



UNIVERSITY OF GHANA

Prospects and Scope of Plant Medicine in Health Care

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IN HEALTH CARE**

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Inter-Faculty Lecture delivered at the University of
Ghana on 13th March, 1986



**GHANA UNIVERSITIES PRESS
ACCRA
1989**

Published for the University of Ghana

by

Ghana Universities Press

P. O. Box 4219

Accra

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ISBN: 9964-3-0153-7

PRODUCED IN GHANA

Typesetting by M.E.S. Equipment Limited

**Printed by the School of Communication Studies Press,
University of Ghana, Legon.**

Cover Design by S. A. Adom

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PROSPECTS AND SCOPE OF PLANT MEDICINE IN HEALTH CARE

INTRODUCTION

It is now becoming increasingly clear that traditional medicine should no longer be considered as a system of the past; it must be a maturing system of our hope for the future. However, its concept is received with mixed feelings among most people. There are those who, by their upbringing, have profound belief in traditional medicine and others whose educational background influences them to disbelieve this system of practice. The problem with these sceptics is lack of knowledge and understanding of herbal materials or the practice of the system or both.

In 1976, an attempt was made by a WHO group of experts from the African Region to define traditional medicine. From the attempted definition and the writings of authors on traditional medicine, it has been made clear that traditional medicine is an integral part of the culture of the people who practise the system. Moreover, it reflects not only the culture but also the social, moral and religious background, attitudes and beliefs that are prevalent in the community. Apart from these influential factors, traditional medicine evolved from environmental resources which the people of a community adapted in their desperation for survival. The practice of herbal medicine is, therefore, as old as man.

On the African continent, traditional medical practice dates as far back as 4000 years. It was the sole medical system for health care before the whiteman introduced orthodox medicine or the so called modern medicine. Even in this present technological era, in the third world, traditional medicine still appears to be the sole means for the preserva-

tion of the health of the rural people who constitute about 70 per cent of the population.

According to WHO survey, between 60 and 90 per cent of patients in the Third World are treated by traditional medical healers: These are 65 per cent of the patients in Sri Lanka, 85 per cent in Burma, 80 per cent in India, 60 per cent in Indonesia, 65 per cent in Nepal, 90 per cent in Bangladesh and 70 per cent in Ghana. These data give a clear picture that, in the Third World, this system of health care delivery is very well accepted by majority of the people. However, in most African countries, political and financial support for the system by Governments have not had commensurate encouragement.

In the Developed World, regardless of the highly advanced orthodox medicine, substantial amounts of medicinal plants are used for treating ailments. In the United States, medicinal plants constitute about 25 per cent of all new and refilled prescriptions dispensed from community pharmacies. During 1959–1974, American consumers paid 3 billion dollars for drugs derived solely from medicinal plants. The picture is similar in Britain and other European countries where the use of herbal medicine is indeed growing.

Traditional art of curing ills consists of two procedural components: psychic or spiritual aspect and the actual process of using medicinal herbs for healing.

I am not competent to speak on the spiritual (magico-religious as P.A. Twumasi terms it in his book, *Medical Systems in Ghana*) aspect of traditional healing because I am not spiritually programmed in our traditional setting to perceive voices and images of the supernaturals. I am, however, convinced that the spiritual aspect is heavily based on pharmacological properties of medicinal herbs used for various rituals, but not vice versa as it is believed. I will, therefore, restrict my testimony to medicinal plant usage.

MEDICINAL PLANT USAGE

It may interest most of you to know that most modern drugs have their origin from plant and animal sources and that even orthodox medicine started as herbal medicine. In view of this, traditional medicine is actually a transitional stage of the development of well organized medical system or modern medicine.

Before 1940, most preparations for treatment in the orthodox hospitals were made from extracts or tinctures of medicinal plants.

A drug like *Morphine*, which is a narcotic analgesic (a powerful pain killer), was obtained from the plant *Papaver somniferum* and tincture of morphine was used. *Atropine* was also obtained from the plant *Atropa belladonna* as a potent antispasmodic and antidiarrhoeal drug. Atropine has been combined with diphenoxylate (a derivative of morphine) in a tablet called Lomotil which is a more potent antidiarrhoeal drug than atropine. *Digitoxin*, which is a drug of choice for treating heart failure, was obtained from a plant called *Digitalis purpurea* or *Digitalis lanata*. The crude powder was used for years before the chemists synthesized it. Its therapeutic effectiveness was discovered by William Withering in 1785, that is over 200 years ago. These are only a few examples of the numerous drugs of herbal origin.

In Ghana, we have thousands of useful medicinal plants which can cure a wide spectrum of diseases ranging from the common cold and gastro-intestinal troubles to major diseases like hypertension, cancer and infectious diseases like viral infections, schistosomiasis (*Bilharzia*) and other parasitic diseases.

Some of the information on these medicinal plants are in books written by Dalziel: *The Useful Plants of West Tropical Africa* (1955); by Irvin: *Woody Plants of Ghana* (1961); by Ayensu: *Medicinal Plants of West Africa* (1978) and by

Ampofo: *First Aid in Plant Medicine* (1983). However, most of these herbal remedies are known by our traditional healers and elderly men and women of families in our rural areas. The herbal knowledge or practice known by traditional healers are jealously guarded with extreme secrecy and security for economic reasons. On the contrary, elders of the rural societies do willingly impart this knowledge to interested people and this has helped in the propagation of some herbal knowledge in this country.

A few examples of efficacious medicinal plants (Tables 1 – 13), which are used in Ghana, will illustrate the prospects and scope of our natural remedies.

Medicinal Plants for Gastrointestinal Disorders

About 25 per cent of medicinal plants are known to be useful in gastrointestinal disorders (Table 1). Fruits like *Ananas comosus* (pineapple) and *Carica papaya* (pawpaw) can be used for indigestion. These fruits contain powerful enzymes like *papain* which is found in the milky sap of pawpaw and *bromelin* found in the juice of pineapple. These powerful enzymes digest proteins and can be used after heavy protein meals to help digestion and to prevent constipation.

There are some effective remedies for the treatment of peptic ulcer. An example is the powder made by grinding green banana (*Musa sapientum*) which has been dried below 50°C. This can be added to cool porridge or beverage for the treatment. Green banana is found to contain water soluble active substance which has anti-ulcer property and promotes healing of the ulcer by increasing the growth of the gastric mucosa. A decoction of the roots of *Strophanthus hispidus* and *Paullinia pinnata* can also give good relief in peptic ulcer.

Abdominal cramps and pains can be relieved with *Phyllanthus niruri* leaves, or the flowers of *Marantochloa flexuosa* or

TABLE 1

Medicinal Plants for Gastrointestinal Disorders

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. <i>Phyllanthus niruri</i>	Bomma gu wakyi (Twi)	Leaves or whole plant	1,2,3,4 are for abdominal cramps and pains and diarrhoea.
2. <i>Marantochloa flexuosa</i>	Sibiri (Twi) or Ntentrema (Twi)	Flowers	
3. <i>Musanga cecropioides</i>	Ote (Twi) or odwuma (Twi) (Umbrella tree)	Stem bark	
4. <i>Lantana camara</i> (Lantanine)	Ananse dokunu (Twi)	Roots	Lantanine is an alkaloid which is antispasmodic.
5. (a) <i>Psidium guajava</i>	Gowa (Ga) (guava)	Leaves	
(b) <i>Paullinia pinnata</i>	Tuantene (Twi)	Roots	
(c) <i>Lantana camara</i>	Ananse dokunu (Twi) Ananu kontso (Ga)	Roots	Diarrhoea and dysentery
6. (a) <i>Psidium guajava</i>	Gowa (Ga) (guava)	Dried leaves	Used as enema for chronic diarrhoea
(b) <i>Clausena anisata</i>	Sesadua (Twi), Tonton tso (Ga)	Root bark	in addition to decoction of the above
(c) <i>Ocimum viride</i>	Nunum (Twi) Suru (Ga)	Leaves	1,2,3,4, or 5.
7. (a) <i>Paullinia pinnata</i>	Tuantene (Twi)	Roots	
(b) <i>Strophanthus hispidus</i>	Ometwa (Twi)	Roots	Diarrhoea, peptic ulcer and piles.

Musanga cecropioides stem bark. *Musanga cecropioides* is also used for diarrhoea. The powdered root of *Lantana camara* is used for colic and stomach ache. It has been found to contain a quinine-like alkaloid called *Lantanine* which has anti-spasmodic activity (i.e. decreasing abdominal cramps and pains).

Diarrhoea and dysentery can well be managed with a decoction of the leaves of *Psidium guajava* (guava), roots of *Paullinia pinnata* and *Lantana camara*. *Psidium guajava* has astringent and antibacterial properties while *Paullinia pinnata* has styptic action and *Lantana camara* has antispasmodic activity on the gastrointestinal tract. In case of chronic diarrhoea, an effective remedy is a combined extract of dried guava leaves, root bark of *Clausena anisata* and leaves of *Ocimum viride* used as enema in addition to the decoction of the herbs.

It is interesting to note that *Paullinia pinnata* and *Strophanthus hispidus* which are remedies for peptic ulcer and diarrhoea are also known effective herbs for piles. It is difficult to imagine the mechanism of action of these herbs in the curative processes, for such paradoxical actions attract sceptics. However, in orthodox medicine, there are drugs with similar diverse properties.

Medicinal Plants for Cold, Chronic Catarrh, Persistent Headaches or Migraine

Calotropis procera, *Clausena anisata* and *Ocimum basilicum* (Table 2) are medicinal plants used in the management of cold, chronic catarrh, persistent headaches or migraine. The leaves of *C. procera* are warmed on charcoal fire, crushed and the juice is instilled into the nostrils. A piece of *C. anisata* root bark can be ground and added to the crushed leaves of *C. procera* for chronic catarrh, headache and migraine. The

leaves of *O. basilicum* are crushed and the juice instilled into the nostrils for chronic catarrh in children.

TABLE 2
Medicinal Plants for Cold, Chronic Catarrh, Persistent Headaches or Migraine

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. (a) <i>Calotropis procera</i> (sodom apple) (b) <i>Clausena anisata</i>	Mpatu-asa (Twi) Gbekebiawuo (Ga)	Leaves Root bark	The leaves are warmed on charcoal fire, crushed and juice instilled in to the nostrils. A piece of <i>Clausena</i> root bark can be ground and added to the crushed leaves for chronic catarrh, headache and migraine.
2. <i>Ocimum basilicum</i>		Leaves	The leaves are crushed and juice instilled into nostrils for chronic catarrh in children

Medicinal Plants for Hypertension, Diabetes Mellitus and Bronchial Asthma

The search for effective treatment of incurable diseases like hypertension, diabetes and asthma which require life-long medication must be an uncompromizing priority. While the search for new and less toxic but efficacious drugs goes on in the developed countries, we in the Third World must turn

our attention to some of the effective herbal remedies for these diseases. They are less expensive or cost-free and may have comparable therapeutic values as the orthodox drugs.

Hypertension

Vernonia amygdalina (bitter leaf), *Cassia occidentalis* and others (Table 3) are useful in hypertension. The fresh leaves of *Vernonia amygdalina* can be chewed and swallowed or ground, stirred in water, strained and the liquid can be drunk for the treatment. It lowers the blood pressure and has sedative or tranquilizing effect on the subject. Experimental findings have confirmed the antihypertensive action of *Vernonia amygdalina*. Moreover, it has been shown to contain an active principle known as *Vernonine* but it is not known whether this substance causes the hypotensive effect. The herb relieves headache which is associated with hypertension and this might be due to the benefit derived from the lowered blood pressure. Ground roasted seeds of *Cassia occidentalis* which has a flavour like coffee and is known as Negro Coffee is widely used for hypertension. Unlike coffee, it does not stimulate the heart nor the brain and lack of these stimulating properties make it safe for the treatment of hypertension with associated heart disease. In addition, extract of the root in combination with the ground roasted seeds produces powerful diuretic effect which is useful in oedemas or dropsy. There is indeed a report of a testimony given by a Swiss Missionary in East Africa who had serious heart disease and was successfully relieved after using the roasted seeds.

Canthium subcordatum has been reported by Boye, Ayitey-Smith and Ampofo (1981) to be effective antihypertensive herb which lowered the blood pressure significantly in 65 – 88 per cent of patients without any serious side effects. *Carica papaya* (pawpaw) and *Persea americana* (Avocado pear) leaves can be used in combination with other

herbs for the treatment or may be used alone (Table 3).

TABLE 3
Medicinal Plants for Hypertension

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. <i>Vernonia amygdalina</i> (bitter leaf)	Awonwene (Twi) Tatso (Ga)	Leaves	Hypertension
2. <i>Cassia occidentalis</i> (Negro Coffee)	Mmofra brode (Twi)	Seeds	Hypertension and heart disease, Oedema
3. <i>Canthium subcordatum</i>	Nte te-a-dua (Twi) or Nyanku mati (Twi)	Stem bark and leaves	Hypertension
4. <i>Carica papaya</i>	Pawpaw	Leaves	Hypertension
5. <i>Persea americana</i>	Avocado pear	Leaves	Hypertension

Diabetes mellitus

In recent years, some traditional healers have claimed to cure diabetes mellitus, although there is no cure for it in orthodox medicine. Since their claims have not been substantiated we can dismiss them. However, there are herbs (Table 4) which have been confirmed to be effective in the management of the disease. Some of these herbs are *Momordica charantia*, *Allium cepa*, *Anacardium occidentale*, *Ipomea batatas* and *Indigofera arrecta*.

Momordica charantia is a climbing plant and is known in Twi as *nyinya*. Extract of the whole plant or the fruits is used as anti-diabetic remedy. It lowers both blood and urine sugar levels in diabetes. This effect has been confirmed

experimentally using rabbits. In addition, the extract gave good results in clinical trials in human. One can have favourable results by using 50 – 60 ml of the fresh fruit juice. The hypoglycaemic substance has been isolated and is called *charantin* (it is sterolglycoside).

TABLE 4
Medicinal Plants for Diabetes Mellitus

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. <i>Momordica charantia</i>	Nyinya (Twi) Nyanyra (Ga)	Whole plant or fruit	(a) Contains charantin as active substance (b) For maturity-onset diabetes (c) Effective orally
2. <i>Allium cepa</i>	Onion	Bulb	(a) Contains: allyl propyl disulphide and allicin (diallyl disulphide oxide) (b) Effective orally (c) Prevents destruction of insulin
3. <i>Anacardium occidentale</i>	Cashew plant	Stem bark	Lowers blood glucose level for 3 hours
4. <i>Ipomoea batatas</i>	Sweet potato	Leaves	(a) Contains insulin-like substance (b) Effective orally (c) 1 gm equivalent to 440 units insulin
5. <i>Indigofera arrecta</i>		Leaves	

Charantin is reported to be more potent than tolbutamide (Rastinon) in equivalent doses. *Charantin* appears to act indirectly on blood sugar by causing the release of insulin

from the pancreas. It is, therefore, useful in maturity – onset diabetes. In other words, it will be effective in diabetic patients whose pancreas can still produce and store some insulin. *Momordica charantia* has antibacterial activity as well.

As far back as 1923 it was observed that dogs whose pancreas have totally been removed could be kept alive for about 66 days on three injections per day of crude *Allium cepa* (onion) extract. The extract's hypoglycaemic effect develops slowly and since it is also effective by mouth, it therefore has advantage over insulin which can only be given by injection.

Allium cepa was extracted with petroleum ether and a given volume of the extract gave hypoglycaemic activity equivalent to 62 – 77 per cent of the activity of tolbutamide (0.5g). Onion extract contains two active substances which are disulphides: allyl propyl disulphide and diallyl disulphide oxide (i.e. allicin). In clinical trials 100 mg/kg of diallyl disulphide oxide (allicin) produced a significant fall in fasting blood sugar and caused a rise in serum insulin level which lasted for 4 hours. The mechanism of action of these substances have been proposed to be due to prevention of the destruction of insulin in the body. This is achieved by inhibiting the enzyme (insulinase) which destroys insulin, consequently, insulin accumulated and remains in the blood for longer period.

In the case of *Anacardium occidentale* (cashew plant), a tincture of the extract of the stem bark lowers blood sugar level for 3 hours. Extract of the leaves of *Ipomoea batatas* (sweet potatoes) contains an insulin – like substance, 1 gm of which when given orally is as effective as 440 units of insulin and when injected subcutaneously had twice the value. It works like insulin by increasing transport of glucose into the body cells and increases the utilization of glucose in the body. It also enhances the storage of excess glucose as glycogen in the liver. This substance has advantage over

insulin since it can be given orally.

Indigofera arrecta is a popular leaf decoction which is used for treating diabetes by Dr. Oku Ampofo in his clinic at Mampong Akwapim. It is found to lower blood sugar level and improves the health of patients significantly. However, there is no information on the chemistry and pharmacology of *Indigofera*.

Bronchial Asthma

Bronchial asthma is another incurable disease which can be managed with herbs (Table 5). The herbs used for asthma appear to be more effective in preventing asthmatic attacks rather than relieving attacks. *Euphorbia hirta* (known as Australian asthma herb), *Scoparia dulcis* (sweet broom weed), *Cymbopogon citratus* (lemon grass) and *Calliandra portoricensis* are used in the management of bronchial asthma.

Euphorbia hirta is known to contain both an alkaloid and a glycoside. It is known as a remedy for inflammation of the respiratory tract and has a special reputation for the treatment of asthma.

Scoparia dulcis is noted for its prophylactic effect on asthma. When one starts experiencing the signs of asthmatic attacks and uses the ground leaves mixed with lime in white clay (or kaolin) attacks will be prevented. The herb is also used for cough when mixed with lime or combined with the root of *Cymbopogon citratus* (lemon grass). The root of lemon grass can be chewed for the prevention of asthmatic attacks. Lemon grass root looks like ginger and it has flavour like ginger.

It is claimed that *Calliandra portoricensis* can effect a complete cure of asthma in some patients. The ground root

bark, in the form of a paste, is added to lime and drunk. It has a mucolytic action (i.e. altering the characteristics of the respiratory tract fluid) or has expectorant action. The subject throws out a lot of sputum from the upper respiratory tract. Two or three treatments at weekly intervals may effect a cure of the disease.

TABLE 5
Medicinal Plants for Bronchial Asthma

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. <i>Euphorbia hirta</i>	Nufusu (Twi) Abanase (Twi) (Australian asthma herb)	Whole plant or leaves	(a) Contains: alkaloid and a glycoside (b) Antiflammatory property on the respiratory tract
2. <i>Scoparia dulcis</i>	Onyame kome ti (Twi) (Sweet broom weed)	Whole plant or leaves	(a) Prophylactic effect (b) Ground leaves mixed with lime in white clay (or kaolin)
3. <i>Cymbopogon citratus</i>	Lemon grass	Roots	(a) Prophylactic effect (b) Combined with other herbs
4. <i>Calliandra portoricensis</i>	Hwentehwente (Twi)	Roots	(a) Mucolytic and expectorant effect (b) May produce complete cure

Medicinal Plants for Malaria Fever and Jaundice

I have noticed that about 2 or 3 per cent of herbal plants in West Africa are used for fever irrespective of whether they

are effective for lowering the body temperature (pyrexia) or for malaria or typhoid fever. It is now very necessary to find out those which have antimalarial property (i.e. antiparasitic property on the plasmodium). It is necessary because chloroquine which is a popular antimalarial drug has proved to be very toxic to man after prolonged use and ineffective on resistant parasites.

Malaria Fever

Table 6 lists six medicinal plants for malaria fever:

Azadiracta indica (nim tree) is used in most West African countries for malaria fever. Nim tree is known to contain *nimbolin*, *tannin* and various *glycosides*. Decoction of the stem bark or leaves is drunk for this purpose and has been reported to possess antimalarial and antipyretic properties. A thorough research needs to be performed to improve its usage as an antimalarial drug.

Decoction of *Cryptolepis sanguinolenta* is used for malaria by Dr. Oku Ampofo at his centre at Mampong. It is well established that it possesses antimalarial property and has some analgesic activity. Three alkaloids have so far been isolated from the plant of which one is *cryptolepine*.

Nauclea latifolia and *Ocimum viride* are widely used for malarial fever but these herbs have only antipyretic effect and may not have effect against plasmodium parasites or antimalarial effect. They must not, therefore, be used alone except in combination with *Azadiracta indica* or *Cryptolepis sanguinolenta*. *Alstonia scholaris* and *Vernonia Colorata* are also popularly used for fever probably because they have both antimalarial and antipyretic properties.

Jaundice

In orthodox medicine, treatment of jaundice is largely symptomatic and usually directed towards the underlying disease (eg. anaemia, malaria or obstruction in the liver).

TABLE 6

Medicinal Plants for Malaria Fever

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. <i>Azadiracta indica</i>	Nim tree	Leaves and stem bark	(a) Contains: nimbo- lin, tannin and gly- cosides (b) Antimalarial and antipyretic effects
2. <i>Cryptolepis sanguinolenta</i>		Roots	(a) Cryptolepine (b) Antipyretic and anti-malarial effects
3. <i>Nauclea latifolia</i>	Peyare biasa (Twi) Tsofatsuru (Ga)	Roots	(a) Antipyretic and analgesic effects
4. <i>Ocimum viride</i>	Nunum (Twi) Suru (Ga)	Leaves	Antipyretic effect
5. <i>Alstonia scholaris</i>		Leaves and stem bark	(a) Contains: echita- mine and ditamine (b) Antimalarial and antipyretic effects
6. <i>Vernonia colorata</i>		Leaves	Antimalarial and anti- pyretic effects

Combinations of herbs of varied medicinal properties are used in traditional medicine. Most of these herbs have high vitamin C (ascorbic acid) contents and others have antipyretic, anti-malarial and antibacterial properties. These herbs may attack the underlying disease or the fundamental error in the mechanism for the stability of the red cells. The various combinations for preparation of decoction or infusion in Table 7 are used for the treatment.

TABLE 7

Medicinal Plants for Jaundice

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. <i>Nauclea latifolia</i>	Peyaribiasa (Twi) Tsofa tsuru (Ga)	Roots	
2. <i>Ocimum viride</i>	Nunum (Twi)	Leaves	Decoction or Infusion
3. <i>Citrus auranti- folia</i>	Lime tree	Fruit and leaves	combinations (a) 1,3 and 4
4. <i>Momordica charantia</i>	Nyinya (Twi) Nyanya (Ga)	Whole plant or leaves	(b) 2,3 and 4 (c) 5,6 and 7 (d) 8
5. <i>Cocos nucifera</i>	Coconut tree	Roots	(e) 3,6 and 9
6. <i>Ananas comosus</i>	Pineapple	Fruit and peel	
7. <i>Saccharum officinarum</i>	Sugar cane	Stem	
8. <i>Ipomoea batatas</i>	Sweet potato	Leaves	
9. <i>Cassia siamæ</i>	Gyedua (Twi)	Leaves	

Bacterial, Viral and Worm Chemotherapy

When one scans through the available information on medicinal plants in West Africa, one can see great prospects for the development of new chemotherapeutic agents from medicinal plants especially antibacterial and antiparasitic drugs. At present almost all antibacterial drugs are products of microorganisms. It appears that research is far behind the ability of many bacteria and parasites to resist modern chemotherapy. For example, for over thirty years penicillin was the drug of choice for the treatment of gonorrhoea but its continued and prolonged therapeutic use has led to the development of completely penicillin resistant strain of gonococci. Moreover, the alternative drug, *spectinomycin* (Togamycin) is also fac-

ing the same fate and if it is completely resisted by the bacteria the disease could easily become incurable. The resistance to chemotherapy is not only restricted to antibacterial drugs but also to antiviral and antimalarial drugs like chloroquine. If efforts are not intensified to overcome this problem we will return to the dark days of pre-chemotherapeutic era. Introduction of new anti-bacterial and anti-parasitic agents from plant sources will solve the drug-resistant problem for a considerable period. It is obvious that if new drugs from plant sources are developed they will have chemical structures different from the present chemotherapeutic drugs and since drug resistance is structure dependent, there is a great hope of curing infectious diseases caused by resistant strains of micro-organisms.

Antibacterial Herbs

The leaf and flower of *Psidium guajava* have shown a considerable antibacterial activity while its fruit shows only a moderate degree of antibacterial activity. Extract of the flower is reported to give positive antibacterial test with *mycobacterium tuberculosis* and the leaf decoction has been used for *cholera*, (Table 8).

The flower of *Euphorbia heterophylla* has also been found to have antibacterial activity on *mycobacterium tuberculosis*. *Bidens pilosa* and *Bidens bipinnata* have shown positive antibacterial activity against a variety of micro-organisms including five *enteric pathogens* and *staphylococcus aureus*. *Diopyros barteri* (*Aheneba nsatea*, princess finger) stem bark extract was shown to be effective against *staphylococci*, *streptococci* and *diphtheria bacillus*. Decoction of *Phyllanthus niruri* is used for gonorrhoea or relief of urethral discharges. These are only a few examples of medicinal plants with antibacterial values.

TABLE 8

Medicinal Plants with Antibacterial Activity

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. <i>Psidium guajava</i>	Gowa (Ga) (guava)	Leaves, flowers and fruit	(a) Flower: activity against mycobacterium tuberculosis (b) Leaf: gonococci and cholera etc.
2. <i>Euphorbia heterophylla</i>		Flowers	(a) Activity against mycobacterium tuberculosis
3. <i>Bidens pilosa</i> <i>Bidens bipinnata</i>	Gyinan (Twi) or ananse mpaane (Twi)	Leaves	Five enteric pathogens and staphylococcus aureus
4. <i>Diopyros barteri</i>	Aheneba nsate a	Stem bark	Staphylococci, streptococci, and diphtheria bacillus
5. <i>Phyllanthus niruri</i>	Bomma gu wakyi (Twi)	Whole plant or leaves	Gonococci etc.
6. <i>Calotropis procera</i> (sodom apple)	Mpatu-asa (Twi)	Leaves and stem bark	Antibacterial activity against syphilis, leprosy and elephantiasis

Antiviral herbs

In the case of viral infections, the development of clinically useful antiviral drugs have been very slow and disappointing because of several fundamental problems. Viruses invade human body cells and replicate by distorting normal metabolic processes of the human cells. Drugs which suppress viral replication would first of all have to penetrate into the human host cells and then inhibit enzymatic processes which produced viral nucleic acids and proteins without affecting

the metabolic processes of the human host cells. The available modern drugs either cannot penetrate the host cells or when they do penetrate they are toxic to the cells. Traditionally, there are effective and nontoxic herbs for treating some viral infections (Table 9).

TABLE 9
Medicinal Plants used for Viral Infections
(For local application)

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. (a) <i>Kola nitida</i> (red cola nut)	Bese (Twi)	(a) Fruit	a, b and c are made into paste for Herpes zoster (shingles)
(b) <i>Paullinia pinnata</i>	Twoantene (Twi)	(b) Root bark	
(c) <i>Clausena anisata</i>	Sesadua (Twi) Tonton tso (Ga)	(c) Root bark	
2. (a) <i>Balannites aegyptiaca</i>	Kobowoo (Brong)	(a) Root bark	a, b, and c are made into paste for Herpes zoster
(b) <i>Hoslundia opposita</i>	Aberewa-aninsu	(b) Flowers	
(c) <i>Kola nitida</i>	Cola nut	(c) Fruit	
3. (a) <i>Psidium guajava</i>	Guava	(a) Leaves	a, b and c are made into a paste for Herpes zoster
(b) <i>Piper guineense</i>	Surowisa (Twi) Adzito-gbowei (Ga)	(b) Fruit	
(c) Kaolin			

Herpes zoster is treated with local application of a paste containing *Kola nitida* (red cola nut), *Paullinia pinnata* (root bark) and *Clausena anisata* (root bark). In addition, the cola nut and root bark of *Paullinia pinnata* is chewed and the juice is swallowed. This treatment cures the disease within seven days. There are other treatments which have been used by Dr. Oku Ampofo and can cure the disease in seven to

fourteen days: Local application of a paste of the root bark of *Balannites aegyptiaca*, a paste of the flowers of *Hoslundia opposita* and *Kola nitida* or a paste of the leaves of *Psidium guajava*, *Kaolin* and *piper guineense*.

Measles is another viral infection which traditional medical treatment has proved to be very effective. It can effectively be treated with decoction of the leaves and bark of *Alstonia boonie*. The decoction is given orally and simultaneously applied topically by washing the body with it. Within 24 to 48 hours the symptoms will be relieved and is followed by a complete cure within 4 to 6 days. It is also used for fever, in which case it has antipyretic effect which may contribute to the relief of fever associated with measles. *Alstonia boonie* has also been useful for chicken pox. A paste of the herb is used for severe cases. This plant has recently been found to contain seven alkaloids which might possibly have various pharmacological and therapeutic properties. Other effective remedies for measles are *Psidium guajava*, *Momordica charantia* and *Cajanus cajan*. These herbs can be combined with *Alstonia boonie* or with others. *Psidium guajava*, is commonly combined with *alstonia boonle* for the treatment (Table 10).

Herbs for worm infestation

Similar encouraging prospects have been found among some medicinal plants which have antiparasitic properties. *Carica papaya* (pawpaw) possesses worm expelling property (anthelmintic). Its milky sap from the stalk, leaf and unripe fruit has been found to be highly powerful worm killer or expeller. The seeds and the flowers are also effective. It is known to expel or destroy ascaris, whipworm and *enterobius vermicularis* (pin worm). Moreover, the male flowers of pawpaw have been effectively used in deworming goats, sheep and chickens.

Tape worm, hookworm and roundworm can also be expelled with the oil from the seed of *carapa procera* which is also

TABLE 10

*Medicinal Plants used for Viral Infections
(For internal use)*

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. <i>Alstonia boonie</i>	Nyame dua (Twi)	Leaves and stem bark	(a) Measles (b) Chicken pox (c) Antipyretic effect
2. <i>Psidium guajava</i>	Gowa (Ga) (guava)	Leaves	Measles: used as decoction of combinations:
3. <i>Momordica charantia</i>	Nyinya (Twi) Nyanyra (Ga)		(a) <i>Alstonia boonie</i> and <i>Psidium guajava</i> (b) <i>Momordica charantia</i> and <i>Psidium guajava</i>
4. <i>Cajanus cajan</i>	Atii (Ga) (pigeon pea)		<i>Cajanus cajan</i> is a remedy for small-pox

a purgative like castor oil. Sleeping sickness caused by trypanosomes has been treated with leaf decoction of *Ageratum conyzoides* and root decoction of *Turraea heterophylla* (Table 11).

There are also effective treatments for guinea worm (*Dracunculus medinensis*) infestation. Dry leaves of *Eleaophorbia drupifera* prepared in palm nut soup have proved very effective and comparable to orthodox drugs in eliminating the worms. Even local application of the leaf paste assists in the extraction of the worms.

In 1986, upon an arrangement with the Head of Department of Community Health, a clinical trial was done on the *Eleaophorbia drupifera*, following an outbreak of guinea worm at a village near Kotoku (Table 14). The results were very encouraging and confirmed the claim by the traditional healers.

TABLE 11

Medicinal Plants for Expulsion of Worms

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. <i>Carica papaya</i>	Brofre (Twi) Akpakpa (Ga) (pawpaw)	(a) Milky sap from stalk, leaf (b) Flowers and seeds	Ascaris, whipworms, and enterobius vermicularis (pin worm)
2. <i>Carapa procera</i>	Sua-bise (Twi)	Oil from the seeds	(a) Tape worm, hook-worm and round-worm (b) purgative effect like castor oil
3. <i>Ageratum conyzoides</i>	Guakuro, (Twi) Gua-ekura (Twi)	Leaves	Sleeping sickness
4. <i>Turraea hetrophylla</i>	Ahunanyankwa (Twi)	Roots	Sleeping sickness
5. <i>Elaeophorbium drupifera</i>	Akane (Twi) Tunyo (Ga)	Dry leaves	Guinea worm
6. <i>Hillieria latifolia</i>	Anafronaku (Twi)	Leaves	Guinea worm
7. <i>Combretum mucronatum</i>	Ohwirem (Twi)	Leaves and stem bark	Guinea worm
8. <i>Balannites aegyptiaca</i>		Fruit and stem bark	Prevention of bilharzia, kills molluscs (snails) and schistosomes

Dr. Oku Ampofo uses *Combretum mucronatum* and *Hillieria latifolia* for guinea worm infection. He has reported that a decoction of *Combretum mucronatum* caused complete extrusion of the worms in 98 per cent of the patients who failed to respond to treatment with a combination of procaine penicillin and either niridazole or thiabendazole which

TABLE 14

*Clinical Trial of Elaeophorbia Drupifera on
Guinea Worm Infestation at a Village near Kotoku*

A. Relief of Symptoms: Pain and Swellings

Treatment	Days	1	2	3	5	7	8	9	14
GROUP 1 (10 patients) + (Metronidazole)	No of Patients who responded	6	10	10	10	10	10	10	10
GROUP 2 (10 patients) x (Herbal Soup) <i>E. drupifera</i>	No of Patients who responded	3	8	9	9	9	9	9	10

B. Worm Elimination from the Body

Treatment	Days	1	2	3	5	7	8	9	14
GROUP 1 (10 patients) + (Metronidazole)	No of Patients who responded	0	0	0	0	1	1	2	5
GROUP 2 (10 patients) x (Herbal Soup) <i>E. drupifera</i>	No of Patients who responded	0	0	0	1	1	1	1	3

C. Healing of Ulcers

Treatment	Days	6	14	16	19
GROUP 1 (10 patients) + (Metronidazole)	No of Patients who responded	2	2	2	8
GROUP 2 (10 patients) x (Herbal Soup) <i>E. drupifera</i>	No of Patients who responded	4	6	7	7

+ Dose of metronidazole: 400 mg (Adults) and 200 mg (Children) 3 times daily for 3 days.

x Dose of Herbal soup (*E. drupifera*): one bowl of soup (made of 3 dry leaves) a day for 3 days (*Note*: the fresh green leaves are poisonous; therefore, the dry leaves picked under the tree are used).

The clinical trial was conducted by Prof. G.A. Ashitey, Dr. S. Adjei, Dr. Rosemary Richardson, all of the Department of Community Health, University of Ghana Medical School, Accra and Prof. E. Ayitey-Smith, Department of Physiology, University of Ghana Medical School, Accra.

are orthodox drugs. He further reported that *Hillieria latifolia* in palm nut soup is as equally effective on the worms.

In preventive medicine, plant medicine may play a significant role. An example is the fruit and stem bark of *Balannites aegyptiaca* (soap berry tree) which are lethal to small fresh water snails (molluscs) that are intermediary host to bilharzia (schistosomiasis) as well as the minute free parasites (schistosomes). The plant contains a saponin which might be the active principle which kills the parasites. It has been noted that one berry, weighing 5.2gm, yields sufficient lethal substance to kill bilharzia molluscs in 30 litres of water. It is indeed effective in low concentrations. It has therefore been recommended for the control of schistosomiasis by planting the trees along the sides of infested waters so that the fruits drop into the water spontaneously.

Medicinal Plants for Miscellaneous Uses

There are also very effective remedies for a variety of ailments, like furuncles (boils), wounds, ganglion and other swellings, rheumatic pains and urinary retention due to enlarged prostate. In the field of family planning and fertility, plant medicine is not without reputation.

Furuncles and carbuncles (boils)

For the treatment of boils a paste of *Khaya senegalensis* stem bark, seeds of *Marantochloa flexuosa* and seeds of *Xylopiya ethiopica* is used. Some of the paste is mixed with lime and drunk, and some paste is applied around the swelling. In addition, the seeds of *Marantochloa flexuosa* is swallowed like a pill: 2 seeds three times daily. This medication causes the boil to burst within 24 hours and the pus drains off. It is the most effective remedy that I have ever known for boils of all types, even for carbuncles ("cow" boils). The seeds of *Marantochloa flexuosa* given alone orally can cure boils (Table 12).

TABLE 12

Medicinal Plants for Miscellaneous Uses

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. (a) <i>Khaya senegalensis</i>	Odupon (Ga) (Dry zone Mahogany)	Stem bark	
(b) <i>Marantochloa flexuosa</i>	Sibiri (Twi) Ntentrema	Seeds	Furuncles or boils
(c) <i>Xylopia aethiopica</i>	hwentia (Twi) So (Ga) (Ethiopian pepper)	Seeds	
2. <i>Maltotus oppositifolius</i>	Satadua (Twi)	Fresh leaves	Cut, wounds and ulcers
3. <i>Aspillia africana</i>	Fofu or mfufu (Twi)	Fresh leaves and flowers	Burns and wounds haemostatic
4. <i>Anchomanes difformis</i>	Ope (Twi) Batafoiakani (Ga)	Leaves	Wounds and burns

Wounds, burns, rheumatic pains and ganglion

Leaves or flowers of *Maltotus oppositifolius*, *Aspillia africana* and *Anchomanes difformis* are used for cut wounds, ulcers and burns. For the treatment of ganglion, swellings and rheumatic pains ointment made from extracts of roots of *fagara xanthoxyloides*, *Clausena anisata* and *Piper guineense* is applied topically (Table 13).

Urinary retention

Dr. Oku Ampofo uses an alcoholic extract of *Croton membranaceus* for the treatment of urinary retention due to enlarged prostate. This medicine enhances urination without the accompanying difficulty and it has been speculated that

it might reduce the size of the prostrate, but the exact mechanism is yet to be found.

TABLE 13

Medicinal Plants for Miscellaneous Uses

<i>Botanical Name of Plant</i>	<i>Local Name of Plant</i>	<i>Parts of Plant Used</i>	<i>Remarks</i>
1. (a) <i>Fagara Xanthoxylodes</i>	Okanto (Twi) Haatso (Ga)	Root bark (fixed oil)	a, b, and c are made into ointment for ganglion, rheumatic pains and swellings
(b) <i>Clausea anisata</i>	Tonton tso (Ga)	Root bark (essential oil)	
(c) <i>Piper guineense</i>	Suro wisa (Twi)	Root bark (essential oil)	
2. <i>Croton membranaceus</i>		Roots	The alcoholic extract is used for urinary retention due to enlarged prostrate, by Dr. Oku Ampofo
3. <i>Abrus precatorius</i> (Prayer beads, crabs eyes; contains: Abrin, a toxic substance)	Obrekuaniwa (Twi)	Seeds	Powdered seeds used orally as contraceptive: 200 mg single dose; duration is 13 menstrual months
4. <i>Phyllanthus ninuri</i>	Bomma gu wakyi (Twi)	Whole plant	(1) Gastrointestinal disorders (2) Malarial fever (3) Gonorrhoea (4) Infertility in women (5) Aphrodisiac (6) Hiccup (7) Eye infection (8) Skin infections (9) Measles (10) Fibroids
5. <i>Physalis angulata</i>	Totototo, tutotuto (Twi) Tootoo (Ga) (Cape goose berry)	Whole plant or leaves and fruits	Infertility in women

Family planning

Plant medicine has as wide a scope as scientific medicine for it covers family planning for which powdered seeds of *Abrus precatorius* are used as oral contraceptive which protects women for 13 menstrual months. On the contrary, *Physalis angulata* and *Phyllanthus niruri* are used for infertility in women.

PROGRESS IN TRADITIONAL MEDICINE IN GHANA

The efficacies or therapeutic values of all these medicinal plants were discovered and established through trial and error by our ingenuous ancestors in an era when they have to fight for human survival in our harsh environment. Little did they know that they were carrying out traditional clinical trials which is presently performed by highly educated professional men. One cannot imagine the enormous information that have been lost because of lack of documentation. However, what were passed on by mouth from generation to generation are still substantial for our scientists and professionals to mould into effective therapeutic brochures or pharmacopoeia for the health care of our people.

In the past, traditional medical practice was confined to the rural areas, but in recent years it has been expanding rapidly to the urban cities because people in the urban communities are beginning to realize the effectiveness of some of the herbal remedies.

One drawback to the establishment of traditional clinics for general practice, as exists in orthodox medicine, is that practitioners, through no fault of theirs, tend to specialize in the treatment of few specific ailments because most of them acquired such limited knowledge of herbs from herbal practitioners who were relatives or others who treated only limited number of diseases. This anomaly can be rectified when the traditional medical system is reorganized, a pharma-

copoeia is written and a comprehensive programme for educating existing practitioners and training new ones are drawn up and implemented on a national basis.

Despite these defects there are traditional practitioners for bonesetting (an equivalent of orthopaedics) psychiatry, obstetrics and gynaecology (traditional midwives), paediatrics, minor surgery and miscellaneous ailments. The system is, therefore, comprehensive in its own form. Just before or after independence there were about three hundred thousand traditional practitioners of all shades in this country but presently the number will run into a million. However, those who registered in 1979 with the officially recognized Ghana Psychic and Traditional Healers Association were about three thousand.

It is gratifying to hear that all the various traditional associations in the country have come together to form Traditional Medical Association of Ghana. We must hope that the merger will accelerate the transformation of the old system to a modern one.

It will be unfair to assume that plant medicine is problem free. There are numerous problems which must be tackled in order to raise the standard of the practice. These are: formulation of preparations in dosable forms, preservation, diagnosis, systematic education and training of practitioners and trainees. All these problems can be solved if they are taken up at a national level. Especially, regarding formulation of preparation, dosage and preservation the necessary manpower and pharmaceutical technology is available right in this country. And through well organized workshops for traditional healers, this knowledge can readily be imparted to them.

For the past ten years there has been good signs of progress in the traditional medical practice. Some practitioners have established clinics with modern facilities in the country. An example is the Complex Hospital at Nsawam built by Dr.

Nartey, I will suggest that in order to standardize the clinical set-up, a typical model traditional clinic must be designed and must include facilities for diagnostic medical laboratory and dispensary. Moreover, training must be designed for traditional nurses, dispensing technologists and medicinal botanists.

Integration of Traditional Medicine with Orthodox Medicine

At the moment, I will not advocate the integration of traditional medicine with orthodox medicine until it has been well organized and the practice and education of practitioners have been improved. Premature integration will result in the "big fish swallowing the small fish".

On this note, I wish to repeat that traditional medicine is a transitional stage in the development of modern medicine, thus progressive and conscious effort must be made to accelerate the transformation. And until that is achieved traditional medicine must play a complementary role in our health care delivery system.

Furthermore, intensive and systematic research programmes must be drawn up and implemented for the purpose of accelerating the transformation. This will require the participation of experts of various professional and scientific disciplines, namely: Orthodox clinicians, traditional practitioners, pharmacologists, biochemists, sociologists, technologists, and pharmacists.

TRIBUTE

I will like to pay tribute to our illustrious medical practitioner, Dr. Oku Ampofo, who devoted most of his professional life to promote traditional medicine here and abroad. He has really put Ghana's image of traditional medicine on the World map. He deserves a national honour.

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