



Research Article

# Identification, domestication and conservation of plants used in managing ruminant animals in Ekiti-State, Southwestern Nigeria

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Field studies were conducted to investigate the medicinal plants through identification, collection and domestication of plants in Southwestern, Nigeria.

Semi-structured Questionnaires, personal interview, group consensus and review of available records showed that 52 botanicals belonging to 29 families were used in treating different ailments affecting ruminant animals in the study area. It was observed that 22 of the botanicals were described as being abundant. Eight out of all the botanicals were endangered and domesticated. The initial growth of the domesticated plants shows that the plants have relatively slow growth of survival, thus conservation measures were proposed. Various sources at which the identified plants could be derived were ranging from forest area, common area, household farm, household area while some were purchased. The type of plants found in a location is dependent on the geographical location. Thus, 38.9 % of the plants species were found at the primary source and this form the highest among the various sources. It was also discovered that the medicinal plants were used for other purposes such as erosion control, shade, wind breaker, boundary demarcation, animal fodder among others.

**Key words:** Botanicals, domestication, conservation, forest, boundary, endangered

## INTRODUCTION

The rearing of animals especially, the ruminant such as goat, sheep and cattle is one of the major works of the people in the rural areas dated back to antiquity (Olanipekun and Tedela, 2013). Ruminants are domestic animals that are commonly reared in small quantities in the rural areas for sustenance (Nduaka and Ihemelandu 1973; Ajala, 1995). They have their popularity among the rural people who reared them because of their various importance. Rearing of animals create jobs for its inhabitants, it provides income, food, ram used during Muslims festival, goats and cattle used by the Christians in various ceremonies and proteins derived used for the building up of body and repair of worn-out tissues among others. However, ruminant animals are pruned to pest and diseases. The pests are mainly caused irritation to the skin surfaces, often leading to wounds and increase the animal susceptible to infection. Example is mange which is caused by mites, ticks, lice and fleas (Jordan and

Partison, 1999). There are various agents of diseases such as bacteria, protozoa, viruses, fungi and parasites causing different diseases. Diseases are departure from normal health, presenting marked symptoms, malady, illnesses and disorder leading to morbidity, reduction in productivity and death. Also, in Ekiti-State, the availability and activities of veterinary services is mostly limited to the urban centre while the people in the rural areas rarely having access to the orthodox methods of treating animals. Where it is available, it is not popular and expensive thus make it unaffordable. The rearing of ruminants in the hands of the rural farmers is managed by the use of plant. Farmers are mostly located in the rural areas, they are scarcely aware of the veterinary and improved management services. In places where the drugs are available, they cannot avoid to pay for them because they are expensive. Incidentally, ruminants owners have an excellent knowledge of the use of ethnobotany in the

managements of animals and its influence on man cannot be overemphasized especially in the developing countries. The use of botanicals is considered relevant and effective. Plants are readily available and they are cheap or at no cost. They are holistic in nature, they are rarely toxic, it does not need skilled personnel for its preparation and there is intimacy and believe that have been developed over a period of time, thus make it work and effective. The herders of the Turkana and Samburu communities in Kenya identified about 60 diseases of livestock and group them as treatable and non-treatable using local remedies. The treatable including mange, cough, bloat, anthrax, dizziness, anaemia, inflammation, mastitis, retained placenta, weaknesses, pains and diarrhoea etc. There are a lot of plants that can be used to treat various diseases, quite often, the same botanicals cured many diseased conditions. For example (Ibe and Martin, 2005) observed that the medicinal plants used under traditional knowledge systems were found to effectively treat quite a lot of problems of the digestive tracts, some reproductive problems and skin diseases. Previous study reported by Khan *et al*; (2003) stated that in West Africa, extracts from the leaves of *Vernonia amygdalina* is used as folk medicine for the treatment of numerous ailments such as stomachache, gastrointestinal troubles, malaria, fever and cough. Also, kamala, *Maltotus Philippensis* has a variety of medicinal uses. Sofowora (1993) reported that all parts of this plant can be used as external applications for parasitic infections of the skin. Its fruits are useful as anthelmintic. A mixture of its extracts with hexachloroethane had given encouraging results in treating fascioliasis (liverfluke) in cattle. The fruits are used in the treatment of intestinal worms, the leaves of this plant are used as fodder, its oil as fixative of foodstuffs and beverages and its wood is used in light constructions.

Another medicinal plant from the humid tropics is *Rauwolfia species*, of the family Apocynaceae, which serve as raw material for the extraction of isolated alkaloids (Sofowora 1986). Its folk medicinal usage is that the root bark and the whole roots are used as purgative and for the treatment of dysentery. It has insecticidal properties and can also stop abortion. Preparations from the root are used for the treatment of intestinal disorders as well as the stimulation of uterine contraction. In the same vein *Jatropha curcas*, of the family Euphorbiaceae is another medicinal plant worth mentioning. It was reported by Iwu, 1989; Olanipekun *et al*, 2013) as being used in ethnoveterinary practices. The oil from the seed is good for laxative and purgative purposes and that the leaves are browsed by goats. Nevertheless, the introduction of modern drugs has neglected the traditional ways used in the management of diseased conditions mentioned above. More attentions are been paid to the modern medication methods to the detriment of the locally prepared ones which could have been developed to standard drugs. Also, in Ekiti-State, the availability and activities of veterinary services is mostly limited to the urban centre while the people in the rural areas rarely having access

to the orthodox methods of treating animals. However, the traditional medication is gaining back its popularity and importance among the rural dwellers and resource-poor due to harsh economic condition of the country, unavailability of the synthetic and modern drugs especially in the rural areas and rampant cases of fake and adulterated drugs (Jawonisi, 1984, Akinpelu; 1999 and Khan *et al*, 2003). Incidentally, the use of plants as medicines have been based on the assumption that the plants will be available on a continuing basis, but the reverse is the case because no concerted effort has been made to ensure this. There has been an unprecedented erosion of biological diversity and indigenous knowledge as a result of increase in demands due to increase in population, changing in farming system, advancement in technology, climate change and extensive destruction of plant-rich habitats such as tropical rain forests, wetlands, Mediterranean ecosystem and parts of the arid zone are posing a serious threat to the continuous availability of the useful herbs.

This erosion, according to Cox (2000) and Maffi (2002), represent the irreversible loss of humanity heritage and diversity. Study by Reyes-Garcia *et al*. (2007) suggested that the conservation of biological diversity can be more successful by finding allies. Previous studies by Alcon (1993) and Berkes *et al*; (1995) had ascertained that the indigenous people were potential allies in the conservation of biological diversity. In lieu of this, this study is to identify the plants used in the management of ruminant's animals with a view to determine the endangered species and propose strategies that would conserve such.

## MATERIALS AND METHOD

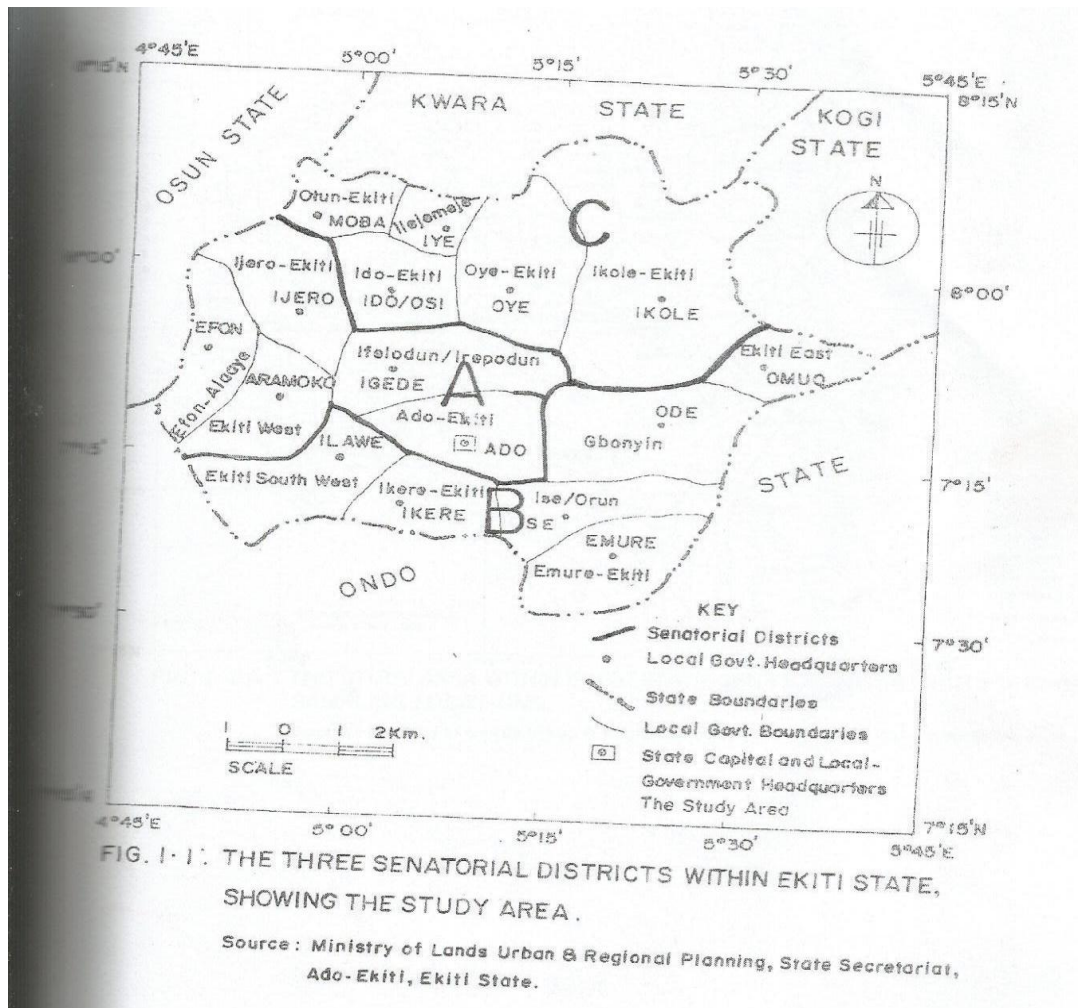
### The study area

This study was carried out in the existing three Senatorial Districts of Ekiti State, Southwestern, Nigeria. The three districts were Ekiti North, Ekiti South and Ekiti Central Senatorial Districts (Fig.1).

In each district, ten rural communities that were still relatively far from urban influence were selected and respondents were randomly selected and interviewed (Omotoyinbo, 2008 and Olanipekun and Kayode; 2014).

### Interview of respondents

In each of these communities, ten respondents who have maintained domicile for a period not less than 20 years were chosen and interviewed with the aid of semi-structured questionnaire matrix. (Kayode 2002, 2005, Kayode and Omotoyinbo, 2008). Thus, a total of 300 respondents were interviewed. The interviews were conducted with a fairly open framework that allowed for focused, conversational and two-way communication. The interviewed started with more general questions on the subject matter. It should be noted that not all the questions were designed and



phrased ahead of time. The majority of questions were created during the interviews thus allowing both interviewer and the respondents the flexibility to probe for details and discuss issues on the subject matter. Plants used for veterinary medicines were identified by the respondents, the local names of the plants, parts used, dosage and methods of preparation and mode of Administration were documented. Samples of plant species identified were collected from their sources, but where the samples were not immediately available for collection, such samples were later collected at their source of habitat. Photographs of the specimens were taken. Secondary information was obtained from records at the State veterinary hospital and key informants consisting of officials of the State Ministries of Agriculture, Environment and Health as well as veterinary Doctors. Voucher specimens were prepared and deposited at the herbarium of the Department of Plant Science.

#### Relative abundance of identified species

The relative abundance of the identified species in each community was determined by the time it would take from the centre of the community to physically come across the plant specimens. Thus, plant specimens that could be sighted between zero minutes to five hours

were regarded as abundant, those that would take more than 5 hours to be seen were regarded as scarce. Also, those species that would take between 5 to 24 hours were regarded as endangered. Strategies that would ensure their conservation were proposed.

#### Ecophysiology of the identified endangered species

Endangered species identified were obtained and subjected to planting to determine its relative growth rate. Planting materials such as seeds, stems and roots of the species were obtained from the study site and planted at the green house of the Department of Plant Science of the University of Ado Ekiti. Kayode and Akande (1998); Kayode and Franco (2002) had earlier provided the climatic and edaphic conditions of the study area. The soil samples was fed into 180 planting pots. Planting materials such as seeds of *P. biglobosa* (Auberville) L. *siceraria* (Molina), *S. nodiflorum* (Jacq) and also the stem of *V. doniana* (Sweet), *B. feruginea* (Bth), *F thonigii* (Del.), *W. indica* (Linn), *A. boonei* (Linn), *T. indica* (Linn) were planted in each of the pots. The pots were watered either early in the morning or late in the evening everyday for 8 weeks.

**Table 1.** List of identified plants used for the management of ruminant animals in Ekiti- State, Nigeria

s/n	Botanical species	Family name	Vernacular name	Part(s) used
1	<i>Acacia arabica</i> (Linn)	Mimosaceae	Kasia	Fruit and stem bark
2	<i>Adansonia digitata</i> (Linn)	Bombaceae	Ose	Leaves
3	<i>Aframomum meleguata</i> (K. Schum)	Zingiberaceae	Ata-ire	Leaves, seeds
4	<i>Agerantum conyzoides</i> (Linn)	Asteraceae	Imi-esu	Leaves
5	<i>Allium cepa</i> (Linn)	Alliaceae	Alubasa elewe	Leaves
6	<i>Allium sativum</i> (Linn)	Alliaceae	Ayu	Seeds and leaves
7	<i>Alstonia boonei</i> (Pers)	Apocynaceae	Ahun	Leaves and stem bark
8	<i>Amaranthus spinosus</i> (Linn)	Amarantheceae	Efo elegun	Leaves
9	<i>Anacardium occidentale</i> (Linn)	Anacardiaceae	Kasu	Leaves and stem
10	<i>Anona senegalensis</i> (Linn)	Annonaceae	Abo	Leaves
11	<i>Aspilia africana</i> (Pers)	Asteraceae	Yunrinyun	Leaves
12	<i>Azardirecta indica</i> (A. Juss)	Meliaceae	Dongoyaro	Leaves
13	<i>Bridelia ferruginea</i> (Bth)	Euphorbiaceae	Ira	Stem bark
14	<i>Calotropis procera</i> (R.Br)	Asclepiadaceae	Bomubomu	Leaves
15	<i>Capsicum frutescens</i> (Linn)	Solanaceae	Ata wewe	Fruit
16	<i>Caccia occidentale</i> (Linn)	Caesalpinaceae	Kassia	Leaves
17	<i>Carica papaya</i> (Linn)	Caricaceae	Ibepe	Seeds
18	<i>Chromolaena odorata</i> (Linn)	Asteraceae	Akintola	Leaves
19	<i>Citrus aurantifolia</i> (Christm)	Rutaceae	Osan wewe	Fruits and seed
20	<i>Elaeis guinensis</i> (Jacq)	Arecaceae	Ope	Fruit, leaves
21	<i>Ficus exasperata</i> (Linn)	Moraceae	Eepinpin	Leaves
22	<i>Ficus thoningii</i> (Linn)	Moraceae	Odan	Leaves
23	<i>Flugea virosa</i> (Linn)	Euphorbiaceae	Isawewe ameranbabo	Leaves
24	<i>Gliricidia sepium</i> (Jacq)	Fabaceae	Agunmaniyé	Leaves
25	<i>Gossypium arboretum</i> (Jacq)	Malvaceae	Owu	Leaves and seeds
26	<i>Guiera senegalensis</i> (Linn)	Combretaceae	Gedu	Leaves
27	<i>Helitricum indicum</i> (Linn)	Boranginaceae	Apari igun	Leaves and stem
28	<i>Hymenocadia acida</i> (Linn)	Hymenocardiaceae	Orupa	Leaves
29	<i>Jatropha gossypifolia</i> (Linn)	Euphorbiaceae	Lapalapa funfun	Leaves, stem and latex
30	<i>Jatropha multifida</i> (Linn)	Euphorbiaceae	Ogege	Leaves
31	<i>Khaya senegalensis</i> (Desr)	Meliaceae	Oganwo	Leaves

Table 1. Cont.

32	<i>Lantana camera</i> (Linn)	Verbenaceae	Ewon adele	Leaves
33	<i>Momordica charantia</i> (Linn)	Cucurbitaceae	Ejirin wewe	Leaves
34	<i>Moringa oleifera</i> (Lam)	Rubaceae	Igbale	Leaves
35	<i>Nicotiana tabacum</i> (Linn)	Solanaceae	Taba	Leaves
36	<i>Ocimum gratissimum</i> (Linn)	Lamiaceae	Efinrin nla	Leaves
37	<i>Psidium guajava</i> (Linn)	Myraceae	Gurofa	Leaves
38	<i>Rauwolfia occidentale</i> (Afz)	Apocynaceae	Asofeyeje	Leaves
39	<i>Saccharium officinarium</i> (Jacq)	Poaceae	Ireke	Stem
40	<i>Sida corymbosa</i> (Linn)	Malvaceae	Iseketu	Leaves
41	<i>Spondia mombin</i> (Linn)	Asteraceae		Leaves
42	<i>Solanum nodiflorum</i> (Linn)	Solanaceae	Odu	Leaves
43	<i>Talinum triangulare</i> (Jacq)	Portulacaceae	Gbure	Leaves
44	<i>Tamarindus indica</i> (Linn)	Fabaceae	Ajagbon	Leaves
45	<i>Thitornia diversifolia</i> (Linn)	Asteraceae	Ododo	Leaves
46	<i>Tridax procumbens</i> (Linn)	Asteraceae	Igbalode	Leaves
47	<i>Triumfetta cordifolia</i> (A. Rich)	Tiliaceae	Akeri	Leaves
48	<i>Venona amygdalina</i> (Del)	Asteraceae	Ewuro	Leaves
49	<i>Vitex doniana</i> (Sweet)	Verbenaceae	Oriri	Leaves
50	<i>Waltheria indica</i> (Linn)	Steculiaceae	Eje	Leaves and stem bark
51	<i>Zea mays</i> (Linn)	Poaceae	Agbado	Seeds
52	<i>Zingiber officinale</i> (Rosc)	Zingiberaceae	Ajo	Seed

After germination the seedlings were thinned to one plant per pot. Weekly heights of seedlings were measured. The first week measurement was taken as initial height while the last week measure was taken as final height. The relative growth rate of the component parts were determined after Rozema *et al*; (1985) as

$$\text{Relative Growth Rate} = \frac{\ln H_2 - \ln H_1}{\text{Time}}$$

Tolerance Index Determination:

$\frac{\text{Relative Growth Rate for a particular treatment}}$

$\frac{\text{Relative Growth Rate for Control}}$

## RESULTS AND DISCUSSION.

### RESULTS.

#### Plants used in managing ruminant animals

Field observation revealed that a total of 52 plant species belonging to 29 families were identified as

being used for the treatment of ruminant animals pests and diseases in the study area (Table 1). Various parts of the plants where leaves form the greatest part were used in treating different ailments in the study area were revealed.

#### Sources of botanicals

Table 2 revealed the sources of plants used in treating ruminant pests and diseases in the study area. It was shown that most of the respondents sourced their botanicals by extracting from the mother plants in the forest, household farms, common and household areas. The type of plants found in a location is dependent on the geographical location. Thus, 38.9 % of the plants species were found at the primary source and this form the highest among the various sources (Table 2). The plants were further classified into cultivated and non-cultivated species. The cultivated species were divided into two sub-groups, widely and

**Table 2.** Sources and geographical location of the identified plants in the study area.

Sources	Geographical location (%)		
	1st degree	2nd degree	3rd degree
CA	6 4.6%	17 13.0%	10 7.6%
HA	7 5.3%	16 12.2%	6 4.6%
PH	2 1.5%	2 1.5%	5 3.8%
FR	13 9.9%	4 3.1%	2 1.5%
HF	23 17.6%	7 5.3%	11 8.4%
Total	51 38.9%	46 35.1%	34 26.0%

CA= Common area, HA= Household area, PH= Purchased, FR= Forest reserve, HF= Household farm.

1<sup>0</sup> = primary source

2<sup>0</sup> = secondary source

3<sup>0</sup> = tertiary source

**Table 3.** Classification of the sourced botanicals used for the cure of ruminant pests and diseases in Ekiti State, Nigeria

Class	Botanical species	% composition (species)
(a) Cultivated Species		
(i) Widely Cultivated	<i>A. occidentale</i> , <i>C. frutescens</i> , <i>C. papaya</i> , <i>C. aurantifolia</i> , <i>E. guinensis</i> , <i>N. tabacum</i> , <i>O. gratisimum</i> , <i>P. guajava</i> , <i>S. officinarium</i> , <i>V. amygdalina</i> and <i>Z. mays</i>	21.1%
(ii) Sparsely Cultivated	<i>A. arabica</i> , <i>A. digitata</i> , <i>A. indica</i> , <i>A. senegalensis</i> , <i>C. occidentale</i> , <i>G. sepium</i> , <i>G. arboretum</i> , <i>G. senegalensis</i> , <i>J. gossypifolia</i> , <i>K. senegalensis</i> and <i>M. oleifera</i>	21.1%
(b) Non-cultivated Species		
(i) Preserved wildling Species	<i>A. meleguata</i> , <i>A. boonea</i> , <i>B. ferruginea</i> , <i>C. proticus</i> , <i>F. exasperate</i> , <i>F. thoningii</i> , <i>F. virosa</i> , <i>H. acida</i> , <i>J. multifida</i> , <i>R. occidentale</i> , <i>S. mombin</i> , <i>S. nodiflorum</i> , <i>T. triangulare</i> , <i>T. indica</i> , <i>V. doniana</i> , <i>W. indica</i> and <i>Z. officinale</i>	30.8%
(ii) Weed	<i>A. conyzoides</i> , <i>A. spinosus</i> , <i>A. africana</i> , <i>C. odorata</i> , <i>H. indicum</i> , <i>L. camara</i> , <i>M. charantia</i> , <i>S. corymbosa</i> , <i>T. procumbens</i> , <i>T. diversifolia</i> and <i>T. cordifolia</i> .	23.07%
(i) Purchased	<i>A. cepa</i> and <i>A. sativum</i>	3.84%

sparsely cultivated species. They were both made up of 21.1% each. The species that were not cultivated were

making up of 30.8% preserved wildlings, 23.07% weed species and 3.84% were purchased species (Table 3).

**Table 4.** List of abundant plants in treating ruminants diseases in Ekiti-State, Nigeria.

S/n	Botanical name	Major products obtainable from cultivation
1	<i>Aframomum meleguata</i>	Seeds as medicine
2	<i>Agerantum conyzoides</i>	Medicine
3	<i>Amaranthus spinosus</i>	Medicine
4	<i>Anacardium occidentale</i>	Fruits and medicine
5	<i>Aspilia africana</i>	Animal fodder and ornamental
6	<i>Azardiracta indica</i>	Erosion and wind control and medicine
7	<i>Calotropis procera</i>	Ornamental and food preparation
8	<i>Capsicum frutescens</i>	Fruits and medicine
9	<i>Caccia occidentale</i>	Shade, stake for yam and erosion
10	<i>Carica papaya</i>	Fruits and wind leaves and stem
11	<i>Chromolaena odorata</i>	Medicine from leaves and stem
12	<i>Citrus aurantifolia</i>	Wind breaker, fruits as medicine
13	<i>Elaeis guinensis</i>	Fruits, wind erosion control
14	<i>Ficus thoningii</i>	Shade and erosion control
15	<i>Gliricida sepium</i>	Yam stakes and wind breaker
16	<i>Momordica charantia</i>	Medicine from leaves and stem
17	<i>Ocimum gratissimum</i>	Leafy vegetable and medicine
18	<i>Talinum triangulare</i>	Leafy vegetable and medicine
19	<i>Thitornia diversifolia</i>	Ornamental
20	<i>Tridax procumbens</i>	Folder and medicine
21	<i>Venona amygdalina</i>	Leafy vegetable and medicine
22	<i>Zea mays</i>	Fruits as food and medicine

### Relative abundance of the plants

Table 5 revealed the relative abundance of the species identified in the study area. It was observed that 22 of the botanicals could be described as being abundant. The plants were well available and found accessible in the study area.

### Endangered species of the identified plants

It was also revealed that 6 species of the botanicals were relatively scarce and

could be said to be endangered (Table 6). These plants were subsequently

subjected to domestication to find out their initial growth rate. Domestication was made by the use of planting materials such as roots, rootstocks and seeds.

**Values in the same column and having the same superscript letters are not significantly different (P<0.05)**

#### KEY

**EN** - Ekiti North Senatorial District  
**EC** - Ekiti Central Senatorial District  
**ES** - Ekiti South Senatorial District

The relative growth rate of the endangered ethnoveterinary botanicals in the study area revealed

**Table 5.** The relative growth rate of the reared plants

S/N	PLANTS	EN	EC	ES
1	<i>L. siceraria</i>	0.34a	0.25a	0.25a
2	<i>V. doniana</i>	0.19a	-	0.24a
3	<i>B. ferruginea</i>	0.13a	0.16a	0.25a
4	<i>F. thoningii</i>	0.25a	0.21a	0.19a
5	<i>W. indica</i>	-	0.22	-
6	<i>A.boonei</i>	0.16a	0.22a	-
7	<i>S.nodiflorum</i>	1.21a	0.14a	0.79a
8	<i>G.arborea</i> (control)	2.73b	2.88b	3.04b

**Table 6.** The relative growth rate of the reared plants

S/N	PLANTS	EN	EC	ES
1	<i>L. siceraria</i>	0.34a	0.25a	0.25a
2	<i>V. doniana</i>	0.19a	-	0.24a
3	<i>B. ferruginea</i>	0.13a	0.16a	0.25a
4	<i>F. thoningii</i>	0.25a	0.21a	0.19a
5	<i>W. indica</i>	-	0.22a	-
6	<i>A.boonei</i>	0.16a	0.22a	-
7	<i>S.nodiflorum</i>	1.21a	0.14a	0.79a
8	<i>G.arborea</i> (control)	2.73b	2.88b	3.04b

Values in the same column and having the same superscript letters are not significantly different (P<0.05)

KEY

EN - Ekiti North Senatorial District  
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that *Gmelina arborea*, the control grows better in the area than the rare botanicals.

## DISCUSSION

The use of plants in treating various health challenges both in animals and man is a common phenomenon of the rural people in the study area. Various plant parts such as leaves, stem barks and roots were utilized but the leaves constituted the bulk of the plants part used. However, unlike the human medicine the practice is not established but effective. The remedies were mostly used at the subsistence level traditionally. Livestocks were mostly managed by extensive system, this practice espoused the animals to wide spread of pests and diseases.

Field observation revealed that in many places it is becoming difficult to extract plants from their natural sources because of the depletion of the forest. Deforestation has reduced the availability of biodiversity. Wilson (2000) and Novacek and Cleland (2001) reported the extinction of genetic diversity and said many organisms may go into extinction before they are discovered. The type of plants found in a location is dependent on the geographical location. Thus, 38.9 % of the plants species were found at the primary source and this form the highest among the various sources (Table 2). This

could serve as favorable incentives for the cultivation in large quantities for other purposes like fruits, nuts, fodder, medicine, fuelwood etc to alleviate the existing poverty in the study area Wood *et al*;2005; Napralert, 2006 The widely cultivated species were those species with edible fruits and species whose leaves were valued for their medicinal usage. The species were also valued as important sources of income most especially during the off-farm seasons. Some of these species were valued for erosion control, provision of shade and boundary demarcation. The species that were not cultivated were making up of 30.8% preserved wildlings, 23.07% weed species and 3.84% of purchased species (Table 3).

The abundant species were mostly cultivated in the study area for various purposes such as medicine, food, boundary demarcation and others. (SCBD, 2006) acknowledges that the level of the different uses of biodiversity improved likelihood of the rural farmers. Conversely, the multipurpose utilization of these species as resulted to the reduction on the availability of the species. Thus, with the increase conversion of valuable natural environment to the plantation of exotic species or agricultural purposes, there is tendency for the continued erosion of botanical diversity of plant species. Also in sourcing for plants for medicine, some of the plants were debarked while some of the species are not cultivated they have recalcitrant or non-viable seeds. This method of extraction is highly destructive



and easily killed plants (Peter,1996; John 1988; Cuninghan 1988; Fasola and Egunyomi 2002, Kayode *et al*; 2009).

The Relative Growth Rate of the endangered ethnoveterinary botanicals in the study area revealed that *Gmelina arborea*, the control grows better in the area than the rare botanicals. During domestication trials, it was observed that different seeds and protergules germinated over a range of time which was also varied from species to species. These differences in germination

periods could be observed to depend on physiology of the seed, with emphasis on the amount of food reserve in the endosperm which in turn reflected in the vigor of germination and the growth of seedlings (Ogwuru, 1995).

However, the plants were perennials, they required prolong number of years to grow and to reach flowering and fruiting stage, thus minimizing their regenerating capability. Kayode *et al*; 2009 had previously asserted that when the rate of regeneration is more than the extraction, the survival of the mother plants is no more protected. Therefore, the extraction which were predatory and annihilative usually results in increasing scarcity of species should be avoided so as to control the continuous loss of indigenous knowledge. Selection should be subjected to available species. Thus conserve the available species and reduce the rate of endangered or extinct plants. It is an important value and ethical demand on society to preserve the Nation biodiversity for the future generation, for aesthetic value, for economic and commercial value, for its pharmaceutical, medical prospect and also provide income and foreign earning and savings.

## CONCLUSION

The study revealed that local communities in the study area and their surrounding areas still strongly rely on medicinal plants to treat their livestock. Various plants were discovered as ethnoveterinary and found relevant for their primary health care especially in the rural areas. Also it was found that a high number of natural resources users were aware of the consistent depletion of a number of plant species used for various purposes. This represent the starting points to tackle the over-exploitation of plants in the wild. The methods of collection were however found to be at the detriments of the survival of the plants where the methods of extraction and exploitation have created a lot of harm especially where there is no adequate measures and steps taken in ensuring the regeneration and afforestation. There is therefore the urgent needs to conserve these species and the available ones to be protected. Some of the strategies include the need to determine the relative regenerating capabilities of debarked species, domestication of the endangered or debarked species, public enlightenment and awareness of the danger inherent in the loss of species diversity. Individual and communities should be interested in participating in afforestation or re-afforestation programme. The indigenous knowledge of the Yoruba

in the flora should be incorporated into the curricular of natures studies and thought at all school levels.

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