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Effect Of Pre-germination Exposre Of Ultraviolet Radition On *Sesbania Grandiflora(l)* Pers Seeds

M. R. Khan
Department of Botany Poona College (University of Pune) Pune

Abstract: Normal healthy seeds of *Sesbania Grandiflora (L)* Pers treated with ultraviolet radiations (UV) at 96 erg mm2 Sec 1 for two hours. Stimulatory effect of enabryonie development in the form of radical and plumule growth was noticed. Intial faster root and shoot growth created better plant stand. Seeds were given 1hr, 2hr, 3hr, 4hr,5hr& 6hr exposure of UV Radiation.The seed germination percentage was significantly increased after the seeds given exposure of U.V radiations for 2 hours. Root Shoot length also shows significant increase when the seeds were exposed to U.V Radiation for 2 hours. A higher dose of exposures of U.V. Radiations was not found more significant.

Key words:*Sesbania Grandiflora (L)* Pers, U.V radiations seed germination.

INTRODUCTION:

Sesbania grandiflora (L) Pers is a quick growing, but with shorter life period, 7 to 10 m tall soft wooded tree with a few branches. Leaves- Compound, large, bipinnate, 15 to 30 cm long, leaflets- 41 to 61, oblong , Flowers- white or pink, boat- shaped, a cluster of 2-4, in panicle. Fruits- pods, 25 to 35 cm long, quadrangular. Seeds- 15 to 20 seeds per pod, light colored. Occurs throughout India. Cultivated in gardens.

All the five organs (roots, stem leaves, flowers and seeds) of the plant are used in medicine. It is acrid, bitter astringent and cooling. The leaves and flowers are used as appetizer, mild laxative and anthelmentic. The flower & leaf juice is applied to eyes in night blindness. The bark is used in dysentery, diarrhoea, fever and colic. The leaves, bark and flowers are also used in cough and bronchitis.

Timing of germination and conditions under which species germinate are key characteristics determining long term survival of the species in the species environment (Baskin and Baskin, 2001, Godoi and tektey 2004). Konowledge of germination requirememts can bring key information when trying to understand the ecology of the species. In general timing of germination strongly depends on water availability, soil nutrient (korner, 1999, Huang etal 2003, Tilg socolowsk etal 2008, farji- Brener etal 2009) as well as on properties of species such as seed size (Bewley and Black 1994) (Socolowski and takaki 2004, Socolowski etal 2008) seed size may affect possibility of germination (schaal 1980 and Du Huang 2008) and germination rate Zhang and Maun 1990) ultimately influencing fitness of the plant

Gimenez etal, 2004) seed mass may vary not only between species but also within the species and between different environmental conditions .It has been shown that larger seeds posses better germination rate (Ouberg and vantreuren, 1995, Simons and Johnson, 2000 Paz and Martinez Ramos, 2003,

Sesbania grandiflora (L) Pers a plant species, a native of Malasia is grown in many parts of India seeds were given U.V exposure. The germination experiment in the laboratory are generally carried out in different controlled conditions such as shade house, green house or incubator (Khan 2004, Godoiand takaki 2004, Kettering etal 2006 DU and Huang 2008, Castro etal, 2006) The advantage of controlled environment over natural condition is that it in easy to stimulate different environmental conditions and is also easy to follow experiments regardless of any environmental hazards such as over rain, flooding Landslides fire, anthropogenic disturbances etc. Despite many studies on germination behavior of the species there are limited research carried out on S.grandiflora seed germination . This research is aimed to understand germination requirements related to effects of U.V rays on germination of Sesbania grandiflora (L) pers.

It is well established that different spectra light exhibit various effect on different crops have multifacete effect which include improvement of germinability of old seed (padamakaretal. 1985). Higher photosynthetic rates compled with hipher yield increased nodulation efficiency (Benker and Patil, 1979 and better root shoot growth (Dirimonov, 1979). Besides forest plants the normal process of bacteria fungi affected plant cell by ultraviolet raditions (Trrell 1980) UV radiation at shorter wavelength can be utilized as a tool for short and long term advantages to crop growth. Critical level of its exposure to forest seed germination as major handicap for its productivity keeping

this in view the present investigation were carried out to find out the critical level of UV exposure for an optimum growth of S.grandiflora seeds.

MATERIALS AND METHODS

Visible sound and healthy seed of S.grandiflora collected from the forest department and stored in cloth bags containing 5-6% moisture were exposed to UV radiation 15 watt hydrogen lamp delivering approximately 80% of its total energy at a wavelength of 230nm and producing the irradiation level of energy equivalent to 96 erg/mm2/sec dose at a distance of 35cm (Ghatak 1982) Pregermination exposer of seed were made with UV radiation for different interval of time ranging from 1 to 6 hours. The optimn germination and growth in petri dishes were recorded at 2 h exposure seed were placed in petridishes under controlled conditions temperature 20°C R.H. 80 – 85) % and light intensity 800 foot candle) in a plant growth chamber germination count were made after 6 days intervals upto 30 days Root and shoot length were counted after 30 days, for germination count. The seeds were placed in petri dishes lined with cotton and a circle of whatman no 42 filter paper and moisturened with distilled water emergence of radish (2 mm) is treated as index for germination, the experiment were also conducted in pots filled with common soil and treated with irradiated seed, were sown in each pots at equal depth and spacing. Five replications with same number of control were kept for each set of experiment.

Table 1: Effect of Ultra violet radition on seed germination and root, shoot length of Sesbania grandiflora(L) pers(Germination in Petri – dishes)

Days after treatment& Percent Germination								
Name of the spices	Treatment germination in petridishes	6	12	18	24	30	Root Length (Cm)	Shoot Length (Cm)
Sesbaniagrandiflora(L) pers	Control 0 hours	18 ± 0.47	25 ± 0.2	30 ± 0.8	32 ± 0.6	40 ± 0.2	5.45 ± 0.7	1.90 ± 0.2
Sesbaniagrandiflora(L) pers	1 hour	25 ± 1.24	30 ±0.6	40 ± 0.4	45 ± 0.2	52 ± 0.6	5.65 ± 0.47	1.98 ±0.2
Sesbaniagrandiflora(L) pers	2 hours	28 ± 0.2	25 ± 0.6	52 ± 0.8	60 ± 0.6	68 ± 0.8	6.90 ± 0.6	2.20 ± 0.2
Sesbaniagrandiflora(L) pers	3 hours	26 ± 0.47	33 ± 0.47	51 ± 0.6	58 ± 0.47	67 ± 0.2	6.37 ± 0.2	2.10 ± 0.6
Sesbaniagrandiflora(L) pers	4 hours	23 ± 1.24	30 ± 0.2	48 ± 0.6	56 ± 0.47	63 ± 0.4	6.18 ± 0.6	2.07 ± 0.6
Sesbaniagrandiflora(L) pers	5 hours	22 ± 0.2	27 ± 0.47	45 ± 0.2	52 ± 0.2	60 ± 0.47	6.15 ± 0.6	2.04 ± 0.2
Sesbaniagrandiflora(L) pers	6 hours	20 ± 0.2	25 ± 0.2	46 ± 0.8	57 ± 0.2	58 ± 0.4	6.12 ± 0.2	2.02 ± 08

1)Each value is mean of five replicates 2) ± indicate for a standard deviation S.D

Table 2 :Effect of Ultra violet radition on seed germination and root, shoot length of Sesbania grandiflora (L) Pers (Germination in Pots along with soil)

Days after the treatment and percent germination

Name of the Species	Treatment germination in pots with soil	6	12	18	24	30	Root Length (cm)	Shoot Length (cm)
Sesbaniagrandiflora(L) pers	Control 0 hours	18 ± 0.2	25 ± 0.47	30 ± 0.8	32 ± 0.6	45 ± 0.2	5.48 ± 0.6	1.98 ± 0.6
Sesbaniagrandiflora(L) pers	1 hours	28 ± .47	35 ± 0.2	42 ± 0.8	45 ± 0.2	56 ± 0.2	5.80 ± 0.8	2.10 ± 0.2
Sesbaniagrandiflora(L) pers	2 hours	30 ± 0.47	39 ± 0.8	60 ± 0.6	62 ± 0.4	72 ± 0.8	6.98 ± 0.47	2.30 ± 0.2
Sesbaniagrandiflora(L) pers	3 hours	27 ± 0.4	34 ± 0.2	55 ± 0.6	62 ± 0.8	70 ± 0.2	6.98 ± 0.2	2.30 ± 0.6
Sesbaniagrandiflora(L) pers	4 hours	27 ± 0.6	33 ±0.6	53 ± 0.2	59 ± 0.6	64 ± 0.2	6.20 ± 0.6	2.12 ± 0.2
Sesbaniagrandiflora(L) pers	5 hours	26 ± 0.2	30 ± 0.8	53 ± 0.2	57 ± 0.47	63 ± 0.2	6.19 ± 0.6	2.06 ± 1.24
Sesbaniagrandiflora(L) pers	6 hours	23 0.2	28 ± 0.47	50 ± 0.2	56 ± 0.2	62 ± 0.2	6.18 ± 0.8	2.05 ± 0.8

1)Each value is mean of five replicates 2) ± indicate for a standard deviation S.D

RESULTS AND DISCUSSION

The treatment is given by UV radiation in different ways & time seeds were germinated in Petri – dishes and given, 1 hour, 2hr 3 hours,4hours 5 hours & 6 hours exposure shows comparatively better germination at 2 hour exposure to UV radiations. Similarly treatment of UV radiation given different time intervals 1, 2, 3, 4, 5, & 6 hours and seeds were sown in porcelain pots of 30 cm diameter pots were filled with common soil and treated seed were sown in each pot at equal depth and spacing show better germination at 2 hr exporuse to U.V rays.

The treatment with U.V rays at different periods 1, 2, 3, 4, 5 & 6 also shows significant increase in germination and root shoot length at 2 hours exposure after 30th days of the treatment. The opimum does of UV exposure is 2 hours which increases seed germination & root shoot length increases significantly at 3, 4 & 6 hours exposure of UV rays similarity exposure for one increase the germination percentage & root length upto some extent seed treatment given for 2 hoursUV rays exposure and germination in porceline pots along with common soil shows better germination percentage &root shoot length as compared to control and other exposures given.

There was no marked difference on germination among forest seeds at clinical exposure radical and plumule length were taken as determinant of germination potential which were significantly affected by the ultraviolet light of shoter exposure significantly stimulates the growth of both root and shoot over control in some species (Drimonov, 1979) Effect of ultraviolet rays on shoot development was more pronounced in same species. The positive effect of low doses of UV radiations was due to the exzymatic action with new form of enzyme or improved activity of enzymes with disruption in the system of intercellular membrabe (Kuzin, 1963; khan, 1980) Ultraviolet addition inereased the free radical in the system and as a result they activate the physiological process in the plant (shahov tal 1965).

SUMMARY AND CONCLUSION

In conclusion UV exposure of the prior to sowing enhanced the germination percentage radical and plumule length initial faster root and length helped in better plant stand of S.grandiflora. The exposure of seed to UV rays for long time such as 3,4,5& 6 hours was not found very significant but the seed exposure of UV rays for 2 hours was found more significant to increase the germination percentage of seeds and root shoot length .

FUTURE STUDY

The present research show the effect of U.V radiation on seed germination & root shoot length of S. Grandiflora. Hence further advanced studies needed on effect of radiations and their required doses.

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