



PLANTS TRADITIONALLY USED IN TREATING MALARIA, TYPHOID FEVER AND RELATED COMPLICATIONS IN SOUTH-WESTERN NIGERIA

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Article history: Abstract:

Received: 4th April 2021 This research study was carried out to examined medicinal plant species that is

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used to treat malaria and typhoid fever and related complications in southwestern Nigeria. This research seek to provide a wider database on the utilization of forest plant parts especially leaves in indigenous healthcare, provide information on parts of the plant species used. The study area was divided into two compartments for the purpose of this research work, undisturbed forest an Data was collected using field surveys and visiting traditional medicine homes for parts the used for the treatment of malaria and typhoid fever. Field trips were embarked upon for three months from July to September 2020 for medicinal plant species identification. The researchers were accompanied by a field assistant who can identify the plant

species in local languages.. The computer PAST Model version 3 was used to analyze plant species diversity indices. The result obtained from the study shown that the study area is rich in plant species that are used to treat malaria and typhoid fever in southwest Nigeria. In, all a total of 110 plant species were belonging to 51 families were enumerated in the study area. The family Rubiaceae has highest number of plant species of eight (8) and this followed by Malvaceae with five (5) plant species. The following parts of the plant were used Leaves, barks, ,roots, flowers, fruits and seeds The result of the diversity index indicates that it was higher in the A 4.591 than B

4.469

Keywords: Plants, traditional medicine, World Health Organization, health care

INTRODUCTION

Plants are usually the main component of traditional medicine (World Health Organization, 2003). With about 80% of the world's inhabitants relying mainly on traditional medicines for his or her primary health care, the normal practice continues to play an important role in health care (Rokaya, et al, 2014). Traditional medicine may be a principal sort of health look after many populations, particularly in low- and middle-income countries where traditional healers are appealing since they share a standard perspective with their clients, and make use of data, beliefs, and practices indigenous to the local culture and also for its cost implication, the affordability of most traditional medicines makes all of them the more attractive at a time of soaring health-care costs (WHO, 2013). this type of health care has continued to realize attention as a crucial means of health care coverage globally, (Narajo, 2005). Malaria fever is one among the tropical diseases of socio-economic importance to which man are trying to find an answer for an extended time. it's the foremost prevalent of the tropical diseases identified as a threat to quite 40% of the world's population with about 200 to 450 million. Thus this research study seeks to document plant species wont to treat malaria, typhoid and therefore the associated complications in southwestern Nigeria (Muriuki 2006, Adekunle, 2008). In Asian and African counties alternative medicinal herbs and plant species are widely accepted by the popul ation, hence sustainable development might be developed from the utilization of untamed plants that are wont to treat malaria and typhoid (Deka,et, al, 2015). This study therefore aimed toward obtaining and identifying plants traditionally utilized in the treatment of malaria, typhoid in southwestern Nigeria with the hope that potential sources of treatments are often unearthed from medicinal plants. Malaria, typhoid with associated complications are the foremost prevalent diseases in these areas.Thus,this research seek to provide a wider database on the utilization of forest plant parts especially leaves in indigenous healthcare.

Study Area

The study was carried out in selected areas in southwestern Nigeria. These are Okomu National Park, Old Oyo National Park, Idanre Forest Reserve, and Gili-gili Forest Reserve. It lies between latitude 6° 21' N and longitude 5° 13' E (NEA, 2013). The park is located in Ovia Southwest local government, Edo State, Nigeria and has four ranges which are; Julius creek range, the Iguowan range, the Arakwan range, and the Babui creek range (Ikemeh, 2009). Idanre forest reserve has a total land area of 527.1 km², although official compartment maps estimate an area of 540.45 km² with coordinates of 6°51'28"N 5°06'20"E (Okosodo et al, 2016). Gili-gili forest reserve was instituted in 1935. Located on Lat. 5° 55' and 6° 09' N and Long. 5° 16' & 5° 27' E; is located in Ovia North-East Local Government Area of Edo State, Nigeria. The reserve covers an area of 365 km² that ranged from water swamp forest to tropical rain forest (Mengistu, Salami 2007). Old Oyo National Park (OONP) lies between longitudes 8° 15' and 9° 0' E and latitudes 3° 45' and 4° 20' N, and has a total land mass of 2,512 km² with the administrative office located along Iseyin - Isokun road, Oyo. The location placed the park at a vantage position of abundance land area as well as diverse wildlife and cultural/historical setting. The entire park is in the southern guinea savanna with the vegetation classified into four- types (Isichei (1995).

The southwestern Nigeria environment comprises of the lowland rainforest, stretching from the coast to about 50 km inland in its western boundary near the Dahomey Gap, to about 150 km inland around the region of the Kukuruku hills, and further stretching to the western bank of the Niger River as it was the eastern boundary. Rainfall is usually between 1,500- 2,500 mm and capable of sustaining the rainforest environment under natural conditions, distributed over an 8 – 9 month period (March – October/November) and depending largely on the distance from the coast. In the times past, vegetation in the zone falls within the lowland rainforest (Ogunjemite and Oates 2008). However, the present physiognomic component of the environment, particularly in the region of Kukuruku Hills, is mainly that of forest/savanna mosaic. The southern parts still have large, continuous patches of reserved forests that had been variously degraded as a result of timber exploitation and encroachment for farming. The impacts of human activities have contributed seriously to the degraded value of the forest environment.



Data collection

The study was carried out in two National Parks and Two forest reserve in southwestern Nigeria. Two compartments were randomly selected in each study site and it was categorized A and B for the purpose of this research study. Data was collected using field surveys and visiting traditional medicine homes for parts used for the treatment of malaria and typhoid fever (Igbarase and Ogbole 2018). Field trips were embarked upon for three months from July to September 2020 for medicinal plant species identification. The researchers were accompanied by a field assistant who can identify the plant species in local languages. Six popular and highly patronized traditional healing homes across the three villages surrounding the study areas were visited. This was followed by direct observation and collections of herbal plants from the wild. The plants collected were identified by their vernacular names and their scientific equivalent found and documented. Identification of herbs as well as their uses was done with the aid of a book of trees of Nigeria (Gbele, et al, 2008) while inventory of available herbs were recorded. Literature on medicinal plants was searched to back up the claims by the traditional practitioners. In addition, parts of medicinal plants not readily identifiable were taken to the herbarium at the Department of Forestry and Wood

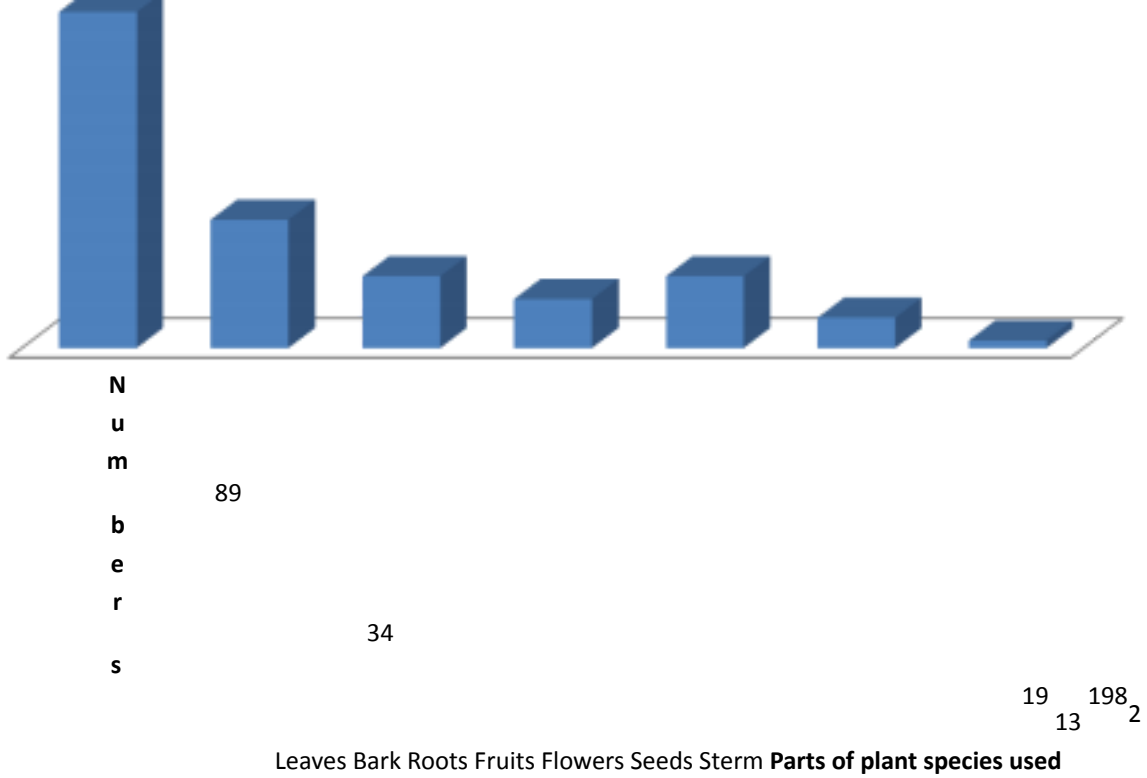


Figure 3, The parts of plant species used

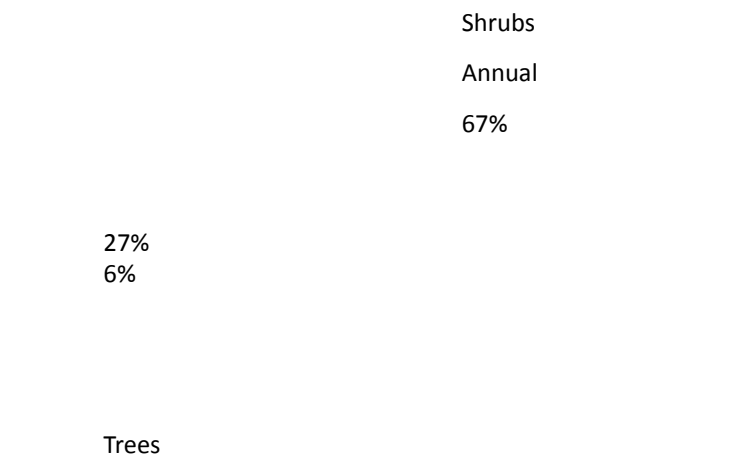


Figure 4, Plant Types recorded as medicinal in the study area

Table1, Diversity index of the plant species in the study area

Diversity index	Dry season	Lower	Upper	Wet season	Lower	Upper	Taxa_S	110	108	110	110	98	109
Individuals	192	192	192	155	155	155	Dominance_D	0.01427	0.0115	0.01373	0.01145	0.01136	
Shannon_H	4.469	4.502	4.58	4.591	4.426	4.583	Evenness_e^H/S	0.7937	0.8255	0.8873			
Brillouin	3.824	3.85	3.913	3.826	3.722	3.824	Menhinick	7.939	7.794	7.939			
Margalef	20.73	20.35	20.73	21.61	19.23	21.41	Equitability_J	0.9509	0.9592				
	0.9746	0.9768	0.9626	0.9798									

Table 2, Checklist of medicinal plant species in the study area

Name of Plant Species Family Part used Medicinal uses Acanthospermus hispidum Lauraceae leaves Malaria,

Typhoid and yellow fever *Adenia cissampeloides* Lauraceae leaves, bark ,root Appetizer, general weakness, jaundice *Adenia venenata* Passifloraceae leaves and bark Malaria, jaundice, anthelmintics, *Aframomum melegueta* Zingiberaceae seeds, leaves Measles, small pox and typhoid fever *Azelia africana* Leguminosae Leaves Malaria *Ageratum conyzoides* Asteraceae Leaves Malaria *Albizia ferruginea* Leguminosae leaves and bark Malaria and Typhoid fever *Alchornea cordifolia* Euphorbiaceae Leaves Malaria and Typhoid fever *Alstonia boonei* Apocynaceae leaves and bark Malaria and Typhoid fever *Anacardium occidentale* Anacardiaceae leaves and bark Malaria and Typhoid fever *Ananas comosus* Anacardiaceae Leaves, bark ,fruits malaria *Annona muricata* Annonaceae Leaves fruit Anemia, dysentery *Annona sanegalensis* Annonaceae Leaves, bark ,fruits Typhoid fever, cough, *Anthocleista djalensis* Gentiaceae Barks Purgative malaria and typhoid fever *Anthocleista vogelli* Loganiaceae Barks and Leaves Vomiting, antidote for snake bite *Anthonotha macrophylla* Leguminosae leaves, bark, roots Appetizer, jaundice ,malaria *Asparagus africana* Liliaceae whole plant antimicrobial, kidney diseases *Aspilia africana* Asteraceae Leaves Malaria and Typhoid fever

European Scholar Journal (ESJ)

Bambusa vulgaris Bambusaceae Leaves Malaria
Bauhinia simplicifolia Fabaceae eaves, fruits Antimicrobials, malaria typhoid fever *Blighia sapida* Sapindaceae Leaves, fruits, bark Malaria
Bridelia ferruginea Euphorbiaceae Leaves, bark, roots mouth wash, Malaria, Typhoid fever *Burkea africana* Fabaceae Bark, twigs Headache
Cajanus cajan Fabaceae Leaves, seeds mouth wash, Malaria, Typhoid fever *Canna indica* Cannaceae leaves Asthma, malaria *Capsicum frutescens* Solanaceae Laves, Fruits Malaria
Carica papaya Caricaceae Leaves, seeds, fruits Malaria, Typhoid fever and gonorrhoea *Cassia sieberiana* Asteraceae Leaves Malaria
Ceasalpinia bonduc Ceasalpiniaceae Leaves, flowers root Dysentery, malaria, typhoid fever stomach disorders, malaria, Typhoid
Ceiba pentandra Bombacaceae Leaves, fever roots
Celosia argenta Amaranthaceae Leaves, Tubers Malaria, anemia, poison antidote Malaria, Typhoid fever and kidney
Chorchorus litorus Bixaceae Leaves, roots diseases
Chromolaena odorata Leguminosae Leaves Malaria *Chrysophyllum albidum* Sapotaceae Leaves, bark, seeds Malaria, Typhoid fever *Cinnamomum zeylanicum* Lauraceae Leaves, bark, oil Nausea, typhoid fever, vomiting,
Citrus aurantifolia Rutaceae Leaves, Fruits, roots Malaria, typhoid fever jaundice *Citrus limon* Rutaceae Leaves, fruits roots Malaria, Colds, cough *Citrus medica* Rutaceae Leaves, fruits, roots Malaria and Typhoid fever *Clappertonia facifolia* Malvaceae Leaves, barks Dysentery, malaria, typhoid fever *Cochlospermum tinctorium* Bixaceae Leaves Malaria *Cola latertia* Sterculiaceae Leaves Malaria *Combretum reticulatum* Combretaceae Leaves Malaria *Curcuma longa* Zingiberaceae Tubers, roots Malaria, Typhoid fever
Cymbopogon citratus Poaceae Leaves Malaria *Daucus carota* Apiacea Leaves Malaria *Diospyros mespiliformis* Ebenaceae Leaves Malaria, Typhoid fever *Emilia sonchifolia* Asteraceae Leaves Malaria *Euphorbia hirta* Euphorbiaceae Leaves Malaria, jaundice *Ficus elegans* Moraceae Leaves Malaria, stomach disorders *Ficus exasperata* Moraceae Leaves Malaria, Blood tonic *Funtumia africana* Apocynaceae Leaves, roots stem, Malaria, constipation *Garcinia kola* Clusiaceae Leaves, Fruits, roots Malaria, cough, asthma *Gongronema latifolia* Asclepiadaceae Leaves, barks Malaria, Typhoid fever, *Gossypium barbadens* Malvaceae Leaves, roots Malaria *Gossypium hirsutum* Malvaceae leaves, roots Malaria
Haematostaphis barteri Anacardiaceae leaves, barks Malaria, Typhoid fever *Harungana madagascariensis* Hypericaceae Leaves roots, barks Typhoid fever cough *Heeria insignis* Anacardiaceae Leaves, bark, roots Malaria, Typhoid fever, blood tonic *Heliotropium indicum* Boraginaceae Leaves, barks Malaria, Typhoid *Hexalobus crispiflorus* Annonaceae Leaves Malaria *Hibiscus rosasinensis* Malvaceae Leaves Malaria, dysentery, *Hyptis suaveolens* Labiatae Laves, roots Malaria, Cough *Khaya senegalensis* Meliaceae Barks Typhoid fever *Khaya grandifoliola* Meliaceae Barks Typhoid fever, cough

Leea guineensis Leeaceae Leaves Malaria *Leonotis nepetifolia* Lamiaceae Leaves Malaria *Leucas martinicensis* Lamiaceae Laves, barks Malaria, Typhoid fever, Leaves, barks, seed,
Lophira alata Ochnaceae roots Malaria, Typhoid fever, jaundice
Lycopodium cernuum Lycopodiaceae Leaves Malaria, jaundice in New born baby *Mangifera indica* Anacardaceae Leaves, bark Malaria
Melicia excelsa Moraceae leaves, barks Malaria, dysentery *Millettia thonningii* Leguminaceae Leaves Malaria
Mitragyna inermis Rubiaceae Leaves Malaria
Monodora myristica Annonaceae Leaves, Seeds Malaria, typhoid fever *Morinda lucida* Rubiaceae Leaves malaria
Morus alba Lecythidaceae Leaves Malaria, piles *Musa paradisiaca* Musaceae fruits, flowers Malaria, Typhoid fever *Musa sapientum* Asteraceae fruits, flowers Malaria, Typhoid fever *Napoleonaea imperialis* Lecythidaceae Leaves, barks ,roots Malaria, Yellow fever, diabetes *Nauclea latifolia* Rubiaceae Leaves Typhoid fever *Newbouldia laevis* Bignoniaceae Leaves Blood tonic, dysentery *Nicotiana tobacum* Solanaceae Leaves, Malaria
Nymphaea lotus Nymphaeaceae whole plant Malaria, vomiting *Ocimum basilicum* Lamiaceae Leaves Malaria, stomach disorders *Ocimum gratissimum* Lamiaceae Leaves Malaria
Ouratea flava Ochnaceae Leaves, Fruits Malaria, Laxative *Oxalis corniculata* Ochnaceae Leaves Typhoid fever, boils Leaves, barks, seed,
Parkia biglobosa Fabaceae roots Typhoid fever blood tonic, diabetes
Parquetina nigrescens Lamiaceae Leaves, barks Malaria, Blood tonic, cough *Paullinia pinnata* Sapindaceae Leaves Malaria *Pennisetum purpureum* Poaceae Leaves Malaria, *Pentaclethra macrophylla* Fabaceae Leaves, barks, latex Typhoid fever, cough, gonorrhoea *Pergularia daemi* Asclepiadaceae Leaves Malaria *Physalis angulata* Solanaceae Leaves Malaria *Piliostigma thonningii* Caesalpiniaceae Leaves Malaria *Pseudocedrella kotschyi* Rubiaceae Leaves, barks Typhoid fever, vomiting *Pycnanthus angolensis* Myristicaceae Laves, barks Malaria typhoid fever *Rauvolfia vomitoria* Apocynaceae Leaves, roots Constipation, Typhoid fever, *Sarcocephalus latifolius* Rubiaceae Leaves Malaria *Senna podocarpa* Caesalpiniaceae Leaves Malaria *Senna siamea* Caesalpiniaceae Leaves Malaria *Sida acuta* Malvaceae Leaves Malaria *Solanum lycopersicon* Solanaceae Leaves, fruits Malaria *Solanum nigrum* Solanaceae Leaves Malaria
Sphenocentrum jollyanum Menispermaceae Leaves Malaria *Menispermaceae*
Synclisia scabrida e Leaves, barks Malaria, Yellow fever,
Tithonia diversifolia Compositae Leaves Malaria *Trema orientalis* Ulmaceae Leaves, barks Typhoid fever *Vernonia amygdalina* Asteraceae Leaves, stem Malaria, Typhoid fever *Xylopia aethiopica* Annonaceae Seeds Malaria

DISCUSSION

The result obtained indicates that the study area is rich in plant species that are used to treat malaria and typhoid fever and the associated diseases in southwest Nigeria. In all, a total of one hundred and ten (110) plant species belonging to 51 families was enumerated in the study area. This finding is consistent with following studies who carried out ethnobotanical surveys in Nigeria such as (Sodipo, and Wannang, 2015) who reported the use of forest plants to treat some tropical diseases, Aguoru and Ogaba, (2010) reported that *Bambusa vulgaris*, *Mangifera indica*, *Ananas comosus*, *Carica papaya*, *Ocimum gratissimum*, *Azadirachta indica*, *Psidium guajava*, *Citrus aurantifolia*, and *Moringa oleifera* were used in the treatment of typhoid amongst the Idoma people of Benue state. Halimat et al., (2017) also reported that *Mangifera indica*, *Alstonia boonei*, *Ananas comosus*, *Carica papaya*, *Ocimum gratissimum*, *Azadirachta indica*, *Psidium guajava*, *Sarcocephalus latifolius*, *Citrus aurantifolia*, *Citrus paradisi*, and *Zingiber officinale* were used in the treatment of typhoid in Minna, Niger State. Another study carried out by Sodipo and Wannang, (2015) in Jere Local Government Area of Borno State showed that *Azadirachta indica* and *Citrus aurantifolia* were also

mentioned.

The result has also shown that leaves, the bark of the trees were mostly used. The leaves of these plants were used singly or in combination with other herbal materials in the fresh or dried forms which are either in the combination of other herbal roots, flowers, and gum of other plant species. Leaves also act as reservoirs for the products of photosynthesis or exudates which contain more bioactive secondary metabolites for protection against devourers (Herbivores). Some of these compounds may be of medicinal value to the human body (Bodeker, et al, 2005). Additionally, the use of leaves is less dangerous to the existence of plant species as compared to the use of underground parts (roots, stem, bark), or the use of entire plants (Phua, 2009) Most of the plant parts used was found to be in the dried state. These were the main methods used in the preservation of the plant materials. As water is a fundamental requirement in microbial growth (Tabuti, 2006), the dried plant materials are better protected from microorganisms infestations. However, if the active compounds in the plants are volatile compounds then the efficacy of the herbal remedies would be lost or reduced in the dried plant materials mode of application is mostly oral by drinking the extracts or concoctions or vapor bathing. However, the dosage levels and the quantities harvested at a time are not measured.. The treatment could be repeated till the person be treated is healed. This finding is in agreement with Anoka (2012) who reported that the medicinal uses are varied and the plant species parts that are used range from leaves, roots, stem, bark to fruits only, or a combination of two or more in a species or with those of other species Acharya, (2008) reported that in India a decoction of or infusion medicinal herbs is used to treat stomach ailments such as diarrhea, dysentery and intestinal colic with flatulence. Ochiai, (2011) reported that in Brazil a decoction of leaves has been found to be useful in the treatment of ovarian inflammation, amenorrhea, rheumatism, and diarrhea, an infusion of the entire plant has been found to give relief from intestinal pains, anoxia, and arthritis

The results show that various plant types were recorded, these are trees, shrubs, and annuals. This is consistent with Adekunle, (2008) reported various plant life forms of trees, shrubs, and herbs in Omo forest reserve southwestern Nigeria. Most of the medicinal plant species recorded in this study have been shown to be biologically active against various illnesses (Abena et al., 2007); (Oreagba,et al 2011); (Sofowora, 2003); (Okoli et al., 2007); (Oshikoya, et al 2008); (Iwu, 2003). The conservation of these important plants and the knowledge of traditional medicine run in parallel, they are important and interrelated as many medicinal plants are under threat due to over collection and destructive harvesting practices.

CONCLUSION AND RECOMMENDATION

The need to search for or effective drugs to treat malaria cannot be over-emphasized. With the widespread of resistant malaria to orthodox variant across Asia and Africa countries and Nigeria in particular, there is an urgent need to study the most commonly used remedies and plants implicated in their formulation to ascertain their capacity to reduce parasite densities and symptoms of malaria. This study will documented a diversity of plants species used in the treatment of malaria in Southwestern Nigeria. Health and wellness tourism has grown throughout the world and includes the consumption of much traditional medicine. Owing to its medicinal history, India and Nigeria has significant potential for promoting traditional medicine as a consumer product for local consumption, as an export product, and as a tourism resource. It is clearly one of the most important elements of these countries intangible heritagescape that is worthy of additional consideration by tourism developers. Based on this research study many local residents can establish herbal gardens that will enhanced a sense of familiarity with local biodiversity and its conservation, especially herbal plants. The traditional use of herbal health remedies will provides significant nutritional, economic, and ecological benefits for rural communities through tourism. Environmental and management problems are imminent such as deforestation barking of trees, defoliation of plant leaves, and overexploitation, hence efforts should be made to educate the residents on the sustainable harvest. Efforts management plans should be set up to train local residents on the need to cultivate most of these plants around their homes and farms to reduce damages done to the forest reserve The government should set up a mechanism to integrate alternate medicine which is the use of wild herbs with orthodox medicine. This will improve the sustainable use of these wild plants and create an efficient method of collecting extract from the plant species. It is also common knowledge that the safety of most herbal products is further compromised by lack of suitable quality controls, inadequate labeling, and the absence of appropriate patient information

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