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AN APPRAISAL OF PHYTOMEDICINE IN AFRICA

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ABSTRACT

Medicinal plants have played a key role in the world health care with about 80% of Africans depending on phytomedicine, which has shown a wide range of uses in the treatment of diseases especially priority diseases of Africa such as HIV/AIDS, malaria, sickle-cell anemia, diabetes and hypertension. These medicinal plants have more beneficial effect than their synthetic counterparts through being safer, acceptable, affordable, culturally compatible and suitable for chronic treatments. Some African phytomedicines are well known in the international market and so supply economic benefit for the producing countries. The use of phytomedicine should be integrated into the health agenda since effective health care cannot be achieved in Africa by using orthodox medicine alone. This can be achieved by adopting the WHO memorandum and guidelines for the institutionalization of phytomedicine into the health sector. Although there are some problems limiting the development of phytomedicine, such as lack of standardization, efficacy and quality control of plants used, extinction of some plant species, lack of funds and others, if these problems can be fully addressed, this will help in the future development and harmonization of phytomedicines.

KEYWORDS: phytomedicine, traditional medicine, traditional medical practitioners (TMPs), orthodox medicine, health care system

1. INTRODUCTION

Traditional medicine as a major African socio-cultural heritage has been in existence for hundreds of years. It was once believed to be primitive and wrongly challenged by foreign religions dating back during the colonial rule in Africa and subsequently by the conventional or orthodox medical practitioners. The traditional medicine has been the focus for wider coverage of primary health care delivery in Africa and the rest of the world [1]. WHO [2] defined traditional medicine as the sum total of knowledge or practices whether explicable or inexplicable used in diagnosing, preventing or eliminating a physical, mental or social disease, which may rely exclusively on past experience or observation handed down from generation to generation, verbally or in writing. It comprises therapeutic practices in existence for hundreds of years before the development of modern scientific medicine and is still in use today without much documented evidence of adverse effects. The new health agenda in Nigeria and Africa focuses on the institutionalization of traditional medicine in parallel with orthodox medicine into the national health care scheme in order to move the health agenda forward since effective health cannot be achieved in Africa by orthodox medicine alone unless it has been complemented with traditional medicine as recorded by Elujoba *et al.* [1]. This traditional medicine comprised the use of plant, animal or mineral materials for healing [2] but the focus here is on phytomedicine (plant medicine) type. According to the World Health Organization [3], phytomedicine is defined as herbal preparations produced by subjecting

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plant materials to extraction, fractionation, purification, concentration or other physical or biological processes. These preparations may be produced for immediate consumption or as the basis for other herbal products. Such plant products may contain recipient or inert ingredients, in addition to the active ingredients.

Furthermore, Iwu *et al.* [4] reported that the first generations of plant medicine were simple botanical materials employed in more or less crude form. These medicines such as *Cinchona, Opium, Belladonna* and *Aloe* were selected based on empirical evidence as gathered by traditional practitioners. The second-generation phytopharmaceutical agents were pure molecules whose compounds differ from the synthetic therapeutic agent only in their origin, for example taxol from *Taxus spp.,* quinine from *Cinchona* and reserpine from *Rauvolfia* spp. [4]. In the development of third generation of plant medicine, the formulation is based on well-controlled double-blind clinical and toxicological studies with phytomedicine to improve the quality, efficacy, stability and the safety of the preparations [5-6].

Iwu *et al.* [4] reported that infectious diseases account for one-half of all deaths in the tropical countries. Irrespective of the efforts made in curbing the incidence of epidermics, drug-resistant microorganisms and the emergence of hitherto unknown disease-causing microbes pose enormous public health concern.

Phytomedicine has played a key role in world health care [7] with about 80% of Africans depending on it (Table 1). Phytomedicine has demonstrated its contribution to the reduction of excessive mortality, morbidity and disability due to diseases such as HIV/AIDS, malaria, tuberculosis, sickle-cell anemia, diabetes, mental disorders [1] and microbial infections [4, 8]. It has reduced poverty by increasing the economic well-being of communities and develops health system by increasing health coverage to the people [1]. Phytomedicines are now very popular in developing countries with knowledge about the safety, efficacy and quality assurance of botanical medicine as reported by Calixto [7].

Table 1 African medicinal plants with their medicinal values

Plants	Disease cured	Action	Usage	Source
Xylopia aethiopica	intestinal spasms, cough, post partum tonic, for lactation, stomach remedy, bronchitis, biliousness, dysentery, headache, female hygiene	soothing, antispasmodic, remove biliousness, emollient, sedative	poultice of the plant	[9]
Garcinia kola	bronchitis, throat infections, relieve colic, head or chest cold, cough, liver disorder	antibiotic, antispasmodic, soothing, sedative, ease cough, expectorant, choleretic	eating the seed of the plant	[10]
Vitex doniana	gastroenteritis, diarrhea, dysentery, infertility, eye diseases	antimicrobial, invigorating and anti-inflammatory	stem bark decoction	[11]
Crytolepis sanguinolenta	fever, malaria, urinary and upper respiratory tract infection, rheumatism, venereal diseases	antiplasmodial, antiviral, antispasmodic, expectorant, anti-inflammatory	hot poultice of dried root	[12-14]

Table 1 African medicinal plants with their medicinal values (cont.)

Plants	Disease cured	Action	Usage	Source
Euphorbia hirta	bronchial and respiratory disorders, urinary disorder, skin diseases, ocular diseases and dysentery	soothing antispasmodic, regenerates skin, emollient antiparasite, anti-inflammatory, antimitotic, antiviral, antibiotic, diuretic	aqueous decoctions of the plant, latex of the plant for cuts and warts	[15-16]
Ocimum gratissimum	respiratory infections, diarrhea, headache, ophthalmic (ocular) diseases, skin diseases, pneumonia, cough, fever, conjunctivitis	anti-inflammatory, soothing, expectorant, invigorating, antiseptic, sedative, emollient	aqueous and ethanol extracts of the leaves	[17]
Citrus aurantifolia	nervousness, anxiety, insomnia, gastroenteritis	sedative, mildly narcotic anti-inflammatory	infusion of leaves and flowers (orange blossom) ethanol and aqueous leaf extracts	[18-19]
Cajanus cajan	sickle-cell anemia	anti-anemic because of phenylalanine	seed	[1]

Table 2 Phytotherapeutic sales in world market [7, 20-22]

	Europe						America	Asia
Year	Germany	France	Italy	UK	Spain	Netherlands	USA	India
1995								$400 million
1996							$3.2 billion	
1997	$3.5 billion	$1.8 million	$700 million	$400 million	$300 million	$100 million		
1998	-	-	-	-	-	-	-	-
1999							$5 billion	

Table 3 Some African phytomedicinals in world market

Plant species	Action	Constituents	Countries	Source
Ancistrocladus abbreviatus	Anti-HIV	Michellamine B	Cameroon and Ghana	[23-24]
Corynanthe pachyceras	Male stimulant	Corynanthidine, corynanthine, yohimbine.	Ghana	[23]
Tamarindus indica	Insecticides	Pectins	Egypt	[25]
Rauvolfia vomitoria	Tranquilizer and antihypertensive	Reserpine, yohimbine	Nigeria, Zaire, Rwanda, Mozambique,	[23]
Cinchona succirubra	Anti malarial	Quinine	West African countries	[26]
Syzigium aromaticum	Dental remedy	Eugenol, terpenoids	East Africa countries, Madagascar	[1]
Agava sisalana	Corticosteroids and oral contraceptives	Hecogenin	Tanzania	[1]
Physostigma venenosum	Opthalmia	Physostigimine (eserine)	Calabar (Nigeria), Ghana,Cote D'ivoire	[23]
Prunus africana	Prostate gland hypertrophy	Sterols, triterpenes, n-docosanol	Cameroon, Kenya, Madagascar	[23, 27]
Catharanthus roseus	Anti-Leukemia and Hodgkin's disease	Triterpenoids, tannins and alkaloids	Madagascar	[1, 28]
Zingiber officinale (Ginger)	Spice, carminative and medicinal products	Gingerol	Nigeria	[23]
Chrysanthemum cinerariifolium	Insecticides	Pyrethrins	Ghana, Kenya, Rwanda, Tanzania, South Africa	[29]

indigenous traditional knowledge and for the integration of traditional medicine into the health scheme [41].

4.2 Future suggestions on the development of phytomedicine in Africa

As medicinal plants are going global with increasing demand in the phytotherapeutic market, some factors have to be put in mind in order to meet the world herbal medicine's standard of safety and efficacy. The following factors must be emphasized in Africa for the development of phytomedicine

- Emphasis on well-controlled and randomized clinical trials to prove the safety and efficacy of herbal medicine. With the growth of the botanical market, the quality, efficacy and safety of phytomedicine used in clinical trails has to be improved so as to produce standardized drugs [7]. Researches on traditional medicines should be made to develop novel therapeutic methods.
- An improvement in the processes of regulation and global harmonization of phytomedicine. The integration of African traditional medicine into the health system should be in a way to bring harmony between traditional and modern system of health care with minimum threat to each other [1, 7].
- Greater emphasis should be placed on collaboration work with TMPs and other scientists in order to bring traditional healers closer to scientists by engaging healers in laboratory work, training them as well as get information on traditional prescriptions for specific diseases [41].
- Emphasis has to be placed on domestication, production, biotechnological studies and genetic improvement of medicinal plants. The domestication of plants will help in reducing effects associated with wild-harvested plants, avoid misidentification and field contamination. Increase the quality of raw materials and yield through genetic breeding and selection. Production of phytomedicine with resistance to microorganism-induced diseases [7].
- Detailed legislation on the ownership of intellectual property right has to be made [7, 41].

5. CONTRIBUTIONS OF SOME RESEARCH CENTERS IN AFRICA AND CONCLUSIONS

Some centers have been formed in Africa to help in carrying out clinical trials, production of standardized drugs and regulatory work.

The centers include:

- **Center for scientific research into plant medicine, Ghana:** They have helped to make sure that drug production is carried out to provide well formulated, suitable, standardized and safe preparations from plants for clinical evaluation, utilization and monitoring in a clinical setting.
- **Center for research on pharmacopoeia and traditional medicine in Rwanda-** produces drugs which are used in curing different diseases.
- **The "village chemist" in Development of pharmacognosy, Obafemi Awolowo University, Ile-Ife, Nigeria:** Manufactures standardized and efficacious phytomedicine for managing different likely infections associated with people living with HIV/AIDS, like antithrush, antifever, antidysentery and antidiarrhea, anticough and anti-infective against skin pathogens and diseases.
- **Swaziland center for research in medicinal and indigenous food plants, University of Swaziland, Swaziland:** They analyze medicinal plants collected by rural people familiar with that the traditional medical system and study's ethnobotanical information on medicinal plants administered by TMPs.
- **Department of traditional medicine, Bamako, Mali:** They keep ethnobotanical information on medicinal plants in rural areas of Mali and researching on their plants to validate claims.

In general, intelligent application of traditional therapies (with proper conducted double-blind clinical trials) will make useful contributions to alleviating sickness and suffering in Africa. Efforts should be made to protect plants from going extinct because a source of health and wealth lies in them. The people and Orthodox practitioners need to be given appropriate information on phytomedicine in other to use them and apply them in the health care delivery system. The integration or harmonization of phytomedicine should be developed in such a way to work hand in hand with orthodox medicine with minimum threat to each other.

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