Studies on the diversity of medicinal plant species utilized for goat reproduction in Abia State Nigeria

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Abstract

The study of local knowledge about natural resources is becoming increasingly important in defining strategies and actions for conservation of medicinal plants. This study therefore sought to identify and document the diversity of plant species utilized for goat reproduction in Abia State, southeastern Nigeria. The ethno-veterinary practices of 44 informants in Abia State, Nigeria were surveyed. Plants were collected, tagged and identified by taxonomists. Quantitative data generated were entered into Microsoft Excel spreadsheet and summarized into means and frequencies. The details on sex, age, occupation, educational status and source of indigenous knowledge were collected. Forty four key respondents with traditional animal healthcare knowledge in this region were identified. Thirty three plant species belonging to 25 families have been documented in the present study. Highest numbers of species are found in families Euphorbiaceae and Malvaceae. Most (52%) of herbal recipes were obtained from the tree, followed by herbs, shrubs and climbers and almost half of the plant species were collected from the wild. Leaves were the most commonly cited plant part used in preparation of herbal recipe. Plant species used for libido enhancement had the highest specie representation whereas *Elaeis guineensis* had highest medicinal uses. The use of monkey fruit (*Acioa barteri*) in animal reproduction was cited for the first time in this paper. This study identified 33 candidate plants utilized for goat reproduction in the study area that have hitherto remained undocumented in this regard.

Keywords: Medicinal plants; reproduction; goat; ethnoveterinary; southeastern Nigeria

Introduction

In rural communities in southeastern Nigeria, West African Dwarf (WAD) goat production fulfils important economic and social functions. In this part of the world, about 80% of rural families keep goats primarily as an investment and source of manure or for meat at home or during festivals (Gefu and Adu, 1984; Ikwuegbu et al., 1994; Okoli et al., 2003). Traditionally, these animals are allowed free grazing or are tethered and fed plant leaves and kitchen wastes brought to them by the owner. Plants utilized for feeding goats constitute an abundant biomass in farm lands, bush fallows and forests in the state and are commonly utilized in the wild by the rural farmers (Obua, 2013). In Nigeria, medicinal plants constitute one of the cheapest and readily available sources of medication for livestock, especially ruminants in the tropics (Alawa et al., 2002; Sori et al., 2004; Ogbuewu et al., 2015). Research has shown that our native plant species are rich in phytochemical compounds such as tannins, alkaloids, steroids, flavonoids and saponins on analysis (Okwu and Ekeke, 2003; Echo et al., 2012; Imam et al., 2013; Akpanyung et al., 2013) and being evergreen plants, they could form an all year round medicinal resource (Oji and Isilebo, 2000).

Southeastern Nigeria is home to sixty percent of the rainforest resources and biological diversity of the country (Okoli et al., 2002). These biological resources including medicinal plants have overtime supported sedentary small scale livestock and arable rural farmers, who depend on the diverse forest resources for livelihood (Reynolds and Atta-krah, 1987; Sori et al., 2004; Tadeg et al., 2005). Several studies have reported the increasing destruction of the forest resources of southeastern Nigeria by natural and entrenched human activities (Njoku, 2006; Njoku, 2009). Being a fragile ecosystem, the rainforest in southeastern Nigeria readily degrade under persistent human pressure as the dependant populations continue to meet their livelihood needs. Added to this, are the recent reports on the activities of migrant pastoralists in the region, which result in soil compaction, deforestation of remaining fragile vegetal cover thereby complicating the perilous forest ecosystem depletion of the region (Blench, 1994; Okoli et al., 2012).

The traditional system of medicine, especially the herbal medicine, in Nigeria is directly linked to its rich floral diversity. The southeastern Nigeria is one such high bio-cultural diversity region, which is one of the global biodiversity hot-spots (Okoli et al., 2002; Okoli et al., 2003; Obua, 2013). Several attempts have been made to document the vast ethnoveterinary information from the region in the form of general documentation (Reynolds and Atta-krah, 1987; Wahua and Oji, 1987; Okoli et al., 2002; Okoli et al., 2003; Obua, 2013). Specifically, information on our indigenous of medicinal plants used in animal reproduction has not been systematically documented in rural communities in Nigeria and there is a danger that this knowledge will soon be lost as traditional social patterns are increasingly disturbed by globalization, environmental degradation, agricultural expansion, cultivation of marginal lands and urbanization warranting urgent need to document and preserve this traditional knowledge. Only hand full of references (Ogbuewu et al., 2015) is available, which have attempted to study and understand medicinal plants used in animal reproduction. The present work is an attempt to identify and document the diversity of plant species used in goat reproduction in Abia State southeastern Nigeria.

Materials and Methods

The field study was conducted in Ikwuano, Umunneochi and Umunagbo Local Government Areas (LGAs) of Abia State, Nigeria. The State is bordered to the south by Rivers and Akwa Ibom States, to the west by Imo State, to the north by Anambra, Enugu and Ebonyi States, and to the east by Cross River State (Figure 1). The State is situated in the southeastern Nigeria and has 17 LGAs distributed in an area of 5, 234.7 km^2. According to 2006 Nigeria Population Census figure, Ikwuano, Ugwunagbo and Umunneochi occupies a total land area of 281, 108 and 368 km^2 and has a total population of 137, 993, 97,710 and 163,928, respectively. Geographically, the State lies between $5^0$25' - $5^0$42'N latitude and $7^0$30' - $7^0$50'E longitude. The study area is 223 m above sea level (Ofomata, 1975) and the climate is classified as tropical with temperatures 26.7 ^{0}C; humidity 75.5% and rainy from April to October (approx. 2500 mm / year). The study area is inhabited predominantly by Igbo speaking people whose major occupation is subsistence farming. Over 80% of rural households keep poultry and livestock especially goats, sheep, pigs and native cattle (Agboola, 1979). The major tree crops were oil palm, orange, mango, paw-paw, breadfruit, coconut and plantain.

Information was collected through semi-structured open ended interview as suggested by Martin (1995). The choice of semi-structured open ended interview was to minimize confusion and maximize response accuracy. The details on age, sex, educational status, occupation and source of indigenous knowledge were collected during interviews. The interview was based on a plant-wise questionnaire. Ten rural farming communities in each of the 3 LGAs that keep goats were purposively selected. Five farming families with over 15 years experiences in goat farming business were selected and visited. Basically, the methodology was as reported by Okoli et al. (2002). As the present work is confined to plants species used in goat reproduction intervention, the traditional practitioner with over 15 years in goat farming who are ready to share their practicing knowledge, have been considered as key respondents. Out of 150 goat producers visited, 44 respondents were selected based on willingness to participate. Respondents were visited thrice during the study period and asked to list the plants they utilized for goat reproduction. This was followed immediately by visits to surrounding compound and farm bushes in the company of the respondent for direct sampling and identification of the listed plants. After documenting the local name of each plant, representative samples were collected, tagged and stored for botanical identification. Plants sampled at the different locations were identified by taxonomists at the Forestry and Wildlife Technology Department, Federal University of Technology Owerri, Nigeria. The identification and confirmation of the medicinal plant species used by key respondents were made through specimen display method (Bhattarai et al., 2006).

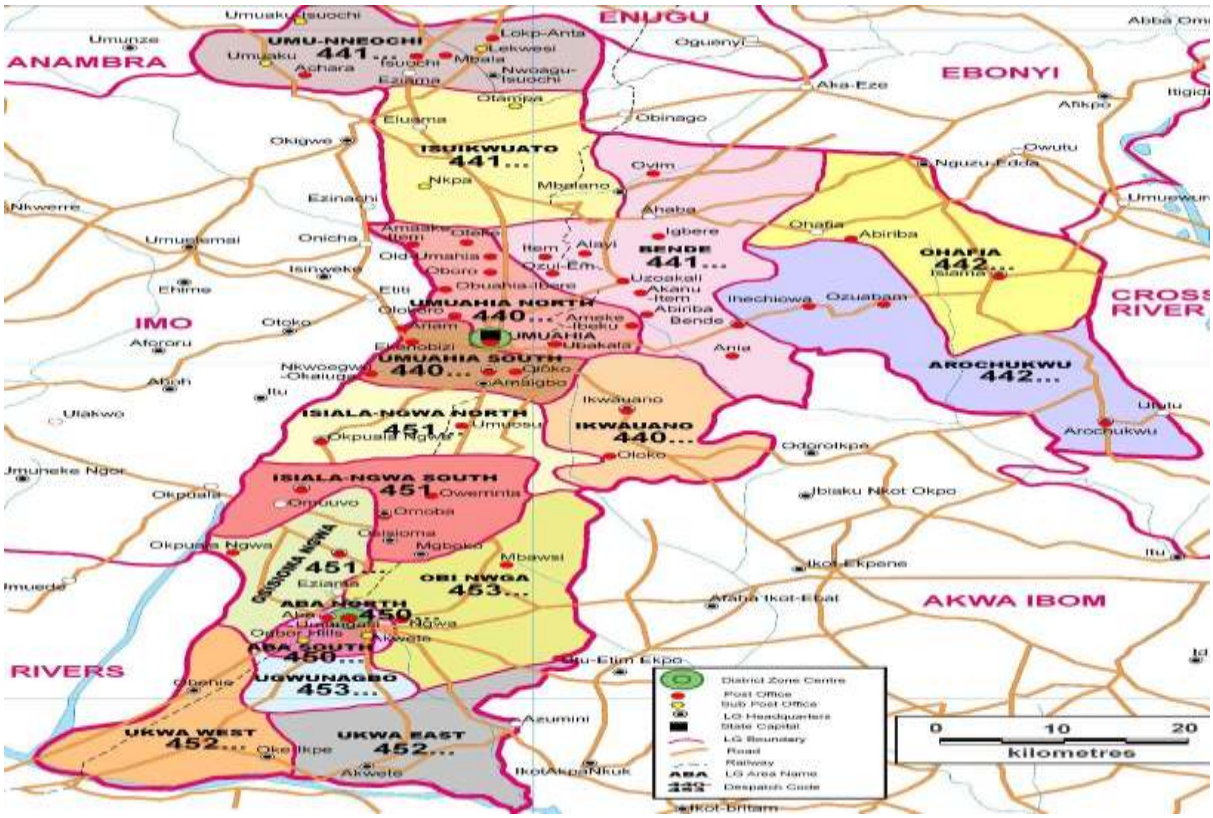

Fig. 1. Map of Abia State showing the study area; Source: www. abiastate.gov.ng

Data were collected in Igbo and translated to English by the research team. The English version of the collected data was entered into Microsoft Excel spread sheet (Windows XP 2007). Descriptive statistics analyses were performed, including mean, histogram, frequency and percentages.

Results

Information on source of indigenous knowledge of medicinal plant use is presented in Figure 2.

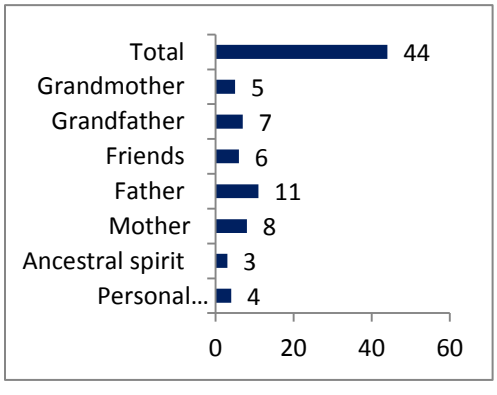

Fig 2. Source of indigenous knowledge

Thirty one (70.45%) respondents gained their knowledge of plant use from their parents and grandparents while thirteen (29.55%) gained their knowledge from personal experience, friends and ancestral spirits. Demographic data revealed that respondents interviewed were from both sexes: 35 (79.55%) males and 9 (20.45%) females (Table 1). 18 (40.9%) were between the age of 20 and 45 years and 26 (59.10%) were above 45 years. Eighteen (40.90%) were farmers, 29 (65.90%) were literate and 10 (22.70%) were civil servants. A total of 33 medicinal plant species distributed between 33 genera and 25 families as illustrated in Table 2. The scientific names of the identified plants were arranged alphabetically. Different families produced numbers of plant species with the highest number of medicinal plants documented belonging to Euphorbiaceae family as demonstrated in Figure 3. Trees (51.52%), herbs (24.24%) and shrubs (18.18%) were the most dominant growth form (Table 3). Leaves were reported to be the most commonly plant part

used as shown in Figure 4. Out the 33 plant species listed, 19 species were used in preparation of traditional human medicine, while 8 plant species were used as animal feed (Table 4).

Table 1. Demographic features of the local experts that were interviewed

Informant	Frequency	Percent (%)
Gender		
Male	35	79.6
Female	9	20.5
Age		
20 - 45	18	40.9
Above 45	26	59.1
Education		
Non literate	15	34.09
Literate	29	65.9
Occupation		
Farmers	18	40.9
Hunter	5	11.4
Civil servant	10	22.7
Herb sellers	8	18.2
Traditional herbalist	3	6.8

Table 3: Growth form of the plant species used in goat reproduction in Abia State southeastern Nigeria

Parameter	Frequency	Percent (%)
Shrub	6	18.18
Tree	17	51.52
Climber	2	6.06
Herb	8	24.24
Total	33	100.00

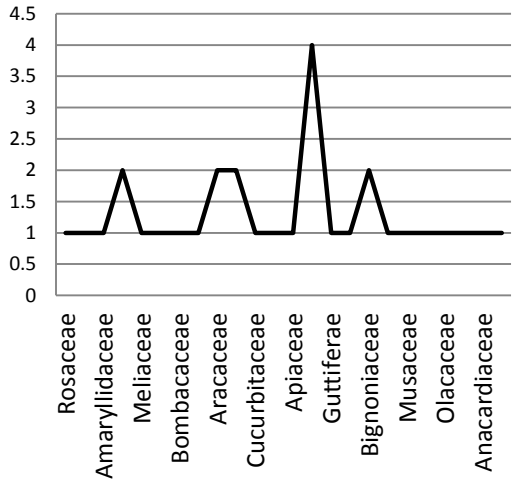

Fig 3. Families of plant species used in goat reproduction

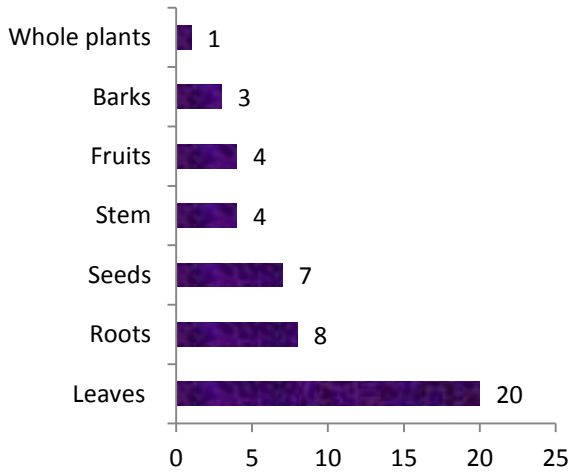

Fig 4. Plant part utilized for goat reproduction in Abia State, Nigeria.

Fourteen and twelve plant species were used to enhance libido (Table 5a) and sperm production (Table 5b), respectively. Six (6) plant species each were used as abortifacient agents (Table 6a) and contraceptive agents (Table 6b). Plant species that boost female conception rate (Table 7a) and stop bleeding during pregnancy (Table 7b) had 7 and 6 species representations, respectively. Plant species that trigger parturient goats to expel retained placenta (Table 8a), ease parturition (Table 8b) and stimulate milk production (Table 8c) had 10, 12 and 9 specie representations, respectively. The list of plant species used to stimulate milk production includes *A. melegueta, A. hypogea, C. papaya, C. pepo, E. guineensis, E. hirta, M. paradisica, P. guineensis* and *S. campanulata*. Plant species with 1, 2, 3, 4, 5 and 7 – medicinal uses are presented in Table 9. Plants with 5 - and 7 - use values were *C. papaya* and *E. guineensis*, respectively. Fifteen plants (*E. guineensis, A. indica, C. odorata, C. nucifera, C. nitida,* C. *pepo, C. esculentus, D. carrota, E. hirta, M. barteri, M. esculenta, G. kola, G. latifolia, M. puberula* and *O. viride*) had 2 medicinal uses. Three plants (*A. esculentus P. guineensis* and *S. acuta*) had 3 – medicinal uses while 6 plants (*A. melegueta, A. cordifolia, A. cepa, K. africana, M. paradisica* and *S. mombin*) had 4 – medicinal uses.

Table 2. Plant species used in goat reproduction in Abia State, Nigeria

S.N.	Plant species	Family	Habitat	Life form
1	*Abelmoschus esculentus* (L.) Moench	Malvaceae	C	Shrub
2	*Acioa barteri* (Hoof. f. ex.Oliv)	Chrysobalanaceae	W	Tree
3	*Aframomum melegueta* K. Schum	Zingiberaceae	W	Herb
4	*Alchonea cordifolia* Schum & Thonn	Euphorbiaceae	W	Shrub
5	*Allium cepa* Linn	Amaryllidaceae	C	Herb
6	*Arachis hypogea* Linn	Fabaceae	C	Herb
7	*Azadirachta indica* A. Juss	Meliaceae	C	Tree
8	*Brachystegia eurycoma*	Fabaceae	W	Tree
9	*Carica papaya* Linn	Caricaceae	C	Tree
10	*Ceiba pentandra* (Linn.) Gaertn.	Bombacaceae	W	Tree
11	*Chromolaena odorata* (L.) King & H.E. Robins	Asteraceae	W	Shrub
12	*Cocos nucifera* Linn	Aracaceae	C	Tree
13	*Cola hispida* Brennan and Keay	Steculiaceae	W	Tree
14	*Cola nitida* (Vent.) Schott. & Endl.	Steculiaceae	C	Tree
15	*Cucurbita pepo L., semen*	Cucurbitaceae	C	Climber
16	*Cyprus esculentus* Linn	Cyperaceae	C	Herb
17	*Dancus carrota* L. Subsp. *sativus* (Hoffm.)	Apiaceae	C	Herb
18	*Elaeis guinensis* Jacq	Arecaceae	W/C	Tree
19	*Euphorbia hirta* Linn	Euphorbiaceae	W	Herb
20	*Garcinia kola* Heckel	Guttiferae	C	Tree
21	*Gongronema latifolia*	Asclepiadaceae	W/C	Climber
22	*Kigelia africana* (Lam.) Benth	Bignoniaceae	W	Tree
23	*Macaranga barteri*	Euphorbiaceae	W	Tree
24	*Manihot esculenta* Crantz	Euphorbiaceae	C	Shrub
25	*Microdesmis puberula*	Pandaceae	W	Shrub
26	*Musa paradisica* L	Musaceae	C	Tree
27	*Ocimum viride* Willd.	Labiateae	C	Shrub
28	*Olax subscorpioidea*	Olacaceae	W	Tree
29	*Piper guineensis* Schum. & Thonn.	Piperaceae	W /C	H erb
30	*Sida acuta* Burm. f.	Malvaceae	W	Herb
31	*Spathodea campanulata* P. Beauv.	Bignoniaceae	W	Tree
32	*Spondias mombin* Linn.	Anacardiaceae	W/ C	Tree
33	*Terminalia ivorensis* A. Chev.	Combretaceae	W	Tree

C - Cultivated; W - Wild

Table 6. Medicinal plant species with abortifacient and contraceptive activities

SN	Plant species	Family	Plant part
	A.. **Abortifacient ability**		
1	*Azadirachta indica* A. Juss	Meliaceae	Leaf / bark
2	*Carica papaya* Linn	Caricaceae	Leaf / Roots / Bark
3	*Kigelia africana* (Lam.) Benth	Bignoniaceae	Bark / root
4	*Ocimum viride* Willd.	Labiateae	Leaf
5	*Spondias mombin* Linn.	Anacardiaceae	Leaf
6	*Piper guineensis* Schum. & Thonn.	Piperaceae	Leaf / seed
	B. Contraceptive properties		
1	*Alchonea cordifolia* Schum & Thonn	Euphorbiaceae	Leaf / bark / root
2	*Azadirachta indica A. Juss*	Meliaceae	Leaf / bark
3	*Carica papaya* Linn	Caricaceae	Leaf / Roots / Bark
4	*Kigelia africana* (Lam.) Benth	Bignoniaceae	Bark / root
5	*Piper guineensis* Schum. & Thonn.	Piperaceae	Leaf / seed
6	*Spondias mombin* Linn.	Anacardiaceae	Leaf

Table 4. Plant species used in human medication and animal feed in Abia State, Nigeria

Family	Plant species	Local name	Animal Feed	Human Medication
Malvaceae	*Abelmoschus esculentus*	Okwuru	-ve	+ve
	Sida acuta	Udo	+ve	-ve
Chrysobalanaceae	*Acioa barteri*	Icheku	+ve	-ve
Zingiberaceae	*Aframomum melegueta*	Ose - oji	-ve	+ve
Amaryllidaceae	*Allium cepa*	Ayabashi	-ve	+ve
Fabaceae	*Arachis hypogea*	Ahuekere	-ve	+ve
	Brachystegia eurycoma	Achi	-ve	-ve
Meliaceae	*Azadirachta indica*	Dogon yaro	-ve	+ve
Caricaceae	*Carica papaya*	Okwuru bekee	-ve	+ve
Bombacaceae	*Ceiba pentandra*	Akpu	-ve	-ve
Asteraceae	*Chromolaena odorata*	Obiarakara	-ve	+ve
Aracaceae	*Cocos nucifera*	Aki - bekee	+ve	+ve
	Elaeis guinensis	Nkwu	+ve	+ve
Steculiaceae	*Cola hispida*	Egirigi	-ve	-ve
	Cola nitida	Oji - awusa	-ve	+ve
Cucurbitaceae	*Cucurbita pepo*	Anyu	-ve	+ve
Cyperaceae	*Cyprus esculentus*	Aki awusa	-ve	-ve
Apiaceae	*Dancus carrota*	Karrot	-ve	-ve
Euphorbiaceae	*Euphorbia hirta*	Ogwu ashima	-ve	+ve
	Alchonea cordifolia	Ubebe	-ve	-ve
	Macaranga barteri	Owiriwa	-ve	-ve
	Manihot esculenta	Ji-akpu	+ve	-ve
Guttiferae	*Garcinia kola*	Aki – ilu	-ve	+ve
Asclepiadaceae	*Gongronema latifolia*	Utazi	-ve	+ve
Bignoniaceae	*Kigelia africana*	Udu-agu	-ve	-ve
	Spathodea campanulata	Imi ewu	+ve	-ve
Pandaceae	*Microdesmis puberula*	Oka-ohia	+ve	+ve
Musaceae	*Musa paradisica*	Ogede	-ve	+ve
Labiateae	*Ocimum viride*	Nchuanwu	-ve	+ve
Olacaceae	*Olax subscorpioidea*	Atu nwa mkpi	-ve	-ve
Piperaceae	*Piper guineensis*	Uziza	-ve	+ve
Anacardiaceae	*Spondias mombin*	Ijikere	+ve	-ve
Combretaceae	*Terminalia ivorensis*	Okwe	-ve	+ve

+ve = Used; -ve = not use

Table 5a. Medicinal plant species with libido enhancement ability

S.N.	Genus	Family	Plant part
1	*Allium cepa* Linn	Amaryllidaceae	Roots
2	*Brachystegia eurycoma*	Fabaceae	Roots
3	*Carica papaya* Linn	Caricaceae	Leaf / Roots / Bark
4	*Cucurbita pepo* L., semen	Cucurbitaceae	seeds
5	*Cocos nucifera* Linn	Aracaceae	Fruits
6	*Cola hispida* Brennan and Keay	Steculiaceae	Leaf
7	*Cola nitida* (Vent) Schott. & Endl	Steculiaceae	Leaf / bark
8	*Cyprus esculentus* Linn	Cyperaceae	Roots
9	*Dancus carrota* L. Subsp. Sativus (Hoffm)	Apiaceae	Roots
10	*Elaeis guineensis* Jacq	Arecaceae	Seeds / roots
11	*Euphorbia hirta* Linn	Euphorbiaceae	Leaf / whole plant
12	*Garcinia kola* Heckel	Guttiferae	Seed / Bark
13	*Macaranga barteri*	Euphorbiaceae	Stem bark / leaf
14	*Sida acuta* Burm. f.	Malvaceae	Leaf

Table 5b. Medicinal plant species with sperm production enhancement ability

S.N.	Genus	Family	Plant part
1	*Acioa barteri (*Hoof. f. ex.Oliv*)*	Chrysobalanaceae	Leaf
2	*Aframomum melegueta* K. Schum	Zingiberaceae	Seed / fruits
3	*Alchonea cordifolia* Schum & Thonn	Euphorbiaceae	Leaf / bark / root
4	*Allium cepa* Linn	Amaryllidaceae	Roots
5	*Brachystegia eurycoma*	Fabaceae	Roots
6	*Cocos nucifera* Linn	Aracaceae	Fruits
7	*Cyprus esculentus* Linn	Cyperaceae	Roots
8	*Dancus carrota* L. Subsp. Sativus (Hoffm)	Apiaceae	Roots
9	*Elaeis guineensis* Jacq	Arecaceae	Seeds / roots
10	*Garcinia kola* Heckel	Guttiferae	Seed / Bark
12	*Kigelia africana* (Lam.) Benth	Bignoniaceae	Bark / root
13	*Olax subscorpioidea*	Olacaceae	Stem / leaf

Table 7. Medicinal plant species used to boost female conception and stop bleeding during pregnancy

S.N.	Plant species	Family	Plant part
	A. Boost female conception		
1	*Alchonea cordifolia* Schum & Thonn	Euphorbiaceae	Leaf / bark / root
2	*Elaeis guineensis* Jacq	Arecaceae	Seeds / roots
3	*Gongronema latifolia*	Asclepiadaceae	Leaf
4	*Kigelia africana* (Lam.) Benth	Bignoniaceae	Bark / root
5	*Microdesmis puberula* Hook	Pandaceae	Leaf
6	*Manihot esculenta* Crantz	Euphorbiaceae	Stem
7	*Ocimum viride* Wild.	Labiateae	Leaf
	B. Stop bleeding during pregnancy		
1	*Abelmoschus esculentus (*L.) Moench	Malvaceae	Stem / seed
2	*Chromolaena odorata* (L.) King & H.E. Robins	Asteraceae	Leaf
3	*Gongronema latifolia*	Asclepiadaceae	Leaf
4	*Elaeis guineensis* Jacq	Arecaceae	Seeds / roots
5	*Manihot esculenta* Crantz	Euphorbiaceae	Stem
6	*Musa paradisica* Linn	Musaceae	Leaf / fruit

Table 8. Medicinal plant species used to ease parturition, expel retained placenta and stimulate milk production

S.N.	Plant species	Family	Plant part
	8 A. Ease parturition		
1	*Abelmoschus esculentus (*L.) Moench	Malvaceae	Stem / seed
2	*Aframomum melegueta* K. Schum	Zingiberaceae	Seed / fruits
3	*Alchonea cordifolia* Schum & Thonn	Euphorbiaceae	Leaf / bark / root
4	*Allium cepa* Linn	Amaryllidaceae	Roots
5	*Ceiba pentandra* (Linn.) Gaertn.	Bombacaceae	leaf
6	*Carica papaya* Linn	Caricaceae	Fresh leaf / fruit
7	*Chromolaena odorata* (L.) King & H.E. Robins	Asteraceae	Leaf
8	*Elaeis guineensis* Jacq	Arecaceae	Seeds / roots
9	*Microdesmis puberula* Hook	Pandaceae	Leaf
10	*Musa paradisica* Linn	Musaceae	Leaf / fruit
11	*Sida acuta* Burm. f.	Malvaceae	Leaf
12	*Spondias mombin* Linn.	Anacardiaceae	Leaf
	8 B. Expel retained placenta		
1	*Abelmoschus esculentus (*L.) Moench	Malvaceae	Stem / seed
2	*Aframomum melegueta* K. Schum	Zingiberaceae	Seed / fruits
3	*Allium cepa* Linn	Amaryllidaceae	Roots
4	*Cola nitida* (Vent) Schott. & Endl	Steculiaceae	Leaf
5	*Elaeis guineensis* Jacq	Arecaceae	Seeds / roots
6	*Macaranga barteri*	Euphorbiaceae	Stem / leaf
7	*Musa paradisica* Linn	Musaceae	Leaf / fruit
8	*Sida acuta* Burm. f.	Malvaceae	Leaf
9	*Spondias mombin* Linn.	Anacardiaceae	Leaf
10	*Terminalia ivorensis* A. Chev.	Combretaceae	Leaf

	8 C. Stimulate milk production		
1	*Aframomum melegueta* K. Schum	Zingiberaceae	Seed / fruits
2	*Arachis hypogea* L	Fabaceae	Seed
3	*Carica papaya* Linn	Caricaceae	Dried leaf
4	*Cucurbita pepo L ., semen*	Cucurbitaceae	Seed
5	*Elaeis guineensis* Jacq	Arecaceae	Seeds / roots
6	*Euphorbia hirta* Linn	Euphorbiaceae	Leaf / whole plant
7	*Musa paradisica* Linn	Musaceae	Leaf / fruit
8	*Piper guineensis* Schum. & Thonn.	Piperaceae	Leaf / seed
9	*Spathodea campanulata* P. Beauv.	Bignoniaceae	Leaf

Table 9. Taxonomic details of candidate medicinal plant species with medicinal uses

S.N.	Family	Genus	Local name
	1 – medicinal use		
1	Chrysobalanaceae	*Acioa barteri (*Hoof. f. ex.Oliv)	Icheku
2	Fabaceae	*Arachis hypogea* Linn	Ahuekere
3	Bombacaceae	*Ceiba pentandra* (Linn.) Gaertn.	Apu
4	Steculiaceae	*Cola hispida* Brennan and Keay	Egirigi
5	Olacaceae	*Olax subscorpioidea*	Atu nwa mkpi
6	Bignoniaceae	*Spathodea campanulata* P. Beauv.	Imi ewu
	2 – medicinal uses		
1	Meliaceae	*Azadirachta indica A. Juss*	Dogon yaro
2	Fabaceae	*Brachystegia eurycoma*	Achi
3	Asteraceae	*Chromolaena odorata* (L.) King & H.E. Robins	Obiarakara
4	Aracaceae	*Cocos nucifera* Linn	Aki - bekee
5	Steculiaceae	*Cola nitida* (Vent.) Schott. & Endl.	Oji - awusa
6	Cucurbitaceae	*Cucurbita pepo L ., semen*	Anyu
7	Cyperaceae	*Cyprus esculentus* Linn	Aki awusa
8	Apiaceae	*Dancus carrota* L. Subsp. *sativus* (Hoffm.)	Karrot
9	Euphorbiaceae	*Euphorbia hirta* Linn	Ogwu ashima
10		*Macaranga barteri*	Owiriwa
11		*Manihot esculenta* Crantz	Ji-akpu
12	Guttiferae	*Garcinia kola* Heckel	Aki – ilu
13	Asclepiadaceae	*Gongronema latifolia*	Utazi
14	Pandaceae	*Microdesmis puberula* Hook	Oka-ohia
15	Labiateae	*Ocimum viride* Willd.	Nchuanwu
	3 – medicinal uses		
1	Malvaceae	*Abelmoschus esculentus (*L.) Moench	Okwuru
2	Piperaceae	*Piper guineensis* Schum. & Thonn.	Uziza
3	Malvaceae	*Sida acuta* Burm. f.	Udo
	4 - medicinal uses		
1	Zingiberaceae	*Aframomum melegueta* (Rosc) K. Schum	Ose - oji
2	Euphorbiaceae	*Alchonea cordifolia* Schum & Thonn	Ubebe
3	Amaryllidaceae	*Allium cepa* Linn	Ayabashi
4	Bignoniaceae	*Kigelia africana* (Lam.) Benth	Udu-agu
5	Musaceae	*Musa paradisica* Linn	Ogede
6	Anacardiaceae	*Spondias mombin* Linn.	Ijikere
	5 – medicinal uses		
1	Caricaceae	*Carica papaya* Linn	Okwuru bekee
	7 – medicinal uses		
1	Arecaceae	*Elaeis guinensis* Jacq	Nkwu

Discussion

Tropical plants have been used for medicinal purposes since the evolution of man. This knowledge is still alive and several hundred species are used in herbal remedies in indigenous system of medicines, where the whole plant or plant part or its extraction is used (Alawa et al., 2002; Okoli et al., 2002; Ogbuewu et al., 2015). More than 60% of the respondents interviewed gained the knowledge of traditional plant use from family members (father, mother, grandfather/ mother). This observation validated their earlier statement by Gueye (2002) that traditional knowledge of medicinal plant use is passed down orally from parents to offspring. The knowledge transfer from one generation to the next was in verbal mode, maybe in the same family, same community or to the

interested outsider, as a global phenomenon (Teklehaymanot et al., 2007; Nanyingi et al., 2008). This observation is in agreement with this documented report.

Demographic results revealed that gender influenced the traditional knowledge of medicinal plant use in the study area. The less number of female in traditional medicinal practice as recorded in Ethiopia and Kenya (Teklehaymanot et al., 2007; Muthee et al., 2011) is true in the present study, as only nine among the respondents were female. This could be due to the fact that males were the custodians of the secrecy shrouded in the practice of herbal medicine in this part of the globe (Yineger and Yewhalaw, 2007). This was also in agreement with the earlier findings of Togola et al. (2005), that men dominated the practice of traditional medicine. The present study revealed that people above 45 years (59.10%) dominate the practice of herbal medicine in the study area, similar to the observations of Togola et al. (2005) that people between 40 years and above has the repository ethnomedicinal knowledge. Majority of the people interviewed (65.9%) were literates. The high literacy rate among the respondents may have accounted for the openness to share to their knowledge. The low percentage of traditional herbalists (6.8%) interviewed could been an indication of the dying interest in herbal practice as a profession.

The present study identified 33 indigenous plant species utilized in traditional veterinary care in southeastern Nigeria. These plants were mostly indigenous or fully adapted to the region and had earlier been collected and deposited by previous Forestry Workers at the Forest Herbarium Ibadan (FHI), Nigeria; with their accession numbers and therefore could be accessed from there. The information obtained from this study compared favourably with the results of similar studies conducted in the region and other zones of Nigeria (Shittu and Bwala 1988; Wahua and Oji 1987; Ogbuewu et al., 2015). Sizeable numbers of the plants documented were collected from the wild indicating the species diversity and abundance in the study area. This also indicates the need for conservation measures, especially for those plants with higher number of medicinal uses. Traditional animal healthcare practices provide a readily available low cost alternative to modern veterinary impute and services in most rural communities of southeastern Nigeria. Our results showed that common reproductive disorders such as retained placenta, low milk yield and low libido among others were readily treated. These indigenous animal healthcare techniques are widely practiced by farmers in the area. Noteworthy in this study is the use of a single medicinal plant in the treatment of more than one ailment. This is seen in plants such as oil palm tree (*E. guineensis*) that had 7 medicinal uses in the current survey. The highest use value returned by palm oil tree could be linked to their wider distribution and availability in the study area (Bussman and Sharon, 2006; Yineger and Yewhalaw, 2007). The survey revealed that more than half of the plant species utilized for goat reproduction in the study location were also used in the preparation of traditional human medicine. This observation is in agreement with the earlier studies in Europe (Guarrera et al., 2005; Bullitta et al., 2007) that established that plants used in traditional human medicine are widely used in ethno-veterinary medicine.

Limited published information exists on the diversity of plants used in small ruminant reproduction in southeastern Nigeria. This is probably because the region was not regarded traditionally as a very important livestock producing area (Agboola 1979; Ogbuewu et al., 2015). Recent developments have, however, focused research efforts on small holder ruminant production systems which is very popular in the region (Ademosun, 1994; Ikwuegbu et al., 1994). Under such circumstance, information on indigenous plants of animal reproductive importance becomes crucial since it provides the clues by means of which research could be focused upon a particular therapeutical action thus leading to a circumvention of the more costly western methodologies (Rosoanaivo 1990; Okoli et al., 2002).

Sexual impotence is one of the commonest conditions with so much attention from herbal practitioners in Nigeria. A lot of medications or preparations mostly as bitters are advertised every day in the electronic and print media. In the current study, the plant species used to enhance male sexual activity have a high frequency thus supporting the claim in the electronic and print media that sexual impotence was one of the commonest conditions of males in the study area. The use of *Garcinia kola* as libido and sperm quality enhancing agent is supported by earlier observations on sperm and libido enhancement ability of *Garcinia kola* seeds in small laboratory animal model by Herbert and Iwuji (2012). The observed spermatogenic and aphrodisia activity validates the pharmacological utilization of the medicinal specie to enhance libido and sperm quality, and calls upon further investigation to isolate the phytochemical compound responsible for the reported activity. Monkey fruit (*Acioa barteri* Hoof. f.) is very common in southeastern Nigeria. The use of monkey fruit to enhance sperm production in mammal has not been cited in other countries.

Retained placenta is among the main reproductive disorders in farm animals especially, ruminants. A wide diversity of plants (*S mombin, A. esculentus, A. melegueta, A. cepa, C. nitida, E. guinensis, M. barteri* among others) is still used in the southeastern Nigeria to expel retained placenta. *S mombin* leaves were mostly used to trigger parturient goats to expel retained placenta in the study area. Scientific evidence has been accumulated (Okoli et al., 2002; Udeh and Oguike, 2008), endorsing the results of the present survey; consuming leaves *S. mombin* was associated with the release of retained placenta in small ruminants (Udeh and Oguike, 2008) and in pigs (Obua et al., 2012). In a similar study by Diame (2010) in Ghana, *M. paradisica* (leaf), *A. esculentus* (seeds), *M. esculenta* (leaf) and *E. guineensis* (kernel) have been reported to trigger the release of retained placenta.

The data collected from this investigation indicated that the farmers used various medicinal plants to increase milk production. Medicinal plants such as *A. melegueta, A. hypogea, C. papaya, C. pepo, E. guineensis, E. hirta, M. paradisica, P. guineensis* and *S. campanulata* were reported to be given to livestock anytime during the year to increase the milk production by stimulating the milk let-down process. The ability of *E. hirta, A. hypogea and E. guineensis* to stimulate milk production in farm animals has been reported by Dokosi (1998) and Mshana et al. (2000) validating the ethnoveterinary use of these plants among the

farmers in the study area. This observation adds more weight to the documentation of the said plants in regard to its traditional use in stimulating milk production. Researchers from Kwazulu Natal have reported the use of *A. hypogea* in traditional medicine to stimulate milk production (Kunene and Fossey, 2006), supporting the traditional use of the plant in stimulating milk production in Nigeria. Gbadamosi and Okolosi (2013) have documented the lactation enhancement activities of *O. gratissimum* and *K. africana*. The use of *A. melegueta* to enhance milk production can be explained in part to the presence some active principles contained in the plant (Iwu, 1993). Milk secretion is enhanced by feeding dried papaya leaves after parturition. This is supported by research result from Ghana that used papaya leaves to enhance milk production (Diame, 2010). This gives credence to some of the claims on the efficacy of papaya leaves in regard to its milk stimulating activity.

The utilization of leaves of *A. indica* and *C. papaya* as anti-fertility agents has been reported in animal models (Ogbuewu et al., 2009; Ogbuewu et al., 2011a, b). This supports the traditional claims in regard to the abortifacient and contraceptive activities of *A. indica* and *C. papaya*, calling for more studies aimed at isolating and characterizing the phytochemicals responsible for the reported anecdotal efficacy of the said plants. The use of these plants for related purpose in western Nigeria further validates its utilization in ethno-veterinary practice and positions it as a possible source of future anti-fertility agents. The anti-fertility activity of *S. mombin* leaves has been reported by Offiah and Anyanwu (1998), validating the ethno-veterinary use of the plant in goat production in Abia State. This observation adds more weight to the documentation of the said plant in regard to its traditional use an anti-fertility agent. Anti-fertility activity of *A. melegueta* has been reported (Kadiri, 2009). The observed anti-fertility activity *A. melegueta* adds more weight to the ethnoveterinary reports in regard to the use of *A. melegueta* as anti-fertility agent, justifying why more studies are required to isolate and purify the active constituents responsible for the reported activity. This observation further validates the ethno-veterinary usage of the documented plant as anti-fertility agent in the study area.

Conclusion

Though the very objective of the present study is documentation of the diminishing wealth of traditional medicinal plant knowledge for future, it opens up a stream of opportunities for further biochemical phytochemical studies. The scientific and clinical validation of the claims in the present investigation is priority among them, which not only authenticate the age long practice, but also contribute towards possible new veterinary drugs from herbal sources. Efforts in this direction may provide the benefit of regional information to the global community.

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