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Original Article

Ethnobotanical study of medicinal flora utilised by traditional healers in the management of sexually transmitted infections in Sesheke District, Western Province, Zambia

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ABSTRACT

Since many rural-poor Lozi people of Sesheke District (Western Province, Zambia) that suffer from sexually transmitted infections do not usually access public health facilities; they turn to traditional healers who administer remedies extracted from medicinal plants. However, the medicinal plants used for sexually transmitted infections and data on the usage of plants in Sesheke District in particular and Western Province in general have not been documented. In this study, an ethnobotanical survey was conducted to document the indigenous knowledge of medicinal plants that alleviate symptoms of sexually transmitted infections in Sesheke District, Western Province, Zambia. Using semi-structured interviews and questionnaires, ethnobotanical data were collected from twenty traditional healers that manage patients presenting with sexually transmitted infections. The results showed that 52 plant species in 25 families and 43 genera were used to treat gonorrhoea, syphilis, chancroid, chlamydia, genital herpes, and ano-genital warts. Sexually transmitted infections were frequently managed using the following plants: *Terminalia sericea*, *Strychnos cocculoides*, *Ximenia caffra*, *Cassia abbreviata*, *Cassia occidentalis*, *Combretum hereroense*, *Combretum imberbe*, *Dichrostachys cinerea*, *Boscia albitrunca*, *Momordica balsamina* and *Peltophorum africanum*. Many of these plants have putative antimicrobial activities which may justify their roles as natural remedies for sexually transmitted infections. Further studies are needed to determine the dosages, minimum inhibitory concentrations, biological activities and toxicities, and characterise the plants' chemical compounds.

Introduction

Up to 80% of the African population uses traditional medicine for primary health care (WHO, 2003). In many African countries including Zambia, traditional healers administer plant remedies to patients suffering from sexually transmitted infections (STI). Traditional beliefs, cultural barriers, low socio-economic status, stigma, lack of confidentiality, and inadequate user-friendly facilities are some of the reasons why the traditional healer is usually the first line of care for STI patients (Peltzer et al., 2006).

Other factors for seeking traditional medicine involve challenges surrounding public health care facilities. These include long distances to hospitals, long waiting queues, lack of laboratory facilities, drug shortages, and poor health worker attitudes. The reluctance to disclose information related to genitalia is further reason to initially seek help from traditional healers (Kamatenesi-Mugisha et al., 2008). It is therefore not surprising that among all the diseases treated by African traditional healers, STI are one of the most frequently encountered (Peltzer et al., 2006).

Vermani and Garg (2002) reviewed medicinal plants for treating STI. Van Vuuren and Naidoo (2010), De Wet et al. (2012), Semenya et al. (2013), and De Wet and Ngubane (2014) recorded South African medicinal flora utilised in the treatment of STI. Van Vuuren (2008) and Naidoo et al. (2013) have also shown that African medicinal plants used for the treatment of STI have good antimicrobial activities. Ndubani and Höjer (1999) documented medicinal plants used by traditional healers in the treatment of STI in Chiawa, Zambia.

In the Lozi language of western Zambia, STI are commonly known as 'matuku a sihule' or 'butuku bwa sihule'; meaning 'diseases of prostitutes'. Several demographic and socio-economic factors force patients with STI in western Zambia (Barotseland) to use medicinal plants: lack of formal education, unemployment, lack of health insurance, poverty, low ages of sexual debut, and risky

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sexual behaviours. For instance, men in Western Province had the highest levels of risky sexual intercourse in Zambia at 90.3%; about 3.1% of men reported an STI; 6.8% of women and 5.3% of men had syphilis (Central Statistical Office et al., 2009). Women in Western Province are the most promiscuous in Zambia, with 3.2% having more than two 2 sexual partners and 28.1% having high risk sexual intercourse (Central Statistical Office et al., 2009).

Data in the 2009 Zambia Demographic Health Survey reveal that about 56.7% women and 74.9% of men had never tested for HIV. Over 15.2% of adults aged 15–49 years and 7.7% of young people aged 15–24 years were HIV positive (Central Statistical Office et al., 2009). The Red Cross reported 30% adult HIV prevalence in Sesheke (Integrated Regional Information Networks, 2006). In 1992, quite early in the AIDS epidemic, sero-prevalence figures for HIV were 16% for blood donors and 41% for patients attending the clinic for STI (Van Der Hoek, 1992).

Despite the presence of curable STI, over 25.7% of people in Western Province do not access health care at clinics because drugs and laboratory facilities are not available (Central Statistical Office et al., 2009). Only a third of eligible pregnant women have access to drugs, and 19% had a urine sample test. Public health service delivery in Sesheke is below par, often characterised by inadequate staff at health facilities, poor health worker training and supervision, in addition to patients walking long distances to access care (Chinyama, 2013). Corollary, a lack of community participation in public health services was reported (Chinyama, 2013). In Sesheke, even workers rarely seek public health services related to STI including HIV/AIDS (Chilekwa, 2014).

Given the aforementioned factors and challenges in Western Province in general and Sesheke District in particular, most of the people that suffer from STI use medicinal plants. The use of medicinal plants in Barotseland including Sesheke is also part of the medical pluralism whereby the introduction of allopathic medicines has not really dampened Bulozi beliefs in indigenous diagnosis and therapeutic systems (Chinsembu, 2009). This paper is an inaugural report on medicinal plants used by traditional healers in the management of STI in Sesheke District, Western Province, Zambia.

Materials and methods

Study area

The study was carried out in villages near Lipumpu, Machile, Mwanalisa, Mambova, Mulimambango, Sankolonga and Mwandi in Sesheke District located in Western Province, Zambia. Geographical locations of Zambia in Africa and Sesheke District in Zambia are shown in Fig. 1. Sesheke is a small town on the border with Namibia. It is a major transit point to the small Namibian town of Katima Mulilo served by the Trans-Caprivi highway from Walvis Bay and Windhoek. Drivers on this route are serviced by a booming commercial sex industry that contributes to STI. Most of Sesheke is inhabited by the Lozi ethnic group whose relative socioeconomic status compares poorly to other parts of Zambia.

Sesheke District covers 28,500 km^2 in the south-western corner of Western Province, Zambia. It has an average altitude of 951 metres above sea level (range of 915–1220 m), within latitudes of 15°30′ and 17°50′ S and longitudes 23°00′ and 25°30′ E (Lwando, 2013). The District is divided by the Zambezi River into two parts, mainland Sesheke facing Zambia and Katima Mulilo facing Namibia.

Located in Zambia's agro-ecological region I, Sesheke generally experiences low and scattered rainfall during mid-November to the end of March with a mean of 670 mm per annum; the highest average rainfall of 180 mm is recorded in January (Lwando, 2013). Although temperatures are quite extreme, average temperatures range from 15 to 26 °C. In winter, night radiation from the sand

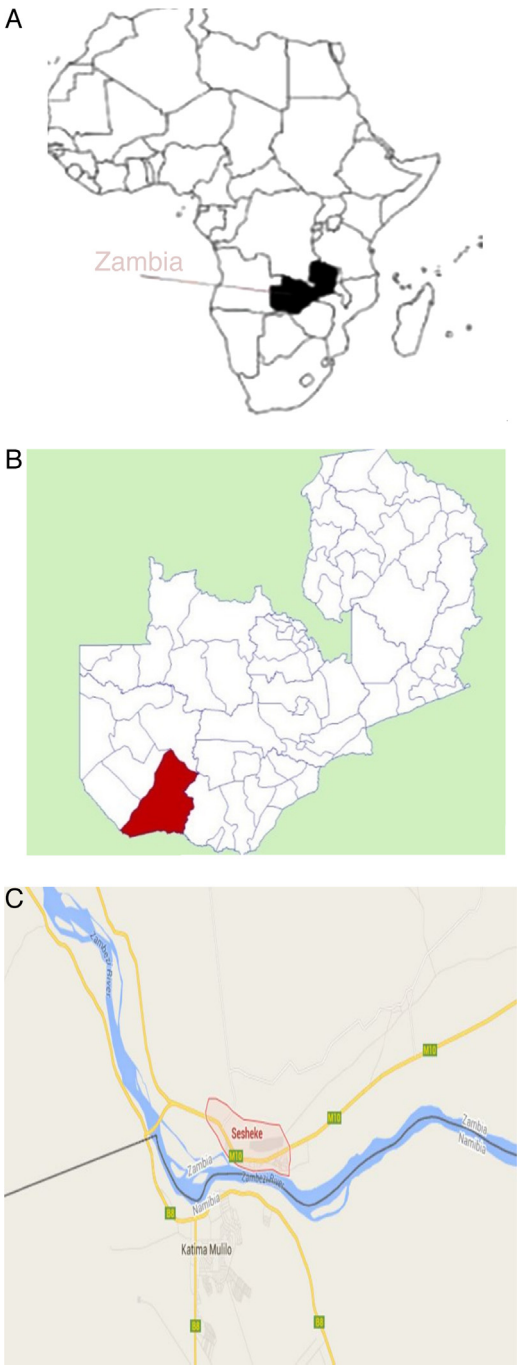

Fig. 1. (A) Geographical position of Zambia in Africa. (B) Location of Sesheke District in Zambia. (C) Sesheke Central.

gives rise to very low night temperatures so that low-lying areas suffer from frigidity (Lwando, 2013). In July, the minimum temperature is 3.6 °C and from September to February the absolute maximum temperature is over 38 °C. During the remainder of the year, temperature is high, over 31 °C.

The terrain in Sesheke District is well vegetated, mostly made up of swamps, floodplains, wetlands, and deciduous woodlands dominated by trees such as the Zambezi teak (Chidumayo, 1987). Sesheke has one of the best-conserved populations of Mukusi (*Baikiaea*) and *Pterocarpus* forests. The remainder of the District is mostly co-dominated by Kalahari woodlands consisting of members of the *Julbernardia*, *Cryptosepalum*, *Ricinodendron* and *Commiphora* (Chidumayo, 1987).

Ethnobotanical data collection

Ethnobotanical data were collected using a method similar to that of Chinsembu and Hedimbi (2010). Briefly, snowball sampling was applied during ethnobotanical surveys of traditional healers that use plants to treat STI in several villages. Key gatekeepers were used to verify the presence of and access to respondent traditional healers in various parts of the District. Twenty traditional healers were eventually included in the study through a two-stage sampling design.

Before conducting interviews, the aim of the study was clearly explained and traditional healers were asked for their consent. Then the traditional healers were individually engaged in semi-structured interviews supplemented with questionnaires. During the conversations, data on respondent characteristics and information related to medicinal uses of plants for the management of STI were captured. All interviews were conducted in the local language, siLozi. Research assistants acted as siLozi-English translators.

Data were collected during two stages consisting of primary and secondary samplings. The primary stage involved an exploratory study of three traditional healers that manage STI. The focus of the exploratory study was to gain critical insights into the work of the traditional healers, distil pertinent issues, and gauge whether a detailed ethnobotanical survey would be feasible. Traditional healers were asked about the main symptoms of STI, their healing practices, and sources of ethnomedicinal knowledge. The following data in relation to the plants were also recorded: siLozi names, plant habits, plant parts used, the STI conditions treated with the plants, and the modes of preparation and application of the plant remedies to the patient.

The secondary sampling stage was a follow-up and detailed descriptive study of seventeen traditional healers who verified prior ethnobotanical data obtained from healers during the exploratory inquiry. To allow for triangulation of ethnomedicinal use, only plants mentioned by at least three traditional healers in the descriptive study (for each disease condition) were eligible for documentation (Koné and Atindehou, 2008). On-the-spot identification of familiar plant species was done in the field. Voucher specimens for all plants were collected in herbarium plant presses and transported to the University of Namibia for identification, confirmation, and storage. Botanical names were verified using the International Plant Name Index (IPNI).

Data analysis

Quantitative analysis of ethnobotanical data was done by calculating the familiarity index F_i. The F_i, a relative indicator of the familiarity of a plant species, is defined as the frequency a given plant species is mentioned as a medicine divided by the total number of traditional healers interviewed in the study (Tabuti et al., 2004). The F_i was calculated as follows:

$$F_i = \frac{N_a}{N_b} \times 100$$

where N_a is the number of informants that mention a species as a medicine, and N_b is the total number of respondents.

Results and discussion

Traditional healers

Of all the twenty traditional healers included in the study, only four were female. This gender difference arises because male traditional healers in the community were more comfortable to talk about STI than female traditional healers who face cultural restrictions when it comes to talking about matters related to sex and STI. The average age of the healers was 52 years. About 90% of the traditional healers received their medicinal plant knowledge from their older family members, and the remainder from spiritual and supernatural powers such as dreams and visions. Only three traditional healers had an apprentice under their tutelage; the rest did not train other people. Healers' knowledge of STI symptoms pointed to the presence of gonorrhoea, syphilis, chancroid, genital herpes, chlamydia, HIV infection, and warts.

Ethnomedicinal flora

Data related to the plants' scientific names, siLozi names, families, voucher numbers, habits, frequency indices, parts, STI treated, modes of preparation and application are in Table 1. Overall, the study recorded 52 plant species used by traditional healers to manage common STI in Sesheke District, Western Province, Zambia. The frequency index revealed 11 commonly used plants with F_i values decreasing from 80 to 50: *Terminalia sericea*, *Strychnos cocculoides*, *Ximenia caffra*, *Cassia abbreviata*, *Cassia occidentalis*, *Combretum hereroense*, *Combretum imberbe*, *Dichrostachys cinerea*, *Boscia albitrunca*, *Momordica balsamina* and *Peltophorum africanum* (Table 1).

The 52 plant species were distributed among 25 families and 43 genera. The family Fabaceae (25%) had the highest proportion of plant species used to manage STI in Sesheke District, followed by Combretaceae (10%), Capparaceae (6%), and Loganiaceae (6%). The other families were represented by 1 and 2 plant species. The families Fabaceae and Combretaceae had the highest diversity of species used to treat STI probably because these families contain several species of plants. In Zimbabwe, Maroyi (2011) also found that most ethnomedicinal plants were in the Fabaceae family. In the neighbouring town of Katima Mulilo, Namibia, Chinsembu and Hedimbi (2010) observed that majority of the medicinal plants used to manage HIV/AIDS opportunistic infections were in the Combretaceae family.

About 50% of the plants used to manage STI were trees, 31% were shrubs, and 19% were climbers. Throughout the year, even after fire outbreaks, the vegetation in Sesheke is mostly trees and shrubs thus readily harvested by healers. Maroyi (2011) also found that trees and shrubs were usually utilised in Zimbabwe. The most plant parts used were roots (39%), followed by stem bark and leaves, both at 27%, respectively. Although roots and barks are believed to contain more potent pharmacological compounds, their indiscriminate harvesting can destroy the plants. Traditional healers and other persons that harvest roots and barks for medicinal purposes should be educated on sustainable harvesting techniques and plant conservation.

A cross-check in the literature showed that apart from having antimicrobial activity, most of the plants in this study were applied in the management of STI in other settings. For example, Ndubani and Höjer (1999) also documented the use of *S. cocculoides*, *X. caffra*, and *C. abbreviata* by *nganga* (traditional healers) in the management of STI in Chiawa, a rural community south-east of Lusaka, Zambia. *C. abbreviata*, *S. cocculoides*, *X. caffra*, and *P. africanum* are also used in the management of STI in Zimbabwe (Maroyi, 2011). Other plants used in the management of STI in Sesheke District were also utilised in South Africa (De Wet et al., 2012; Naidoo et al., 2013).

P. africanum is a multi-use medicinal plant with high amounts of phenolics, alkaloids, saponins, cardiac glycosides, and flavonoids; it is harvested in Zimbabwe to alleviate syphilis (Maroyi, 2011). A review of the pharmacology and phytochemistry of *P. africanum* revealed that the plant has several active compounds that confer antibacterial, antifungal, anti-HIV, antioxidant, and anti-helminthic activities (Mazimba, 2014). These biological activities may justify the healing of patients suffering from STI.

Strychnos species contain alkaloids with antimicrobial, cytotoxic, antiamoebic and antiplasmodial activities (Ohiri et al., 1983;

Table 1
Ethnobotanical data of medicinal plants used to manage STI in Sesheke District, Western Province, Zambia.

Family Scientific name, Local siLozi name, voucher number	Plant habit; part(s) used	STI treated; frequency index	Preparation and administration
Anacardiaceae *Lannea stuhlmannii* Engl., Musamba, s53	Tree; roots	Gonorrhoea, syphilis; 25	Crushed fresh roots are soaked in warm water, drink solution
Sclerocarya caffra Sond., Mulula, s248	Tree; stem bark, leaves	Gonorrhoea, HIV/AIDS; 30	Pound plant materials, boil in water, drink concoction
Asparagaceae *Sansevieria kirkii* Baker, Lukushe, s274	Climber; roots	Most STI; 20	Boil fresh roots with water and drink solution while tepid
Bignoniaceae *Kigelia africana* (Lam.) Benth., Muzungula, s200	Tree; fruit	Syphilis; 75	Exudate is used as a dressing for wounds; boil in water, drink decoction
Burseraceae *Commiphora angolensis* Engl., Mubwabwa, s270	Tree; stem bark	Gonorrhoea, Chlamydia symptoms in men; 30	Pound dry material, mix with water, drink
Capparaceae *Boscia albitrunca* Burch. Gilg & Benedict, Kabombwa- mutemwa, s27	Tree; roots	Syphilis, HIV/AIDS; 50	Boil in water, drink while warm
Capparis tomentosa Lam., Chiwezeze, s8	Climber; roots	Syphilis rashes, HIV/AIDS; 25	Boil roots boiled in water, mixed with tea, and drunk; drink tepid decoction; decoction of roots is used as a topical wash for rashes
Cleome gynandra L., Namanga, s84	Shrub; leaves	Chancroid; 35	Boil, disinfect wounds
Combretaceae *Combretum apiculatum* Sond., Mukalanga, s56	Shrub; leaves	General STI syndromes; 45	Boil leaves in water, drink warm solution
Combretum hereroense Schinz, Mububu, s42	Shrub; leaves	Gonorrhoea, Chlamydia symptoms in men; 60	Crush leaves, suspend in water, drink cold infusion
Combretum imberbe Wawra, Muzwili, s2	Tree; leaves	General STI; 55	Crush leaves, suspend in water, drink infusion
Combretum mossambicense Engl., Silutombolwa, s299	Climber; whole plant	Gonorrhoea, syphilis; 35	Cut into small pieces, pound, put in water, drink cold infusion
Terminalia sericea Burch. ex DC., Muhonono, s5	Tree; roots, leaves	Gonorrhoea, syphilis; 80	Macerate materials together, boil in water, drink decoction
Convolvulaceae *Ipomoea verbascoidea* Choisy, Litalala, s219	Climber; roots	Gonorrhoea; 25	Roots are boiled and the solution is drank
Cucurbitaceae *Momordica balsamina* L., Lombwalombwa, s282	Climber; whole plant	Gonorrhoea, syphilis, HIV/AIDS; 50	Boil, decoction is taken with porridge
Dioscoreaceae *Dioscorea hirtiflora* Benth., Mantembe, s254	Climber; leaves	Syphilitic sores, chancroid; 15	Grind fresh leaves and apply to sores
Ebenaceae *Diospyros lycioides* Desf., Mupichu, s111	Shrub; leaves	Gonorrhoea, syphilis; 45	Leaves are soaked in cold water for 3 days, solution is drank
Euclea divinorum Hiern, Musokola, s261	Shrub; stems, leaves	Syphilis, genital herpes; 35	Boil and wash syphilitic ulcers
Euphorbiaceae *Croton gratissimus* Burch., Mukena, s249	Tree; leaves	Syphilis; 20	Exudate from crushed leaves is applied to sores
Euphorbia benthamii Hiern, Kabomba, s245	Shrub; leaves	Gonorrhoea, Chlamydia symptoms in men; 20	Boil a handful of leaves in pot of water. Take one cup of decoction three times a day
Fabaceae *Abrus precatorius* L., Mupitipiti, s110	Climber; roots	Gonorrhoea, Chlamydia, syphilitic ulcers, genital herpes; 20	Boiled and taken orally as an infusion; topical application to wounds
Acacia mellifera (M.Vahl) Benth., Kakumbwe, s148	Shrub; stem bark, roots	Syphilis; 35	Boil in water and drink solution
Acacia nilotica (L.) Del., Mukotokoto, s123	Tree; leaves, roots, stem bark	Gonorrhoea, Chlamydia symptoms in men; 25	Pound, add warm water, and drink
Afzelia quanzensis Welw., Muwande, s204	Tree; stem bark, roots	General STI; 40	Crush in water, oral
Albizia versicolor Welw. ex Oliv., Mububa, s195	Tree; stem bark	Gonorrhoea, Chlamydia symptoms in men; 15	Dry, boil and drink solution
Baikiaea plurijuga Harms, Mukusi, s163	Tree; stem bark	Syphilis; 30	Decoctions and infusions are taken orally
Brachystegia spiciformis Benth., Mutuya, s154	Tree; stem bark	General STI; 40	Boil in water, drink solution while tepid
Burkea africana Hook., Musheshe, s149	Tree; roots, stem bark	Gonorrhoea, HIV/AIDS; 40	Dried plant parts are pounded into powder, boiled in water, sieved, and filtrated is introduced into urethra
Cassia abbreviata Oliv., Mululwe, s118	Tree; stem bark, roots	Gonorrhoea, HIV/AIDS; 60	Macerate in water, drink
Cassia occidentalis L., Changu, s126	Shrub; roots	Gonorrhoea; 60	Boiled, orally taken as a tea

Table 1 (*Continued*)

Family Scientific name, Local siLozi name, voucher number	Plant habit; part(s) used	STI treated; frequency index	Preparation and administration
Colophospermum mopane (Benth.) Leonard, Mupane, s122	Tree; stem bark	Syphilis; 15	Macerate, boil in water, drink decoction; bark extract is applied to sores
Dichrostachys cinerea (L.) Wight & Arn., Muselesele, s179	Shrub; roots, stem bark, leaves	General STI syndromes especially syphilis; 55	Crush plant materials, mix with water, drink filtrate; leaves are drunk as a tea; chew leaves and apply paste to syphilis sores; topical application of dried bark powder to sores or skin eruptions
Peltophorum africanum Sond., Munyele, s189	Tree; stem bark, roots	General STI; 50	Boil cut plant materials in water. Drink decoction
Lamiaceae	Shrub; stem bark, roots	General STI syndromes; 45	Boil in water, drink decoction in small amounts using tea spoon
Clerodendrum myricoides R.Br. & Vatke, Mutume, s108			
Clerodendrum uncinatum Schinz, Mubwanyo, s151	Shrub; roots	Gonorrhoea; 30	Crush dry roots, mix in boiled water, drink
Leguminosae	Shrub; leaves	Syphilis; 25	Fresh leaves are boiled in boiled and solution is drunk
Indigofera ormocarpoides Baker, Kungandofu, s39			
Loganiaceae	Tree; roots	Gonorrhoea; 75	Crush in water and drink solution
Strychnos cocculoides Baker, Muhuluhulu, s81			
Strychnos innocua Del., Muzimbikolo/Muteme, s55	Tree; roots	Gonorrhoea, Chlamydia symptoms in men; 50	Root decoction is taken orally
Strychnos potatorum L.f., Mulombelombe, s85	Tree; roots	Syphilis; 30	Boiled and taken orally
Malvaceae	Tree; stem bark, leaves, roots	General STI; 45	Boil in water, drink decoction
Adansonia digitata L., Mubuyu, s6			
Meliaceae	Tree; roots, fruits	Gonorrhoea, genital warts; 25	Roots are boiled in water, solution is drunk; fruit peels are burnt, mixed with Vaseline, rubbed onto genital warts
Entandrophragma caudatum (Sprague) Sprague, Mupamena, s43			
Trichilia emetic Vahl, Musikili, s91	Tree; stem bark, leaves	Gonorrhoea, syphilis; 20	Soak crushed bark and leaves in water, drink small amounts of solution; boil in water, decoction is drunk; powdered dry roots applied to wounds
Menispermaceae	Climber; roots, leaves	Syphilis, chancroid; 35	Powdered dry roots are mixed with Vaseline and applied to sores; root decoction is drunk
Cissampelos mucronata A.Rich., ltende, s61			
Moraceae	Tree; leaves	Genital warts; 15	Pound leaves, rub into warts
Ficus natalensis Hochst., Mutaba, s79			
Olacaceae	Tree; stem bark	Bacterial vaginosis, gonorrhoea; 25	Apply powder to vagina; dissolve stem powder in water and drink
Ximenia americana L., Mutente, s46			
Ximenia caffra Sond., Mulutulua, s96	Shrub; roots	General STI conditions; 75	Cut roots into very small pieces, mix with water, boil, and drink solution
Plumbaginaceae	Shrub; leaves	Generally treats all STI symptoms; 30	Macerate leaves into paste which is applied to sores and rashes; crush dried leaves, mix with water or honey solution and drink
Plumbago zeylanica L., Sikalutenta, s9			
Polygalaceae	Shrub; stem bark, roots	Syphilis, gonorrhoea; 20	Dry materials, crush, mix with water, sieve, drink filtrate
Securidaca longepedunculata Fresen., Muiinda, s73			
Rhamnaceae	Climber; roots	Gonorrhoea, syphilis, HIV/AIDS; 15	Macerate, soak in cold water, drink infusion
Helinus integrifolius Kuntze, Mulalawa, s18			
Ziziphus mucronata Willd., Mukalu, s25	Tree; stem bark	Gonorrhoea, syphilis, Chlamydia symptoms in men; 40	Boil in water for half an hour, drink solution; wash urethra; powder is applied to wounds
Solanaceae	Shrub; roots	HIV/AIDS; 24	Cut, macerate in warm water, drink solution
Solanum panduriforme E.Mey, Ntulwantulwa, s64			
Vitaceae	Climber; roots	Syphilitic rashes, Genital herpes; 25	Cold infusion used as a dressing to heal wounds
Ampelocissus obtusata Planch., Munsansa, s108			

Tona et al., 1999). *S. potatorum* has considerable antimicrobial activity which may help alleviate symptoms of STI (Mallikharjuna and Seetharam, 2009) and diarrhoea (Tona et al., 1999). Mabogo (1990) also reported the use of the following plants in the treatment of STI among the Venda people of South Africa: *Adansonia digitata*, *Acacia karroo*, *Aloe* sp., and *X. caffra* (the large sour plum).

Ximenia americana and *X. caffra* alleviate STI in many countries (Vermani and Garg, 2002; Chinsembu and Hedimbi, 2010; Kambizi

and Afolayan, 2001; Hedimbi and Chinsembu, 2012). Nair et al. (2013) found that water extracts of *X. caffra* leaves had good antibacterial activity, an important property in the management of STI. A common ethnomedicine for STI, *X. caffra* contains the novel antigonococcal agent, bisnorsesquiterpene vomifoliol, which has 63.1% activity against *Neisseria gonorrhoeae* (Nair et al., 2013). In a separate study, Naidoo et al. (2013) reported that leaf extracts of *X. caffra* possess anti-gonnococcal activity. *Albizia versicolor* contains saponins, lupeol, acacic acid, and lactone; it had activity against STI, fungal infections, and *Trichomonas vaginalis* (De Wet et al., 2012).

Ampelocissus obtusata was a remedy for syphilis in Zimbabwe (Maroyi, 2011). *Baikiaea plurijuga was* a known remedy for syphilis in many parts of Zambia (Theilade et al., 2001). *B. albitrunca* was used to treat symptoms of syphilis, gonorrhoea, and HIV/AIDS in Namibia and South Africa (Chinsembu et al., 2014). *Capparis tomentosa* had antibacterial, anti-*Trichomonas* and antifungal properties (Buwa and Van Staden, 2006). *Combretum apiculatum was* an ethno-remedy for STI in Namibia, and it generally possesses triterpenes, glycosides, alkaloids, quercetrin, kaempferol, and ellagic acid derivatives (Chinsembu et al., 2011).

Traditional healers use *Abrus precatorius* to treat gonorrhoea in Kenya (Kareru et al., 2008) and India (Parekh and Chanda, 2007). *Trichilia emetic* is a remedy for STI in South Africa (De Wet et al., 2012). *Securidaca longepedunculata* has antibacterial activity and is a common treatment for *Trichomonas vaginalis* and other STI in many countries including Nigeria and South Africa (Fernandes et al., 2008; Maroyi, 2011).

The frequent use *T. sericea* in this study mirrors reports by Semenya et al. (2013) that plants in the genus *Terminalia* have many antimicrobial properties including anti-HIV functions. Fyhrquist et al. (2014) described that hot decoctions of *T. sericea* are used in the management of gonorrhoea. *Terminalia* species possess ellagitannins, powerful chemical ingredients with antimicrobial efficacy against multi-antibiotic resistant *N. gonorrhoeae*. Naidoo (2014) cautioned that the cellular safety and efficacy of some the plants used in the management of STI was not guaranteed. More studies should be done to ascertain their biological activities and toxicities. Experiments related to posology are also urgently needed.

Conclusion

The study documented the indigenous knowledge of medicinal plants that alleviate symptoms of STI in Sesheke District, Western Province, Zambia. Overall, 52 plant species found in 25 families and 43 genera were utilised in the management of gonorrhoea, syphilis, chancroid, chlamydia, genital herpes, and ano-genital warts. Further studies are needed to determine the minimum inhibitory concentrations, biological activities, cellular safety, and to isolate as well as characterise the plants' active compounds.

Conflicts of interest

The author declares no conflicts of interest.

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