International Journal of Innovative Horticulture. 7(1):54-55, 2018 **Short Communication**

Pre-sowing seed treatments for Indian indigo (*Indigofera tinctoria*)

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ABSTRACT

Indian indigo (*Indigofera tinctoria*) is a dye yielding plant with medicinal properties. The seeds of the plant are very small and possess a hard seed coat. Different kinds of scarification treatments i.e. thermal, mechanical and chemical were carried out to break the dormancy of the seeds. Best result was obtained when the seeds were subjected to chemical scarification. About 76% of the seeds germinated when they were given a pre-sown treatment of quick dip in 100% concentrated sulfuric acid.

Keywords: *Indigofera tinctoria,* Indian Indigo, seed treatment, scarification.

Indian indigo (*Indigofera tinctoria*) commonly known as king of dyes is a deciduous sub shrub of the south eastern Asia. It belongs to the bean family or Fabaceae. The shoots of the plant contain indigotin, which is the source for a deep blue dye. These plant derived dyes are useful in dyeing cloths which do not produce dermatitis (Gulrajani and Gupta, 1992). Indigo is the oldest blue dye utilized by man and was commercially much exploited till synthetic colouring material was evolved. The plant besides utilized as a source of blue dye is also valued in ayurveda as an important ingredient of hair tonics like *Neelibhringadi thailam*. It is used in the treatment of myelocytic leukemia (Aobchey *et al*., 2007). It is also useful in treatment of inflammatory skin conditions and treatment of tonsils. The plant has hepatoprotective activity (Singh *et al.,* 2001) and antidyslipidemic activity (Narender *et al.,* 2006). An infusion of roots is given as an antidote in case of snake bite poisoning. The plant has significant importance as a potential green manure crop also. (Garrity *et al.,* 1994)

Indigofera can be grown as an annual, biennial or perennial plant. The seeds of the plant are small and possess a very hard seed coat (Fig. 1). Hence the germination of the seeds is difficult in natural conditions. To efficiently cultivate a species, the seeds must be viable and nondormant. Cultivation using nondormant seeds, or seeds released from dormancy, allows uniform germination, emergence, and optimal stand for establishment. Scarification of an impermeable seedcoat allows physically dormant seed to imbibe water and subsequently germinate (Jones *et al.,* 2016). A number of scarification methods have been found to overcome physical dormancy. In this study, an experiment was planned to determine the efficient method of seed germination in *Indigofera tinctoria*. The seeds were subjected to thermal, mechanical or chemical scarification. Thermal scarification involves subjecting the pre sown seeds at particular temperature for fixed time. The different thermal scarification treatments and the germination percentage of the seeds are enlisted in Table 1. The treatments for mechanical scarification involve sanding, grinding and both. The seed germination obtained with mechanical scarification is shown in Table 2. In chemical scarification, the seeds are subjected to sulphuric acid treatment at varying concentration for fixed amount of time (Table 3).

The treatments were carried out in four replications with 100 seeds per replication. The percentage of total number of seeds germinated per treatment was calculated. The results from this study show that a quick dip in 100% concentrated sulfuric acid was the best scarification treatment for seed germination in *Indigofera tinctoria*. By this treatment 76% of the seeds germinated. The maximum and minimum germination percentage obtained from different scarification treatments are depicted in Fig. 2. The best treatment for thermal scarification was subjecting the seedlings to 80°C for 6 hours, which gave a germination percentage of 28. For thermal scarification the germination percentage varied from 2-28%. The best mechanical scarification treatment was a combination of sanding and grinding, which provided a germination percentage of 10.

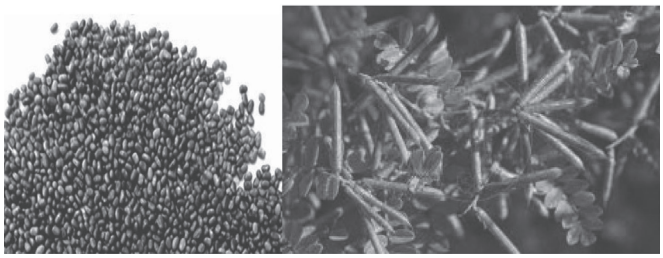

Fig. 1: Seeds and Pods of *Indigofera tinctoria*

Table 1: Thermal scarification, treatments and germination percentage

Treatments	Temperature	Time (hours)	Germination (%)
T1	40°C	2	3
		4	7
		6	7
		12	8
		24	10
T2	60°C	2	8
		4	9
		6	13
		12	14
		24	16
T3	80°C	2	9
		4	11
		6	28
		12	23
		24	18
T4	100°C	2	14
		4	17
		6	12
		12	4
		24	2

Table 2: Mechanical scarification, treatments and germination percentage

Treatments	Germination (%)
Sanding	3
Grinding	5
Sanding + Grinding	10

Table 3: Chemical scarification, treatments and germination percentage

Treatments	Sulfuric acid concentration (%)	Time	Germination (%)
T1	10	Quick dip	1
		1 minute	2
		5 minute	3
		10 minute	5
		30 minute	18
		60 minute	21
T2	25	Quick dip	2
		1 minute	3
		5 minute	8
		10 minute	13
		30 minute	15
		60 minute	20
T3	50	Quick dip	5
		1 minute	6
		5 minute	7
		10 minute	12
		30 minute	34
		60 minute	28
T4	75	Quick dip	17
		1 minute	23
		5 minute	30
		10 minute	61
		30 minute	2
		60 minute	1
T5	100	Quick dip	76
		1 minute	18
		5 minute	1
		10 minute	0
		30 minute	0
		60 minute	0

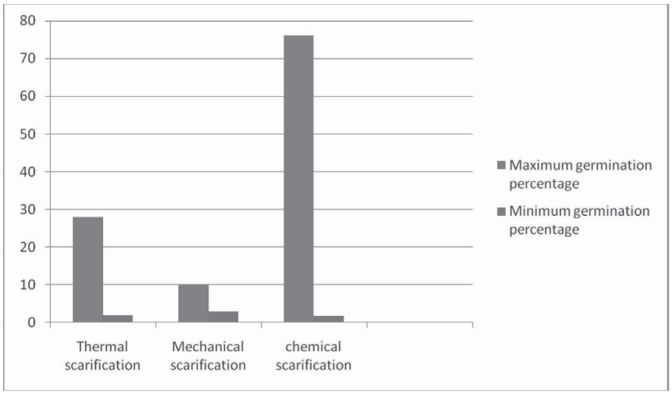

Fig. 2: Maximum and minimum germination percentage when the pre sown seeds are subjected to various types of scarification

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