

HERBAL MEDICINE IN NIGERIA: HOLISTIC OVERVIEW

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ABSTRACT

Herbal medicine practice in Nigeria is currently attracting serious attention from the scientific and industrial community. The World Health Organization supports the use of herbal medicine provided they are proven to be efficacious and safe. This review attempts to discuss in detail the components of herbal medicines, pros and cons, drug-drug interactions and its role in the primary health care system.

Keywords: Herbal medicines, extracts, interactions, practice in Nigeria

INTRODUCTION

People on all continents have used hundreds to thousands of indigenous plants for treatment of ailments since prehistoric times. History has it that medicinal herbs were found in the personal effects of Otzi the Ice-man, whose body was frozen in the Otztal Alps for more than 5,300 years. These herbs appear to have been used to treat the parasites found in his intestines. Herbal medicine(s) is receiving much attention not only in the developing countries of the world like Nigeria, but also in the western world where it is estimated that about 50 percent of the population uses herbal medicines. Similarly, the World Health Organization (WHO) has estimated that about 4 billion people, 80% of the world population presently use herbal medicine for some aspect of primary health care. Certainly herbal medicine is gaining prominence the world over.

HISTORICAL BACKGROUND

Herbal medicine is the oldest form of healthcare known to mankind. Herbs had been used by all cultures throughout history. It was an integral part of the development of modern civilization. Primitive man observed and appreciated the great diversity of plants available to him. The plants provided food, clothing, shelter, and medicine. Much of the medicinal use of plants seems to have been developed through observations of wild animals, and by trial and error. As time went on, each tribe added the medicinal power of herbs in their area to its knowledgebase. They methodically

collected information on herbs and developed well-defined herbal pharmacopoeias. Indeed, well into the 20th century much of the pharmacopoeia of scientific medicine was derived from the herbal lore of native peoples. Many drugs commonly used today are of herbal origin.

It therefore means that every culture has explored and used plants for medicinal purposes. The presence of several plants with medicinal properties in a *Neanderthal* tomb in Iraq suggests that herbs may have been used therapeutically for more than 60 000 years (Solecki, 1975).

The first records come from China, where the Emperor Shen Nung compiled *Pen Tsao* (The Great Herbal, or Chinese *Materia Medica*) in about 3000 BC. This book had many subsequent editions, and many of the thousand or more drugs described are still used in China (Guthrie, 1945). Ancient Egyptian medicine of 1000 B.C. are known to have used garlic, opium, castor oil, coriander, mint, indigo, and other herbs for medicine and the Old Testament also mentions herb use and cultivation, including mandrake, vetch, caraway, wheat, barley, and rye. It is also on record that the Ebers Papyrus discovered in a tomb in Egypt in 1862, dates from 1550 BC and is the oldest medical text to survive. It contains hundreds of herbal remedies, including castor seeds and senna for constipation, and a decoction of cumin, goose fat and milk for various stomach complaints. Mesopotamian practice is recorded on a thousand clay tablets dating from the 7th Century BC: over 200

plant-derived medicines again included castor oil and senna as laxatives (Porter, 1977).

In the written record, the study of herbs dates back over 5,000 years to the Sumerians, who described well-established medicinal uses for such plants as laurel, caraway, and thyme.

In Indian Ayurveda medicine has used many herbs such as turmeric possibly as early as 1900 B.C (Argawal *et al.*, 2007). Many other herbs and minerals used in Ayurveda were later described by ancient Indian herbalists such as Charaka and Sushruta during the 1st millennium BC. The Sushruta Samhita attributed to Sushruta in the 6th century BC describes 700 medicinal plants, 64 preparations from mineral sources, and 57 preparations based on animal sources (Girish and Shridhar, 2007).

The first Chinese herbal book, the Shennong Bencao Jing, compiled during the Han Dynasty but dating back to a much earlier date, possibly 2700 B.C, lists 365 medicinal plants and their uses - including ma-Huang, the shrub that introduced the drug ephedrine to modern medicine. Succeeding generations augmented on the Shennong Bencao Jing, as in the Yaoxing Lun (Treatise on the Nature of Medicinal Herbs), a 7th century Tang Dynasty treatise on herbal medicine.

The ancient Greeks and Romans made medicinal use of plants. Greek and Roman medicinal practices, as preserved in the writings of Hippocrates and - especially - Galen, provided the pattern for later western medicine. Hippocrates advocated the use of a few simple herbal drugs - along with fresh air, rest, and proper diet. Galen, on the other hand, recommended large doses of drug mixtures - including plant, animal and mineral ingredients. The Greek physician compiled the first European treatise on the properties and uses of medicinal plants, De Materia Medica. In the first century AD, Dioscorides wrote a compendium of more than 500 plants that remained an authoritative reference into the 17th century.

Medicinal plants are densely distributed in the tropical rainforest zones of the world of which Nigeria fall into. The medical systems in developing countries involve both traditional herbal systems and orthodox medicines.

Due to the economic predicament of these countries, the people resort to the traditional herbal system for their primary health care needs. In Africa, particularly Nigeria, new drugs are not often affordable thus up to 80 % of the population use medicinal plants as remedies (Kirby, 1996; Hostettmann and Marston, 2002). For instance, *Nuclea latifolia* is therapeutically useful in dental caries (Falodun *et al.*, 2007). It was reported by WHO that in Nigeria, the ratio of Traditional Health Practitioners to the population was 1:110, while the ratio of Medical Doctors to the population was 1:16, 400 (African Health Monitor, 2003). This gives credence to the fact that people patronise Traditional medicine practitioners (TMPs) for their primary health needs more than orthodox medical doctors (WHO, 2002). This condition and the fact that international commercial orthodox medicines are becoming increasingly out of reach for most Nigerians contributed to the dependence of a large percentage of the Nigeria people on local herbal medicine (Sofowora, 1992). It is however worth noting that Africa, North and South America together with Asia are the areas containing the worlds' greatest number of plants species that are not found elsewhere. From this immense reservoir of plants, herbalists in Nigeria source different herbal medicines which are widely used today and surprisingly gaining recognition by government as can be seen by the establishment of the Herbal Medicine Board.

WHAT ARE HERBAL MEDICINES?

Herbal medicine -- also called botanical medicine, phytomedicine or plant medicine has been defined by WHO as finished labelled medicinal products that contain as active ingredient aerial or underground parts of plants or other plant materials - which include in addition to herbs, fresh juices, gums, fixed oils, essential oils, resins, and dry powders of herbs - leaves, bark, roots, rhizomes or other plant parts which may be entire, fragmented or powdered, or combinations thereof whether in the crude state or as plant preparations. Herbal medicines have been used to treat many conditions, such as asthma, eczema, premenstrual syndrome, rheumatoid arthritis, migraine, menopausal symptoms, chronic fatigue, and

irritable bowel syndrome, among others. Herbs as medicines should be taken with caution because of some undesirable side effects associated with their use. Substances derived from plants remain the basis for a large proportion of the commercial medications used today for the treatment of heart disease, high blood pressure, pain, asthma, and other problems. For example, ephedra (herb) used in Traditional Chinese Medicine for more than two thousand years to treat asthma and other respiratory problems. Ephedrine, the active ingredient in ephedra, is used in the commercial pharmaceutical preparations for the relief of asthma symptoms and other respiratory problems. It helps the patient to breathe more easily. Another example of the use of herbal preparations in modern medicine is the foxglove plant. This herb had been in use since 1775. At present, the powdered leaf of this plant is known as the cardiac stimulant digitalis to the millions of heart patients it keeps alive worldwide.

There are over 750,000 plants on earth. Relatively speaking, only a very few of the healing herbs have been studied scientifically. And because modern pharmacology looks for one active ingredient and seeks to isolate it to the exclusion of all the others, most of the research that is done on plants continues to focus on identifying and isolating active ingredients, rather than studying the medicinal properties of whole plants. Herbalists, however, consider that the power of a plant lies in the interaction of all its ingredients. Plants used as medicines offer synergistic interactions between ingredients both known and unknown.

TRADITIONAL MEDICINE

Herbal medicine in proper context cannot be divorced from Traditional Medicine Practice. Therefore, it is just proper we know what traditional medicine is. The WHO define traditional medicine as the sum of all knowledge and practices (whether explicable or not) used in the diagnosis, prevention and elimination of the physical, mental, and social imbalance and relying exclusively on the practical experience and observations handed down from generation to generation whether verbally or orally or in writing. From the above definition, it can be seen that traditional medicine practice stem

from the knowledge of herbal medicines. Africans and Nigerians in particular do not just see disease as being caused by physical factors but also include the concept of spiritual influences i.e. ancestral spirits. The traditional treatment has to take into account these various supernatural causes. The traditional African healer knows a lot about physical causes of illness and also has the great knowledge of the kind of leaves, fruits, roots and juices of plants and their combinations which can be used medicinally.

SOME HERBAL MEDICINES IN USE IN NIGERIA AND THEIR APPLICATIONS.

Few herbal remedies have conclusively demonstrated any positive effect on humans, possibly due to inadequate testing (Ernst, 2007). Many of the studies cited refer to animal model investigations or in-vitro assays and therefore cannot provide more than weak supportive evidence.

However, examples of medicinal plants in use in other parts of the world and in Nigeria in particular that have demonstrable some interesting pharmacological results includes:

Aloe vera. It is traditionally used for the healing of burns and wounds (Maenthaisong *et al.*, 2007). A systematic review (from 1999) states that the efficacy of aloe vera in promoting wound healing is unclear, while a later review (from 2007) concludes that the cumulative evidence supports the use of aloe vera for the healing of first to second degree burns (Ernst, 2007; Vogler and Ernst, 1999).

Boophone (*Boophone disticha*) this highly toxic plant has been used in South African traditional medicine for treatment of mental illness (Stafford *et al.*, 2008). Research demonstrated in vitro and in vivo effect against depression (Pedersen *et al.*, 2008; Sandager *et al.*, 2005; Neergaard *et al.*, 2009).

Alligato pepper, *Aframomism melegueta*. K. Schum (Zingiberaceae) Local names: Yoruba- oburo ata. Ata ire, Urhobo- Erhie, Huasa - chitta, gyan'dammar yaji. The fruits, seeds, leaves are used as stimulant, and as remedy against cold.

Calendula (*Calendula officinalis*) is used traditionally for abdominal cramps and constipation (Gordon, 1998). In animal research an aqueous-ethanol extract of *Calendula officinalis*

nalis flowers was shown to have both spasmolytic and spasmogenic effects, thus providing a scientific rationale for this traditional use (Bashir *et al.*, 2006).

Goat weed (*Ageratum conyzoides* L (Compositae) Local name: Yoruba – ime-esu, imi-ewure, Ibo- akwukwo-nwa osi nake, Urhobo- Ikpamak. The whole plant leaves and seeds are used in herbal formula. The juice from fresh plant is used for dressing wounds, ulcers, craw craw and as a remedy for inflammation. A decoction of the root is a remedy for abdominal pains and the raw root is chewed for digestive disorders.

Garlic (*Allium sativum*) L.Liliaceae, Hausa- Tafarnwa, The bulbs and leaves parts are used in ethnomedicine. It has diuretic properties and is given in fevers, coughs, flatulence, disorders of the nervous system. It has been used as a remedy for asthma and hoarseness of the chest. The bulb juice is used as a broad spectrum antibiotic against fungi and bacteria. It may also lower total cholesterol levels (Ackerman *et al.*, 2001).

Echinacea (*Echinacea angustifolia*, *Echinacea pallida*, *Echinacea purpurea*) extracts is used for the treatment of rhinovirus colds (Shah *et al.*, 2007).

Feverfew (*Chrysanthemum parthenium*) is sometimes used to treat migraine headaches (Shrivastava *et al.*, 2007). Although many reviews of Feverfew studies show no or unclear efficacy, a more recent RTC showed favourable results (Silberstein, 2005). Feverfew is not recommended for pregnant women as it may be dangerous to the fetus (Yao *et al.*, 2006; Modi and Lowder, 2006).

Gawo (*Faidherbia albida*), a traditional herbal medicine in West Africa, has shown promise in experimental animal tests (Tijani *et al.*, 2008).

German Chamomile (*Matricaria chamomilla*) has demonstrated antispasmodic, anxiolytic, anti-inflammatory and some antimutagenic and cholesterol-lowering effects in animal research (Mckay *et al.*, 2006). In vitro chamomile has demonstrated moderate antimicrobial and antioxidant properties and significant antiplatelet activity, as well as preliminary results against cancer. Essential oil of chamomile was shown to be a promising antiviral agent against herpes simplex virus type 2

(HSV-2) in vitro (Koch *et al.*, 2008).

Ginger (*Zingiber officinale*), administered in 250 mg capsules for four days, and effectively decreased nausea and vomiting of pregnancy in a human clinical trial used for colds, toothaches, asthma, rheumatism, piles and headaches. The ripe fruit is given as laxative. Seeds boiled with milk are believed to be powerful abortifacient and remedy for diabetes.

Grapefruit (*Naringenin*) components may prevent obesity.

Green tea (*Camelia sinensis*) components may inhibit growth of breast cancer cells and may heal scars faster (Belguise *et al.*, 2007; Zhang *et al.*, 2006).

Honey may reduce cholesterol and wound healing (Al Walili, 2004).

Lemon grass (*Cymbopogon citratus*), Local name: Isoko- eghu. When administered daily, the aqueous extract of the fresh leaf, has lowered total cholesterol and fasting plasma glucose levels in rats, as well as increasing HDL cholesterol levels. Lemon grass administration had no effect on triglyceride levels (Adeneye and Agbaje, 2007).

Morinda citrifolia (*noni*) is used in the Pacific and Caribbean islands for the treatment of inflammation and pain (Pande *et al.*, 2005). Human studies indicate potential cancer preventive effects (Wang *et al.*, 2009).

Black cumin (*Nigella sativa*) has demonstrated analgesic properties in mice. The mechanism for this effect, however, is unclear. In vitro studies support antibacterial, antifungal, anticancer, anti-inflammatory and immune modulating effects (Hajhashemi *et al.*, 2004).

Pawpaw (*Carica papaya* L Caricaceae) local name: Hausa- gwanda, Ibo- okwulu ezi, Yoruba- ibepe, sigun, gbegebe is used as insecticide use for wound dressing (Regnault *et al.*, 2004).

Peppermint oil is used in Nigerian ethnomedicine as remedy against irritable bowel syndrome (Capello *et al.*, 2007).

Pomegranate contains the highest percentage of ellagitannins of any commonly consumed juice. Punicalagin, an ellagitannin unique to pomegranate, is the highest molecular weight polyphenol known. Ellagitannins are metabolized into urolithins by gut flora,

and have been shown to inhibit cancer cell growth in mice (Heber, 2008).

Rauvolfia serpentina, high risk of toxicity if improperly used extensively for sleeplessness, anxiety and high blood pressure and has been widely used in Nigeria in the management of psychiatric problems.

Rose hips – Small scale studies indicate that hips from *Rosa canina* may provide benefits in the treatment of osteoarthritis.

Saw Palmetto can be used for (high blood pressure) BPH. The fat soluble extract of this berry has become a leading natural treatment for BPH. This extract when used regularly, has been shown to help keep symptoms of BPH in check (Schneider *et al.*, 1995).

Shiitake mushrooms (*Lentinus edodes*) are edible mushrooms that have been reported to have health benefits, including cancer-preventing properties (Fang *et al.*, 2006). In laboratory research a shiitake extract has inhibited the growth of tumor cells through induction of apoptosis. Both a water extract and fresh juice of shiitake have demonstrated antimicrobial activity against pathogenic bacteria and fungi (Hearst *et al.*, 2009).

St. John's wort, has yielded positive results, proving more effective than a placebo for the treatment of mild to moderate depression in some clinical trials (Kuznetsov *et al.*, 2005). A subsequent, large, controlled trial, however, found St. John's wort to be no better than a placebo in treating depression (Gaster and Holroyd, 2000). However, more recent trials have shown positive results (Davidson or positive trends that failed significance. A 2004 meta-analysis concluded that the positive results can be explained by publication bias but later analyses have been more favorable. The Cochrane Database cautions that the data on St. John's wort for depression are conflicting and ambiguous.

Stinging nettle in some clinical studies effective for benign prostatic hyperplasia and the pain associated with osteoarthritis. In-vitro tests show antiinflammatory action. In a rodent model, stinging nettle reduced LDL cholesterol and total cholesterol. In another rodent study it reduced platelet aggregation.

Umckaloabo (*Pelargonium sidoides*): an extract of this plant showed efficacy in the treatment of acute bronchitis in a controlled

trial and is approved for this use in Germany.

Willow bark (*Salix alba*) can be used for a variety of anti-inflammatory and antimicrobial purposes due to presence of salicylic acid and tannins. Has been in use for aprox. 6000 yrs and was described in the 1st century AD by Dioscorides (Mahdi *et al.*, 2006).

Cam wood *Baphia nilida* Latal (Papilionaceae) local name: Yoruba-owiwi, irosun, Hausa- majiga, Urhobo- orhua. In urhobo land a paste of its leaves is applied to the lower portion of the abdomen of pregnant women to prevent miscarriage.

Bitter leaf (*Vernonia amygdalina*, L (compositae) local name: Yoruba- ewuro, Hausa-shiwaka, Urhobo- olugbo. A decoction of the leaves is used for stomach pains. Also used for skin infections, as an antipyretic, laxative and antidiabetic.

Ginkgo (*Ginkgo biloba*) has been used in traditional medicine to treat circulatory disorders and enhance memory. Although not all studies agree, ginkgo may be especially effective in treating dementia (including Alzheimer's disease) and intermittent claudication (poor circulation in the legs). It also shows promise for enhancing memory in older adults. Laboratory studies have shown that ginkgo improves blood circulation by dilating blood vessels and reducing the stickiness of blood platelets. By the same token, this means ginkgo may also increase the effect of some blood-thinning medications, including aspirin. Kava kava (*Piper methysticum*) is said to elevate mood, well-being, and contentment, and produce a feeling of relaxation. Several studies have found that kava may be useful in the treatment of anxiety, insomnia, and related nervous disorders. However, there is serious concern that kava may cause liver damage. It's not clear whether the kava itself caused liver damage in a few people or whether it was taking kava in combination with other drugs or herbs. It's also not clear whether kava is dangerous at previously recommended doses, or only at higher doses. Some countries have taken kava off the market. It remains available in the United States, but the Food and Drug Administration (FDA) issued a consumer advisory in March of 2002 regarding the "rare" but potential risk of liver failure associated with kava-containing products.

HERBAL MEDICINES IN NIGERIA: PAST AND PRESENT

Traditional medicine had in the past been seen as a fetish way of curing diseases. It is believed that poor and illiterate individuals are the patronisers of traditional medicine. This thought is buttressed by the point that most of its practitioners were regarded as witch doctors who took care of their patient with occultic powers. Practitioners of traditional medicine were not in any way seen as doctors; even the western trained doctors saw them as a threat to the well being of their patient.

It should be however be noted that before now, quacks bedevilled the Nigerian traditional medicine practice. This was largely due to lack of necessary legislations to control and regulate the practice. But regulation of herbal medicines was introduced in Nigeria in 1993 in Decree No.15 and was revised in 1999. Under this decree herbal medicines are regulated as dietary supplements, health foods, functional foods and as an independent regulatory category. As reported in the WHO global survey on National policy on traditional medicine and regulation of herbal medicines, May 2005, Nigeria, the expert committee on TM/CAM was created in 1978. The work of this committee led to the creation of two national research institutes on TM/CAM and herbal medicines, founded in 1988 and 1992. They are the Nigeria Natural Medicines Development Agency in Lagos, Nigeria and the National Institute for Pharmaceutical Research and Development. In recent years, the treatments and remedies used in traditional African medicine vis- a-vis Nigeria have gained more appreciation from researchers in Western science. Developing countries have begun to realize the high costs of modern health care systems and the technologies that are required, thus proving Africa's dependence to it (Helwig, 2010). Due to this, interest has recently been expressed in integrating traditional African medicine into the continent's national health care systems.

Today, in some Asian and African countries, up to 80 % of the population relies on traditional medicine or practices for their primary health care needs (WHO. Fact Sheet, Traditional Medicine, Geneva, May 2003.). In

Nigeria, it's no exception the Nigerian people and even the government equally are aware of the role and need for an alternative means of health care for the people. This awareness gave birth to the establishment of the "Nigerian Natural Medicine Development Agency" (NNMDA).

Herbal medicine/traditional medicine practice in Nigeria permeates every tribe. In a research involving Eighty nine species, plants belonging to forty six families were identified from fifty respondents, with herbal recipes recorded for thirty five ailments or therapeutic indications/uses. Individual plant species with highest frequency of prescription include *Nuclea latifolia* and *Pilliosigma thonningii*, *Ageratum conyzoides*, *Newboldia laevis*, *Phyllanthus muererianus* *Cochlospermum planchonii*, *Ocimum gratissimum* and *Parkia biglobosa*. This research indicates that for the Igede people in Benue state traditional medicine have wide acceptability and a long history (Igoli *et al.*, 2005).

THE PROS AND CONS OF HERBAL MEDICINES.

Increasing cost and distrust of modern western medical care in recent years has promoted the use of alternative and traditional therapies. Many of these herbal remedies include some form of herbal or homoeopathic remedy that is not medically regulated for safety or efficacy (Ernst and White, 2000).

In most developed countries herbal medicines are gaining popularity. However, usually herbal medicines in most places are not regulated as medicines. Problems might arise as a result of the lack of adequate regulations, the pharmacological complexity of herbal products and the paucity of information on the pharmacological and toxicity of these compounds. Herbal medicines can be purchased from outlets ranging from health food stores to internet sites and thus crucial evaluation of their safety is relevant and important.

The upsurge of global awareness and use of herbal medicines has created the multiplicity of markets of these herbal remedies and increase in herbal preparation and formulation in the Nigerian market. Listed below are few of such preparations:

- B-Success 28 plant, a Powder, use as an

- antibiotic with aloe vera
- Operation sweep, a Powder, use for Rheumatoid arthritis
- Aloe vera Tablets, an Antioxidant
- Zarausmacine, Powder, an Antibiotic
- Virgy-virgy computer Worm expeller, powder, worm expeller
- Dorasine powder, Powder, Typhoid fever, malaria,
- Man power Powder, Watery of sperm, low sexual energy sperm count, diabetes

The popularity and availability of these remedies has generated concerns regarding the safety, efficacy and responsibility of practitioners using the Nigerian traditional remedies.

These influx of herbal remedies into the Nigeria market, with some meeting and some not meeting the requirements set by the standard organization of Nigeria (SON) and the national agency for food and drug administration and control (NAFDAC), is a matter of concern that some cases of poisoning by unidentified chemicals and concoctions might have been due to inadequate or improper labelling requirements of these remedies (Obi, 1997).

Several herbs used in traditional medicine have been validated by scientific evidence for their efficacy and safety (Okunji *et al.*, 1997). Attempts to isolate the active constituents and develop them into therapeutic agents have posed far more challenges than was anticipated. The usual sequence in drug discovery based on traditional medicine is the identification of the herbs used by traditional healers and subjecting them to *in vitro* bioassay. This has not been as successful as would be expected given the resources and time expended in bioassay guided separation of plant extracts. Due to reasons which are not completely well understood, some plant extracts appear to have biological activities that are superior to that of the isolated pure compounds. The organic fraction of the alcoholic extracts of *Enantia chlorantha* and *Ancistrocladus* spp. for example, showed greater antiplasmodial activity than the individual compounds isolated from them. In other cases, the *in vivo* laboratory results did not correlate with either the ethnomedical evidence or the clinical observations. The *in vivo* antiplasmodial activity of,

Pothomorphe umbellata, a well known traditional Brazilian antimalarial plant could not be confirmed using the standard intraperitoneal *Plasmodium berghei* mice model (De Ferreira da Cruz, 2000).

One herbal product worth mentioning come by the trade name Jobelyn an extract of *Sorghum bicolor*, a NAFDAC registered herbal product presented in the form of capsules and syrup, marketed by "Health Forever" in Nigeria. The product has high antioxidant rating, promotes heart health, regenerates red blood cells and thus has been used in the Nigerian health care system as an adjunct in the management of sickle cell disease. It promotes immune response and healthy joint function.

The above notwithstanding, "adulteration, inappropriate formulation, or lack of understanding of plant and drug interactions have led to adverse reactions that are sometimes life threatening or lethal.

Herbal remedies can also be contaminated, and herbal medicines without established efficacy, may unknowingly be used to replace medicines that do have corroborated efficacy (Ernst, 2007). Although not frequent, adverse reactions have been reported for herbs in widespread use (Sal, 2006). On occasion serious untoward outcomes have been linked to herb consumption. A case of major potassium depletion has been attributed to chronic licorice ingestion, and consequently professional herbalists avoid the use of licorice where they recognise that this may be a risk.

NAME CONFUSION

The common names of herbs (folk taxonomy) may not reflect differences in scientific taxonomy, and the same (or a very similar) common name might group together different plant species with different effects. For example, in 1993 in Belgium, medical doctors created a formula including some Traditional Chinese medicine (TCM) herbs for weight loss. One herb (*Stephania tetrandra*) was swapped for another (*Aristolochia fangchi*) whose name in Chinese was extremely similar but which contained higher levels of a renal toxin, aristolochic acid; this mistake resulted in 105 cases of kidney damage.

Note that neither herb used in a TCM con-

text would be used for weight loss or given for long periods of time. In Chinese medicine these herbs are used for certain forms of acute arthritis and edema (Dan Bensky *et al.*, 2004; Vanherweghem *et al.*, 1993; Lin *et al.*, 2003).

INTERACTIONS OF HERBAL MEDICINES WITH ORTHODOX MEDICINES.

Many people have the mistaken notion that, being natural, all herbs and foods are safe. This is not so. Very often, herbs and foods may interact with medications you normally take that result in serious side reactions. Experts suggest that natural does not mean it is completely safe. Everything you put in your mouth has the potential to interact with something else. The medication that is taken by mouth travels through the digestive system in much the same way as herbs taken orally do. So, when a drug is mixed with herb or another food, each can alter the way the body metabolizes the other. Some drugs interfere with the body's ability to absorb nutrients. Similarly, some herbs can lessen or increase the impact of a drug.

Some dietary components increase the risk of side effects. Theophylline, a medication administered to treat asthma, contains xanthines, which are also found in tea, coffee, chocolate, and other sources of caffeine. Consuming large amounts of these substances while taking theophylline increases the risk of drug toxicity. Certain vitamins and minerals impact on medications too. Large amounts of broccoli, spinach, and other green leafy vegetables high in vitamin K, which promotes the formation of blood clots, can counteract the effects of heparin, warfarin, and other drugs given to prevent clotting.

Dietary fibre also affects drug absorption. Pectin and other soluble fibres slow down the absorption of acetaminophen, a popular painkiller. Bran and other insoluble fibres have a similar effect on digoxin, a major heart medication.

Hawthorn, touted as effective in reducing angina attacks by lowering blood pressure and cholesterol levels, should never be taken with digoxin, the medication prescribed for most heart ailments. The mix can lower the heart rate, causing blood to pool, bringing on possible heart failure. Ginseng can increase blood

pressure, making it dangerous for those trying to keep their blood pressure under control. Ginseng, garlic or supplements containing ginger, when taken with the blood-thinning drug, Coumadin, can cause bleeding episodes. Coumadin is a very powerful drug that leaves little room for error, and patients taking it should never take any medication or otherwise before consulting a qualified health professional.

In rare cases, ginseng may over stimulate the CNS resulting in insomnia. Consuming caffeine with ginseng increases the risk of overstimulation and gastrointestinal upset. Long term use of ginseng may cause menstrual abnormalities and breast tenderness in some women. Ginseng is not recommended for pregnant or lactating women.

Ginkgo Biloba. The active ingredients in *Ginkgo biloba* extract account for its antioxidant properties and its ability to inhibit platelet aggregation. Consequently, this herbal product is promoted for use in improving cognitive function and blood flow. To date, however, at least four reports of spontaneous bleeding in association with use of *Ginkgo biloba* have been published (Rosenblatt and Mindel, 1997). *Ginkgo biloba* has potential interactions with garlic, vitamin E and medications with antiplatelet or anticoagulant properties.

Garlic capsules combined with diabetes medication can cause drastic decrease in blood sugars level. Some people who are sensitive to garlic may experience heartburn and flatulence. Garlic has anti-clotting properties. Goldenseal is used for coughs, stomach upsets, menstrual problems and even arthritis. However, the plant's active ingredient will raise blood pressure, complicating treatment for those taking antihypertensive medications, especially beta-blockers. For patients taking medication to control diabetes or kidney disease, this herb can cause dangerous electrolyte imbalance. High amount of consumption can lead to gastrointestinal distress and possible nervous system effects. Not recommended for pregnant or lactating women.

Feverfew, believed to be the natural remedy for migraine headaches, should never be taken with other migraine medications. It can result in the patient's heart rate and blood

pressure to raise dangerous levels.

Guarana, an alternative remedy being used as a stimulant and diet aid, contains 3 percent to 5 percent more caffeine than a cup of coffee. So, if you are taking any medication that advises you against taking any drink with caffeine, you should avoid taking this stimulant. It may cause insomnia, trembling, anxiety, palpitations, urinary frequency, and hyperactivity. Avoid during pregnancy and lactation period. Long term use of Guarana may lead to decreased fertility, cardiovascular disease, and several forms of cancer.

Kava: A herb that has anti-anxiety, pain relieving, muscle relaxing and anticonvulsant effects, should not be taken together with substances that also act on the central nervous system, such as alcohol, barbiturates, anti depressants, and antipsychotic drugs. Kava has also been shown to have additive effects with central nervous system depressants. A patient who was taking Alprazolam (Xanax), cimetidine (Tagamet) and terazosin (Hytrin) became lethargic and disoriented after ingesting kava (Almedia and Grimsley, 1996).

Kava should not be used with benzodiazepines, barbiturates, antipsychotics and alcohol. In addition, patients with Parkinson's disease should be discouraged from using kava products.

Kava dermatopathy has been reported with the use of kava as a traditional South Pacific beverage. Recently, two cases associated with use of commercially available kava preparations were reported. A 70-year-old man who had been taking kava extract for anxiety for two to three weeks experienced itching several hours after sun exposure. Erythematous, infiltrated plaques then developed on his face, chest and back. A similar case involved a 52-year-old woman who presented with papules and plaques on her face, arms, back and chest after taking a kava extract for three weeks. In both cases, biopsy revealed lymphocytic infiltration of the dermis with destruction of the sebaceous glands. Because kava is lipophilic, it was hypothesized that kava can concentrate in sebaceous oils and trigger an immune response, resulting in a drug reaction (Jappe *et al.*, 1998).

St. John's Wort is a popular herb used for the treatment of mild depression. The active in-

gredient of St. John's Wort is hypericin. Hypericin is believed to exert a similar influence on the brain as the monoamine oxidase (MAO) inhibitors such as the one in major antidepressants. Mixing MAO inhibitors with foods high in tyramine, an amino acid, produces one of the most dramatic and dangerous food-drug interactions. Symptoms, which can occur within minutes of ingesting such foods while taking an MAO inhibitor, include rapid rise in blood pressure, a severe headache, and perhaps collapse and even death.

Some patients report that Saint John's Wort caused excessive stimulation and sometimes dizziness, agitation and confusion when taken with other antidepressants (Gordon, 1998).

White Willow, a herb traditionally used for fever, headache, pain, and rheumatic complaints may lead to gastrointestinal irritation, if used for a long time. It exhibits similar reactions as aspirin (aspirin is derived from white willow). Long term use may lead to stomach ulcers.

HERBAL MEDICINES: THE PROGRESS SO FAR IN NIGERIA.

Health is the most precious of all things and it is the foundation of all happiness. Traditional medicine has developed in various communities in Nigeria in response to the health needs of the people. Many communities have, therefore, since creation, developed various traditional systems using locally-available resources for the alleviation of their health problems. The development of traditional medicine in Nigeria has led to various categories of healers, the various healing methods, strategies and medicines or remedies now known. The British colonial masters brought in orthodox medicine and, today, both systems of medicine exist in the country; both have the primary objective to cure, manage or prevent diseases and maintain good health.

It should be recalled that Nigeria like most African states marked the African Traditional Medicine day was observed in Nigeria for the first time in 2003 following its inclusion on the WHO's calendar for observance in member states, so as to promote the role of traditional medicine in the continents' healthcare system. The country has made "a number of

mile stones" in pursuance of the objectives of the African Traditional Medicine Day. According to the microbiologist, that the nation is making progress can be seen in the fact that the nation found it worthy to establish the agency, which is a parastatal under the Federal Ministry of Science and Technology, to research, develop, document, preserve and promote the nation's natural medicine, which has been explained to be "traditional or indigenous healthcare systems, medications and non-medications, healing arts, sciences and technologies."

The agency pioneered the development of a pharmacopoeia, a database listing drug use in medical practice and describing their compositions, preparations, uses, dosages, effects and side effects, the Nigerian context.

Another landmark is the fact that the National Agency for Food, Drugs Administration and Control (NAFDAC) "has put together criteria for listing traditional medicine". And the nation currently has a Traditional Medicine Bill before the National Assembly. Once passed by the relevant authorities, the bill "Will regulate the practice and practitioners in such a way that it would facilitate the integration of traditional medicine into healthcare system." Although Nigeria's slow progress and little role in global natural medicine practice can be attributed to strong resistance from orthodox medicine practitioners in the country. Hostility to the development of traditional medicine has been coming from the orthodox medical practitioners owing to their level of lack of understanding of what traditional medicine is supposed to be.

In Nigeria, the National institute for Pharmaceutical Research and Development (NIPRD), Abuja, and the Nigeria Natural Medicine Development Agency (NNMDA), Lagos, are blazing the trail in the development alternative medicines in the management of AIDS/Malaria. They have made progress in developing herbal cures for AIDS, malaria and TB, screening is ongoing for over 20 plants for diabetes, TB and hypertension which are part of the critical projects at the NNMDA.

Similarly, a study on preliminary evaluation of a local phytomedicine for the management of HIV/AIDS by a team of researchers from

NIPRD published in the Newsletter of the International Conference on AIDS investigated the potential value of an herbal product used locally for the treatment of AIDS patients. Drugs currently in use against HIV/AIDS have cumbersome dosage regimen, unbearable and potentially fatal adverse effects, and are generally unaffordable hence the need for cheaper and less toxic alternatives.

The researchers studied the freeze-dried extract of the crude medicinal sample. Laboratory animals, as well as, clinical isolates of *Mycobacterium tuberculosis*, *Candida albicans*, *Bacillus subtilis*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli* and *Mycobacterium smegmatis* were used for the experiments. Acute toxicity (LD₅₀) was determined. The minimum inhibitory concentration and minimum bactericidal concentration were determined. Immuno-active studies were carried out using the passive cutaneous anaphylaxis (PCA) model in rats. The results indicated that no remarkable adverse reaction was recorded in laboratory animals within 24 hours. The preliminary data suggest immunostimulant activity of the extract. The sample caused a dose dependent relaxation of both the isolated guinea pig ileum, and the rabbit jejunum. No anti-TB activity was recorded, but significant inhibitory activity was noticed against *Candida albicans*, *Escherichia coli* and *Pseudomonas aeruginosa*. The product appeared to be safe and may be useful against some opportunistic infections. The relaxant effect on the guinea pig ileum and rabbit jejunum corroborates the use of the product since this could be beneficial in the treatment of profuse diarrhoea, which is frequently noticed in AIDS patients."

Furthermore, NIPRD have developed formulations from local plant extracts, which have been studied in the Institute. They include: A solid dosage form of NIPRISAN, a preparation for the Management of Sickle Cell disease; A solid dosage form of CONAVIL, a preparation for use in the supportive Management of HIV/AIDS; A solid dosage form of NIPRD AM-1, a preparation for the treatment of uncomplicated malaria; A semi solid topical preparation of NIPRISAN for the treatment of fungal infections; and A solid dosage form of a plant extract for the management of

peptic ulcer.

Until now, Nigeria has developed phytomedicines for ulcers, anaemia, contraception, malaria and HIV, and it now holds patents for some of these medicines in several countries. Both were developed from herbal medicines obtained from local traditional healers. The NIPRD followed a procedure in which the traditional healers and their patients sign consent forms, allowing study of the phytomedicine and the effects on patients. In phase 1 placebo-assisted clinical trials, patients were given the experimental phytomedicines for both sickle cell anemia and for HIV. After three months, patients in the experimental group were found to be improving. The clinical trials are continuing. The NIPRD is also targeting malaria, and started a pilot clinical trial of a new anti-malarial phytomedicine in July 2000. The HIV/AIDS phytomedicine is called Dopravil. From preliminary anecdotal and experimental evidence, the new compound looked promising.

However, local researchers have made huge progress on herbal cures for malaria. One of such herbs used to treat malaria that efforts are currently on to study its safety limits is *Enatia chlorantha*, a herb that bears different local names in Nigeria. The stem bark of this plant also known as African yellow wood among the Yoruba speaking community is called "Iyani" or "Awopa" while in Benin it is called "Evenbavbogo" In Nigeria, the bark extract are used widely to treat malaria fever, high body temperature, wounds, kick start labour in pregnant women and as a naturally occurring antibiotics. The plant is also used traditionally to treat jaundice, tuberculosis and leprous spots. The aqueous extract is effective in the treatment of conditions like ulcer.

CONCLUSION

In conclusion, the field of herbal medicine is a ground that needed to be explored. Nigeria tropical rain forest abounds with medicinal plants with promising medicinal activities that need to be researched. Grants from government to researchers and research institutes will open this new field. For Nigeria to meet WHO health for all by 2015, the Traditional Medicine Bill and other health related legisla-

ture need to be passed into law so that traditional medicine is fully integrated into our healthcare system.

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