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Ethnobotany of forest plants used in traditional treatment of benorrhoea in Orile-Owu Osun state, Nigeria

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Abstract
Benorrhoea disease is becoming a very serious problem among women that if proper treatment is not done to it, will eventually instigate infertility problem. In recent times, due to the economic recession, a lot of fake and adulterated drugs have been full our markets. Consequently, a large number of populace is being forced to accept the traditional Medicare. In this study, survey of medicinal plants for curing benorrhoea disease was conducted in Orile- Owu community, Osun State, Nigeria. Information about the disease and respective medicinal plants for curing them were gathered through the use of questionnaires (Oral interpretation) which were administered to experienced farmers, hunters and Herbalists were done. To confirm the efficacy and strength of these plants, phytochemical screening was conducted**.** However, 20 medicinal plants were identified for curing benorrhoea disease in which 17 species belong to different families **(***Pedaliaceae*, *Tiliaceae*, *Steculiaceae*, *Sapindaceae*, *Combretaceae*, *Asteraceae*, *Amaryllidaceae*, *Annonaceae*, *Meliaceae*, *Sapotaceae*, *Liliaceae*, *Hypoxidaceae*, *Santalaceae*, *Euphorbiaceae* among others) while the remaining 3 species (*Garcina Kola*, *Cola nitida* and *Waltheria indica*) belong to *steculiaceae* family. The part of the plant used was leaves usually prepared in liquid form. It was observed that crude protein, moisture content, crude fibre, Ash and carbohydrate range from 14.57% to 29.37%; 14.40% to 58.09%, 4.54% to 29.05%, 6.65% to 22.08% and 2.04% to 43.60% respectively. This confirmed the high level of nutrients in the plants.

Keywords: Benorrhoea, medicinal plants, phytochemical, disease, family, nutrients

1. Introduction
Medicinal plants have great applications in folk medicine within the African region and there is heavy reliance on them in alleviating various disease conditions with no or little effect (Sonibare *et al.,* 2014) [18]. In fact, for centuries, plants have provided man with an array of products crucial to his socio-economic life (FAO, 1990) [8]. Kafaru (1994) reported that the use of plant for medicine dates back to the time of early man, who had the crudest tools as his implements and used stones to start his fire. Many plants are investigated for the development of Phyto compounds useful in drug development. There is no doubt that these natural compounds from plants had contributed positively to the health care delivery system in many rural communities in Africa. About 70-80% rural population depends on medicinal plants for health care (Ripu and Nirmanl, 1980). Cox and Balick (2008) [5] and Kasparek (1997) [13] reported that when modern health care fails, the patient frequently turns to use of indigenous health care. Hence, Nigerians, including the urban dwellers that had once rejected the efficacy of the traditional medicine, are shifting base to medicinal plants (Adodo, 1998, 2004) [1, 2]. However, the efficacy and potential use of medicinal plants have been studied by several scientists and authors. Ugbogu and Odewo, (2004) [20] identified some plants that cured about 17 ailments among which are malaria, abortion, cough, hemorrhoids are recorded. Sofowora, (1993) [17] listed 56 medicinal plants and their essential active constituents. Different parts of plants have been used traditionally to cure many ailments in some West African Countries. Gbile *et al.,* (1985) [9] indicated some plants such as *Mangifera indica, Carica, papaya, Nicotiana tabacum, Picralima nitida, Calamus deeratus* among others to cure ailments like malaria, diabetes, convulsion, stomach upset, glandular disorders, fontanel in infant and many others. There has been intensive research into the local plants for their potentials in Nigeria. Okarfor (1980) [15] indicated that the forest zone of Nigeria contains numerous woody plants of medicinal importance whose products range from fruits, seeds, leaves to flowers and twigs and which have formed common ingredients in a variety of traditional Nigerian drugs and dishes.

Consequently, World Health Organization has produced a guideline for the use of traditional medicine all over the world (WHO 1991) [21]. With all the advances made in modern and orthodox medicine, the practice of traditional medicine as a bold self-reliance effort is still very much alive and playing a very important role in health care of Nigerians. (Ugbogu and Odewo, 2004) [20]. However, medicinal plants with its great potential have even solved a lot of problems. One of such problems is benorrhoea. Benorrhoea is transmitted bacterial infection that if untreated cause infertility (Adodo, 1998) [1]. It is usually spread during unprotected sexual intercourse between opposite sex. Normally, sperm is expected to flow and penetrate into woman's virginal before fertilization can take place. However, the reverse is the case with benorrhoea victim. Benorrhoea is encountered in different ways and the most serious one happens during intercourse. The sperm the man discharges into the woman's vagina will not be effective because immediately the man withdraws from her, the sperms spills off with his organ. In another case, the outflow only occurs when the woman rises. Some are advised to stay at the position of intercourse for a period of time. It could also be experienced in menstrual cycle. All the accumulated sperm discharge will first be seen before the real menstruation. Consequently, researches done by other scientists (Edeoga and Gomina, 2000; Laird and Pierce, 2002 and Edeoga, 2006) [6, 7, 14] confirmed that the disease is now one of the major problems instigating infertility. Therefore, the present study was undertaken in order to document some medicinal plants available in Orile-Owu with aim to identify those plants and determine their chemical constituents present in them.

2. Materials and Methods

Study area

Orile – Owu forest reserve is situated in the extreme South of Irewole Local Government Area of Osun State, approximately latitudes $7^0 8^1$ and $7^0 11^1$ North and longitudes $4^0 5$ and $4^0 23^1$ East. The land area was originally 307.4km^2 but later approximately 35.22km^2 was de reserved by the then government of Oyo State to the cocoa development unit which was named Orile – Owu farm settlement. The working area now remains approximately 272.03km^2. The vegetation is mainly of the high forest type. The mean minimum relative humidity ranges from 83% in June to September, and 72% in December to January, the soils are freely drained and the top soils are without gravels (Agbeja and Labode, 1997) [3]. Orile – Owu Forest reserve is sub-divided into centres namely: Arinkinkin, ayegunle, Agba Ogun, Ala Adura, Okodowo, Elewe, Binuyo, Ogun Edo, and Onikete. These are villages that surround the reserve. The major tribe in the area is yoruba, majority of the people are farmers, traders, timber, contractor with few civil servants. Their high agricultural activities have degraded the rain forest around the area.

Methods

Information on the plants that cure benorrhoea was obtained from experienced herbalists, hunters and farmers in Orile-Owu community through questionnaires (Oral interpretation). The plants mentioned by these people were collected from reserves that surrounded the community. The plants which were confirmed by at least five persons were reported in this study. The information gathered include: local names and recipe/administration. The botanical names, families and habits of the taxa were determined using the Flora of West Tropical Africa by Hutchinson and Dalziel (1954, 1958 and 1963) and Forest Herbarium Ibadan (FHI).

Phytochemical screening

Leaves of 20 plants species namely; *Triumfetta cordifolia* Guill, *Newbouldia laevis*, *Garcina kola* Heckel, *Paulina pinnata, Ficus exasperata*, *Senna alata, Lactuca capensis* Thumb., *Annona senegalensis* Pers Var., *Sphenocentrum jollyanum* and *Sesamum indicum* were randomly collected from each village. The bulky samples were dried at 60^0C for 2 days and the powdered using mortar and pestle. Each powdered sample was parked in a separate polythene bag and kept in desiccators for subsequent chemical analysis.

Moisture Content

The samples (leaves) were weighed into clean, dry and reweighed moisture cans (A.O.A.C., 1980). These aluminum moisture cans were first washed, dried in the moisture oven (Gallenkamp) cooled in the desiccators and then weighed. Representative portions of the samples were put the wet sample was taken. They were then dried in the moisture oven at 80^0C for 20 hours and at 110^0C for 4 hours. The cans were cooled in the desiccators and weighed. The weighing was carried out until constant weights were obtained. The moisture content of samples was calculated using this formula.

$$\% \text{ moisture} = \frac{\text{weight of moisture}}{\text{Weight of sample 1}} \text{X } 100$$

Crude Protein

Duplicate samples of 1g each nitrogen free were weighed on paper and recorded (Sample weight). It was then placed in kjeldah flasks and numbered. A piece of weigh paper was weighed, recorded and placed in tube for blank (two blanks).
Two (2) seldah tablets (containing Cuse02, K2SO4 and pumice) were added to each tube. To each tube, 12ml of H2SO4 was added. The racks of the tubes were connected to top of apparatus to remove fumes. It was then set on digestion rack. Timer was reset for 30mins of digestion. The cooling rack was removed for 30mins and 75ml distilled water was added to each tube. The tubes were then placed in distillation machine and the door was closed. (Reading in ml of acid titrate was recorded)

% Nitrogen = (M acid) (0.1 NHCI) (1.4) g sample
% crude protein =% Nitrogen x 6.25*

N.B. Conversion factor varies from product to product. Digestion block was turned to heat at temperature 420^0C.

Ash determination

1g of the samples was weighed using mettle balance (Gallenkamp mettle H18) into pre-weighed silica dishes. Samples were in the meanwhile kept in desiccators to avoid dust contamination after weighing. They were then transferred into a preheated murfle furnace was switched off and dishes were put in desiccators, allowed to cool and then weighed.% Ash of the samples were then calculated using the formula.

$$\% \text{ Ash (dry basis)} = \frac{\text{Ash weight (gm)}}{\text{Sample weight (gm)}} \text{ X } 100$$

Crude Fibre determination

1g of the dried grounded sample was weighed into a 280ml conical flask and followed immediately by the addition of 100ml digestion reagent. This was then boiled and reflux for 45 minutes in a water jacket condenser to present evaporation of liquid. Thereafter, the conical flask was cooled.

The sample was then filtered through what man filter paper No. 4. This was followed by several washings with hot water and then once with mentholated spirit. When filtration was completed, the residue where removed with spatula and transferred into a silica dish. It was then dried overnight at 105^0C before it was cooled in desiccators and weighed. Thereafter, the fibre was ashed at 600^0C in a murfle furnace for 4 hours cooled in desiccators and weighed again. The percentage of fibre was calculated from the difference in weighing multiply by 100.

Fat determination

The values of fat were obtained from the total ether extractive by the use of soxhiet continuous extraction method as follows: 2gms of the samples were weighed into labeled thimble and a correspondingly labeled, coded boiling flask was weighed as well. The boiling flasks were filled with 300ml of petroleum ether and closely followed by plugging the extraction thimble lightly with cotton-wool. The apparatus was assembled, put and allowed for a reflux for about 6 hours. Therefore, the thimble was removed carefully and the petroleum ether was collected in the top container of the set-up and drained into a container for re-use. When the boiling flask was almost free of petroleum ether. It was removed and dried at 105^0C for one hour. The flask was later cooled in desiccators and weighed. The% fats were then calculated for each sample using the formular.

$$\% \text{ fat} = \frac{\text{weight of fat}}{\text{Weight of sample}} \text{ X } 100$$

3. Results and discussion

Table 1: Available medicinal plants in the study area for curing benorrhoea

No.	Local name	Taxas	Families	Part used	Recipe/ Administration
1	Eluru	*Sesamum indicum* Thonn	Pedaliaceae	Leaves	Leaves are crushed inside water for drinking. Dosage: 1 short thrice daily
2	Akee-eeri	*Triumfetta cordifolia* Guill	Tiliaceae	Leaves	Leaves are crushed in water for drinking. Dosage: 1 tea cup twice daily.
3	Orogbo	*Garcina kola* Heckel	Steculiaceae	Stem bark	The stem bark is ground along with other herbs and mix with honey for licking. Dosage: Take 1 glass cup daily
4	Kakansela	*Paullinia pinnata* Linn.	Sapindaceae	Stem bark	Cut the stem bark into pieces and soak them inside water or alcohol for 24 hours and then drink. Dosage: 2 short twice daily.
5	Afara	*Terminalia superba ENgl. &* Diels	Combretaceae	Leaves	Squeeze the leaves in water. Dosage: Take 1 glass cup twice daily.
6	Yanrin	*Lactuca capensis* Thumb.	Asteraceae	Leaves	Fry palm oil and allow it to cool. Grind the leaves and mix it with cool oil. Dosage: 1 short twice daily.
7	Isu meri	*Crinum zcylanicum (L*	Amaryllidaceae	Tuber	The tuber of the plant is boiled along with lemon grass and onion. Dosage: drink I spoon daily.
8	Abo	*Annona senegalensis* Pers Var.	Annonaceae	Leaves	Leaves are crushed in water with limes (Probably 3 limes) and then drink. Dosage: 1 short thrice daily.
9	Oganwo	*Khaya grandifolia* CDC.	Meliaceae	Stem bark	Boil the stem bark with water for 20mins. Dosage: 1 glass twice daily.
10	Isu baka	*Gambeya africana* Linn.	Sapotaceae	Tuber / root	Cut the tuber into pieces, add one alligator pepper and soak them inside alcohol for drinking. Dosage: 1 tea cup thrice daily.
11	Epa ikun	*Curculigo pilosa*	Hypoxidaceae	root	Cut the root into pieces along with melon and potash; soak in water for 24 hours before drinking. Dosage: Take 1 glass cup twice daily.
12	Korikodi	*Waltheria indica* Linn.	Sterculiaceae	Roots	A decoction of the plant's roots together with native carbonate soda. Dosage: 1 glass cup thrice daily
13	Etieerin	*Aloe vera* A. Berger	Liliaceae	Leaves	Grind four leaves of the plant, mix it with solution of water and honey, and add little dried ginger for drinking. Dosage: Take 1 short twice daily
14	Afomo	*Viscum album* De wild	Santalaceae	Leaves	Soak two handfuls of the fresh or dried in cold water for 8 hours. Sieve and store in a flask for drinking. Dosage: 1 short thrice daily.
15	Lapalapa	*Jatropha*	Euphorbiaceae	Juice	The juice is mixed with Osun in Yoruba and black soap for bathing virginal. Dosage: Take 1 short twice daily
16	Obi abata	*Cola nitida* K. Schum	Sterculiaceae	Leaves	Squeeze the leaves in water for drinking. Dosage: Take 1 glass cup twice daily.
17	Epin	*Ficus exasperate* Vahl	Moraceae	Leaves	The leaves are crushed inside water for drinking. Dosage: Take 2 glass cup twice daily.
18	Orikotemi	*Byrsocarpus coccineus* Schum. Thom.	Connoraceae	Leaves	A decoction of the leaves is drunk Dosage: 1 short twice daily. Cold infusion of the leaves
19	Asunran	*Senna alata* Linn.	Cesalpineaceae	Leaves	The leaves are squeezed in water for drinking. Dosage: 1 glass cup twice daily.
20	Bara	*Curcumis melo* Linn.	Curcubitaceae	Fruit	The fruit is removed for the pod, cut into pieces, soak in palm wine or lime juice with potash and ferment for three days. Dosage: 2 spoons daily.

Table 2: Nutrient composition of some selected medicinal plants for curing benorrhoea

Samples	Moisture content (%)	Crude protein (%)	Crude fibre (%)	Ash (%)
Paulina pinnata	54.85	24.08	4.54	7.45
Ficus exasperata	16.50	20.72	21.32	18.23
Senna alata	31.39	14.57	20.27	8.51
Sphenocentrum jollyanum	18.30	22.40	8.30	7.40
Triumfetta cordifolia	58.09	19.15	26.41	12.71
Newbouldia laevis	13.28	20.95	29.05	6.65
Garcina kola	56.68	29.37	14.71	22.08
Lactuca capensis	39.95	20.60	27.15	14.34
Annona senegalensis	14.40	17.04	19.40	8.30
Sesamum indicum	33.04	20.83	18.20	9.70

4. Discussion

Table 1 showed the available medicinal plants found in the study area for curing benorrhea disease. Twenty (20) different species were identified namely; *Senna alata, Sphenocentrum jollyanum, Paulina pinnata, Sesamum indicum, Ficus exasperata, Triumfetta cordifolia, Garcina kola, Lactuca capensis, Annona senegalensis* among others. The medicinal plants were grouped into I8 families (*Pedaliaceae, Tiliaceae, Steculiaceae, Sapindaceae, Combretaceae, Asteraceae, Amaryllidaceae, Annonaceae, Meliaceae, Sapotaceae, Liliaceae, Hypoxidaceae, Santalaceae, Euphorbiaceae, Moraceae, Connoraceae, Cesalpineaceae,* and Curcubitaceae) in which 3 species such as *Garcina kola, Waltheria indica and cola nitida* were found in the same family (Steculiaceae). The part of the plants commonly used for the preparation is leaf while bark, root, juice and stem are used in small quantity. This corroborates with the findings of Ugbogu and Akinyemi, (2004) [19] that vegetative parts (67%) of plant are commonly used in ethno botany than those of reproductive parts (18%) and the whole plant parts (15%). This observation is similar to some other findings such as Burkill (2000) [4] and Adodo (2004) [2]. The medicinal preparations are mostly in liquid forms. Gbile *et al.* (1985) [9] reported that medicinal plants are prepared in form of liquid, powder, decoction, bathing soap among others and majority of them are used in mixtures while few are used singly.

In the table 2, nutrient composition of some selected medicinal plants for Curing benorrhoea were shown. It was observed that crude protein, moisture content, crude fibre, Ash and carbohydrate range from 14.57% to 29.37%; 14.40% to 58.09%, 4.54% to 29.05%, 6.65% to 22.08% and 2.04% to 43.60% respectively. This indicates that the nutrient compositions of the plants are very high. The highest moisture content (58.09%) was present in *Triumfetta cordifolia* while the lowest moisture content (14.40%) was obtained from *Annona senegalensis.* The moisture content of this leaves agrees with definitions of vegetables, which were characterized with high water content Gbile *et al.*, (1985) [9]. It was shown that crude protein in *Garcina kola* contains (29.37%) (Highest) while the lowest percentage (14.57%) was found in *Senna alata*. This implies that the levels of protein in the plants are relatively high. This contributes to the formation of hormones which contains a variety of body functions such as growth, repair and maintenance (Mau et al, 1999). It also showed that crude fibre in *Newbouldia laevis* have 29.05% (highest percentage) while *Paulina pinnata* contained 4.54% (lowest). Edeoga *et al*., (2006) [7] showed the crude fibre in Newbouldia laevis (28.72%) to have a physiological effect on the gastrointestinal function of promoting the reduction of tracolonic pressure which is beneficial in diverticular disease. Fibre also has a biochemical effect on the absorption of bile acids and consequently the re-absorption of dietary fats and cholesterol. High content of Ash was obtained from *Garcina kola* (22.08%) while the lowest content of Ash (6.65%) was found in *Newbouldia laevis*. The high content of ash is useful in assessing the quality of grading of the plant.

5. Conclusion

Nigeria forest contains diverse of medicinal plants and its diversity is indispensable to human wellbeing because it provides a number of remedies required in healthcare and in the provision of employment. Benorrhoea is a problem which can be traced to both male and female. According to the report, the disease is transmissible and any of the couple could be held responsible for the transmission. It is apparent that with traditional medicines, there is a plant for every health disorder and they should not be neglected when such case arises. It is observed that a quite number of the local people and a few numbers of the educated people have a sound knowledge of medicinal plants which is then passed from generation to generation, orally or in written form within the family cycle. Potential of medicinal plants can only be known if the active constituents of plants and its standard of nutrients are identified. The active principles differ from plants to plant due to their biodiversity and they produce a definite physiological action on human body. They act as antiviral, anti-microbial, antibacterial, ant parasitic, anti-inflammatory, expectorate and immune against diseases that contribute to infertility in the body system.

However, the medicinal plants are highly nutritious composed of protein, fibre, ash, moisture content, carbohydrate and this make it to be more comparable with vegetables. This is evidence that they are not poisonous.

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