

## Medicinal Plants Used in the Treatment of Infant Diseases in South Western Nigeria

<sup>1</sup>P. O. Fatoba, <sup>\*</sup>1S. B. Adeyemi, <sup>1</sup>A. A. Adewole and <sup>2</sup>M. T. Fatoba

<sup>1</sup>Department of Plant Biology, Faculty of Life Sciences, University of Ilorin, Ilorin, Nigeria.

<sup>2</sup>Physical and Health Education, Adeyemi College of Education, Ondo.

[\*Corresponding Author: E-mail: [adeyemi.sb@unilorin.edu.ng](mailto:adeyemi.sb@unilorin.edu.ng); ☎: +2348052248230]

### ABSTRACT

This study was aimed at documenting medicinal plants used in the treatment of infant diseases in South Western Nigeria. Common infant diseases treated with herbs by people of South Western Nigeria include convulsion, measles, malaria, cough and jaundice among others. The method employed was semi-structured format of interview which involved one-on-one interview using the local language (Yoruba). Forty-five plants belonging to thirty-three families were documented alongside with their medicinal use in the treatment of infant diseases. Information on various recipes was also documented which include their preparation, parts used, administration and dosage. There is still the need for researchers to explore this vital information through scientific validation to the claim of the indigenous people. Also screening, isolation and characterization of active constituents of the plants would give leads in the production of novel drug.

**Keywords:** Infant Diseases, Convulsion, Administration, Dosage, Indigenous people.

### INTRODUCTION

Illness is an aspect of “*aisan*” in Yoruba which means not well or, less often, a description of one of the specific symptoms noted in the negative statements about health (Jegade, 2002). It was observed by Jegede (2002) that some conditions which could have been identified as diseases in medical terms are not regarded as such because they are considered normal under certain circumstances because they are required in the child developmental processes. Infant feeding practices have long been recognized as one of the potentially important determinant of specific infections (Brown et al., 1989).

Approximately 10 million children under-five years die each year with large variation across region and countries (Espo, 2002). Globally the number of deaths among children under age five has reduced from 12.4 million in 1990 to 8.1 million in 2009 (UNICEF, 2010). The reduction may be due to interventions targeted at communicable diseases such as malaria, measles, diarrhoea, respiratory infections and other immunizable childhood infections which have been the major causes of child mortality (Mesike and Mojekwu, 2012).

Earlier studies have noted that children in Nigeria die mainly from malaria, acute respiratory infections, measles, and diarrhoea (Mesike and Mojekwu, 2012). Children who are undernourished have lower resistance to infection and are more likely to die from common childhood ailments such as malaria, diarrhoeal diseases or respiratory infections. In Nigeria, it is estimated that malnutrition contributes over 50% of mortality among children aged under-five years (UNICEF, 2006). Apart from poor feeding practices and shortfalls in food intake, micronutrients deficiency is a direct cause of child morbidity and mortality. Micronutrients such as iron, iodine, vitamin A, are necessary for the healthy development of children. Their absence in the diet cause serious disorders. For example, lack of sufficient iodine can lead to goitre, hypothyroidism, mental and physical impairment (UNICEF, 2002).

It was not known where or when plants first began to be used in the treatment of disease, but the connection between plants and health has existed for thousands of years (Faleyimu and Oluwalana, 2008). Herbal or botanical medicine, or phytotherapy, was defined as “the use of plant materials to prevent and treat ill

health or promote wellness” (Ameh et al., 2010). The use of herbs as medicine is the oldest form of healthcare known to humanity and has been used in all cultures throughout history (Barnes et al., 2007).

There is limited documentation of medicinal plants used in the treatment of infants' diseases in Nigeria, but several ethnobotanical studies focusing on medicinal plants have been documented all over the world (Cox, 2005; Kumar et al., 2005; Singh and Singh, 2001; Wang et al., 2005). In view of the fact that infant diseases are widely observed in Nigeria due to the attitude of mothers to some illness which are supposed to be treated, non-availability of health care practitioners and cost of accessing orthodox mode of treatment, it is paramount to document some ethnobotanicals used in the treatment of infant diseases in South Western Nigeria. This study is aimed at providing baseline information about the medicinal plants that can be used for treating infant diseases, also serving as baseline information for further validation.

## **MATERIALS AND METHODS**

### **Study Area**

The ethnobotanicals survey was carried out in some selected states (Ekiti, Lagos, Ogun, Ondo and Oyo) in South West of Nigeria. The South Western part of Nigeria is the abode of Yoruba people with a population of approximately 50 million (NPC, 2006). The area is characterized by tropical rainforest and Guinea savannah vegetation as well as patches of derived savannah arising basically from human activities like bush burning for agricultural and hunting purposes (Ogundele, 2007). The inhabitants are involved in different professions; civil service, trading and farming.

### **Methods**

The survey was conducted in the local language (Yoruba) via oral interview using the modified method of Sofowora (1993). Information on various remedies including plant

names, family, parts used, methods of administration and dosage were obtained. One Hundred (100) informants were interviewed. Sixty percent (60%) of the respondents were women and most of the recipes were only given with their local names. The scientific names were gotten and certified in the herbarium of the Department of Plant Biology, University of Ilorin.

## **RESULTS**

Enumerations of recipes obtained from the field survey depict the dependence of the inhabitant of the study area on herbal medicine as they have herbal remedies for virtually all the infant diseases (Table 1). Various plant parts (stem, bark, fruits, leaves, bulb, seeds and flower) were collected as recipes. Generally, stem barks and leaves were predominant in the prescription.

Forty-five (45) plants belonging to thirty three (33) families were collected as plants having potential for the treatment of infant diseases (Table 2). The mostly used parts of plant as documented in this present study are the leaves (Table 2).

During the course of this ethnobotanical survey, most female respondents said breast feeding of infants can in one way or the other serve as therapy to some of the diseases. People of the study area are conversant with the usage of the documented medicinal plants. Most of the informants gave remedies mostly for common infant diseases such as malaria, cough, dysentery, diarrhoea, measles, convulsion and jaundice among others.

## **DISCUSSION**

Medicinal practices are known to still be an important component of everyday life in many regions of the world (Bussman and Sharon, 2006) as evident by the information given by the respondents in the present study.

Table 1: Enumeration of the recipes for the treatment of various infant diseases

S/No	Disease	Recipes	Modes of Administration and Dosage
1	<b>Blood Shortage (Anaemia)</b>	<b>Recipe 1:</b> <i>Sorghum bicolor</i> shoots, barks of <i>Mangifera indica</i> and <i>Theobroma cacao</i> are boiled together for 30 minutes with 2 litres of water, two tins of milk and 4 cubes of sugar are added to the herbal preparation. <b>Recipe 2:</b> <i>Perquatina nigrescens</i> leaves squeezed and added with half tin of milk.	5 ml of the decoction taken orally thrice daily 5 ml of the infusion taken orally thrice daily
2	<b>Constipation</b>	The juice of <i>Annanas comosus</i> and sweet orange are extracted for drinking.	The Juice is taken orally; 0-12 months old taken 5 ml thrice daily; 1-5years old taken 5 ml five times daily.
3	<b>Convulsion</b>	<b>Recipe 1:</b> <i>Allium cepa</i> , <i>Allium sativum</i> and <i>Zingiber officinale</i> are ground together. The ground material is mixed with palm oil. <b>Recipe 2:</b> The leaves of <i>Rauwolfia vomitoria</i> and the leaves and fruits of <i>Xylopi aethiopica</i> are boiled in water for 45minutes.	The mixture is applied topically all over the body of the baby and should be allowed to enter the eyes. About 2 <sup>1</sup> / <sub>2</sub> ml is given orally to the affected child. 10 ml orally taken thrice daily.
4	<b>Cough</b>	<b>Recipe 1:</b> <i>Calotropis procera</i> leaves are boiled in water with banana fruit for 30 minutes. <b>Recipe 2:</b> The fruits of <i>Xylopi aethiopica</i> are added to fried oil. The fruits are then separated after 8 minutes and sugar is then added to the extract. <b>Recipe 3:</b> <i>Allium cepa</i> , <i>Allium sativa</i> and <i>Zingiber officinale</i> are made into powder. The mixture is then mixed with palm oil.	5 ml taken orally five times daily It is taken Orally by licking. 5 ml taken orally thrice daily.
5	<b>Diarrhoea</b>	The leaves of <i>Alstonia boonei</i> is squeezed to obtain the juice.	The Juice is Orally by using 5 ml of the juice thrice daily.
6	<b>Dysentery</b>	<b>Recipe 1:</b> Leaves of <i>Perquatina nigrescence</i> are squeezed. The juice extracted is mixed with a pint of salt. <b>Recipe 2:</b> The infusions of leaf of <i>Gossypium barbandense</i> is made in cold and hot water.	5 ml of the juice taken orally every three hours Oral by using 5 ml of the juice every three hours.
7	<b>Jaundice</b>	<b>Recipe 1:</b> The barks of <i>Alstonia boonei</i> is soaked in water for two to three days. <b>Recipe 2:</b> Matured unripe pawpaw is cut into pieces and soaked in fermented maize water (Omiidun) for three days. <b>Recipe 3:</b> Fruits of unripe <i>Annanas comosus</i> , leaves of <i>Anacardium occidentale</i> and seeds of <i>Gossypium barbandense</i> are boiled in clean water.	5ml taken orally five times daily. 2.5ml taken orally five times daily. 10 ml taken orally four times daily
8	<b>Helminthic infestation</b>	<b>Recipe 1:</b> The leaves of <i>Azadirachta indica</i> is squeezed with water. Lime and garlic are added to the infusion. <b>Recipe 2:</b> The infusions of dried leaves of <i>Corchorus olitorus</i> is prepared either with hot water or cold water.	10 ml of the infusion taken orally twice daily. 5 ml taken orally once daily

		Recipe 3: The roots of <i>Rauwolfia vomitoria</i> is boiled in water for 30 minutes.	5 ml taken orally thrice daily.
9	<b>Malaria</b>	Recipe 1: Decoction of <i>Alstonia boonei</i> and <i>Carica papaya</i> leaves is made. Recipe 2: Extract of the leaves of <i>Morinda lucida</i> is squeezed out using water.	5 ml taken orally thrice daily. 5 ml taken orally thrice daily.
10	<b>Measles</b>	Recipe 3: Lemon grass, lime, grape, unripe pawpaw, unripe pineapple and garlic are boiled in water for 15 minutes. The leaves of <i>Momordica charantia</i> is boiled in water.	10 ml taken orally thrice daily. The decocted material is used to bathe every day and night until the measles cure.
11	<b>Small Pox/Chicken Pox</b>	Recipe 1: The leaves of <i>Rauwolfia vomitoria</i> , indigofera and <i>Cajanus cajan</i> are boiled in water for 45minutes. Recipe 2: The leaves of <i>Kalanchoe crenata</i> is made into powder and mixed thoroughly with Shea butter.	It is taken orally, 15 ml four times daily; the decoction is also used for bathing. Topically on the affected area of the body.
12	<b>Teething</b>	Recipe 1: The juice is extracted from the stem of sugar cane. Recipe 2: The leaves of <i>Mezoneuron benthamianin</i> is ground and mixed with black soap.	Taken orally (5 ml) every three hours. The prepared soap is then used to bath twice daily.

Several researchers have carried out various scientific studies on the documented ethnobotanicals. For instance, the phytochemical composition, nutritional composition and screening for various ailments of *Alstonia boonei*, *Gossypium barbadense* and *Vernonia amygdalina* have been reported (Gbadamosi and Obogo, 2013). Also Aibinu et al., (2007) have carried out *in-vitro* anti-microbial screening of *Kalanchoe crenata*. *In vitro* anti-bacterial activity has also been carried out on *Mirabilis jalapa* (Zachariah et al., 2012). Anti-anaemic studies on *Mangifera indica*, *Terminalia catappa*, *Sorghum bicolor*, *Perquatina nigrescens*, and *Theobroma cacao* has also been carried out (Gbadamosi et al., 2012).

In the survey carried out by Odugbemi et al. (2007), most of the plants used in the treatment of malarial disease corroborate with the documented ethnobotanicals used for the same

infant diseases. Also, *Citrus paradisi* have shown positive result when screened against microfilarial larva of *Simulium yahense* (Ebigwai et al., 2012). Antimicrobial activity of the leaf extract of neem (*Azadirachta indica*) against human pathogenic bacteria has also been carried out (Maragathavalli et al., 2012).

Medicinally, baobab fruit powder is used for treating fevers, gastric complaints, malaria, haemoptysis, and as a general health tonic, particularly in children, pregnant women and the elderly people (www.aminaherbs.com). Apart from vitamin C supplements, the seed was found to be a good source of energy, protein and fat (Osman, 2004). Many herbs have shown positive result in the treatment of infant diseases such as malaria, jaundice measles, small pox, and Guinea worm among others.

Fatoba et al: Medicinal Plants Used in the Treatment of Infant Diseases in South.....

Table 2: Profile of plants used in the treatment of infant diseases

S/N	Botanical Names	Family	Common Name	Local Names	Plant Parts Used	Medicinal uses
1	<i>Adansonia digitata</i> L.	Bombacaceae	Baobab	Igi Ose (Y)*	Leaves, Stem Barks, Roots	Indigestion, skin infections, Vitamin C Deficiency
2	<i>Aframomum melegueta</i> (Sonn.) K. Schum	Zingiberaceae	Alligator pepper	Ataare (Y)	Fruits	Small Pox, Chicken Pox, Cough
3	<i>Allium sativum</i> L.	Liliaceae	Garlic	Alubosa Ayuu (Y)	Bulbs	Convulsion
4	<i>Alstonia boonei</i> De Wild	Apocynaceae	Stool wood	Ahun (Y)	Leaves, Barks	Fever, Convulsion, Diarrhoea
5	<i>Anacardium occidentale</i> L.	Anacardiaceae	Cashew	Kaju (Y)	Leaves	Fever, Malaria
6	<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	Pineapple	Ope Oyinbo (Y)	Fruits	Malaria, Dysentery
7	<i>Argemone Mexicana</i> L.	Papaveraceae	Mexican poppy	Ekan-Ekun (Y)		Abscesses
8	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Neem tree	Dongoyaro (H) Igi kasia (Y)	Leaves, Stem	Dysentery, Fever
9	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Hog weed	Olowojeja (Y)	Leaves	Small pox, Jaundice
10	<i>Cajanus cajan</i> (L.) Millsp.	Mimosaceae	Pigeon Pea	Otili (Y)	Leaves, Seeds	Small pox, Measles
11	<i>Calotropis procera</i> (Aiton) R. Br.	Asclepiadaceae	Giant milk weed	Bomubomu (Y)	Leaves	Cough
12	<i>Carica papaya</i> L.	Caricaceae	Pawpaw	Ibepe (Y)	Leaves	Malaria, Jaundice, Convulsion
13	<i>Cassia fistula</i> L.	Fabaceae	Golden shower	Aidan toro (Y)	Leaves, Stem barks and Roots	Convulsion, mouth sore
14	<i>Citrus aurantifolia</i> (Christm.) Swingle	Rutaceae	Lime, Swing	Osan wewe(Y)	Fruits, Leaves	Fever, jaundice, measles
15	<i>Citrus limon</i> (L.) Burm. F.	Rutaceae	Lemon	Osan Iaimu (Y)	Fruits, leaves	Stomach ache, convulsion
16	<i>Citrus paradisi</i> Macfad.	Rutaceae	Grape fruit	Osan gerepu (Y)	Fruits	Malaria
17	<i>Combretum alnifolia</i> Loefl.	Combretaceae	Combretum	Opon (Y)		Eczema
18	<i>Corchorus olitorius</i> L.	Tiliaceae	Jute plant	Eweedu, Ooyo (Y)	Leaves	Diarrhoea, abscess, antihelmintic
19	<i>Cymbopogon citratus</i> (DC.) Strapt.	Poaceae	Lemon grass	Kooko oba (Y)	Leaves	Malaria, Cough
20	<i>Daniella oliverii</i> (Rolfe) Hutch. & Dalziel	Caesalpinaceae	Balsam tree	Iya (Y)	Leaves	Malaria

21	<i>Garcinia kola</i> Heckel	Gutiferae	Bitter Kola	Orobo (Y)	Nuts	Cough, Catarrh, Jaundice
22	<i>Gossypium barbandense</i> L.	Malvaceae	Cotton	Owu (Y)	Leaves	Malaria, measles, skin infections
23	<i>Heliotropium indicum</i> L.	Boraginaceae	Cock's comb	Apari Igun, ogbe Ori akuko (Y)	Leaves	Mouth sore, small pox
24	<i>Jatropha curcas</i> L.	Euphorbiaceae	Physic nut	Botuje, Lapalapa (Y)	Leaves	Pneumonia, Stomach ache, skin infections, diarrhoea
25	<i>Kalanchoe crenata</i> (Andrews) Haw.	Crassulaceae	Never die	Eti odundun	Leaves	Small pox, ear problem
26	<i>Mangifera indica</i> L.	Anacardiaceae	Mango tree	Mangoro (Y)	Leaves, Barks	Malaria, fever, Anaemia
27	<i>Mimosa pudica</i> L.	Mimosaceae	Sensitive plants	Patanmo (Y)	Leaves	Boils, Guinea worm
28	<i>Mirabilis jalapa</i> L.	Nyctaginaceae	4 O'clock plant	Tanaposo, Aje onisu (Y)	Leaves	Eczema, wound, colic, purgative
29	<i>Momordica charantia</i> L.	Cucurbitaceae	African cucumber	Ejinrin were (Y)	Leaves	Convulsion, Disorder, measles, chicken pox
30	<i>Morinda lucida</i> Benth.	Rubiaceae	Brime stone tree	Oruwo (Y)	Leaves	Jaundice, fever, malaria
31	<i>Musa sapientum</i> L.	Musaceae	Banana	Ogede wewe (Y)		Diarrhoea, cough, jaundice
32	<i>Ocimum gratissimum</i> L.	Lamiaceae	Basil	Efinrin nla (Y)	Leaves	Cough, insect repellent, dysentery
33	<i>Perquatina nigrescence</i>	Periplocaceae	African parquatina	Ogbo (Y)	Leaves	Anti-anaemic, dysentery, stomach disorder, skin disease
34	<i>Psidium guajava</i> L.	Myrtaceae	Guava	Guofa (Y)	Leaves	Diarrhoea, dysentery, fever, cough, malaria
35	<i>Rauwolfia vomitoria</i> (Benth.) Swizzlestick	Apocynaceae	Serpent wood	Asofeyeje (Y)	Leaves	Nervous disorder, jaundice, scabies, diarrhoea
36	<i>Ricinus communis</i> L.	Euphorbiaceae	Castor oil plants	Lara (Y)	Leaves, Seeds	Catarrh, constipation, ring worm, itching, purgative
37	<i>Saccharium officinarum</i> L.	Poaceae	Sugar cane	Ireke (Y)	Stems	Helminthic infestation, joint pain
38	<i>Sessamum indicum</i> L.	Pedaliaceae	Gingerfly	Ekuku (Y)	Culm	Dysentery, ear ache
39	<i>Sorghum bicolor</i> (L.) Moench.	Poaceae	Guinea corn	Oka baba (Y)	Shoots, Leaves	Blood tonic, malaria, fever
40	<i>Terminalia catappa</i> L.	Combretaceae	Almond tree	Furutu (Y)	Leaves	Fever, dysentery, diarrhoea, laxative

**Fatoba et al: Medicinal Plants Used in the Treatment of Infant Diseases in South.....**

41	<i>Theobroma cacao</i> L.	Sterculiaceae	Cocoa	Koko (Y)	Leaves, Barks	Blood tonic, tooth ache
42	<i>Vernonia amygdalina</i> Schreb.	Asteraceae	Bitter leaf	Ewuro (Y)	Leaves, Stem	Stomach disorder, dysentery, skin infection, malaria
43	<i>Vitellaria paradoxa</i> C.F. Gaertn.	Sapotaceae	Shea butter	Ori, emi (Y)	Leaves, Stem barks	Skin rashes, nasal decongestion
44	<i>Xylopia aethiopica</i> (Deunal) A. Rich	Annonaceae	Ethiopian pepper	Eeru (Y)	Fruits	Cough, convulsion, stomach ache
45	<i>Zingiber officinalis</i> Roscoe	Zingiberaceae	Ginger	Atale (Y)	Rhizomes	Fever, malaria, digestive disorder, liver disease, typhoid.

\*Language: H= Hausa; Y= Yoruba

Plants are reservoir of secondary metabolites that are primarily medicinal. Secondary plant products are discontinuously distributed in the plant kingdom with some being the characteristic of single or related species or genera. The presence or absence of a characteristic secondary plant products are produced as defence against fungi (Seigler, 1998). On a more important note, Kochlar (1986) identified the healing potentials of these plant products. He further reported that these potentials embrace traditional, spiritual and mythical roles and the exact number of plant species that are medicinally important cannot be estimated. Olukoya et al. (1992) reported the efficacy of some herbal preparation in the treatment of different kinds of ailments including many microbial infections such as gonorrhoea, sore throat and diarrhoea.

It is imperative to integrate herbal remedies into the treatment of infant disease alongside orthodox line of medication. Orthodox line of medication is either costly or far from the rural people, such people can make use of herbs in taking care of their medical needs.

## CONCLUSION

There is a still the need for researchers to explore this vital information serving as baseline information for further scientific validation to the claim of the indigenous people. Moreover, isolation and characterization of active constituents of the plants would give leads in the production of novel drug.

## REFERENCES

- Aibinu, I.E., Odunayo, R.A., Adenipekun, T., Adelowotan, T. and Odugbemi, T. (2007). *In Vitro* Antimicrobial Activity of Crude Extracts from Plants *Bryophyllum pinnatum* and *Kalanchoe crenata*. *African Journal of Traditional, Complementary and Alternative Medicine*, **4**(3): 338 – 344.
- Ameh, S.J., Obodozie, OO, Inyang US, Abubakar MS and Garba M (2010). Current phytotherapy - a perspective on the science and regulation of herbal medicine. *Journal of Medicinal Plant Research*, **4**(2):072-081.
- Barnes J, Anderson LA and Phillipson JD (2007). *Herbal medicine*. 3rd Edition, Pharmaceutical Press, London. pp 1-23.
- Brown KH, Black RE, Guillermo LR and Hilary CK (1989). Infant-Feeding Practices and their Relationship with Diarrheal and Other Diseases in Huascar (Lima), Peru. *Paediatrics*, **83**(1):31-41.
- Bussman RW and Sharon D (2006). Traditional medicinal plant use in Northern Peru: tracking two thousand years of healing culture. *J. Ethnobiol. Ethnomed*, **2**:47-57.
- Cox PA (2005). The seven pillars of ethnomedical wisdom. *Ethnobotany*, **17**:24-34.
- Ebigwai JK, Edu EA, Obi-iyeke GE and Nta IA (2012). Lavacidal activity of *Citrus paradisi Macf.* and *Murraya koenigii spheng.* (Rutaceae) extracts on microfilarial larva of *Simulium yahense*. *Annals of Biological Research*, **3** (4):1985-1987
- Espo M (2002). Infant Mortality and its underlying Determinants in Rural Malawi (Unpublished). University of Tampere Medical School.
- Faleyimu OI and Oluwalana SA (2008). Medicinal Value of Forest Plant Seeds in Ogun State, Nigeria. *World Journal of Biological Research*, **1**(2): 1-6.
- Gbadamosi IT, Moody JO and Yekini AO (2012). Nutritional composition of ten Ethnobotanicals used for the treatment of Anaemia in southwest Nigeria. *European Journal of Medicinal Plants*, **2**(2):140-150.
- Gbadamosi IT and Obogo SF (2013). Chemical Constituents and In Vitro Antimicrobial Activities of Five Botanicals Used Traditionally for the Treatment of Neonatal Jaundice in Ibadan, Nigeria. *Nature and Science*, **11**(10): 130-135.
- Jegade AS (2002). The Yoruba Cultural Construction of Health and Illness. *Nordic Journal of African Studies*, **11**(3): 322-335.



- Kochlar SL (1986). *Tropical crops. A textbook of Economic Botany*. Macmillan Publishing Ltd. London. Pp. 401-410.
- Kumar A, Tewari DD, Sharma R, and Pandey VO (2005). Practices of folk phytoveterinary in Devipatan division, Uttar Pradesh. *India Journal Natcon*, **17**(1), 153-161.
- Maragathavalli S, Brindha S, Kaviyarasi NS, Annadurai B and Gangwar SK (2012). Antimicrobial Activity in Leaf Extract of Neem (*Azadirachta Indica* Linn.). *International Journal of Science and Nature*, **3**(1):110-113.
- Mesike CG and Mojekwu JN (2012). Environmental Determinants of Child Mortality in Nigeria. *Journal of Sustainable Development*, **5**(1):65-75.
- NPC. (2006). *Population and Housing Census of the Federal Republic of Nigeria*. National Population Commission, Nigeria
- Odugbemi OT, Akinsulire RO, Aibinu IE and Fabeku PO (2007). Medicinal Plants Useful For Malaria Therapy in Okeigbo, Ondo State, Southwest Nigeria. *Afr. J. Traditional, Complementary and Alternative Medicines*, **4**(2): 191- 198.
- Ogundele SO (2007). Aspects of Indigenous Medicine in South Western Nigeria. *Ethno Med*. **1**(2): 127-133.
- Olukoya DK Idiaka N and Odugbemi T (1992). Antimicrobial activity of some medicinal plants from Nigeria. *Journal of Ethnopharmacology*, **39**:67-72
- Osman MA (2004). Chemical and Nutrient Analysis of Baobab (*Adansonia digitata*) Fruit and Seed Protein Solubility. *Plant Foods for Human Nutrition*, **59**: 29–33.
- Siegler DS (1998). Plants with saponins and cardiac glycosides. [www.life.unic.edu/plantbio363/Saponin slides](http://www.life.unic.edu/plantbio363/Saponin_slides).
- Singh NK and Singh DP (2001). Ethnobotanical survey of Balrampur. *Flora- fauna*, **7**(2), 59-66.
- Sofowora A (1993). *Medicinal Plants and Traditional Medicine in Africa*. Polygraphic Venture Ltd, Ibadan. 289 pp.
- UNICEF (2002). *The State of the World Children, 2001*. UNICEF, New York.
- UNICEF (2006). *Information Sheet: Nutrition, June 2006*. UNICEF, Nigeria.
- UNICEF (2010). *Levels and Trends in Child Mortality, Report 2010*. UNICEF, New York.
- Wang, Yu-hua, Pei, SJ, and Xu JC (2005). Sustainable management of medicinal plant resources in China: Literature review and implications. *Resources Science*, **24**(4):81-88.
- [www.aminaherbs.com](http://www.aminaherbs.com). *Baobab Fruit powder: Medicinal uses of Adansonia digitata* (Baobab). Retrieved on 8<sup>th</sup> January, 2013.
- [www.huilesutiles.eu](http://www.huilesutiles.eu). Chemicals and their Biological Activities In: *Citrus paradise* MacFAD. (Rutaceae) – *Grapefruit*. *Dr. Duke's Phytochemical and Ethnobotanical Databases*. Retrieved on 7<sup>th</sup> January, 2012 at 09:55am.
- Zachariah SB, Vidya V, Aleykutty NA, Jaykar B and Halima OA (2012). Free Radical Scavenging and Antibacterial Activity of *Mirabilis jalapa* Linn Using *In Vitro* Models. *Asian Journal of Pharmaceutical and Clinical Research*, **5**(3):115-119.