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Analysis of Breach of Dormancy of Jurema Preta (*Mimosa hostilis* Benth.) and Mororó(*Bauhiniacheilantha*(Bong.) Steud)

José Crisólogo De Sales Silva,[1*] Lívio Kelver Martins Da Silva,[2**] João Paulo Silvério Da Silva,[3***] José Iran Sousa E Silva,[4] Alex Romualdo N. de Oliveira,[5]

[1]*Prof. Dr. Titular Zootecnia, Universidade Estadual De Alagoas – Santana Do Ipanema / AL - Brazil*
[2,3,4,5]*zootechnistofuniversidade Estadual De Alagoas – Santana Do Ipanema / AL- Brazil;*

Abstract: *The seed dormancy limits seedling production and the potential for using them. This study aimed to determine the best method for breaking dormancy in seeds of Mimosa hostilisBenth. AndBauhinia cheilantha (Bong.)Steud. The experiment was conducted at the Laboratory of Food Science, State University of Alagoas (UNEAL) Campus II, located in the municipality of Santana do Ipanema, Alagoas State, Brazil. Five treatments were studied (T): T1 - immersion in water at 100 ° C until cooling thereof; T2 - immersion in water at 50 ° C until cooling thereof; T3 - immersion in sulfuric acid for 5 minutes, followed by washing in water for 10 minutes; T4 - mechanical scarification by sandpaper for 2 minutes, and T5 - Witness. Where it came to evaluating the germination speed index (GSI) and germination percentage (G%). Data were subjected to analysis of variance and the means compared by Tukey test at 5% significance level. The immersion in sulfuric acid was the best method to break seed dormancy of Mimosa hostilisBenth., now for* (*Bauhinia cheilantha*(Bong). Steud) *in the chiseling was the best method for breaking dormancy.*

Keywords: *Germination. Seeds. Mechanicalscarification.*

I. INTRODUCTION

The Caatinga vegetation is adapted to arid conditions (xerophytic). As for flora, have been reported until now about 1000 species, estimated to have a total of 2000 to 3000 and mostly Leguminosae, which were cataloged 80m endemic species (QUEIROS, 1999).

The Black Jurema plant (Mimosa hostilisBenth.) is a tree belonging to the family Fabaceae, the order of Fabales typical savanna, occurring practically in almost all Brazilian northeast. Well adapted to dry climate has small leaves alternate, bipinnate compound and with several pairs of opposite pinnae. It has thorns and provides enough resistance to drought with great sprouting capacity throughout the year (Wikipedia, 2013).

The Mororó (*Bauhinia cheilantha*(Bong). Steud) is a common species in the scrub, and inhabiting fertile clay at elevations above 500 m, and can be used as good fodder for goats and sheep. Belonging to the family Leguminosae, is found in many soils of the hinterland, and features sturdy coat. After reaching physiological maturity seeds of some species undergo dormancy thus demanding conditions favorable for germination to occur, either by natural induction of the medium, or by artificial methods (CORREIA, 2004).

Although feasible, many species have seeds that do not germinate even in conditions considered favorable for its development (METIVIER, 1986; EIRA et al. 1993). And so these seeds are considered dormant.

The crop species which exhibit dormancy becomes a problem due to the time delay that delayed germination of seedlings and develop mainly to the fact that after planting, when much time in soil, the seeds are susceptible to fungal attacks, which can cause damage, both in production and economic.The impermeability of the coat is the primary cause of seed dormancy, which may be associated with the presence of palisade cells and a cuticle layer which protects the embryo (SANTOS et. Al. 2004).

For cutaneous type of dormancy, which occurs most Leguminosae, overrun may occur through: with sulfuric acid; immersion in hot water. Mechanical scarification: wear occurs where the integument through sand or other material, allowing water ingress (FOWLER&BIANCHETTI, 2000).

Therefore, the objective of this study was to evaluate the influence of scarification methods to break seed dormancy and germination of the species studied.

II. MATERIAL AND METHODS

The experiment was conducted at the Laboratory of Food Science, State University of Alagoas (UNEAL) II campus, located in the municipality of Santana do Ipanema, semi-arid region of the State of Alagoas.

Seeds were collected from headquarters located in the municipalities of Santana do Ipanema and the Trenches Well, from September to October 2012. To collect seeds, we performed a light touch to promoting fruit abscission seeds, which were collected.

The treatments were five in number, represented by the following methods: T1 - Immersion in water at 100 °C until cooling thereof; T2 - Immersion in water at 50 °C until cooling thereof; T3 - immersion in sulfuric acid for about 5 minutes followed by washing in running water for 10 minutes, T4 - Scarification mechanical sanding for 2 minutes, and T5 - control.

After the treatments, the seeds were germinated in trays with 3 sheets of filter paper moistened with water and, when necessary, moistened.

Being evaluated variables: a) percentage of germination according Bartlett (1947) where after sowing, was noted to the cumulative daily number of germinated seeds, until it is found, b) Germination Speed Index (GSI) as proposed by Garcia (1994). The data obtained for each of the characteristics evaluated in the experiment were tested with analysis of variance (Tukey) all at 5% probability ($p<0,05$), n = 30.

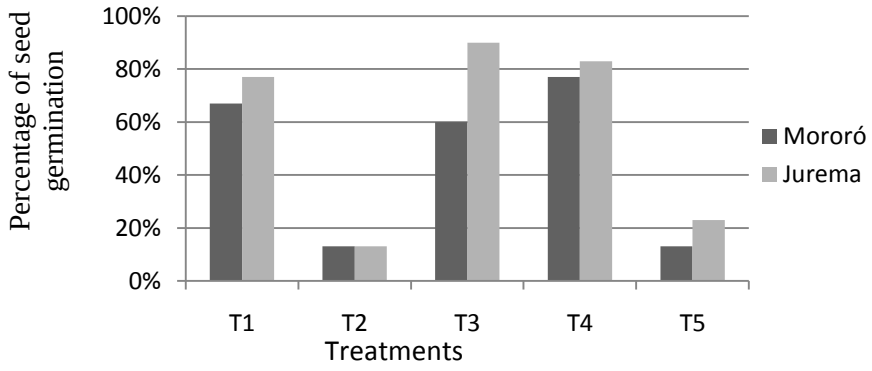

Figure 1. Percentage of seed germination Mororó (*Bauhinia cheilantha*(Bong). Steud) and Jurema Black (*Mimosa hostilis*Benth), subjected to five treatments (T) of dormancy: T1 - Immersion in water at 100 ° c until cooling thereof; T2 - immersion in water at 50 ° C by cooling thereof; T3 - immersion in sulfuric acid for 5 minutes followed by washing in running water for 10 minutes, T4 - Scarification mechanical sand for 2 minutes, and T5 - Witness. The data obtained for each of the characteristics evaluated in the experiment were tested with analysis of variance (Tukey) all at 5% probability.

III. RESULTS AND DISCUSSION

With about 12 hours after treatments in some seeds JuremaPreta, since you could see a large difference in the volume of the seeds of T1, T3 and T4, this increase caused by the hydration thereof, demonstrating a significant efficacy in relationship break dormancy seed coat. What also occurred with seeds Mororó passed by the same treatments (T1, T3 and T4), however these after 24 hours.

Table 1: Number of seeds germinated (NSG), germination percentage (G%) and germination speed index (GSI) for different scarification treatments in seeds JuremaPreta ((*Mimosa hostilis*Benth.), n = 30 per treatment.

Treatments	NSG	G%	GSI
T1	23	77	42
T2	04	13	7,3
T3	27	90	54,2
T4	25	83	43,7
T5	07	23	8,9
C.V.(%)			5

Treatments T1 - immersion in water at 100 ° C until cooling thereof; T2 - immersion in water at 50 ° C until cooling thereof; T3 - immersion in sulfuric acid for about 5 minutes followed by washing in running water for about 10 minutes; T4 - Mechanical scarification by sandpaper in about 2 minutes, and T5 - Witness. The data obtained for each of the characteristics evaluated in the experiment were tested with analysis of variance (Tukey) all at 5% probability.

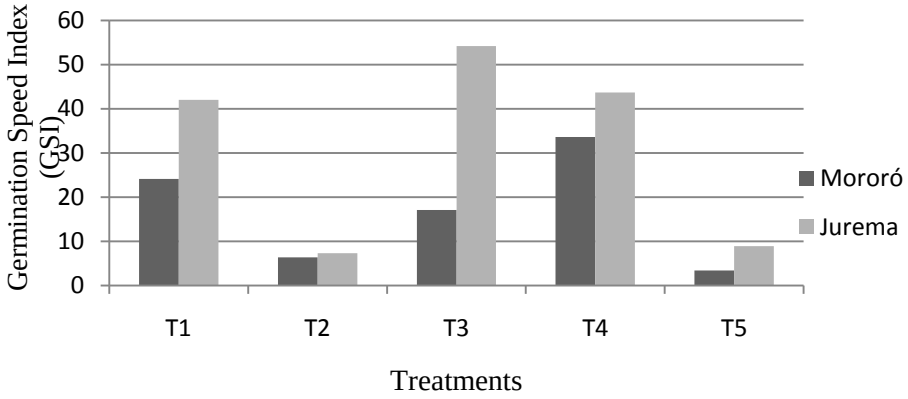

Figure 2. Germination Speed Index of seed Mororó (*Bauhinia cheilantha*(Bong). Steud) and JuremaPreta (*Mimosa hostilis*Benth), subjected to five treatments (T) to break dormancy: T1 - Immersion in water at 100 ° c until the same cooling T2 - Immersion in water at 50 ° C by cooling thereof; T3 - immersion in sulfuric acid for about 5 minutes followed by washing in running water for 10 minutes, T4 - Scarification mechanical sand for about 2 minutes; and T5 - Witness. The data obtained for each of the characteristics evaluated in the experiment were tested with analysis of variance (Tukey) all at 5% probability.

The same happens in germination phase, where there is a wide variation in germination compared to T1, T3 and T4 for treatments T2 and T5 (Figure 1), demonstrating the efficacy of treatments stronger. Getting these results according to the research conducted by VASTANO Jr. et. al. (1983), with leguminous tree species using chemical and mechanical scarification. Also there is the same treatment efficiency in relation to Germination Speed Index (GSI) as shown in Figure 2.

Table 2: Number of seeds germinated (NSG), germination percentage (G%) and germination speed index (GSI) for different scarification treatments in seeds Mororó (*Bauhinia cheilantha*(Bong). Steud).

Treatments	NSG	G%	GSI
T1	20	67	24,1
T2	04	13	6,4
T3	18	60	17,1
T4	23	77	33,6
T5	04	13	3,4
C.V.(%)			5

Treatments T1 - immersion in water at 100 ° C until cooling thereof; T2 - immersion in water at 50 ° C until cooling thereof; T3 - immersion in sulfuric acid for about 5 minutes followed by washing in running water for about 10 minutes; T4 - Mechanical scarification by sandpaper in about 2 minutes, and T5 - Witness. The data obtained for each of the characteristics evaluated in the experiment were tested with analysis of variance (Tukey) all at 5% probability.

Bakke et al. (2006) researchedthetoleranceof jurema preta seedstowaterandsaltstressesduringgermination. Seedsgermination in polyethyleneglycol (PEG-6000) andsodiumchloride (NaCl) solutionswasanalyzedunderfivedifferentosmoticpotentials (0.0; -0.3, -0.6, -0.9 and –1.2MPa), in ordertosimulatewaterandsalt stress, respectively, in four 100-seed replications for eachtreatmentseedswereplacedinto10cmx10cmx4cm boxes, andgerminationaccomplished in BOD germinatoradjustedto 30oC. The numberofgerminatedseedswasmonitoredevery 24 hours, andpercentageandspeedofseedgerminationweregeneratedfromthese data. Meanpercentagegermination in thecontroltreatmentwas ~95%, reducingto 63-53% at –0.9 to –1.2-MPa PEG solutions, andto 27- 9.5% atNaClsolutionsat equivalente osmoticpotentials. Velocityofgermination index was more affected, anddecreasedupto 1/8 ofthecontrol, at –0.6 MPa. Jurema preta andconcludesthatseedsshowedlowertolerancetoNaClthantowater stress, andthisspeciescanbeclassified as a glycophyte.

IV. CONCLUSION

Immersion in sulfuric acid for 5 minutes followed by rinsing in tap water for about 10 minutes, was the best method to break seed dormancy in Jurema Black (*Mimosa hostilis*Benth) Already for Mororó (Bauhinia cheilantha bong. Steud) mechanical scarification by sandpaper in about 2 minutes, despite the laborious, proves to be the best method for breaking dormancy.

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