The Scientific Temper
VOL-X, NO.1&2; JANUARY-JULY, 2019
ISSN 0976 8653, E ISSN 2231 6396
A Web of Science Journal
e-mail:letmepublish@rediffmail.com
Doc ID : https://connectjournals.com/03960.2019.10.41

RESPONSE OF ORGANIC MATERIALS AND LIGHT UPON GERMINATION OF LEGUMINOUS INDIGOFERA PLANTS

KUMARI CHHAYA
Ex-Research Scholar, Jai Prakash University Chapra (Bihar)
Email ID: kumarichhaya1978@gmail.com

ABSTRACT

Indigofera linifolia and *Indigofera hirsuta* germination have been tested for dormancy whenever in organic solvents medium and light wave absorption during study period. Both species appeared to be in possession of seed coat dormancy, and, none of the organic solvents were effective in breaking dormancy to any appreciable extent. Presence or absence of light, any light of any colours also was not effective in breaking dormancy or increasing germination percentage.

INTRODUCTION

The essence of comparative biology is the absolute study as well as the comparison of species in relation to variables of environment of their germination and growth behavior. The vulnerability of the plant to environmental fluctuations increases manifold when seedling emerge from the seed where it was most safe. The mechanism regulating germination are, therefore, of major importance amongst the many processes which contribute to the plant adaptation to its environment. Several workers (Amen, 1966; Toole, 1956; Agrawal and Vyas, 1970; Cornilisen et al, 1996; Pandey and Sinha, 1978) studied germination behavior of legume seeds. In germination studies, breaking of dormancy is the main purpose particularly in legumes and species selected for the present investigation also seem to have seed coat dormancy although variables in intensity. In the present investigation an attempt has been made to correlate germination behavior of these species in nature with the effect of various dormancy mechanisms as well as some of the environment variables.

METHODS AND MATERIALS

Seeds were collected from fully ripened pods and stored with precaution to avoid mixing other seeds by keeping these inside glass tubes properly sealed. Prior the start of experiment they were surface sterilized with 0.2% solution of mercuric chloride so as to remove the presence of any surface borne pathogen. In the present investigation the seeds were pricked with a sharp pointed needle before putting them for germination. Distilled water was used for germination studies unless otherwise required. The seeds were left on moist filter papers sacked by cotton wool in petridishes (9 cm diasmeter) on tasble. Generally 25 seeds were placed in each petridish for germination and four replicates were maintained for each treatment. The emergence of radical up to a length of 1 mm was considered to be the sign of germination. Scores of seeds germinated was made after 24 hrs and this was continued for a week.

RESULT AND DISCUSSIONS

The effect of different organic solvents is presented in Table 1. After the perusal of table it becomes clear that they are not effective in breaking dormancy to any appreciable degree in any of the two species, although there are slight variation in germination percentage put a definite trend is not discernible. The final germination percentage are also similar in control and in different treatment conditions. It can be concluded safely that the dormancy of these seeds are not caused in any significant manner by materials soluble in organic solvents.

Table 1: Effect of different Organic solvents on germination of seeds (% germination)

Organic solvent	I. linifolia	I. hirsuta
Ether	5	22
Xylene	4	25
Absolute Alcohal	5	24
Acetone	6	22
Control	5	20

Table 2: Effect of Conc. H2SO4 on germination of seeds in response of treatment period.

Species	control	20 min	40 min	60 min	80 min	100 min
I. linifolia	5	55	70	90	90	80
I. hirsuta	20	85	100	70	20	02

Table 3: Effect of different wavelengths of light on percentgermination of seeds

Light colour	I. linifolia	I. hirsuta
Red	93	100
Yellow	95	100
Green	91	99
Blue	96	96
Orange	92	91
Far-Red	94	97
40 W Incandescent	94	95

There concentrated sulphuric acid has been found to be effective in breaking the dormancy of leguminous seeds which are generally seed coat dormant. The results of scarification have been presented in Table 2. The dormancy of I. linifolia appears to be most intense as only 5% germination is possible without scarification, whereas I. hirshuta germinates to a considerable extent even without scarification (20%). Thus according to intensity of dormancy, I. linifolia occupies the highest place and I. hirsute the lower. Similar trend is observed in achieving 100% germination. The seeds of I. hirsute attain germination (100%) with treatment for 40 minutes only whereas for other seeds to achieve full germination the duration of treatment required is 60 minuites and even after this duration only 90% (maximum) germination is achieved. Mallick and Chatterjee (1967) has also reported effectiveness of sulphuric acid in leguminous seeds. The retention of viability after considerable period of sulphuric acid treatments shows the effectiveness of seed coat of leguminous seeds.

The result of different colour of light has been presented iin Table 3. It also presents a picture which is in agreement with first experiment. Similar reports abound for leguminous seeds (Mallick and Chatterjee, 1967; and Vyas, 1970). The two experiments involving light may appear to be a more wastage of time in the presence of a many reports of the ineffectiveness of light.

CONCLUSION

There is direct effect of chemicals in germination and dormancy breakage observed during study period. Therefore, germination rate can be promoted with several chemicals in practice in nursery stage of plants.

REFERENCES

1. Agarwal SK and Vyas LN (1970): Studies on the extent and role of dormancy in the seeds of Indigofera astragalina. Journal of Indian Botanical Society, 49 (1-4_: 158-163.
2. Amen RD (1966): The extent and role of seed dormancy in alpine plants. Q. Rev. Biol. 41: 271-281.
3. Cornellisen JHC, Castro Diez P and Hunt R (1996): Seedling growth, allocation and leaf attributes in a wide range of woody plant species and types. Journal of Ecology, 84: 755-763.
4. Mallick P and Chatterjee UN (1967): Eco-physiological studies on seed germination: Germination experiments with seeds of Clitoria terneata Linn, Tropical Ecology 8:117-125.
5. Pandey BN and Sinha RP (1978): Temperature effect on seed germination of Crotolaria spp., Geobios, 5:148-151.
6. Toole EH, Handricks SB, Borthwick HA and Toole VK (1956): Physiology of seed germination. Ann. Rev. PL. Physiol. 7: 299-324.

http://www.scientifictemper.com/