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Full Length Research Paper

Conservation studies on *Telfairia occidentalis* Hook .F. A. indigenous plant used in enthnomedicinal treatment of anemia in Nigeria

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Optimum ways of conserving *Telfairia occidentalis* due to its usefulness to mankind was the basis of this study. Its seed viability potential, seed germination, seedling growth, mean number of seeds per fruit and effect of fruit extract on seed germination were investigated. One hundred percent seed viability was observed inside the fruit, the mean number of seeds per fruit was 71.5. The effect of fruit extract on seed germination was 100% in 100% concentration, 73.3% in 50% concentration, 30.3% in 25% concentration while the control had 20%. It was observed that seed germination decreased with decreasing fruit extract concentration. Seedling survival was 65%. The study revealed seedling growth as the area of problem requiring greater attention for improvement. A central nursery for raising seedlings is recommended for this makes the collection of seeds, seedlings, leaves, roots, research materials etc easily assessable. This has the advantage of research leading to new information and knowledge, more planting material available to farmers, other individuals and ethnomedicinal practitioners who use it to treat anaemia among others. The consumption of *T. occidentalis* for individual good health and thus a healthy nation is encouraged. Further more, every effort that will keep *T. occidentalis* save and protected with a view to conserving the plant for its value to mankind is advocated.

Key words: *Telfairia occidentalis,* conservation, viability potential, seedling growth, seed germination.

INTRODUCTION

Telfairia occidentalis is a tropical plant. Its habitat is the wet part of Nigeria and Africa in general. It belongs to the family cucurbitaceae. The fruit is fluted-Figure 1. It is from this morphorlogy it derives its name-fluted pumpkin. Other names are Ugu in Ibo in Eastern part of Nigeria, Yoruba- Egusi iroko, Benin-Uwmenkhen. The plant found use mostly in Ethnomedicine for the treatment of anaemia. There is hardly any home in Nigeria where Ugu is not consumed in daily meals due to its health restoration value.

The young leaves are sliced and stored in a bottle to which coconut water and salt are added. This is used for the treatment of convulsion in ethno medicine (Gbile, 1986). The roots are used as rodenticide and ordeal poison (Gill, 1992). The leaves contain essential oils, vitamins, root contains cucubitacine, sesquiterpene, lactones (Iwu, 1983). Akoroda (1990) reported that Ugu plant is mostly cultivated by women in the eastern part of Nigeria for its leafy shoots and immature edible seeds. The leaves are rich in iron and play a key role in the cure of anaemia, they are also noted for lactating properties and are in high demand for nursing mothers (Okoli and Mgbeoku, 1983). The plant has also been reported to contain considerable amount of antinutrients (Ajibade et al., 2006).

T. occidentalis is leafy vegetable used mainly for soups, salads or accompany main course (Hopkins, 2001). Vegetables are very important food and highly beneficial for the maintenance of good health and prevention of diseases (Ayto, 1993) and good health is the one free from diseases (Schwartz, 2006). Some leaves including the leaves of *T. occidentalis* can be beneficially used in heart diseases, hypertension, hypoglycemia, diabetes and even in fatal cases of meningitis. They have been

Figure 1. Flouted whole fruit of *Telfairia occidentalis*

effectively used in lowering blood cholesterol and preventing blood clothing (Weiner, 1992).

Production constraints using the seeds have been reported by Anno-Nyako (1988). He noted that the seeds are recalcitrant and that they can only be keep viable and transported in the large fruit which is 20 – 50 cm in length and 10 – 20 cm in width. This was also the observation of (Balogun et al., 2002). In addition, shortage of serious nature in terms of seeds for planting and consumption was also noted. The urgent need to develop propagation systems that are vegetative with a view to circumventing the use of seeds as propagules is the view expressed by Balogun et al., (2007) and Ng, (2000). However, the current Author's thinking is different from the above views. The current supplies of the plants most valued parts are obtained from the ones raised from seeds. A link is certainly missing. The current Author in a bid to continue to document Ethno knowledge had an interactive session with indigenous farmers in the production areas and thereafter conducted a formalized study.

The purpose of this study was to provide information leading to adequate production of *T. occidentalis* plants in the right quantity and quality on sustainable basis. The use of seeds as planting materials still retained since it is cheaper and affordable to the farmers. There is the likelihood of more farmers in the production of *T. occidentalis* with cheap planting materials and affordable technical know how. The implication of this, is that more farmers will participate in the production of *T. occidentalis,* more income to the farmers due to high demand for *T occidentalis,,* more materials available to ethno medicinal practitioners and the plant can be saved from possible extinction.

MATERIALS AND METHOD

Plant materials

Fresh fruits were obtained from local farmers in Okada local government area in Edo State Nigeria.

General methods

Seed viability determination

To ensure that goods seeds were available for the experiments, the fruits were opened and the seeds observed for sprouting, this was on information gathered from the ethno farmers that all good seeds sprout inside the fruit.

Determination of mean number of seeds per fruit

This was done by opening the ridges with a sharp knife; thereafter all seeds were extracted from the fruits. The following formula was used to calculate the mean number of seeds per fruits € $^{X}/_{n}$ = mean, where X is total number of seeds, n = the number of fruits from which seeds were extracted. The advantage in this procedure is that for large or small scale farming the umber of fruits to give a predetermined number of seeds can be calculated.

Seed germination and seedling growth

Two beds measuring 1 x 10 m were prepared in a tree nursery. They were both of forest top soil and labeled germination bed and transplant bed respectively. For this study sprouted or cracked seeds were not regarded as germinated seeds. The ones regarded as germinated are the ones with the emergence of radicles. The cracked seeds from the fruits were sown in the germination bed in three replicates. The germinated seeds in the germination bed were transferred to the transfer bed at the two leaf stage. Solid wooden stakes were pegged at a distance of 1 m along the length of the bed on to which the young plant climbed rather than creeping on the ground. The stakes were connected with a strong twin at the height of 2 m to enable the plants form suitable canopy and make harvesting of the young leaves easy. Watering was done every alternate day morning and evening with 200 ml of water per seedling. A modification of the method described by Egharevba et al. (1994a) was adopted.

Effect of fruit extract on seed germination

After the seeds were extracted from the fruits, the *mesocarp* was soaked in water for one hour and filtered. The filtrate was regarded as 100% concentration. This was divided into two, to one half, water of equal volume was added making it 50% concentration. The 50% was further divided into two and one part had equal volume of water added to it. Thus making it 25% concentration. The filtrate used was of the following strength – 100, 50 and 25%. Water was used as the control. Seed germination was monitored for one month.

RESULTS AND DISCUSSIONS

The results obtained from this study are presented in this section. Possible mean number of seeds per *T. occident-*

Table 1. Mean number of seeds per fruit of *T. occidentalis* and seed viability potential.

Parameters	Fruit nos / seed viability											
Fruits	1	2	3	4	5	6	7	8	9	10	Total seeds	$\overline{X}$ no. of seeds per fruit $€x_{/n}$
Seeds per fruit	71	72	71	72	72	72	72	70	71	70	715	71.5
% seed viability per fruit	100	100	100	100	100	100	100	100	100	100	100% (viable)	

Table 2. Effect of fruit extract on seed germination of *T. occidentalis.*

Fruit extract Concentrations	Means % germination/Days			
	7	14	21	30
100%	20.0	23.3	60.3	100.0
50%	20.0	33.3	73.3	73.3
25%	10.0	20.0	30.3	30.3
Control (H_20)	10.0	10.0	20.0	20.0

Figure 2. Opened fruit showing arrangement of *T. occidentalis.*

alis fruit is presented in Table 1. Figures 2 and 3 show seed arrangement and some individual seeds.The occurrence of seeds in each fruit was fairly regular. A mean number of 71.5 seeds per fruit was obtained. The result showed that it is possible with some measure of certainty to tell the number of seeds in a given set of *T. occidentalis* fruits. This gives room for good planning in farming a given target area.

Figure 3. Seeds detached from the inner arrangement *T. occidentalis*

Seed viability

All the seeds in the fruits were observed to be viable. They had all sprouted. If they were not viable they would not have sprouted. One hundred percent seed viability was recorded in the study (Table 1).

Seed germination and seedling growth

From sprouted seeds 70% met the definition of germination. The radicles emerged and were growing into seedlings. Concluding that the seeds have germinated because they have sprouted will be misleading. The result showed that not all sprouted seeds can truly germinate and grow into young plants. The seeds that did not germinate amounted to 30%. In this study. In recent years there has been increasing stress on detailed evaluation of seedlings to distinguish critically those which have the potential to produce normal plants under favourable field condition from those which are without planting value. It has been observed that seedling stage is the most critical

stage in the life cycle of any plant as the microhabitat of the seedling is quite distinct from that of the adult plant (Gill,1992; Bekenden and Grob,1979).

Effect of seed extract on seed germination

The results obtained from this study are presented in Table 2. Significant differences in the effect of fruit extract on seed germination of *T. occidentalis was observed* among the levels of concentrations used. Response to fruit extract was observed to decrease with decreasing concentration. With 100% concentration, 100% seed germination was obtained, from 50% concentration 73% was observed and 25% concentration gave 30% germination. The control gave 20% germination. The concentration as it is in the natural fruit favours optimum seed germination as evidenced from this study.

Seedling growth

From the result of this study 65% seedlings served and gave succulent and young shoots. To realize the objective of *T. occidentalis* farming. Seedling evaluation is vital before field planting. The importance is to thin out the seedlings that cannot make final crop. This study showed that 35% of the seedlings could not make final crop. The International Seed Testing Association (I.S.A.T.A., 1976) evaluation method should be adopted. (Although Balogun et al., (2007) suggested vegetative propagation to circumvent the use of seeds as propagules, the findings in this study does not support this. They based their suggestions on "shortage of seeds for planting and consumption". The problem as evident from this study is not the seed. The seeds are viable inside the fruits and sprout in readiness for germination when matured. This collaborates the report of (Anno-Nyuako, 1988). The identified problem in this study is seedling growth. All sprouted seeds germinated when sown in forest top soil but not all germinated seeds became good seedlings.

The production of *T. occidentalis* in Nigeria is in the hands of few ethno farmers. Production level of *T. occidentalis* can be improved upon by effecting the following:

(1) By establishing a central nursery in the local production areas by Government Agricultural Agency. To this centre local farmers can sell their fruits of *T. occidentalis.*

(2) Seedlings can be raised in this centre for sales to farmers and interested individuals. The nursery can be mechanized for higher productivity. The possible advantages of the central nursery include: research opportunities leading to new information and knowledge, availability of the *T. occidentalis* as vegetable to all people, availability of planting material to ethno medicinal practitioners that use it for the treatment of anaemia. The establishment of central nursery for the production of *T. occidentalis* seedlings arising from its numerous advantages is recommended.

Furthermore, it is surprising that people have taken so long a period to acknowledge the true value of vegetables and plants generally that can offer effective healing (Bayhock, 1991). The consumption of *T. occidentalis* and related vegetables for individual good health and a healthy nation is encouraged. Every effort that will keep *T. occidentalis* save and protected with a view to conserving the plant for its values is advocated.

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