Article title: ETHNOBOTANICAL SURVEY OF THE MEDICINAL PLANTS USED IN THE TREATMENT OF SEXUALLY TRANSMITTED DISEASES IN IBADAN, OYO STATE, NIGERIA

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**ETHNOBOTANICAL SURVEY OF THE MEDICINAL PLANTS USED IN THE
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OYO STATE, NIGERIA**

ABSTRACT

Plants have been used locally and traditionally in the treatment and management of some ailments. The use of medicinal plants is in combination with the several cultural beliefs and traditional practices and has a long history in therapeutic success because many drugs used clinically today are developed directly or indirectly from plants. Sexually transmitted diseases (STDs) are sets of venerable diseases that are rampant in Nigeria contributing to its high morbidity and mortality rate. Ethnobotanical studies of the available local medicinal plants used for the management of STDs will lead to the discovery of better antimicrobials to treat STDs.

The ethnobotanical survey of plants used in treatment of Sexually transmitted diseases was carried out in Ibadan city. The study was aimed at documenting the use of traditional medicines in treatment of sexually transmitted diseases (STDs) among the people of Ibadan. The specific areas of study were Bode Market in Ibadan South East Local Government Area, Oje Market in Ibadan North East Local Government Area and Olunde area in Oluyole Local Government Area. The respondents interviewed included herb sellers, herbalist and herbal therapists. A well-structured questionnaire was used to obtain information from them and communication was done verbally in Yoruba. Medicinal plants recommended were collected and taken to Forestry Research institute of Nigeria (FRIN) in Jericho, Ibadan for proper Identification.

From the survey, 52 Species of plants representing 34 families were reported by 80 traditional medicine practitioners as remedies for treating Sexually transmitted diseases. The families that were highly used include Anacardiaceae, Fabaceae and Cucurbitaceae. The plants commonly used were *Citrullus colocynthis* (L.) Schrad, *Plumbago zeylanica* L., *Citrus aurantifolia* Christm., *Mangifera indica* L., *Senna alata* L. Roxb, *Erythroleum suaveolens* (Guill. & Perr.) Brenan and *Gladiolus dalenii* Van Geel. The plant *Citrullus colocynthis* had the highest frequency of use.

The high frequency of use of these plants suggests their efficacy and potency against Sexually transmitted disease. The further analysis of these plants can help to develop new, effective therapeutic medicinal drugs (antimicrobials) that would be useful to control Sexually transmitted diseases thereby reducing their morbidity and mortality impact on Global health.

Key words: Sexually transmitted diseases, Ethnobotanical survey, Medicinal plants.

CHAPTER ONE

INTRODUCTION

Plants have been used locally and traditionally in the treatment and management of some ailments. The use of these plants is in combination with several cultural beliefs and traditional practices and has contributed greatly to the development of some drugs used in herbal medicines and orthodox medicines. Herbal medicine is distinct from Traditional medicine in such that it uses the knowledge of the activity of the medicinal plants to treat a particular ailment excluding the traditional and cultural practices associated with Traditional medicine practice (Emiru *et al.*, 2011).

The use of medicinal plants has a long history in therapeutic success because many drugs used clinically today are developed directly or indirectly from plants. Medicinal plants have been used in the long run in treatment of ailments especially by those living in rural areas who do not have access to the modern medicine practices and facilities. These people depend solely on the use of herbal medicinal from folk medicinal healers, herbal drug sellers, herbalists and the formulations are sometimes used with their various traditional and cultural beliefs and practices (Rahman *et al.*, 2018).

According to the World Health Organization (WHO) about 65-80% of the world's population in developing countries depends essentially on plants for their primary healthcare due to poverty and lack of access to modern medicine (Awoyemi *et al.*, 2012). The traditional knowledge of the medicinal plants and their uses by indigenous healers are not only useful for the conservation of cultural tradition and biodiversity but also in the development of the community health care and drugs for the people. This indigenous knowledge on medicinal plants started with man when he learned how to use the traditional knowledge on medicinal plants (Emiru *et al.*, 2011).

1.1 ETHNOBOTANY

1.1.1 Definition of Ethnobotany

The term “Ethnobotany” was first used and introduced by the American botanist Dr. John William Hershberger, in 1895 during a lecture in University of Philadelphia to describe his research. He described ethnobotany as “the study which deals with the utilization of plants by primitive and indigenous people”. He later published the term in 1896 (Ali *et al.*, 2006 and Rahman *et al.*, 2018). Ethnobotany is the science of people’s interaction with plants (Turner, 1995). It studies the relationship between people and plant in all its complexity. It involves the comparative observation and study of plant use within a society and also; the beliefs and cultural practices associated with the use. It is the study of total natural and traditional interrelationships between man and plants and his domesticated animals. (Ijaz *et al.*, 2017).

Ethnobotany is a research that studies the relationship between plant and human in an environment and also study and evaluate the effects of these plant on human in all stages of civilization. Ethnobotany has emerged as an interdisciplinary science that involves anthropology, botany, taxonomy, sociology, archaeology, ecology, folklore, mythology, economics, medicine, linguistics, forestry, agriculture, phytochemistry, pharmacology and economic botany (Pei, 2002). The study of ethnobotanicals has helped to bridge the gap between herbal medicine, orthodox medicine and that of Traditional medicine and ascertain if they truly have the acclaimed inherent properties. The bio scientific investigation of medicinal plants used locally by people through ethnobotanical survey has given a great insight to drug development approach (Emiru *et al.*, 2011 and Pei, 2002).

1.1.2 Historical Perspective of Ethnobotany

Man has been depending on the nature for his basic needs right for the inception of time. He developed interest and curiosity in plants and its diversity right from his needs for food, shelter and protection. When there was need for relief and cure for injuries and diseases, he sought for remedies among plants. He was able to distinguish edible plants from the poisonous and the medicinal plants by observing animals that feeds on these various plants. The whole concept brought about the science of medicine because since those times plants have been indispensable

sources of preventive and curative medical preparations for humans and animals (Schultz *et al.*, 1990 and Rahman *et al.*, 2018).

From historical reports, the traditional use of medicinal plants has been dated back to 5000 BC in China and 1600 BC in Syrians, Babylonians, Hebrews and Egyptians (Wang *et al.*, 2007 and Dery *et al.*, 1994). The history of the oldest civilization of the ancient cultures of Africa, China, Egypt and the Indus valley suggests evidence that support the use of Traditional medicine in these areas. Ethnobotany was later introduced in China as science in the late 1970s (Pei, 2002).

In Ethnobotanical survey of plants, information about the plants used and their activities is collected in a structured pattern to derive adequate and useful data. Some of the methods ethnobotanists employ to obtain information about a medicinal plant for drug discovery include:

1. Note taking
2. Photography
3. Tape and videos
4. Recording
5. The use of questionnaires
6. Conducting interviews
7. Field excursions with traditional practitioners and local people
8. Collecting and preparing plant specimen
9. The use of herbarium specimens
10. Literature review on medicinal plants

To access reliable information, it is best obtained from Traditional healers (diviner priests and herbalists), herb sellers, tradomedics, traditional birth attendants and the local people. An effective communication is achieved when the interaction is based on the language they understand and is appealing to them and they are assured of their safety and that of their practices. The ethnobotanist obtains the plants suggested by the local people and carry out research on them (Rahman *et al.*, 2018).

Ethnobotany and ethnomedical studies are today the most effective method of identifying new medicinal plants or refocusing on those plants reported in earlier studies for the possible extraction of beneficial bioactive compounds (Thirumalai *et al.*, 2009).

1.2 SEXUALLY TRANSMITTED DISEASES

Sexually transmitted diseases (STDs) are also known as sexually transmitted infections (STIs) or venereal diseases (VD). They are a group of communicable diseases and the major mode of transmission is primarily through sexual contact (Gilson and Mindel, 2001). They are transferred from one individual to another during any form of sexual contact which include sexual intercourse (Vaginal – anal), kissing, oral – genital, the use of “sex toys” such as vibrators. The common contact area includes the penis, vagina, cervix, lips, oropharynx, anus, rectum and adjacent skin area. There is an increased rate at which these areas are becoming sites of diseases due to various sexual practices. STDs can also be transferred through breastmilk and by injection in drug abusers (CDC, 2011).

The term infection is used in Sexually transmitted infection (STI) because it involves the transmission of the disease causing organism (infectious Organism) from an infected person to another when there is contact. It is important to know that not all diseases that are transferred through sexual contact are called sexually transmitted diseases because these diseases can be transmitted through other means. For example, meningitis can be transmitted through sexual contact but also through aerosolization of the droplets from an infected patient’s saliva therefore it is not classified as STD (Gilson and Mindel, 2001).

Sexually transmitted diseases are caused by several organisms such as bacteria, viruses, fungi, protozoa and parasites and are part of the major causes of illnesses in the world especially in developing countries (WHO, 2006). The spread of (STDs) in recent years has been erratic and continues to increase dramatically worldwide because of the mode of transmission of these causative agents. They survive and grow rapidly because the genitals areas are generally moist, warm and ideal for their growth. Other factors that contribute to the wide spread of STDs include patterns of sexual behavior, Sociocultural, demographic and economic factors. The more the numbers of sexual partners the higher the risk of contracting STDs. Also, sexual preferences play

a major role in transmission of STDs. There is higher chance of infection in the homosexual than in the Heterosexual. The common STDs include:

1. Gonorrhea
2. Syphilis
3. Chlamydia
4. Vulvovaginitis (trichomoniasis and vaginal candidiasis)
5. Herpes simplex virus
6. Human immunodeficiency virus (HIV)
7. Acquired immunodeficiency syndrome (AIDS)
8. Genital herpes
9. Genital warts
10. Hepatitis B
11. Human papilloma virus

Sexually transmitted diseases may be curable or incurable (modifiable or manageable). The curable STDs include gonorrhea, syphilis and chlamydia infection while the incurable but modifiable and manageable STDs include herpes simplex, human papilloma virus (HPV) and hepatitis B diseases (Amu and Adegun, 2015).

1.3 STATEMENT OF PROBLEM

Sexually transmitted diseases has been a part of the major health problems being tackled in Nigeria and affects the country socially and economically. In recent times there has been high incidence of sexually transmitted diseases in Nigeria especially in the rural areas which has contributed immensely to the high rate of mortality, morbidity and stigma in the country. Also the potency and effectiveness of several antimicrobials that have been approved and used for the diseases over time is reducing due to resistance of the causative microorganisms to the available antimicrobials.

1.4 JUSTIFICATION

This study focuses on the medicinal plants used in treatment of sexually transmitted diseases locally. The availability of drugs used in treatment of sexually transmitted diseases to the rural

areas is very low. Medicinal plants are readily available and easily accessible to those in rural and urban areas. Several medicinal plants are available locally around man that may have potential antimicrobial properties and can be used by man. Ethnobotanical survey helps to get information of these plants to prevent loss of information among the traditional users of these plants. It also helps to protect and preserve some species (conservation of endangered species that would be useful) and also study some plants scientifically to critically analyze their phytochemistry and confirm their potential properties. This will provide more drugs that are cheaper, available, potent in activity, with reduced side effect, has broad spectrum of activity, and are resistant to microorganisms to achieve improved and optimal control of sexually transmitted diseases in the country.

1.5 OBJECTIVES

The main objectives of the survey to investigate the indigenous knowledge of the treatment of sexually transmitted diseases in Ibadan, Oyo state to;

1. Identify the plants used in treatment of sexually transmitted diseases
2. Identify the parts used, method of preparation and use of the plants
3. Document, publicize and preserve the of knowledge of use
4. Encourage prevention and protection of endangered species
5. Disseminate information to the public and researchers
6. Provide potential plants for scientific investigation of their ethno pharmacological properties and isolation of their active pharmacological constituents to improve medicinal plant use.

CHAPTER TWO

LITERATURE REVIEW ON SEXUALLY TRANSMITTED DISEASES

2.1 EPIDEMIOLOGY OF SEXUALLY TRANSMITTED DISEASES

2.1.1 Epidemiology of Sexually transmitted diseases (STDs) globally

Sexually transmitted diseases are common and rampant infectious diseases that are present among all ages and gender either male or female; and particularly between age 15 – 50 years and in infants. In recent years the emergence of sexually transmitted diseases has increased making it a critical global and national health priorities.

According to the World Health Organization (WHO) there are nearly 357 million people globally who are infected with one of the four common STDs: gonorrhea, syphilis, chlamydia, trichomoniasis (WHO, 2016). The World Health Organization (WHO) estimates that there are more than 1 million STDs acquired each day globally. Among the developed countries in the world, the United States has the highest rates of STD infection with 12 – 15 million new cases each year. In the U.S it is estimated that there are 20million new STDs each year and half of these are among young people around ages 15 – 24years.

From the WHO 2013 report, the new cases of curable STDs estimated by the WHO regions were as follows: 126 million in the Americans, 128 million in the Western pacific region, 93 million in the African region, 26 million in the eastern Mediterranean region, 79 million in the southeastern region, and 47 million individuals in the European region (WHO, 2013).

2.1.2 Epidemiology of Sexually transmitted diseases locally

In Nigeria, STDs prevalence is attributed to social factors such as poor educational status, socioeconomic status, marital status, type of family and religion (Sanchez *et al.* 1996). High rates of sexually transmitted diseases in vulnerable groups, general lack of perceived risks, low literacy levels, low socioeconomic status of the people has aggravated the spread of HIV/AIDS in Nigeria (UNAIDS, 2004). This implies that STDs constitute great medical, social and economic problem.

2.2 Current approaches and intervention to the control of Sexually Transmitted Diseases

The importance of sexually transmitted diseases has been recognized more globally since the inception of HIV/AIDS epidemic and there has been good evidence that proper control and management STDs can reduce the transmission of HIV. According to the WHO and UNAIDS, STDs control programme has three objectives:

1. To interrupt the transmission of STDs
2. To prevent the development of diseases, complications and sequelae; and
3. To reduce the transmission of HIV diseases (Mayaud *et al*, 2004)

2.3 Prevention and control Sexually Transmitted Diseases

The prevention and control of STDs are based on the following five major strategies (5) stated in the CDC, 2015:

1. accurate risk assessment and education and counseling of persons at risk on ways to avoid STDs through changes in sexual behaviors and use of recommended prevention services.
2. pre-exposure vaccination of persons at risk for vaccine preventable STDs;
3. identification of asymptomatically infected persons and persons with symptoms associated with STDs;
4. effective diagnosis, treatment, counseling, and follow up of infected persons; and
5. evaluation, treatment, and counseling of sex partners of persons who are infected with an STD (CDC, 2015).

2.4 SOME COMMON SEXUALLY TRANSMITTED DISEASES IN NIGERIA

2.4.1 GONORRHOEA

This is a bacterial infection caused by the Gram-negative diplococcus organism *Neisseria gonorrhoeae* (also known as *Gonococcus bacteriae*). It is one of the oldest known sexually transmitted diseases and the most common. The organism is transmitted through sexual contact and it can affect both male and female. Gonorrhea infection can affect multiple sites in the body. It affects the rectum, urethra or throat most often and can also affect the vagina and the cervix of the female, the joint and the eye most commonly in babies. The highest incidence of gonorrhea is in men 20 to 24 years of age and in women 15 to 24 years of age. Risk factors for women acquiring gonorrhea include a previous gonococcal or other STD infection, new or multiple sex partners, inconsistent condom use, or engaging in commercial sex work or drug use (Koda-Kimble and Young, 2013).

FIGURE 2.1 Photo of Gonorrhoea infections (Webmd, 2019)

2.4.1.1 Mode of transmission

In contrast to popular belief, gonorrhea is not transmitted through the use of toilet seats or door handle. The causative organism *Neisseria gonorrhoeae* cannot live outside the body for longer

than few minutes likewise it does not live on body surfaces such as the skin of the hands, arms or legs. This organism survives only on moist surfaces within the body such as the vagina, cervix, back of the throat (from oral - genital contact), rectum and in the tube of the urethra that drains urine from the bladder (Workowski *et al.*, 2010).

Gonorrhea is transferred most commonly through sex (horizontal transmission) with higher risk of transmission from males to females (50% per contact). However, mothers who are infected also transfer the infection to their babies during childbirth (vertical transmission). The mother to child transmission is of increased risk with vaginal childbirth unlike other forms of childbirth like surgery (Workowski *et al.*, 2010).

2.4.1.2 Pathophysiology

N. gonorrhea infects the columnar or cuboidal epithelium (cube like epithelium) by attaching itself to it through its pili and penetrates within 1-2 days. The infection induces a neutrophilic response in the body system visualized by a purulent discharge (Workowski *et al.*, 2010).

2.4.1.3 Symptoms

Generally, gonorrhea infection is asymptomatic during the early stages of infection. Symptoms appear earlier in male than in female which pose an increased risk of complications in female. It appears within 10 days of contact with an infected individual (Workowski *et al.*, 2010).

Signs and symptoms in men include:

1. Purulent discharge and dysuria
2. Painful urination
3. Pus – like discharge from the tip of the penis
4. Pain or swelling in the testicles
5. Hematuria (blood in the urine) (Koda-Kimble and Young, 2013; CDC, 2015).

Signs and symptoms in women include:

1. Burning during urination
2. Frequent urination
3. Increased and yellowish vaginal discharge
4. Hematuria (blood in the urine)

5. Vaginal itching or burning
6. Redness and swelling of the genitals
7. Purulent or mucopurulent endocervical discharge
8. Vaginal bleeding between periods
9. Painful intercourse
10. Abdominal or pelvic pain
11. Cervix abnormalities
12. Erythema (Koda-Kimble and Young, 2013; CDC, 2015).

2.4.1.4 Complications

Gonorrhoea if not treated early or untreated result to pelvic inflammatory disease (PID); a serious complication in female and leads to infertility, chronic pelvic pain also sterility in male and female, gonococcal arthritis affecting the joints and also infertility in male (Koda-Kimble and Young, 2013).

2.4.1.5 Diagnosis of Gonorrhea

(a) Culture of endocervical region

The Gold standard or the classical method used to diagnose Gonorrhea is through collection specimen from the infected site (rectum, throat, cervix) by swabbing. The swab used should be made of a wire shaft and a synthetic fiber tip because swab with wooden shafts or cotton tips are toxic to the organism leading to its death. The sample is then cultured in the laboratory to enhance growth and ease identification of organism by using its genetic material. The test may yield negative results sometimes due to sampling errors or technical difficulties hence the development of newer tests that are highly sensitive or specific (Koda-Kimble and Young, 2013).

(b) Gram stain

This is used to diagnose gram negative diplococci within the polymorphonuclear leukocytes. It is highly specific, less costly and quick to perform (Koda-Kimble and Young, 2013).

(c) DNA probes

It identifies the genetic material of the bacteria to yield more rapid results. It is highly sensitive and specific and used more widely than culture (Koda-Kimble and Young, 2013).

(d) Ligase chain reaction (LCR) assays

It has sensitivity of 95% and a specificity of 98%-100%. Its advantages over other methods include convenience, ease of access to samples which includes urine and vaginal swabs and it identifies nonviable gonococcal nucleic acid. However, Ligase chain reaction (LCR) assay is highly expensive (Koda-Kimble and Young, 2013).

2.4.1.6 Medications used to treat gonorrhea

The standard of treatment for gonorrhea is third-generation cephalosporins such as ceftriaxone. Fluoroquinolones should not be used owing to high levels of resistance (Koda-Kimble and Young, 2013).

2.4.2 SYPHILIS

Syphilis is a systemic infection caused by a bacterial organism called *Treponema pallidum* (*T. pallidum*) commonly known as spirochete. The infection has been in existence for several centuries. The causative agent (a spirochete) is a wormlike spiral – shaped organism that burrows into the moist, mucous – covered lining of the mouth or genitals. It gives rise to a classic, painless ulcer known as chancre at the site of sexual contact.

FIGURE 2.2 Photo of Syphilis Infections (Webmd, 2019)

2.4.2.1 Mode of transmission

Syphilis infection can be classified as congenital (transmitted from mother to child in utero) or acquired (through sex or blood transfusion). The infection is highly contagious in the presence of the ulcer (chancre). The ulcer could be present in the mouth, vagina, scrotum. Any form of contact with the ulcer either by kissing or sexual intercourse enhance the transmission of the organism.

2.4.2.2 Symptoms

Syphilis in most cases is asymptomatic in female especially in the primary phase. The infection progresses through three stages with each stage having its own characteristics.

(a) Primary stage (inactive)

Formation of ulcer that develops 10 to 90 days after infection with average of 21 days. The ulcer can resolve without treatment after 3 - 6 weeks of infection but the disease will reoccur months later as a secondary syphilis if not treated at the primary stage. The ulcer usually involves the penis in the heterosexual male, the penis or anus in the homosexual male, and the vulva, perineum, or cervix in the female (Koda-Kimble and Young, 2013).

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(b) Secondary stage

This is a systemic stage of the infection because the infection has been transferred to several organs of the body. It develops about weeks to months after the primary stage of infection and last for about 4 - 6 weeks. It is more common in the female patient than in the male patient because of the asymptomatic presentation at the primary stage in female.

Patient develops itchy lesion that is round or oval, rose or pink in color, occurs primarily on the trunk. As lesions mature, they become papular or nodular with scaling (the so-called papulo squamous rash) and are found on the palms of the hands or bottoms of the feet and may include the mouth. Other manifestations of secondary syphilis include hair loss, sore throat, fever, headache, hepatitis, aseptic meningitis, neuropathies, and glomerulonephritis (Koda-Kimble and Young, 2013).

(c) Tertiary stage

The tertiary stage of syphilis infection arises when an infected individual passes through the primary and secondary stage of infection asymptomatic or not treated at initial stages. The period in which some patients carry infection in their body without clinical manifestation of symptoms is called the **Latent stage**. The latent stage is divided into two phases: the early latent (<1 year's duration) and late latent (>1 year's duration). However, the tertiary stage can develop rapidly without the latent stage and in 10-40% of untreated persons. At the tertiary stage, the syphilis is

no more contagious and can cause varieties of neurologic, cardiovascular and systemic problems in the body system (Koda-Kimble and Young, 2013).

The problems include:

1. Heart problems due to abnormal bulging of the large vessels of the heart (aorta)
2. The development of large nodules (gummas) in several body organs
3. Central nervous system infection leading to stroke, mental confusion, meningitis, weakness (neurosyphilis), sensational problems
4. Sight deterioration
5. Deafness of the ears

The damages to the body system during the tertiary stage are severe and maybe fatal (Dong-Hui *et al.*, 2009).

2.4.2.3 Diagnosis

(a) Cardiolipin / non-treponemal tests

These include the Venereal Disease Research Laboratory test (VDRL) and the rapid plasma regain (RPR) test. They are the standard screening tests that measures serum reagin titers and thus useful to evaluate therapy. If VDRL is reactive there is possibility of syphilis infection at the period but if non-reactive there maybe infection or no infection at that time because at the early phase of the primary stage of infection tests may be negative which should not be interpreted as absence of infection (Koda-Kimble and Young, 2013 and Workwshi *et al.*, 2010).

The tests are reported quantitatively as serologic dilutions (1:2, 1:4, 1:8). The level of the titer generally reflect the degree of the disease activity and is useful to measure patient's response. Highest titer are seen in secondary and early latent disease. Confirmatory fluorescent treponemal antibody absorption (FTA-ABS) test should be carried out if either of the tests above is positive (Koda-Kimble and Young, 2013 and Workwshi *et al.*, 2010).

(b) Fluorescent treponemal antibody absorption (FTA-ABS) test

This measures specific IgG antibody against *T.pallidum*. The major reason for this confirmatory testing is because positive result from the Cardiolipin / non-treponemal tests could give false positive results (absence of syphilis infection in individual but result shows presence of syphilis infection) due to various acute or chronic illnesses present in the individual at that time. The false positive results yield lower titers (1:1 to 1:4) and occur in 1 – 2% of the general population (Koda-Kimble and Young, 2013).

The causes of false positive results of serologic tests for syphilis are;

1. Advanced age,
2. Bacterial infection (e.g. endocarditis, mycoplasma, tuberculosis)
3. Chronic liver disease
4. Lyme disease
5. Malignancies
6. Pregnancy
7. Viral diseases (e.g. varicella, measles, HIV, mononucleosis)

TABLE 2.1 Treatment of various stages of syphilis is stated in this guidelines according to (WHO, 2017)

EARLY SYPHILIS (PRIMARY, SECONDARY OR LATENT SYPHILIS NOT MORE THAN 2 YEARS)	
Recommended regimen	Penicillin G benzathine, 2.4 million units IM as a single dose.
Alternative regimen	Procaine benzyl penicillin, 1.2 million units IM daily x 10days
Alternative regimen for penicillin –allergic non-pregnant patient	Doxycycline 100mg orally, twice daily x 14days OR Tetracycline 500mg orally, twice daily x 14days
Alternative regimen for penicillin–allergic pregnant patient	Erythromycin 500mg orally, twice daily x 14days
LATENT SYPHILIS (INFECTION MORE THAN 2 YEARS WITHOUT EVIDENCE OF TREPONEMA INFECTION)	
Recommended regimen	Penicillin G benzathine, 2.4 million units IM once weekly x 3wks
Alternative regimen	Procaine Penicillin G, 1.2 million units IM daily x 20days
Alternative regimen for penicillin –allergic non-pregnant patient	Doxycycline 100mg orally, twice daily x 30days OR Tetracycline 500mg orally, twice daily x 30days
Alternative regimen for penicillin–allergic pregnant patient	Erythromycin 500mg orally, twice daily x 30days
NEUROSYPHILIS	
Recommended regimen	Aqueous Penicillin G benzathine, 12-24 million units IV, given daily in doses of 2-4 million units every 4 hours x 14days
Alternative regimen	Procaine Penicillin G, 1.2 million units IM once daily x 10 -14days AND probenecid 500mg every 4hours x 10- 14 days
Alternative regimen for penicillin –allergic non-pregnant patient	Doxycycline 200mg orally, twice daily x 30days OR Tetracycline 500mg orally, 4times daily x 30days
EARLY CONGENITAL SYPHILIS (UPTO 2 YEARS OF AGE) AND INFANTS WITH ABNORMAL CSF	
Recommended regimen	Aqueous Penicillin G benzathine, 100,000 – 150,000 IU/kg/day, Given as 50,000 IU/kg/dose IV every 12 hours during the first 7days of life and every 8hours after for total of 10days.
Alternative regimen	Procaine Penicillin G, 50,000 IU/kg IM once daily x 10days
CONGENITAL SYPHILIS OF 2 OR MORE YEARS	
Recommended regimen	Aqueous Penicillin G benzathine, 200,000 – 300,000 IU/kg/day IV or IM, Given as 50,000 IU/kg/dose every 4 – 6hours x 10 - 14days.
Alternative regimen for penicillin allergic patient after the first month of life	Erythromycin 7.5 – 12.5 mg/kg orally, 4 times daily IM for 30 days

2.4.3 CHLAMYDIA

It is a bacterial infection caused by the organism *Chlamydia trachomatis*. It is similar to gonorrhoea in terms of transmission and symptoms. The organism is found in the cervix, urethra, throat, rectum and infects both male and female (Koda-Kimble and Young, 2013; Dong-Hui *et al.*, 2009).

FIGURE 2.3 Morphology of *Chlamydia trachomatis* (Webmd, 2019)

2.4.3.1 Mode of transmission

Chlamydia is transmitted through contact with the affected area. It can affect the eye if it comes in contact with infected semen or fluid which may result to conjunctivitis. It can be transmitted to foetus during pregnancy, new born acquire the infection by passage through infected birth canal which result to lethal eye damage or pneumonia (Koda-Kimble and Young, 2013).

2.4.3.2 Symptoms

It may be asymptomatic in both male and female but majorly in female. Signs and symptoms may take about 1 – 3 weeks or months or not until diseases spread to other body organs before they manifest.

Chlamydia manifestations in women include:

Cervicitis (infection of the uterine cervix), vaginal discharge or abdominal pain, typical symptoms of urinary tract infection like pain during urination, urinary frequency and urgency (Koda-Kimble and Young, 2013).

Chlamydia manifestations in men include:

A white cloudy or watery discharge from the penis, pain in the testicles and while voiding urine (Cotch *et al.*, 1991).

2.4.3.3 Diagnosis

Diagnosis is done by specimen culture, direct immunofluorescence assay (DFA), enzyme immunoassay (EIA), or NAAT of endocervical or male urethral swabs (PCR and LCR). All are generally sensitive method to detect Chlamydia (Workwshi *et al.*, 2010).

Complications

Pelvic inflammatory disease and its incidence may be reduced active screening of *Chlamydia* in young, sexually active women (Workwshi *et al.*, 2010).

2.4.4 VULVOVAGINITIS

They are classes of vaginal infections that are characterized by non-specific vaginal symptoms such as itching, burning, irritation and abnormal discharge that are caused by infection or other medical conditions. They occur in female. The most common vaginal infections are bacterial vaginosis BV (22 - 50% of cases), vulvovaginal candidiasis (VVC; 17- 39%) and trichomoniasis (4 – 35%). However, about 7% to 72% of vaginitis cases may remain undiagnosed (Dong-Hui *et al.*, 2009; Koda-Kimble and Young, 2013).

2.4.4.1 Bacterial vaginosis (BV)

Bacterial vaginosis was formerly called nonspecific vaginitis, leukorrhea, *G. vaginalis* or *H. vaginalis*. It is characterized by change in vaginal ecology where the normal vaginal lactobacillus

flora is replaced by *Mobiluncus* species, *Prevotella* species, *Ureaplasma* species, *Mycoplasma* species and increased numbers of *G. vaginalis* (Dong-Hui *et al.*, 2009 and Alli *et al.*, 2011). The normal microbial flora plays an important role in preventing genital and urinary tract infections in women (Dong-Hui *et al.*, 2009). Many sexually active women are infected with *G. vaginalis* but non sexually active heterosexual women may also be infected.

Risk factors include multiple sexual partners, douching, lack of condom use and decreased concentrations of vaginal lactobacilli.

Symptoms:

A white thin discharge with fishy odour, no vaginal pruritus or burning (Koda-Kimble and Young, 2013)

Diagnosis:

- (a) Vaginal gram stain that shows overgrowth of vagina with *G. vaginalis* and the other microorganisms.
- (b) A 10% KOH solution mixed with vaginal secretions will yield transient fishy odour because of increased production of biogenic diamines (positive amine test) (Koda-Kimble and Young, 2013; Workwshi *et al.*, 2010)

2.4.4.2 Vulvovaginal candidiasis (VVC)

It is caused by *Candida albican* about 80-92% of the case but other organisms include *Candida glabrata*, *Candida tropicalis*. 75% women will experience at least one episode and 40% - 45% will experience two or more episodes within their lifetime. It is not usually described as a STD because celibate women can experience VVC but it was discovered that the incidence of VVC increases when women become sexually active. Hence it is often diagnosed during evaluation for STD when women present with vaginal symptoms (Workwshi *et al.*, 2010).

Symptoms:

Vaginal pruritus, vaginal soreness, vulvar burning dyspareunia, a nonodorous, highly viscous, white discharge which may vary in consistency from curdlike to watery. Symptoms may be worse before menstruation and reduces with onset of menstruation (Koda-Kimble and Young, 2013).

Diagnosis:

- (a) wet mount preparation with 10% KOH or a Gram stain of the vaginal discharge that improves the visualization of yeast or pseudohyphae.
- (b) If the result above is negative, patient's vaginal discharge should be cultured for *Candida* in an appropriate growth medium.

2.4.4.3 Trichomoniasis

Trichomoniasis is an STD caused by the protozoan *Trichomonias vaginalis*. It infects the urethra, although the site of infection (urethra versus prostate) is uncertain. Highest rate of incidence in women with multiple partners and those with high occurrence of other STDs (Cotch *et al.*, 1991).

Symptoms:

Men and women are usually asymptomatic. Classic symptoms in women include diffuse, yellow-green discharge with pruritus, dysuria and cervical micro-haemorrhages (Cotch *et al.*, 1991).

Diagnosis

- (a) Broth culture is considered to be the gold standard for identification of trichomoniasis, but it requires up to a 7-day incubation period and the culture system is not widely available.
- (b) Direct microscopic observation of trichomoniasis using a wet mount suffers from low sensitivity, but is up to 99% specific (Dong-Hui *et al.*, 2009).

2.5 LITERATURE REVIEW ON SOME OF THE PLANTS RECOMMENDED FOR TREATMENT OF SEXUALLY TRANSMITTED DISEASES IN THE COURSE OF SURVEY

2.5.1 INTRODUCTION

The chapter discusses about some plants (botanical) that have been identified by the traditional health practitioner majorly the herb sellers and herbal therapist to have activity in treatment of some sexually transmitted diseases. Most of the plants have curatives effect on the clinical symptoms seen in the diseases. The effectiveness of these plants have been establish over the years by the Traditional medical practitioner due to successful treatment of individuals that have fallen victim of the diseases at one time or the other.

Through research, the effectiveness of traditional use of some of these plants for treatment of sexually transmitted diseases has been proved scientifically. The activity and effectiveness of some of these plants has been suggested to be as a result of the active plant constituents present in them. Plants with different habit (tree, shrub, and herb) are shown to have a wide range of phytochemical and bioactive possibilities.

2.5.2 PLANTS RECOMMENDED

The following are the recommended botanicals (plants):

2.5.2.1 *Senna alata* (L.) Roxb.

FIGURE 2.5 Picture of *Senna alata* (L.) Roxb.

Family: Fabaceae

Synonyms: *Cassia alata* L., *Cassia alata* L. var. *perennis*. Pamp

Common name: Emperor's candlesticks, Candle bush, Candlebra bush, Christmas candles.

Local name: Asunwon (Yoruba)

Description

Senna alata is an evergreen shrub in frost free areas. It has huge pinnate leaves which are composed of 7-14 pairs of large, oblong leaflets (Floridata Plant Encyclopedia, 2015). The inflorescence looks like a yellow candle. The seed pods are nearly straight, dark brown or nearly black. Pods contain 50 to 60 flattened, triangular seeds (Hirt and Mpia, 2008). The cup shaped flowers are bright yellow, and carried in erect terminal clusters arising from leaf axils. The sepals that protect the flowers before they open are waxy and smooth to the touch. The candle-like flower clusters include open flowers at the bottom and unopened flowers with their waxy sepal covered at the top (Floridata Plant Encyclopedia, 2015). The fruit is a straight or slightly curved, winged pod (Hirt and Mpia, 2008).

Ecology and Distribution

Senna (or *Cassia*) *alata* hails from the Tropics, including Africa, Southeast Asia, the Pacific Islands, and even tropical America. Such a widespread natural distribution for a single species is very uncommon (Hirt and Mpia, 2008).

Chemical composition

Anthraquinone, chrysophanic acid, rhein, chrysoeriol, kaempferol, quercetin, 5,7,4'-trihydroflavanone, kaempferol-3-O-beta-D-glucopyranoside, kaempferol-3-O-beta-D-glucopyranosyl-(1-->6)-beta-D-glucopyranoside, 17-hydrotetratriacontane, n-dotriacontanol, n-triacontanol, palmitic acid ceryl ester, stearic acid, palmitic acid (Liu *et al.*, 2009). Kaempferol, luteolin and aloe-emodin were isolated from its methanol residue active extract ((Tatsimo *et al.*, 2017).

Ethnomedicinal uses

It has a very effective laxative, purgative and fungicidal properties for treating ringworm and other fungal diseases of the skin (Floridata Plant Encyclopedia, 2015). The leaves are ground in a mortar to obtain a kind of "green cotton wool". This is mixed with the same amount of vegetable oil and rubbed on the affected area two or three times a day. A fresh preparation is made every day (Hirt and Mpia., 2008). It is used in Cameroon to treat several infections such as gonorrhea, gastrointestinal and skin disease (Tatsimo *et al.*, 2017).

Ethnopharmacology

The methanol residue extract of *Senna alata* leaves exhibit a high antibacterial activity against Multi-drug resistant *Vibrio cholera* and *Shigella flexneri* due to the presence of Aloe-emodin (Tatsimo *et al.*, 2017).

2.5.2.2 *Citrullus colocynthis* (L.) Schrad

FIGURE 2.6 Picture of *Citrullus colocynthis* (L.) Schrad

Family: Cucurbitaceae

Synonyms: *Colocynthis vulgaris* Schrad., *Citrullus colocynthoides* Pangalo

Common Name: Bitter Apple, Vine of Sodom, Desert gourd

Local Name: Baara Egusi (Yoruba)

Description

It leaves are angular and located alternatively on long petioles. A leaf is about 5 to 10 centimeters in length and has about 3 to 7 lobes. The middle lobe sometimes may have an ovate structure. Leaves are triangular in shape with many clefts and are rough, hairy in texture with open sinuses.

The upper surface of the leaves is fine green in colour and the lower surface is comparatively pale (Borhade Pravin *et al.*, 2013).

A bitter apple plant produces around 15 to 30 globular fruits with a diameter of almost 7 to 10 centimeters. The fruit outer portion is covered with a green skin having yellow stripes. The fruits may also be yellow in colour. Ripe bitter apple fruit have a thin but hard rind. The fruit have a soft, white pulp which is filled with numerous ovate compressed seeds (Borhade Pravin *et al.*, 2013).

Flowers are yellow in colour and appear singly at leaf axils. They are monoecious; the pistils and stamens are present in different flowers of the same plant. They have long peduncles. Each flower is also comprised of a yellow campanulate. The Corolla has five lobes and the calyx is parted five ways. The female flowers are easily identified from the males by their villous, hairy, ovary (Borhade Pravin *et al.*, 2013).

Seeds are about 6mm in size, smooth, compressed and ovoid-shaped. They are located on the parietal placenta. The seeds are light yellowish-orange to dark brown in color. The bitter apple plant has a large perennial root that sends out long and slender, angular, tough, rough vine-like stems. The stems are normally spread on the ground and have a tendency to climb over herbs and shrubs by their axillary branching tendrils (Borhade Pravin *et al.*, 2013).

Ecology and Distribution

Citrullus colocynthis is a desert viny that grows in sandy, arid soils. It is native to Mediterranean Basin and Asia and widely distributed among the west coast of Northern Africa, eastward through the Sahara, Egypt until India (Borhade Pravin *et al.*, 2013).

Chemical composition

The main chemical in the fruit pulps are; colocynthin (bitter principle upto 14%), colocynthein (resin), colocynthetin, pectin gum. Cucurbitane type triterpene glycoside (colocynthoside A & B, cucurbitacin E 2-O-beta-D-glycoside and its aglycone Cucurbitacin E). 2-O-beta-D-glucopyranosyl-16alpha-20R-dihydroxy-cucurbita-1,5,23E,25(26)-tetraen-3,11,22-trione. 2-O-beta-D-glucopyranosyl-cucurbitacin B and 2, 25-di-O-beta-D-glucopyranosylcucurbitacin L (Gurudeeban *et al.*, 2010).

Seed contain a fixed oil (17%) and albuminoids (6%). Fatty acid like stearic, myristic, palmitic, oleic, linoleic, Linolenic acid. Protein; 8.25% and rich in lysine, leucine and sulfo amino acid like methionine. Vitamin; B1, B2 and Niacin. Mineral; Ca, Mg, K, Mn, Fe, P and Zn (Gurudeeban *et al.*, 2010).

Phytochemical analysis of the powdered leaves shows high level of tannins and flavonoids, moderate level of glycosides and alkaloids and trace amount of steroids. (Gurudeeban *et al.*, 2010).

Ethnomedicinal uses

Fruit or root with or without nux-vomica is rubbed into a paste with water and applied to boils and pimples. The fruits are bitter and pungent and used as purgative, anthelmintic, antipyretic, carminative, antitumor. Also used to treat ascites, leukoderma, ulcers, asthma, bronchitis, urinary discharges, jaundice, enlargement of spleen, tuberculosis, dyspepsia, constipation, anemia, throat diseases, elephantiasis, joint pain. (Kirtikar *et al.*, 2006).

The extract from root is useful in jaundice, ascites, urinary diseases, rheumatism, cough and asthma attacks in children. A poultice of root is useful in inflammation of the breast. (Narkarni, 2007). Root parts applied to enlarged abdomen in children. (Kirtikar *et al.* 2006).

Ethnopharmacology

The methanolic extract of dried powdered leaves showed high fungal activity against *Aspergillus fumigatus* and *Mucor sp.* While the aqueous extract had activity against *Mucor sp.* and *Penicillium sp.* Therefore, it can be used in some fungal infections caused by these organisms (Gurudeeban *et al.*, 2010).

2.5.2.3 *Mangifera indica* L.

FIGURE 2.7 Picture of *Mangifera indica* L.

Family: Anacardiaceae (Poison ivy family)

Synonyms: *Mangifera domestica*, *Mangifera sativa*

Common name: Mango, manga, manja, mangot, manguier

Local name: Mongoro (Yoruba)

Description

Mangifera indica grows to a height of 10-45 m, dome shaped with dense foliage, typically heavy branched from a stout trunk. The leaves are spirally arranged on branches, linear-oblong, lanceolate – elliptical, pointed at both ends, the leaf blades mostly about 25-cm long and 8-cm wide, sometimes much larger, reddish and thinly flaccid when first formed and release an aromatic

odour when crushed (Shah *et al.*, 2010). The inflorescence occurs in panicles consisting of about 3000 tiny whitish-red or yellowish – green flowers. The fruit is a well-known large drupe, but shows a great variation in shape and size. Within each fruit there is a large flat elongated fibrous stone containing a single seed. The seed is solitary, ovoid or oblong, encased in a hard, compressed fibrous endocarp. The evergreen drooping leaves resemble those of the peach tree. (Shah *et al.*, 2010).

Ecology and distribution

It is found naturalized in most tropical countries e.g. Nigeria, Asia.

Chemical Composition

Ether extract of the plant parts showed presence of saponins, steroids and triterpenoids (Shah *et al.*, 2010). Ethanol extract contained alkaloids, anthracenosides, coumarins, flavonones, reducing sugars, catechol and gallic, tannins, saponins, steroids and triterpenoids (Shah *et al.*, 2010).

Mangiferin (a pharmacologically active hydroxylated xanthone C-glycoside is extracted from mango at high concentrations from the young leaves, bark, and from old leaves (Rocha *et al.*, 2007). Urushiols, Isomangiferin, tannins & gallic acid derivatives (Shah *et al.*, 2010).

Ethnomedicinal uses.

Most parts of the tree are used medicinally and the bark also contains tannins, which are used for the purpose of dyeing (MDidea Extract Professional, 2015). Dried unripe mango is used as a spice in the Southeast Asia cuisine (Rocha *et al.*, 2007).

Ethnopharmacology

Studies indicate that it has antibacterial, anti-fungal, anthelmintic, anti-parasitic, anti-tumor, anti-HIV, anti-bone resorption, antispasmodic, antipyretic, antidiarrhoeal, antiallergic, immunomodulation, hypolipidemic, anti-microbial, hepatoprotective, gastroprotective properties (Shah *et al.*, 2010).

Mangiferin, being a polyphenolic antioxidant and a glucosyl xanthone, it has strong antioxidant (Rocha *et al.*, 2007), anti-lipid peroxidation, immunomodulation, cardiogenic, hypotensive, wound healing, antidegenerative and antidiabetic activities. (Rose 1999; Subhar *et al.*, 2007).

An infusion of the leaves or bark helps against hypertension and promotes a good blood circulation (Aswal *et al.*, 1984). Ripe mango fruit is considered to be invigorating and freshening. The juice is restorative tonic and used in heat stroke (Gabino *et al.*, 2008).

2.5.2.4 *Citrus aurantifolia* Christm.

FIGURE 2.8 Picture of *Citrus aurantifolia* Christm.

Family: Rutaceae

Synonyms: *Limonia aurantifolia* Christm., Orth. Var., *Limonia aurantifolia* Christm.

Common name: Key lime, Mexican lime, West Indian lime.

Local name: Osan wewe (Yoruba)

Description

C. aurantifolia is a perennial evergreen shrubby tree and grows to a height of 3 -5m with many thorns. The stem is irregularly slender, branched and possesses short and stiff sharp spines or thorns 1cm or less. Alternate leaves that are elliptical to oval in shape, 4.5 - 6.5cm long, and 2.5 -

4.5cm wide with small rounded teeth around the edge. Petioles are 1-2cm long and narrowly winged. Flowers are short and axillary racemes, bearing few flowers which are white and fragrant. Petals are 5, oblong and 10 -12mm long. The fruits are green, spherical to round, 2.5 -5cm in diameter and are yellow when ripe.

Ecology and Distribution

C. aurantifolia is called a miracle fruit because of its distinct aroma and delicious taste. It is cultivated worldwide, especially in the tropical and subtropical regions. There are many species in the genus of Citrus but the common species are *Citrus aurantifolia* (key lime), *C. hystrix* (makrut lime), *C. limon* (lemon), *C. sinensis* (sweet orange), *C. aurantium* (sour orange), *C. limetta* (bitter orange), *C. tachibana* (tachibana orange), *C. maxima* (shaddock), *C. medica* (citron), *C. paradise* (grapefruit), *C. reticulata* (tangerine), *C. tangelo* (tangelo), *C. jambhiri* (rough lemon) (Narang and Jiraungkoorskul, 2016).

Chemical composition

There are many natural metabolites in citrus fruit that confer on it the potential to provide good health. *C. aurantifolia* contains active phytochemical substances like flavonoids (apigenin, hesperetin, kaempferol, nobiletin, quercetin and rutin), flavones, flavanones and naringenin, triterpenoid and limonoids. There are at least 62 volatile compounds in the fruit peel oils and 59 in the leaf oils of several lime species. Limonene was the major volatile constituent in the fruit peel oils then terpinene, pinene and sabinene. Limonene, pinene and sabinene were the major constituents of the leaf oils then citronellal, geranial, linalool and neral (Lota *et al.*, 2002).

The phytochemical and vitamin contents of five varieties of an 100g of these citrus species; *C. sinensis*, *C. reticulata*, *C. limonum*, *C. aurantifolia* and *C. grandis* include bioactive compounds such as alkaloids (0.4mg), flavonoids (0.6mg), phenols (0.4mg), tannins (0.04mg), ascorbic acids (62mg), riboflavin (0.1mg), thiamin (0.2mg), and niacin (0.05mg). Fresh Citrus fruits contain crude protein (18%), crude fiber (8%), carbohydrate (78%), moisture (6%), crude lipid (1%), ash (8%) and food energy content (363g/cal) (Okwu and Emenike, 2006).

Fruit essential oils of *C. aurantifolia*: limonene (54%), γ -terpinene (17%), β -pinene (13%), terpinolene (1%), α -terpineol (0.5%), and citral (3%). (Costa *et al.*, 2014).

Ethnomedicinal uses

Studies indicates its traditional uses or phytochemical properties of *C. aurantifolia* as antibacterial, antidiabetic, antifungal, antihypertensive, anti-inflammation, anti-lipidemia, antioxidant, anti-parasitic and antiplatelet activities (Okwu and Emenike, 2006).

It is used to treat cardiovascular, hepatic, osteoporosis and urolithiasis diseases and serves as fertility promoter (Costa *et al.*, 2014).

Ethnopharmacology

About 100 μ g/ml of *C. aurantifolia* extract can inhibit the growth of colon SW-480 cancer cell by 78% after 48h of exposure (Patil *et al.*, 2013).

2.5.2.5 *Gladiolus dalenii* Van Geel

Family: Iridaceae

Synonyms: *Gladiolus cooperi* Baker, *Gladiolus natalensis* Reinw. Ex Hook

Common name: Wildflower, Natal gladiolus, Cornflag

Local name: Baka

Description

Gladiolus dalenii is a deciduous evergreen perennial. It grows up to 2m tall. Leaves are erect, 20 mm wide, grey – green, in a loose fan. It produces five tall flower spikes up to 7 large, intensely scarlet orange to red or variously coloured, hooded flowers with a bright yellow throat; bracts green to red brown, clasping. It flowers from December to February (Frank *et al.*, 2016).

Ecology and Distribution

Gladiolus dalenii is one of the most widely distributed species of gladiolus, ranging from eastern South Africa and Madagascar throughout tropical Africa and into Western Arabia. It is the main parental species of the large flowering grandiflora hybrids. (Sayim *et al.*, 2016).

Chemical composition

High level of alkaloids (active group of compounds attributed to its antifungal properties) were found in its dichloromethane CH₂Cl₂/Methanol (MeOH) soluble extract. (Odhiambo *et al.*, 2010).

Ethnomedicinal uses

Gladiolus corms are used in Nigeria, Cameroon, Ghana and Bostwana alone or in combination with other plant materials in food and ethnomedicine to treat infections of the skin, gut, urogenital system and upper respiratory tract (Nguedia *et al.*, 2004). Corms are used in south west Nigeria to treat gonorrhoea, dysentery and other infectious conditions (Sayim *et al.*, 2016).

The bulb extract of the *Gladiolus dalenii* Van Geel is used in local communities in Kenyan Lake Victoria Basin to treat different infections such as meningitis, malaria, diarrhoea, ulcers, skin related problem, gastrointestinal diseases, sexually transmitted diseases and HIV related fungal infections (Odhiambo *et al.*, 2010).

Ethnopharmacology

Dichloromethane (CH₂Cl₂) / Methanol (MeOH) in the ratio 1:1 soluble extract of the *Gladiolus dalenii* has antifungal activity against *Aspergillus niger*. CH₂Cl₂ soluble extract delayed sporulation in *A. niger*. (Odhiambo *et al.*, 2010).

2.5.2.6 *Plumbago zeylanica* L.

Family:	Plumbaginaceae
Synonyms:	<i>Plumbago scandens</i> L.
Common name:	Doctor bush, Wild leadwort
Local name:	Inabiri

Description

Plumbago zeylanica is an herbaceous plant with glabrous stems that are climbing, prostrate, or erect. The leaves are petiolate or sessile and have ovate, lance-elliptic or spatulate to oblanceolate blades that measure 5-9 x 2.5-4 cm in length. Bases are attenuate while apexes are acute, acuminate, or obtuse. Inflorescences are 3-15 cm in length and have glandular, viscid bracts. The bracts are lanceolate and 3-7 x 1-2 mm long. The heterostylous flowers have white corollas 17-33mm in diameter, Calyx 7-11 mm and tubes 12.5-28 mm in length. Capsules are 7.5-8 mm long and contain reddish brown to dark brown seeds 5-6 mm. (*Plumbago zeylanica* L., Flora of North America).

Roots are 30 cm or more in length, 6 mm or more in diameter, stout, cylindrical, friable, blackish red in colour, light yellow coloured when fresh, reddish brown when dry, straight unbranched or slightly branched with or without secondary roots with uniform texture. Stem are woody, spreading, terete, striate glabrous and reach a height of about 0.5-2m (1.6-6.6ft) (Lin *et al.*, 2003).

Fruits are oblong 7.5-8 mm long five furrowed capsule that contains single seed. Each seed is oblong in structure (Lin *et al.*, 2003).

Ecology and Distribution

A native of South Asia and grows in deciduous woodland, Savannas and scrub lands from sea level up to 2000 m altitude (*Plumbago zeylanica* L., Flora of North America). *Plumbago zeylanica* grows throughout the tropical and sub-tropical climates of the world. (Jain *et al.*, 2014).

Chemical composition

The root bark of *P. zeylanica* contains plumbagin. Two plumbagic acid glucoside; 3' o-beta-glucopyranosyl plumbagic acid and 3' -o-beta glucopyranosyl plumbagic acid methyl ester with five naphthaquinones (plumbagin, chitranone, maritinone, elliptinone and isoshinanolone), and five coumarins (seselin, methoxy seseli, suberosine, Xanthyletin and xanthoxyletin) were isolated from the root (Lin *et al.*, 2003).

Leaves contain plumbagin, chitanone and stem contains plumbagin, zeylanone, isozeylanone, sitosterol, stigmasterol, campesterol and dihydroflavinol-plumbaginol (Lin *et al.*, 2003).

The presence of these bioactive compounds such as elliptinone, zeylanone, sistosterol and plumbagin has been attributed to its therapeutic uses (Jain *et al.*, 2014).

Ethnomedicinal uses

Wide application of *Plumbago zeylanica* in Traditional medicines against various diseases as anti-inflammatory, anti-malaria, anti-fertility, antimicrobial, anti-oxidant, blood coagulation, wound healing, memory enhancer and anti-cancer (Jain *et al.*, 2014). Powdered bark, root or leaf is used in treatment of gonorrhoea, syphilis and tuberculosis in Ethiopia (Aditi G., 1999).

The Zambians use the roots boiled in milk as remedy for inflammation of the mouth, throat and chest (Aditi G., 1999).

Ethnopharmacology

1. Anti-inflammatory: methanolic extract of the root of *Plumbago zeylanica* at 300 and 500 mg/kg produced 31.03 and 60.3% inhibition of acute inflammation respectively in Carrageenin induced raw paw oedema (Jain *et al.*, 2014).

2. Anti-bacterial activity: the alcoholic extract roots of *Plumbago zeylanica* was tested against multi-drug resistant bacteria (*Staphylococcus aureus*, *Escherichia coli*, *Salmonella paratyphi* and *Shigella dysenteriae*). The extract had strong antibacterial activity against all tested bacteria (Jain *et al.*, 2014).

3. Anti-viral activity: 80% methanolic extracts of *Plumbago zeylanica* inhibited the growth of coxsackievirus B3 (CVB3) (Jain *et al.*, 2014).

4. Anti- diabetic: oral administration of ethanolic extract of *Plumbago zeylanica* (100 mg, 200 mg/kg/p.o), tolbutamide (250 mg/kg/p.o) increased the activity of hexokinase and decreased the

activity of glucose-6-phosphatase ($P < 0.001$) in streptozotocin treated diabetic rats (Zarmouh *et al.*, 2010).

FIGURE 2.9 Structure of Plumbagin (5-Hydroxy-2-methyl- [1,4] naphthoquinone), a bioactive compound in *Plumbago zeylanica*. (Webmd, 2019).

2.5.2.7 *Curculigo pilosa* (Schumach. & Thonn.) Engl

FIGURE 2.10 **Picture of *Curculigo pilosa* (Schumach. & Thonn.) Engl**

Family: Hypoxidaceae

Synonyms: *Curculigo minor*, *Curculigo generis*, *Curculigo gallabatensis*

Common name: English African crocus, ground-squirrel's ground nut

Local name: Epakun

Description

Curculigo pilosa is an herbaceous plant with stout, erect vertical, cylindrical rhizomes 45 cm high and 0.9-9.4 x 0.7-1.8 cm. Leaves are cluster and grass-like about 60cm long pseudo petiolate, lanceolate to ovate, erect or reflexed, 5.0-26.0 mm broad. Leaf lamina plicate thinly pilose with whitish to yellowish hair Scape terete, sparsely pilose, subterranean, 0.5-1.5 cm long. Flowers are solitary and yellowish that shoots to 20 cm at the end of the dry season, 1.2-2.5 cm in

diameter. Perianth segments acute, 8.8-15.0 x 2.5-3.5 mm; Filaments filiform, 1.8-4.0 mm long. Anthers 2.5-3.0 mm long. (Sofidiya *et al.*, 2011).

Ecology and Distribution

It is common in tropical Africa, Madagascar. It is widely spread

Chemical composition

The Gas Chromatography-Mass Spectrometry (GCMS) of methanolic extract of *Curculigo pilosa* gave spectra fragmentation patterns. The major peaks are fatty acids such as pentadecanoic acid, hexadecanoic acid and octadecanoic acid. Also linoleic acid ethyl ester was found in considerable amounts. It also contained hydrocarbons 3-eicosyne and nonadecane (Elijah *et al.*, 2014).

It contains phytochemicals like saponins, tannins and phenolics. (Whiting DA., 2011). Phytochemical constituents such flavonoids, terpenoid, saponins, tannins, alkaloids, cardiac glycosides, steroids and anthraquinone are present in the plant (Gbadamosi and Egunyomi, 2010). Dry plant material contains: Phenolics (65.17 mg/g), flavonoids (23.17 mg/g) and proanthocyanidin (4.23 mg/g) (Sofidiya *et al.*, 2011).

Rhizome contain crude fibre (34.76%), Carbohydrate (34.09%) and moderate energy value (188.77 Kcal/100g). (Sofidiya *et al.*, 2011).

Ethnomedicinal uses

In Nupe ethnomedicine, it is used in management and treatment of venereal disease and candidiasis in Humans (Elijah *et al.*, 2014). It is reported in Nigeria to treat leukemia, gonorrhoea and cough and also used as an astringent, purgative, aphrodisiac, demulcent. (Soladoye *et al.*, 2012).

Rhizome use traditionally in manufacture of infant food and sorghum beer in west Africa. (Sofidiya *et al.*, 2011).

Ethnopharmacology

The ethyl acetate extract of *Curculigo pilosa* showed highest activity against *Candida albican* with inhibition zone of (15mm), *Staphylococcus faecalis* (11mm), *Staphylococcus aureus* (6mm) and *E. coli* (5mm) (Elijah *et al.*, 2014).

Extract of *Curculigo pilosa* rhizome inhibits *Candida albican* (Gbadamosi and Egunyomi, 2010)

2.5.2.8 *Erythrina senegalensis* DC.

Family: Fabaceae

Synonyms: *Chriocalyx latifolius* Walp., *Duchassaingia senegalensis* (DC.) Hassk

Common name: Coral flower, parrot tree

Local name: Lakale, Ologun sheshe

Description

Erthrina senegalensis is a medium size shrubby tree, 3-4.4 m high but may grow up to 15 m in height and 1.5 m in girth, and prickly. The bark is very rough and fissured which is remarkable in old trees. Crooked branches with an irregular crown; the thorns on old wood are slightly curved with thick woody bases. The leaves have various shape and sizes with three leaflets 15 x 10 cm with the central leaflet the largest. Leaves are usually lanceolate to broadly ovate, glabrous, and sometimes with prickles on the midrib. The flowers are produced September – January in slender racemes up to 30 cm long and scarlet but turn black overtime. Petals are about 2.5-5 cm long and when leafless are folded very flat so that stamens are hidden. The pods are about 12 cm long and irregularly constricted but usually between seeds; the seeds are red, glossy with a white hilum about 0.6 cm long (Oliver-Bever, 1983).

Ecology and Distribution

A common savannah tree that occur at the banks of streams. It is distributed from Senegal to Cameroon and also grows in Kenya, Tanzania, Zimbabwe and Ethiopia (Oliver-Bever, 1983).

Chemical composition

Plant yields alkaloids with curariform activity known collectively as *Erythrina* alkaloids. The major ones are α - and β - erythroidine, erysodine, erysovine, erysotrine, and erysopine. Erysodine represents 50% of the total alkaloids (Iwu, 2014)

Ethnomedicinal uses

It is used by traditional healers in Dioila, Kolokani and Koutiala for amenorrhea, malaria, jaundice, infections, abortion, wound and pain. The root infusion is used in Nigeria as a toothache remedy and in Ivory Coast to Venereal diseases (Oliver-Bever, 1983).

Aqueous extract of the bark is used to treat jaundice and its infusion mixed with lime and pepper is administered for venereal diseases in Northern Nigeria (Iwu, 2014). Pounded bark and leaves are used in soups to treat female infertility. Extract of bark is given to women during childbirth; administered in Guinea after delivery and in Nigeria during labour to ease pain (Iwu, 2014). In Central Africa, infusion of bark and roots is used in enema for fevers, inflammation and stomach ache (Iwu, 2014).

Ethnopharmacology

The alkaloids are active orally and has been found useful as muscle relaxants in several clinical applications such as the control of convulsions; as adjunct to general anaesthesia, especially to relax muscles of the abdominal wall; and in electroconvulsive therapy (Iwu, 2014).

2.5.2.9 *Erythroleum suaveolens* (Guill. & Perr.) Brenan

Family: Fabaceae

Synonyms: *Fillae suaveolens* Guill. & Perr.

Common name: Ordeal tree, Red water tree, Sassy, Sasswood

Local name: Obo, Erun

Description

Erythroleum suaveolens (Guill. & Perr.) Brenan is a perennial tree that is 30 metres in height and slightly buttressed (Akinpelu *et al.*, 2012). It has a rough and blackish bark. The leaves have 2-3 pairs of pinnae that carries 7-13 leaflets. The leaflets are 5 by 2.5 cm (1.97 in x 0.98 in). The leaves are green coloured and ovate. It has fluffy flowers that are spiked and creamy-yellow in colour. The fruits are hard with flat pod (*Erythroleum suaveolens*, Flora of Zimbabwe, 2017).

Ecology and Distribution

It grows in the Savannah regions. It can be found in Mozambique, Zimbabwe and Nigeria (Akinpelu *et al.*, 2012).

Chemical composition

It contains high level of Saponins (Akinpelu *et al.*, 2012). Chloroform extract of stem bark of *Erythroleum suaveolens* contained amide, norcassaide and new diterpenoid alkaloid: norerythrosuaveolide (characterized as 7b-hydroxy-7-deoxo-6-oxonorcassaide) (Ngounou *et al.*, 2005). The aqueous and chloroform extract of *Erythroleum suaveolens* contained saponins, tannins, steroids and alkaloid (Aiyegoro *et al.*, 2007)

Ethnomedicinal uses

The tree bark is used in Liberia to make toxic concoction that is used for a form of trial by ordeal called “sasswood”. The use gave it its common name “Ordeal tree” (Lesson and Coyne 2012). The stem bark decoction is used in folk medicine as emetic and purgative, anaesthetics, anthelmintic, antimalarial, analgesic and disinfectant. It has been used in skin diseases, oedemas, gangrenous

wound, rheumatism and arthritis (Aiyegoro *et al.*, 2007; Burkill *et al.*, 1985). It has also been reported for use as poison or repellent against rodent, insects and some aquatic animals. It is used in tanning hides and dyeing (Dongmo *et al.*, 2001).

Ethnopharmacology

Ethanol extract stem bark of *Erythroleum suaveolens* (Guill. & Perr.) Brenan containing various concentration of crude saponins from the plant inhibits the activity of acetylcholinesterase in the haemolymph, muscle, hepatopancreas and intestine of *Lanistes lybicus* snails leading to their death which makes it a potential molluscicide (Akinpelu *et al.*, 2012). Chloroform extract of stem bark possess antifungal and antibacterial properties (Ngounou *et al.*, 2005).

CHAPTER THREE

STUDY AREA AND METHODOLOGY

3.1 THE STUDY AREA

The ethnomedical survey was carried out in Ibadan city, Oyo state using three Local Governments Areas. The three Local Governments Areas were Ibadan South East Local Government, Ibadan North East Local Government and Oluyole Local Government Area.

3.1.1 LOCATION, POPULATION AND SIZE

Ibadan is the capital and the most populous city of Oyo State, Nigeria with the coordinates 7°23'47" N 3°55'0" E. It has a population of over 3 million and it is the third most populous city in Nigeria after Lagos and Kano and the country's largest city by geographical area covering a total area of 3,080 square kilometres (1,190 sq. mi). It is located in the South Western Nigeria in the South Eastern part of Oyo state at about 119 kilometres (74miles) North East of Lagos and 120 kilometres (75 miles) East of the Nigerian International border with the Republic of Benin.

3.1.2 WEATHER AND CLIMATE

The city has tropical wet and dry climate, with a lengthy wet season and relatively constant temperature throughout the year. A relative humidity of 75%, mean maximum temperature of 26°C with minimum of 21°C and a mean total rainfall of 1420 mm occur in the city (Gbadamosi and Egunyomi, 2014).

3.1.3 LOCAL GOVERNMENTS IN THE STUDY AREA

There are eleven (11) Local Governments in Ibadan Metropolitan area consisting of five urban local governments in the city and six semi-urban local governments in the less city.

The Urban local governments include:

Ibadan North Local Government

Ibadan North-East Local Government

Ibadan North-West Local Government

Ibadan South-East Local Government

Ibadan South-West Local Government

The Semi-urban local governments include:

Egbeda local Government

Akinyele Local Government

Ido Local Government

Ona ara Local Government

Oluyole Local Government

Lagelu Local Government

FIGURE 3.1: Map of Oyo State showing the Ibadan Local Government Areas

Ibadan indigenes are Yoruba-speaking people of south western Nigeria. In their custom and tradition, they allow and value the use of botanicals in the prevention, management and treatment of ailments and diseases. They have diverse types of medicinal plants that are accessible and affordable. This with other factors has encouraged them to depend on herbs for treatment of diseases (Gbadamosi and Egunyomi, 2014). The use of medicinal plants among the Yoruba people has been in existence since ancient times. Most of the forefathers and mothers that discovered and had the knowledge of these medicinal plants were unable to write (document), so information was passed verbally from generation to generation. The information about the type of plants, plants parts, method of preparation and use, activity of some plants that are very essential has been lost over time due to lack of effective communication. However, since the inception of civilization the trado-medicinal knowledge could be inherited through transmission from generation to generation within extended family, traditional religion (herbalist). The documentation and preservation of the indigenous knowledge of Yoruba Traditional medicine became essential due to loss of plant varieties by deforestation, loss of indigenous knowledge due to erosion of cultural practices and limitations of orthodox drugs (side effects and resistance of microorganisms to antimicrobial). The use of herbal remedies in traditional folk medicine provides an interesting and a large unexplored source for creation and development of potentially new drugs (Lindequist *et al.*, 2005).

In the course of the survey, the respondents include: Herb sellers, Herbalists, Traditional medical practitioners for example the herbal therapist, and others who had knowledge about sexually transmitted diseases.

3.2 METHODOLOGY

3.2.1 SELECTION OF RESPONDENTS

Most of the respondents were herb sellers while others include Traditional medical practitioner (e.g. Herbal therapist), herbalists and others. They were selected based on their traditional knowledge about sexually transmitted diseases and their management. The areas visited are Bode Market in Ibadan South East LGA, Oje Market in Ibadan North East LGA and Olunde area in Oluyole LGA. These locations were selected because they are the major sites for Traditional medicine practice and the Traditional medical practitioners were concentrated there. The

categories of respondent were limited because some were insecure to give out information and share their experiences. All respondents were informed properly about the study and their consent was obtained before the interview and it was conducted in Yoruba language. Some gave information willingly while some that were reluctant at first later gave little information because of the fear of selling out their business secret.

The gender distribution of respondents was Sixty-seven (67) female and Thirteen (13) male with a total of Eighty (80) respondents.

3.2.2 DATA COLLECTION TECHNIQUE

The prepared questionnaire which was well structured was administered and used to obtain adequate information and data on sexually transmitted diseases and plants used in their management. In most cases the respondents could not read and write in English language hence, questions were asked from the questionnaire verbally in the language they understand (Yoruba) and documented accordingly.

The questionnaire was composed of two sections. A section inquires for general information about the respondent while the other is based on their knowledge about sexually transmitted diseases, treatments and managements of the diseases and plants used in terms of plant name, plant parts, mode of administration, frequency of administration.

(a) Information about respondent (Socio – Demographic data):

Specific questions were asked about name, age, gender, occupation of the respondent, study area, year of experience in practice.

(b) Knowledge on sexually transmitted diseases:

The study is aimed at medicinal plants used in treatment of sexually transmitted diseases. The respondents were asked of their knowledge about sexually transmitted diseases and the types. If they are aware of these then they are asked about the treatment in terms of the medicinal plants used. The local name(s) of the medicinal plant(s), medicinal plant part(s), types of sexually transmitted infection the medicinal plant (s) is used for, method of preparation of the medicinal

plant (s), mode of administration and frequency of administration of the medicinal plant (s) were asked how medicinal plants are collected and preserved.

The information provided were documented by proper jottings on paper, audio record and some of the plants were photographed. Literature materials were obtained from Journals, published books and the internet.

3.2.3 METHOD OF DATA ANALYSIS

The medicinal plants recommended were collected in the study area from the Respondents and were taken to Forestry Research Institute of Nigeria (FRIN) in Jericho, Ibadan for proper identification and authentication. Literature review of Journals, published books was used to judge the usefulness of the recommended plants used in treatment of sexually transmitted diseases. All data obtained were processed manually using information collected on paper, audio record and photograph of some of the plants. The resulting record of plants and their uses provides baseline data for phytochemical and pharmacological studies. The result was presented in tables, Use Mention Index and Percentage. The Use Mention Index were calculated to know the frequency of use of the plants.

UMI was calculated using the formula below:

$$\text{UMI} = \frac{\text{number of respondents who mentioned the specie}}{\text{total number of respondents}}$$

The percentage UMI of each plant was also determined by multiplying the corresponding UMI of the plant by 100.

CHAPTER FOUR

RESULT

4.1 INTRODUCTION

This section gives the result of the findings and the discussion for the findings. The total number of respondents are 80 individuals.

4.2 SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENT

This section gives a detailed account of the socio-economic and socio-demographic characteristics of the respondents. The characteristics of the respondents were obtained from the questionnaire and each characteristic is discussed as a sub-heading.

4.2.1 GENDER DISTRIBUTION OF RESPONDENTS

Table 4.1: Gender distribution as a socio-demographic characteristic of the respondents within the study area.

SEX	NUMBER OF RESPONDENTS	PERCENTAGE (%)
Male	13	16.25
Female	67	83.75
Total	80	100.00

4.2.2 AGE DISTRIBUTION

Table 4.2: Age distribution as a socio-demographic characteristic of the respondents within the study area.

AGE GROUP	NUMBER OF RESPONDENTS	PERCENTAGE (%)
15-20	0	0
21-30	2	2.50
31-40	10	12.50
41-50	38	47.50

51-60	10	12.50
61 and above	20	25.00
Total	80	100.00

4.2.3 EDUCATIONAL LEVEL

Table 4.3: Educational level attainment as a socio-economic characteristic of the respondents in the study area

TYPE	NUMBER OF RESPONDENTS	PERCENTAGE (%)
Primary education	13	16.25
Secondary education	15	18.75
Tertiary education	2	2.50
Others (no formal education)	50	62.50
Total	80	100.00

4.2.4 OCCUPATION OF RESPONDENTS

Table 4.4: Occupation as a socio-economic characteristic of the respondents within the study area.

OCCUPATION	FREQUENCY	PERCENTAGE(%)
Traditional medical practitioner	15	18.75
Herbalist	2	2.50
Herb seller	51	63.75
Others	12	15.00
Total	80	100.00

The work experience of the respondents ranges from about 2years upward since most of them were born into the trade.

4.3 LOCAL PERSPECTIVE AND DIAGNOSIS OF SEXUALLY TRANSMITTED DISEASES AMONG IBADAN TRADITIONAL MEDICAL PRACTITIONERS

The common sexually transmitted diseases that is known to the Traditional medical practitioner of Ibadan is Gonorrhoea. The others include Jeri-Jeri (Syphilis) and Candidiasis. They believe the following causes sexually transmitted diseases: Poor hygiene, dirtiness, sharing of uncleaned toilet, microorganisms such as bacteria, poor sexual habit for example having sexual intercourse with animals, multiple sexual partners. They believe it can affect both male and female.

1. GONORRHEA (ATOSI)

It is referred to as **Atosi** but it is classified into several categories based on the symptoms. It is most common in men and is late symptomatic in female because the female reproductive part is wider than that of the male. It is diagnosed symptomatically.

Symptoms:

After intercourse the individual feels warmth while urinating. On day 2 or 3 of infection the private part will start paining the individual. Infrequent urination on day 4, difficulty in urination on day 5 because the microorganisms has created a blockage in the urether then pus develops.

Atosi oloyun or Atosi eletu:

Pus like discharge. The pus then comes out with the urine, the residual urine then comes out again (little and frequently) with the accumulated pus.

Atosi eleje: when Gonorrhea is left untreated overtime there will be blood in the urine.

2. SYPHILLIS (JERI-JERI)

It is caused by a microorganism which looks like worm. It called the name Jeri-Jeri because when eri (waste from milled corn) is placed closed to the private part of the infected individual the organism comes to eat the eri (Y) and while doing this it drops off.

Symptoms:

Itching at the private part which soothes the individual, rashes on the private part, burning sensation. The rashes break and fluid from the rashes transfer to another part of the private area then sores develops.

3. VULVOVAGINITIS (JABE-JABE)**Symptoms:**

The individual feels there is something crawling at the private area. The individual is tempted to scratch. The individual feels bitten and wound develops on the private part. It affects mostly female but can be transferred to male through female. In the female, the vagina swells which may be scary to the individual. In male the urine comes out through the penis scattered at several spot.

Complications

They believe complications set in when the sexually transmitted disease is not treated for a very long time. The complications include: infertility, HIV/AIDS (arun ti o gbogun).

4.4 PLANTS USED BY THE TRADITIONAL PRACTITIONERS IN THE MANAGEMENT AND TREATMENT OF SEXUALLY TRANSMITTED DISEASES

Table 4.5: Plants used to treat Sexually transmitted diseases in the study area

S/N	Family	Botanical names	Local names	Parts used	Preparation	Voucher number	Frequency	UMI	% UMI
1	Acanthaceae	<i>Andrographis paniculata</i> (Burm f.) Nees	Awogba arun	Root	Infusion	FHI 109630	25	0.313	31.3
2	Amaryllidaceae	<i>Allium sativum</i> L.	Ayuu	Bulb	Infusion	FHI 107576	15	0.188	18.8
		<i>Allium ascalonicum</i> L.	Alubosa elewe	- Leaf	Infusion	FHI 107763	2	0.025	2.5
3	Anacardiaceae	<i>Anacardium occidentale</i> L.	Kasu	Bark	Powder Decoction	DPHUI 1558	21	0.263	26.3
		<i>Lannea welwitschi</i> (Hiern) Engl.	Orira	Bark	Infusion		5	0.063	6.25
		<i>Mangifera indica</i> L.	Mongoro	Bark	Powder Decoction		21	0.263	26.3
		<i>Spondias mombin</i> L.	Iyeye	Bark	Powder Decoction	FHI 63948	21	0.263	26.3

4	Annonaceae	<i>Uvaria afzelii</i> G.F. Scott-Elliot	Gbogbonise	Root	Powder Infusion	FHI 56875	20	0.250	25.0
		<i>Xylopia aethiopica</i> (Dunal) A. Rich.	Eru Alamo/ Eru	Leaf Root	Powder Infusion	FHI 108978	15	0.188	18.8
			Awonka	Bark Fruit	Decoction				
5	Apocynaceae	<i>Gongronema latifolium</i> Benth	Madunmaro	Root	Infusion	FHI 58439	5	0.063	6.3
		<i>Picralima nitida</i> (Stapf) T. Durand & H. Durand	Abeere	Fruit	Powder Infusion	FHI 108794	22	0.275	27.5
6	Aristolochiaceae	<i>Aristolochia repens</i> Mill.	Akogun	Root	Infusion Powder Decoction	FHI 101137	30	0.375	37.5
7	Asteraceae	<i>Ageratum conyzoides</i> (L.) L.	Imi – esu	Leaf	Juice Charred Tincture	FHI 109634	40	0.500	50.0
		<i>Vernonia amygdalina</i> Delile	Ewuro	Leaf	Juice	FHI 108055	30	0.375	37.5
8	Caricaceae	<i>Carica papaya</i> Linn.	Ibepe	Fruit	Decoction	FHI 108046	2	0.025	2.5

9	Clusiaceae	<i>Garcinia kola</i> Orogbo	Bark	Decoction	FHI 110091	2	0.025	2.5
		Heckel						
		<i>Harungana madagascariensis</i> Lam. Ex Poir.	Amuje	Bark	Tincture	25	0.313	31.3
10	Combretaceae	<i>Anogeissus leiocarpus</i> Guill. & Perr.	Orin pupa	Root	Infusion	5	0.063	6.3
			Orin funfun	Root	Infusion	5	0.063	6.30
		<i>Terminalia avicennioides</i> Guill. & Perr.	Idin	Bark	Decoction	FHI 64363 20	0.250	25.0
11	Connaraceae	<i>Cnestis ferruginea</i> (Vahl) DC.	Gboyin	Root	Decoction	20	0.250	25.0
12	Cucurbitaceae	<i>Citrullus colocynthis</i> (L.) Schrad	Baara	Fruit	Decoction Infusion	60	0.750	75.0
		<i>Lagenaria breviflora</i> (Benth.) Roberty	Tagiri	Fruit	Juice Infusion	FHI 109040 14	0.175	17.5
		<i>Momordica charantia</i> L.	Ejirin were	Leaf	Juice Powder	FHI 109638 40	0.500	50.0

					Infusion				
13	Euphorbiaceae	<i>Euphorbia lateriflora</i> Schumach.	Enu Opiri	Stem	Powder	FHI 109817	20	0.250	25.0
		<i>Jatropha curcas</i> L.	Lapalapa funfun	Leaf Juice	Juice	FHI 109020	8	0.100	10.0
14	Fabaceae	<i>Cassia fistula</i> L.	Asunwon	Leaf	Powder		15	0.188	18.8
			Pupa	Root	Decoction				
		<i>Erythroleum suaveolens</i> (Guill. & Perr.) Brenan	Obo	Bark	Decoction	FHI 108886	15	0.188	18.8
					Powder				
					Lotion				
		<i>Senna alata</i> (L.) Roxb.	Asunwon dudu	Leaf Root	Decoction Powder	FHI 108062	36	0.450	45.0
		<i>Tetrapleura tetraptera</i> (Schum. & Thonn.) Taub.	Aidan	Seed	Decoction	FHI 110141	4	0.050	5.0
15	Gentianaceae	<i>Anthocleista djalensis</i> Chev	Sapo A.	Root	Infusion Decoction	FHI 107912	25	0.313	31.3

16	Hypoxidaceae	<i>Curculigo pilosa</i> (Schumach. & Thonn.) Engl.	Epa ikun	Rhizome	Powder	FHI 52223	42	0.525	52.5
17	Iridaceae	<i>Gladiolus dalenii</i> Van Geel	Baka	Corm	Powder Infusion Decoction		50	0.625	62.5
18	Laminaceae	<i>Ocimum</i> <i>gratissimum</i> L.	Efirin	Leaf	Juice	FHI 108057	30	0.375	37.5
19	Moraceae	<i>Ficus aesperifolia</i> Miq.	Ipin	Leaf	Infusion		3	0.038	3.8
		<i>Ficus thonningii</i> Blume	Roro	Leaf	Powder		10	0.125	12.5
20	Moringaceae	<i>Moringa oleifera</i> Lam.	Idagba molye	Root	Decoction		5	0.063	6.30
21	Mrytaceae	<i>Syzygium</i> <i>aromaticum</i> (L.) Merr. & L.M	Kanafuru	Fruit	Infusion		5	0.063	6.3
22	Olacaceae	<i>Olax</i> <i>subscorpioides</i> Oliv.	Ifon	Root	Decoction	FHI 109983	30	0.375	37.5
23	Papilionoideae	<i>Erythrina</i> <i>senegalensis</i> DC.	Lakale	Bark	Infusion		35	0.437	43.7

24	Poaceae	<i>Sorghum bicolor</i> (L.) Moench	Poporo / Oka baba	Seed	Infusion Decoction	FHI 47514	15	0.188	18.8
25	Phyllanthaceae	<i>Bridelia ferruginea</i> Benth	Ira	Bark	Powder	DPHUI 1499	25	0.313	31.3
26	Plumbaginaceae	<i>Plumbago zeylanica</i> L.	Inabiri	Root	Tincture	FHI 48067	30	0.375	37.5
27	Polygalaceae	<i>Securidaca longepedunculata</i> Fresen.	Ipeta	Root	Infusion Decoction Powder	FHI 109972	30	0.375	37.5
28	Ranunculaceae	<i>Actea pachypoda</i> L.	Iyun eye	Leaf	Decoction		1	0.013	1.3
29	Rubiaceae	<i>Morinda lucida</i> Benth. <i>Sabicea calycina</i> Benth.	Oruwo Ogaun	Leaf Bark	Powder Infusion Powder	FHI 106992	25 35	0.313 0.438	31.3 43.8
30	Rutaceae	<i>Citrus aurantifolia</i> (Christm.) Swingle	Osan wewe	Fruit	Infusion	FHI 110009	40	0.500	50.0
31	Solanaceae	<i>Nicotiana tabacum</i> L.	Taba	Leaf	Tincture	DPHUI 0337	20	0.250	25.0

32	Tiliaceae	<i>Glyphaea brevis</i> (Spreng.) Monach	Atori	Leaf Root	Decoction	FHI 108898	20	0.250	25.0
33	Vitaceae	<i>Cissus populnea</i> Guill. & Perr.	Ogbolo	Leaf	Infusion	FHI 109459	2	0.025	25.0
34	Zingiberaceae	<i>Aframomum</i> <i>meleguata</i> K.Schum.	Ataare	Fruit	Powder	FHI 109986	45	0.563	56.3
34	Others	NA	Toro	Root	Decoction		5	0.063	6.3
		NA	Danko- tanko	Root	Infusion		4	0.050	5.0
		NA	Teyo	Root	Infusion Decoction		10	0.125	12.5

FIGURE 4.1 Percentage of use of plant parts for treatment of Sexually transmitted diseases in Ibadan.

Table 4.6: TABLE SHOWING PLANTS FAMILY AND THE NUMBER OF SPECIES IN EACH FAMILY

S/N	FAMILY	NUMBER OF SPECIES	FREQUENCY
1	Acanthaceae	1	1.81
2	Amaryllidaceae	2	3.63
3	Anacardiaceae	4	7.27
4	Annonaceae	2	3.63
5	Apocynaceae	2	3.63
6	Aristolochiaceae	1	1.81
7	Asteraceae	2	3.63
8	Caricaceae	1	1.81
9	Clusiaceae	2	3.63
10	Combretaceae	3	5.45
11	Connaraceae	1	1.81
12	Cucurbitaceae	3	5.45
13	Euphorbiaceae	2	3.63
14	Fabaceae	4	7.27
15	Gentianaceae	1	1.81
16	Hypoxidaceae	1	1.81
17	Iridaceae	1	1.81
18	Laminaceae	1	1.81
19	Moraceae	2	3.63
20	Moringaceae	1	1.81
21	Mrytaceae	2	3.63
22	Olacaceae	1	1.81
23	Papilionoideae	1	1.81
24	Poaceae	1	1.81
25	Phyllanthaceae	1	1.81
26	Plumbaginaceae	1	1.81
27	Polygalaceae	1	1.81

28	Ranunculaceae	1	1.81
29	Rubiaceae	2	3.63
30	Rutaceae	1	1.81
31	Solanaceae	1	1.81
32	Tiliaceae	1	1.81
33	Vitaceae	1	1.81
34	Zingiberaceae	1	1.81
35	Others	4	7.27
36	Total	56	100

4.5 PHYTOTHERAPEUTIC REMEDIES FOR SEXUALLY TRANSMITTED DISEASES TREATMENT RECOMMENDED DURING THE SURVEY

The method of preparation and the method of use of the medicinal plants recommended, dosage, other materials added, method of administration and how the plant parts are preserved.

METHOD OF PREPARATION AND USAGE

The phytotherapeutic remedies recommended by the Traditional medical practitioner (traditional health practitioner, traditional birth attendant, herb seller, and herbalist) involve the use of one or more combination drugs which are to be prepared using the following method.

GONORRHEA

1. The leaves of *Glyphaea brevis*, *Xylopiya aethiopica*, the diced fruit of *Citrullus colocynthis* and potash are cooked and sieved after cooking. One shot cup or three spoonsful is to be taken orally three times daily.
2. The fruit of *Citrullus colocynthis* is diced into small pieces, the seed is removed. The diced fruit is cooked with potash and sieved. Three spoonsful of the decoction is to be taken orally until symptoms resolve.
3. The diced fruits of *Citrullus colocynthis*, *Gladiolus dalenii*, *Citrus aurantifolia*, the rhizome of *Curculigo pilosa*, the roots of *Senna alata*, *Uvaria afzeli* and Teyo (Y) are soaked in water for three days. The infusion is to be taken orally twice daily (morning and night) until symptoms resolve.
4. The diced fruit of *Citrullus colocynthis*, the corm of *Gladiolus dalenii*, the rhizome of *Curculigo pilosa*, the roots of *Anthocleista djalensis*, *Senna alata*, *Cassia fistula*, the leaves of *Momordica charantia* and potash are soaked with the juice of *Citrus aurantifolia*. One glass cup of the infusion is to be taken morning and night until symptoms resolve.
5. The bark of *Erythroleum suaveolens* is grinded with a fruit of *Aframomum melegueta*. The powder is poured into Adi (refined waste from a palm kernel). The peak of the feather of a hen is used to pick the mixture and drop on the penis. Not to be taken orally.

6. The root of *Aristolochia repens*, the rhizome of *Curculigo pilosa* and the fruit of *Gladiolus dalenii* are washed, peeled, cut into small pieces, dried and grinded into powder form. One and half teaspoonful of the powder is to be taken with Pap once daily after meal.
7. The root of *Cnestis ferruginea*, *Anthocleista djalonenensis*, Toro (Y) plant, the fruit and bark of *Xylopia aethiopicia*, the leaves of *Actea pachypoda*, *Momordica charantia*, the seeds of *Tetrapleura tetraptera*, *Sorghum bicolor* are cooked. One glass cup is to be taken frequently until symptoms resolve.
8. The fruit of *Citrullus colocynthis*, *Gladiolus dalenii*, the root of *Anthocleista djalonenensis*, the roots and leaves of *Cassia fistula* and *Senna alata* are cooked with small alum and potash. Drink frequently until symptoms resolve.
9. The fruits of *Citrullus colocynthis* (cut into small pieces), *Gladiolus dalenii*, the root of *Anthocleista djalonenensis*, the roots and leaves of *Cassia fistula* and *Senna alata* are washed, dried and grinded into powder. The powder is to be taken with pap once daily.

SYPHILLIS

1. The roots of *Securidaca longepedunculata*, *Olex subscorpiodea* are soaked in a bowl of water for 24 hours. The infusion is to be taken orally for three days.
2. The leaves of *Ficus thonningii*, *Momordica charantia*, *Citrullus colocynthis* are pounded, dried and blended to achieve a fine powder. The powder is then capsulated. One capsule is to be taken twice daily.
3. The Bark of *Mangifera indica*, *Spondia mombian*, *Anacardium occidentale* are grinded. Cook with potash and two times the volume of water. One shot cup is to be taken Morning and night.
4. The bark of *Sabicea calycina*, *Erythroleum suaveolens* are marcerated and mixed with the local black soap. The preparation is used to wash the affected area until symptoms resolve.
5. The bark of *Sabicea calycina*, *Erythroleum suaveolens*, the fruit of *Aframomum melegueta*, the stem of *Euphorbia lateriflora* are dried and grinded with sulphur (Imi orun) and potash (Kaun biala) into powder. The powder is mixed with the local black soap or white soap. The area is bathed with the soap until it dries up.

GONORRHEA AND SYPHILIS

1. The fruits of *Citrullus colocynthis*, *Lagenaria breviflora*. The fruits are cut and soaked with one cup of *sorghum bicolor* seeds in 2L of water. One glass cup is to be taken daily
2. The fruits of *Citrullus colocynthis*, *Lagenaria breviflora*, *Citrus aurantifolia*. The fruits juice is extracted. Two shot cups is to be taken once daily.
3. The root of *Plumbago zeylanica*, the Bark of *Harungana madagascariensis* are soaked into alcohol. One shot cup of the tincture is to be taken twice daily after meals.
4. The root of *Securidaca longepedunculata*, the leaves of *Nicotiana tabacum* are soaked in alcohol. One shot cup of tincture is to be taken twice daily after meals.
5. The leaves of *Momordica charantia*, *Vernonia amygdalina* are squeezed in water to extract juice. One glass cup is to be taken once daily after meal.

GONORRHEA AND VULVOVAGINITIS

1. The equal quantities of leaves of *Ocimum gratissimum*, *Vernonia amygdalina* and *Ageratum conyzoides* are squeezed in water to extract juice. One glass cup is to be taken once daily after meal.
2. The root of *Aristolochia repens* and *Glyphaea brevis* are boiled in water for 15minutes. One glass cup is to be taken once daily after meal.
3. The fruit juice of *Citrullus colocynthis* is extracted and mixed with dried and powdered rhizome of *Curculigo pilosa* and corm of *Gladiolus dalenii*. The preparation is dried thoroughly. One half teaspoonful of the powder is to be taken with pap once daily after meal.

VULVOVAGINITIS (CANDIDIASIS AND TRICHOMONIASIS)

1. The Bark of *Terminalia avicennnioides*, *Olex subscorpioidea*, *Securidaca longependuculata* are boiled in water for 15 minutes. One glass cup is to be taken once daily after meal.

2. The leaves of *Momordica charantia*, *Morinda lucida*, *Cassia fistula*. The leaves are dried and grinded into powder. One teaspoonful of powder is to be taken with pap once daily after meal.

GENERAL USE

1. The bulb of *Allium sativum*, the roots of *Aristolochia repens*, *Gongronema latifolium*, *Anogeissus leiocarpus*, Orin funfun (Y), the fruits of *Syzygium aromaticum*, *Picralima nitida*, the bark of *Erythrina senegalensis*, the Bark of *Lannea welwitschi*, the seed of *Tetrapleura tetraptera* and Danko - tanko (Y) are soaked in water. Take one glass cup every morning.
2. The leaves of *Morinda lucida*, *Momordica charantia* and the fruit of *Picralima nitida* are soaked in water. One glass cup is to be taken twice daily.
3. The leave of *Citrullus colocynthis*, *Cassia fistula* and *Senna alata*, the root of *Anthocleista djalonensis* and Teyo (Y) are cooked. One glass cup is to be taken twice daily for 3 – 5 days.
4. A polythene bag sized leaves of *Ageratum conyzoides* is burned. The charred powder is soaked in alcohol. One shot cup is taken twice daily after meals.
5. The leaves of *Jatrophas curcas* is squeezed into water. Two shot cup is to be taken daily.
6. The leaves of *Jatrophas curcas* is squeezed into water. The water is used with white soap to wash the affected area.
7. The root of *Cissus populnea* and the leaves of *Allium ascalonicum* are soaked in water. three shot cup of the infusion is to be taken daily.

4.6 GENERAL OVERVIEW OF THE METHOD OF PREPARATION

The Medicinal plants can be prepared as several preparations. These preparations include infusion, decoction, tincture, soaps and mixtures. The plants used can be dried, soaked, boiled, pounded, charred (burned), grinded, capsulated to achieve desired result. Below are some of the ways the people interviewed prepare their medicinal plants.

Drying:

The leaves, stems, barks, roots, corms, bulbs, fruits and seeds of the recommended plants are use preferably when fresh than when dry. When dried plants parts are required the fresh plant parts are dried through this process:

1. A table stand is built and net is used to cover the head instead of wood to make a plain surface.
2. The plant part is washed with only water to exclude dirt and some microorganisms.
3. The plant part is then spread on the clean net and placed in a wide room for air drying.
4. It is then taken after three days. At this time, it is expected to be well dried.
5. Then it can be used as required for example in powder preparation.

Plants parts especially leaves are not dried using sun light because all the needed constituents would be loss by evaporation.

Boiling:

The boiling of herbal preparation is the local system of Traditional medicine preparation. Once the preparation starts boiling it is left on fire for another 30 minutes to kill any form of microorganisms. Boiling is done with two times (2 X) the volume of plants parts to be boiled to avoid burnt or too concentrated extract. Any plant parts that will be boiled do not require drying.

Burning:

The plant parts needed are cleaned to remove dirt and placed on a large tray and burned. The plant parts that are usually burned include fruits, roots, seeds because they do not dry easily.

Powder:

To achieve powdered plant parts, the plant parts are either dried or burned (charred). The dried or burned part are then grinded with the local grinding machine to get powder.

Capsulation:

Capsulation is a modern method of delivering Traditional medicines. For the powder to be acceptable to taste, to achieve optimal concentration at the site of actions and to achieve appropriate dosing the use of gelatin capsule is introduced. Some of these preparations taste and

odour are not palatable, which may discourage the patient from using the preparation. Also, the saliva and mucous along the Gastrointestinal tract may extract from the powder some of the constituents needed at the site of action thereby reducing the optimal dose needed for optimal activity. Capsulation help to gets all the active pharmaceutical constituent to the point of absorption to achieve optimum therapeutic effect.

4.7 TYPES OF PREPARATIONS

Infusion: the plants parts needed are soaked in water for days to extract constituents.

Decoction: the plants parts are boiled in water to extract constituents.

Tincture: the plants parts are soaked in alcohol to extract constituents.

Capsule: the plants powder is encapsulated in gelatin shell.

Soaps: the plants powder or extract is incorporated into a soap (. e.g. black soap)

Mixture: the plants powder or extract is incorporated into a liquid base such as Adi (Y)

4.8 OTHER MATERIALS ADDED TO THE PREPARATION AND METHOD OF PLANT PRESERVATION

Ataare (*Aframomum melegueta*): added most time to preparation or formulation as preservatives.

Kaun biala (Potash): added to soften plant parts to hasten extraction of constituent into solvent.

Imi orun (Sulphur)

Alcohol: as a solvent to prepare tincture.

Ose dudu (Black soap): as a base to contain medicinal powder or extract to wash affected area.

Adi: a refined waste from palm kernel.

Preservation of the medicinal plants formulations are done by proper storage, re-boiling in case of decoction, proper covering of lid, addition of traditional preservatives like *Aframomum melegueta*.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Discussion

Sexually transmitted diseases (STDs) remains a public health problem of major significance in the world. STDs continue to present major health, social and economic problems in the developing world, leading to considerable morbidity, mortality and stigma (Choudhry *et al.*, 2010). The implications of the disease bring about the need to control Sexually transmitted diseases. In Nigeria, there is high incidence of Sexually transmitted diseases and their complications which is very rampant in the rural area because of lack of access to quality health care. Several plants are available in Nigeria that can be used for treatment of Sexually transmitted disease which will help to control the Sexually transmitted diseases.

Ibadan city is a part of Nigeria where traditional medicinal practice is very common and rampant especially in the areas such as Bode market, Oje market and Olunde area which were the focus of the survey. The areas were focused on because Traditional medical practitioners who have vast knowledge of Traditional medicine were highly localized there.

The ethnomedical survey of plants used in the treatment of Sexually transmitted diseases in Ibadan using the three areas revealed that *Citrullus colocynthis* (L.) Schrad is the most frequently used plant with the highest UMI followed by *Gladiolus dalenii* Van Geel, *Aframomum melegueta* K. Schumn., *Curculigo pilosa* (Schumach. & Thonn.) Engl., *Citrus aurantifolia* Christm., *Momordica charantia* L., *Senna alata* (L.) Roxb., *Plumbago zeylanica* L., and *Ageratum conyzoides* (L.) L. are the prioritized medicinal plant species with higher frequencies of use as shown in **Table 4.5**. Other plants with lower frequency of use such as *Sabicea calycina*, *Anthocleista djalonensis* A. Chev, *Syzygium aromaticum* (L.) Merr. & L.M are shown in **Table 4.5**. Use Mention Index (UMI) is a mathematical expression of the frequency of use of a particular plant species among the total number of respondents. It was calculated using the formula as shown on **page 51**.

A total of 52 plant species of 34 families and 4 unknown plant species with unknown families were identified to be useful in treatment and management of STDs. The survey shows that Fabaceae, Anacardiaceae and Cucurbitaceae were the plant families used most commonly for treatment of sexually transmitted diseases (**Table 4.6**). The importance of the families Anacardiaceae, Fabaceae

and Euphorbiaceae in sexually transmitted diseases regimen have been reported by some authors (Ajibesin *et al.*, 2011; Chisembu and Hedimbi, 2010; Gbadamosi and Egunyomi, 2014).

The bar chart shown in **Figure 4.1** revealed the percentage of the plants part used as responded by the respondent. It yielded root 31.15%, leaf 24.59 %, bark 18.03%, fruits 14.75%, seeds 4.91%, rhizome 1.64%, stem 1.64%, corm 1.64% and bulb 1.64%. The roots were the common part of plant used in management of sexually transmitted diseases which is in agreement with that reported in Zimbabwe and Kenya (Kambizi and Afolayan, 2011; Kamanja *et al.*, 2015). However, from a similar study performed by Gbadamosi and Egunyomi, 2014 in Ibadan; Nduche and Okwulehie, 2014 in Abia State leaves were the most commonly used followed by roots. This shows that roots and leaves are very useful in the management of sexually transmitted diseases.

Thirty – one prescriptions were reported and documented for the management of the venereal diseases including Gonorrhoea, Syphilis, Vulvovaginitis and others. Gonorrhoea was the most common and frequently diagnosed STDs as reported by the traditional medical practitioners and a few made mention of HIV/AIDs. In an ethnobotanical survey of plants used for treatment and management of Sexually transmitted infections in Nigeria by Gbadamosi and Egunyomi, 2014 Gonorrhoea was also documented as the most frequent STD mentioned and HIV/AIDS as the least mentioned by the respondents.

The result of this survey shows that *Citrullus colocynthis* is the most commonly used plant used in management STDs. It is found in the recipes for Gonorrhoea, Syphilis and Vulvovaginitis such as candidiasis. Other plants commonly used include *Curculigo pilosa*, *Ageratum conyzoides*, *Citrus aurantifolia* Christm., *Gladiolus dalenii* Van Geel, *Anthocleista djalensis*, *Aristolochia albida*, *Aframomum melegueta* K. Schum, *Xylopia aethiopica*, *Lagerflora* (Benth) Roberty, *Momordica charantia* L. and *Tetrapleura tetraaptera* (Schum. & Thonn.) Taub. *Mangifera indica* L. has been reported specifically useful in the management of syphilis which was also documented in the research done by Nduche and Okwulehie, 2014.

The common methods of preparation were decoction and infusion and the common route of administration was the oral route. This is similar to that reported by Kambizi and Afolayan, 2011. Other preparations include soaps, powder, tincture, juice and lotions and route of administrations include topical.

The leaves, stems, barks, roots, corms, bulbs, fruits and seeds of the recommended plants are use preferably when fresh than when dry in order to get sufficient amount of active ingredients present in them. However, if there is need to dry plants they dry the plants in an open room with air instead of drying in the sun because it was believed that the sun light will evaporate the metabolites or volatile oils that are essential for activity. The most common method of preservation as reported by some of the respondents was proper storage and addition of *Aframomum melegueta* K. Schum. Potash was added to preparation to hasten extraction of constituents.

STDs associated skin infections are treated by combining plants such as fresh peels of *Euphorbia lateriflora* Schum. & Thonn., *Erythroleum suaveolens* (Guill. & Perr.) Brenan and *Bridelia ferruginea* Benth with any soap but the most commonly used soap is black soap.

Several of these plants has been analyzed for various properties. The activity of these plants has been attributed to their phytochemical constituents. Several of these plants contain various phytochemical constituents such flavonoids, terpenoid, saponins, tannins, alkaloids, cardiac glycosides, steroids and anthraquinone. These secondary metabolites have antimicrobial properties (Gbadamosi and Egunyomi, 2010) and are considered as potential sources of novel antimicrobial compound. Some of these compounds have been associated to antibacterial activities and thus have curative properties against pathogenic microbes (Kudi *et al.*, 1999; Abubakar *et al.*, 2011). The *Senna alata* (L.) Roxb. Leaf has been considered as natural antibacterial source due to the presence of flavonoids and anthraquinones (Tatsimo *et al.*, 2017). The plant *Curculigo pilosa* has a great amount of fatty acids and its derivatives. These metabolites have been reported to have biological significance in the diagnosis and control of venereal diseases such as gonorrhea and candidiasis (Elijah *et al.*, 2014). Hence its use in treatment of Sexually transmitted diseases among the Traditional medical practitioner in Ibadan.

The findings of this ethnobotanical survey will be useful in the health care, conservations of endangered species, development of new, cheap, effective, quality drugs with lower side effects. There is need for further research and analysis of the plants with high frequency of use such as *Citrullus colocynthis* (L.) Schrad, *Gladiolus dalenii* Van Geel, *Senna alata* L. Roxb., *Bridellia ferruginea* Benth, *Erythroleum suaveolens* (Guill. & Perr.) Brenan and *Plumbago zeylanica* L. to determine their activity, potency and efficacy.

5.2 CONCLUSION

The ethnobotanical survey revealed that 52 plant species from 34 families are used for the management and treatment of sexually transmitted diseases in Ibadan, Oyo State. The families that were highly used include Anacardiaceae, Fabaceae and Cucurbitaceae. The plants commonly used were *Citrullus colocynthis* (L.) Schrad, *Plumbago zeylanica* L., *Citrus aurantifolia* Christm., *Mangifera indica* L., *Senna alata* L. Roxb, *Erythroleum suaveolens* (Guill. & Perr.) Brenan and *Gladiolus dalenii* Van Geel. The plant *Citrullus colocynthis* had the highest frequency of use. The analysis of these plants can help to develop new, effective therapeutic medicinal drugs (antimicrobials) that would be useful to control Sexually transmitted diseases thereby reducing their morbidity and mortality impact on Global health.

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10. Which sign / symptom do you know is related to sexually transmitted diseases?

TYPES	SYMPTOMS
Gonorrhea (Atosi)	
Syphilis (Jeri-Jeri)	
Vulvovaginitis (Jabe-Jabe)	
HIV/AIDS (Eedi)	
Others (Arun miran ti E mo)	

11. Complete the following in regards to the information on the treatment of this diseases.

FOR GONORRHOEA (ATOSI)

Characteristics	Plant	Local name	Plant Part	Method of Preparation	Mode of Administration	Dosage

FOR SYPHILIS (Jeri –Jeri)

Characteristics	Plant	Local name	Plant Part	Method of Preparation	Mode of Administration	Dosage

FOR VULVOVAGINITIS (Jabe-Jabe)

Characteristics	Plant	Local name	Plant Part	Method of Preparation	Mode of Administration	Dosage

OTHERS (Arun miran ti E mo)

Characteristics	Plant	Local name	Plant Part	Method of Preparation	Mode of Administration	Dosage

12. Do you have any suggestion on how the local drugs for **STDs** can be improved?

13. Years of experience in trade _____

Thank you very much for your time.