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***In vitro* evaluation of aqueous seed extract of *Psoralea corylifolia* L. on seed germination and seedling vigour of maize**

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ABSTRACT

Aqueous seed extract of seeds of *P.corylifolia* were evaluated for seed germination and vigour index at 10, 20, 30, 40 and 50% concentration for 3,6, 12 and 24hours of treatment in maize seeds. Maximum and significant activity was observed in 20% concentration at 12hours of duration and recorded 88.0% germination and 1398.5 vogour index. Compared to control, it was recorded 72.1% germination and 1010.1 vigour index. In 30 and 40% concentration at 12 hours of duration, significant activity was recorded. In 6 hours of duration, moderate activity was observed in 10, 20, 30 and 40% concentration. No significant activity was observed in 3 hours and 24 hours duration at 10, 20, 30, 40 and 50% concentration of aqueous seed extract

Key words: *Psoralea corylifolia*, Maize, Germination, Vigour Index

INTRODUCTION

Agriculture is a major and essential activity in many parts of the world, where economically weak population directly or indirectly depends on agriculture (Daniel, 2000). Despite the significant achievements in food grain production, Indian agriculture continues to face serious challenges from ever increasing population because, stored grains mainly get deteriorated due to infection or infestation by different species of fungi. In India 30% of agriculture production i.e., almost 15.000 crores is lost due to storage fungi (Mathur, 1999) by species of *Fusarium*, *Aspergillus*, and *Penicillium* which plays a dominant role in biodeterioration of grains (Bhora and Purohit, 2003). These storage fungi produces mycotoxins viz., aflatoxins, steriomatocystin, zearaleonone, patulin, ochratoxin and fumonisin which have been linked to increased incidence of cancer in human beings. These fungi by producing mycotoxins reduces the nutritive value of seeds and which becomes dominant role in malnutrition. Use of phytochemicals and biopesticides has recently been given much emphasis against the use of chemical fungicides and pesticides due to their eco-friendliness (Neelamegam, 2011). To overcome these problems, a common procedure is by using synthetic fungicides which leads to many side effects and causes causes mutagenic, carcinogenic or tetragenetic (Basilico and Basilico, 2009). An alternative strategy to reduce the strong fungi is by adopting eco-friendly approach. In the present study, *Psoralea corylifolia* L. (Seed) belongs to family Fabaceae is used to test their potentiality for seed germination and seedling vigour in maize seeds.

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MATERIALS AND METHODS:

Plant Materials

Fresh, dried, healthy seeds of *P. corylifolia* were collected from seed market, Mysore. The seeds were washed thoroughly with running tap water for 2-3 times and once in sterile distilled water. Then the seeds were air dried at room temperature on a sterile blotter under shade (Verma and Dohroo, 2003).

Test seeds

Maize seeds were collected from seed market, Mysore and used for further studies.

Preparation of aqueous extract

One hundred grams of thoroughly washed and air dried healthy seeds of *P. corylifolia* were macerated with 100ml sterile distilled water in a waring blender (Waring international, New hart-ford, CT,USA) for 5 minutes. The Macerate was filtered through double layered muslin cloth and then centrifuged at 4000 rpm for 30 minutes. The supernatant was filtered through Whatman No.1 filter paper and sterilized at 120⁰ C for 10 minutes. The filtrate obtained served as the mother extract (100%). The extract were preserved aseptically in a brown bottle at 5⁰ C until further use(Verma and Dohroo, 2003).

Growth promoting potential of aqueous seed extract of *P. corylifolia* on maize seeds

Healthy maize seeds were soaked with aqueous seed extract of *P. corylifolia* at 10, 20, 30 and 40% concentration for 3,6,12 and 24 hours duration and control seeds treated with distilled water were subjected to germination test and vigour index analysis *in vitro* by paper towel method (ISTA,1999). Seedling vigour was analyzed after seven days of incubation following the method Abdul Baki and Anderson(1973). The experiment was carried out with four replicates of 100 seeds each and repeated three times.

RESULT

Growth promoting potential of aqueous seed extract of *P. corylifolia* on maize seeds

Data on seed germination and seedling of seeds treated with different concentrations of the aqueous extract of seeds of *P. corylifolia* for different periods of soaking is presented in Table 1. Total germination failure was observed at 6,12 and 24hours of treatment with 50% concentration of the extract and at 24hours treatment with 40% concentration of the extract. Slight increase in seed germination and seedling vigour was observed in seeds treated with 10% concentration of the extract in all the duration of treatments tested. Highly significant increase in seed germination and seedling vigour was observed in the seeds treated with 20% concentration of the extract for the different durations tested. The seedlings vigour increased with increased period of soaking in this concentration upto 12 hours. No significant increase in seed germination or seedling vigour at 24hours treatment in this concentration over 12hours treatment.

At 30% concentration treatment, marginal increase in seed germination and seedling vigour was observed at 3,6 and 12hours of treatment over control. However, total germination failure of seeds was observed in this concentration at 24hours treatment. At 40% concentration, significant decrease in seed germination and vigour index were observed in all the duration of treatment tested compared with control. At 24hours period of soaking, total germination failure was observed in this concentration. At 50% concentration, highly significant reduction in seed germination and vigour index was observed at 3hours treatment, total germination failure was observed in this concentration at 6, 12 and 24hours treatment compared with control (Table 1).

Table 1: Effect of aqueous seed extract of *P. corylifolia* L. on seed germination and seedling vigour of maize.

Duration of seed treatment (hours.)	Concentration (%)	Germination (%)	Vigour index (MRL + MSL) x germination %
3 hours	10	74.00 ^e ±0.0	1017.5 ^g ±0.0
	20	76.00 ^h ±.5	1029.8 ⁱ ±0.3
	30	73.00 ^d ±0.1	1010.7 ^d ±0.0
	40	71.00 ^b ±0.3	1004.6 ^b ±0.1
	50	71.00 ^b ±0.3	1004.6 ^b ±0.1
	Control	71.00 ^b ±0.2	1015.2 ^f ±0.1
6 hours	10	74.00 ^e ±0.0	1036.0 ^k ±0.0
	20	77.00 ^h ±0.5	1031.9 ^j ±0.5
	30	72.00 ^c ±0.1	1029.6 ⁱ ±0.1
	40	72.00 ^c ±0.5	1017.5 ^g ±0.0
	50	0.0 ^a ±0.0	0.0 ^a ±0.0
	Control	72.00 ^c ±0.2	1036.0 ^k ±0.1
12 hours	10	75.00 ^f ±0.1	1008.5 ^c ±0.2
	20	88.00 ^j ±0.2	1398.5 ^l ±0.3
	30	74.00 ^e ±1.0	1021.2 ^h ±0.1
	40	73.00 ^d ±0.5	1011.6 ^c ±0.0
	50	0.0 ^a ±0.0	0.0 ^a ±0.0
	Control	72.00 ^c ±0.2	1010.1 ^d ±0.1
24 hours	10	75.00 ^f ±0.1	1008.5 ^c ±0.2
	20	88.00 ^j ±0.2	1398.5 ^l ±0.3
	30	0.0 ^a ±1.0	0.0 ^a ±1.0
	40	0.0 ^a ±0.0	0.0 ^a ±0.0
	50	0.0 ^a ±0.0	0.0 ^a ±0.0
	Control	72.00 ^c ±0.2	1010.1 ^d ±0.1

Values are the mean of three replicates, ± standard error. The means followed by the same letter (S) are not significantly different at P<0.05 when subjected to Tukey's HSD.

DISCUSSION

Evaluation of different concentration of seed extract on seed germination and seedling vigour by paper towel method revealed that these concentration (40 and 50%) and duration of treatment (12 and 24hours) resulted in total germination failure suggesting that higher concentrations with longer duration of treatment is highly phytotoxic to maize seeds. This is evident from the fact that at 24hours periods of treatment with 30 and 40% of aqueous extract and 6,12 and 24hours treatment of 50% aqueous extracts resulted in 100% loss in seed germination compared with control. The result of the present investigations of seed germination and seedling vigour test suggests that 20% concentration of the extract is the highly suitable treatment for maize seeds to control

seed borne fungi of maize coupled with increased seed germination. Thus, in the present investigation, appropriate / optimum dosage and period of soaking of maize seeds for the control of seed borne fungi has been standardized for the first time.

CONCLUSION

From this observation it can be concluded that, medicinal plants plays a key role in growth parameters of maize seeds. Further investigation is needed to isolate bioactive compound for *P.corylifolia* and to test its potential for seed germination and seedling vigour.

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REFERENCES

- Abdul - Balki AA., and Anderson JD. Vigour determination in soybean seed by multiple criteria. *Crop science* 1973;13:630-633.
- Basilico MZ., Basilico JC. Inhibitory effect of some spice essential oils on *Aspergillus ochraceus* NRRL 3174 growth and ochratoxin production. *Letters in Applied Microbiology* 1999; 29(4): 238-241.
- Bohra NK., and Purohit DK. Fungal toxicity with special reference to mycotoxins. *Journal of Environmental biology* 2003; 24(3) : 213-221.
- Daniel RR. Future challenges in food grain production in India. *Current science* 2000;79(8) : 1051-1052.
- ISTA. Proceedings of the International seed testing association, International rules for seed testing. *seed science and technology* 1999;76: 481-484.
- Mathur SC., and Tannan SK. Future of Indian Pesticides industry in next millennium. *Pesticides information.* 1999;24 (4) : 9-18.
- Neelamegam R. Allelopathic Effect of *Ixora coccinea* Linn. on Seed Germination and Early Seedling Growth of Paddy (*Oryza sativa* L.). *Journal of Phytology* 2011; 3(6): 51-55
- Verma S., and Dohroo NP. Evaluation of botanicals *in vitro* against *Fusarium oxysporum* f. sp. *Pisi* causing wilt of pea. *Plant diseases research* 2002; 18(2) : 131-134.