

TRADITIONAL TREATMENT OF FEMALE INFERTILITY: YORUBA PERSPECTIVE**¹Subair, B. K. and ^{1,2}Ade-Ademilua, O. E.**¹Department of Botany, Faculty of Science, University of Lagos, Akoka, Lagos, Nigeria²African Centre of Excellence for Drug Research, Herbal Medicine Development and Regulatory Science (ACEDHARS), 100213, Lagos, Nigeria.

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Received 29th October, 2021; accepted 7th January, 2022**ABSTRACT**

This survey was to conserve knowledge of indigenous medicine through identification and documentation of the recipes and plants used in the treatment of female infertility by the Yoruba people of Southwestern Nigeria. An ethnobotanical survey was conducted using oral informal interviews. The target respondents included diviners/spiritualists, herb sellers, traditional birth attendants, farmers/hunters and other members of the community. The survey yielded 12 recipes recorded with all being orally administered. There were 30 plants distributed in 21 families; 20% of which are climbers, 20% herbs, 23% shrubs and 37% trees. Leaves (26.67%) were the most utilised part while the least utilised are rhizomes (3.33%). Materials of animal and mineral origin were also utilised. It is hoped that the documentation provided from this study will help in the conservation of knowledge of traditional medicine and to serve as a bedrock for further scientific evaluation.

Key words: Ethnobotany; Southwestern Nigeria; female reproduction; herbal medicine recipe; plant life forms.

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INTRODUCTION

Traditional, folk or herbal medicine is the most ancient method of curing diseases. It has been reported that plants are the first and only true medicines ever used (Gill, 1992). The World Health Organisation (WHO) estimates that over 80% of health-care needs are met by traditional health-care practices (WHO, 2002) due to their accessibility, availability and affordability. Hence, the most common traditional medicine practiced across Africa is the use of medicinal plants. Africa is the cradle of mankind with a rich biological and cultural diversity, making its traditional medicine system the oldest and, perhaps, the most assorted (Mahomoodally, 2013). The Yoruba people of southwestern Nigeria, Africa's most populous country, are a major ethnic group accounting for about 21% of the country's population (Ogundele, 2007). Holding a reservoir of traditional medicinal practices in the treatment of various diseases, they inhabit areas from western Africa to other parts of the world (Abimbola, 2006). Yorubas are about 47 million people worldwide. Healing in Yoruba tradition is achieved through the use of whole, part or products of plants, animals and mineral substances. These are usually used singly or mixed (Borokini and Lawal, 2014).

Ethnobotanical research searches for potentially valuable medicinal materials (Schultes, 1994) beginning with a survey of the various plants used by the people in the prevention, treatment and/or control of a disease or an adverse physical condition. Resource persons include skilled herbalists and diviners. Others are hunters, community elders, traders, travelers and other members of the community. As a result of a rapid and continuous erosion of valuable traditional knowledge, there is a pressing need for the documentation of medicinal uses of African plants and traditional medicine systems (Mahomoodally, 2013).

The United Nations Population Funds (UNFPA) at the International Conference on Population and Development (ICPD) in 1994 defined reproductive health as a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. This includes all matters relating to the reproductive system and its functions and processes. Zegers-Hochschild *et al.* (2009) clinically defined infertility as a disease of the reproductive system as being the failure to achieve a clinical pregnancy after 12 months, or more, of regular, unprotected sexual intercourse. The World Health Organisation (WHO) estimated that between 8 and 12% of

couples experience some form of infertility during their reproductive lives (15-44 years), thus affecting 50 to 80 million people worldwide. Out of this number, 20-35 million couples in Africa are affected. Africa continues to suffer from high rate of infertility especially in parts of West, Central and Southern Africa (Mascarenhas *et al.*, 2012). The rate of infertility in African countries ranges from 15-30% (Umeoru, 2007). In Nigeria, couples suffering from infertility have been extrapolated in some parts being as high as 20% (Okonofua, 2003) and 45% (Adetoro and Ebomoyi, 1991).

The most common cause of infertility is ovulation disorder, which occurs in 40% of women with infertility issues (Jose-Miller *et al.*, 2007). This results from hormonal abnormalities or imbalances. More than 85% of infertile women in sub-Saharan Africa have a diagnosis of infertility attributable to an infection compared with 33% of women worldwide (Mascarenhas *et al.*, 2012).

Presented here are a compilation and analyses of the ethnobotanical information on the plants and recipes used in the management of female infertility in Southwestern Nigeria. Hopefully, this will serve as bedrock for further investigation into the plants to ascertain the phytochemicals responsible for the reported activities as well as possible cultivation of these plants as a conservation method.

MATERIALS AND METHODS

The ethnobotanical survey was carried out across Lagos, Ogun, Oyo, Ondo and Ekiti states (south western region of Nigeria). The map of the study area is shown in Figure 1. Informal oral interviews were conducted using modified recommendations by Martin (1995) in order to obtain ethnobotanical information on medicinal plants and traditional medicine preparations used in management and treatment of female infertility within the study area. The target respondents were randomly selected to include diviners/spiritualists, herb sellers, traditional birth attendants, farmers/hunters, elderly members of the community and other individuals the community regards as possessing handed-down or acquired knowledge of medicinal plants around them. Some of the respondents were materially and/or monetarily incentivised to encourage them to give relevant information. The interviews covered recipes, plant and part used, method of preparation, mode of administration and dosage (Soladoye *et al.*, 2014). The interviews were conducted in Yoruba with repeated visits to some respondents who volunteered to embark on field trips for specimen collection.

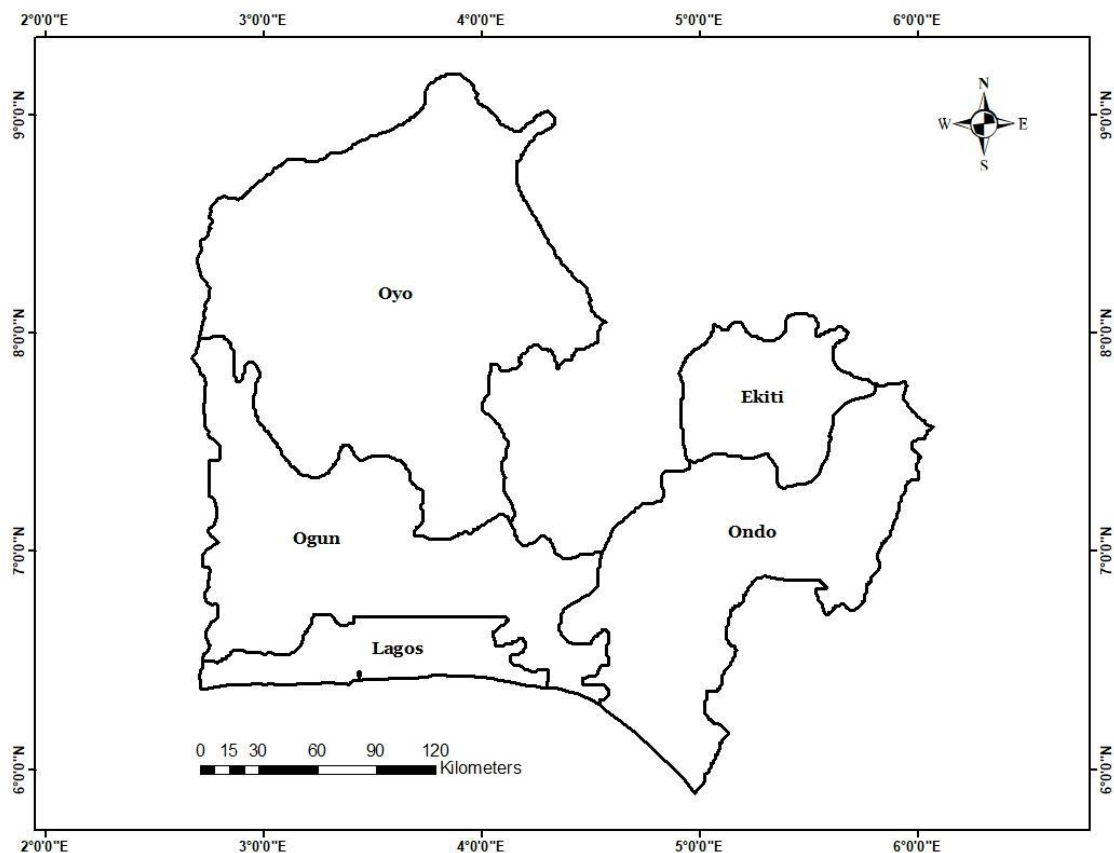


Figure 1: Map of the study area in Nigeria

Study area for the ethnobotanical survey was within the southwestern region of Nigeria. It included Lagos, Ogun, Oyo, Ondo and Ekiti states. Field trips were also conducted to collect samples of some of the plants mentioned in the course of the interviews, including both vegetative and reproductive parts from the wild, home gardens and herbal markets with the help of some of the respondents. They were identified and authenticated with voucher specimens deposited at the University of Lagos Herbarium (LUH) and the Forestry Research Institute of Nigeria (FRIN), Ibadan (FHI).

RESULTS

Mode of preparation, administration and dosage of recipes

A total of 12 recipes was recorded (Table 1) for the treatment of female infertility and all are orally administered. The recipes obtained for treating female infertility involve the use of plants, animals and inorganic materials. Part(s) used, method of preparation, administration, dosage and caution are also stated.

Table 1: Recipes for treating female infertility in southwestern Nigeria

Recipe	Ingredients	Local Name (Yoruba)	Part Used	Method of Preparation	Administration and Dosage	Caution
1	<i>Momordica charantia</i> L. <i>Ocimum gratissimum</i> L. <i>Vernonia amygdalina</i> Del. <i>Tragia benthamii</i> Baker Distilled spirit	Ejinrin-wewe Efinrin Ewuro Esinsin funfun Oti	Leaf Leaf Leaf Leaf	Wash all ingredients and crush together with little water. Make-up the volume to 75 cl with distilled spirit	Drink 20 ml daily	
2	<i>Portulaca quadrifida</i> L. <i>Chaerephon nigeriae</i> (Thomas, 1913)	Biyenme/ awaiye-ma-ku Adan	Whole plant Whole bat	Roast <i>Chiroptera</i> sp. and dust off the hairs. Grind the plant into paste and cook with the bat as soup	Eat up the soup with desired food, then eat the bat	Avoid burning the bat, take immediately after menses
3	<i>Pistia stratiotes</i> L. <i>Cocos nucifera</i> L. <i>Bostaurus</i> (Linnaeus, 1758)	Oju-oro Agbon Maalu	Leaf Fruit Beef	Cook the beef, grind the leaves and cook all in coconut water	Eat as soup with a desired food	This will only work if fibroid is absent
4	<i>Euphorbia hirta</i> L.	Ege-gogoro	Whole plant	Clean whole plant and pound	Eat as soup with desired food or simply drink Drink 20 ml daily	Use soon after menses
5	<i>Cola nitida</i> (Vent. Ex Endl.) Schott et Endl. Distilled spirit	Igi obi Oti	Tree sap	Bottle the sap in distilled spirit and shake-up	Drink 20 ml daily	
6	<i>Annona senegalensis</i> Pers. <i>Musa paradisiaca</i> L.	Abo Ogede agbagba	Fruit Fruit	Cut up the flesh of freshly picked <i>A. senegalensis</i> fruit, grind and plaster unto peeled fruit of <i>M. paradisiaca</i> , then roast	Eat as desired	Do not burn or scrape-off the <i>A. senegalensis</i> fruit

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7	<i>Citrullus colocynthis</i> (L.) Schrad <i>Curculigo pilosa</i> (Schm. & Thonn.) Engl. <i>Elaeis guineensis</i> Jacq. <i>Zea mays</i> L.	Bara Epakun Ope Agbado	Fruit Rhizome Stem sap Seeds	Cut and boil or soak plant parts in palm wine (stem sap) or supernatant from uncooked pap from <i>Zea mays</i>	Drink 20 ml daily for 2 weeks	
8	<i>Dissotis rotundifolia</i> (SM.) Triana <i>Capsicum annuum</i> L. <i>Elaeis guineensis</i> Jacq. <i>Parkia biglobosa</i> (Jacq.) G. Don Sodium chloride <i>Clarias gariepinus</i> (Burchell, 1822)	Awede, awede- epa Ata-josin Ope Iru Iyo Eja-aro	Leaf Fruit Seed Seed Crystals Whole fish	Pluck the leaves avoiding the stalk and chop finely. Cook as soup with salt, oil, pepper and fermented <i>P. biglobosa</i> seeds without artificial seasoning. Add the fresh fish and eat immediately from the pot	Eat first thing in the morning for 2 to 3 days	Make a fresh soup each day
9	<i>Ricinus comunis</i> L. <i>Capsicum annuum</i> L. <i>Piper nigrum</i> <i>Elaeis guineensis</i> Jacq. Sodium chloride 9 medium sized <i>Clarias</i> <i>gariepinus</i> (Burchell, 1822)	Lara Ata-josin Iyere Ope Iyo Eja-aro	Seed Fruit Seed Seed Crystals Whole fish	Make into soup in an earthen were pot using fermented <i>R.</i> <i>communis</i> seeds	Eat directly from the pot 1 fish per day first thing in the morning before speaking. On day 9, ask husband or a male relative to take the pot to a T-junction and break it	Do not remove any part of the fish
10	Locally bred <i>Gallus gallus</i> <i>domesticus</i> . <i>Lolo stone</i>	Adiye ibile lolo	Eggshell	Grind to dust, add a little water and draw out “ <i>ogbe- alaja</i> ” (an <i>odu ifa</i>). Then wash off with water	Drink immediately after monthly period	Intercourse must be with a single partner

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11	<i>Cissampelos owariensis</i> P. Beaux ex DC.	Jokooje	Leaf	Soak or boil in water	Drink freely
	<i>Angreacum distichum</i> Lindl.	Eela	Leaf		
	<i>Calliandra haematocephala</i> Hassk.	Tude Eru-alamo	Leaf & root		
	<i>Xylopiya aethiopica</i> (Delm) A. Rich		Fruit Root		
	<i>Ancistrophyllum</i> <i>secondiflorum</i> (P. Beauv.) G. Mann & H. Wendl.	Okuku Egbesi Ogungun	Root		
	<i>Nauclea latifolia</i> Smith	Awopa	Bark		
	<i>Ceiba pentandra</i> (L.) Gaertn.	Kassia	Bark		
	<i>Enantia chlorantia</i> Oliv.	Gbogbonise	Stem		
	<i>Cassia fistula</i> L.	Eja-aro	Root		
	<i>Uvaria chamae</i> P. Beauv	Maalu	Fish fillet		
	<i>Clarias gariepinus</i> (Burchell, 1822)		Cheese		
	<i>Bos taurus</i> (Linnaeus, 1758)				
12	<i>Dissotis rotundifolia</i> (SM.) Triana	Awede, awede- epa	Leaf Fruit	Grind the leaves and make into soup with	Eat soup first thing in the morning for
	<i>Capsicum annum</i> L.	Ata-josin	Seed	salt, oil and pepper	3 days
	<i>Elaeis guineensis</i> Jacq.	Ope	Crystals		
	Sodium chloride	Iyo			

Plant diversity

A total of 30 plant species distributed in 21 families were identified for the treatment for female infertility in southwestern Nigeria. These are listed with their local and common names in Table 2. The growth habit of the plants varied from climbers (20%), herbs (20%), shrubs (23%) to trees (37%) as shown in Figure 2.

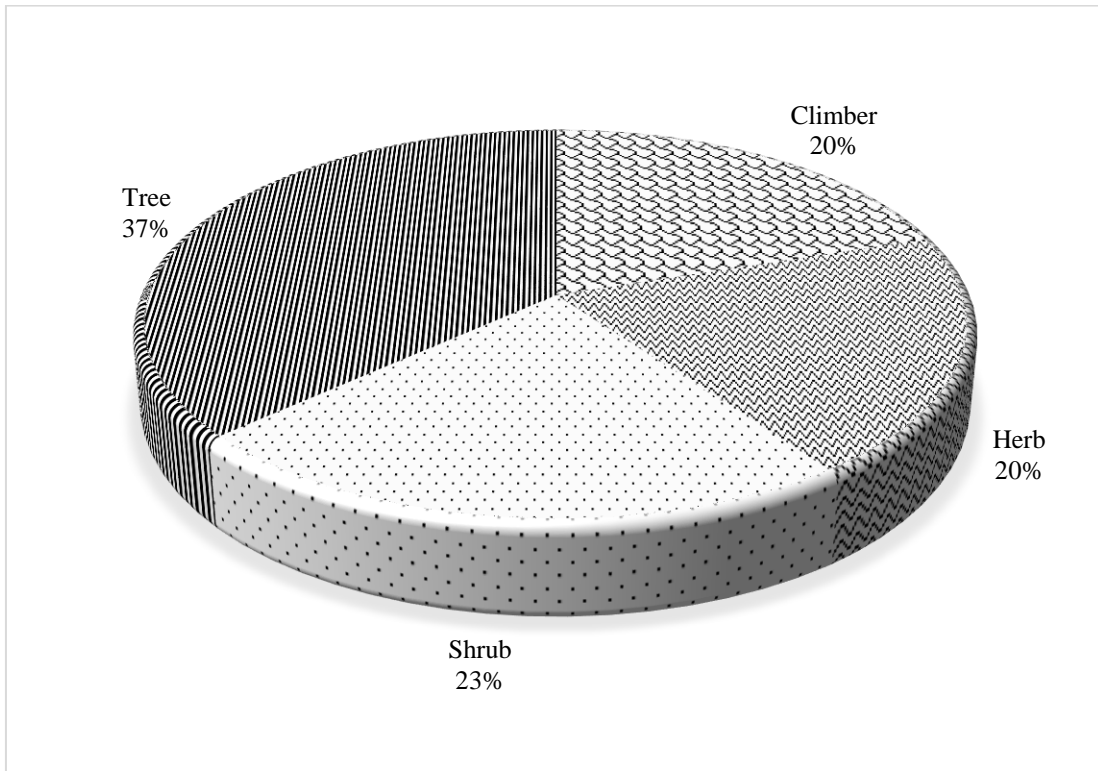


Figure 2: Percentage of occurrence of plant life forms used to treat female infertility in southwestern Nigeria.

Table 2: Species identification for the treatment of infertility in southwestern Nigeria

BOTANICAL NAME	FAMILY	GROWTH HABIT	LOCAL NAME (Yoruba)	COMMON NAME
<i>Ancistrophyllum secundiflorum</i> (P.Beauv.) G. Mann & H. Wendl.	Arecaceae	Tree	Okuku	Large rattan
<i>Angraecum distichum</i> Lindl.	Orchidaceae	Climber	Ela	Comet orchid
<i>Annona senegalensis</i> Pers.	Annonaceae	Tree	Abo	Custard apple
<i>Calliandra haematocephala</i> Hassk.	Mimosaceae	Shrub	Tude, Ule	Powder puff bush
<i>Capsicum annuum</i> L.	Solanaceae	Shrub	Ata-josin, asofeiyeje	Cayenne pepper
<i>Cassia fistula</i> L.	Caesalpinaceae	Tree	Kasia	Golden rain tree
<i>Ceiba pentandra</i> (L.) Gaertn.	Bombacaceae	Tree	Ogungun	Kapok
<i>Cissampelos owariensis</i> P. Beaux ex DC.	Menispermaceae	Climber	Jokooje	Velvet leaf
<i>Citrullus colocynthis</i> (L.) Schrad	Cucurbitaceae	Climber	Bara	Bitter melon, bitter
<i>Cocus nucifera</i> L.	Arecaceae	Tree	Agbon	Coconut
<i>Cola nitida</i> (Vent. Ex Endl.) Schott et Endl.	Sterculaceae	Tree	Obi	Kola nut
<i>Curculigo pilosa</i> (Schum. & Thonn.) Engl.	Hypoxidaceae	Herb	Epakun	African crocus
<i>Dissotis rotundifolia</i> (SM.) Triana	Melastomaceae	Herb	Awede, Agbede- epa	Pink lady
<i>Elaeis guinensis</i> Jacq.	Arecaceae	Tree	Ope	African oil palm
<i>Enantia chlorantia</i> Oliv.	Annonaceae	Tree	Awopa	African yellow wood
<i>Euphorbia hirta</i> L.	Euphorbiaceae	Herb	Ege gogoro	Asthma herb, hairy spurge
<i>Momordica charantia</i> L.	Cucurbitaceae	Climber	ejinrin-wewe	Balsam apple
<i>Musa paradisiaca</i> L.	Musaceae	Herb	Ogede agbagaba	Plantain
<i>Nauclea latifolia</i> Smith	Rubiaceae	Shrub	Egbesi	African peach, pine cushion tree
<i>Ocimum gratissimum</i> L.	Lamiaceae	Shrub	Efinrin	Scent leaf
<i>Parkia biglobosa</i> (Jacq.) G. Don	Mimosaceae	Tree	Iru	Locust bean
<i>Piper nigrum</i> Schum et Thonn	Piperaceae	Shrub	Iyere	Black pepper
<i>Pistia stratiotes</i> L.	Araceae		Oju oro	Water lettuce

<i>Portulaca quadrifida</i> L.	Portulacaceae	Herb	Awaye ma ku/ Biyenme	Small-leaved purslane, Ten o'clock plant
<i>Ricinus communis</i> L.	Euphorbiaceae	Shrub	Ilara, laa	Castor oil plant
<i>Tragia benthamii</i> Baker	Euphorbiaceae	Climber	Esinsin funfun	Climbing nettle
<i>Uvaria chamae</i> P. Beauv	Annonaceae	Climber	Gbogbonise	Bush banana
<i>Vernonia amygdalina</i> Del.	Asteraceae	Shrub	Ewuro	Bitter leaf
<i>Xylopia aethiopica</i> (Delm) A. Rich	Annonaceae	Shrub	Eru/ eru-alamo	Grains of Salem
<i>Zea mays</i> L.	Poaceae	Herb	Agbado	Maize, corn

The plant parts with the most common usage were the leaves (26.67%), fruits (20.00%), seeds (16.67%) and roots (13.33%). Bark, stem and whole plant each accounted for 6.67% while the least commonly used plant part was the rhizome (3.33%) as shown in Figure 3.

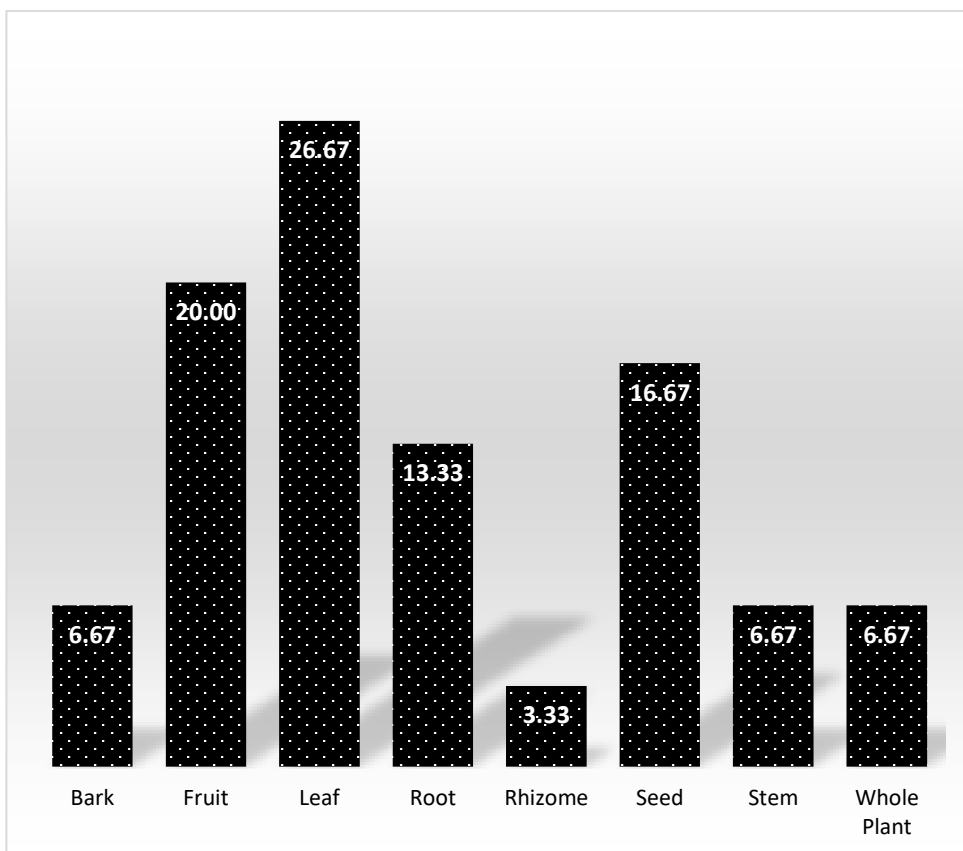


Figure 3: Percentage frequency of citation of plant parts used in treatment of female infertility in southwestern Nigeria

DISCUSSION

A survey of the various medicinal recipes used in the prevention, treatment and/or control of any disease or adverse physical condition is what should begin an ethnobotanical research. This is because such research seeks potentially valuable medicinal materials (Schultes, 1994). The variety of recipes recorded in the treatment of female infertility in this study is an indication of the diversity of plant species employed by traditional medicine practitioners among the Yoruba people located in southwestern part of Nigeria.

A total of 12 recipes were recorded to treat female infertility all of which are administered orally. Traditional medicine recipes are generally referred to as “herbal medicines” probably because plants have been said to be the first and only true medicines ever used (Gill, 1992). Items from sources other than plants are, however, included in some recipes. This survey revealed that various plant and animal organs along with inorganic materials are employed in the treatment of female infertility. Table salt and distilled spirit (gin) are examples of inorganic items while local fowl and bat are some of the animals employed in the preparation of the reported recipes. Borokini and Lawal (2014) have also reported the use of inorganic and whole or parts of animals in traditional healing system.

A total of 30 plant species belonging to 21 families with varying growth habits were used in the traditional recipes recorded. The most dominant growth habit was tree with 11 species. *Elaeis guineensis*, a tree earlier reported by Fashola (2015), was also recorded in this study. Species of shrubs mentioned were 7, some of which have been reported in earlier surveys. Examples include *Piper nigrum* (Fashola, 2015), *Xylopiya aethiopica* (NNMDA, 2013; Soladoye *et al.*, 2014; NNMDA, 2018) and *Ocimum gratissimum* (Soladoye *et al.*, 2014). Climbers such as *Cissampelos owariensis* reported in this study had been reported within the study area (Fashola, 2015). The use of *Momordica charantia* whole plant in the treatment of female infertility has also been reported (Sharaibi *et al.*, 2017). Soladoye *et al.* (2014) reported *Citrullus colocynthis* as one of the dominant plants in recipes for the treatment of female infertility within a similar study area.

The most dominant plant parts utilised in the treatment of female infertility from this study are the leaves. As a result of convenience and sustainable collection, leaves have been widely reported as the most sourced plant part for phytomedicine. In northern Peru and southern India Bussmann and Glenn (2010) and Balamurugan *et al.* (2018) reported leaves as the main part used to treat various gynecological disorders. However, stem and bark were reported by Fashola (2015) as the most widely used plant part in the treatment of female reproductive health problems in Oyo state, southwestern Nigeria.

CONCLUSION

The results of this study have demonstrated the diverse potentials of plants used for the treatment of female infertility among the Yoruba people of South-eastern Nigeria. This collection of information is a documentation for the conservation of indigenous traditional medicine knowledge as well as a footing for scientific evaluation. Since most practitioners collect their materials from the wild, there is the need to create awareness and educate them on sustainable collection and conservation methods such as domestication for personal use and large-scale trade.

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