

Short Communication

Effect of pre-sowing treatments on seed germination and seedling growth of *Tetracarpidium conophorum* Mull.

Ehiagbanare, J. E.^{1*} and Onyibe, H. I.²

¹Department of Biological Sciences, Igbinedion University, Okada, Nigeria.

²Ambrose Alli University, Ekpoma, Nigeria.

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Pre-sowing treatments were evaluated for *Tetracarpidium conophorum*. Mechanically scarified *T. conophorum* seeds soaked in indole acetic acid for 24 h yielded 90% seed germination. Smoked- and sun-dried seeds for 14 days yielded 73 and 33.3% seed germination, respectively. Poorest values were obtained from acid treatment (0%), while the control had 20%. The tough seed coat is the main germination problem.

Keywords: Traditional methods, Presowing treatments, *Tetracarpidium conophorum*, seed germination, seedling growth.

INTRODUCTION

The plant *Tetracarpidium conophorum* is a climber found in the wet part of southern Nigeria and West Africa in general. Its habitat is usually large trees. The fruits are greenish with four round seeds in each fruit. The testa of the seed is hard and the cotyledons white in colour. The fruits are edible and the plant is medicinal and used for various purposes. As reported by Dalziel (1937) the plant is known as "ukpa" in Ibo, "adala" in Yoruba and "Kaso" in Cameroon. The plant is used for the treatment of male infertility and dysentery (Ajaiyeoba and Fabare, 2006). Although some studies have been carried out on *T. conophorum*, they are on the areas of nutritive value of the seeds (Akpuaka and Nwankwo, 2000; Adebona, 1988). Some phytochemical constituents present in *T. conophorum* are tannins, proteins, oil, carbohydrates and fibre (Enujiugha, 2003).

However, there is scanty information on the regeneration of this very important plant. The plant is still in the wild. There is no evidence of efforts to domesticate this useful plant. The high rate of forest destruction affects their habitat. The plant could face possible extinction in the very near future. To prevent this useful plant from extinction and provide basis for its conservation, this current study was undertaken.

MATERIALS AND METHOD

Information from communities where *T. conophorum* is found showed that the seeds after extraction are smoke-dried until there is at least a crack in the testa. From this information, the conclusion was reached that the seed testa could be the restricting factor to seed germination. Two different experiments were designed using the traditional method and some pre-sowing treatments. All containers were filled with only top soil. With the traditional method seeds were smoke dried or sun dried for a period of 14 days. The seeds were citified dried enough when they no longer stick together and cracks were noticed on the seed testa. Ten seeds were sown at 1 cm depth in standard containers and replicated three times. The second experiment consist of the following pre-sowing treatments; mechanical scarification using sandpaper, acid scarification in 100% H₂S04 (sulphuric acid) for 5 min, soaking in water for 24 h, soaking in 1AA after a crack in the testa for 24 h and the seeds in the control which were not treated were sown fresh. All containers were arranged in randomized block design. Watering of the containers was done every other day. Seed germination was monitored for 40 days. Germinated seeds were recorded and discarded. Three sets of seedlings were grown for seedling evaluation; the results obtained were statistically analyzed.

RESULTS AND DISCUSSION

The results obtained from this current study are presented in Tables 1 and 2. From this current study it became indisputably clear that traditional knowledge is vital in solving environmental problems. The information study

*Corresponding author. E-mail: drehiagbanare@yahoo.com.

Table 1. Effect of traditional method on germination of *Tetracarpidium conophorum* seeds.

Drying method	% Germination	Seedling growth	
		Mean height (cm)	Mean no. of leaves
Smoke-dried seeds	73.00	30.0	8 ± 0.01
Sun dried seeds	33.3	24.0	4 ± 0.03
Fresh seeds (control)	20.0	18.0	3 ± 0.02

Table 2. Effect of some pre-sowing treatments on germination of *Tetracarpidium conophorum* seeds.

Presowing Treatments	% Germination	Seedling growth	
		Mean height (cm)	Mean no of leaves
Mechanical scarification (sand paper used)	70.0	46.0	12.1
Acid scarification (con H ₂ SO ₄ used)	0.0	0.0	0.0
Soaking in water (7 days)	30.0	28.0	14.6
Soaking in IAA (indole acetic acid for 24 h)	90.0	56.0	29.0
Fresh seed sown (control)	20.0	18.0	7.5

led to the conclusion that the effect of pre-sowing treatments on the seed germination of *T. conophorum* seeds needs to be investigated. The outcome of the investigations showed that although significant differences exist in the traditional methods and pre-sowing treatments (Tables 1 and 2), good germination percentages were obtained. The smoke dried seeds yield 73% while the mechanical scarified seeds and the seed soaked in 1AA for 24 h after cracking the testa had 70 and 90% seed germination, respectively. Although the smoke dried seeds had good germination percentage, the role of smoke is not quite understood. However, what is obvious is that the seed testa is probably the restricting force to water imbibition – a process necessary for seed germination. Odunfa (1989) ascribed early germination of seeds to scarification due to cracks which permit water and gases into the seed resulting in enzymatic hydrolysis and thus transforming the embryo into a seedling. Very poor germination was observed in the control and no germination was seen in the acid treated seeds probably due to acid kill.

When and wherever possible traditional information regarding the problems of the environment should be utilized as vital tools in policy formulation and research ideas. The traditional drying method of the seeds of *T. conophorum* till they crack showed the way to the source of the germination problem, the seed coat. Germinating the seeds of *T. conophorum* can best be achieved by mechanical scarification and soaking in 1AA for 24 h.

This is recommended to nursery men, government control agencies for reforestation and afforestation and commercial cash crop growers. This is a good technique for the germination and conservation of this very important medicinal and edible tropical fruit-plant.

REFERENCES

- Adebona MB (1988). Development of conphor nut-based cereal snack food 1 – Biscuit J. Food Agric. 2: 123–136
- Ajaiyeoba EO, Fadare DA (2006). Antimicrobial Potential of extracts and fractions of the African Walnut-*Tetracarpidium conophorum*. Afr. J. Biotechnol. 16 November 2006. 5(22): 2322 – 2325.
- Akpuaka MU, Nwankwo E (2000). Extraction, analysis and utilization of a drying oil from *Tetracarpidium conophorum* Biores, Technol. 73: 195–196.
- Dalziel JM (1937). The Useful Plants of West Tropical Africa. Whitriars press, London pp. 164 -165.
- Enujiugha VN (2003). Chemical and functional Characteristics of Conophor nut. Paki J. Nutr. 2: 335–338.
- Odunfa SA (1989). Essentials of Biology Production Text Production pp. 132–136.