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COAT IMPOSED DORMANCY IN *MIMOSA HIMALAYANA* SEEDS

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ABSTRACT

***Germination with and without scarification treatments* was studied in freshly collected and one year old seeds of *Mimosa himalayna*. The results indicated that seeds of this species are dormant due to impermeability of their seed coat to water. The dormancy may be terminated to a little extent during dry storage. However, scarification treatments resulted in the termination of the dormancy. Mechanical and chemical scarifications proved most effective treatments.**

Keywords : Dormancy, *Mimosa*, seeds

INTRODUCTION

In recent past Nitrogen fixing species assume considerable importance for restoration of degraded sites and are for their amelioration characteristics and generally used in plantation programmes (Purohit *et al.*, 1995). Legumes can enrich soil through decomposition of their nitrogen rich leaf litter (Cole *et al.*,1996). However, impermeability to water uptake is a factor in a majority of seeds which caused coat imposed dormancy and delayed germination in most hard seeds of leguminaceae (Bewley and Black,1982; Bewani and Mohammed, 1985) and in other species too (Naidu *et.al.*,2006). Like the seeds of most of the species of Acacias, shows dormancy due to their seed coat impermeability for water (Rolston,1978; Cavanagh, 1980; Karihaloo 1984; Rana and Nautiyal,1981). The same type of dormancy was reported in *Mimosa himalayana* seeds. The plant is an erect or straggling shrub, attaining a height of 1.5 to 3.0 meter with smooth bark and thorny branches, found throughout India ascending to 1,000 meter in the outer Himalaya. It is common along water courses, heavily grazed scrub forests and abandoned cultivated lands and considered useful for hedges. The roots, leaves and fruits find minor medicinal uses (Anonymous,1962). However, its freshly collected seeds exhibit a dormancy which is not terminated without treatment and results obtained, and reported here in this communication.

MATERIALS AND METHODS

Ripe pods of freshly collected as well as one year old seeds of *Mimosa himalayana*

(moisture content 2.78%) were collected from its natural habitat from srinagar in January-February, and then subjected to normal sun drying. Pods were broken to seperate the seeds. The dried seeds were stored in sealed polythene bags put in tin boxes at room temperature and studied freshly and one year old storage seeds in March. These seeds were divided into seven lots of 100 seeds of each lot and studied separately. Seeds were observed daily for radicle emergence and counts were made. Each lots was replicated four times, each replication containing 25 seeds of equal size (Karihaloo 1984; Rana and Nautiyal, 1989)

First lot of 100 seeds of both fresh as well as one year old seeds imbibed in distilled water at room temperature for 24 hours, served as control. While seeds of second lot were immersed in once boiled water in conical flask for hot water treatment, allowed to cool and left as such for 24 hours at room temperature. For mechanical scarification two methods were used here, firstly the micropylar end of the seeds were punctured with a sharp needle avoiding injury to the seed structure (third lot), and seeds of fourth lot were rubbed against a sand paper. Under chemical scarification treatment one year old seeds were chemically scarified by immersing these in concentrated sulphuric acid individually for 2, 4, and 6 hours, while the freshly collected ones were dipped in such acid for 5, 10 and 15 minutes. The mechanically as well as chemically scarified seeds were imbibed in distilled water at room temperature for 24 hours, similar to control ones, before placing them for germination.

For germination, the scarified seeds and un-scarified seeds were studied at room temperature, 23-32 ^{0}C in petri dishes lined with Whatman filter paper (No. 1). These were regularly moistured with distilled water and germination counts taken daily. These treatments were replicated four times each treatment comprising of 25 seed.

RESULTS AND DISCUSSION

Germinability of freshly collected and one year old seed of *Mimosa himalayana* (seed moisture 2.78%) without and after scarification presented in Table 1. Although the germination percentage of scarified seed was higher then the unscarified seed of *Acacia farnesiana* (Rana & Nautiyal, 1989). The scarification treatments considerably improved the germination in this species. But scarification of seeds not only brought out 100 % germination but an early onset of germination also took place. Also one year old seeds have a different pattern of germination as compared to the fresh seeds.

Table 1 Percentage germination in unscarified and scarified fresh and one year old seeds of *Mimosa himalayana* (± SE).

Treatments	Seed Lot	Days After Imbibition 2	6	12	18	24	30
Control	Fresh	0±0	0±0	6±2	14±2	14±2	14±2
	1Yr. Old	0±0	0±0	35±5	40±5	55±5	55±5
Hot Water	Fresh	0±0	4±0	8±2	12±4	14±4	16±4
	1Yr. Old	0±0	10±0	15±5	70±5	90±5	95±5
Puncturing	Fresh	0±0	4±0	8±2	22±2	32±4	36±8
	1Yr. Old	0±0	10±0	40±10	90±0	100±0	100±0
Rubbing	Fresh	4±0	12±0	72±4	82±2	94±2	98±2
	1Yr. Old	0±0	35±5	80±10	95±5	100±0	100±0
Acid Treated	Fresh (5 min.)	0±0	0±0	8±4	20±4	36±4	54±2
	1Yr. Old (2 hr.)	0±0	10±0	100±0	100±0	100±0	100±0
Acid Treated	Fresh (10 min.)	0±0	0±0	4±0	10±2	16±4	40±0
	1Yr. Old (4 hr.)	0±0	30±0	50±5	90±10	-	-
Acid Treated	Fresh (15 min.)	0±0	0±0	14±2	14±2	16±4	42±2
	1Yr. Old (6 hr.)	20±0	40±10	65±5	-	-	-

under rubbing with sand paper in fresh and one year old seeds respectively (Table 1). Although the onset of germination was earliest and also vigorous in chemically scarified seeds as in mechanically scarified ones yet most of the seeds had shown deterioration after one month of germination.

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