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Use of non-edible plant seeds for arts and ornamental designs

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Abstract

Non-edible plant seeds are found around us and are regarded as waste and nuisance to the environment due to their hardness or pungent odour. Ornamental design unveils the usefulness and aesthetic value of these non-edible plant seeds. Some of these seeds including Flamboyant (*Delonix regia*), African star apple (*Chrysophyllum albidum*), Velvet tamarind (*Dalium guineense*), Nicker nut (*Caesalpinia bonduc*), Rosary pea (*Abrus precatorios*), Incense tree (*Canarium schwenfurthii*), Thorn apple (*Datura stramonium*), Lucky nut (*Thevetia peruviana*), Saw palmetto (*Serenoa repens*) and Cabbage palm (*Sabal palmetto*) among others were obtained by handpicking from the ground, or plucked directly from the trees. They were used to make variety of ornaments ranging from Jewelries, Key holders, Wall frames, Prayer beads, Pen vase, Flower vase, as Ornaments on bag and slippers. From this study, nineteen (19) non-edible plant seeds within eight (8) families were used for ornaments. Most of them belong to the family Fabaceae (47.3%), Arecaceae (15.8%), Euphorbiaceae (10.4%), Sapotaceae (5.3%) and Solanaceae (5.3%) among others. The products obtained from this work have shown that non-edible plant seeds are vital instruments to meet man's desire for beauty, thereby converting these seeds from waste to wealth. This study will stimulate further interest in the students of Economic Botany especially when included in the course content.

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Introduction

Man's flair for the use of natural objects to enhance beauty is historical (Armstrong, 2000). Primitive man wore necklaces made from bones, claws and teeth of slain animals. In recent times, the desire for beauty has extended to the use of natural jewelry as shiny pieces of corals, pearls and precious or semi-precious stones, polished and set in gold or silver forms. Today, plant have now become natural sources of jewelries with the exception of amber and coconut pearls, most botanical jewelries are made from relatively inexpensive materials (Armstrong, 2000). Human uses seeds (include the fruits with pericarps that cannot be easily removed, commonly called 'seeds') in many ways. Seeds are colourful, durable, and easy to access, so humans drilled and strung seeds into necklaces and bracelets for thousands of years (Li *et al*., 2014). The oldest seed ornaments were discovered in Africa and can be dated back to the Middle Stone Age (280,000 to 45,000 years ago).

Ornamental design is, in fact, a kind of practical Science, which, like other kinds, investigates the phenomena of nature for the purpose of applying natural principles and results to some new end (Chestnova, 2014). Unlike the fine arts, which imitate nature in reproducing its images and are pleasurable through the beauty of things they represent, ornamental arts achieve beauty by imitating the principles rather than the forms found in nature. It is this proximity to nature that elevates ornamental arts. Instead of being a trivial matter of cheap manufacture, it is a key element in understanding the world. An ornamentalist, like a Scientist, studies its principles with a view to apply them to new inventions. It is the ornamentalist task 'to adorn the contrivances of mechanical and architectural skill by the application of those principles of decoration and of those forms and modes of beauty, which nature herself has employed in adorning the structure of the world. Training of ornamentist must from the beginning revolve around the objects they would go on to design. Ornament, according to Chestnova (2014), reflects the order of the world, and embodies it, thus giving the products of human industry something of the character of natural things. Ornaments and decorations are ingredients necessary to the completeness of the results of mechanical skill because they are universally desired by all human beings. In the ancient world, famous artistic works were not valued for their materials alone or for the technical skill and innovation of their execution, but for their beauty and ornament. The curiosities and capabilities of a person are in the ornament. Ornament is decoration; display in it is the movement of the makers, the process of production and the uniqueness of the materials.

Non-edible seeds refer to seeds that are not fit for consumption. A variety of plants species provide non-edible seeds. Armstrong, (2000) reported that non-edible seeds of some plant such as *Juniperus monosperma, Juniperus osteosperma, Ungnadia speciosa, Delonix regia, Leucaena leucophala* and *Entada gigas* were use for making ornament. The non-edible plant seeds of *Canarium schwenfurthii* were also used as suggested by Orwa *et al*, (2009) for making ornaments. Similarly, Li *et al,* (2014) identified plant species whose non-edible seeds can be used for ornamental designs to include *Thevetia peruviana, Elaeis guinensis, Abrus precatorious, Cycas revoluta, Canarium pimela, Areca catechu, Pistacia vera, Caryota maxima, Caesalpinia major* and *Trapa natans* among others.

In addition to making jewelries and wall frames, these non-edible seeds have other uses .The seeds of *Abrus precatorious* can be used to treat skin diseases, that of *Caesalpinia bonduc* can be used to treat rheumatism (Li *et al*, 2014), for playing games (Ayo; in Yoruba), used as marbles and buttons (Armstrong, 2000). The seeds of *Mucuna urens* are placed in water and use for bathing new born babies that inhaled so much air during birth as well as treatment of itches. Bitter tea is made from sea heart to relieve pain during child birth, used as teething rings and as good luck charms for sailors embarking on a long ocean voyage (Armstrong, 2000). *Pentaclethra macrophylla* is a minor food supplement in the eastern part of Nigeria (Asoegwu, 2006). Non-edible plant seeds are considered waste by man in our environment as some have been deemed unsuitable

for human consumption due to their hardness and pungent odour. This study unveils the ornamental values of these seeds which are applied as means of beautification to man, alternative employment opportunities and diversify wealth creation. This study is to establish the relevance of non-edible plant seeds for ornamental designs which include their identification and various applications.

Materials and methods

Description of the Study Area

The study was carried out in Abraka and its environs, located in the South-South geopolitical zone of Nigeria and popularly referred to as the Niger Delta region. Abraka lies between latitude 5°45´ and 5°50´ North of the equator and longitude 60 and 6°15´ East of Greenwich meridian. It is bounded on the North by Edo State's Orhionmwon Local Government Area, East by Ukwuani and South by Ughelli North Local Government Areas. While West by Agbor plains. Abraka has a total area of approximately 164sq.km (Fig. 1), mean temperature of 30°C and annual rainfall of 3,098mm with mean monthly rainfall ranging from 25.8mm in December to 628.9mm in September (Efe, 2006). Abraka experiences double rain maxima and August break (Ojeh and Thaddeus, 2012).

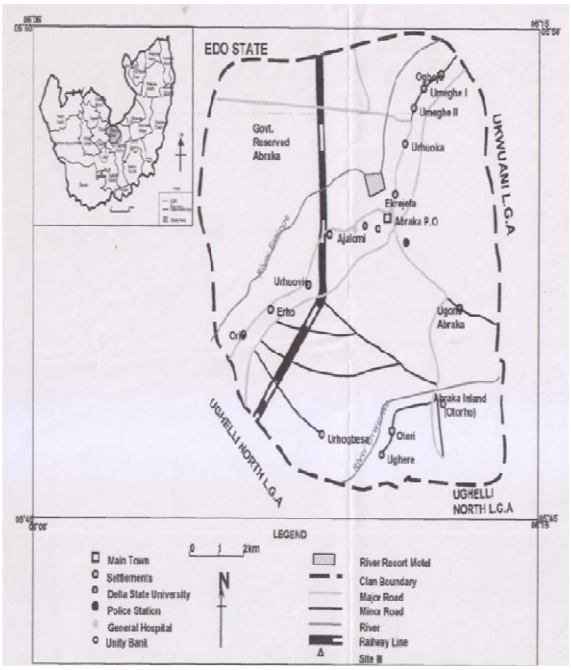

Fig. 1. Map of Abraka and its environs
Source: Ojeh and Thaddeus (2012).

Plant Materials

The following plant materials were used for this study: Non-edible plant seeds such as *Delonix regia, Chrysophyllum albidum, Dalium guineense, Caesalpinia bonduc, Abrus Precatorios, Entada gigas* among others.

Other Materials

Drilling machine, cobbler's needle, Fish line, Earring and necklace hooks, Stopper, polish, UHU gum, ABRO oil spray paint, Gouache, Straw board and White emboss paper.

Data Collection and Methodology

The non – edible plant seeds used for ornamental designs were obtained by hand picking from the ground or plucked directly from the trees. Some seeds were drilled using mechanical drilling machine (Black and Decker KR554RE) to create holes inside and ropes were passed through them while the others glue was used to hold them. The seeds of *Leucaena lecucophala* and *Delonix regia* were boiled for some minutes to allow passage of needle through them, painting was necessary for some design. All the seeds were polished to give them quality and radiance. Different products were made from these seeds corresponding to different ornamental designs of interest and packaged appropriately**.** Information about non-edible plant seeds for ornamental designs were obtained from semi-structured interviews, participatory observation with local residents of Abraka, Delta State and Journals articles.

Identification of Non-Edible Plant Seeds

The common and scientific names of seeds collected were identified using relevant literature (Odugbemi, 2008). Further identification was obtained from Journals and articles online.

Results

This work revealed a total of Nineteen (19) non-edible plant seeds that are important for ornamental design. These plant species are documented in Table 1. It cut across eight (8) different families. Fig. 2 shows the percentage distribution of the families of the seeds use for the study.

The study showed that majority of the seeds belonged to the family Fabaceae with 47.3% followed by Arecaceae (15.8%), Euphorbiaceae (10.4%) while the least were recorded in Burseraceae, Annonaceae, Solanaceae and Sapotaceae with 5.3% respectively. Some of the plant seeds are presented in Plates 1-5. Similarly, some ornaments prepared with these seeds are presented in Plates 5-13.

Table 1. Plants species that produce non-edible seed used for ornamental designs.

SN	Common Name	Scientific Name	Family Name
1	Flamboyant	*Delonix regia* (Bojer ex Hook) Raf.	Fabaceae
2	Velvet tamarind	*Dalium guineense* (Wild)	Fabaceae
3	Rubber seed	*Hevea brasiliensis* (Wild. Ex A. Juss) Mull.Arg	Euphorbiaceae
4	Wild tamarind	*Leucaena leucophala* (Lam) Dewit	Fabaceae
5	Rosary pea	*Abrus precatorious* L.	Fabaceae
6	Nicker nut	*Caesalpinia bonduc* (L.) Roxb.	Fabaceae
7	Horse eye bean	*Mucuna urens* (L.) Medik	Fabaceae
8	Sea heart	*Entadas gigas* (L.) Fawc. & Rendle	Fabaceae
9	African oil bean	*Pentaclethra macrophylla* (Benth.)	Fabaceae
10	African star apple	*Chrysophyllum albidum* G. Don	Sapotaceae
11	Sour sop	*Annona muricata* L.	Annonaceae
12	Lucky nut	*Theveita peruviana* (Pers.) K. Schum	Apocynaceae
13	Sand box	*Hura crepitans* L.	Euphorbiaceae
14	Thorn apple	*Datura stramonium* L.	Solanaceae
15	Incense tree	*Canarium schweinfurthii* Engl.	Burseraceae
16	Pink shower cassia	*Cassia grandis* L.	Fabaceae
17	Raffia palm	*Raphia hookeri* Manni & Wendi	Arecaceae
18	Cabbage palm	*Sabal palmetto* (Walt.) Lodd.	Arecaceae
19	Saw palmetto	*Serenoa repens* (Bartram) J.K. Small	Arecaceae

Plate 1a. *Leucaena leucophala* plant and seed pods**.**

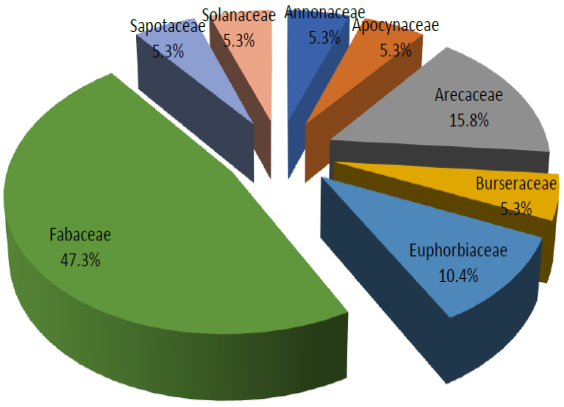

Fig. 1. Percentage distribution of families of Non-edible plant seeds used in this study.

Plate 1b. Seeds of *Leucaena leucophala.*

Plate 2. Seeds of *Sabal palmetto***.**

Plate 3. Seeds of *Serenoa repens*.

Plate 4. Seeds of *Mucuna urens*.

Plate 5. Seeds of *Entadas gigas*.

Plate 6. Pendant made with *E. gigas L. leucophala, D. regia and T. peruviana* seeds.

Plate 7. Necklace and ear rings made with *S. repens,* various non-edible plant seeds.

Plate 8. Wall frames designed with *H. brasiliensis, S. palmetto and M. urens* seeds.

Plate 9. Key holder made with *E. gigas* seed.

Plate 10. Flower vase made with *S. palmetto* seeds.

Plate 11. Prayer beads made with *C. bonduc* seeds.

Plate 12. Shoe ornamented with *S. palmetto* and *D. regia* seeds

Plate 13. Bag ornamented with *S. palmetto* seeds.

Discussion

The nineteen non – edible plant seeds that fit into use for ornamental designs recorded in the study showed that majority of the seeds belonged to the family Fabaceae (47.3%), followed by Arecaceae (15.8%), Euphorbiaceae (10.4%) while the least were recorded in Burseraceae, Annonaceae, Solanaceae and Sapotaceae with 5.3% respectively. From the ornaments made with non-edible plant seeds, eight (8) jewelries which included necklace, ear rings and bracelets were made from *L. leucophala, D. regia, T. Peruviana, D. regia, S. palmetto* and *M. urens* among others. Application of non-edible plant seeds such as *L. leucophala* has been used in making necklace (Francis, 2002). Similarly, *Mucuna urens* and *Entada gigas* have been reported by Armstrong (2000) to be applicable in making necklace.

Li *et al* (2014) identified similar plants as recorded in this study which included *Thevetia peruviana, Abrus precatorious* and *Caesalpinia bonduc* for making ornaments. These j*ewelries have been reported to serve as* material for the enhancement of one's physical body and self-image of one's public personality (*Bailey, 2003).* Necklaces made from these seeds are common in America and Asia as well as other parts of the world. The most dominant Fabaceae family recorded in this study has been reported to posses several other attractive seeds that are used for necklaces in the Caribbean, Mexico and Central America. The most spectacular are from the striking half-red, half-black seeds of Precatory bean *Abrus precatorius* (Armstrong, 2000). It has many names, including Crab's Eyes, Coral Bean or Seed, and Rosary Pea. Some non-edible plant seeds were also applicable in making wall frames, flower and pen vases, ornaments on shoes and bags. These forms of beautifications and ornamental designs have been applicable in ancient and contemporary times as wall – hangings and furniture covers (Vivek ***et al.,*** 2014). Ornaments of non-edible plant seeds in combination with other materials are used to decorate doorways and wall frames. Prayer bead was made from *Caesalpinia bonduc* seeds. This prayer bead is used by some religions for prayers as reported by Armstrong (2000) and have been reported to be one of the species of

bodhi bead plants in China known as Nickernut or bonduc nut (Li *et al.,* 2014). The seed of *E. gigas, S. palmetto* and *R. hookeri* made good key holders. The polished seed makes it attractive to touch.

Conclusion

Non-edible plant seeds are found around us and are usually hard with pungent odour. Most of them have edible fruits which after consumption the seeds are discarded as they are regarded as waste. However, this study has shown that non-edible plant seeds are raw materials that can be utilized in making useful decorative products or ornaments. The products obtained from this work have shown that non-edible plant seeds are vital instruments to meet man's desire for beauty, thereby converting these seeds from waste to wealth. Furthermore, this work proves that there is a relationship between Botany and Fine Arts.

We therefore suggest that a course can be developed in Botany titled "Botanical Arts and Management" - the study that deals with utilizing non-edible plant seeds and other plant materials for decorative products as man himself desire beauty.

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