

An Exploratory Ethnobotanical Study of the Practice of Herbal Medicine by the Akan Peoples of Ghana

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Abstract

This exploratory ethnobotanical study took place in Kumasi, the capital city of the Asante, one of the Akan tribes. Data was collected using the multi-method approach of descriptive review, semi-structured interviews with traditional medical practitioners, and brief scientific review. Traditional Akan medicine is holistic and does not separate the physical world from the supernatural world. It is deeply rooted in traditional religion, with illness seen as a departure from the natural equilibrium. Traditional healers are either spiritually based or non-spiritually based.

This study found the traditional knowledge of healing and use of medicinal plants is disseminated through generations by family members. However, the acquisition of academic qualifications is now a priority, and formal training is taking place in the workplace and a university. Techniques used in diagnosis and treatment consist of a fusion of traditional and biomedical methods. Treatment of hypertension was used as an example, with all practitioners recognizing hypertension's clinical signs and symptoms. Medicinal plants are predominantly wildcrafted and dispensed mainly by decoction, although prepared formulas are given. To prevent self-medication, patients are seen frequently. Scientific evidence validates the pharmacological actions of the medicinal plants. Public health care in Ghana is accessed by a "cash and carry" system that is only available to those who can afford it. Approximately 75 percent of the population depends on traditional medicine for primary health care. A national health insurance scheme was introduced in

2004, and it has been proposed that traditional medicine will be integrated into this new system. (*Altern Med Rev* 2005;10(2):112-122)

Introduction

The use of plants as medicines to treat illness has a long and venerable history. Over the centuries the indigenous peoples of the world have developed sophisticated social systems and their traditional healers, through oral tradition and empirical means, have acquired and compiled detailed knowledge regarding the use of medicinal plants, which has been disseminated from generation to generation.

In an attempt to explore how the biopsychosocial relationship between cultural belief systems and health interact to shape the etiology of illness, diagnosis, and treatment, a multi-method, exploratory ethnobotanical study was undertaken in Kumasi, Ghana. Ghana was chosen primarily for its rich historical and valued tradition of herbal medicine and for ease of access to practicing herbalists. This study focuses on traditional Akan herbalists living in the area surrounding the urban town of Kumasi. It also investigates the scientific validation of the pharmacological actions of medicinal plants used by Akan healers in treatment.

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The Akan is a collective name for a number of tribes in Ghana who occupy the region bounded by the Black Volta River in the north, the Gulf of Guinea in the south, the Camoe River in the west, and the Volta River in the east. They constitute the largest ethnic group in Ghana, with Twi being the most commonly spoken language.¹ The Akans are considered to be one of the most traditionally well-cultured, indigenous inhabitants of Africa² with an established social system.

The Asante (Ashanti) are the most predominant group of Akans and have a matrilineal society. The town of Kumasi is their capital city and home to the Asantehene (King of Asante).

Traditional Akan Beliefs

Akan ontology is conceptually complex and much debated; therefore, only very brief details are discussed below. These focus on the construct of the individual's relationship with the natural world forming the basis for health.

According to Opoku (cited in Ephirim-Donkor:³ "The human being is a composite of okra (soul), the sunsum (intangible element) necessary for character, ntoro (inherited characteristics) and mogya (blood)." Thus, the individual is seen as the product of the male spirit (ntoro-sumsum) and female blood (mogya), the union of which gives rise to the okra. Danquah (cited in Minkus)⁴ defines sunsum as, "the power that sustains a person's character or individuality" and Owoahene-Acheampong¹ describes okra as, "a life principle; it is a small indestructible part of God," and on death returns to join the creator and the ancestors. Therefore, there is a triad of ntoro-sunsum (spirit), okra (divine), and mogya (blood), which forms a basis for holistic health and healing.

Mother Earth holds great reverence for the Akan; nature is believed to be a living thing. Within the natural world, the Akan see the earth, plants, stones, and bodies of water as containing their own individual sunsum, giving each a unique essence;⁴ natural phenomena can also be inhabited by spirit-powers (obosom).¹

Traditional Akan Medicine

Traditional Akan medicine has its roots in a cosmology where there is no clear conceptual distinction between the physical world and the supernatural world. Health, illness, and healing are part of this integrated worldview, wherein the Akan traditional religion plays a major determinant. Onyame (God) permeates and resonates throughout Akan culture.

To be healthy is broadly described as implying health of mind, body, and spirit, and calls for "living in harmony with one's neighbors, with the environment, and with oneself – a total harmony that encompasses physical, social, spiritual, natural, and supernatural realities."⁵

Illness is a departure from this natural equilibrium. The Akan term for illness is yadee – ya meaning pain, and adee meaning painful thing. A painful thing can be physical, psychological, emotional, spiritual, social, or environmental, and can be naturally or supernaturally caused. Agyapong⁶ described five main sicknesses that can affect a person as follows:

- ▲ Sunsum mu yadee – spiritual sickness. This can be caused by witchcraft and destructive powers purchased or acquired from a spiritualist.
- ▲ Dua bo – curse from the gods. An enemy has consulted a deity to bring ill health upon some one who has offended him.
- ▲ Efie yadee – "home sickness" caused by bad feelings arising within a family.
- ▲ Ho nam mu yadee – diseases of the body. These are conceptualized as originating and emanating from the belly or the center of the body.
- ▲ Mogya mu yadee – sickness of the blood.

Traditional Medical Practitioners (TMP) of Ghana

Traditional medicine (TM) is defined by the World Health Organization (WHO) as, “the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and social imbalance, and relying exclusively on practical experience and observation handed down from generation to generation, whether verbally or in writing.”⁷

The WHO also defines a TMP as, “a person who is recognized by the community where he or she lives as someone competent to provide health care by using plant, animal and mineral substances and other methods based on social, cultural and religious practices.”⁷

Writing on TMPs in Ghana, Evans-Anfom⁸ noted that, “TMPs acquired their knowledge through a) instruction, b) dreams and visions and c) a ‘voice’ heard in the bush.” Ampofo⁹ indicated that herbalists undergo a period of tutelage under an experienced TMP for up to 10 years, trainees being chosen because they have an interest in healing.

The training of a traditional Asante healer takes three years. They are called to the profession by “hearing a voice” or through spiritual possession. Men and women are trained separately at different shrines and live in the house of the trainer. Training includes communication with deities and spirits, divination, and a thorough knowledge of medicinal plants and their uses.¹⁰

The various categories of TMPs are subject to the interpretation of the researcher. For instance, Appiah-Kubi¹¹ recognized five groups; whereas, Twumasi¹² identified four. The difficulty in categorization is apparently because TMPs combine specializations. For example, some have expertise in snakebite or eye disease,¹² while others treat psychosocial and mental health problems.¹³ Nevertheless, whatever the specialty, TMPs are divided into spiritually based and non-spiritually based practitioners,^{1,10,14} both groups using plant and animal products for treatment.

Tsey¹⁴ noted the main difference between the two divisions is their belief system. The non-spiritually based practitioner tends to look at medicinal plants with an increasingly biomedical approach, while the spiritually based practitioner believes that illness cannot be treated without dealing with the spiritual factors.

Spiritually Based TMPs

Spiritually based TMPs include:

▲ Spiritualists or Diviners (fetish priests and priestesses) – Claiming their powers arise from spiritual agencies, they use methods of possession, divinations, and rituals to facilitate diagnosis and healing. Diagnosis is confirmed during interview with the patient.

▲ Shrine Devotees – These are men or women whose life is devoted to the service of gods / goddesses. Healing involves possession and communication with supernatural elements, including resolving afflictions from witchcraft.

▲ Faith Healers – Often a senior member of an African church, they use the Bible, holy water, and prayer to affect healing.

Non-spiritually Based TMPs

Non-spiritually based TMPs include:

▲ Herbalists – They are very knowledgeable in the use of medicinal plants and other natural products.

▲ Bonesetters – They are specialists in mending fractured limbs.

▲ Traditional Birth Attendants (TBAs) – These include traditional midwives, usually older women, who assist in maternity care.

Health Care in Contemporary Ghana

Within Ghana a pluralistic system of health care presently operates. Prior to becoming a British colony, traditional medicine provided all aspects of

health care. The British instigated the biomedical health care system and missionaries brought medical personnel who established clinics and dispensaries. After independence, President Nkrumah both improved biomedical services and encouraged the use of traditional medicine.

Present health care systems can be placed in four categories: (1) public through the Ministry of Health (MOH) – teaching hospitals, regional hospitals, district clinics, and village or community health posts; (2) private-for-profit biomedicine – private doctors, midwives, pharmacists; (3) private non-profit biomedicine – often religious missions, providing 40 percent of rural health care; and (4) traditional medicine.

It is estimated there is a ratio of 1:400 TMPs per capita compared to 1:12,000 medical doctors.¹⁴

Traditional Medicine in Contemporary Ghana

Approximately 75 percent of the population depend on TM at one time or another for their primary health care needs.¹⁵ In rural areas, a TMP is a village-based member of the community, and payment for services is generally in kind, although more practitioners are requesting monetary payment.¹⁴ The Danida study¹⁶ noted that costs ranged from \$1.00-\$50.00 depending on the illness treated, therefore challenging the view held by many Europeans that Africans utilize TMPs due to poverty. According to Ampofo,⁹ recourse to TM in Ghana is usually instigated by the belief that certain diseases can only be treated by traditional methods.

TMPs advertise their services, especially in the urban areas; it is impossible to miss signs advertising the many “benefits” of an herbal preparation and clinics offering cures for myriad conditions. Medicinal plants are sold at roadside stalls and markets. The facilities offered by herbal clinics vary. The practices visited include a modern purpose-built clinic, a traditional clinic with residential facilities, and a practice within a compound situated in a traditional building with earthen floors.

The MOH, in collaboration with the Ghana Federation of Traditional Medicine Practitioners, adopted a strategic plan for the promotion of TM for

2000-2004, which included the development of a comprehensive training program in traditional medicine. In line with this plan, the Kwame Nkrumah University of Science and Technology (KNUST) is currently offering a BSc degree in herbal medicine, and research into medicinal plants has been ongoing since 1972 at the Centre for Scientific Research into Plant Medicine. However, plans to prescribe and dispense certified herbal medicines and to integrate TM into the public health system by the end of 2004 are yet to be implemented.

TBAs work alongside midwives in community clinics after receiving training in hygiene and modern techniques.¹⁷ This is in accordance with the WHO definition of the integrated model of health, “where modern and traditional medicines are integrated at the level of medical education and practice.”¹⁸

Methodology

Study Design

In accordance with the traditional practices of the Akan people, it was decided the study methodology should incorporate both spiritual and cultural considerations along with scientific evidence. Given the nature of the project, it was determined that a qualitative approach would provide the most effective tool for data collection.

Of the qualitative methods of data collection evaluated, interviews were considered the best method of data collection since they provide “real-life” stories. Because a structured interview does not allow flexibility to explore interesting issues that arise, and an unstructured interview does not provide enough focus, a semi-structured interview was used with a set of pre-determined questions, with order and wording that could be varied. It was also decided the interview could be extended according to how the interviewee response was perceived and the appropriateness of a question.¹⁹

Moreover, a method of triangulation was employed; i.e., data that originated from the epistemology of traditional knowledge was evaluated within an epistemology arising from scientific knowledge. Thus, the methods first provided a descriptive review to place in context the traditional beliefs and medicine of the Akan people, creating a background to the

study.

Next, five TMPs were interviewed with a view to exploring how: (1) herbal medicine is interlocked within the Akan belief system; (2) TMPs source, prepare, and prescribe the medicinal plants used in the treatment of hypertension (a common condition in Ghana, which was chosen as a focal point, and seen as a condition of “too much blood”); and (3) TMPs describe diagnosis and treatment of their patients. An interpretive approach was used to analyze the interviews.

Finally, a brief review of the literature was done for scientific validation of the pharmacological action of medicinal plants prescribed by the TMP in treatment of hypertension.

Data Generation

Contact was made with the Department of Pharmacy at KNUST in Kumasi, who kindly agreed to assist with the project and arranged for interviews with traditional herbalists known to them.

Five traditional male herbalists were interviewed using a hand-held recorder. A lecturer in the department assisted in all interviews and sometimes acted as interpreter if Twi was spoken (all the herbalists spoke English but some felt more comfortable speaking in Twi). All interviews took place at the practices of the traditional herbalists.

To create spontaneity within the interview, prompt cards were not used, the questions of the research instrument provided the guidelines, and further questions naturally arose. At times discourse between the interviewee and interviewer occurred that provided valuable insights into methods of herbal practice. During the interview process, a conscious effort was made to be sensitive to the responses of the interviewee and to respect his wishes if he did not want to reveal further information.

Data Analysis

The guidelines for analysis of the transcripts were by the voice-centered relational method described by Mauthner and Doucet.²⁰ The transcripts were read four times, looking for different themes and comparisons among the five herbalists as follows:

▲ How and why they became herbalists and how they presented themselves as herbalists. The transcript was then re-read, to see how interviewers socially, intellectually, and emotionally responded to the stories.

▲ Examining relationships as to what was being said about the nature of the patient-practitioner interrelationship.

▲ How hypertension was diagnosed and treated, and whether there were different methods employed.

▲ Looking at aspects of herbal treatment regarding how the herbs were gathered and prepared.

Study Limitations

This study was limited by the small size of the sample and the fact that the sample was chosen by a third party; therefore, the data collected may not be fully representative of all Akan traditional herbal practitioners.

It is difficult when interviewing people from a different cultural heritage and ontology to fully understand the subtle nuances of communication. In addition, since some interviews were conducted through an interpreter, important data may have been lost or filtered out through interpreter bias.

Since the interviews were conducted by an “outsider,” the TMPs may not have fully divulged their practices and treatments. The impact that religion, both traditional and Christian, had on the practice of the TMPs was not fully investigated in this study.

Results

The sample interviewees were male, full-time herbalists, ages 25-55; three were reasonably well educated. This is apparently unrepresentative of herbal practitioners in Ghana. Tsey¹⁴ writes of interviewing six male and six female herbalists with a mean age of 50, who all practiced part-time and eight were illiterate. Full-time herbalists are more common in urban areas and tend to be male.

Table 1. Training of Traditional Herbalists

Interviewee	Teacher	Length of training	Number of years an herbalist
1	Mother	Still training	8
2	Grandmother and Uncle	18 years	25
3	Herbalist	4 years	10
4	Father and an Herbalist	6 months with father; 2.5 years with an herbalist	3
5	Employer	Still training	2

Training of Herbalists in Ghana

The different paths and time taken to become an herbalist are shown in Table 1. In general, training occurs via two methods – family tradition and informal apprenticeship.

Family tradition featured in three interviews, where a family member disseminated knowledge through generations. One interviewee studied with his mother, who was still training him, and the mother had learned from her grandmother. Another herbalist had been taught by his uncle, who was an herbalist, and his grandmother, who was a fetish priest.

A third interviewee first sought formal education, although his father was a fetish priest. He concentrated on his studies as his father had encouraged him to do but saw his father as an inspiration.

One herbalist served an apprenticeship. Members of his family were farmers, his mother taught him about plants, and he had formal horticultural education. On finishing school he became an apprentice to an elder herbalist. He understudied with him for four years before the herbalist died, after which he carried on the work of his mentor. When he encoun-

tered difficulties in making a diagnosis after his mentor died, he received help in the form of visions and dreams. In order to access the dreams, he claimed he first had to be given the “spirit” by expressing interest and praying, although he did not indicate who he prayed to. Dreams feature strongly in African spirituality. Ephirim-Donkor³ writes, “When human activity ceases during sleep, the sunsum of the sleeping person continues its chores in the realm of the sacred, activities that are a prelude to the course of events in the world of objectivity.”

Patient-Practitioner Relationship

To the Western point of view, a paternal ideology appears to operate. The practitioner assumes a position of authority, with the TMPs taking responsibility for advising patients on their illnesses as well as their personal problems.¹⁰ An air of secrecy and fear is sometimes fostered, which was explained as being for the patient’s own good to prevent them from overdosing. It was explained that, “They can take more than expected, because they want to get well quicker.” Secrecy and fear also protect the privilege and status of the practitioner.

Table 2. Symptoms Reported by Patients with Hypertension

Symptom	Number of times identified
Tiredness	2
Weakness	3
Headache	2
Breathlessness	2
Tinnitus	1

Patients are seen on a weekly basis and treatment extends for at least six months, to be sure the treatment is effective. Seeing a patient frequently also prevents self-medication and therapy shopping.

Diagnosis and Treatment Using Hypertension as an Example

Medical care consists of a fusion of biomedical techniques and traditional knowledge. All interviewees used a sphygmomanometer and stethoscope

to measure blood pressure. Two also had laboratory-testing facilities in their clinics, where they tested blood, urine, and stool, and checked for other diseases such as malaria and bilharzias. Table 2 catalogs symptoms they associated with hypertension.

One practitioner commented on how the “blood disease” caused tinnitus; another how people came to see him because they “felt their blood is full, overworking” and they could not work in the fields.

There is recognition that hypertension can lead to a stroke and may be associated with heart disease, diabetes, or asthma. Diagnosis might be by divination. It was said that a fetish priest could hold the hand of a patient and know the different types of illness and see the plant that would help, even though the name of the plant may be unknown.

The medicinal plants traditional herbalists indicated they used in treatment of hypertension are shown in Table 3.

Patients were given herbs and taught how to make decoctions, or the decoctions were prepared by the herbalist and given to the patient using an assort-

Table 3. Medicinal Plants Indicated by TMPs

Name	Twi Name	Parts Used	Preparation	Condition Treated
<i>Tetrapleura tetraptera</i>	Prekese	Fruit	Powder in soup	Hypertension with diabetes
<i>Alstonia boonei</i>	Nyamedua	Bark	Decoction	Hypertension with longstanding fever
<i>Strophanthus gratus</i>				Heart failure
<i>Anthocleista nobilis</i>	Bontodee	Bark	Decoction	Hypertension
<i>Ipomoea batatas</i>	Aborodwobaa	Leaves	Decoction	Type 2 diabetes
<i>Uapaca guineensis</i>	Kuntan	Stem	Decoction	Hypertension

ment of recycled bottles. Decoctions were prepared over a charcoal fire in a large earthenware pot filled with leaves/barks/roots; preservatives were not regularly used. Patients were not encouraged to buy their own herbs because a plant can have one or more names in Ghana; different communities have their own vernacular for naming plants.

Treatment could form part of the diet. For example, the fruit of *Tetrapleura tetraptera* was put into soup (a thick sauce with meat/fish and fufu), or the fruit pulp was scraped and ground into a powder. The powder would be left to stand in boiling water for about 30 minutes, and then the extract could be used.

A pre-prepared powder from northern Ghana was put into a full bottle of Coca-Cola (widely sold in Ghana) to disguise the taste; the powder dissolved and the Coca Cola was drunk.

Treatment and choice of herbs was determined by the presenting complaint. However, one clinic prescribed prepared herbal formulas containing plants of European origin shown in Table 4.

Patients were either given the mix for hypertension or, if they suffered from both hypertension and diabetes, they received a mix for each condition. Dietary advice was also given as shown in Table 5.

All herbalists interviewed kept records of patient details, diagnosis, and prescriptions, either in a large book or on cards. Patient progress was recorded and, if necessary, a patient was referred to a "medical doctor."

Collection and Preparation of Medicinal Plants

Medicinal plants are wildcrafted from the bush or forest and not cultivated, since the plants are plentiful and not hard to find; one herbalist kept a kitchen garden.

It was said, "If you want effective treatment you have to go to the bush, to treat the patient well."

Table 4. Contents of European Formula for Hypertension

Medicinal plant	Common name
<i>Viscum album</i>	Mistletoe
<i>Allium sativum</i>	Garlic
<i>Crataegus oxycantha</i>	Hawthorne
<i>Taraxacum officinalis</i>	Dandelion

Table 5. Dietary Advice for Patients with Hypertension

- No cooking with salt
- No fatty foods
- No Coca-cola (except for herbal mixtures with Coca-cola)

All the interviewees had workers or an apprentice who gathered the plants and the herbalist authenticated the plants collected. Some plants come from northern Ghana already prepared. According to Ampofo,⁹ "Plant materials in the savannah and grassland area are often more potent than those in the tropical rain forest."

Plants are dried in the sun, and large piles of roots and barks laid out for drying are conspicuously visible. Once dry, they are washed and cut into small pieces. Drying without washing prevents loss of active constituents and encourages enzymatic activity.²¹ Certain barks are pounded to make a powder. In one instance, medicinal plants were commercially prepared and packaged in a central factory, then distributed as compound formulas in tincture or liquid form.

Scientific Validation of Botanicals Used

A brief review of available literature on the pharmacological properties of the medicinal plants used by the TMPs revealed few studies have been conducted, and those that exist are often by the same researcher. The European formula mix is not included in the review, as the plant actions are well known.

Tetrapleura tetraptera (Leguminosae)

An ethnobotanical survey of medicinal plants in Ghana confirmed the use of *Tetrapleura tetraptera* in the treatment of hypertension¹³ and Abbiw²² indicates a diuretic action. Other therapeutic uses include management of convulsions, leprosy, and rheumatic pain. *Tetrapleura tetraptera* also has anti-ulcerogenic, molluscicidal, and antimicrobial activity.²³

Comparative biological experiments *in vivo* and *in vitro* indicate *Tetrapleura tetraptera* has a hypotensive effect on smooth muscle due to the active constituents coumarin and scopoletin.²⁴ Scopoletin was found to relax smooth muscle and inhibit the positive chronotropic and inotropic effects of isoprenaline, noradrenaline, and calcium, but these actions were not mediated via the cholinergic mechanisms of the nicotinic or muscarinic cholinoreceptors. It is thought scopoletin is a non-specific spasmolytic agent, relaxing smooth muscle and therefore dilating blood vessels. However, no definitive conclusions on the precise mechanism of action by scopoletin have been made.²⁵

Tetrapleura tetraptera also contains aridanin. Ojewole²⁶ found these triterpenoid glycosides interfered with cellular calcium mobilization, therefore interrupting the contractile processes of muscle.

The fruit and seed of *Tetrapleura tetraptera* have low sodium content and are rich in potassium, iron, magnesium, phosphorus, and vitamin C. The fruit and roasted seeds are used in soups as a spice and a thickener.²⁷

Alstonia boonei (Apocynaceae)

The *Ghana Herbal Pharmacopoeia*²⁸ lists the constituents of *Alstonia boonei* as including triterpenoids and the alkaloids echitamine and echitamidine. The ethnobotanical survey showed it is used in the treatment of hypertension and malaria, and an infusion from the bark has been used as anti-venom for

snake bites. The stem bark is also used as an astringent and febrifuge for relapsing fevers. Topical application of the leaves and latex reduces swellings and rheumatic and muscular pains.¹³

Comparative *in vitro* studies produce conflicting results for *Alstonia boonei*. One study found an aqueous extract of stem bark containing the alkaloid echitamine relaxed smooth muscle,²⁹ while Makinde and Taiwo found the aqueous extract contracts smooth muscle. They attribute this variance in results to the fact that another active principal may have a stimulant action, or seasonal and ecological conditions at the time of harvest might have caused variability in the active constituents.³⁰

The traditional use of stem bark as a febrifuge in relapsing fevers was confirmed as an extract of stem bark reduced pyrexia in comparative biological tests.³¹

Anthocleista nobilis (Loganiaceae)

The root bark of *Anthocleista nobilis* is used in the treatment of diabetes, gastrointestinal parasites, and jaundice. *Anthocleista nobilis* contains the alkaloids brucine and loganine²² and has been noted to be antispasmodic and neurotropic, having a marked hypotensive effect.³¹ In comparative biology studies it was found the alkaloids inhibit muscular contraction induced by norepinephrine.³²

Strophanthus gratus (Apocynaceae)

Strophanthus gratus is indicated for use in the treatment of cardiac failure. The pharmacological effects of *Strophanthus* spp. are well documented; Peterson in 1905 described the use of *Strophanthus hispidus* as a cardiac tonic, increasing arterial tension.³³ *Strophanthus gratus* contains the cardiac glycoside γ -strophanthin (ouabain) and the alkaloid inoetine. It has therapeutic use in congestive heart failure and edema, having a positive inotropic effect on cardiac muscle. It has a narrow therapeutic index, with the maximum dose quoted in Mrs. Grieve of one-half grain,³⁴ so clinical toxicity can easily occur. Irvine³⁵ writes that a decoction of crushed stems is drunk in Ghana for severe sickness and weakness.

Ipomoea batatas (Convolvulaceae)

The leaves of *Ipomoea batatas* are known to contain an “insulin-like-substance” and 1 g leaves was found to be equivalent to 440 units of insulin.³⁶ An extract of *Ipomoea batatas* (caiapo) has been found to improve glycemic control by reducing insulin resistance in type 2 diabetics during randomized, double-blind, placebo-controlled trials. The decreased insulin resistance did not affect body weight, glucose effectiveness, or insulin dynamics.^{37,38}

Uapaca guineensis

No available relevant research was found for *Uapaca guineensis*.

Conclusion

In this study, it was observed that the knowledge of medicinal plants and their use in treatment was propagated through family tradition and apprenticeship, as previously described by other researchers. However, a new form of training is emerging and importance is being placed on looking to the future by obtaining academic qualifications and business acumen in order to become a traditional herbalist.

Techniques used in diagnosis and treatment involve a fusion and assimilation of biomedical skills with traditional knowledge. Interviewees utilize allopathic testing methods in conjunction with divination and spiritual elements. The perception of most interviewees is that “Westerners” are “one dimensional” and do not comprehend the spiritual or holistic perspective of life, therefore not encompassing the metaphysical elements involved in the treatment of the whole person and consequently failing to embrace these aspects of humanity.

Practitioners protect their knowledge by generating an air of secrecy and maintain patient compliance by frequent consultations and dispensing, which also enables them to record patient progress. However, they know their limitations and refer to a medical doctor when required.

Medicinal plants are thought to contain more active constituents when harvested from their natural habitat, but quality control is difficult to achieve during the drying process, when contamination by wildlife can easily occur. Decoctions do not provide

standardized dosages and a lack of preservative allows for microbial growth. However, standardized formulas do not cater to individual therapeutic requirements as “one size fits all.”

Scientific studies do not replicate the methods used by traditional herbalists to extract active principals or quantify natural synergy. However, scientific evidence substantiates the therapeutic use of medicinal plants prescribed by the TMP.

In this exploratory study, it was found there is a trend toward modernization, both in training and practice. Although it could be argued that different paradigms of health and illness in Western biomedicine and TM stand in the way of complete integration, a fusion and integration of traditional knowledge with contemporary medical techniques by the traditional herbal practitioners is evident. This appears to increase the therapeutic potential of herbal medicine, while maintaining the subtlety of cultural heritage and understanding traditional notions of illness.

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