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CLIMATE CHANGE PARTNERSHIP ACTIONS FOR SUSTAINABLE FUTURE AND RESTORING LIFE ON EARTH

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EDITIORS: Agele, S. O. (PhD), Balogun, I. A. (PhD), Oluleye, A. (PhD) and Oladeji S. O. (PhD)

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Dr. S. O. Oladeji

President, Netlink Environmental Conservation Organisation (NECOR),

Room 21 Abubakar Adamu Building

Federal University of Technology, Akure.

P. M. b. 704, Akure, Nigeria

E-mail: sooladeji@fita.edu.ng.

sooladeji@necorng.org

info@necorg.org.

www.mecorng.org.

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Scientific Review Committee

Prof. S. O. Agele- Chairman Scientific Committee
Department of Crop, Soil and Pest Management, FUTA
+2348035784751
soagele@futa.edu.ng

Prof. I. A. Balogun
Department of Meteorology,
Federal University of Technology,
Akure.
iabalogun@futa.edu.ng.

Prof. A. Oluleye
Department of Meteorology,
Federal University of Technology,
Akure.
aoluleye@futa.edu.ng.

Dr. S.O. Oladeji
Department of Ecotourism and Wildlife Management, FUTA.
Executive Director, NECOR
+2348030698896
sooladeji@futaedu.ng.
sooladeji@necorng.org

PREFACE

There is a growing concern on the adverse impacts of climate on biodiversity. This phenomenon is greatly manifested in form of shifting weather patterns threatening global food security, health and species existence. Humanity is at the receiving end of the consequences of climate change hence there is a need to step up actions on all fronts- overtime, everywhere all at once.

This calls for collaboration, partnership and networking to strengthening synergy among relevant stakeholders in a bid to tackling climate change menace. This forms the basis for the theme of this year world Environmental conservation conference: **CLIMATE CHANGE PARTNERSHIP ACTIONS FOR SUSTAINABLE FUTURE AND RESTORING LIFE ON EARTH.** The theme is conceived with a view to create an interface for information sharing and offer opportunities for participants to refine their commitments and pledges in the quest to achieving Sustainability in the face of climate change.

This year World Environmental Conservation Conference is memorable in the sense that it received overwhelming funding from the host - West African Science Service on Climate Change and Adapted Land use). WASCAL is posed to provide information and knowledge at the local, national and regional level to cope with the adverse impacts of climate change. Thus, this conference will offer opportunities for participants to learn from good practices demonstrated and showcase by WASCAL during the course of the conference. It will also strengthen staff-student exchange and provide prospect for Doctorate Research Doctoral Research in West Africa Climate System Programme (DRP WACS) – WASCAL among others.

Special appreciation goes to the management of The Federal University of Technology, Akure the host institution, National Park Service and African Regional Center for Space Science and Technology Education-English (ARCSSTE-E) that co-host this conference. We equally acknowledge other private, individual and corporate organizations that have contributed towards the success recorded in this event.

All the submitted articles were subjected to strict double blind peer-review process by the reviewers that are experts in the area of the particular submitted manuscript. The accepted manuscripts are published in WECC 2023 proceedings and also available for download on the organization website (www.necorng.org).

The accepted manuscripts fall within the underlisted subthemes:

- Climate change adaptation strategies in Agriculture, Forestry and Other Land Use (AFOLU)
- Climate smart city and architectural landscape design
- Retrofitting and decarbonization in tourism and hospitality industry
- Indigenous knowledge and local innovation in climate change adaptation
- Climate risk management, health, safety and hygiene
- Carbon credit-offset marketing/circular economy
- ICT development in environmental conservation (image processing and acquisition, computer vision, graphics, speed, interface technology, HMD devices, GIS: Body Tracking, AI and IOT, VRT, IVE).

We commend our keynote speaker Prof. Douda Kone Director Capacity Building Department, WASCAL Headquarter, Ghana and other guest speakers Prof. Babatunde Rabiu, Director General, Chief Executive Office, African Regional Centre for Space Science and Technology Education-English (ARCSSTE-E) and Dr. Goni I. M., Conservator General National Park Service.

It is hoped that researchers, students and policy makers will find the papers in this book very useful. Even though all the papers were reviewed and edited, the content and option expressed remain essentially that of the authors and not necessarily that of Netlink Environmental Conservation Organization.

Dr. Oladeji S. O.

President Netlink Environmental Conservation Organization

Convener World Environmental Conservation Conference

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GROWTH RESPONSE OF *NAUCLEA DIDERRICHII* SEEDLINGS TO ORGANIC MANURE APPLICATION

Majolagbe, M. O[1*]., Ogunwande, O. A[1]., Kazeem-Ibrahim, F[1]., Olaifa K.A[1]., Omidiran Mobolaji O[1]., Dahunsi, O.M.[2]

*Corresponding email: mikkeyline@yahoo.com Tel: +2348062483011

1 Forestry Research Institute of Nigeria (FRIN), Jericho, Ibadan, Oyo State, Nigeria.

2 Federal College of Forestry, Jos Plateau State.

ABSTRACT

Nauclea diderrichii is an excellent timber species, especially for its attractive graincolours, natural durability and excellent traditional uses. This study was designed to investigate the effects of varying levels of different organic manures (cow dung, horse dung and poultry) on early seedling growth of N. diderrichii. The experiment was laid in a 3 by 4 factorial completely randomized design with 10 replicates. Seedlings' growth parameters; seedlings height (cm), stem collar diameter (mm) and number of leaves were assessed every week for a period of 16 weeks. The results indicated that seedlings treated with 10g poultry manure (P1Q2) had the best seedling height (39.59 cm), collar diameter (8.80 mm) and number of leaves (7.70) and were significantly different from the control of seedling height (20.34 cm), collar diameter (8.60 mm) and number of leaf (6.34). The result showed that the application of organic manure does not influence leaf growth as no significant leaf number was observed on the assessed seedlings. The results of the study generally suggest that the application of organic fertilizer had significant effects on all the growth parameters considered. This study has shown that organic manure enhanced the growth of Nauclea diderrichii seedlings and this will help in mass production of the species either for plantation establishment or commercial

INTRODUCTION

Successful plantation establishment is a practice solemnly depends on nursery production of high-quality seedlings of well-graded stocks that can compete favourably with the harsh conditions of the fieldand later produce a desirable set of trees that is seedlings with good vigour. Over the recent years, the level of forest exploitation and degradation has increased (Kouami, 2014) and the level of forest establishment by individuals especially in tropical Africa has to be increased to meet the current demand for wood and wooden products (FAO and ICRAFT, 2020). In addition, there is a need to produce planting stocks of high-quality standard especially the indigenous species in the right amount that can compare favourably with the conifers or other exotic species that required further amendments for their survival when introduced for various afforestation programmes (Ogunwusi, 2012).

Nauclea diderrichii is a tree of the member of Rubiaceae family (Keay, 1989) and found in moist regions in West Africa (Lamidi *et al*, 2011). It is among the threatened species and included in the IInternational Union for Conservation of Nature (IUCN) red list of threatened species (Pitekelabou *et al*, 2015). The wood of *N. diderrichii* is important commercially and highly demanded in the international market due to its excellent grains, colour and appearance (Falana *et al.* 2017). According to the ITTO 2010 statistical report, the export of the species sown wood from Cote Divore stood at 4000m^3 which is equivalent to about 439m dollars, Congo and Cameroun was about 22000 m^3 and 4000 m^3 respectively at a considerably big income. However, the reports from Nigeria were missing as this calls for immediate action so that Nigeria's forest lands are repositioned with the indigenous tree species.

N. diderrichii is an evergreen deciduous large tree up to 50m tall; bole branchless for up to 30m, with straight, cylindrical up to 150 – 180 cm in diameter (Lamidi *et al,* 2011), with lower or no buttresses, the heartwood is orange or golden yellow with grey sapwood(Addo-Danso *et al.*, 2012). The wood is medium – density to heavy with a density of 670 – 910 kg/m^3 at 12% moisture content (Keay, 1989). The wood of *N. diderrichii* is a popular wood for carving mortals(Orwa *et al*. 2009), poles, furniture, drum making, doors, tools handles, yellow local dye, sculptures and dug – out canoes and other heavy constructions (Ogunwusi, 2012), fuelwood and charcoal production especially the off-cuts (Isa *et al*. 2016). However, the present availability of the species remains uncertain due to over-exploitation and low stocking rate in Nigeria forest.

According to Akanbi (2013) degraded soil with an application of organic manure irrespective of their sources significantly increased the growth performances of the seedlings, as this may be in support that the optimum growth of seedlings especially the slow-growing forest stocks can be enhanced by appropriate use of organic manures. Therefore, the experiment aims to assess the effects of different organic manures on early seedling growth of *N. diderrichii* and to discover the right quantity of manure needed for optimum growth of the species.

MATERIALS AND METHOD

The experiment was conducted in the Tree Improvement Section of Sustainable Forest Management Department, Forestry Research Institute of Nigeria (FRIN), Ibadan, Oyo state, Nigeria. FRIN Ibadan is located on latitude 7° 23' 18" N to 7°23'43"N and longitude 3° 51' 20' E' to 3° 53' 43" E, The location lies 199 m above the sea level. The annual rainfall ranges between 1000mm and 1450mm and temperature range

of 34.9^{O}C and 26.46^{O}C and relative humidity of 74.55% (FRIN, 2021)..Matured fruits of *N. diderrichii* were collected from the mother tree in the Forestry Research Institute of Nigeria, Ibadan, these fruits were crushed and extracted. The seed grains were pre-sown into germination baskets filled with sterilized river sand and placed inside the propagator. After germination, the baskets were bought out and lightly watered every day with the use of a hand sprayer. Germinated seedlings were allowed to grow for 3 months after which they have pricked out into the soil-filled polythene pots with dimensions (15 x 8 x 8) cm.

The sowing medium was prepared by filling the germination tray with sterilized river sand, and the seeds were broadcasted on the prepared sowing medium. Watering was done and the tray was placed in the propagator for germination to take place. The soil collected was sieved to remove debris and stones and then filled into polythene pots measured to an equal weight of 2kg per pot.

PREPARATION OF ORGANIC MANURE

Three different organic manures were used in this experiment, these were poultry droppings (poultry manure), cow dung and horse dung. Horse dung used for this study was collected from the polo field of Ibadan Polo Club, Eleyele Ibadan, Oyo State, Nigeria, the poultry droppings and cow dung were also collected from the poultry and cow ranch section of the Federal College of Forestry, Jericho, Ibadan, Oyo state, Nigeria. Each of these organic materials was collected separately and allowed to cure for a period of 4 weeks. After this, each of these was sun-dried, milled, sieved and stored for application.

ORGANIC MANURE APPLICATION

Polythene pots were watered to field capacity and arranged in the greenhouse to prevent any external interference. After 4 weeks of germination of *N. diderrichii*, equal-sized seedlings were prickedout and transplanted into the prepared polythene pots, one seedling per pot and allowed them to be stabled for 2 weeks. After 2 weeks of transplanting, varying grams of dry samples of manures were applied to each of the plants in the form of side dressing and watered. The initial parameters which include plant height and number of leaves were taken. Watering of the plants continued at an interval of 3 times per week and readings were taken at an interval of two weeks throughout the experiment. The duration of the experiment was 24 weeks.

Growth Measurements

Ten seedlings were selected from each treatment and the shoot height, stem girth, root length, root girth (bulb tap root) and plant dry weight were determined. Seedling height was measured from the soil surface to the shoot apex with a thread and a metre rule. Stem girth was measured at a height of 10.3 cm from the base of each stem with the aid of vernier callipers, while root length was measured from the base of the bulb tap root to the tip after they had been removed from the polythene bags and the soil washed off. Root girth (bulb) was also determined at a length of 3 cm away from the stem base of each seedling with the aid of thread and a metre rule. Plant dry weight was determined after carefully removing the seedlings from the growing medium and washing off any soil particles. The seedlings were divided into root and shoot components for each treatment put in separate envelopes and dried in an oven set at 80ºC for 48 hrs. The dried plant materials were removed from the oven and allowed to cool after which their dry weights were determined with an electronic weighing balance.

Ten (10) treatments were considered in this experiment. These include cattle dung, horse dung and poultry manure at varying grams of 0g (no manure application), 5g, 10g, and 15g. The experiment was 3 x 4 factorial arranged in a Completely Randomized Design (CRD) with ten (10) replicates. Parameters assessed include the number of leaves, seedling height (mm) and collar diameter (mm) for a period of twenty-four (24) weeks.

The data recorded were analyzed using SPSS and the significant means differences were separated by Duncan Multiple Range Test at 5% level of probability.

EXPERIMENTAL LAYOUT

C1Q0 Cow dung Control (0g)	H1Q1 Horse Dung at 5g	H1Q2 Horse Dung at 10g
H1Q3 Horse Dung at 15g	C1Q1 Cattle Dung at 5g	C1Q2 Cattle Dung at 10g
C1Q3 Cattle Dung at 15g	P1Q1 Poultry Dropping at 5g	P1Q2 Poultry Dropping at 10g
P1Q3 Poultry Dropping at 15g	H1Q0 horse dung control (0g)	P1Q0 poultry manure control (0g)

RESULTS

The results of different organic manure has great effect on seedlings growth as 10 g application of poultry manure produced seedlings of the highest height of with the mean 39.59 cm and was significantly different from other manure applications. Followed by this was the result

from the poultry applications; poultry 5g (30.99) and poultry 159g (29.97). These generally indicated that poultry manure irrespective of the levels of application produces seedlings with improved height. On the other hand, 5g horse dung application produced *N. diderrichii* seedlings with the least height (19.29 cm). The result was not significantly different from that of control (20.34).

Number of Leaves

The results of the response of seedlings of *N. diderrichii* to the treatment of different nutrient sources and levels of applications did not have a significant effect on the seedling's number of leaves with all the treatments considered. The results showed that 5g and 10g poultry manure application had the highest mean values of 8.0 while 15g horse dung application had the lowest mean value (7.30) for the leaf production but were not significantly different from one another.

Collar Diameter

The result of the collar diameter of the seedling's production to different manure sources at varied levels of applications was significantly different to one another along the treatments. Application of P1Q2 produced seedlings that had the highest mean value of 7.703, followed by this is the seedlings from P1Q3 application with a mean (of 7.03), and C1Q0 with a mean (of 6.73), H1Q2 horse dung application with a mean (6.24). However, H1Q3 horse dung had the least leaf mean (5.58) for the *N. diderrichii* seedlings' collar diameter.

	Height (cm)		Number of leaf		Collar diameter (mm)	
Treatments	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Control	20.3400^{a}	20.3±2.04	8.6000^{a}	8.6±0.96	6.3400^{abc}	6.34±.46
cowdung 5g	29.8100^{bc}	29.8±2.29	8.5000^{a}	8.5±0.97	5.7520^{ab}	5.75±0.90
Cowdung10g	28.6900^{bc}	28.7±2.91	8.1000^{a}	8.1±1.10	6.7250^{bcd}	6.72±0.43
cowdung 15g	25.4700^{b}	25.5±3.65	8.5000^{a}	8.5±1.08	6.1340^{abc}	6.13±0.57
horsedung 5g	19.2900^{a}	19.3±7.03	8.0000^{a}	8.0±3.19	5.6000^{a}	5.6±2.01
horsedung 10g	26.2400^{b}	26.2±2.79	8.7000^{a}	8.7±1.06	6.2460^{abc}	6.24±0.47
horsedung 15g	25.7600^{b}	25.8±9.27	7.3000^{a}	7.3±2.79	5.5800^{abc}	5.58±2.01
poultry 5g	30.9900^{c}	31.0±4.44	8.8000^{a}	8.8±0.79	6.5470^{a}	6.55±0.66
poultry 10g	39.5900^{d}	39.6±4.23	8.8000^{a}	8.8±0.79	7.7030^{d}	7.70±0.58
poultry 15g	29.9700^{bc}	30.0±3.88	8.6000^{a}	8.6±0.97	7.0260^{cd}	7.03±0.61

* Mean values with the same letters along the column are not significantly different at ($p<0.05$).

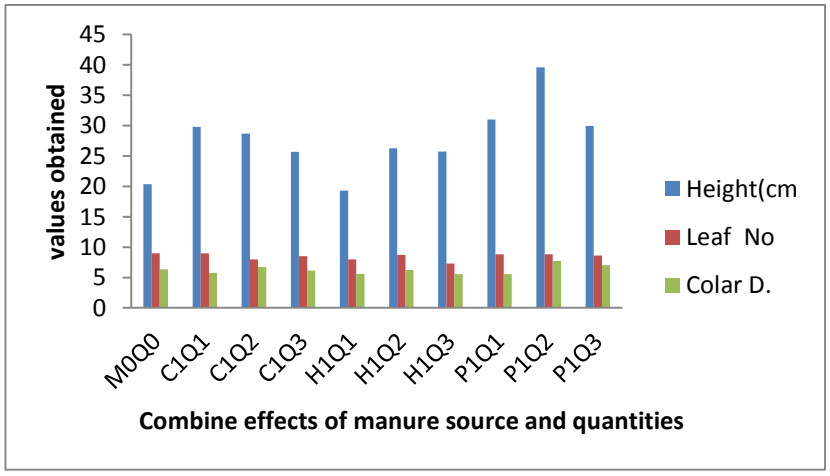

Figure 1: Chat showing combined effects of organic manure application on seedling growth of *N. diderrichii*

DISCUSSIONS

According to chat 1, the results of *Nauclea diderrichii* planted with poultry manure at 10g has the best overall growth parameters both for the seedling's height, leaf number and collar diameter, this was followed by the poultry manure at 5g and 15g. The results generally indicated that poultry manure improved the performances of *N. diderrichii* seedling growth. This is attributed to the nutrient components in poultry

manure being higher than other sources of organic manure applied treatments. This shows a significant growth performance when compared to the control (M0Q0). The result reveals that higher nitrogen content was present in poultry manure than the horse dung and cow dung (Adekiya and Agbede, 2009). The study was in line with the studies of Murmu *et al*. (2013) and Nwoboshi, 1982) that organic manure exhibits some major elements and trace elements that are necessary for plant growth. The organic manure also provides plant growth regulators which enhance the plant's early plant development. Ibode *et al.*, (2022) reported that organically prepared manure increases the values of nitrogen, phosphorus, potassium, and many cations in the soil which stimulates the growth of *Cedrela odorata* for enhanced seedling production. The study was in contrast withAkintola and Bodede (2019) that values of seedling number of leaves obtained were significantly higher than the values obtained from other sources of manure as the number of leaves was not significantly different from one another but different significantly with other seedlings growth parameters assessed. Generally, the highest growth parameters recorded in the seedlings grown in soils with organic manures were significantly higher than those from the control as this may be attributed to the fact that organic manure is rich in nutrients (FAO, 2004 and Awotedu, *et al.* 2020).

Followed by general performances of the poultry manure was the effect of cow dung on general seedlings growth of *N. diderrichii* as expressed by chat 1 above. The result shows an increase in the seedling's height and moved conversely with an increase in concentrations from 5g, 10g and 15g from 30 cm, 27 cm and 25 cm respectively and was significantly different from the control. This may be attributed to a desirable threshold limit of manure application to plant species. There was no significant difference between the number of seedlings and leaf production to the levels of cow dung application. Leaf production is a major factor that signifies the ability of the living plant to receive sunlight for photosynthetic activities which results in improved plant growth.

CONCLUSION

Seedling growth of *N. diderrichii* shows a significant contribution of different organic manure sources on the height and collar diameter of the seedlings. The study reveals that poultry manure at a 10g level of application has the best performance while application above the threshold point of 10-12g may be detrimental to seedling optimum growth. It also shows that cow dung application as a source of manure for seedling growth of *N. diderrichii* performed better while horse dung application moderately improved the seedling's growth. However, the application of organic manure irrespective of the sources generally increases the seedling's growth of *N. diderrichii* but further increment or reduction from such a level reduces the growth. This suggests that the optimum level for seedling growth performances of *N. diderrichii* is 10g.

REFERENCES

Addo-Danso, S. D., Bosu, P. P., Nkrumah, E. E. Pelz, D. R. Coke, S. A. and Adu-Bredu, S. (2012). Survival and Growth of Nauclea diderrichii and Pericopsiselata in Monoculture and Mixed-Species Plots in Ghana. Journal of Tropical Forest Science 24(1): 37–45.

Adekiya A.O and T.M. Agbede (2016). Effect of methods and time of poultry manure application on soil and leaf nutrient concentrations, growth and fruit yield of tomato (Lycopersicon esculentum Mill), Journal of the Saudi Society of Agricultural Sciences, King Saud University. www.sciencedirect.com

Akanbi, O.O.O. Famaye, A.O,. Ojeniyi, S.O,. Nduka, B.A., Taiwo, N., Olasupo, F.O., Azeez, O.M, Edibo, G.O and Gbemisola, D.O (2013). Growth Response Of Cashew Seedlings To Applied Organic Fertilizers of Animal and Plant Origin on a Degraded Soil in Ibadan, South-West, Nigeria. *International research journal of agricultural and soil science*. ISSN: 2251 – 0044) vol. 3(3). Pp 93-98. http://www.interesjournals.org/IRJAS

Akintola, O. O., Bodede, I. A (2019). Distribution and Accumulation of Heavy Metals in Red Cedar (*Cedrela odorata*) Wood Seedling Grown in Dumpsite Soil. *Journal of Applied* Sci*ence and Environmental Management.* 23(4):811-817.

Awotedu, B. F., Awotedu, O. L., Majolagbe, M. O., Ariwoola,O. S (2020). Effects of varying levels of organic manure and fertilizer application on the growth performance of *Mansonia altissima* (A. Chev.) seedlings. *International Research Journal of Multidisciplinary Studies*Vol. 6(6), June, 2020 ISSN: 2454-8499.

Falana, A.R., Musa, F.B., Olawuyi, E.B And Adesokan, B.O And Isienyi, N.C (2017). Seedlings Growth Performance of *Nauclea diderrichii* (Merr) as Influenced by Different Light Intensity. Journal of Forestry Research and Management (JFRM) vol. 14(2): http://www.frin.gov.ng/jfrm

FAO 2010. *Global Resources Assessment 2010. Country Report, Ghana.* FAO, Rome.

FRIN, (2013): Forestry Research Institute of Nigeria Annual Metrological station data report.

Ibode, R.T., Akintola, O.O., Tunde-francis, A.A., Owolola, O. I., Afolabi, R.T. and Ademigbuji, A.T (2022).Effect of different organic manure on the growth of *cedrelaodorata*l. (red cedar). *Journal of Research in Forestry, Wildlife & Environment Vol. 14(1) http://www.ajol.info/index.php/jrfwe ISBN: 2141 – 1778*. Pp.93-97

Isa, H., Katsayal, U. A., Agunu, A., Nuhu, A. and Abdulhamid, Z (2010).Phytochemical screening and thin layer chromatographic profile of *Nauclea diderrichii* leaf extracts.*Bayero Journal of Pure and Applied Sciences, 10(1):* 281 – 284. ISSN 2006 – 6996

Keay, R.W.J. (1989). Trees of Nigeria. A Revised Version of "Nigerian Trees". Clarendon Press, Oxford.

Kouami Kokou1 (2014). Natural Distribution of *Nauclea diderrichii* (Rubiceae) in Semi Deciduous Forest of Togo (West Africa) and Implementationof Integrated Silviculture. *American Journal of Plant Sciences,* ISSN: 1220-1235. http://www.scirp.org/journal/ajps

Lamidi, M., Liu, W., di Giorgio, C., Elias, R., Ollivier, E. & de Meo, M.P (2011). Genotoxic and clastogenic activity of saponins extracted from Nauclea bark as assessed by the micronucleus and the comet assays in Chinese hamster ovary cells. *Journal of Ethnopharmacology* 137: 176–183.

Nwoboshi, L. C. (1982). *Tropical Silviculture Principles and Techniques*. Ibadan University Press Publishing House, Ibadan, Nigeria, pp. 330-333.

Murmu, K., Swain, D. K., Ghosh, B. C. (2013). Comparative assessment of conventional and organic nutrient management on crop growth and yield and soil fertility in tomato-sweet corn production system. *Australian Journal of Crop Science.* 7(11):16171626.

Ogunwusi, A. A (2012). The forest products industry in Nigeria. *African research review,* 6(4): 191-205.

Pitekelabou R., Aïdam A.V., Kokou K., Kokoutsè A.D., Etsè K.D., Adjonou K., Glato K., Aliaki E. (2015). *In vitro* vegetative multiplication of *Nauclea diderrichii* (De Wild &T. Durand) Merrill, an endangered forest species in Togo. *International Journal of Innovation and Scientific Research,* 13(2), 474-484. *www.frin.gov.ng/frin1/journals.html*

Ibode, R.T.. Akintola, O.O., Tunde-francis, A.A., Owolola, O. I., Afolabi, R.T. and Ademigbuji, A.T (2019). Effect of different organic manure on the growth of *Cedrela odorata* l. (red cedar). *Journal of Research in Forestry, Wildlife & Environment Vol. 14(1) March, 2022 . http://www.ajol.info/index.php/jrfwe ISBN: 2141 – 1778*. Pp 93-97