



Pre-Treatment Effects on the Germination of *Dacryodes klaineana* (Pierre) H.J.Lam., Seed Kernel

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ABSTRACT

This study examined the pre-treatment effects on the germination of *Dacryodes klaineana*. The study was conducted in the nursery of Moist Forestry Research, Station, Okhuesan-Ubiaja, Edo State. The seed kernels were subjected to four (4) different pre-treatment methods and a control with each treatment replicated five times. However, 16 weeks after planting, seeds roasted in fire for 5 minutes had the highest germination percentage of 86% followed by those soaked with H₂SO₄(60%) and scarification (50%) by filling respectively. *Dacryodes klaineana* seeds kernel roasted in fire will yield desirably despite the hard seed coat and also saves cost and time. It is however recommended for seedling propagation.

Keywords: *Dacryodes klaineana*, pre-treatment, germination percentage and seedlings emergence

INTRODUCTION

The impediment of embryonic seed development in many seeds is overcome by subjecting the seeds in an appropriate environmental requirement. The major environmental conditions necessary are access to moisture and air, a suitable range of temperature, freedom from high concentration of inorganic salts, poison, and contact to light and some inhibitors. With or without these conditions germination can still not take place in some seeds (Yakubu *et al.*, 2014; Noggle and Fritz, 1986). *Dacryodes Klaineana* (Pierre) H.J.Lam locally called by the binis as 'Orumu-eze', Ishan as 'Akpogho'; Igbo as 'Ube-miri-oku' is an indigenous forest tree with various medicinal values, belong to the family Burseraceae (Aigbokhan, 2014) It resembles *Dacryodes edulis* but different in seed, fruit colour and leaf. It is evergreen tree with a low spreading crown, dioeciously and a medium sized tree up to 25-30m tall; bole brenchless for up to 10m, Up to 60-120m in diameter. PROTA (2008) reported that *D. klaineana* seeds, roots and leaves have pharmacological uses. In cote d Ivoire *D. klaineana* is used to treat tachycardia and cough. The fruit is eaten raw or cooked; the pulp is boiled or roasted to yield kind of butter. The ground leaf is an ingredient of an enema applied against painful menstruation (PROTA, 2008; Tabuti *et. al.*, 2003). It's by products are also useful; the wood makes excellent fuel wood. PROTA (2008) reported that the wood (trade name; adjouaba) is used in construction and for mortars, axe, handles and wagons. It has also recommended for telegraph poles and railway sleepers, furniture, parquetry and paper making. The seed kernel is very small with a hard coat that needs ways to break its dormancy to enhanced adequate germination. *D. Klaineana* in Edo State Forest is going into extinction due to the high demand of the wood and few trees present in the wild. These factors seriously depleted the populations of the tree species. This study was carried out with a view to enhancing germination and seedlings growth of *D. klaineana* as to increase and improved the production and population of this species in our forest in order to prevent it from going into extinction.

MATERIALS AND METHODS

This study of pre-treatment effects in the germination of *Dacryodes klaineana* was conducted at Moist Forest Research Station (Okhuesan Office) Esan South East Local Government Area of Edo State. The samples were authenticated by the taxonomist of Moist Forest Research Station, Mr Emmanuel Isebmeh. These matured fruits were collected and were air-dried for 3 days and processed by removing the edible pulp part away from the seeds. The seeds were subjected to four different pre-germination treatments and a control with each treatment replicated five times as follows:

T ₀	=	Control
T ₁	=	Soaked in tap water for 2 hours
T ₂	=	Soaked in H ₂ SO ₄ for 5 minutes
T ₃	=	Roasted in fire for 5 minutes
T ₄	=	Scarified by filing

The experiment was a 4 x5 factorial. The pots were filled with topsoil and one seed sown directly at a uniform depth of 3cm into the pots giving a total of 20 pots. Complete randomized Design (CRD) was used in setting up the experiment, under the nursery shed at the Moist Forest Research Station. Watering was done once daily and seedlings emergence was observed and recorded weekly till 16 weeks after planting. Germination percentage of the seeds was carried out and data was analyzed with Analysis of Variance (ANOVA).

Table 1: Germination Percentage of *Dacryodes Klaineana* seeds under various soil media

Treatment	Germination (%)
T ₀	0
T ₁	0
T ₂	60
T ₃	86
T ₄	50

Table 2: Analysis of variance (ANOVA) for the germination of *D. Klaineana* under different treatments.

Source of Variation	Df	Sum of squares	Mean of squares	Fcal	F tab
Treatments	5	53.4	12.1	7.8	3.478*
Error	10	18.3	1.6		
Total	20	68.7	4.9		

RESULTS AND DISCUSSION

Table 1 shows that seeds of *Dacryodes Klaineana* that was roasted in fire for five (5) minutes (T₃) had the highest germination value of 86%, 16 weeks after planting, followed by (T₂) with germination of 60%,

(T₄) with germination of 50% while (T₁ and T₀) had zero %. The appreciable germination response recorded with seed subjected to roast in fire for 5 minutes. This finding is in agreement with Remison (1997), Bells (1999), Tieu *et al.* (2001) and Yakubu *et al.* (2014) that heat is a good agent for causing early germination and results to

99% germination success. Also, the germination response to H_2SO_4 was in agreement with the findings of Gull *et al.* (1992), Emongor *et al.*, 2004, Sangotoyinbo *et al.*, (2013) and Imani *et al.*, 2014, Using H_2SO_4 gave great percentage of germination success. However, even though the percentage of germination in scarification was not too high, it also shown that mechanical scarification also enhanced germination in seeds of tropical trees but it was very low in *D. klaineana*. The analysis of variance (ANOVA) shows that there is significant difference among the treatments at 5% probability. Generally no germination was recorded in all the treatment during the 6 weeks of sowing. Also no germination was recorded in T_0 and T_1 , throughout the experiment. ICUC (2001) Sangotoyinbo *et al* (2013) reported that regardless of any pre-germination treatment applied to the seeds of tropical trees, germination normally commences after 8 days and that pre-treatment only increases the germination percentage and also reduce germination time.

CONCLUSION AND RECOMMENDATIONS

Results obtained from this study revealed that pre-germination treatment enhance germination percentage. The table 2 shows the analysis of variance (ANOVA) carried out showed that there is significant difference at 5% level of probability amid the treatment. *D. klaineana* that was subjected to roast in fire for 5minutes gave the best germination results with maximum germination of 86% while Conc. H_2SO_4 and scarified by filling gave 60% and 50% respectively in germination performance. Seeds soak in water and control recorded 0%. These findings indicated that *D. klaineana* will germinate fairly well when its seed kernel is subjected to fire. However to enhance and ensure optimum and good germination of *D. klaineana*, seeds subjected to roast in fire will yield desirable germination response with a period of 16 weeks. For farmers who may not have access to Conc. H_2SO_4 and no time to scarified by filing, and to save cost, roast in fire is recommended. This will increase the germination rate and produce satisfactory results. This finding are very crucial to the multiplication of the plant as it is presently under the threat of extinction while research should also

be carried out to know the best timing to be used to break the dormancy of the seeds for research purpose.

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