RESEARCH ARTICLE

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# Diversity of Fruit Tree Species in Site II, Delta State University, Abraka, Nigeria

O. M. Agbogidi, B. Okoremu, and F. O. Stephen

**ABSTRACT**

**This study was carried out with a view of documenting the fruit tree species diversity in the site II of Delta State University, Abraka in May 2021. Sampling for fruits diversity was carried out through direct observation within the study area. Photographs were taken to aid identification; accurate taxonomic references were employed in the process of identification of the specimens collected. Percentage distribution of the fruit tree species and families encountered were documented. From the results of the study area surveyed, a total number of 20 fruit tree species belonging to 13 families were enumerated. The distribution of the fruits based on frequency of occurrence in the visible head count of fruit trees showed that the Indian almond fruit tree species (*Terminalia catappa*) is most dominant with approximately 90%, followed by the coconut species (*Cocos nucifera*) and oil palm fruit specie (*Elaeis guineensis*) with approximately 50%, banana (*Musa acuminata*), mango (*Mangifera indica*) and orange (*Citrus sinensis*) with approximately 30%, pawpaw (*Carica papaya*), Guava (*Psidium guajava*), and Lime (*Citrus aurantiifolia*) with approximately 15%. Others recorded very low species with 5% occurrence, respectively. The study showed that fruits are diverse in the premises of site II of Delta State University, Abraka. The species are important in the ecosystem function and services; hence activities which could lead to their depletion should be controlled.**

**Keywords:** Diversity, fruit tree species, Abraka, Delta State.

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**O. M. Agbogidi***
Department of Botany, Faculty of Science, Delta State University, Nigeria
(e-mail: omagbogidi@yahoo.com)
**B. Okoremu**
Department of Botany, Faculty of Science, Delta State University, Nigeria
**F. O. Stephen**
Department of Botany, Faculty of Science, Delta State University, Nigeria

****Corresponding Author***

## I. Introduction

Fruit, the fleshy or dry ripened ovary of a flowering plant, enclosing the seed or seeds. Thus, apricots, bananas, and grapes, as well as bean pods, corn grains, tomatoes, cucumbers, and (in their shells) acorns and almonds, are all technically fruits. Fruit crop production is thus of particular economic importance. In 2007, a total of about 500 millions of fruit crops (exclusive of melon) were produced in the world on approximately 47 million ha.

Fruits are very important components of the diet. Fruits are, in general, low in calories and fat but high in vitamins, minerals and dietary fibre (Turcotte, 2010). Fruits are generally considered to be high in dietary fibre, vitamin C and other certain vitamins. Fruits also contain various phytochemicals, which are required for proper long-term cellular health and disease prevention. Regular consumption of fruits is associated with reduced risks of cancer, cardiovascular disease (especially coronary heart disease), stroke, Alzheimer disease, cataracts, and some of the functional declines associated with aging (WHO, 2003). Vegetables are sources of many nutrients, especially potassium, folate, the antioxidant vitamins A and E, and dietary fibre. These nutrients support body function in many ways, which makes vegetables important components of a healthy diet. For example, potassium helps to maintain healthy blood pressure, folate (folic acid) helps with red blood cell production, vitamin A enhances immune function, and vitamin E protects cells from free radicals. Though vegetables are an excellent food source of vitamins A/beta-carotene and E, fruits offer more substantial amounts of other antioxidant nutrients like vitamin C. Vitamin C helps heal cuts and wounds and keeps teeth and gums healthy. It also aids in iron absorption, protects the body's cells from oxidative damage due to free radicals, and enhances immune system function (Turcotte, 2010; Agbogidi, 2019).

Fruits and vegetables play a significant role in human nutrition, especially as sources of vitamins C (ascorbic acid), A, thiamine (B1), niacin (B3), pyridoxine (B6), folacin (also known as folic acid or folate) (B9), E], minerals, and dietary fibre (Wargovich, 2000). Diets rich in fruits and vegetables have been shown to be correlated with positive health outcomes, including decreased cardiovascular disease risk, lowered risk for certain cancers (Temple & Gladwin, 2003), and lower body mass index (Charlton *et al*., 2014). A recent WHO/FAO expert consultation report on diet, nutrition, and prevention of chronic diseases, sets population nutrient goals and recommends intake of a minimum of 400 g of fruits and vegetables (excluding potatoes and other starchy tubers) per day for the prevention of chronic diseases such as heart diseases, cancer, diabetes and obesity. The report states that there is convincing evidence that fruits and vegetables decrease the risk for obesity, and evidence that they probably decrease the risk of diabetes. Further, there is convincing

evidence that fruit and vegetables lower the risk for cardiovascular diseases (CVD), and also prevent and alleviate several micronutrient deficiencies, especially in less developed countries (WHO, 2003). Overall, it is estimated that up to 2.7 million lives could potentially be saved each year if consumption of fruits and vegetables is sufficiently increased. Nutrition plays a very important role in the well-being of an adolescent. Nutritional needs during adolescence are increased because of the increased growth rate and changes in body composition associated with puberty (Spear, 2002; Jenkins & Horner, 2005). The dramatic increase in energy and nutrient requirements coincides with other factors that may affect adolescents' food choices and nutrient intake and thus, nutritional status. These factors, including the quest for independence and acceptance by peers, increased mobility, greater time spent at school and/or work activities, and preoccupation with self-image, contribute to the erratic and unhealthy eating behaviours that are common during adolescence (Spear, 2002).

Sound nutrition can play a role in the prevention of several chronic diseases, including obesity, coronary heart disease, certain types of cancer, stroke, and type 2 diabetes (WHO, 2003). To help prevent diet-related chronic diseases, it is proposed that healthy eating behaviours should be established in childhood and maintained during adolescence (Spear, 2002). The objective of this study is to document the diversity of fruit tree species in site II, Delta State University, Abraka with a view to encouraging their conservation, cultivation and consumption.

## II. Materials and Methods

The study was carried out in site II, Delta State University, Abraka, Nigeria. Abraka is a favourite destination for domestic and international tourism. It attracts numerous domestic and international tourists. Abraka's Rivotel is famous for its natural flowing spring water, and has recreational facilities for outdoor activities like canoeing, fishing, swimming, barbecue. Abraka has a tropical wet and dry season, with a lengthy wet season and relatively constant temperatures throughout the course of the year. Abraka's wet season runs from March through October, though August has somewhat of a lull in precipitation. This lull nearly divides the wet season into two different wet seasons. The remaining months form the city's dry season. Like a good portion of West Africa, Abraka experiences the harmattan between the months of November and February.

Abraka is located within latitudes 5°45′ and 5°50′N of the equator and longitude 6° and 6°15′E of the Greenwich meridian (Fig. 1). It has a tropical type of climate with mean temperature of 30 °C and annual rainfall amount of 3,098 mm, and monthly rainfall amount ranging from 25.8 mm in December to 628.9 mm in September (Efe & Aruegodor, 2003).

The study used random sampling design to conduct an inventory on the fruit tree species within site II campus of the University. Sampling was done along different paths, streets, walkways, residential areas, forested areas within the premises of site II, Delta State University, Abraka. The inventory was carried out by first mapping out locations accordingly to aid the research process. The sampling was conducted daily for a period of 1 week so as to cover the mapped out locations, sampling was majorly carried out in the morning so as to enable the researcher carry out sampling effectively before sunrise.

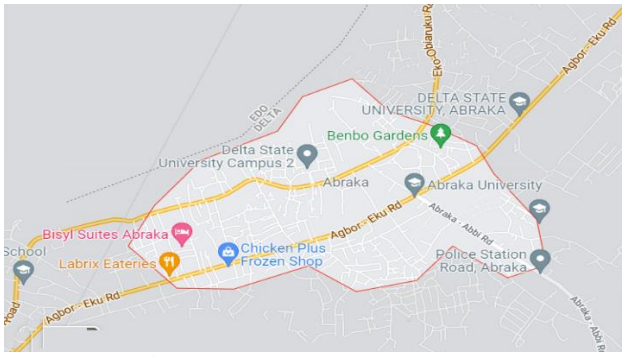


Fig. 1. Map of Delta State University, Site 2, Abraka, Delta State. Source: Google Search engine.

During the study, fruit bearing trees within the mapped out study areas were inventoried and recorded. Their details were entered into a field notebook and then samples of the fruit trees encountered were collected through documentation and photographs taken in order to authenticate their scientific names. Accurate taxonomic references were employed in the process of identification of the specimens collected. The number of fruit tress encountered were documented, the number of their occurrences also documented as well as their families.

The identification of fruit species was carried out using photographs of fruits trees. Identified fruit species were grouped into common names, botanical names and families and presented in Tables and Charts.

The species occurrence documented during the study were subjected to statistical analysis using the percentage (%) of occurrence by dividing the total number of a species by the total number of all species multiplied by a hundred.

$$Percentage\ (\%)\ occurrence = \frac{number\ of\ a\ species}{Total\ number\ of\ all\ species} \times 100$$

## III. Results and Discussion

The results of diversity of fruit species growing within site II premises of Delta State University, Abraka, Delta State are presented in Table I. A total of 20 fruit tree species belonging to 13 families were encountered and recorded. The distribution of the fruit species based on frequency of occurrence in the visible head count of fruit trees showed that the Indian almond tree species *(Terminalia catappa*) is most dominant with approximately 90%, followed by coconut species (*Cocos nucifera*), and Oil palm fruit (*Elaeis guineensis*) with approximately 50%, Banana (*Musa acuminata*), Mango (*Mangifera indica*), Orange (*Citrus sinensis*) with approximately 30%, Pawpaw (*Carica papaya*), Guava (*Psidium guajava*), Lime (*Citrus aurantiifolia*) with approximately 15%, others including maize, okra and tomatoes recorded very low species with 5% occurrence, respectively (Fig. 2).

TABLE I: THE FRUIT TREE SPECIES ENUMERATED IN SITE II, DELTA STATE UNIVERSITY, ABRAKA

| Family | Botanical names | Common names |
|---|---|---|
| Anacardiaceae | *Mangifera indica* | Mango |
| | *Anacardium occidentale* | Cashew |
| Arecaceae | *Cocos nucifera* | Coconut |
| | *Phoenix dactylifera* | Date palm |
| | *Elaeis guineensis* | Oil palm |
| Caricaceae | *Carica papaya* | Pawpaw |
| Combretaceae | *Terminalia catappa* | Indian almond |
| Convolvulaceae | *Ipomoea batata* | Sweet potato |
| Cucurbitaceae | *Citrullus colocynthis* | Bitter apple |
| Malvaceae | *Abelmoschus esculentus* | Okra |
| | *Theobroma cacao* | Cocoa |
| Moraceae | *Ficus carica* | Fig |
| Musaceae | *Musa acuminata* | Banana |
| Myrtaceae | *Psidium guajava* | Guava |
| Poaceae | *Zea mays* | Corn |
| Rutaceae | *Citrus sinensis* | Orange |
| | *Citrus aurantiifolia* | Lime |
| | *Citrus hystrix* | Kaffir lime |
| Solanaceae | *Capsicum annum* | Pepper |
| | *Solanum lycopersicum* | Tomato |

Field survey (2021).

Fruits are rich in fibre which is very essential for the smooth movement of the digestive system. There are some fruits that give body energy as they contain carbohydrates which is the main source of energy. Carbohydrate in fruits, are mainly sugar which actually breaks down easily and provides a quick source of energy. Fruits contain at least 90 to 95% water which is also an important nutrient. Basically, fruit benefits a healthy lifestyle by giving us carbohydrate, fibre and micro-nutrients which aid our bodies to function properly. Fruits give more energy than sugar or sweet as they contain natural glucose and fructose. It is advisable to grow more fruit trees around our environment to give us free access to enjoying nature at low cost. The frequency occurrence of fruit species in site II, DELSU, Abraka is presented in Fig. 2.

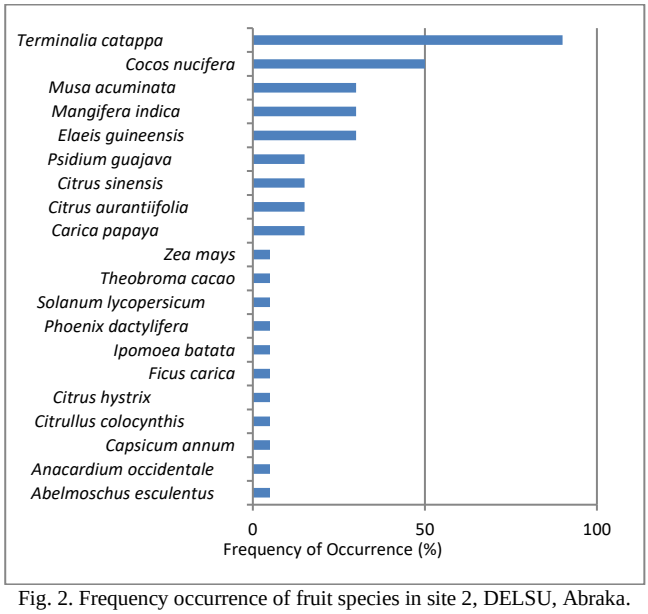


Fig. 2. Frequency occurrence of fruit species in site 2, DELSU, Abraka.

In general, fruit trees thrive best in well-drained soil with a sandy, loamy texture. If there's too much clay, or too many rocks, it can be difficult for a fruit tree to flourish. Soils that are lacking in nutrients also make it challenging for fruit trees to produce tasty, juicy fruit. Fruit trees also need lots of fertilizer, all year long. It helps them to yield more fruit. In fact, it is a good idea to add fertilizer to fruit tree containers on a monthly basis, unless you opt for a slow-release fertilizer. In this instance, new fertilizer is added at least every three months.

The almond fruit (*Terminalia catappa*) which is the most frequent occurring fruit species in the study area, plays an important role in controlling the economy of a huge nation like India. As much as the contributions to your life, they also stay and provides shade through-out our lifetime. They contribute every inch of their life, to become more useful to us. From giving a highly nutritious edible seed, providing landscape, construction and furniture materials, fibre, coir, medicinal contents, oils, tonics, beverage ingredients, and all the way to making even dye, facewash, masticatories, sweeteners, edible flowers, thickeners, stimulants, diversify habitats outside their roles in carbon sequestration (Agbogidi, 2019; Agbogidi *et al.*, 2022).

## IV. CONCLUSION

These fruits tree species should be conserved and more planted. The fruits should be included in our daily diets for a healthy living. Also, they should be cultivated and sustainably used to perpetuate their species.

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