XV WORLD FORESTRY CONGRESS
Building a Green, Healthy and Resilient Future with Forests
2–6 May 2022 | Coex, Seoul, Republic of Korea

Propagation and growth from seeds and root segment cuttings of fruit tree-plus *Diospyros mespiliformis* (Ebenaceae) in Benin West Africa

GNONLONFIN Laurent[1], OUINSAVI Christine[1], Gouwakinnou Gérard[2] BIAOU Honoré[2]

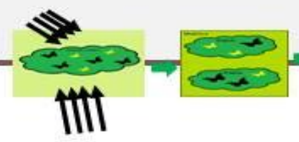
[1]Laboratory of Forests Research and Studies, laurentgnonlonfin@gmail.com University of Parakou [3]Laboratoire de Botanique et de Biologie des plantes, Université de Parakou

Propagation and growth from seeds and root segment cuttings of fruit tree-plus *Diospyros mespiliformis Hotch .ex. Rich (Ebenaceae) in Benin, West Africa*

Laurent GNONLONFIN[1]*, Christine N. A. OUINSAVI[1], Berlarmain FANDOHAN[2], Gérard N. GOUWAKINNOU[3]

[1] Laboratory of Forest Research and Studies (LERF), Doctoral School of Agronomic and Water Sciences, University of Parakou, 03 BP 123 Parakou, Republic of Benin. [2] Université nationale d'agriculture École des sciences et techniques de conservation et de transformation des produits agricoles BP 114, Sakété, Bénin
[3]Laboratory of Ecology, Botany and Plant Biology (LEB), Faculty of Agronomy, University of Parakou, 03 BP 125 Parakou, Republic of Benin.

INTRODUCTION



Threat to biodiversity conservation

D. mespiliformis a tree species of importance in ethno-medicine, food security but threatened by extinction due to over-utilisation. According to Arbonnier (2002) the species cannot tolerate certain type of soil while other reports indicate that it is often found on all type of soil into the early stage of development. Therefore it is great time to investigate on this aspects.

AIMS OF THIS STUDY

Assess key factors that influence seed germination and rooting ability of *D. mespiliformis*.

MATERIALS AND METHODS

Study area

The experiment was carried out on the within the agricutural college of Ina, Bembereke Borgou. Annual rainfall (800-1100 mn) Annual temperature (27°C) with two distinct saesons.

Procurement of seeds/Root sample and seed pretreatment

Seeds and root segment cuttings obtained from 4 habitats (inundated-Parkland-Wooland-Savannah).

Sampling techniques

The experimental design used was Completely Ramdomized Design (CRD). The various treatment combinations used in this study included: T1 seedlings without any seed treatment (Control) T2 seedlings with 48 hours water immersion T3 seedlings with seed integument removed (Respectively three diameter categories for RSC cf pictures)

Soil collection, preparation and design

Three different soil samples (Sandy, clay and loamy) were collected in the area of Ina

Seeds were then soaked in 4*3 factorial in completely Ramdomization Design. , where 4 different seed/Roots provenance, 3 soil types Three root segment diameter.

Data collection and Analysis

The following variables were collected Emergence of radicle-Number of leaves-Root length-Shoot height-Percentage survival of the seed and shoot of D. mespiliformis.
Data were then subjected to analysis of variance using Minitab. Means were compared using Duncan Multiple Range Test at 5%level of probability.

1 Seeds
2 Seed pretreatment
3 Mother tree with running root
4 Root segments cuttings without atventitious root
5 1-2.5 cm diameter of RSC
6 3-7 cm diametre of RSC
7 Diameter of RSC > 7 cm

MAIN RESULTS

Germination rate and growth

The early emergence of radicle 28 days was observed in clay followed by loamy soil with Seedlings 48 hours water immersion and seed integument removed; while late 62 days was observed in sandy with no seed treatment (did not germinate at all).

Number of leaves

The highest mean value in the number of leaves was observed in removed seed tegument followed by 48 hours water immersion and clay or loamy soil; while sandy and no seed treatment have the lowest number of leaves in the mean value.. The same observation with shoot height and root length for the experiment with root segment cuttings(confer pictures)

Percentage survival and plant or shoot vigor

Rate of the percentage survival of the seed/Shoot of D. mespiliformis was greatly affected by the type of soil (Sandy) and seed pretreatment respectively (root segment cuttings diameter).

Table 1: Effect of root diameter on growth of shoot after 24 weeks from root planting

Root diameter (cm)	Number of leafy shoots	Number of leaves per leafy shoot	Heigth of the leafy shoot (cm)
1-2,5	4,15±0,27	14±0,71	63,7±0,24
3-5	2,1±0,42	8,6±0,98	48,1±0,36
D>5	0,17±0,38	4,35±0,04	13,9±0,83
P value	0,0485	0,175	0,0937

Regarding this table, there were sufficient variations (significant difference) among the number of leafy shoots, number of leaves per leafy shoot and the heigth of the leafy shoot of RSC of *D. mespiliformis* used in this study as indicated by the wide range of variability among growth characters

Legend : a-Young plant of D. mespiliformis 60 weeks after sowing b-leafy shoot l of 2,5 cm RSC c-leafy shoot of d>7cm d- Young plant from RSC e-Breeding after 62 weeks

Discussion

This experiment shows that seed pretreatment (seedlings with 48 hours immersion and seed integument removed) and also clay and loamy soil aid germination and growth of *D. mespiliformis* (Toudou et al, 2017), respectively (Oumarou et al, 2019)
No seed treatment with sandy soil have deficiency in rapid germination of the seed and rapid shoot leafy of RSC and survival of young plant of D. mespiliformis.
We recommended that seeds and RSC of D. mespiliformis should be sowed/planted on clay and loamy soil for proper growth

CONCLUSION

Results show that early germination/leafy shoot of the seed/RSC was in clay and loamy soil with seed pretreatment and low RSC diameter (28 days and 16 days) while no seed treatment and sandy respectively RSC diameter > 7 cm all failed totally to germination and leafy shoot.

PERSPECTIVES

Authentic multipurpose tree providing wood, edible fruit, traditionnal drug, fodder, ecosystemic importance) *D. mespiliformis* is still an . important precious plant resource for local people. Several detailed research works on its organoleptic components, are indispensable for substainable land use. Therefore, there is an urgent need to define and promote conservation strategies for these key species

References

Oumarou Haman Zephirin, Hamawa Yougouda, Tsobou Roger, Dangai Yohana, Binwe Jean Baptiste, Madi Amedi Damba Rodrigue, Abdoulaye Herbert, Wangbitching Jean De Dieu, Fawa Guidawa, Mapongmetsem Pierre Marie. Vegetative Propagation of *Bombax costatum* Pellegr. & Vuillet (Malvaceae) by Root Segments Cuttings: Effects of Mother Tree Diameter and Origin of Cuttings. *American Journal of Agriculture and Forestry*. Vol. 7, No. 6, 2019, pp. 248-258. doi: 10.11648/j.ajaf.20190706.12

Acknowledgements

West African Sciences Service Centre and Federal Ministry of Education and and Research through its Wascal-UAC program.

Corresponding author
laurentgnonlonfin@gmail.com