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## Production of *Thaumatococcus daniellii*, Benn. (Benth) in Ogun State of Nigeria

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### Abstract

The sweet prayers plant (*Thaumatococcus daniellii*) Benn. Benth. is widely found in tropical rain forests of West Africa. It is a tropical monocotyledon rhizomatous herbs, a non timber forest product, is cultivated under forest condition, with shaded trees that form *T. daniellii* canopy. From this empirical research it could be seen that percentage contribution of to total monthly income of producers was estimated to be 26.23 %. This implies that *T. daniellii* makes a significant contribution to the income of the producers. This explains why the producers were very serious with the cultivation of the *T. daniellii*. The Profitability of the cultivation of *T. daniellii* was estimated using benefit-cost ratio. The total present value of the producer was estimated as N69, 680 while total present value of cost was N11, 312. The benefit-cost ratio was 6.15. This implies that the cultivation of *T. daniellii* was profitable to the producer, since the benefit-cost ratio was greater than 1. The development to encourage the domestication and cultivation *T. daniellii* will encourage the sustainable conservation of this forests product in South West, Nigeria. Also it will help improve livelihoods by providing employment and increasing income. Research has shown that *T. daniellii* can be cultivated by integrating it into agroforestry systems. This can also be encouraged among tree crop farmers.

**Keywords:** Production, Sweetener, Agroforestry, *Thaumatococcus daniellii*

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## Introduction

Forest resources are of great importance to people all over the world ranging from forest fringe communities to urban communities, which live near and far from the forests. (Fonta, *et al.*, 2010). The resources also range from products such as timber, herbs, twines, fruits and wildlife. Conventional forestry practice in Nigeria has for a long time neglected other products except timber. These other products have been perceived globally and in Nigeria at various times as 'minor forest products or non-timber forest products (NTFPs). During the first two to three decades of forestry in Nigeria, non-timber trees and plants were selectively poisoned by the Nigeria Forestry services resulting in the destruction of substantial part of the forest ecosystem. Many forest dwellers that depended on non-timber resources for their sustainability were displaced by this action. This act also led to the conversion of valuable natural forests to monoculture plantation of exotic timber species which lack the common traditional values for medicines, fruits, vegetables and other non-timber products of economic and sometimes religious values (Wilson, 1990). Many governments' policies consider non-timber forest products (NTFPs) as minor products. However, a visit to a forest fringe community or even urban markets in Nigeria reveals the importance of NTFPs in the daily lives of people. They are used as food, in medicine, for shelter, clothing and to earn livelihoods. While some are used in the natural state, others are processed before use.

It is a tropical monocotyledon rhizomatous herbs, a non timber forest product, is cultivated under forest condition, with shaded trees that form canopy. The thicker the shade or canopy, the wider the leaves. So the leaves are not cut at all to allow good fruiting. The fruit is subterranean, that is, underground. The fruit produce proteinous sugar. *T. daniellii* does not flower. It also thrives well under secondary forest like cocoa, kola, and rubber plantation. It thrives optimally in semi-deciduous humid lowland rainforest region of Nigeria, where annual rainfall is adequate (1200-1800mm). Its presence on a newly cleared plot indicates good soil fertility. To plant, stolon from one or two leaves are buried in the soil. It takes less than three years to grow and fruiting takes less or 7 years to mature (Dalziel, 1937). Local uses are versatile, ranging from cultivation as fetish plant in Gabon, to collecting leaves from its natural habitat for wrapping and boiling food in Ghana and Nigeria. The most exiting use of *T. daniellii*, however, is its use as sweetener or taste modifier. The aril of the fruit contains thaumatin, a mixture of extremely sweet proteins. For that reason, *T. daniellii* is traditionally used for sweetening bread and flavouring palm wine. Since the mid-90s, it is used as sweetener and flavor enhancer by the food and confectionary industry in many countries, substituting synthetic sweeteners. Presently, fruits are extracted from the natural habitat and sold to buying companies. The method of harvesting the fruits is often not sustainable. Damaged fruit leads to irregular supply which is not attractive for the food industry. Integrating *T. daniellii* in cropping systems or plantations seems to be a promising way to lessen these shortcomings, contributing to both income generation and diversification of crop production by small farmers

*Thaumatococcus daniellii* otherwise known as the 'miraculous berry' or 'sweet prayer' plant native of west Africa, is 'Eweran' in Yoruba, 'akwukwogichi' or 'Akwukwo Uma' in Delta, 'Ogu' in Igbo groups of Nigeria.. *T. daniellii* is particularly found in southern parts of Ghana, Cote d'Ivoire and Nigeria. It is also known to exist in the Princes Islands, Angola, the Central African Republic, Uganda and Indonesia. Records of occurrence had also been reported in the tropical and sub-tropical zones of the world in Forest and sometimes in Forest –savannah zone. (FAO, 1990)

The aim of this study is to determine the socio economic value and enhancement of production of *Thaumatococcus daniellii* in South West Nigeria and the objectives are to identify the socio- economic characteristics of the collectors / farmers in the study area, examine factors responsible for sustainable production, examine the existing level of production of *Thaumatococcus daniellii* in the study area and highlights the versatility of the crop.

## Materials and Methods

The study was conducted in Remo North Local Government Area of Ogun State. Five villages that are cultivating the *T. daniellii* leaf were visited; these were Ajegunle, Kajola –Gbooro, Iseun, Baba- pupa, and Oko-delokun. Thirty Producers were interviewed purposively with the aid of structure questionnaire and oral interview. Descriptive statistic analysis such as percentage and frequency table and budget analysis were used for the data analysis of the producer.

## Results and Discussion

Percentage contribution of *T. daniellii* to total monthly income of producers was estimated to be 26.23 %. This implies that *T. daniellii* makes a significant contribution to the income of the producers. This explains why the producers were very serious with the cultivation of the *T. daniellii*. The Profitability of the cultivation of *T. daniellii* was estimated using benefit-cost ratio. The total present value of the producer was estimated as N69, 680 while total present value of cost was N11, 312. The benefit-cost ratio was 6.15. This implies that the cultivation of *T. daniellii* was profitable to the producer, since the benefit-cost ratio was greater than 1.

From table 2. Eighty percent (80%) of the respondents were males, this indicate that *T. daniellii* is cultivation is predominantly a male activity and above 67% of these producers were between 40-60 years of age. These are the people who still have the strength to work on the farm to cultivate the plant. Eighty-seven percent (87%) of the producers have a household size between 1-10. This implies that there would be sufficient family labour to work on the farm, thereby reducing the amount hired labour that would be required on the farm. About 47% of the respondents had no formal education while none of them had beyond OND/NCE certification. Close to 97% of the respondents claimed farming was their primary occupation while only 20% chose farming as their secondary occupation. This explains why they seemed to devote adequate attention to the cultivation of *T. daniellii*, since farming was their main activity.

Forty- seven percent (47%) of the producers earned between N6, 000 - N20, 000 from the cultivation *T. daniellii*. Considering the relatively low cost of living in the study area, it could be deduced that income from *T. daniellii* cultivation

has made significant contribution in improving the standard of living of the producers. Several reasons were cited by the producers as constraints facing them in the cultivation like climate change, flood, drought, bush fire, disease and pest and deforestation.

### Conclusion and Recommendations

From this empirical research it could be seen that percentage contribution of *T. daniellii* to total monthly income of producers was estimated to be 26.23 %. This implies that *T. daniellii* makes a significant contribution to the income of the producers. This explains why the producers were very serious with the cultivation of the *T. daniellii*. The Profitability of the cultivation of *T. daniellii* was estimated using benefit-cost ratio. The total present value of the producer was estimated as N69, 680 while total present value of cost was N11, 312. The benefit-cost ratio was 6.15. This implies that the cultivation of *T. daniellii* was profitable to the producer, since the benefit-cost ratio was greater than 1. The development to encourage the domestication and cultivation *T. daniellii* will encourage the sustainable conservation of this forests product in South West, Nigeria. Also it will help improve livelihoods by providing employment and increasing income. Research has shown that *T. daniellii* can be cultivated by integrating it into agroforestry systems. This can also be encouraged among tree crop farmers.

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## Tables

**Table 1:** Socio-economic Characteristic of *T. daniellii* producer.

| Variable                    | Percentage | Frequency  |
|-----------------------------|------------|------------|
| <b>Sex</b>                  |            |            |
| Male                        | 24         | 80         |
| Female                      | 6          | 20         |
| <b>Total</b>                | <b>30</b>  | <b>100</b> |
| <b>Age</b>                  |            |            |
| >40                         | 0          | 0          |
| 40-50                       | 2          | 6.7        |
| 51-60                       | 18         | 60         |
| 61-70                       | 9          | 30         |
| 71-above                    | 1          | 3.3        |
| <b>Total</b>                | <b>30</b>  | <b>100</b> |
| <b>Household size</b>       |            |            |
| 1-5                         | 8          | 26.7       |
| 6-10                        | 18         | 60         |
| 11-15                       | 2          | 6.7        |
| 16-20                       | 2          | 6.7        |
| <b>Total</b>                | <b>30</b>  | <b>100</b> |
| <b>Educational status</b>   |            |            |
| No formal                   | 14         | 46.7       |
| Primary                     | 11         | 36.7       |
| Secondary                   | 4          | 13.3       |
| OND/NCE                     | 1          | 3.3        |
| HND/BSc                     | 0          | 0          |
| <b>Total</b>                | <b>30</b>  | <b>100</b> |
| <b>Primary Occupation</b>   |            |            |
| Farming                     | 29         | 96.7       |
| Artisan                     | 0          | 0          |
| Civil Servant               | 1          | 3.3        |
| Trading                     | 0          | 0          |
| <b>Trading</b>              | <b>30</b>  | <b>100</b> |
| <b>Secondary Occupation</b> |            |            |
| Farming                     | 6          | 20         |
| Artisan                     | 7          | 23.3       |
| Civil Servant               | 1          | 3.3        |
| Trading                     | 10         | 33.3       |
|                             | 6          | 20         |
| <b>Total</b>                | <b>30</b>  | <b>100</b> |

Source: Field Survey 2012.

**Table 2:** Monthly Income of Producers from *T. daniellii*

| Monthly Income   | Frequency | Percentage |
|------------------|-----------|------------|
| ≥ N5,000         | 15        | 50         |
| N6,000 - N10,000 | 7         | 23.3       |
| N11,000 -N20,000 | 7         | 23.3       |
| N21, 000-N30,000 | 1         | 3.3        |
| <b>Total</b>     | <b>30</b> | <b>100</b> |

Source: Field Survey, 2012

**Table 3:** Constraint Facing Producers of *T. daniellii*

| <b>Constraint</b> | <b>Percentage</b> | <b>Frequency</b> |
|-------------------|-------------------|------------------|
| Climate           | 7                 | 23.3             |
| Flood             | 1                 | 3.3              |
| Drought           | 9                 | 30               |
| Bush Fires        | 6                 | 20               |
| Disease/pest      | 4                 | 13.3             |
| Deforestation     | 3                 | 10               |
| <b>Total</b>      | <b>30</b>         | <b>100</b>       |

Source: Field Survey, 2012