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The chemical constituents of some medicinal plants used in health management in South East Nigeria: A review

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Abstract
It has been observed that many Igbos of South East Nigeria use medicinal plants to treat and manage their health problems. This paper lists some of these medicinal plants and their chemical constituents. Over 50% of all synthetic drugs were derived mainly from higher plants and were used since antiquity. In the South East of Nigeria, the Traditional Medicine healers dispensed these plant drugs and their practices were shrouded in secrecy and in an unscientific manner and thus were not accepted by orthodox medical practitioners. The World Health Organization (WHO) in 1987 recognized Herbal Traditional Practice as one of the legitimate Primary Health Care Delivery Systems Worldwide. There has been an upsurge of many illnesses in the society and the problem of fake drugs and the unavailability of genuine drugs has necessitated the use pf plant-based supplements imported from China, India, Japan and other countries or sourced locally for treating or managing these diseases. With improved scientific research method, many of the phytochemicals and other components of these medicinal plants have been identified. The scientific basis of the use of these medicinal plants and the role of some accompanying phytotoxins that can cause severe side effects is also discussed. These medicinal plant drugs should be dose standardized by Government Approved Agencies.

1. Introduction

Herbal medicine is the oldest form of healthcare known to mankind. The Egyptians for instance practiced it many years before the birth of Christ. Herbs and herbal treatment had been used by all cultures throughout history and were also mentioned in the Holy Bible. St. John said “the leaves of trees are the healing of the Nation”. St. Paul said “the weak eateth herbs… etc.” Herbal medicine has been handed down from generation to generation. Hippocrates the Greek physician of the 5th and 6th Century used herbs to treat his patients [1].

The Flora of West-Tropical Africa of which Nigeria is part has for centuries provided a wealth of active potent materials for healing purposes. It is estimated that between 35,000 and 70,000 different species of plants have been used as medicine by various peoples of the world. [2].

Western medicine has its origins in Mesopoania, Egypt, the Unani (Islamic),

Ayurvedic (Hindu) centered in Western Asia and India, the oriental (China, Japan) and Europe (Anglo-Saxon times) [3].

In Nigeria, for many years, traditional herbal healers practiced their trade shrouded in secrecy and often accompanied by magic and incantations. This led to the notion that herbal medicinal practices were demonic and unscientific and thus was shunned and looked down upon by modern orthodox medical practitioners who use synthetic drugs. [4].

Herbal treatment has however stood the test of time, instead of being on the wane, it is spreading even more. Despite all this disarrangement, it is known that ethnic groups in Nigeria of which South East is a part still collect medicinal plants from these herbal medicine practitioners. About 80% of the rural population in South East Nigeria still depends on plant medicine for treatment especially with incidence of drug resistant microorganisms [1,3].

The knowledge of chemistry and allied courses has revealed the nature, classes and constituents of the active materials present in the plants which affect their uses in the treatment and prevention of diseases. The technique used in isolating them involve extraction (using various low boiling solvents), fractionation, purification and subsequent characterization using different techniques such as chromatography, spectroscopic analytical procedures etc [5].

These chemical substances which occur mainly in higher plants are classified as follows: Nitrogen containing – Alkaloids, Terpenoids, Phenolics and other chemical substances [6]. These substances are found in the leaves, flowers, fruits bulbs, stem and roots. The herbs are available as fresh, dried, capsules, tablets, tea, tincture, bath compress, poultice, ointment, incisions, powders, enema etc [7,8,9,10]. The structures of some chemical constituents of plants are presented in Fig I. These substances carry out a number of protective functions in the body such as: boost the immune system, protect the body from free radicals, kill pathogenic germs and much more[10]. The chemical constituents of some of the various plants used in treating different diseases in South East Nigeria are listed in Table 1.

Some of the chemical constituents of the plants are know to be toxic to humans and animals and are known as phytotoxins. They belong to the classes of chemical constitutes mentioned above. These phytotoxins range from mere irritants and inducers of tremors to the very potent carcinogens. Their natures vary from proteinaceous compounds to the more complex heterocyclic compounds and their derivatives. The diversity of these substances has made it a difficult task to enumerate all of them [11,12,13,14].

Nicotine, a toxic alkaloid is present in *Nicotiana tobacum, N. rustica* and *N. glauca*. It has been shown to act on both the central and peripheral nervous systems causing death as a result of the paralysis of the respiratory system. Nicotine poisoning also produces heart palpitations, clammy skin, nausea, vomiting, diarrhea, laboured breathing. In severe poisoning, death may be rapid[12,14].

Plants of the Solanaceae family also synthesize water-extractable substances which have shown anti-choline esterase activity. The most active of these substances are the solanines (glycoalkaloids) which are present in potato plants (*Solanum tuberosum*), the egg plant (*Solanum melongena*) and the deadly nightshade berries.[13,14,15]

The toxic property of cyanogenic glycosides is based on their ability to yield HCN. Dhurrin, for instance occurs in many varieties of sorghum. It is known to be poisonous to animals due to release of HCN from Dhurrin, the main glycoside present in them. After ready absorption into the blood stream, the acid causes death of body cells by blocking the use of oxygen. Aside from death, acute cyanide toxicity at small doses can cause headache, tightness in throat, and chest and muscle weakness [13,16].

Oxalic acid is potentially poisonous if present in plants. It accumulates in large amounts in some species of pants such as those of the genera *Halogeton, Bassia, Oxalis*. It reacts with calcium, removing it from the blood. Crystals of insoluble calcium oxalate cause mechanical damage to the kidneys and other organs[12,16].

The coumarins were formally used as flavours but were discarded following reports of extensive liver damage to rats. It is widely distributed in many plant species. Some deviatives of coumarins found in nature – the furocoumarins e.g psoralen from *Psoralea corylifolia* have been reported to produce photosensitization of the skin[13].

Care should therefore be taken while collecting medicinal herbs in order to avoid collecting plants with toxic constituents. The action of phytotoxins (which depends on dose) is generally described by the physiological or biochemical changes which they produce [12]. The chemical families of naturally occurring plant-made toxins and their effects on humans and animals are presented in Table 2. Structures of some phytotoxins are also presented in Fig. 1.

Table 1. *Disease And Active Ingredients In Plant Materials [2,4,16, 20-27]*

S/N	Disease	Common name of plant/ part used	Botanical Name	Family Name	Active Ingredient	Native Name
1.	Malaria	a. Cinchona, bark and leaf	*Cinchona officinalis*	Rubiaceae	Quinine	-
		b. Paw-paw, leaf	*Carica papaya*	Caricaceae	Vitamins A,B and C, β-carotene, flavonoids, organic acids, resins, papain, pectin, alkaloids	Okwuru - bekee
		c. African basil or Clove basil	*Ocimum gratissimum*	Lamiaceae	Thymol	Nchanwu Dogonyaro

S/N	Disease	Common name of plant/ part used	Botanical Name	Family Name	Active Ingredient	Native Name
2.	Diabetes mellitus	d. Neem, leaf	*Azadirachta indica*	Meliaceae	Alkaloid, Gedunin, Nimbolide	Mangolo
		e. Mango, leaf	*Mangifera indica*	Anacadiaceae	Tannins, Resins, volatile oils, Quercetin, methyl salicylate	Mminiohia
		f. Uvaria, root and leaf	*Uvaria chamae*	Annonaceae	Alkaloid	
		a. Bitter climber	*Congronemria latifolium*	Asclepiadaceae	Alkaloid, Terpenes	Utazi
		b. African cucumber	*Mormodica charantia*	Cucurbitaceae	Charantin (steriodal, saponin),	
		c. Garlic, bulb		Amary llidaceae	Alkaloid, Glycosides, Fatty acids, Terpenoids	Ayo-isi
		d. Banana, flowers	*Alluim sativum*	Musaceae	Allicin, diaysulphide	Unere
		e. Cashew, leaf	*Musa sapientum*	Anarcardiaceae	Potassium	Kashu
		f. Mango, leaf	*Anarcadium occidentale* *Mangifera indica*	Anarcardiaceae	Tannins Tannine, Resins, volatile oils,	Mangolo
		g. Ginger, root	*Zingiber officinale*	Zingiberacea	Quercetin, Methyl salicylate	Oseala
		h. Bridelia, leaf	*Bridelia micrantha*	Euphorbiaceae	Terpenes	Ogaofia
		i. Bitter leaf, leaf, bark roots, fruits.	*Veronia amygdalina* *V. colorata, V. nigritana*	Asteraceae	Tannins Vernonin (bitter glycoside),	Onugbu
		j. Bark	*Anthocleista djalonensis*	Loganiaceae	Veronodalin, Veromygdin, saponnins Alkaloids, inulins, saponins, Glycosides-loganin	Ute agu
3.	Hyperten- sion	a. Banana, fruit	*Musa sapientum*	Musaceae	Potassium	Unere
		b. Avocado, leaf	*Persea americana*	Lauraceae	Potassium	Ube bekee
		c. Bitter leaf, bark, leaf, roots, fruits	*Vernonia amygdalis, V. colorata, V. nigritiana*	Euphorbiaceae	Vernonin (bitter gycoside), Veronodalin, Veromygdin, saponins	Onugbu
		d. Resurrection plant, leaf	*Bryophyllum pinnatum*	Crassulaceae	Glycosides, tannins, flavonoids,	Odaopue
		e. Leopard lily, roots	*Sanseverra liberica*	Agavaceae	Saponins, Steroids, Organic acids Alkaloids, saponins	Ebube agu
4.	Cancers a. Colon b. Prostate	a. Soya bean, Seeds	*Glycine max*	Fabaceae	Glucosyl ceramode (GlcCer) a Sphingolipid Stigmasterol,	Soyabeans
		a. Karaya gum tree, bark	*Sterculia setigera*	Sterculiaceae	Sitosterol	Oseowere
		b. Tomato, fresh fruit	*Lycopersicum esculentum*	Solanaceae	Lupeol (a tritepene)	(Yoruba)
		c. Purge weed	*Euphorbia heterophyta*	Euphorbiaceae	Lycopene Quercetin (a flavonoid)	
		d. Corn silk	*Zea mays*	Graminae	Vitamins C and K, Amylase, Amylopectin, Amylo - hemicellulose, Hordeine (alkaloid), steroids, saponins and Tannins	Tomanto Oka
		e. Ginger	*Zingiber officinale*	Zingiberacea	Terpenes	Oseala
		f. Negro coffee, seed	*Cassia occidentalis*	Fabaceae	Physcion, Stigmasterol, Tannins, Resins, Chrysarobin	Akedi agbara
5.	Liver Disease	Bitter kola	*Garcinia kola*	Clusiaceae	Alkaliod	Akilu
6.	Digestive Disorders (laxative)	a. Guava fruit	*Psidium guajava*	Myrtoideae	Triterpenoids saponines, sitosterol,	Gova
		b. Aloe vera, leaf	*Aloe vera*	Liliaceae	Aloin, flavonoids, saponins	Aloe vera
7.	Ulcers Internal , External, Burns	Aloe vera, leaf	*Aloe vera*	Liliaceae	Aloin, Aloe-emodin (anthraqunone)	Aloe vera
8.	Dermatolo- gical Diseases	a. Ring worm bush	*Cassia alata*	Caesalpiniacea	Anthraquinone, Glycosides Tannins, Saponins, Steroids	Ogalu
		b. Aloe vera, leaf	*Aloe vera*	Liliaceae	Aloin	Aloe vera
		c. African Rauwolfia, leaf	*Rawolfia vomitoria*	Apocyanacea	Tannins, Saponins, Steroids, Alkaloids	Egbu Aloe vera
		d. Resurrection plant, leaf	*Bryophyllum pinnatum*	Crassulaceae	Glycosides, Tannins, Flavonoids, saponins, steroids, organic acids	Odaopue
		e. Leaf	*Tridax procumbens*	Asteraceae	Glycosides, Tannin, flavonoids, Saponins, Steroids, Alkaloids	Akwukwo mmiri
		f. Pig nut, leaf	*Jatropha curcas*	Euphorbiaceae	Glycosides, Tannins, Saponins, Steroids, Alkaloids	
		g. Leaf	*Physalis angulata*	Solanaceae	Glycosides, Tannins,	Ogbakpom

S/N	Disease	Common name of plant/ part used	Botanical Name	Family Name	Active Ingredient	Native Name
		h. Plantain, leaf, peel (ripe and unripe)	*Musa paradisciaca*	Musaceae	Flavonoids, Saponins, Steroids Glycosides, Tannins,	Ogede
		i. Banana, leaf, peel (ripe and unripe)	*Musa sapientum*	Musaceae	Flavonoids, saponins, steroids, Alkaloids Glycosides, Tannins, Flavonoids, saponins, steroids, Alkaloids	Unele
9.	Sickle Cell anemia	a. Pigeon pea	*Cajanus cajan*	Fabaceae	Alkaloids	Fiofio
		b. Fagara	*Zanthoxylon anthoxyloides*	Rutaceae	Phenolics and Fatty acids	Oriata (Yoruba)
10	Anti-Cholesterol	a. Soya bean	*Glycine max*	Fabaceae	Linoleic, Linolenic, Unsaturated fatty acids	Soya beans
		b. Corn Oil	*Zea mays*	Graminae	Oleic, linoleic, Unsaturated fatty acids	Oka
		c. Resurrection Plant	*Bryophyllum pinnatum*	Crassulaceae	Glycosides, tannins, flavonoids, Saponins, Steroids,	Odaopue
		d. Avocado pear	*Persea americana*	Lauraceae	Organic acids Saponins, Triterpenoids	Ube bekee
11	Nervous illnesses a. Mental Disorder b. Hypotensive diuretic ileum contraction c. Stimulant	African Rauwolfia	*Rauwolfia vomitoria*	Apocyanaceae	Reserpine, Ajmaline, Alstonine, Yohimbine	Egbu
		Hog apple, leaf	*Morinda lucida*	Rubiaceae	Digitolutein, Rubiadin,Damnacanthal	Ogere
		a. Coffe tree	*Coffea arabica*	Rubiaceae	Caffeine	Kofi
		b. Kolanut tree	*Cola accuminata, cola nitida*	Steruliaceae	Caffeine, Theobromine, Tannins	Oji
12	Convulsion	a. African Bowstring or whipcord hemp or snake plant	*Sansevieria trifasciata*	Asparagaceae	Alkaloids, saponins	_
		b. Resurrection Plant, leaf	*Bryophyllum pinnatum*	Crassulaceae	Glycosides, Tannins, Flavonoids, Saponins, Steroids, Organic acids	Odaopue
		c. African Guinea Pepper (fruit)	*Xylopia aethiopica*	Annonaceae	Alkaloid, Terpenes	Uda
		d. Fruit and seed	*Tetrapleura tetrapetra*	Fabaceae	Saponisides, Oleanic triglycoside, Coumarin	Uhiokinhio
		e. Oil bean tree (leaf smoke)	*Pentachletra macropylla*	Leguminoceae	Alkaloids, terpenes	Ukpaka
		f. West African Black pepper or Ashanti pepper, leaf and root	*Piper guineense*	Piperaceae	Terpenes, alkaloids	Uziza
		f. Wild Cocoyam, leaf	*Caladium bicolor*	Araceae	Saponins, Tannins	Edemuo
13	Headaches and migraine	a. Horseradish tree, leaf	*Moringa oleifera*	Moringaceae	Vitamins A and C	Okwe-bekee
		b. Tree of life, roots	*Newbouldia laevis*	Bignoniaceae	Alkaloids, Tannins, Saponins	Ogilisi
14	Kidney/ Bladder Urinary	Corn silk	*Zea mays*	Graminae	Vitamin K, Amylase, Amylopectin, Amylo-hemicellulose, Hordene (alkaloid), Steriods, saponins, Tannins	Oka
15	Blood Booster	a. Tender leaves	*Daniella oliveri*	Caesalpiniaceae	Alkaloids, Tannins, Essential oils	Agba
		b. Sweet Potato, leaf	*Ipomea batata*	Convulvulaceae	Alkaloid, Organic acids	Ji-Oyibo
		c. Custard apple, root	*Annona senegalensis*	Annonaceae	Alkaloids, Tannins, Mucilage	Uburu ocha
16	Antihelminthic	a. Resurrection plant, leaf sap	*Bryophyllum pinnatum*	Crassulaceae	Glycosides, Tannins, Flavonoids, Saponins, Steroids, Organic acids	Odaopue
		b. Worm plant, whole plant	*Spigelia anthelmia*	Loganiaceae	Alkaloids, Spigeline	Aparan (Yoruba)
		c. Sodom apple, whole dried plant	*Calotropis procera*	Asclepiadaceae	Calotropin	Otokwuru
17	Inflammation / Boil/Absesses	a. Leopard's claws, leaf	*Acanthus montanus*	Acanthaceae	Alkaloids	Agamebu
		b. Leaf	*Amaranthus hybridus*	Amaranthaceae		Inine
		c. African Spinach, leaf, root, whole plant	*Amaranthus spinosus*	Amaranthaceae	Tannins, resin	Inine Ogwu

S/N	Disease	Common name of plant/ part used	Botanical Name	Family Name	Active Ingredient	Native Name
18	Bronchitis, Asthma	a. Leaf, stem	*Adhatoda vasica*	Acanthaceae		Ajaa
		b. Morning glory, leaf	*Ipomea hederacea*	Convulvulaceae		Elili nda
		c. Wild mustard, leaf, juice	*Cleome ciliate*	Capparidaceae		
		d. Cat whiskers, leaf juice	*Gynandropsis gynandra*	Capparidaceae	Alkaloids	Oyili akpu
19	Ear ache	a. Leopard lily, leaf and root	*Sansevierra liberica*	Agavaceae	Alkaloids and saponins	Ebube agu
		b. leaf	*Creteva adansonii*	Sterculiaceae		
20	Toothache, mouth infection, dental caries	a. Edible stemmed vine, leaf, stem, tuber	*Cissus quadrangularis*	Ampelidaceae	Saponins, tannins	Ogbakiki
		b. leaf	*Spondias mombin*	Anacardiaceae		Ijikere
		c. Calabash nutmeg, root	*Monodora myristica*	Annonaceae	Alkaloids, resin, tannins, saponins	
		d. Giroflier, cloves	*Syzygum aromaticum*	Myrtaceae		Uburu ocha Osara
		e. Young stem twigs	*Alchornea laxiflora*	Euphorbiacee	Alkaloids, tannins, mucilage	agboghoeze Ububo
21	Tuberculosis	Crinum lily, bulb	*Crinum gigantum*	Amaryllidaceae	Alkaloid of the emetic group	Albaza
22	Diarrhea and dysentery	a. Conessi, bark	*Holarrhena floribunda*	Apocyanaceae	Alkaloids, Reducing sugars,	Bakin mutum
		b. bark	*Piliostigma thonningii*	Caesalpiniaceae	tannins, steroidal glycosides	
		c. leaf	*Napoleona vogelii*	Lecythidaceae	Alkaloids, tannins	Nkpodo
		d. bark	*Securinega virosa*	Euphobiaceae		Njisi nta
		e. Broom weed, leaf	*Sida acuta*	Malvaceae	Alkaloids and tannins	Udo
23	Uterine haemorrhage	a. Mangoro, leaf, stem, bark	*Mangifera indica*	Anacadiaceae	Tannins, Resins, volatile oils, Quercetin, methyl salicylate	Mangolo
		b. leaf	*Dracaena mannii*	Agavaceae		Olokoro moudu
24	Jaundice and yellow fever	a. leaf	*Pterianthus macrocarpus*	Lecythidaceae		Anwushi
		b. Conessi, seed	*Holarrhena floribundia*	Apocyanaceae	Alkaloids reducing sugars, tannins, steroidal glycosides	Bakin mutum
25	Leprosy	a. Whole plant	*Synedrella nodiflora*	Asteraceae	Saponins, tannins	Ogwuafo
		b. Oil bean tree, bark	*Pentaclethra macrophylla*	Mimosoidae	Saponins, tannins, paucine	Ugba
		c. Sodom apple, stem, bark	*Calotropis procera*	Asclepiadaceae	Calotropin	Otokawuru
26	Headlice	a. Sea purse, seeds	*Dioclea reflexa*	Fabaceae		Ahu – oku
		b. Sweet potato, leaf	*Ipomoea batatas*	Convulvulaceae	Alkaloids, organic acids	Ji-oyibo
27	Elephantiasis	a. Ata, root and leaf	*Fagara leprieurii*	Rutaceae		Uko
28	Eye disorder	a. Cassava, tuber extract	*Manihot esculenta*	Euphorbiaceae	Saponin, tannin	Akpu
		b. Tree of life, leaf	*Newbouldha laevis*	Bignoniaceae	Alkaloids and saponins	Ogilisi
		c. Goat weed, leaf	*Ageratum conyzoides*	Asteraceae	Phenolic esters, alkaloids	Agadi-isi-awo-ocha
		d. leaf	*Emilia sonchifolia*	Asteraceae	Limonene	Nti ele
		e. Pink lady, leaf and aerial parts	*Dissotis rotundifolia*	Melastomataceae		Oyili-mmuo
29	Tetanus	Bird Goosebery, leaf	*Hoshurindia opposita*	Lamiaceae		Aka-muo

Table 2. *Some Common Plant Toxins And Antinutrients [12,13,16,28]*

S/N	Toxin family	Examples of Occurrence in plants	Effect on human and animals
1.	Cyanogenic glycosides	Sweet potatoes, stone fruits, lima beans, cassava root, whole sorghum	Gastrointestinal inflammation, inhibition of cellular respiration
2.	Goitrogens (Glucosinolates)	Rape (Canola), mustard, radish, cabbage, peanut, soybean, onion, broccoli, Brussels sprouts	Goiter, impaired metabolism, reduced iodine uptake, decreased protein digestion
3.	Glycoalkaloids	Potato, tomato, egg plants	Depressed central nervous system, kidney inflammation, carcinogenic, birth defects, reduced iron uptake cotton seed
4.	Gossypol	Cotton seed	Reduced iron uptake, spermicidal, carcinogenic
5.	Lectins	Most cereals, soybeans, other beans, potatoes	Intestinal inflammation, decrease nutrient uptake/absorption
6.	Oxalate	Spinach, rhubarb, tomato	Reduced solubility of calcium, iron and zinc
7.	Phends	Most fruits and vegetables, cereals, soybeans, potato, tea, coffee	Destroys thiamine, raises cholesterol, oestrogen mimic
8.	Coumarins	Celery, parsley, parsnips, figs.	Light-activated carcinogens, skin irritation

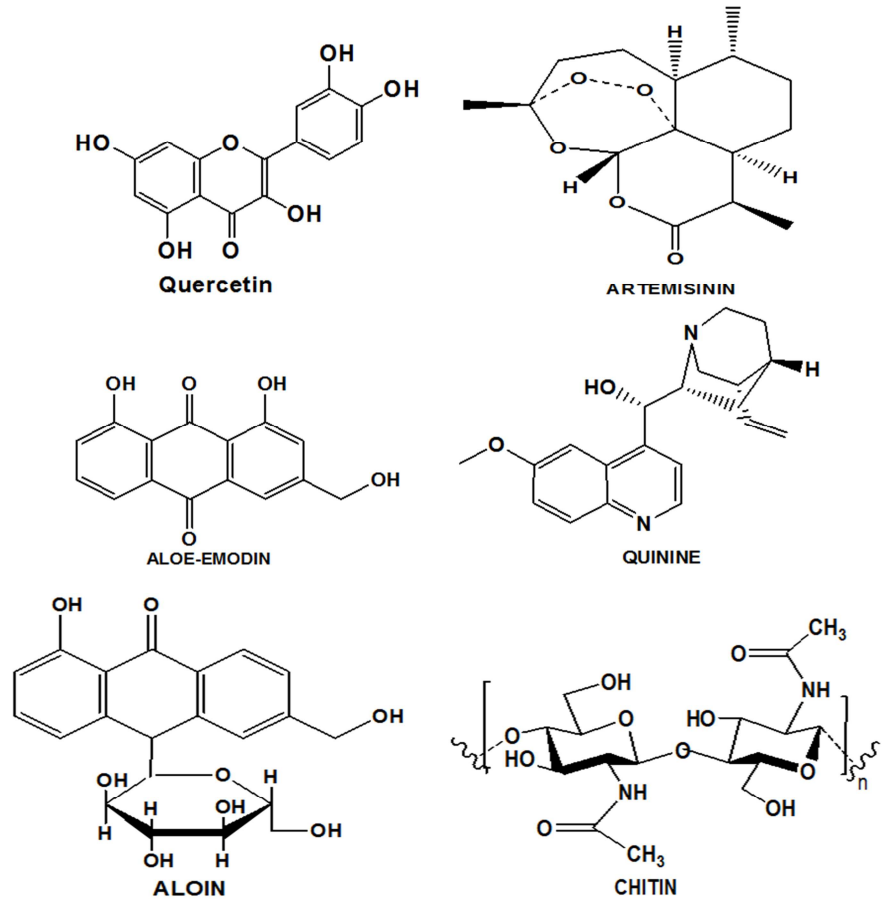

Fig. 1a. *Structures of some compounds found in some medicinal plants*

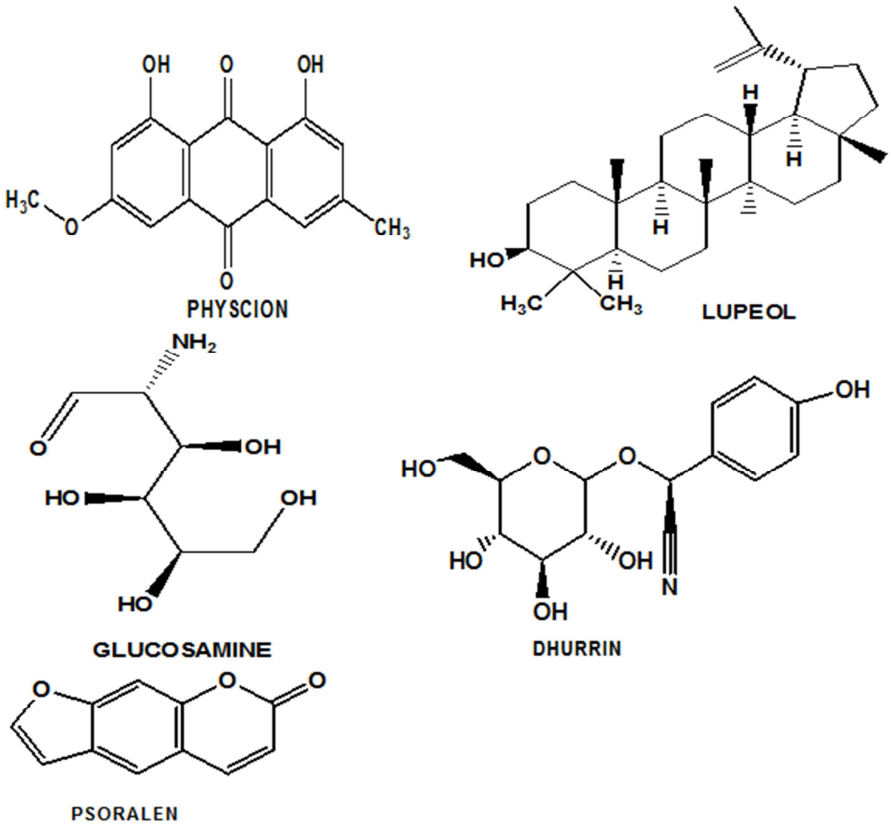

Fig. 1b. *Structures of some compounds found in some medicinal plants continues*

2. Survey of Plants Used in Treating Different Diseases

The survey is presented in table 1.

Recently many herbal drugs are marketed under such names as 'GNLD' 'For Ever Living Product'; 'Tianshi Products', 'For-More Products', 'Edmark Products', etc. These products are now being patronized.

These drugs have been imported into Nigeria from China, Japan, India, South Africa. The chemical composition of some these products are known. Some of them are based on *Aloe vera* species and some from sea foods. For example the Tianshi products marketed as chitin-chitosan is made from the exoskeleton of crabs which are mainly chitin which is an N-acylated glycoside. During usage the chitin is partially de-acylated to release glucosamine. Glucosamine is a biological compound that is responsible for maintaining proper physiological functions of man. This chitin-chitosan is recommended for the prevention of cancers especially digestive system and other forms of cancer[17].

The healing power of foods like the juices of fruits like carrot, oranges, water melon etc and vegetables for treating many difficult diseases like cancers has also been stressed. The author classified foods into living and dead. Living foods are the natural fruits and vegetables and advised it should constitute 80% of our diet. Dead foods are meat, dairy products and cooked foods which should constitute about 20% [18].

3. The Chemical Basis of the Uses of these Plants in Phytotherapy

3.1. The Plants in Phytotherapy

The phytoactive compounds in these plants serve as antimicrobial, antitussive, anti-inflammatory, antiglycaemic, tranquilisers, analgesics, anti-cancers etc agents. For example, beta sitosterol and stigmasterol (sterols); quercetin (flavonoid); beta carotene, lycopene, lupeol (Terpenes), aloin, aloe-emodin, physcion (Anthraquinones) act as anti-oxidants which attack the free radicals (reactive oxygen species) and thus help the body to resist infections, repair damaged cells, prevent cancers, aging, HIV and AIDs. Together with others such as alkaloids, saponins, tannins, vitamins, amino acids, glyconutrients, and mineral supplements all contribute in promoting optimal functioning of the immue, digestive, circulatory, respiratory and excretory systems which the synthetic drugs may not effectively achieve. Phytoactive compounds work well when used under dose standardized controlled instructions[7,11].

4. Conclusion

This literature is not exhaustive. More research works are going on in different tertiary institutions and research centres to isolate the active ingredients in plants in the various geopolitical zones of the country. The active ingredients are known not to only alleviate dysfunctions but also regulate life processes and prevent diseases. Care should be taken to avoid contamination of medicinal herbs by some toxic lethal plants. The myth surrounding the use of herbs is gradually being broken.

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References

[1] Lambo, J.O. (1979). The healing powers of herbs with special reference to obstetrics and gynaecology In: *African Medicinal Plants*, Sofowora, A (ed). University of Ile-Ife press, Ile Ife, Nigeria, pp 23-30.

[2] Okujagu, T.F. (ed) *Medicinal Plants of Nigeria*, South-West Nigeria, Vol. 1, Federal Ministry of Science and Technology, Abuja, Nigeria, pp 1-133.

[3] Trease, G.E. and Evans, W.C. (2002) *Pharmacognosy*, 15th edn., W.S. Saunders, China, pp 3,493.

[4] Sofowora, A. (1979) .African Medicinal Plants (proceedings of a conference), University of Ile-Ife press, Ile-Ife, Nigeria, pvii.

[5] Sofowora, A. (1986). The State of Medicinal Plant Research in Nigeria, University of Ibadan press, Ibadan, Nigeria, p. v.

[6] Kemp, D.S. and Vellaccio, F. (1980). *Organic Chemistry,* Worth Publishers Inc., New York, U.S.A. pp 401-410.

[7] http://www.herbalpalace.com/alternative-medicine/herbal-medicine.html. 11/10/2010.

[8] Pamplona-Roger, G.D. (1999). *Encyclopedia of Medicinal Plants*, Vol. 1, Desktop publishing, Spain. pp 76-93

[9] Finar, I.L. (1975). *Organic Chemistry*, Vol. 2. *Stereochemistry and the Chemistry of Natural Products*, 5th edn., Kyodo Shing Long Printing Industries pte Ltd, Singapore, p. 697

[10] Schultz, J. "Secondary Metabolites in Plants. Biology. The Gale Group Inc. 2002 Encyclopedia. com 17th August, 2009, http://www. encyclopedia.com, 13/9/2009.

[11] Pamplona-Roger, G.D. (1999) *Encyclopedia of Medicinal Plants*, Vol. 2, Desktop Publishing, Spain, pp 481-486, 781.

[12] Phytotoxins, http://en.wikipedia.org/wiki/phytotoxin//, 7/7/2009.

[13] Fuller, T.C. (1997). Poisonous Plants. In: *McGraw Hill Encyclopedia of Science and Technology*, 8th edn, Vol. 14, The Lakeside Press, New York, pp 101-107.

[14] Olumbe, B. (ed.) (1989). *The Metabolism of Aflatoxins and other Mycotoxins*, Akinola Printing works, Ibadan, Nigeria, pp 1-31.

[15] http://en.Wikipedia.org/wiki/Glycoalkaloid, 23/1/2010

[16] Harbone, J.B. (1973). *Phytochemical Methods,* Chapman and Hall Ltd. London, pp 50 – 216

[17] Falodun, A. and Agbakwuru, E.O. (2004). Synthesis of Quercetin tetraacetate, Proceedings of International Conference of the Chemical Society of Nigeria (supplement to J.Chem. Soc. Nigeria), September 20-24, 2004 pp 27-31.

[18] Malkmus, G. (2006). *Hallelujah Diet*, Destiny Image Publishers. Inc. Shippenburg PA 17257 – 0310, pp 141 – 159.

[19] Lata, N. and Dubey, V. (2010). Preliminary Phytochemical Screening of *Eichhornia crassipes*: the world's worst aquatic weed, Journal of Pharmacy Research, 2010, 3 (6), 1240-1242.

[20] Ogunbona, F.A., Akala, E.O., Aiyeoba, K.T., Fadiran, E.O., Femi, O. (eds), (1990) Malaria Hemotherapy in Nigeria-Problems and Prospects, Medex Prospects, Medex Publication Ltd, Lagos, Nigeria, P. 7.

[21] Tor-Anyiin, T.A., Shaato, R., Oluma, H.O.A. (2003). Ethnobotanical Survey of Anti-Malarial Medicinal Plants Amongst the TIV people of Nigeria, Journal of Herbs, Spices and Medicinal Plants, Vol. 10 No. 3, The Haworth Herbal Press, U.S.A. pp 61-74.

[22] Ukwuoma, B and Muanya, C. (2004), Natural Health in Guardian, May 27, p. 45.

[23] Moghadasian, M.H., Frohlich J.J. (1999), Effect of Dietary Phytosterols on Cholesterol metabolism and Arterosclerosis, Clinical and Experimental Evidence, Am. J. Med. 107, pp 588-594.

[24] Akpuaka, M.U. and Ezem, S.N. (2011) Preliminary Phytochemical Screening of Some Nigerian Dermatological Plants, *Journal of Basic Physical Research,* Vol. 2 No. 1, pp 1-5.

[25] Okafor, J.C. and Ham, R. (1999). Identification, Utilization and Conservation of Medicinal Plants in South Eastern Nigeria. *Issues in African Biodiversity Support Programme,* No 3, pp. 1-7.

[26] Akpuaka, M.U. and Tor-Anyin (2011). A Triterpenoid from Stem Bark of *Sterculia setigera*, *J. Chem. Soc. Nig*., Vol. 36. No 2, pp 85-89.

[27] Okujagu, T.F. (ed) (2008) *Medicinal Plants of Nigeria*, South-East Nigeria, Vol. 1, Lisida Consulting, Lagos, Nigeria. pp. 1-204.