

INFLUENCE OF STAGES OF SEED MATURITY ON GERMINATION RATE OF (*Dennettia tripetala*) PEPPER FRUIT

Nwachukwu, O. C.

Aronu, A. J.

Adebayo, O.

*Forestry Research Institute of Nigeria
Eastern Research Station, Umuahia, Abia State.*

ABSTRACT

*An investigation was conducted to determine the influence of the stages of seed maturity of *Dennettia tripetala* on the germination rate of the seed. The stages are green matured, yellowish matured and red matured seeds. The experiment was conducted using Complete Randomized Design (CRD) with 4 replicates for each of the 3 treatments. There was a significant influence on the germination rate of the seeds; the red matured seeds and yellow matured seeds showed greater influence which was significantly different from that of the green matured seeds. Therefore, with the prevalent climatic conditions in the rainforest zone, the farmers are advised to watch out for wildings after each fruiting season of the species, this could also save the time of raising them direct from the seed.*

Keywords: *Influence, stages, seed-maturity, germination, *Dennettia tripetala**

INTRODUCTION

Dennettia tripetala (Baker, F) which has the synonym of *Uvariopsis tripetala* (G. E. Schatz) belongs to the Genus: *Dennettia* and family: *Annonaceae*. It has its common name as the 'pepper fruit' and a native of Nigeria and Ivory Coast. *Dennettia tripetala* is a small woody shrub of the rain-forest and occasionally in the savanna which reaches a height of about to 18m and girth of 60cm, Burkill (1985). The wood is soft, white coloured and prone to termite attack. It has a fibrous bark which has a strong scent. The young leaves are usually chewed because of its spicy taste. The fruits, green at first, turns yellow and later red when ripen. The fruit ripens around April and has peppery and spicy taste for which it is chewed (Burkill, 1985).

This plant, one of the important indigenous plants of west tropical Africa (Etukudo, 2000), also has a socio-cultural importance as it is often offered to visitors as a sign of good reception in combination with colanuts. According to Okwu and Morah (2004), the fruits contain important vitamins and minerals and are also used medicinally. The plant kingdom contributed immensely to human health when no synthetic medicines were available, and when no concept of surgery existed (Idu, 2009).

The socio-economic value of pepper fruit cannot be over-emphasized as the fruits can be sold to generate income by rural dwellers who plant them within their compound. As at the time of this report, a kilogram could sell for as much as two hundred naira (N200.00) only in Umuahia city of Abia State though may not be as expensive as that in the rural part of the State where it is cultivated in larger quantity.

As a shrub, *Dennettia tripetala* plays an important role as the integral part of the structure of traditional home-garden. This implies that the specie helps in the maintenance of soil nutrient status; protection of the environment through reduction in wind speed and prevention of soil erosion, and the moderation of the micro-climate among other benefits (Otegbeye and Famuyide, 2005). Agbogidi et al (2006) disclosed that the shrub, pepper fruit has remediation potentials in crude oil contaminated sites.

Africa appears to have provided little for other continents, because it is only beginning to be known, and had been degraded and extremely difficult to rehabilitate. The utilization, protection and domestication of plants in the forest areas of tropical Africa started with those perennial fruit trees and vegetables which could be eaten raw and experimented with for centuries prior to the discovery of fire and the subsequent utilization of roots, tubers and vegetables

(Okigbo, ISHS Acta Horticulturae 53). Many of those plants which include *Dennettia tripetala* abound in compound farms and have undergone various phases of domestication.

The success of the domestication of any species best begins from the information on the fruits to its ecology. This investigation will provide the information that will help deter the neglect shown to *Dennettia tripetala*. In this paper, the influence of stages of seed maturity on the germination rate of *Dennettia tripetala* (pepper fruit) was highlighted as a strategy for improving this important fruit plant.

MATERIALS AND METHODS

The materials used for this experiment included seeds of *Dennettia tripetala* (collected directly from the fruit trees within Umuahia vicinity); seed boxes containing top soil and knapsack sprayers for watering. A complete randomized design (CRD) experiment with 3 treatments replicated 4 times was used. The three stages of seed maturity were indicated by the colour of the fruits; green, yellow and red matured fruits. The fruits are sorted to the different stages, the seeds extracted, washed and dried (under mild sunlight). The different stages of seed maturity were used as the treatments with 50 seeds selected for each of the 4 replicates of each treatment. The seeds were planted in the seeds boxes kept under the nursery shade and monitored for 40 days to raise data. The first germination occurred after sowing in 19 days time. The data was analysed using the ANOVA table and mean separation conducted to determine the significantly different means.

RESULTS AND DISCUSSION

As shown on table 1, there is significant difference between the means of the germination rate of the different stages of seed maturity (Table 1). When mean separation was performed and the different germination rate means ranked (Table1), it was revealed that the means of red matured seeds and yellowish matured seeds were statistically the same ($p>0.05$) but significantly different from the mean of the green matured seeds (Table 1). This implies that the full hereditary characteristics of the plant may not have come into full display in the green matured plants. The mother plant should be visited for collection of planting materials and should not be bought from the market. This is to ensure that the green fruits which later turn red or yellow are avoided when raising the seedlings of *Dennettia tripetala*.

Table 1: Germination % of seeds of *Dennettia tripetala* with varying colours (50 seeds each) for 40 days

Seed type	Number of samples	Mean germination %	Standard Deviation
Redish matured seeds	4	79.75 ^a	25.99
Yellowish matured seeds	4	63.25 ^a	28.94
Greenish matured seeds	4	25.50 ^b	14.37
Total	12	56.17	32.58

*means with different superscripts are significantly different ($p < 0.05$)

The red matured seeds, which have the highest germination rate, also indicate the possibility of multiplying this species through the wildings. The red matured fruits can also be put to dual use by extracting the seeds for planting and chewing and using the remnants for the production of flavourings.

CONCLUSION

The overall importance of *Dennettia tripetala* is quite enormous. Apart from being a good source of income to farmers, it is believed that it has the remediation potentials in crude oil contaminated sites. Despite all these and much more; information on the nursery and silvicultural technique is lacked on these indigenous and important fruit species. The overall result of this study indicated the possibility of raising the seedlings of *Dennettia tripetala* from the wildings which can be necessitated by the vigour through which over-ripe matured seeds will germinate when fallen off. Therefore, with the prevalent climatic conditions in the rainforest zone, the farmers are advised to watch out for wildings after each fruiting season of the species, this could also save the time of raising them direct from the seed. Also, farmers should be encouraged through the provision of incentives so that the raising of the plant may shift from mere subsistent practice. This is believed will make the all important plant to gain the needed popularity particularly in this part of the world.

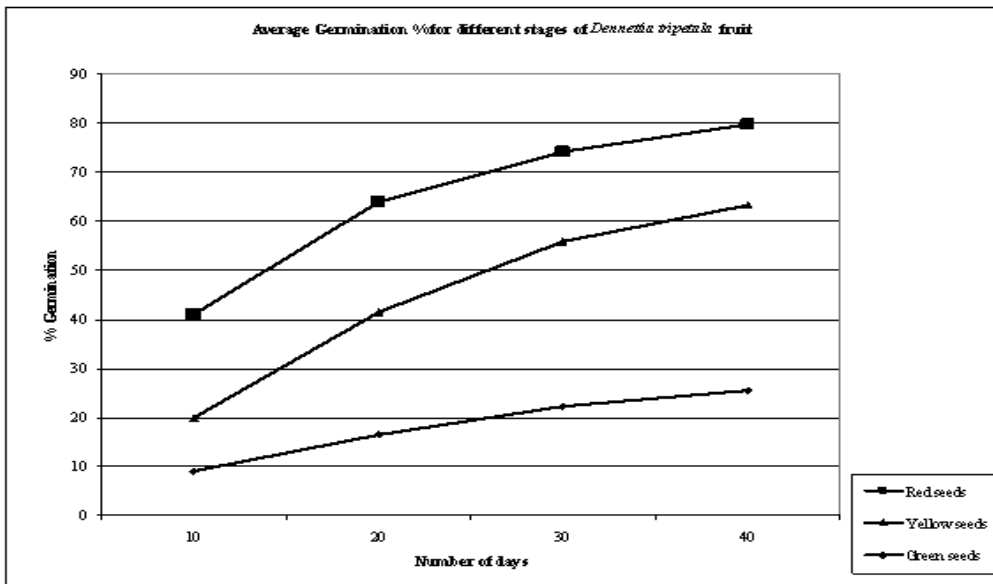


Fig 1: Influence of stages of seed maturity on germination of *Dennettia tripetala*

REFERENCES

- Agbogidi O. M., Onosdde A. T. and Okonta B. C.** (2006). Susceptibility of *Dennettia tripetala* (Bak) F. seeds to crude oil. *International Journal of Food Agriculture and Environment*, 350-352.
- Burkill, H. M.** (1985). Useful plants of West Africa. Vol. 5. Royal Botanic Gardens, Kew. Entry for *Aframomum melegueta*. www.aluka.org/action/metadata.
- Etukudo, I. G.** (2000). *Forests, our divine treasure*. Uyo: Dorand publishers.
- Idu, M.** (2001). The plant called medicine. An inaugural lecture of the University of Benin delivered by Professor MacDonald Idu on February 5, 2009). *Guardian* March 16, 2009. www.guardian.com/focus.
- Okwu D. E. and Morah F. N. I.** (2004). Mineral and nutritive value of *Dennettia tripetala* fruits. *Indian Journal of Agricultural Research*. www.cababstractsphis.org/abstracts/abstracts
- Otegbeye, G. O. and Famuyide, O. O.** (2005). Agroforestry systems In the Arid and semi-arid land of Nigeria: management and socio-economic importance of the Agroforestry woody species. *Journal of Forestry Research and Management*, 2, 1-11.
- Okigbo, B. N.** (ISHS Acta Horticulturae 53). Neglected plants of Horticultural and Nutritional Importance. In Traditional farming systems of tropical Africa. In: IV Africa symposium on horticultural crops. www.actahort.org/showpdf.