.505
12	T ₁₁	84.750	40.000	12.815	3.975	5.150	9.125	1.820	0.017	755.17	1.402
G.MEAN		82.95	37.916	12.531	4.142	5.245	9.419	1.860	0.018	784.71	1.602
C.D. (5%)		1.280	4.194	0.445	0.757	0.491	0.762	0.087	0.009	66.13	0.199
SE(m)		0.448	1.462	0.156	0.260	0.171	0.267	0.044	0.663	23.05	0.059

All the priming methods have positive influence on seed quality parameters of chilli individually but the effect of priming method was found significant. Speed of germination and Germination percentage (16.22 and 87.50) respectively and were highest in coconut water 3% seeds and it was significantly low in unprimed (control) seeds (10.55 and 73.50%). However seedling attributes were also positively influenced by priming and highest seedling length (11.50 cm) and seedling dry weight (0.024 gm per 10 seedlings) was

observed in Coconut water 3% seeds followed by Cow urine 3% Seeds having seed vigour index I and seed vigour index II (929.22 and 1.98 mg) respectively and found to be lowest in unprimed seeds having seedling attributes (511.62 and 1.102 mg respectively).

Conclusion

It is concluded from the present investigation that the different priming treatment showed significant effect on seed

germination and seed vigour parameters. Priming with Coconut water (3%) increased the germination (%) and seed vigour in Chilli. Coconut water (3%) exhibited high mean value for Seedling characters like seed germination percentage (85.5%), germination energy (46 %), Speed of germination(16.0), root length (5.125cm), shoot length (5.625cm), seedling length (10.8), seedling fresh weight (2.0gm) and seedling dry weight (0.023gm), seed vigour index I (929.2) and seed vigour index II (1.988), in compared with other treatments.

References

1. Ashraf M, Foolad MR. Pre-sowing seed treatment: A shotgun approach to improve germination, growth and crop yield under saline and non-saline conditions. *Advanced agronomy*. 2005; 88:223-271.
2. Gurusinghr S, Bradford KJ. Galactosyl sucrose oligosaccharides and potential longevity of primed seeds. *Seed Science Research*, 2001; 11:121-124.
3. Harris D, Raghuwanshi BS, Gangwar JS, Singh SC, Joshi KD, Rashid A, Hollington PA. Participatory evaluation by farmers of 'on-farm' seed priming in wheat in India, Nepal and Pakistan. *Experimental Agriculture*. 2001; 37(3):403-415.
4. Jain P, Sharma RC, Bhattacharya P. Effect of new organic supplement (Panchgavya) on seed germination and soil quality. 186, 1999. doi:10.1007/s10661-013-3513-8.
5. Mehta DK, Kanwar HS, Thakur AK, Thakur KS. Influence of organic seed priming on germination and seedling quality in bell pepper (*Capsicum annuum* L.) *Journal of Hill Agriculture*. 2010; 1(1):85-87. ISSN: 0976-7606.
6. Manoj Kumar. Influence of Seed Priming with Urine, Phosphorus and Zinc on Maize (*Zea mays* L.) Yield in an Acid Soil of Northeast India. *Indian Journal of Hill Farming*. 2014; 27(1):78-80.
7. Mariselvam D. performance of bioprime dbhendi (cv. Arkaanamika) seeds with biocontrol agents and liquid biofertilizers under laboratory and field condition. MSc. (Agri) Thesis, Tamil Nadu Agricultural University, Coimbatore, 2012.