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Trends in Preventing Medicinal Plants from Extinction in Ado Local Government Area of Ekiti State, Nigeria

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ABSTRACT

This study examines how the medicinal plant species in Ado Local Government Area of Ekiti State, Nigeria could be rescued from further ecological genocide due to human socio and agro-economic development. Combination of social survey and direct field observations are carried out. Semi-structured questionnaire matrix and conversational interviews (two-way communication) based on human exploration of the environment in the last 10 years are employed. The results show that a total of 48 medicinal plant species belonging to 25 different families are discovered to be at risk extinction in the study area. Thirteen (13) medicinal plant species are considered to be endangered, 17 medicinal plant species are threatened, while 18 are considered scarce. The scientific and local names and families of the plants are identified with clues on their medicinal significance. The overall population of medicinal plants species in the study area is on the decline. This work reveals that the extinction agents are mostly humans, consequent upon economic and social development such as agricultural development, urbanization, lumbering and logging, assaultive herb grazing, bush burning and habitat distortions and deforestation. Ex situ conservation (protecting endangered plant species outside its natural habitat) should be introduced in form of botanical gardens, arboretums and parks in the local government area by the Ministry of Environment.

Keywords: *Forest, imminent extinction, medicinal plants*

INTRODUCTION

The indiscriminate and wanton destruction of tropical forests is alarming and has been a matter of grave concerns to all stakeholders. Medically important plant species are not spared in this unpleasant plant elimination. The natural

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vegetation including the wild medicinal plant species are disappearing at an alarming rate (Swanson 1998; Kayode 2004, 2005; Stravastava S., Stravastava V, and Stravastava P., 2008). The tropical rainforest, home of about half of the world's plants are in particular danger, declining at an estimated 16.8million hectares per annum according to a 2012 report by the Food and Agriculture Organisation (FAO). This phenomenon combined with unabated exploitation of the tropical forest is putting many species of medicinal plants in grave risk of genetic erosion and eventual extinction (Groombridge and Jenkins 2002; Marinelli 2005). Already, about 15,000 medicinal plants are being threatened with extinction worldwide (Voeks and Leony, 2004; Kayode, 2007; Roberson, 2008). Experts estimate that the earth is losing at least 1 potential major drug every two years (Hamilton 2003; Bhatta, 2006, IUCN, 2007).

Ado is the capital city of Ekiti State. The State is located in south western part of Nigeria on longitude $5^{o}.25^{1}$-8^{o} 20^{N}, and latitude $5^{o}.00$-$6^{o}.00$E . It has its vegetation consisting of dry low land rainforest and derived savannah (Kayode 2002, 2004, 2007). Most medicinal plants in the study area are wild, that is, *in-situ*. There is hardly any cultivated or *ex-situ* medicinal species, except a few domesticated medicinal species which arise as a result of environmental ornamentation (Anselm 2001; Adeniran 2015, Adeniran and Falemu, 2017). Institutional botanical gardens and privately owned botanic cultivations are rare and where they are available, they are not structurally viable and are poorly managed (Kayode 2007). Effort to conserve plant biodiversity is at low ebb and annual encroachment and destruction of the forest vegetation is on the increase (Kayode 2007). This action seriously threatens the medicinal plants in their natural habitats *(in-situ)* through destruction in the forms of deforestation, tree felling, annual bush burning, sporadic and unplanned agricultural practices, unchecked cattle grazing, urbanization and industrialization (Strivastava S., Strivastava V. and Strivastava P. 2008; Roberson 2008).

According to Kayode and Kadeba (2001), Anselm (2001), Kayode (2004), Omotayo and Borokini (2012), very little attention has been paid to re-afforestation and biodiversity conservation by the stakeholders in the entire State in general and in the study area in particular. This is in consonance with the observations of Falaye, Oluyege, Olufayo and Fowape (2006), Kayode (2007), Strivastava S., Strivastava V. and Strivastava P. (2008) that over exploitation and habitat destruction would lead to loss of unique and precious species, and that species conservation and human survival go hand in hand. Adeniran (2015) affirms that if critical decision is not taken to conserve bioresources (forest and forest products including aromatic and medicinal species), their complete extinction in the coming

decades will be inevitable. It is on this backdrop, that this study considers the trends in preventing medicinal plants species from imminent extinction in Ado Local Government Area of Ekiti State, Nigeria.

MATERIALS AND METHOD

Combination of social survey and direct field observation were adopted in this study. Purposive sampling technique was used in selecting four communities from the local government area. A simple random sampling technique was adopted to select twenty (20) aborigen informants for the study. The instrument for data collection were interview and semi-structured questionnaire matrix. The interview was focused, conversational and involved two-way communication, based on human activities in the environment in the last 10 years (Kayode 2005, 2007). Field trips were also undertaken to sight selected medicinal plants in the study area to ascertain the endangered, threatened and rare species. Voucher specimens of the medicinal botanicals were obtained and were scientifically identified. Their medicinal values were equally ascertained (Abii and Amarachi 2007; Abolaji, Adebayo and Odesanmi 2007). The results were tabulated and interpreted.

RESULTS AND DISCUSSION

A total of 48 medicinal botanicals belonging to 25 different families were discovered to be at various risk (Table 1, 2 and 3). The plant species were categorized according to Roberson (2008), Strivastava S., Strivastava V. and Strivastava P. (2008) thus: the endangered species – the species that face the most serious threat of extinction. These species requires direct human protection for survival (Table 1); the threatened species – these medicinal plants are generally abundant in some areas but still face serious dangers (Table 2) and the rare species– medicinal plants in this category have small or decline populations (Table 3).

Table 1 shows that 27.08% of the medicinal botanicals were considered to be endangered. The plant species which are distributed among different 4 families namely, Fabaceae, Combretaceae, Meliaceae and Mimosaceae are mostly trees which are (timber and logging plants). According to Kayode (2004; 2007) these medicinal tree species are constantly felled for timber and logging works by Saw-millers and timber workers. It was further revealed that the continual timber cutting without replacement has been observed to be one of the factors responsible for biodiversity loss (Kayode 2005; Bhatta (2006).

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Table 1: Check list of Medicinal Plants considered to be endangered in Ado Local Government Area, Ekiti State, Nigeria

SN	Plants Species	Family	English names	Local names	Medicinal Importance
1	*Pterocarpus soyauxii* Taub	Fabaceae	Red heart wood, camwood	Osun pupa, Orosun	Stem bark is used to treat anaemia.
2	*Pterocarpus osun* Craib	Fabaceae	Forest Osun, lesser camwood	Igi Osun, Osun	Inner bark used as blood tonic
3	*Pterocarpus midbraedii* Harms	Fabaceae	Vermillion wood	Ure, Igi ire	Leaves as soup ingredient to treat anaemia.
4	*Terminalia superba* Engl. and Diels	Combretaceae	-	Afara	Root extract used to treat pile.
5	*Terminallia catapa* Retz	Combretaceae	Umbrella tree Indian almond	Afara	Fresh leaves decoction is used to treat insomnia (sleep disorder).
6	*Terminalia macro- petera* Guill and Perr	Combretaceae	-	Igi Udi, Idi	Root extract used to treat pile.
7	*Trichilia heudelotii* Planch	Meliaceae	Trichilia	Igi Akika	Root extract used to treat ulcer, gonorrhoea and cardiac ailments.
8	*Khaya ivorensis* A. Chev	Meliaceae	Red Mahogany	Oganwo	Root extract used to treat pile and dysentery.
9	*Entandrophragma angolense* (Welw) C.D.C Berg.	Meliaceae	Cedar mahogany	Ijebu/Igedu	Stem bark used to treat anaemia and haemolysis.
10	*Entandrophragma candollei* Harms	Meliaceae	Mahogany	Ijebu	Bark decoction used for blood tonic.
11	*Entandrophgragma cylindricum* Sprague	Meliaceae	Sapele wood	Ijebu/Igebu	Inner back used as soup ingredient to treat anaemia.
12	*Entandrophragma utile* Dawe and Sprague	Meliaceae	Utile	Jebo	Inner bark used as soup ingredient for iron and folic acid deficiency.
13	*Pipadeniastrum africana* Hook. f	Mimosaceae	African green heart tree	Agboyin	Stem bark and leaves twig used for treatment of anaemia, cardiac ailments and headache

Table 2: Checklist of medicinal plants considered to be threatened in Ado-Local Government Area, Ekiti State, Nigeria

SN	Plant species	Family	English names	Local names	Medicinal important
1	Loranthus *micranthus* Linn	Loranthaceae	Mistoetle	Afamo	Decoction of dry leaves treats insomnia and hypertension.
2	*Rauwolfia serpentina* syn. *Rauwolfia vomiteria* Ait	Apocynaceae	Wizzle stick	Asofeyeje	Dried root bark infusion is used to treat insomia and increase libido.
3	*Butyrospermum paradoxum* (Gaertrnf) Hepper	Sapotaceae	Shea butter tree	Igi ori	Infusion of foliage leaves used as blood tonic.
4	*Parkia biglobosa* (Willd) Benth	Papillionaceae	Locust bean tree	Igi Iru	Beans used as soup ingredient to supply iron and folic acid.
5	*Azadirachta indica* Linn	Meliaceae	Neem tree, magosa plant.	Dogoyaro	Decoction of leaves strengthen immune system, improves digestion and make the liver healthy.
6	*Melanthera Scandens* Schumach and Thonn	Asteraceae	-	Ako yurinyun	Cold infusion of fresh leaves is anti-diabetic and anti-malaria.
7	*Blighia sapida* K.D Koenig	Sapindaceae	Ackee apple tree	Igi Isin (Ushin)	Root extract is used to treat gonorrhoea and backache.
8	*Alchornea laxiflora* (Beth), Pax and K. Hoffin	Euphorbiaceae	Arithmetic stick	Iyapepe, pepe	Foliage leaves is used to treat pile, and anaemia.
9	*Cnidoscolus aconitifolius* Linn	Euphorbiaceae	Tree spinach, Chilite rubber	Iyana paja	Leaves infusion is haematinic, prevents impaired vision, kidney stone and haemorrhoids (pile).
10	*Jatropha curcas* Linn	Euphorbiaceae	Pig plant	Lapaapa funfun	Seed is used to treat renal infection, paralysis, dropsy, and is contraceptive.
11	*Mallotus oppositifolius* (Geisel) Mull-Arg	Euphorbiaceae	Woolly fruit plant	Atori igbo, Orokoro	Stem bark, Root extract is used for worm expulsion.
12	*Gnetum africanum* Linn	Gnetaceae	African joint fir	Okazi/Eeru Eriru	Leave as soup ingredient rectifies sore-throat and anti-nausea, anti-inflammation.
13	*Murraya Koenigii* Linn	Rutaceae	Sweet neem leaves Curry leaf	Efinrin, oso, Marugbo Sanya	Leaves chewed to loose weight, mental health prevent brain cell degeneration, improves eye sight and prevents cataract.
14	*Gongronema latifolium* Linn	Asclepiadaceae	Bush buck	Arokeke	Treatment of cough, diabetic, high blood pressure, worm, dysentery and malaria.
15	*Mucuna pruriens* Linn. DC. Syno. *Mucuna prurita*	Fabaceae	Velvet bean	Werepe	Seeds extracts are used to treat sexual debility, snake poison and promote mental health.
16	*Bridelia ferruginea* Benth	Euphorbiaceae	Bridelia	Igi ira, Ira odan	leaf is antibiotic, bark is used to control black tongue disease and fever.
17	*Alstonia bonnie* De-willd	Apocynaceae	Stool wood	Igi ahun	Stem bark treats malaria; Leaves decoction cure convulsion in children.

In Table 2, 35.42% of the medicinal plant species distributed among 14 different families were considered to be threatened. This threatened medicinal species are abundant in some area, but face serious dangers resulting from unfavourable

changes in the environment such as bush burning, unchecked cattle grazing, deforestation and lumbering (Hamilton and Redford 2007, Roberson 2008). It was also noted by Voeks and Leony (2004), Kayode (2007), Strivastava S., Strivastava V. and Strivastava P. (2008), that habitat destruction in the course of agricultural and economic development would result into loss of vegetation and primary forest disruption.

Table 3: Check list of Medicinal plants that are considered rare in Ado Local Government Area, Ekiti State, Nigeria

SN	Plant species	Family	English name	Local name	Medicinal importance
1	*Pycnanthus angolens*is Warb	Myristicaceae	-	Akomu	Sap is used to treat cough.
2	*Zanthoxylum zanthoxyloides* [Lam] Water-ham	Rutaceae	Zantho-fagara	Igi ata	Root extract is an anti-sickling agent.
3	*Zanthoxylum rabescens* Planchex Hook f	Rutaceae	Fagara, spiny tree	Igi ata	Root extract is used as anti sickling agent.
4	*Annona muricata* Vell.	Annonaceae	Sour sop plant	Sowasop	Fruit juice is anti-arthritis. Decoction of leaves and stem regulate blood sugar, cures liver and pancreas ailments. Leaf tea palliates HIV symptoms and is anti-cancer.
5	*Morinda lucida*Benth-Gbif	Rubiaceae	BrimstoneTree	Oruwo Iwo	Leaves infusion cures malaria, yellow fever and hypoglycemia Root extract is used to treat heart ailments.
6	*Taraxacum officinale.* Weber	Asteraceae	Dandeliongreen	Yanrin	Cold infusion of leaf is haematinic, and anti poison.
7	*Gossypium hirsutum* (Linn)	Malvaceae	Upland cotton plant	Igi owu	Root extracts (little doses) treats irregular menstral cycle, hasting child delivery.
8	*Apocynum cannabinum* (Linn)	Apocynaceae	Indian Hemp	Igbo	Cold infusion of fresh leaves treat insomnia.
9	*Citrus lemon* (L) Burn. F.	Rataceae	Lemon	Orombo	Fruit is anti-scurbutic, anti-oxidant, improves digestion.
10	*Piper guineense* Schum andThonn	Piperaceae	African black pepper	Iyere	Fruit as food ingredient to teat fever, fruit decoction increases libido.
11	*Telfairia pedata* (Smith Ex Sims) Hook. F	Cucurbitaceae	Oyster nut, lesser Telfairia	Iroko	Cold infusion of tender leaves serves as blood tonic.
12	*Allium fistulosum* Linn.	Alliaceae	Scallions,	Alubosa elewe Welsh onion	Bulb is anti-bacterial, antiseptic, diuretic, stomachic vermifuge.
13	*Aframomum melegueta* (Rose) K. Schum	Zingiberaceae	Grain of paradise	Atare	seed extracts Improved libido and sexual vigor.
14	*Jatropha gossypifolia* Linn	Euphorbiaceae	Belly ache bush	Lapalapa pupa	Leaves infusion treats diarrhoea, microbial infection
15	*Xylopia aethiopica* (Dunal) A Rich	Annonaceae	Negro peper, grains of selim	Eruje, eeru	Root extract is used to treat pneumonia chicken pox and stomach disorder Bark steeped in palm wine treats asthma, rheumatism.
16	*Borassus aethiopum.* Mart	Arecaceae	AfricanFan palm	Agbon aja	Root extract is used to treat asthma.
17	*Garcina cola*Heckle	Clusiaceae	Bitter Kola,Sap tree	Orogbo, Kola	Fruit prevent osteo-arthritis, Root extract is used to treat male sexual problem. Fruit improves lung function. Prevents cough and bronchitis
18	*Tetrapleura tetraptera* (Schum Thonn) Taub	Fabacceae	Tetrapleura	Arindan,Aidan,	Dry fruit infusion is anti-diabetic anti convulsion, postpartum treatment for mothers.

Table 3 reveals 37.50% of the medicinal plant species which are considered to be rare in the study area. These medicinal plants are distributed among 15 different families but have decline populations (Adeniran 2015; Adeniran and Falemu 2017. The rarity of these medicinal plants stem from human actions such as forest destruction due to unplanned agricultural practices and mechanization, urbanisation, indiscriminate cutting of trees and useful herbs. In the same vein, Adeniran (2015), has viewed ignorance, poor conservative attitude and lack of ethno-botanical knowledge as pivotal reasons why many medicinal plant species are dying out in mass destruction and hence the rarity of the enlisted medical plants in the study area. The prolonged annual dry season and persistent North East dry Moonson winds culminating in unfavourable climate change is partly responsible for the seasonal rarity of most berbaceous medicinal species in the study area (Kayode 2001, 2002, 2005; Adeniran and Owoeye, 2015).

CONCLUSION AND RECOMMENDATIONS

The overall population of medicinal plants species in the study area is on the decline year by year. Field survey in this work reveals that the extinction agents are mostly humans, consequent upon his economic and social development such as agricultural development, urbanization, lumbering and logging, assaultive herb grazing, bush burning and habitat distortions cum deforestation among others. If the present trend of forest losses is left unchecked, then most medicinal plants in the study area may become extinct in the nearest future. Majority of the local people in the study area who depend solely on local medical plants for health up-keeping will be stranded when most of the useful medical plants are destroyed. In order to conserve and repopulate the already fading away medicinal bio-diversities in the study area, the following conservation strategies are recommended according to Lee and Jusaltis (2000), Kayode (2005), Holobiuc and Blindu (2007), Laslo, Vicas, Agud and Zapartan (2011):

1. Indiscriminate logging of the forest both in the reserve and free areas should be controlled by the government because most of these trees involved in logging are medicinal species.
2. The knowledge and usefulness of medicinal plants were lost at the demise of ancient fathers, the present crop of generation knows little or nothing about medically important herbs, herbal medicine education should be introduced in schools to enlighten youths for future biodiversity security.
3. Agricultural practices, bush burning, and unchecked cattle grazing should

be controlled in the study area to safeguard rare and endangered medicinal plant species.

4. *In-situ* conservation of medicinal species should be enforced by legislation; this will protect the endangered and threatened plant species in their natural habitats and hence conserve them.
5. *Ex situ* conservation (protecting endangered plant species outside its natural habitat) should be introduced in form of botanical gardens, arboretums and parks in the local government area by the Ministry of Environment.
6. The State University and Ministry of Agriculture should team up to build a virile seed and gene banks for vulnerable medicinal plant species to serve as backup against extinction of species.
7. Intensive research into and implementation of Silviculture with bias towards medicinal trees should be carried out by the State Ministry of Agriculture and Forestry.
8. Stakeholders, opinion groups, Non-Governmental Organisations, (NGO's),, Plant scientists should stage continuous media campaigns against destruction of forest, "the home of medicinal plants".
9. The State Department of Forestry and Agriculture should employ micro-propagation techniques to nurse and conserve exotic medicinal flora in the study area.

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