



COMMONLY USED MEDICINAL PLANTS IN THE MANAGEMENT OF SICKLE CELL ANAEMIA AND DIABETES MELLITUS BY THE LOCAL PEOPLE OF EDO STATE, NIGERIA

Ilondu¹ E M and Enwa F O²

¹Department of Botany, Faculty of Science, Delta State University, Abraka.
martinailondu@yahoo.co.uk, +2348036758249

²Department of Pharmaceutical Microbiology, Faculty of Pharmacy, Delta State University, Abraka.

*Corresponding Author Email: felixenwa@yahoo.com

ABSTRACT:

A study of some plants used in the management of sickle cell anaemia and diabetes by the local people of Edo State. They include *Allium cepa*, *Allium sativum*, *Aloe vera*, *Carica papaya*, *Collocasia esculenta*, *Gossypium hirsutum*, *Garcinia cola*, *Ipomoea batatas*, *Jatropha curcus*, *Jatropha tanjorensis*, *Mangifera indica*, *Mucuna puriens*, *Musa paradisiaca*, *Ocimum gratissimum*, *Pisidium guajava*, *Terminalia catapa*, *Telfairia occidentalis*, *Spermacoce ocymoides* and *Vernonia amygdalina*, and the phytochemical properties present in these plants were also evaluated.

KEYWORDS:

Anaemia, medicinal plants, diabetes.

1. INTRODUCTION

Plants are important to our everyday existence. They provide our food, produce oxygen we breath and serves as raw materials for many industrial products such as clothes, foot wears and so on. Plants also provide raw materials for our buildings and in the manufacture of biofuels, dyes, perfumes and pesticides.

The plant kingdom is a treasure house of potential drugs and in recent years there has been an increasing awareness about the importance of medicinal plants. From earliest times, mankind have used plants in an attempt to cure diseases and relieve physical suffering³². Primitive people in all ages have had some knowledge of medicinal plants, derived as the result of trial and error. These primitive attempts at medicine were based on speculation and superstition. Most tribes have believed that diseases were due to the presence of evil spirits in the body and could be driven out only by the use of poisonous or disagreeable substances calculated to make the body an unpleasant place in which to remain³².

The traditional African healing system is known by many names like folk medicine, native medicine, herbal medicine and ethno medicine²⁸. According to Sofowora⁴⁴, the term folk medicine refers to the knowledge of the mode of treatment. Ethnomedicine according to Gbile¹⁸ refers to the use of plants by members of an indigenous culture for which there is no organised medicinal plants. Mume³³ described traditional medicine as tradomedicalism, which is a system of treating disease by the employment of the

agencies and forces of nature. Traditional medicine has prominently been used in the treatment of all kinds of diseases in Africa. The administration of the native or traditional drugs has been in the hands of native herbalists who are quite often old people especially old ladies in rural settings. According to the history of Nigeria traditional medicine²⁰, thousands of plants have been used for centuries in the practice of herbalism and many of them are known by our herbalists for their presumed pharmacological properties.

From the foregoing we can see that the use of medicinal plants has always been part of human culture and remains the mainstay of primary health care in most of the third world. Plants produce a source of medicine which are useful in treatment of various categories of human ailments and conditions. The world health organisation (WHO) has estimated that up to 80% of the world's population relies on plant for their primary health care. While in Nigeria, a WHO survey estimated that up to 75% of the population patronise traditional medicine³⁹. This is because modern drugs are not usually affordable by the population. The massive use of plant is encouraged by their efficiency, their availability and the low cost of herbal concoctions.

According to the world health organisation (WHO, 1977) a medicinal plant is any plant which contains substances that can be used for the therapeutic purpose in one or more of its organs or substances which are precursors for the synthesis of useful drugs. Medicinal plants are further defined as plants that have at least

one of their parts (leaves, stem, barks or roots) used for therapeutic purpose⁴⁰.

Since plants form the main ingredient of traditional systems of healing it has been a source of inspiration for several major pharmaceutical drugs. Roughly 50,000 species of higher plants (about 1 in 6 of all species) has been used medicinally. This represents by far the biggest use of the natural world in terms of number of species. The use of medicinal plants is increasing worldwide, in view of the tremendous expansion of traditional medicine and a growing interest in herbal treatment.

Medicinal plants are divine gifts to us from Mother Nature who has kept these green remedies in her plant kingdom for mankind to use to fight death from disease and cure themselves from ailments. It is up to us to explore, seek, search and reap the benefits of these treasures.

This work provides additional information to boost the available ethno repository with an aim to survey the medicinal plants commonly used by the people of Edo state for the control of sickle cell disease and diabetes in Edo state. It also provides information on the phytochemical contents of these plants.

2. MATERIAL AND METHODS

2.1. Plant materials

Traditional herbal healers and some relations who have good knowledge of the use of medicinal plants for the treatment of diabetes and anaemia were interviewed.

Local people, who reside in the rural area of Benin, provided some of the local names and information regarding the use of these plants. The plants were identified using "A Handbook of West African Weeds"⁶

The botanical names of the plants have been arranged alphabetically as follows: *Allium cepa*, *Allium sativum*, *Aloe vera*, *Carica papaya*, *Colocasia esculenta*, *Garcinia kola*, *Gossypium hirsutum*, *Ipomoea batatas*, *Jatropha curcas*, *Jatropha tanjorensis*, *Mangifera indica*, *Mucuna puriens*, *Musa paradisiaca*, *Ocimum gratissimum*, *Pisidium guajava*, *Telfairia occidentalis*, *Spermocoe ocymoides*, *Vernonia amygdalina*.

The various plants were collected freshly and the leaves, seeds, bulbs were air dried. With the aid of a dry blender, mortar and pestle, these plants were made into powdered form.

2.2. Extraction of the Various plants

100mls of n-hexane was added to 20g of each powdered plant sample in a conical flask. The mixture was stirred with a stirrer and covered. They were allowed to stand for 24 hours and filtered using sterile filter paper. The filtrates (extract) were concentrated to 10mls on a water bath. They were cooled and stored in a refrigerator.

2.3. Phytochemical test of the various chemical components

For the phytochemical test, the procedures of Trease and Evans^{45,21,35} were employed to check for the presence of Alkaloid, Saponins, Tanins, Flavonoids, Steroid.

2.3.1. Alkaloids

1 ml of 1% HCl was added to 3mls the extracts in a test tube. The mixture was heated for some minutes, cooled and filtered. The filtrates were used for the following tests to determine the presence of alkaloids.

a) 2 drops of Wagner's reagent was added to 1ml of the extracts. A reddish brown precipitate observed in any of the extract tested indicates the presence of alkaloids.

b) 2 drops of Meyer's reagent was added to 1 ml of the extracts. A creamy precipitate observed in each extract tested indicates the presence of alkaloid.

2.3.2. Tannins

a) 1 ml of freshly prepared 10% KOH was added to 1ml of the extracts. A dirty white precipitate observed in any of the extracts tested indicates the presence of tannins.

b) 2 drops of 5% FeCl₃ was added to 1 ml of the extracts. A greenish precipitate in any of the tested extract confirms the presence of tannins.

2.3.3. Saponins

To test for the presence of saponins, two types of test procedures are used viz frothing and Emulsion test

(a) Frothing test: 2mls of the extract in a test tube was vigorously shaken for two minutes. Frothing observed in each extract tested indicated the presence of saponins.

(b) Emulsion Test: 5 drops of Olive oil was added to 3ml of the extracts in test tubes and the mixture shaken vigorously. A stable emulsion formed in any of the extract tested indicated the presence of saponin.

2.3.4. Steroids

Salkowski method was used to test for steroids. About 0.5g of the extract was dissolved in 3mls of CHCl₃ and filtered. To the filtrate was added concentrated H₂SO₄ to form a lower layer. A reddish brown colour was taken as positive steroid ring.

2.3.5. Flavonoids

Three methods were used to determine the presence of flavonoids in the plants sample.

(a) 5mls of dilute ammonia solution was added to a portion of the aqueous filtrate of each plant extract followed by the addition of concentrated H₂SO₄. A yellow colouration observed in each extract indicated the presence of flavonoids. The yellow colouration disappeared on standing.

(b) Few drops of 1% aluminium solution was added to a portion of each filtrate. A yellow colouration was observed indicating the presence of flavonoids.

(c) a portion of the powdered plant sample was in each case heated with 10ml of ethyl acetate over a steam bath for 3 minutes. The mixture was filtered and 4ml of the filtrate was shaken with 1ml of dilute ammonia solution. A yellow colouration was observed indicating a positive test for flavonoids.

3. RESULT

Table 1: Common plants used in the management of Diabetes mellitus

Botanical name	Family	Local name	Common name	Part used
<i>Colocasia esculanta</i>	Araceae	Akhaa	Cocoyam	Leaves
<i>Allium sativum</i>	Liliacea		Garlic	Bulb
<i>Pisidium guajava</i>	Myrtaceae	Eguava	Guava	Leaves
<i>Musa pardisiaca</i>	Musaceae	Oghede	Plantain	Shoot
<i>Vernonica amygdalina</i>	Asteraceae	Ebe oboyiwo	Bitter leaf	Leaves
<i>Ocimum gratissimum</i>	Lamiaceae	Ebenwonkuo	Scent leaf	Leaves
<i>Aloe vera</i>	Liliaceae		Aloe vera	Leaves
<i>Magnifera indica</i>	Anacardiaceae	Ogwi	Mango	Leaves
<i>Allium cepa</i>	Liliaceae	Alubara	Onions	Bulb
<i>Spermacoce ocymoides</i>	Rubiaceae			Leaves
<i>Garcinia kola</i>	Guttiferae	Edun	Bitter kola	Seed

Table 2: Common plants used in the management of sickle cell anaemia

Botanical name	Family	Local name	Common name	Part used
<i>Jatropha tanjorensis</i>	Ephorbiaceae		Hospital too far	Leaves
<i>Ipomoea batatas</i>	Convolvulaceae	Iyan-ebo	Potato	Leaves
<i>Mucuna pruriens</i>	Fabaceae		Devil beans	Leaves
<i>Terminalia catapa</i>	Combretaceae	Ebo-omobadan	Almond tree	Leaves
<i>Telfairia occidentalis</i>	Cucurbitaceae	Ebe-umwenkhien	Fluted pumpkin	Leaves
<i>Gossypium hirsutum</i>	Malvaceae	Ikpowu	Cotton tree	Leaves
<i>Mangifera indica</i>	Anacardiaceae	Ogwi	Mango	Leaves
<i>Jatropha curcas</i>	Euphorbiaceae	Ebe omoebo	Barbados nut	Leaves
<i>Carica papaya</i>	Caricaceae	Uwuho	Pawpaw	Leaves

Table 3: Summary of medicinal plants and their phytochemical contents

Plants	Alkaloids	Flavonoids	Tannins	Saponin	Steroids
<i>Ipomoea batatas</i>	+	+	+	+	-
<i>Allium sativum</i>	+	+	-	+	+
<i>Pisidium guajava</i>	+	+	+	+	+
<i>Mucuna pruriens</i>	-	+	+	+	+
<i>Terminalia catapa</i>	+	+	+	+	+
<i>Vernonia amygdalina</i>	+	+	+	+	+
<i>Telfairia occidentalis</i>	+	+	+	+	-
<i>Ocimum gratissimum</i>	+	+	+	+	+
<i>Gossypium hirsutum</i>	+	+	+	+	+
<i>Aloe vera</i>	+	+	+	-	-
<i>Mangifera indica</i>	+	-	+	+	-
<i>Jatropha carcas</i>	+	+	+	+	+
<i>Allium cepa</i>	+	+	+	+	+
<i>Spermacoce ocymoides</i>	+	-	+	+	-
<i>Carica papaya</i>	+	+	+	+	+
<i>Garcinia kola</i>	+	+	+	+	+
<i>Jatropha tanjorensis</i>	+	+	-	-	+
<i>Musa paradisiaca</i>	+	+	+	+	-

4. DISCUSSION

Sickle cell anaemia and diabetes are disease conditions which are prevalent in our community. This work has shown some traditional plant remedies that have been used by indigenous people of Edo State for the management and treatment of these ailments. Also, phytochemical analysis was also carried out on the plants. These phytochemicals include alkaloids, flavonoids, saponin, steroid and tannins. These phytochemicals generally have a wide range of pharmacological activities or actions²⁸. Most of these phytochemicals constituent are potent bioactive compounds found in medicinal plant parts which are precursors for the synthesis of useful drugs. All plant parts synthesize some chemicals by themselves which metabolise their physiological activities. These phytochemicals are used to cure disease in herbal and homeopathic medicine. Alkaloids, the most revered of all phytochemicals are said to be pharmacologically active and their action are felt in the automatic nervous system, blood vessels, respiratory system, gastrointestinal tract. In addition, alkaloids are antispasmodic, analgesic and also have bactericidal effects. Tannins are well known for their anti-oxidant and anti-microbial properties as well as for soothing relief, skin regeneration, as anti-inflammatory and diuretics properties. Saponin lower the cholesterol level, have anti-diabetic and anti-carcinogenic properties⁴⁵. In addition, saponins are expectorants, cough suppressant and for haemolytic activities. Flavonoids are significantly recognised for their anti-oxidant, anti-carcinogenic and anti-microbial and anti-tumour properties. Steroid regulates carbohydrate and protein metabolism and possesses anti-inflammatory properties⁴⁰.

All the plants studied have proved to be very important in medicinal plant research because of the phytochemicals they possess.

From this study *Allium sativum*, *Pisidium guajava* leaf, *Musa paradisiaca* shoot, *veronica amygdalina*, *Ocimum gratissimum*, *Aloe vera*, *Mangifera indica*, *Allium cepa*, *Spermacoce ocymoides*, *Garcinia kola*, are used in the treatment of diabetes by the local people while *Jetropha tanjorensis*, *Ipomoea batatas*, *Mucuna pruiens*, *Terminalia catapa*, *Telfairia occidentalis*, *Gossypium hirsutum*, *Mangifera indica*, *Jatropha carcas*, *Carica papaya* leaves are used to control sickle cell anaemia.

CONCLUSION

Conclusively, with the present policy on poverty alleviation in developing countries, it is hoped that herbs mentioned in this work and others too numerous to be mentioned could be explored as potential sources of drug production.

Finally, natural products are becoming more important in modern day society, as man is moving away from synthetic products which can be detrimental to the environment and human health.

This review has highlighted some herbs used by the local people to control sickle cell anaemia and diabetes mellitus. These plants reviewed though does not eradicate these health problems but help to control and enables patients to live stable lives.

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***Corresponding author address:**

Enwa F O
Department of Pharmaceutical Microbiology,
Faculty of Pharmacy, Delta State University, Abraka.