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Review article

South African medicinal plants used for health conditions affecting males: an ethnobotanical review

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ABSTRACT

Introduction: Health issues affecting males remain a public health challenge due to the limited treatments and male health-seeking behaviour. In South Africa, local communities have relied on plant-based therapies to address health issues including those affecting males. This review explored the ethnobotanical and indigenous knowledge of plants used for managing male urogenital and sexual-reproductive conditions in South Africa, to establish the existing status and identify gaps for further research.

Methods: Following a systematic search, 51 eligible studies were extracted from electronic databases.

Results: A total of 337 plants belonging to 83 families were collated across seven provinces in South Africa. Fabaceae (37) and Asteraceae (37) were the most represented plant families. *Hypoxis hemerocallidea* Fisch., C.A.Mey. & Avé-Lall. (18 citations), and *Entada elephantina* (Burch.) S.A.O'Donnell & G.P.Lewis (synonym: *Elephantorrhiza elephantina* (Burch.) Skeels) (12 citations) were the commonly used plants. Roots (33.4%) and leaves (17%) were the most commonly used plant parts. Decoction (44%) and oral-based (53%) were the dominant preparation and administration method, respectively. The two major health conditions had 18 subcategories as derived from the eligible studies. Particularly, aphrodisiac and erectile dysfunction were the most encountered conditions and were managed with 133 plants. Provinces such as the Northern Cape and North West had limited studies on plants used for male healthcare needs.

Conclusion: We highlighted the importance of plants in meeting the primary healthcare needs of males. This suggests the need to promote additional research into the cultural, therapeutic, and dynamic trends in the use of plants for meeting the healthcare needs of males, especially in rural areas.

Introduction

Disorders of urogenital and sexual-reproductive functions are common, most prevalent and often neglected conditions among men of all ages, ethnicities, and cultural backgrounds, which may develop at any phase of life (Dunn et al., 2004; Ariba et al., 2007; Idung et al., 2012; Mitchell et al., 2013). In addition, the increased engagement of civil society in improving male urogenital and sexual-reproductive health conditions and the important role of males in the gender equality agenda calls for explicit commitment and action (Russell-Bennett et al., 2024). According to StatsSA (2021), the average life expectancy at birth for males was 59.3 years in 2021. Health conditions such as erectile/sexual dysfunction, bladder and kidney problems, prostate problems and low sperm count account for 40% of total infertility or failure to achieve pregnancy in South Africa (Jacobson, 2010). In addition, syphilis, gonorrhoea and chlamydia infections account for 6–10 million cases in men aged 15–49 years (Kularatne et al., 2018). Globally, males tend to have a shorter life expectancy than women (Sen, 1993; Okojie, 1994; Baker et al., 2014; WHO, 2011; 2019). Male sexual dysfunction (SD), urinary tract infections, urinary incontinence, and sexually transmitted infections (STI) often require lifelong treatment with several relapses and side effects occurring after treatments with conventional drugs (Taibi et al., 2021).

Urogenital and sexual reproduction comprises a series of internal and external organs that function collaboratively to produce male germ cells that fuse with female germ cells to produce offspring and form part of male excretion (Spasovska Trajanovska et al., 2013; Chen et al., 2019). Urogenital and sexual reproduction health encompasses the proper functioning of the reproductive system and sexual function at all stages of life. The maintenance of normal sexual and reproductive function depends on the coordination of the human multi-system, involving the coordination of the nervous system, the cardiovascular

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system, and the endocrine system (Spasovska Trajanovska et al., 2013; Gerra et al., 2016). When the systems or psychosocial aspects above change, it affects the quality of normal sex life.

In South Africa, conditions related to urogenital and sexual-reproduction health coupled with access to healthcare facilities disproportionally affect males. The shortage of medical personnel and medications in South Africa restricts healthcare access to those living in remote rural areas (De Villiers, 2021). Moreover, health services are of often of poor quality and late diagnosis makes the treatment difficult for underprivileged communities (Falchetta et al., 2020). The United Nations Sustainable Development Goals of 2030 (specifically goal #3) provides a solid framework for promoting action aimed at reducing premature mortality among people and improving their health and well-being which should look at various and diverse mechanisms such as the use of traditional medicines and practices (Russell-Bennett et al., 2024). Medicinal plants and associated products have remained an integral part of human society and shaped healthcare development throughout history (Halberstein, 2005; Fokunang et al., 2011; Kalle and Sõukand, 2012).

In many developing countries, rural communities rely extensively on the use of medicinal plants to manage and treat male urogenital and sexual-reproductive health conditions (Makunga et al., 2008; Hossan et al., 2010; Abdillahi and Van Staden, 2012; Kaingu et al., 2013; Sofowora et al., 2013; Moteetee and Kose, 2016; Tsobou et al., 2016; Yuan et al., 2016; Ajao et al., 2019; Fiaveh, 2020; Feyisa et al., 2022; Mongalo and Raletsena, 2022). Recent years have seen an increased interest in developing new drug leads and/or compounds from plant-based materials to address the global health concerns such as erectile/sexual dysfunction, low sperm count, and urinary tract infections (Cragg and Newman, 2013; Sen and Samanta, 2015; Masuku et al., 2020; Newman and Cragg, 2020; Ogunlakin et al., 2023). The current review entails a systematic collation and analysis of studies focusing on the use of medicinal plants and associated indigenous knowledge in the management of male urogenital and sexual-reproductive health conditions in South Africa. It is anticipated that the review will establish the prevailing status, identify existing knowledge gaps and serve as reference material for future research efforts in the field of medicinal plants and male health.

Materials and methods

Search procedure

Literature was sourced from scientific databases such as Google Scholar, PubMed, ScienceDirect, Scopus, Web of Science, and Medline. Additionally, dissertations, theses, and ethnobotanical books were retrieved from the North-West University online repositories. This served as source materials required to execute a systematic literature search to identify all articles and published books related to the use of plants for the management of male urogenital and sexual-reproductive health conditions in South Africa. The timeline was from January 1996 to December 2023. Diverse keywords and phrases were used to access eligible articles. These include the male urinary tract, male reproduction, male urological systems, male sexually transmitted infection, male health care, traditional male medicine, health anthropology, male ethnomedicinal studies, herbal remedies for male diseases, Indigenous knowledge of plants used for males, and ethnobotanical papers containing information on plants which was unambiguously linked to a male health use. The Boolean operators of 'AND' and 'OR' were included to extend the search. Bibliographies of selected articles were also examined to identify further references that might have been omitted from the initial searches. All published studies related to the use of plants for managing male health urogenital and sexual-reproductive conditions in South Africa were included in this systematic review (Table 1; Fig. 1).

The search strategy adhered to the PRISMA statement (Liberati et al., 2009; Moher et al., 2009). The four-step procedure was implemented through identification, screening, eligibility, and inclusion (Gough et al., 2017). In the identification phase, 3 552 articles were found. In the screening phase, all these articles' titles and abstracts were read. Articles (in total of 1 500), which did not have these keywords in abstracts, were excluded from the next screening (Fig. 1). During the review for the abstracts, introductions, and conclusions, we made a synthesis and looked deeper into publications which were ethnobotanical studies conducted in South Africa and contained data on the use of plants to treat male urogenital and sexual-reproduction health conditions; published in scientific peer-reviewed journals in English; based on empirical evidence, contain at least one citation of a plant species use; for each study. The collected information included Latin names of the plants, plant parts, diseases or condition treatment, preparation and mode of administration; and STIs that were explicitly indicated to affect males. Plants names were verified by using the World Flora Online (https://www.worldfloraonline.org/).

A total of 870 articles were excluded as not meeting the inclusion criteria (Fig. 1). The exclusion criteria were based on articles, research solely concerned with modern medicines and those lacking explicit indication related to male subject matter. Articles published in languages other than English were excluded as there could be translation errors. Furthermore, letters, case reports, manuals, and guidelines, and those reporting female and animal studies were excluded from this review (Fig. 1). Fifty-one (51) articles were selected for full-text eligibility. When the primary inspection of an abstract of an article did not give adequate information to make an informed judgement, the full article was searched in the third step and reviewed before deciding on their inclusion in the review, and those that met the inclusion criteria were retrieved for critical appraisal (Fig. 1).

Results and discussion

Overview of studies on plants used in managing male urogenital and sexual-reproduction health conditions

Based on eligibility criteria, 51 studies on plants used to manage male urogenital and sexual-reproduction health conditions, conducted throughout South Africa were identified (Fig. 1). Male health conditions pose a significant public health problem globally (Jewkes et al., 2009; Baker et al., 2014; Hensen et al., 2014; Peters and Norton, 2018; Colvin, 2019). Maintaining health conditions in males is essential in maintaining a healthy happy family and the prevention of violent behaviour in the family unit (Yount et al., 2020; Torres-Soto et al., 2022). However, the current conventional therapies have limited control of the pathological aspects of conditions affecting male as well as their high cost and limited availability for many rural populations particularly in developing countries led to the realisation of alternative therapies (Yadav and Agarwala, 2011; Masuku et al., 2020). The importance and the diversity of ethnobotanical studies have generated a great deal of information about the uses of plants and have provided valuable ethnobotanical information, but these investigations remained fragmented (Li et al., 2019; Fakchich and Elachouri, 2021). All the published works considered in this review entailed ethnobotanical field surveys on medicinal plants used for male urogenital and sexual reproduction conditions (Table 1).

As shown in Table 1, 45% of the studies were conducted in Limpopo Province, followed by KwaZulu-Natal Province (15.6%), and Eastern Cape Province (13.7%). The provinces with the least studies were Western Cape (10%), Mpumalanga (7.9%), North-West (3.9%) and Northern Cape (3.9%). Based on the area or region, most of the studies conducted in Limpopo were done in Capricorn, Sekhukhune, and Waterberg district municipalities, and the most represented ethnic group were Bapedi. These results corroborate the study conducted by Mongalo

Table 1
An overview of the 51 eligible literatures documenting the use of medicinal plants for managing male urogenital and sexual-reproductive health conditions in South Africa.

Source	Province[1]	Area/region	Ethnic group	Number of plants	Number of plant families	Number of Health conditions	Voucher specimen	Characteristic of participants[2]	Data collection methods
Asong et al. (2019)	NWP	Ngaka Modiri Molelma	Batswana	23	15	7	Yes	THPs	Semi-structured questionnaires, visual aid (flip-file), FGD
Asowata-Ayodele et al. (2016)	ECP	Nkonkobe Municipality	Xhosa	6	6	3	Yes	THPs, farmers	Rapid Appraisal Approach and field walk guide
Bhat (2014)	ECP	Transkei region	Xhosa	2	2	2	Yes	Herbalist, THPs, Tribal priest, IKHs	Interviews and field walk guide
Buwa-Komoren et al. (2019)	ECP	Seymour	Xhosa	2	2	2	No	IKHs, herbalist, THPs	Structured questionnaire and field walk guide
Chauke et al. (2015)	LP	Mopani district	Bapedi	17	14	5	Yes	THPs	Structured interviews and Field walks guide
Cocks (1997)	ECP	King Williams Town and East London	Xhosa	7	7	2	No	THPs	Structured interviews and field walk guide
Constant and Tshisikhawe (2018)	LP	Vhembe District	vhaVenda	2	2	3	Yes	THPs	Semi-structured interviews and field walk guide
Coopoosamy and Naidoo (2012)	KZNP	Durban	Zulu	7	6	7	No	THPs, herbalists	Structured questionnaires and field walk guide
Corrigan et al. (2011)	KZNP	KwaNibela Peninsula	Zulu	3	3	3	Yes	THPs, IKHs	Rapid Appraisal Approach and field walk guide
De Beer and Van Wyk (2011)	NCP	Agter–Hantam	Afrikaans	9	6	2	Yes	Community members	Rapid Appraisal Approach and field walk guide
De Wet et al. (2012)	KZNP	Northern Maputaland	Zulu	31	23	5	Yes	Community members	Structured questionnaire and field walk guide
Erasmus et al. (2012)	LP	Capricorn, Sekhukhune and Waterberg	Bapedi	18	17	1	Yes	THPs	Semi-structured questionnaire and field walk guide
Gail et al. (2015)	ECP	Mpoza	Xhosa/Zulu	9	9	2	Yes	THPs	Semi-structured interviews, FGD and field walks guide
Gebashe et al. (2019)	KZNP	Durban, Hammarsdale and Pietermaritzburg	Zulu	1	1	1	Yes	THPs	Questionnaires and face-to-face interviews and field walk guide
Hutchings et al. (1996)	KZNP	All regions	Zulu	44	29	8	Yes	Community members	Ethnobotanical studies and field walk guide
Maema et al. ((2016a)	LP	Mogalakwena Local Municipality	Bapedi	7	6	4	Yes	THPs	Ethnobotanical survey and field walk guide
Maema et al. (2019)	LP	Waterberg District	Bapedi	14	11	5	Yes	THPs	Dual-purpose reconnaissance survey and Field walks guide
Maema et al. (2016b)	LP	Mogalakwena Municipality	Bapedi	2	2	2	Yes	THPs	Ethnobotanical survey and field walk guide
Magodielo (2018)	NWP	Molatedi village	Batswana	2	2	1	No	THPs, IKHs	Indigenous research approach, in-depth interviews, FCD and Field walks guide
Mahwasane et al. (2013)	LP	Lwamondo area	vhaVenda	8	4	7	Yes	THPs	Interviews and Field walks guide
Maroyi and Mosina (2014)	LP	Capricorn District	Bapedi	5	5	3	Yes	Unspecified	Structure and semi-structured questionnaires, and Field walks guide
Mataha (2021)	LP	Modladji	Balubedu	23	13	10	Yes	Community members	Matrix Method, visual aid (flip-file) and Field walks guide

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Table 1 (*continued*)

Source	Province[1]	Area/region	Ethnic group	Number of plants	Number of plant families	Number of Health conditions	Voucher specimen	Characteristic of participants[2]	Data collection methods
Mathibela et al. (2019)	LP	Blouberg area	Bapedi	17	12	3	Yes	THPs	Semi-structured questionnaire and Field walks guide
Matsiliza and Barker (2001)	ECP	Grahamstown	Xhosa	1	1	1	Yes	Unspecified	Interviews and Field walks guide
Mhlongo and Van Wyk (2019)	KZNP	Amandawe area	Zulu	48	26	8	Yes	Unspecified	Interviews and Field walks guide
Mongalo and Makhafola (2018)	LP	Blouberg area	Bapedi	15	12	4	Yes	THPs, herbalists	Interviews and Field walks guide
Mphephu (2017)	LP	Thulamela Local Municipality	Bapedi	2	2	1	Yes	Community members	Case study, FGD and Field walks guide
Ndawonde et al. (2007)	KZNP	Uthungulu, Umkhanyakube, & Zulland	Zulu	5	4	5	Yes	Community members	Interviews and Field walks guide
Nortje and Van Wyk (2015)	NCP	Kamiesberg area	Rastafarian	16	15	3	Yes	THPs	Interviews and Field walks guide
Nzue (2009)	WCP	Cape Peninsula	Bapedi	1	1	1	Yes	THPs, IKHs, herbalists	In-depth interviews and Field walks guide
Papo et al. (2022)	LP	Ga-Mashashane	Khoisan	10	7	4	Yes	Community members	semi-structured and structured Interview and Field walks guide
Philander (2011)	WCP	WCP	Rastafarian	16	13	7	Yes	THPs	Interviews and Field walks guide
Rankoana (2016)	LP	Sekhukhune district municipality	Bapedi	9	9	2	Yes	Community members	Structured interviews and Field walks guide
Rasethe et al. (2019)	LP	Capricorn, Mopani, Sekhukhune, Waterberg and Vhembe	Bapedi	9	8	6	Yes	Community members	Structured-interviews and Field walks guide
Seile et al. (2022)	MP	Godide and Hlalakahle	Bapedi	22	17	6	Yes	Herbalists	Interviews and Field walks guide
Semenya et al. (2013a)	LP	Capricorn, Sekhukhune and Waterberg	Bapedi	21	15	1	Yes	THPs	Semi-structured interviews, and Field walks guide
Semenya and Potgieter (2014a)	LP	Capricorn, Sekhukhune and Waterberg	Bapedi	25	20	6	Yes	THPs	Semi-structured questionnaire and Field walks guide
Semenya and Potgieter (2014b)	LP	Capricorn, Sekhukhune and Waterberg	Bapedi	55	30	6	Yes	THPs	Semi-structured interviews, and Field walks guide
Semenya et al. (2013a)	LP	Capricorn, Sekhukhune and Waterberg	Bapedi	47	32	3	Yes	THPs	Semi-structured interviews, and Field walks guide
Semenya et al. (2012)	LP	Capricorn, Waterberg and Sekhukhune districts	Bapedi	13	12	3	Yes	THPs	Semi-structured interviews, and Field walks guide
Semenya et al. (2013c)	LP	Capricorn, Waterberg and Sekhukhune districts	Bapedi	21	17	1	Yes	THPs	Semi-structured interviews, and Field walks guide
Semenya et al. (2013d)	LP	Capricorn, Waterberg and Sekhukhune districts	Bapedi	10	9	4	Yes	THPs	Semi-structured interviews, observation, and Field walks guide
Semenya et al. (2013b)	LP	Capricorn, Waterberg and Sekhukhune districts	Bapedi	26	14	1	Yes	THPs	Semi-structured interviews, observation, and Field walks guide
Semenya et al. (2013e)	LP	Capricorn, Waterberg and Sekhukhune districts	Bapedi	37	24	4	Yes	THPs	Semi-structured questionnaire and Field walks guide
Semenya et al. (2013f)	LP	Matebele Village	Bapedi	8	7	6	Yes	Community members	

(*continued on next page*)

Table 1 (*continued*)

Source	Province[1]	Area/region	Ethnic group	Number of plants	Number of plant families	Number of Health conditions	Voucher specimen	Characteristic of participants[2]	Data collection methods
									Semi-structured questionnaire and Field walks guide
Shabangu (2021)	KZNP& MP	Mkhondo and Edumbe	Zulu	16	15	6	Yes	Community members	Interviews and Field walks guide
Shai et al. (2020)	MP	Bushbuckridge Local Municipality	Mapulana	6	5	2	Yes	Community members	Interviews and Field walks guide
Thinyane and Maroyi (2019)	ECP	Alfred Nzo District Municipality	Zulu	3	3	4	Yes	Community members	Open-ended interviews and Field walks guide
Thring and Weitz (2006)	WCP	Bredasdorp/Elim	Afrikaans	8	6	2	Yes	Community members	Interviews and Field walks guide
Tshikalange et al. (2016)	MP	Bushbuckridge municipality	Mapulana	17	10	9	Yes	THPs	Interviews and Field walks guide
Van Wyk et al. (2008)	WCP	Graaff-Reinet and Murraysburg	Khoisan and Cape Dutch	10	9	4	Yes	Community members	Interviews and Field walks guide

[1] Province: NWP = North-West Province, KZNP = KwaZulu-Natal Province, WCP = Western Cape Province, GP = Gauteng Province, LP = Limpopo Province, MP = Mpumalanga Province, ECP = Eastern Cape Province, NCP = Northern Cape Province, FSP = Free State Province.

[2] Characteristic of participants: THPs = Traditional Health Practitioner, IKH = Indigenous Knowledge Holders, FCD = Focus Group Discussion.

and Makhafola (2018), which referred to Limpopo Province as a hotspot for medicinal plants which may be associated with the rich biodiversity. However, studies may be lacking in certain areas due to limited funding, lack of awareness, language and cultural barriers, stigma associated with studied conditions and other factors that might serve as setbacks in documenting such medicinal plants (Mongalo and Raletsena, 2022). Furthermore, most of the surveys might have yielded fewer plant species due to the reluctance of participants to offer information and or the lack of researchers capable of extracting information from various communities (Chinsembu, 2016). Given the importance of depositing voucher specimens of recorded plants in the herbarium (Nesbitt, 2014; Weckerle et al., 2018; Yadav, 2020), it is commendable that 92% of the eligible articles adhered to this requirement (Table 1).

The diverse range of participants involved in the eligible studies were Traditional Health Practitioners (THPs, 50%), community members (25%), herbalists and Indigenous Knowledge Holders (IKHs, 8%) (Table 1). The high proposition of THPs may stem from their status as primary health caregivers among African communities, serving a vital role in the delivery of healthcare (Domfeh, 2007; Thipanyane et al., 2022). THPs, alongside community members, herbalists, and IKHs, offer distinct approaches aimed at reinstating Indigenous health models (Zuma et al., 2016). Given their widespread across Africa, these services are pivotal in healthcare provision, particularly in less developed regions (Matowa et al., 2020). In South Africa specifically, THPs assume significant roles, encompassing practices such as divination, diagnostic, consultations and herbal remedies distribution, thus contributing significantly to the healthcare landscape (Campbell-Hall et al., 2010; Zuma et al., 2016). Data was collected through a set capture questionnaire and open interviews. Approximately 79% of the studies collected their data through structured, semi-structured, in-depth, or structured interviews which were supplemented with field walks. Other studies applied the Rapid Appraisal Approach and Focus Group Discussion (5%), the Matrix Method, with a visual aid, and Case study (8%) (Table 1). According to Vogl et al. (2004), the use of multidisciplinary methods of data collection in ethnobotanical studies provides a means for both getting to know participants and generating important insights that can be compared with results from our structured techniques. These methods offer a good opportunity to explore and experiment with various techniques, enabling the collection of both qualitative and quantitative data on contemporary theoretical issues surrounding the development, nature, and transmission of ethnobotanical knowledge. The questionnaires were designed to focus on the local names of plants, their various medicinal applications, the parts of the plant used and the methods of preparation and administering treatments to patients.

Based on the analysed literature, the studies applied a combination of qualitative analysis methods alongside limited quantitative indices such as Informants Consensus Factor (ICF), Frequency of Citation (FC), Fidelity Level (FL), and Relative Frequency Citation (RFC). According to Zougagh et al. (2019), ethnobotanical indices can develop linkages between plant species and their assigned applications, which may be influenced by plant availability and cultivation ease, as indicated by the high utilisation rates among surveyed participants. Even though these ethnobotanical indices are used to quantify data and imply efficacy or drug discovery potential, their validity is questioned due to a lack of development by statisticians or pharmacologists, casting doubt on their ability to appropriately represent cultural plant relevance (Leonti, 2022). This raises broader questions regarding whether numerical values can properly convey the cultural significance of plants, going beyond mathematical considerations and into core epistemological questions.

Inventory of plants used to manage male health conditions

Based on the eligible studies, an inventory of 337 plant species used for managing male urogenital and sexual-reproductive health

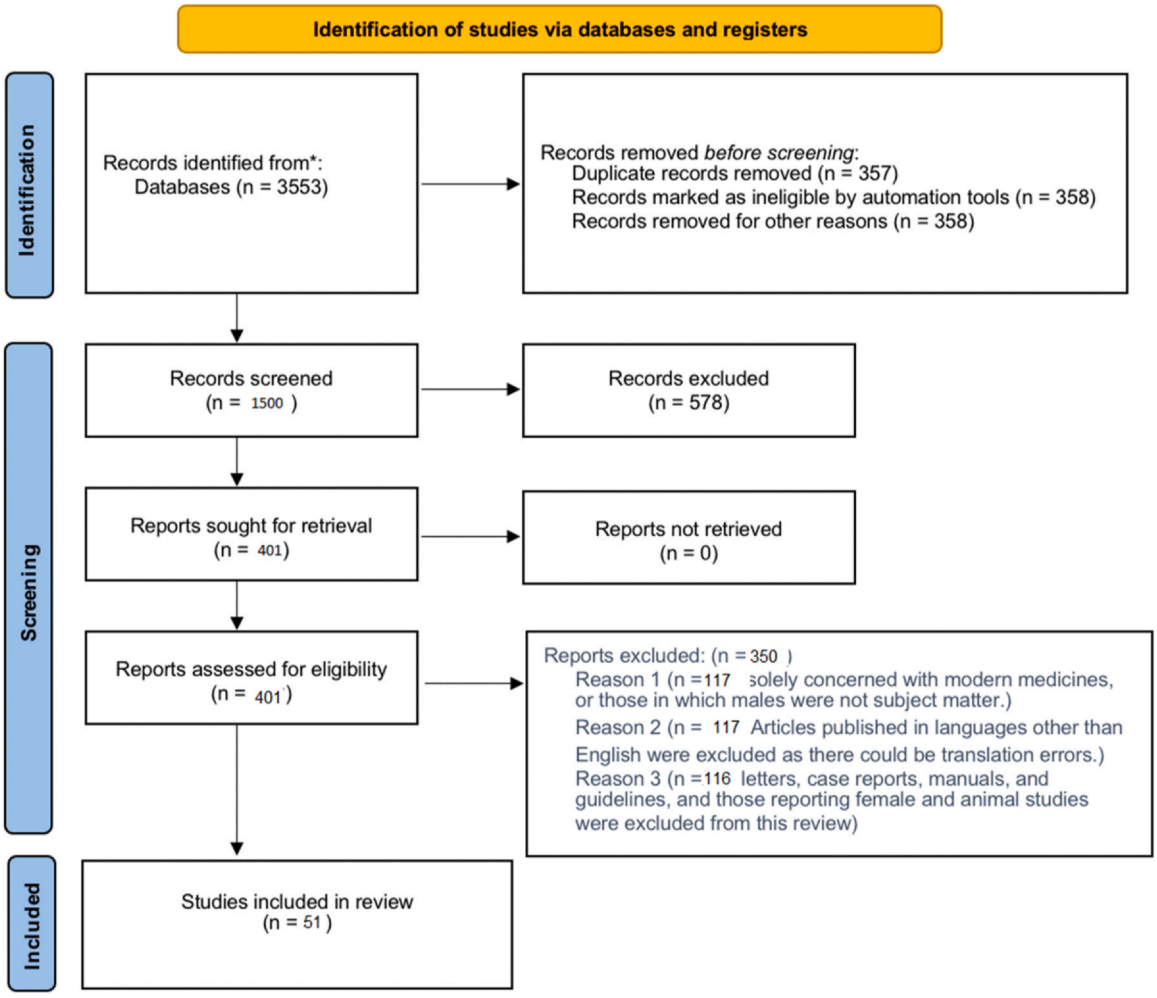

Fig. 1. Systematic approach applied for the selection of articles included in this review.

conditions was recorded (Table 2). Ethnobotanical knowledge and practice within any culture vary by geographical origin, residence, ethnicity, religion, age, and gender (Pfeiffer and Butz, 2005). Analysis of the data revealed that *Hypoxis hemerocallidea* Fisch., C.A. Mey. & Avé-Lall. (18 citations, treating 11 conditions), *Entada elephantina* (Burch.) S.A.O'Donnell & G.P.Lewis (synonym: *Elephantorrhiza elephantina* (Burch.) Skeels) (12 citations, treating 11 conditions), *Carica papaya* L. (11 citations, treating four conditions), *Catharanthus roseus* (L) G. Don (10 citations, treating eight conditions) and *Peltophorum africanum* Sond. (10 citations, treating five conditions) were the most commonly used plants for the treatment of male urogenital and sexual-reproductive health conditions (Table 2). Studies conducted in other countries such as Botswana (Mukanganyama et al., 2011), Lesotho (Kose et al., 2015; Moteetee and Kose, 2016; Seleteng-Kose et al., 2019), Namibia (Chinsembu et al., 2015), and Zambia (Chinsembu, 2016) have found similar results that the above-mentioned plant species were used to manage men's urogenital and sexual-reproductive health conditions. The causes for the similarity may be an agreement on the possession of biologically active compounds or the effectiveness of the medicinal plants for the reported conditions. *H. hemerocallidea*, commonly known as African potato, *Titikwane/Sesogadi, Inkomfe, Monna wa maledu, iLabatheka* and starflower, is listed in southern Africa as one of the most popular indigenous medicinal plants (Van Wyk et al., 2008). Existing studies have demonstrated that *H. hemerocallidea* is traditionally used for the treatment of a wide range of conditions including aphrodisiac (Semenya et al., 2013a; Mongalo and Makhafola, 2018), genital warts ((De Wet et al., 2012; Asong et al., 2019), Gonorrhoea (Erasmus et al., 2012), Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (HIV/AIDS) (Gail et al., 2015; Rasethe et al., 2019), bladder and prostate problems (Ndawonde et al., 2007; Nzue, 2009; Philander, 2011; Mhlongo and Van Wyk, 2019), sterility (Rasethe et al., 2019), testicular tumours/cancer (Ndawonde et al., 2007; Thinyane and Maroyi, 2019; Shabangu, 2021), erectile dysfunction (Semenya et al., 2013e), STI (Ndawonde et al., 2007; De Wet et al., 2012), urinary tract infections (Thinyane and Maroyi, 2019) and syphilis (Asong et al., 2019). *H. hemerocallidea* is mentioned as one of the species used for the treatment of urinary tract infections, infertility, treatment of benign prostate hypertrophy, HIV/AIDS, immune boosting, and testicular cancer in other studies (Bandeira et al., 2001; Otunola and Afolayan, 2019; Pereus et al., 2019; Aparicio et al., 2021).

In terms of popularity (based on occurrence and uses in multiple provinces) about 9% (30) of the recorded plants (*H. hemerocallidea*, *E. elephantina*, *C. papaya*, *C. roseus*, *P. africanum*, *Eucomis pallidiflora* Baker, *Securidaca longepedunculata* Fresen., *Ziziphus mucronata* Willd., *Dodonaea viscosa* Jacq., *Opuntia stricta* (Haw.) Haw., *Sclerocarya birrea* Hochst., *Senna italica* Mill., *Zanthoxylum humile* (E.A.Bruce) P.G.Waterman, *Albizia adianthifolia* (Schumach.) W.Wight, *Annona senegalensis* Pers., *Drimia sanguinea* (Schinz) Jessop, *Eucomis autumnalis* (Mill.) Chitt., *Jatropha zeyheri* Sond, *Kigelia africana* (Lam.) Benth., *Merwilla plumbea* (Lindl.) Speta, *Ximenia caffra* Sond., *Boophone disticha* Herb., *Ricinus communis* L., *Solanum aculeastrum* Dunal, *Bulbine frutescens* Willd., *Bulbine latifolia* Spreng., *Prunus africana* (Hook.f.) Kalkman, and *Hypoxis obtusa* Burch.) were identified as the most

Table 2
Medicinal plants used in managing male urogenital and sexual-reproductive health conditions in South Africa. (Botanical names were verified using the World Flora Online http://www.worldfloraonline.org/).

Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Abrus precatorius L.	Fabaceae	Matihloya baloyi (V)	Whole plant	Decoction	Unspecified	Kidney problems	(Tshikalange et al., 2016)
Acokanthera oppositifolia (Lam.) Codd	Apocynaceae	Inhlungunyembe (Z)	Unspecified	Ground	Unspecified	Urinary tract	(Hutchings et al., 1996)
Acorus calamus L.	Acoraceae	Ikalamuzi (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Acrotome inflata Benth.	Lamiaceae	Zekhoukwana (Ba)	Roots/fruit	Decoction	Oral	Gonorrhoea	(Mataha, 2021)
Adansonia digitata L.	Malvaceae	Kheboho (Ba)	Bark	Decoction	Oral, topical	Penis enlargement	(Mataha, 2021)
		Unspecified		Unspecified	Unspecified	Sterility	(Rasethe et al., 2019)
Adenia gummifera Harms	Meliaceae	Impindamshaya (Z)	Roots	Decoction	Oral	HIV/AIDS, gonorrhoea	((De Wet et al., 2012)
Afroaster hispidus (Thunb.) J.C.Manning & Goldblatt	Asteraceae	Udlutshana (Z)	Unspecified	Unspecified	Unspecified	Erectile dysfunction, kidney, bladder problem	(Mhlongo and Van Wyk, 2019)
Agapanthus praecox Willd.	Amaryllidaceae	Uhani (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Agathisanthemum bojeri Klotzsch	Rubiaceae	Mavunge (V)	Roots	Decoction	Unspecified	Swollen testicles	(Tshikalange et al., 2016)
Agathosma apiculata E.Mey. ex Bartl. & H.L.Wendl.	Rutaceae	Umbhucu (Z)	Leaves	Unspecified	Unspecified	HIV/AIDS, genitals sores	(Gail et al., 2015)
Agathosma betulina (P.J.Bergius) Pillans	Rutaceae	Buchu (Z)	Leaves	Unspecified Decoction	Unspecified Oral	Kidney, bladder problems	(Philander, 2011) (Thring and Weitz, 2006)
		Boegoe (AFR)	Unspecified	Unspecified	Unspecified	Kidney failure	(Van Wyk et al., 2008)
Agathosma ovata (Thunb.) Pillans	Rutaceae	umahesaka-omhlophe (Z)	Bark	Unspecified	Unspecified	Kidney, urinary tract	(Hutchings et al., 1996)
Agave americana L.	Asparagaceae	Unspecified	Leaves	Infusion	Oral	Gonorrhoea, chlamydia, syphilis	(Maema et al., 2019)
Agave angustifolia Haw.	Asparagaceae	Unspecified	Roots	Infusion	Oral	Gonorrhoea	(Maema et al., 2016b)
Agave sisalana Perrine	Asparagaceae	Unspecified	Roots	Decoction	Oral	Gonorrhoea, chlamydia, syphilis, genital warts	(Maema et al., 2019)
Ageratum conyzoides L.	Asteraceae	Unspecified	Leaves	Infusion	Oral	HIV/AIDS	(Mahwasane et al., 2013)
Albizia adianthifolia (Schumach.) W.Wight	Fabaceae	Aalwyn, bitteraalwyn (AFR)	Leaves	Infusion	Oral	Kidney, bladder problem	(De Beer and Van Wyk, 2011)
		Igowane (Z)	Leaves	Decoction	Enema	Syphilis	(De Wet et al., 2012)
		Intelezi (Z)		Unspecified	Unspecified	HIV/AIDS	(Gail et al., 2015)
		Molomanama (Ba)	Unspecified				(Mataha, 2021)
		Isibhaha (Z)				Urinary infections	(Mhlongo and Van Wyk, 2019)
Albizia brevifolia Schinz	Fabaceae	Mojakaranta (Ba)	Bark	Decoction	Oral	Gonorrhoea	(Mataha, 2021)
Alectra sessiliflora (Vahl) Kuntze	Orobanchaceae	Ndluwa (V)	Whole plant	Decoction	Unspecified	Kidney problems	(Tshikalange et al., 2016)
Aloe arborescens Mill.	Asphodelaceae	Lepetaletšo (Ba)	Leaves/roots	Decoction	Oral	HIV/AIDS, gonorrhoea	(Mataha, 2021)
		Kgopha-ya-fase (SEP)	Roots/leaves	Decoction	Oral	HIV/AIDS	(Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013b)
Aloe chabaudii Schönland	Asphodelaceae	Mokhoda (Ba)	Roots/leaves	Decoction	Oral	Gonorrhoea	(Mataha, 2021)
Aloe falcata Baker	Asphodelaceae	Kgopha (SEP)	Roots	Decoction	Oral	HIV/AIDS	(Semenya et al., 2013a); (Semenya et al., 2013d)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Aloe maculata All.	Asphodelaceae	Icena (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Aloe marlothii A.Berger	Asphodelaceae	Sekgophasagoema (SEP)	Roots	Decoction	Oral	Gonorrhoea HIV/AIDS	(Erasmus et al., 2012) (Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013)
Alternanthera pungens Kunth	Amaranthaceae	Motsweetswe (SEP)	Leaves Tuber	Maceration, decoction Decoction	Oral	Gonorrhoea	(Erasmus et al., 2012) (Semenya and Potgieter, 2014b) (Semenya et al., 2012) (Semenya et al., 2013c)
Ammocharis coranica Herb.	Amaryllidaceae	Motsweetswe (SEP)	Roots	Decoction	Oral	Erectile dysfunction Aphrodisiac	(Semenya and Potgieter, 2014a) (Semenya and Potgieter, 2014b) (Semenya et al., 2013)
Anethum graveolens L.	Apiaceae	Dille (X)	Leaves/seeds	Decoction	Unspecified	Erectile dysfunction	(Asowata-Ayodele et al., 2016)
Annona senegalensis Pers.	Annonaceae	uNwele (Z) Muembe (V) Lefalatša-maru (SEP) Unspecified	Leaves Roots/bark/leaves Roots	Unspecified Decoction Unspecified	Unspecified Oral Unspecified	HIV/AIDS Sterility, aphrodisiac Erectile dysfunction Chlamydia	(Gail et al., 2015) (Mahwasane et al., 2013) (Rankoana, 2016) (Rasethe et al., 2019)
Annona senegalensis Pers.	Annonaceae	Matllepo (MAP)	Roots	Unspecified	Unspecified	STI	(Shai et al., 2020)
Anredera cordifolia (Ten.) Steenis	Basellaceae	Unspecified	Tuber	Decoction	Oral	Gonorrhoea, chlamydia, syphilis, HIV/AIDS, genital warts	(Maema et al., 2019)
Apodytes dimidiata E.Mey. ex Arn.	Metteniusaceae	Umdakane (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Arctotis stoechadifolia P.J.Bergius	Asteraceae	Unspecified	Whole plant	Ground, infusion	Oral	Cleaning kidneys	(Semenya and Potgieter, 2014b) (Semenya et al., 2013)
Aristea africana Hoffmanns.	Iridaceae	Moerbos (AFR)	Whole plant	Unspecified	Unspecified	Bladder, kidney problems	(Nzue, 2009)
Artemisia afra Jacq. ex Willd.	Asteraceae	Wildeals, wormwood (ENG)	Leaves	Infusion	Oral	Bladder, kidney problems	(Thring and Weitz, 2006)
Artemisia annua L.	Asteraceae	Mohlaswapatla (SEP)	Roots	Decoction	Oral	Erectile dysfunction, aphrodisiac	(Semenya and Potgieter, 2014a) (Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b) (Semenya et al., 2012) (Semenya et al., 2013)
Asparagus concinnus (Baker) Kies	Asparagaceae	Lefalatsamaru (SEP)	Roots	Decoction	Unspecified	Gonorrhoea	(Chauke et al., 2015)
Athrixia phylicoides DC.	Asteraceae Asteraceae	icholocholo (Z) innyathelo(Z)	Roots Leaves/stem	Infusion Decoction	Unspecified Unspecified	Aphrodisiac Urinary tract	(Hutchings et al., 1996) (Hutchings et al., 1996)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Baccharoides adoensis (Sch.Bip. ex Walp.) H.Rob.							
Bauhinia galpinii N.E.Br.	Fabaceae	Mutswiriri (V)	Roots	Decoction	Oral	Aphrodisiac	(Mahwasane et al., 2013)
Berkheya speciosa O.Hoffm.	Asteraceae	Ikhakhasi (Z)	Unspecified	Unspecified	Unspecified	Bladder, prostate	(Mhlongo and Van Wyk, 2019)
Biancaea decapetala (Roth) O.Deg.	Fabaceae	Mokgabane (SEP)	Roots	Decoction	Oral	Gonorrhoea	(Semenya and Potgieter, 2014b) (Semenya et al., 2012) (Semenya et al., 2013c) (Erasmus et al., 2012)
Bidens pilosa L.	Passifloraceae	Uqandolo (Z)	Whole plant	Decoction	Oral	Genital sores, warts	(De Wet et al., 2012)
		Chuchuza (Z)	Leaves	Infusion	Unspecified	Swelling prostate, STI, genital herpes	(Shabangu, 2021)
Blepharis diversispina C.B.Clarke	Acanthaceae	Mooka pitsi (SEP)	Roots	Decoction	Oral	Chlamydia	(Mathibela et al., 2019)
Boophone disticha Herb.	Amaryllidaceae	Incwadi (Z)	Bulb	Maceration	Topical	Circumcision wounds	(Gebashe et al., 2019)
		Gifbol (AFR)		Unspecified			(Philander, 2011)
		Unspecified			Unspecified	Kidney problem	(Van Wyk et al., 2008) (Rasethe et al., 2019)
Boscia albitrunca Gilg & Gilg-Ben.	Capparaceae	Mohlophi (SEP)	Roots	Decoction	Oral	HIV/AIDS	(Semenya and Potgieter, 2014a) (Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013b)
		Unspecified					
Bulbine alooides Willd.	Asphodelaceae	Rooiwater (AFR)	Leaves	Decoction	Oral	Bladder infection	(Cocks, 1997)
			Sap	Unspecified	Unspecified	HIV/AIDS	(Gail et al., 2015)
Bulbine angustifolia Poelln.	Asphodelaceae	Marumo a ngata (SEP)	Roots	Unspecified	Oral	Aphrodisiac	(Mongalo and Makhafola, 2018)
Bulbine frutescens Willd.	Asphodelaceae	Makgabinyane (TSW)	Roots	Unspecified	Unspecified	Candidiasis	(Asong et al., 2019)
		Ibhucu, intelezi (Z)	Unspecified			Genital herpes	(Coopoosamy and Naidoo, 2012)
			Leaves/roots	Decoction	Topical	Bladder, kidney problems	(Thinyane and Maroyi, 2019)
Bulbine latifolia Spreng.	Asphodelaceae	Rooiwortel (AFR)	Roots	Unspecified	Unspecified	Bladder, kidney problems	(Nzue, 2009)
						STI, erectile dysfunction, kidney, bladder, prostrate problems	(Philander, 2011)
		Ibhucu (Z)	Tubers	Decoction		Aphrodisiac	(Shabangu, 2021)
Bupleurum mundtii Cham. & Schltdl.	Apiaceae	Leeuhout (AFR)	Stem/leaves	Decoction	Unspecified	Prostate problems	(Nortje and Van Wyk, 2015)
Burkea africana Hook.	Fabaceae	Monatlo (SEP)	Leaves	Ground, infusion	Topical	Circumcision wounds	(Semenya and Potgieter, 2014a) (Semenya and Potgieter, 2014b)
				Ground			(Semenya et al., 2013)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
			Roots	Decoction	Oral	HIV/AIDS	(Semenya et al., 2013a); (Semenya et al., 2013d)
						Gonorrhoea	(Semenya et al., 2013c)
Callilepis laureola DC.	Asteraceae	Phela (SEP)	Tuber	Decoction	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)
						Erectile dysfunction, kidney problems & low sperm count	(Semenya and Potgieter, 2014b)
						Aphrodisiac	(Semenya et al., 2013)
Callilepis salicifolia Oliv.	Asteraceae	Phelana (SEP)	Tuber	Decoction	Oral	Gonorrhoea	(Erasmus et al., 2012)
						Gonorrhoea, HIV/AIDS	(Semenya and Potgieter, 2014b)
							(Semenya et al., 2013a); (Semenya et al., 2013d)
			Roots			HIV/AIDS	(Semenya et al., 2013b)
Canthium inerme Kuntze	Rubiaceae	Udakane (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Capparis tomentosa Lam.	Capparaceae	inkunzi-ebomvu(Z)	Roots	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Cardiospermum halicacabum L.	Sapindaceae	ikhambhi leziduli (Z)	Leaves	Politice	Unspecified	Bladder problem, STI	(Hutchings et al., 1996)
Carica papaya L.	Caricaceae	Upopo (Z)	Leaves, roots	Decoction	Oral	Gonorrhoea	(De Wet et al., 2012)
		Unspecified	Roots				(Maema et al., 2016b)
		Unspecified				STI	(Maroyi and Mosina, 2014)
		Mopopopo (Ba)	Leaves			Gonorrhoea	(Mataha, 2021)
		Mophopho	Roots			Chlamydia	(Mathibela et al., 2019)
		"wapoo" (SEP)				Gonorrhoea	(Semenya et al., 2013c)
				Ground, Infusion		Erectile dysfunction,	(Semenya and Potgieter, 2014b)
				Ground		gonorrhoea	(Semenya and Potgieter, 2014a)
							(Semenya et al., 2012)
			Fruit	Poultice		Aphrodisiac	(Semenya et al., 2013)
			Tuber	Decoction	Oral	Gonorrhoea	(Erasmus et al., 2012)
Carissa bispinosa Desf.	Apocynaceae	Mothokolo (SEP)	Roots	Unspecified	Unspecified	Sterility	(Chauke et al., 2015)
						Sterility, erectile dysfunction	(Rankoana, 2016)
		Mothokolo o monnyane (SEP)		Decoction	Oral	Chlamydia	(Mathibela et al., 2019)
Carpobrotus edulis (L.) N.E.Br.	Aizoaceae	Tima (SEP)	Leaves	Unspecified	Topical	HIV/AIDS	(Mongalo and Makhafola, 2018)
Carya illinoinensis (Wangenh.) K.Koch	Juglandaceae	Umnkantsha (Z)	Roots	Unspecified	Unspecified	Aphrodisiac	(Shabangu, 2021)
Cassia abbreviata Oliv.	Fabaceae	Molomanama (SEP)	Roots/stem bark	Decoction	Unspecified	STI, HIV/AIDS	(Chauke et al., 2015)
		Monepenepe (SEP)	Roots		Oral	Chlamydia	(Mathibela et al., 2019)
			Stem bark	Unspecified		Aphrodisiac	(Mongalo and Makhafola, 2018)
Catha edulis (Vahl) Forssk. ex Endl.	Celastraceae	Lewane (SEP)	Roots	Decoction	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
							(Semenya and Potgieter, 2014b)
						Aphrodisiac	(Semenya et al., 2013)
Catharanthus roseus (L.) G.Don	Apocynaceae	Dabula (TSW)	Leaves	Unspecified	Unspecified	Genital warts, syphilis	(Asong et al., 2019)
		Lepolomo le pinki la drop (SEP)	Roots	Decoction	Oral, enema	Gonorrhoea STI Gonorrhoea	(Erasmus et al., 2012) (Maema et al., 2016a) (Semenya et al., 2013c) (Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)
		Mozosa-banna (Ba)				Erection dysfunction, cleaning kidneys, gonorrhoea	(Semenya et al., 2012) (Mataha, 2021)
		Unspecified				Gonorrhoea, chlamydia, syphilis, HIV/AIDS, genital warts	(Maema et al., 2019)
						STI	(Maroyi and Mosina, 2014)
Cenchrus ciliaris L.	Amaryllidaceae	inThungamuzi (Z)	Whole plant	Decoction	Unspecified	Urinary tract infections	(Gebashe et al., 2019)
Centella asiatic (L.) Urb	Apiaceae	Setimamollo (TSW)	Whole plant	Unspecified	Unspecified	Genital warts	(Asong et al., 2019)
Ceropegia purpurascens K.Schum.	Apocynaceae	Monamela (SEP)	Roots	Decoction	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a) (Semenya and Potgieter, 2014b)
						Aphrodisiac	(Semenya et al., 2013)
Choritaenia capensis Benth.	Apiaceae	Mothata (TSW)	Bark	Decoction	Oral	Erectile dysfunction	(Magodielo, 2018)
		Xinungu (MAP)			Unspecified	Penis enlargement	(Tshikalange et al., 2016)
Cinnamomum verum J.Presl	Lauraceae	Mokwere-kwere-o-mogolo (SEP)	Roots	Decoction	Oral	HIV/AIDS	(Semenya and Potgieter, 2014b) (Semenya et al., 2013b) (Semenya et al., 2013c)
Cissus quadrangularis L.	Vitaceae	Mohlabadipoo (SEP)	Whole plant	Unspecified	Oral	Syphilis	(Mongalo and Makhafola, 2018)
Citrullus lanatus (Thunb.) Matsum. & Nakai	Cucurbitaceae	Morotse (SEP)	Roots	Unspecified	Unspecified	HIV/AIDS	(Semenya and Potgieter, 2014b)
						Gonorrhoea, HIV/AIDS	(Semenya et al., 2013c)
Clematis brachiata Thunb.	Ranunculaceae	Ityolo (X)	Leaves	Infusion	Unspecified	STI	(Asowata-Ayodele et al., 2016)
		Ufufuno (Z)	Stem/Leaves	Decoction	Oral	Genital sores, warts	(De Wet et al., 2012)
Cliffortia odorata L.f.	Rosaceae	Wilde wingerd (AFR)	Leaves/roots Leaves	Unspecified	Unspecified	Bladder, kidney problems	(Nzue, 2009) (Philander, 2011)
Clivia miniata (Lindl.) Bosse	Amaryllidaceae	Unspecified	Bulb	Unspecified	Unspecified	HIV/AIDS	(Rasethe et al., 2019)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Combretum apiculatum Sond.	Combretaceae	Tsholakhudu, Kgosi ya di thlare (TSW)	Bulb	Unspecified	Unspecified	Molluscum contagiosum	(Asong et al., 2019)
		Rooibos (AFR)				Bladder, kidney problems	(Nzue, 2009)
		Umdubu (Z)	Unspecified			Kidneys, bladder, prostate problems, aphrodisiac	(Mhlongo and Van Wyk, 2019)
Combretum molle R.Br. ex G.Don	Caricaceae	Umbondo (Z)	Leaves/roots	Decoction	Oral	STI	(De Wet et al., 2012)
Corchorus asplenifolius Burch.	Malvaceae	Ubangalala (Z)	Roots	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Cotyledon orbiculata L.	Crassulaceae	Pigs ear (ENG)	Roots	Maceration, decoction	Oral	Gonorrhoea	(Erasmus et al., 2012)
		Tsebe ya kolobe (SEP)		Maceration			(Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d)
Crinum macowanii Baker	Amaryllidaceae	Umduze (Z)	Bulb	Decoction	Unspecified	Urinary tract	(Hutchings et al., 1996)
		Intelezi (Z)	Unspecified	Unspecified	Unspecified	Erectile dysfunction	(Mhlongo and Van Wyk, 2019)
		Letotse (SEP)	Leaves			Kidney problems	(Rankoana, 2016)
Crinum moorei Hook.f.	Amaryllidaceae	Umduze (Z)	Bulb	Decoction	Unspecified	Urinary tract	(Hutchings et al., 1996)
Crinum stuhlmannii Baker	Amaryllidaceae	Umduze (Z)	Bulb	Decoction	Unspecified	Urinary tract	(Hutchings et al., 1996)
Crossyne guttata (L.) D.Müll.-Doblies & U.Müll.-Doblies	Amaryllidaceae	Gifbol (AFR)	Bulb	Unspecified	Topical	Circumcision wounds	(Philander, 2011)
Cryptocarya latifolia Sond.	Lauraceae	umhlangwenya (Z)	Bark	Unspecified	Unspecified	Urinary tract	(Hutchings et al., 1996)
Cucumis myriocarpus Naudin	Cucurbitaceae	Mogapyana (SEP)	Tuber	Decoction	Oral	Gonorrhoea	(Erasmus et al., 2012) (Semenya et al., 2012)
			Roots			Chlamydia	(Semenya and Potgieter, 2014b)
						Gonorrhoea, syphilis	(Semenya et al., 2013c)
Cucumis zeyheri Sond.	Cucurbitaceae	Monyaku (SEP)	Fruits	Maceration	Enema	Chlamydia	(Mathibela et al., 2019)
Curtisia dentata (Burm.f.) C.A.Sm.	Curtisiaceae	Gejalihomvu (Z)	Bark	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Cussonia paniculata Eckl. & Zeyh.	Araliaceae	Umsenge (Z)	Leaves/bark	Unspecified	Unspecified	HIV/AIDS	(Gail et al., 2015)
Cynanchum viminale (L.) L.	Apocynaceae	Mokwere-kwere- o-mogolo (SEP)	Twigs	Unspecified	Unspecified	HIV/AIDS	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)
			Roots				(Semenya et al., 2013a); (Semenya et al., 2013d)
Dalbergia obovata E.Mey.	Fabaceae	Umzungulu (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Datura stramonium L.	Solanaceae	Kgookgoo (SEP)	Roots	Decoction	Oral	Sterility	(Maema et al., 2016a)
Dianthus mooiensis F.N.Williams	Caryophyllaceae	Tlhokalatsela (TSW)	Roots	Unspecified	Unspecified	Genital warts	(Asong et al., 2019)
Dianthus L.	Caryophyllaceae	Unspecified	Unspecified	Unspecified	Unspecified	Kidney infection	(Cocks, 1997)
	Fabaceae	Moreetse (SEP)	Roots	Decoction	Unspecified	STI	(Chauke et al., 2015)

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Dichrostachys cinerea (L.) Wight & Arn.		Sinabane (Z)	Unspecified	Unspecified			(Shabangu, 2021)
Dicoma anomala Sond.	Asteraceae	Hlonya (SEP)	Tuber	Decoction	Oral	STI	(Semenya and Potgieter, 2014b) (Semenya et al., 2013)
Dicoma capensis Less.	Asteraceae	hosabi(e)s (AFR)	Leaves	Decoction	Unspecified	Bladder problems	(Nortje and Van Wyk, 2015)
		karmedik, vêrpis, vyfpondbos (AFR)	Unspecified	Infusion	Oral	Bladder, kidney problems	(Van Wyk et al., 2008)
Dioscorea sylvatica Eckl.	Dioscoreaceae	Monamela (SEP)	Roots	Decoction	Oral	Gonorrhoea	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b) (Erasmus et al., 2012) (Semenya et al., 2013a); (Semenya et al., 2013d)
			Bulb				
Dioscorea Plum. ex L.	Dioscoreaceae	Skorpaati (AFR)	Unspecified	Decoction	Oral	Bladder infection	(Cocks, 1997)
Diosma oppositifolia L.	Rutaceae	Buchu (Z)	Leaves	Unspecified	Unspecified	Kidney, bladder problems	(Philander, 2011)
Diospyros lycioides Desf.	Ebenaceae	Unspecified Xintomane (V)	Roots	Unspecified Decoction	Unspecified	STI	(Rasethe et al., 2019) (Tshikalange et al., 2016)
Diospyros mespiliformis Hochst. ex A.DC.	Ebenaceae	Ntoma (V)	Roots/leaves	Decoction, Infusion	Unspecified	Urinary tract, STI	(Tshikalange et al., 2016)
Diospyros pubescens Pers.	Ebenaceae	Kraaibos (AFR)	Unspecified	Unspecified	Unspecified	Kidney problems	(Nortje and Van Wyk, 2015)
Dipcadi viride (L.) Moench	Asparagaceae	Ugibizisila (Z)	Unspecified	Unspecified	Unspecified	Urinary infections	(Mhlongo and Van Wyk, 2019)
Dodonaea angustifolia L.f.	Sapindaceae	Ysterhouttoppe (AFR)	Leaves	Infusion	Oral	Bladder, kidney problems	(Thring and Weitz, 2006)
Dodonaea viscosa Jacq.	Sapindaceae	Sasterolien (AFR)	Unspecified	Unspecified	Unspecified	Bladder, kidney problems	(De Beer and Van Wyk, 2011)
			Leaves			Kidney problems	(Philander, 2011)
		Mofenshe (SEP)	Roots	Decoction	Oral	HIV/AIDS	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013b) (Semenya et al., 2013c)
						Gonorrhoea	
Dolichos falciformis E.Mey.	Fabaceae	Mofenshe (SEP)	Roots	Maceration, decoction	Oral	HIV/AIDS	(Semenya et al., 2013b)
Dombeya rotundifolia (Hochst.) Planch.	Malvaceae	Nhliziyonkulu (Z)	Bark	Unspecified	Oral	Aphrodisiac	(Shabangu, 2021)
Dombeya tiliacea (Endl.) Planch.	Malvaceae	Iklolo (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Dracaena hyacinthoides (L.) Mabb.	Asparagaceae	Makgotse (SEP)	Roots	Decoction	Oral	HIV/AIDS	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013b)
Drimia capensis (Burm.f.) Wijnands	Asparagaceae	Gifbol (AFR)	Bulb	Unspecified	Topical	Circumcision wounds	(Philander, 2011)

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Table 2 (*continued*)

Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Drimia elata Jacq. ex Willd.	Asparagaceae	Sekanama (SEP)	Bulb	Decoction	Oral	Gonorrhoea	(Erasmus et al., 2012)
				Unspecified	Topical	STI	(Papo et al., 2022)
				Decoction	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)
						Gonorrhoea	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)
						Aphrodisiac	(Semenya et al., 2013)
						Gonorrhoea, HIV/AIDS	(Semenya et al., 2013a); (Semenya et al., 2013d)
Drimia sanguinea (Schinz) Jessop	Asparagaceae	Sekanama (TSW)	Bulb	Unspecified	Unspecified	Candidiasis, condylomata acuminate, genital warts, syphilis	(Asong et al., 2019)
					Oral	STI	(Mongalo and Makhafola, 2018)
			Tuber	Infusion	Unspecified	Sterility	(Chauke et al., 2015)
Dysphania ambrosioides (L.) Mosyakin & Clemants	Amaranthaceae	Ikhambi leslumo (Z)	Unspecified	Unspecified	Unspecified	Urinary infections, bladder, prostate, kidneys problems	(Mhlongo and Van Wyk, 2019)
Eclipta prostrata (L.) L.	Asteraceae	Umphamephuce (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Ekebergia capensis Sparrm.	Meliaceae	Unspecified	Roots	Unspecified	Unspecified	STI	(Rasethe et al., 2019)
Elaeodendron transvaalense (Burtt Davy) R.H.Archer	Celastraceae	Monamane (SEP)	Roots/bark	Unspecified	Oral	STI	(Papo et al., 2022)
		Unspecified	Bark		Unspecified		(Rasethe et al., 2019)
		Monamane (SEP)	Roots			HIV/AIDS	Semenya and Potgieter, (2014a)
				Decoction	Oral		(Semenya et al., 2013a); (Semenya et al., 2013d)
Elephantorrhiza burkei Benth.	Fabaceae	Mosijana (SEP)	Roots	Decoction	Oral	Chlamydia	(Mathibela et al., 2019)
		Mohauwane (SEP)		Unspecified		STI	(Mongalo and Makhafola, 2018)
		Gumulolu (V)			Unspecified	Aphrodisiac	Mphephu, (2017))
Elytropappus rhinocerotis Less.	Asteraceae	Renosterbos (AFR)	Leaves	Unspecified	Unspecified	Bladder, kidney problems	(Nzue, 2009)
				Infusion	Oral		(Thring and Weitz, 2006)
Emex australis Steinh.	Polygonaceae	Umanyiwa yinkomo (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Ensete ventricosum (Welw.) Cheesman	Musaceae	Banana (ENG)	Roots	Decoction	Unspecified	STI	(Chauke et al., 2015)
Erianthemum dregei Tiegh.	Ranunculaceae	Iphakama (Z)	Leaves	Decoction	Oral	HIV/AIDS, gonorrhoea	(De Wet et al., 2012)
Eriosema cordatum E.Mey.	Fabaceae	umhlabankunzi (Z)	Roots	Decoction	Oral	Aphrodisiac	(Hutchings et al., 1996)
		Ubangalala (Z)	Unspecified	Unspecified	Unspecified		(Mhlongo and Van Wyk, 2019)
Eriosema distinctum N.E.Br.	Fabaceae	Ubangalala (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Eriosema salignum E.Mey.	Fabaceae	Iqonsi (Z)	Unspecified	Unspecified	Unspecified	Erectile dysfunction, aphrodisiac	(Mhlongo and Van Wyk, 2019)
Erythrina caffra Thunb.	Combretaceae	Umsinsi (Z)	Roots	Decoction	Oral	Genital warts	(De Wet et al., 2012)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
			Unspecified	Unspecified	Unspecified	Bladder, prostate problem	(Mhlongo and Van Wyk, 2019)
Erythrina lysistemon Hutch.	Fabaceae	Muvhale (V)	Bark	Decoction	Oral	Aphrodisiac	(Mahwasane et al., 2013)
		Mothobje (Ba)	Tuber/roots			HIV/AIDS	(Mataha, 2021)
		Umsinsi (Z)	Unspecified	Unspecified	Unspecified	Bladder, prostate problem	(Mhlongo and Van Wyk, 2019)
Entada elephantina (Burch.) S.A.O'Donnell & G.P.Lewis	Fabaceae	Mositsane (TSW)	Roots	Unspecified	Unspecified	Pearly penile papules, genital warts, herpes simplex	(Asong et al., 2019)
		Mosehlana, moshisane (SEP)		Decoction Infusion	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)
						HIV/AIDS	(Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d)
						Aphrodisiac	(Semenya et al., 2013)
						HIV/AIDS	(Semenya et al., 2013b)
		Mosijana o mogolo (SEP)				Chlamydia	(Mathibela et al., 2019)
		Khesesana (Ba)		Chew		Waist pain, penis enlargement	(Mataha, 2021)
		Mohauwane (SEP)		Unspecified		STI	(Mongalo and Makhafola, 2018)
		Unspecified			Unspecified	HIV/AIDS	(Rasethe et al., 2019)
		Intolwane (Z)		Decoction		Aphrodisiac	(Shabangu, 2021)
			Leaves/roots		Oral	Syphilis	(Thinyane and Maroyi, 2019)
Euclea crispa (Thunb.) Gürke	Ebenaceae	Mokwerekwere (SEP)	Roots	Unspecified Decoction	Oral	STI	(Papo et al., 2022)
						HIV/AIDS	(Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013b)
						Gonorrhoea	(Semenya et al., 2013c)
Euclea natalensis A.DC.	Ebenaceae	Mohlakola (SEP)	Roots	Decoction	Unspecified	Sterility	(Chauke et al., 2015)
		ichitamuzi (Z)	Bark	Unspecified	Unspecified	Urinary tract infections, STI	(Hutchings et al., 1996)
		Umshekisane (Z)	Unspecified			Bladder, prostate problem	(Mhlongo and Van Wyk, 2019)
Eucomis autumnalis (Mill.) Chitt.	Asparagaceae	Umatunga (Z)	Unspecified	Unspecified	Unspecified	Urinary problems, penis enlargement	(Coopoosamy and Naidoo, 2012)
		Ukhwalo (Z)				Cleaning the kidneys, bladder, prostate problem	(Mhlongo and Van Wyk, 2019)
		uMathunga (Z)		Decoction		Urinary condition	Ndawonde et al., (2007)

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Table 2 (*continued*)

Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
		Mathuba-difala (SEP)	Bulb	Unspecified		Urinary disease, STI	(Rankoana, 2016)
		Unspecified				STI	(Rasethe et al., 2019)
		iSkenama (Z)	Unspecified			STI, aphrodisiac	(Shabangu, 2021)
Eucomis pallidiflora Baker	Asparagaceae	Unspecified	Bulb	Unspecified	Unspecified	STI	(Rasethe et al., 2019)
		Mathubadifala	Roots	Unspecified	Oral	STI	(Papo et al., 2022)
		(SEP)Mathubadifala (SEP)	Bulb	Decoction		Erectile dysfunction	(Semenya and Potgieter, 2014a)
				Decoction	Oral, unspecified	Chlamydia, erectile dysfunction, aphrodisiac	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)
				Decoction	Oral	Aphrodisiac	(Semenya et al., 2013)
						Chlamydia	(Semenya et al., 2013a); (Semenya et al., 2013d)
Euphorbia cupularis Boiss.	Euphorbiaceae	Mokhure (SEP)	Roots	Decoction	Unspecified	Erectile dysfunction	(Chauke et al., 2015)
Euphorbia hypericifolia L.	Euphorbiaceae	Umaphipha (Z)	Leaves	Infusion	Unspecified	Gonorrhoea	(Asowata-Ayodele et al., 2016)
			Whole plant	Decoction	Oral	STI	(De Wet et al., 2012)
Euphorbia maleolens E.Phillips	Euphorbiaceae	Rofa-bja-Tau (SEP)	Whole plant	Ground, infusion	Oral	HIV/AIDS	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)
				Decoction			(Semenya et al., 2013a); (Semenya et al., 2013d)
				Ground, decoction			(Semenya et al., 2013b)
Euphorbia prostrata Aiton	Euphorbiaceae	Letswetlane (TSW)	Rhizome	Unspecified	Unspecified	Candidiasis, syphilis	(Asong et al., 2019)
Euphorbia tirucalli L.	Fabaceae	Umnduze (Z)	Stem/leaves	Decoction	Oral	Gonorrhoea	(De Wet et al., 2012)
Faidherbia albida (Delile) A.Chev.	Fabaceae	Muhoto (V)	Bark	Unspecified	Unspecified	STI	Constant and Tshisikhawe, (2018)
		Mokgaba (SEP)	Branches			Sterility	(Rankoana, 2016)
Ficus abutilifolia Miq.	Moraceae	Mofa (SEP)	Roots/stem bark	Decoction	Unspecified	STI	(Chauke et al., 2015)
Ficus sur Forssk.	Moraceae	ingobozweni (Z)	Roots/fruit	Infusion	Unspecified	Gonorrhoea, sterility	(Hutchings et al., 1996)
Flueggea virosa (Roxb. ex Willd.) Royle	Phyllanthaceae	isibangamhlota sehlati (Z)	Roots	Unspecified	Unspecified	Syphilis, gonorrhoea, sterility	(Hutchings et al., 1996)
Foeniculum vulgare Mill.	Apiaceae	Imboziso (Z)	Leaves	Decoction	Oral	HIV/AIDS	(Gail et al., 2015)
Galium tomentosum Thunb.	Rubiaceae	T'naaitand (AFR)	Unspecified	Unspecified	Unspecified	Urinary tract infections	(Nortje and Van Wyk, 2015)
		Red storm (ENG)	Roots			HIV/AIDS, bladder problems	(Philander, 2011)
Garcinia livingstonei T.Anderson	Clusiaceae	isihlumanye (Z)	Bark	Ground	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Geigeria aspera Harv.	Asteraceae	Makgonatsotlhe (SEP)	Whole plant	Unspecified	Unspecified	HIV/AIDS	Semenya and Potgieter, (2014a)
				Decoction	Oral		(Semenya et al., 2013a); (Semenya et al., 2013d)
						Gonorrhoea	(Semenya et al., 2013c)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Gerbera viridifolia (DC.) Sch.Bip.	Asteraceae	Nomgushe (X)	Tuber	Ground	Unspecified	Kidney infection	(Cocks, 1997)
Gethyllis namaquensis (Schönland) Oberm.	Amaryllidaceae	Naka tsa tholo (SEP)	Bulb	Maceration	Enema	Chlamydia	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d)
Gloriosa modesta (Hook.) J.C.Manning & Vinn.	Colchicaceae	ihlamvu lehlathi (Z)	Corms	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Gloriosa superba L.	Colchicaceae	ihlamvu (Z)	Corms	Ground	Unspecified	Aphrodisiac, sterility, gonorrhoea	(Hutchings et al., 1996)
Gomphocarpus fruticosus (L.) W.T.Aiton	Apocynaceae	Motsotsa poo,thaka (SEP)	Roots	Decoction	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)
							(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)
							(Semenya et al., 2012)
						Aphrodisiac	(Semenya et al., 2013)
		Ibetshane (Z)	Roots	Unspecified	Unspecified		(Shabangu, 2021)
Gomphrena celosioides Mart.	Amaranthaceae	Lebolomo la naga (SEP)	Leaves	Decoction	Unspecified	STI	(Chauke et al., 2015)
Grewia flava DC	Malvaceae	Moretlwa (TSW)	Roots	Unspecified	Unspecified	Pearly penile papules	(Asong et al., 2019)
		Mothetlwa (SEP)			Oral	STI	(Mongalo and Makhafola, 2018)
Grewia flavescens Juss.	Malvaceae	Motsotsojane (TSW)	Leaves	Unspecified	Unspecified	Candidiasis	(Asong et al., 2019)
Grewia occidentalis L.	Malvaceae	Mogwane (SEP)	Leaves	Unspecified	Topical	STI	(Papo et al., 2022)
Gunnera perpensa L.	Gunneraceae	Izibu (Z)	Unspecified	Unspecified	Unspecified	Bladder, prostate problem	(Mhlongo and Van Wyk, 2019)
		Wilde-ramenas (AFR)	Roots			Bladder, kidney problems	(Nzue, 2009)
Gymnanthemum corymbosum (Thunb.) H.Rob.	Asteraceae	Morotolodi (Ba)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mataha, 2021)
Gymnosporia senegalensis Loes.	Celastraceae	Mophato (SEP)	Roots/leaves	Decoction	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)
							(Semenya and Potgieter, 2014b)
						Aphrodisiac	(Semenya et al., 2013)
Haemanthus albiflos Jacq.	Amaryllidaceae	Poeierkwas (AFR)	Whole plant	Unspecified	Unspecified	STI	(Nzue, 2009)
Harpagophytum procumbens (Burch.) DC. ex Meisn.	Pedaliaceae	Lemata (SEP)	Bulb	Decoction	Oral	Gonorrhoea	(Mathibela et al., 2019)
Helichrysum appendiculatum Less.	Asteraceae	Indlebeyemvu (Z)	Leaves	Infusion	Topical	Circumcision wound	(Gebashe et al., 2019)
Helichrysum caespititium (DC.) Sond.	Asteraceae	Mabjana (SEP) Bokgatha,(SEP)	Whole plant	Decoction	Oral	Gonorrhoea	(Erasmus et al., 2012)
							(Semenya and Potgieter, 2014b)
							(Semenya et al., 2013a); (Semenya et al., 2013d)
Helichrysum crispum D.Don	Asteraceae	Kooigoed (AFR)	Leaves	Infusion	Oral	Bladder, kidney problems	(Thring and Weitz, 2006)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Helichrysum nudifolium (L). Less	Asteraceae	Imphepho (TSW)	Leaves	Unspecified	Unspecified	Genital warts	(Asong et al., 2019)
Helichrysum odoratissimum Sweet	Asteraceae	Imphepho (X)	Leaves	Decoction	Oral	Aphrodisiac	Buwa-Komoren et al., (2019)
				Unspecified	Unspecified	Kidney problem	(Philander, 2011)
		Kooigoed (AFR)	Unspecified				(Nortje and Van Wyk, 2015)
Helichrysum pallidum DC.	Asteraceae	Mpetso (MAP)	Roots	Burn	Unspecified	Penile sores	(Tshikalange et al., 2016)
Helichrysum paronychioides DC.Humbert	Asteraceae	Phate-ya-ngaka (TSW)	Whole plant	Unspecified	Unspecified	Candidiasis, pearly penile papules	(Asong et al., 2019)
Helichrysum pedunculatum Hilliard & B.L.Burtt	Asteraceae	Indlebeyemvu (X) Isigqutsi (Z)	Leaves	Unspecified	Topical	Circumcision wound	(Bhat, 2014) (Gebashe et al., 2019)
Helichrysum rutilans D.Don	Asteraceae	Kooigoedbos (AFR)	Unspecified	Infusion	Unspecified	Kidney, bladder problems	(Nortje and Van Wyk, 2015)
Helichrysum sp.	Asteraceae	Phate-ya-ngaka (female) (TSW)	Whole plant	Unspecified	Unspecified	Candidiasis	(Asong et al., 2019)
Helinus integrifolius Kuntze	Rhamnaceae	Morakane (SEP)	Roots	Decoction	Unspecified	STI	(Chauke et al., 2015)
Hermannia althaeoides Hurt ex Link	Malvaceae	Bangalala (X)	Roots	Decoction	Oral	Erectile dysfunction	Matsiliza and Barker, (2001)
Heteropyxis natalensis Harv.	Myrtaceae	inkunzi (Z)	Bark	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Hippobromus pauciflorus Radlk.	Sapindaceae	Perdepis (AFR)	Leaves/roots/ stem	Unspecified	Unspecified	Bladder, kidney problems	(Nzue, 2009)
Hypoxis colchicifolia Baker	Hypoxidaceae	Inongwe (X)	Corms	Decoction	Oral	Urinary tract infection	Buwa-Komoren et al., (2019)
		igudu (Z)		Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Hypoxis hemerocallidea Fisch., C.A.Mey. & Avé-Lall.	Hypoxidaceae	Inkomfe (Z)	Corm/leaves	Decoction	Oral	Genital warts, STI, gonorrhoea, HIV/AIDS	(De Wet et al., 2012)
			Corms/leaves/ roots			Urinary tract infections, testicular tumours	(Thinyane and Maroyi, 2019)
			Unspecified	Unspecified	Unspecified	Testicle, prostate cancer	(Shabangu, 2021)
						Bladder, prostate problem	(Mhlongo and Van Wyk, 2019)
			Corm/roots			Bladder, kidney problems	(Nzue, 2009)
			Roots	Ground		HIV/AIDS	(Gail et al., 2015)
		Nonkwe (Z)	Bulb	Unspecified		Bladder, kidney problems	(Philander, 2011)
		iLabatheka (Z)	Tuber			STI, prostate problems, testicular tumours	Ndawonde et al., (2007)
		Sesogadi (SEP)		Infusion	Oral	Gonorrhoea	(Erasmus et al., 2012)
		Unspecified		Decoction		Erectile dysfunction	(Semenya and Potgieter, 2014a)
				Ground, infusion		HIV/AIDS, Gonorrhoea	

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
							(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)
							(Semenya et al., 2013a); (Semenya et al., 2013d)
				Decoction		Aphrodisiac	(Semenya et al., 2013)
				Ground		HIV/AIDS	(Semenya et al., 2013b)
			Roots	Decoction		Gonorrhoea	(Semenya et al., 2013c)
			Tuber	Unspecified		HIV/AIDS, sterility	(Rasethe et al., 2019)
		Monna wa maledu (SEP)	Bulb			Aphrodisiac	(Mongalo and Makhafola, 2018)
		Tshupoo ya poo (TSW)			Unspecified	Genital warts, syphilis.	(Asong et al., 2019)
Hypoxis L.	Hypoxidaceae	inKhomfe (Z)	Unspecified	Unspecified	Unspecified	HIV/AIDS	(Corrigan et al., 2011)
Hypoxis obtusa Burch.	Hypoxidaceae	Unspecified	Bulb	Decoction	Oral	STI	(Maroyi and Mosina, 2014)
				Unspecified	Unspecified	Sterility	(Rasethe et al., 2019)
		Monnamaledu (SEP)	Tuber	Ground	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)
				Ground, infusion		Chlamydia, erectile dysfunction	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)
						Chlamydia	(Semenya et al., 2013a); (Semenya et al., 2013d)
				Decoction		Aphrodisiac	(Semenya et al., 2013)
Hypoxis rigidula Baker	Hypoxidaceae	Ilabatheka (Z)	Unspecified	Unspecified	Unspecified	Bladder, prostate problem	(Mhlongo and Van Wyk, 2019)
Hypoxis zeyheri Baker	Hypoxidaceae	Nenongwe (X)	Tuber	Unspecified	Unspecified	Kidney infection	(Cocks, 1997)
Indigofera sessilifolia DC.	Fabaceae	Unspecified	Whole plant	Unspecified	Unspecified	Kidney infection	(Cocks, 1997)
Ipomoea batatas (L.) Lam.	Euphorbiaceae	Ubhatata (Z)	Leaves	Decoction	Oral	Gonorrhoea	(De Wet et al., 2012)
Ipomoea oblongata E.Mey.ex Chiosy A.	Convolvulaceae	Morebe (TSW)	Roots	Unspecified	Unspecified	Genital warts	(Asong et al., 2019)
Ipomoea obscura (L.) Ker Gawl.	Convolvulaceae	Kgomodimaswi (SEP)	Roots	Decoction	Oral	Gonorrhoea	(Erasmus et al., 2012)
							(Semenya and Potgieter, 2014b)
							(Semenya et al., 2013a); (Semenya et al., 2013d)
Jacaranda mimosifolia D.Don	Bignoniaceae	Unspecified	Bark	Decoction	Oral	Gonorrhoea	(Maema et al., 2019)
Jasminum abyssinicum R.Br.	Oleaceae	Mthundangazi (MAP)	Roots	Decoction	Unspecified	Bladder cleaning	(Tshikalange et al., 2016)
Jasminum fluminense Vell.	Oleaceae	Maloyana (MAP)	Roots	Decoction	Unspecified	STI	(Tshikalange et al., 2016)
Jatropha curcas L.	Euphorbiaceae	Sehlare sa banna (SEP)	Roots	Decoction	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)
							(Semenya and Potgieter, 2014b)
							(Semenya et al., 2012)
						Aphrodisiac	(Semenya et al., 2013)
Jatropha erythropoda Pax & K.Hoffm.	Euphorbiaceae	Thotamadi (SEP)	Bulb	Decoction	Oral	Chlamydia	(Mathibela et al., 2019)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Jatropha zeyheri Sond	Euphorbiaceae	Mfelo (MAP)	Bulb	Chew	Unspecified	Testicle sores	(Tshikalange et al., 2016)
		Seswagadi (TSW)	Roots	Unspecified		Genital warts	(Asong et al., 2019)
				Decoction	Oral	Gonorrhoea	(Semenya et al., 2013a); (Semenya et al., 2013d)
		Unspecified					(Erasmus et al., 2012)
Kalanchoe pinnata (Lam.) Pers.	Hypoxidaceae	Umvuthuzi (Z)	Leaves	Decoction	Oral	STI	(De Wet et al., 2012)
Kigelia africana (Lam.) Benth.	Bignoniaceae	Moyo (Ba)	Unspecified	Infusion	Oral	Aphrodisiac	(Mataha, 2021)
		umVongothi (Z)	Leaves/fruits	Decoction		STI	(De Wet et al., 2012)
			Fruits			Erectile dysfunction	(Shabangu, 2021)
				Unspecified	Topical	Penis enlargement	(Corrigan et al., 2011)
			Unspecified		Unspecified	Swollen testicles	(Mhlongo and Van Wyk, 2019)
Kleinia longiflora DC.	Asteraceae	Unspecified	Roots	Decoction	Oral	STI	(Maroyi and Mosina, 2014)
		Lekgabolo, motlalamaswi (SEP)				Chlamydia	(Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d)
Kohautia senegalensis Cham. & Schltdl.	Rubiaceae	Madi a phalana (TSW)	Roots	Decoction	Oral	Erectile dysfunction	(Magodielo, 2018)
Krauseola mosambicina (Moss) Pax & K.Hoffm.	Crassulaceae	Isihlaza (Z)	Whole plant	Infusion	Oral, enema	STI	(De Wet et al., 2012)
Lantana camara L.	Verbenaceae	Unspecified	Leaves/twigs	Decoction	Oral	Gonorrhoea, chlamydia, syphilis, HIV/AIDS	(Maema et al., 2019)
Lasiosiphon kraussianus (Meisn.) Hutch. & Dalziel	Thymelaeaceae	Impevu (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Leonotis leonurus (L.) R.Br.	Lamiaceae	Khenopinopi (Ba)	Roots	Unspecified	Unspecified	Gonorrhoea	(Mataha, 2021)
		Wildedagga (AFR)	Leaves/stem			Bladder, kidney	(Nzue, 2009)
		klipdagga, wilde dagga (AFR)	Leaves	Decoction	Oral	problems	(Thring and Weitz, 2006)
Lessertia frutescens (L.) Goldblatt & J.C.Manning	Fabaceae	Kalkoenbos, kankerbos(sie) (AFR)	Unspecified	Unspecified	Unspecified	Kidney stones; cleanse the bladder	(De Beer and Van Wyk, 2011)
		KankeruNwele (Z)	Leaves			HIV/AIDS	(Gail et al., 2015)
		keurtjies, kankerbossie (AFR)		Decoction	Oral	Bladder, kidney problems	(Thring and Weitz, 2006)
		wildekeur, kalkoenbel, kankerbos (AFR)		Infusion		Kidney pain	(Van Wyk et al., 2008)
Lolium multiflorum Lam.	Poaceae	Botsakatsaka (SEP)	Whole plant	Decoction	Oral	Kidney problem	(Semenya and Potgieter, 2014b) (Semenya et al., 2012) (Semenya et al., 2013)
Macrotyloma maranguense (Taub.) Verdc.	Fabaceae	Xikondlo (MAP)	Bulb	Chew	Unspecified	Swollen or painful testicles	(Tshikalange et al., 2016)
Malva neglecta Wallr.	Malvaceae	Tikamotse (TSW)	Whole plant	Unspecified	Unspecified	Herpes simplex	(Asong et al., 2019)
	Malvaceae	Uvemvane (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	

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Table 2 (*continued*)

Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Malvastrum coromandelianum (L.) Garcke							(Mhlongo and Van Wyk, 2019)
Mangifera indica L.	Anacardiaceae	Mangoza (Z)	Unspecified	Unspecified	Unspecified	STI	(Shabangu, 2021)
Melianthus pectinatus Harv.	Francoaceae	kriekie-roer-my-nie (AFR)	Roots	Decoction	Unspecified	Urinary tract infections	(Nortje and Van Wyk, 2015)
Mentha longifolia (L.) L.	Lamiaceae	Ballerja (AFR)	Unspecified	Unspecified	Unspecified	Kidney problems	(De Beer and Van Wyk, 2011)
Merwilla plumbea (Lindl.) Speta	Asparagaceae	Ichile (Z)	Unspecified	Unspecified	Unspecified	Bladder, prostate problem	(Mhlongo and Van Wyk, 2019)
		Inguduza (Z)				Erectile dysfunction	(Coopoosamy and Naidoo, 2012)
			Bulb			Aphrodisiac	(Shabangu, 2021) Ndawonde et al., (2007)
Mesembryanthemum emarcidum Thunb.	Aizoaceae	Kougoed (AFR)	Unspecified	Unspecified	Unspecified	kidney failure	(Van Wyk et al., 2008)
Microcos microthyrsa (K.Schum. ex Burret) Burret	Malvaceae	iSonyane (Z)	Roots	Decoction	Oral	Sterility	(Corrigan et al., 2011)
Microglossa mespilifolia B.L.Rob.	Asteraceae	Ikhambi lesduli (Z)	Unspecified	Unspecified	Unspecified	Erectile dysfunction, urinary infections	(Mhlongo and Van Wyk, 2019)
Mimosa pigra L.	Fabaceae	Imbune (Z)	Roots	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Mimusops caffra E.Mey. ex A.DC.	Bignoniaceae	Amasethole (Z)	Roots	Decoction	Oral	Gonorrhoea	(De Wet et al., 2012)
		Umasethole (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Mimusops zeyheri Sond.	Sapotaceae	Monupudu (SEP)	Roots	Unspecified	Oral	Syphilis	(Mongalo and Makhafola, 2018)
Momordica balsamina L.	Cucurbitaceae	inkaka(Z)	Seeds	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
		Monyaku (Ba)	Unspecified				(Mataha, 2021)
		Intshuku (Z)	Leaves	Decoction	Unspecified	Kidney problems	(Shabangu, 2021)
Momordica charantia L.	Cucurbitaceae	Nku-yakheplantane (Ba)	Unspecified	Infusion	Oral, topical	Aphrodisiac	(Mataha, 2021)
Momordica foetida Schumach.	Cucurbitaceae	Nku-yakhesotho (Ba)	Tuber	Ground	Oral, topical	Aphrodisiac	(Mataha, 2021)
Moringa oleifera Lam.	Moringaceae	Morinka (Ba)	Unspecified	Infusion	Oral, topical	Aphrodisiac	(Mataha, 2021)
Mundulea sericea (Willd.) A.Chev.	Fabaceae	Mundulea (Z)	Roots/bark	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Musa acuminata Colla	Caryophyllaceae	Ubhanana (Z)	Roots	Decoction	Oral	HIV/AIDS	(De Wet et al., 2012)
Myrothamnus flabellifolia Welv.	Myrothamnaceae	Bergboegoe (AFR)	Bark/stem	Unspecified	Unspecified	Aphrodisiac	(Nzue, 2009)
		Tsoga, Makgonatsohle (SEP)	Whole plant	Ground	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)
		Boka (SEP)		Ground, infusion			(Semenya and Potgieter, 2014b)
				Decoction		Aphrodisiac	(Semenya et al., 2013)
						HIV/AIDS	(Semenya et al., 2013a); (Semenya et al., 2013d)
Nicotiana glauca Graham	Solanaceae	Unspecified	Roots	Decoction	Oral	Gonorrhoea, syphilis	(Maema et al., 2019)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Nidorella ivifolia (L.) J.C.Manning & Goldblatt	Asteraceae	Meidebos, perskebos (AFR)	Unspecified	Unspecified	Unspecified	Bladder infections	(De Beer and Van Wyk, 2011)
Notobubon galbanum (L.) Magee	Apiaceae	Bergseldery (AFR)	Leaves/stem	Unspecified	Unspecified	Bladder, kidney problems	(Nzue, 2009)
Nymphaea nouchali Burm.f.	Nymphaeaceae	Izibu (Z)	Unspecified	Unspecified	Unspecified	Bladder, prostate problem	(Mhlongo and Van Wyk, 2019)
Obetia tenax (N.E.Br.) Friis	Urticaceae	imbadi enkulu (Z) Imbabazane (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996) (Mhlongo and Van Wyk, 2019)
Ocotea bullata (Burch.) Baill.	Lauraceae	UmNukani (Z)	Bark	Unspecified	Unspecified	Urinary tract infections, erectile dysfunction	(Coopoosamy and Naidoo, 2012)
						Urinary problem	Ndawonde et al., (2007)
Opuntia ficus-indica (L.) Mill.	Cactaceae	Unspecified	Roots	Decoction	Oral	Gonorrhoea, chlamydia, syphilis, genital warts	(Maema et al., 2019)
		Motloro (SEP)				Gonorrhoea	(Erasmus et al., 2012) (Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b) (Semenya et al., 2012) (Semenya et al., 2013c) (Semenya et al., 2013)
						STI	(Maema et al., 2016a)
Opuntia stricta (Haw.) Haw.	Cactaceae	Umdolofiya (Z) Motoro o hwibidu (SEP)	Stem Roots/leaves	Decoction	Oral	Gonorrhoea STI	(De Wet et al., 2012) (Maema et al., 2016a)
		Unspecified	Roots			Gonorrhoea, genital warts	(Maema et al., 2019)
Ormocarpum trichocarpum (Taub.) Engl.	Fabaceae	Xisitane (MAP)	Roots	Infusion	Unspecified	Erectile dysfunction	(Tshikalange et al., 2016)
Osyris lanceolata Hochst. & Steud.	Santalaceae	Mphera (SEP)	Roots	Decoction	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a) (Semenya and Potgieter, 2014b)
						Aphrodisiac	(Semenya et al., 2013a)
Ozoroa engleri R.Fern. & A.Fern.	Musaceae	Isifice (Z)	Leaves/roots	Decoction	Oral	Gonorrhoea	(De Wet et al., 2012)
Ozoroa insignis Delile	Anacardiaceae	Monokoana (SEP)	Leaves	Unspecified	Oral	STI	(Papo et al., 2022)
Ozoroa sphaerocarpa R.Fern. & A.Fern.	Anacardiaceae	Monoko, Momoko (SEP)	Roots Bark/roots	Decoction Ground, infusion	Unspecified Oral	HIV/AIDS Erectile dysfunction	(Chauke et al., 2015) (Semenya and Potgieter, 2014b)
			Bark	Ground			(Semenya and Potgieter, 2014a)
						Aphrodisiac	(Semenya et al., 2013)
Pappea capensis Eckl. & Zeyh.	Sapindaceae	Morotolodi (Ba) Moroba diepe (SEP)	Leaves/seeds Bark	Infusion Decoction	Oral	Urinary tract Chlamydia	(Mataha, 2021) (Mathibela et al., 2019)
Parmelia sulcata	Parmeliaceae	Klipblom (AFR)	Unspecified	Infusion	Oral	Syphilis, kidney problems	(Van Wyk et al., 2008)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Pelargonium hypoleucum Turcz.	Geraniaceae	Rooirabas (AFR)	Roots	Decoction	Unspecified	Urinary tract infections	(Nortje and Van Wyk, 2015)
Pelargonium L'Hér	Geraniaceae	Selumi (SEP)	Roots	Decoction	Oral	HIV/AIDS	(Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013b)
Pelargonium ramosissimum Willd.	Geraniaceae	Dassieboegoe; dassiebos (AFR)	Unspecified	Unspecified	Unspecified	Kidney, bladder problem	(De Beer and Van Wyk, 2011)
Pelargonium triste (L.) L'Hér.	Geraniaceae	Kaneelbol (AFR)	Corm/roots	Unspecified	Unspecified	Bladder, kidney problem	(Nzue, 2009)
Peltophorum africanum Sond.	Fabaceae	Unspecified	Bark	Unspecified	Unspecified Oral	STI	(Rasethe et al., 2019) (Papo et al., 2022)
		Mosehla (SEP)	Roots/bark				(Mongalo and Makhafola, 2018)
		isikhaba-mkhom (Z)			Unspecified	STI, sterility	(Hutchings et al., 1996)
		Mosehla (SEP)		Decoction	Oral	HIV/AIDS	(Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013b)
						Erectile dysfunction	(Semenya and Potgieter, 2014a)
						HIV/AIDS, erectile dysfunction	(Semenya and Potgieter, 2014b)
						Aphrodisiac	(Semenya et al., 2013)
Pentzia incana Kuntze	Asteraceae	Skaapbos, ankerkaroo (AFR)	Leaves	Unspecified	Unspecified	Kidney pains	(De Beer and Van Wyk, 2011)
Persicaria lapathifolia (L.) Delarbre	Polygonaceae	Uxhaphozana (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Petroselinum crispum (Mill.) Fuss	Apiaceae	Morogane (SEP)	Leaves	Decoction	Oral	Cleaning the kidney	(Semenya and Potgieter, 2014b)
		Pietersielie, parsley (AFR, ENG)		Infusion		Bladder, kidney problem	(Thring and Weitz, 2006)
Philenoptera violacea (Klotzsch) Schrire	Fabaceae	Mphata Morotela (SEP)	Roots	Decoction	Oral	Chlamydia	(Mathibela et al., 2019)
Phytolacca dodecandra L'Hér.	Phytolaccaceae	ingubivumile(Z)	Leaves/roots	Unspecified	Unspecified	Urinary complaints, sterility	(Hutchings et al., 1996)
Piliostigma thonningii (Schumach.) Milne-Redh.	Fabaceae	Nkholonkhotlho (MAP)	Roots/leaves	Decoction	Unspecified	Erectile dysfunction	(Tshikalange et al., 2016)
Pittosporum viridiflorum Sims	Pittosporaceae	Umkhwenkwe, umVusamvu (Z)	Leaves	Infusion	Unspecified	Erectile dysfunction	(Asowata-Ayodele et al., 2016)
Plectranthus ciliatus E.Mey.	Lamiaceae	Sehlare sa pelo (SEP)	Roots	Unspecified	Unspecified	HIV/AIDS	Semenya and Potgieter, (2014a)
				Decoction	Oral		(Semenya et al., 2013a); (Semenya et al., 2013d)
Pouzolzia mixta Solms	Urticaceae	Moreba (TSW)	Roots	Unspecified	Unspecified	Pearly penile papules	(Asong et al., 2019)
Protea caffra Meisn.	Proteaceae	Sehlare sa pelo (SEP)	Seed	Ground, infusion	Oral	Chlamydia	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
							(Semenya et al., 2013a); (Semenya et al., 2013d)
Protorhus longifolia Engl.	Anacardiaceae	Inhluthe (Z)	Unspecified	Unspecified	Unspecified	Urinary tract infections	(Mhlongo and Van Wyk, 2019)
Prunus africana (Hook.f.) Kalkman	Rosaceae	Elimnyama (Z) Unspecified Inyazangoma (Z)	Bark	Ground Unspecified	Unspecified	HIV/AIDS Prostate hypertrophy	(Gail et al., 2015) (Rasethe et al., 2019) (Coopoosamy and Naidoo, 2012)
Prunus persica (L.) Batsch	Rosaceae	Moperekisi (SEP)	Roots	Ground, infusion Ground Decoction	Oral	Erectile dysfunction, aphrodisiac Erectile dysfunction Aphrodisiac	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b) (Semenya and Potgieter, 2014a) (Semenya et al., 2012) (Semenya et al., 2013)
Psidium guajava L.	Myrtaceae	Unspecified	Leaves	Infusion	Oral	Gonorrhoea, genital warts	(Maema et al., 2019)
Psoralea velutina E.Mey.	Fabaceae	Furweelbos (AFR)	Leaves	Unspecified	Unspecified	Kidney pain, prostate cancer	(Philander, 2011)
Pterocarpus angolensis DC.	Fabaceae	umbilo (Z)	Roots	Unspecified	Unspecified	Aphrodisiac, sterility	(Hutchings et al., 1996)
Pupalia lappacea (L.) Juss.	Amaranthaceae	isinama esibomvu sehlathi (Z)	Flowers	Poultice	Oral	Aphrodisiac	(Hutchings et al., 1996)
Pyrenacantha kaurabassana Baill.	Cactaceae	Inzema (Z)	Roots	Decoction	Oral	Genital warts	(De Wet et al., 2012)
Pyrenacantha scandens (Thunb.) Planch. ex Harv.	Icacinaceae	umsekelo (Z)	Roots	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Ranunculus hyperboreus Rottb.	Anacardiaceae	Uxhaphozi (Z)	Whole plant	Decoction	Oral	Genital sores, warts, gonorrhoea	(De Wet et al., 2012)
Ranunculus multifidus Forssk	Ranunculaceae	isijojokazana (Z)	Leaves	Poultice	Topical	Urinary tract, STI, syphilis	(Hutchings et al., 1996)
		Brandblare (AFR)	Leaves/roots	Unspecified	Unspecified	STI	(Nzue, 2009)
Raphionacme procumbens Schltr.	Apocynaceae	Dema (SEP)	Bulb	Infusion	Unspecified	Erectile dysfunction	(Tshikalange et al., 2016)
Rauvolfia caffra Sond.	Apocynaceae	Monadi (Ba)	Roots	Decoction	Oral	Aphrodisiac	(Mataha, 2021)
		Umhlambamanzi (Z)	Unspecified	Unspecified	Unspecified	Kidney, urinary tract infections	(Mhlongo and Van Wyk, 2019)
Relhania calycina subsp. lanceolata K.Bremer	Asteraceae	Broom (AFR)	Leaves	Unspecified	Unspecified	Prostate cancer	(Philander, 2011)
Rhipsalis baccifera (Sol. ex J.S.Muell.) Stearn	Cactaceae	Ugebeleweni (Z)	Unspecified	Unspecified	Unspecified	Sterility	(Mhlongo and Van Wyk, 2019)
Rhoicissus tridentata (L.f.) Wild & R.B.Drumm.	Vitaceae	isinwazi (Z)	Tubers	Unspecified	Unspecified	Sterility	(Hutchings et al., 1996)
		Mopidikwa (SEP)	Roots	Decoction		Bladder, kidney problems	(Rankoana, 2016)
		Mbhezaneleyi kulu (MAP)				STI	(Tshikalange et al., 2016)
Rhynchosia Lour.	Fabaceae	Ubangalala (Z)	Roots	Unspecified	Unspecified	Aphrodisiacs	(Hutchings et al., 1996)
Ricinus communis L.	Euphorbiaceae	Unspecified	Roots/leaves	Decoction	Oral	Gonorrhoea, chlamydia, syphilis	(Maema et al., 2019)
		Uhlakuva (Z)	Unspecified	Unspecified	Unspecified	Swollen testicles,	(Mhlongo and Van Wyk, 2019)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
						bladder, prostate, kidney problems	
		Umhlafutho(Z)				Kidney infection	(Shabangu, 2021)
		Mothoba (SEP)	Leaves		Inhalation	STI	(Papo et al., 2022)
Rumex crispus L.	Polygonaceae	Idololenkonyane (Z)	Unspecified	Unspecified	Unspecified	Kidney problems	(Shabangu, 2021)
Rumex lanceolatus Thunb.	Polygonaceae	Idololenkonyane (Z)	Rhizome	Decoction	Unspecified	Sterility	(Hutchings et al., 1996)
Rumex steudelii Hochst. ex A.Braun	Polygonaceae	Idololenkonyane (Z)	Roots	Infusion	Oral	Kidney pain	(Cocks, 1997)
Ruta graveolens L.	Rutaceae	Wynruit (AFR)	Leaves	Infusion	Unspecified	Urinary tract infections, kidney problems	(Nortje and Van Wyk, 2015)
				Decoction	Oral	Bladder, kidney problems	(Thring and Weitz, 2006)
Salacia leptoclada Tul.	Celastraceae	Amapunzana (Z)	Roots	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Salvia dentata Aiton	Lamiaceae	Bergsalie (AFR)	Unspecified	Unspecified	Unspecified	Kidney problems	(De Beer and Van Wyk, 2011)
Sambucus canadensis L.	Viburnaceae	Unspecified	Leaves	Decoction	Oral	Erectile dysfunction	(Maema, Mahlo, et al., 2016)
Sandersonia aurantiaca Hook.	Colchicaceae	ihlamvu (Z)	Corms	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
Sansevieria hyacinthoides (L) Druce	Asparagaceae	Mosekela tsebeng (TSW)	Roots	Unspecified	Unspecified	Genital warts	(Asong et al., 2019)
Sarcophyte sanguinea Sparrm.	Icacinaceae	Umavumbuka (Z)	Stem	Decoction	Oral	HIV/AIDS, Gonorrhoea, genital warts	(De Wet et al., 2012)
Scadoxus puniceus (L.) Friis & Nordal	Amaryllidaceae	Idumbe likahloyile (Z)	Unspecified	Unspecified	Unspecified	Bladder, prostate, kidney problems	(Mhlongo and Van Wyk, 2019)
Schinus molle L.	Anacardiaceae	Thoba (SEP)	Bark/roots	Decoction	Oral	Gonorrhoea	(Maema et al., 2016a)
Schkuhria pinnata (Lam.) Kuntze ex Thell.	Asteraceae	Luswielo (V)	Whole plant	Decoction	Oral	Gonorrhoea	(Mahwasane et al., 2013)
Sclerocarya birrea Hochst.	Anacardiaceae	Morula (Ba,SEP)	Bark	Infusion Decoction	Oral, topical Oral	HIV/AIDS	(Mataha, 2021) (Semenya and Potgieter, 2014b) (Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013b)
		Umganu (Z)				Gonorrhoea	(De Wet et al., 2012)
		Morula (TSW, MAP)		Unspecified	Unspecified	Genital warts STI	(Asong et al., 2019) (Shai et al., 2020)
Securidaca longepedunculata Fresen.	Polygalaceae	Unspecified	Leaves	Infusion	Oral	Aphrodisiac, sterility, STI	(Maroyi and Mosina, 2014)
		Mpesu,mamba (SEP)	Roots	Decoction		Chlamydia Aphrodisiac	(Mathibela et al., 2019) (Semenya et al., 2013)
		Mopesu (SEP)		Ground		Erectile dysfunction	(Semenya and Potgieter, 2014a)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
				Ground, infusion			(Semenya and Potgieter, 2014b)
		Mphesu (SEP)				Aphrodisiac	(Mongalo and Makhafola, 2018)
		Unspecified			Unspecified	Sterility	(Rasethe et al., 2019)
		Mupesu (V)	Bark	Unspecified		Aphrodisiac	Mphephu, (2017)
Senecio longiflorus (DC). Sch.Bip	Asteraceae	Mosiama (TSW)	Whole plant	Unspecified	Unspecified	Syphilis	(Asong et al., 2019)
Senecio serratuloides DC.	Asteraceae	Unsukumbili (Z)	Leaves	Decoction	Oral	STI, gonorrhoea, HIV/AIDS	(De Wet et al., 2012)
		Unspecified		Unspecified	Unspecified	HIV/AIDS	(Rasethe et al., 2019)
Senna didymobotrya (Fresen.) H.S.Irwin & Barneby	Fabaceae	Unspecified	Roots	Infusion	Oral	Gonorrhoea, chlamydia, syphilis, genital warts	(Maema et al., 2019)
		Morotelachosi (Ba)	Bark	Decoction		Aphrodisiac	(Mataha, 2021)
Senna italica Mill.	Fabaceae	Setlommana (SEP)	Roots	Decoction	Unspecified	STI	(Chauke et al., 2015)
		Sebetšana (SEP)			Oral	Gonorrhoea	(Erasmus et al., 2012)
		Morotela tshoshi (SEP)					(Mathibela et al., 2019)
		Mankgane (SEP)					(Semenya and Potgieter, 2014b)
							(Semenya et al., 2013a); (Semenya et al., 2013d)
		N`warimangana (MAP)			Unspecified		(Tshikalange et al., 2016)
				Unspecified		Sterility	(Rankoana, 2016)
Senna obtusifolia (L.) H.S.Irwin & Barneby	Fabaceae	Mutsheketsheke (V)	Roots	Decoction	Oral	Swollen penis	(Mahwasane et al., 2013)
Senna occidentalis (L.) Link	Fabaceae	Mochabela-nowa (Ba)	Roots	Ground	Oral, topical	Aphrodisiac	(Mataha, 2021)
Senna petersiana (Bolle) Lock	Fabaceae	Munembenembe (V)	Roots	Decoction	Oral	Sterility	(Mahwasane et al., 2013)
Seriphium plumosum L.	Asteraceae	Hotnotswortel (AFR)	Unspecified	Decoction	Unspecified	Kidney problems	(Nortje and Van Wyk, 2015)
Sesamum eriocarpum (Decne.) Byng & Christenh.	Pedaliaceae	beesduwweltjie (dubbeltjie) (AFR)	Unspecified	Unspecified	Oral	Syphilis	(Van Wyk et al., 2008)
Sesamum trilobum (Bernh.) Byng & Christenh.	Pedaliaceae	Incamashele (AFR)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Setaria megaphylla (Steud.) T.Durand & Schinz	Poaceae	Ubabe (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Sida lancifolia Burtt Davy	Malvaceae	Uvemvane (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Siphonochilus aethiopicus (Schweinf.) B.L.Burtt	Zingiberaceae	Unspecified	Bulb	Unspecified	Unspecified	HIV/AIDS	(Rasethe et al., 2019)
		African Ginger (ENG)	Unspecified			STI	(Seile et al., 2022)
Solanum aculeastrum Dunal	Solanaceae	Umthuma (X)	Roots	Decoction	Oral	Erectile dysfunction	(Bhat, 2014)
		Intuma (Z)	Unspecified	Unspecified	Unspecified	Kidney problem	(Mhlongo and Van Wyk, 2019)
		Bitterappel (AFR)	Bulb			STI	(Nzue, 2009)
		Gifapple(Z)	Fruits				(Philander, 2011)

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Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
						Urinary infections	
Solanum campylacanthum Hochst. ex A.Rich.	Solanaceae	Thola (SEP)	Roots	Unspecified	Unspecified	Erectile dysfunction	(Rankoana, 2016)
		Thola ye serolwane (SEP)	Fruits	Maceration, Decoction	Oral	Gonorrhoea	(Erasmus et al., 2012)
				Ground, maceration			(Semenya and Potgieter, 2014b)
				Decoction			(Semenya et al., 2013c)
Solanum capense L.	Solanaceae	isithuma (Z)	Leaves	Unspecified	Unspecified	Urinary complaints, warts	(Hutchings et al., 1996)
Solanum catombelense Peyr.	Solanaceae	Morola o monnyane (SEP)	Roots	Decoction	Oral	Chlamydia	(Mathibela et al., 2019)
Solanum dasyphyllum Schumach. & Thonn.	Solanaceae	Intuma (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Shabangu, 2021)
Solanum elaeagnifolium Cav.	Solanaceae	Unspecified	Roots/stem	Decoction	Oral	Gonorrhoea, chlamydia, syphilis, HIV/AIDS, genital warts	(Maema et al., 2019)
Solanum L.	Solanaceae	gifappel, vuilsiekbossie (AFR)	Roots	Decoction	Oral	Syphilis	(Van Wyk et al., 2008)
Solanum marginatum L.f.	Solanaceae	Intuma (Z)	Unspecified	Unspecified	Unspecified	Sterility	(Mhlongo and Van Wyk, 2019)
Solanum mauritianum Scop.	Solanaceae	Unspecified	Roots	Decoction	Oral	Gonorrhoea, chlamydia, syphilis, HIV/AIDS	(Maema et al., 2019)
				Maceration, decoction	Enema	Kidney problem	(Semenya et al., 2012)
		Mothola-omo-tala (SEP)	Fruit	Maceration		Cleaning kidneys	(Semenya and Potgieter, 2014b)
				Maceration, infusion	Oral		(Semenya et al., 2013)
Solanum tomentosum L.	Solanaceae	Slangbessiebos (AFR)	Unspecified	Unspecified	Unspecified	kidney problems	(De Beer and Van Wyk, 2011)
Stapelia gigantea N.E.Br	Apocynaceae	Menoanoga (TSW)	Whole plant	Unspecified	Unspecified	Molluscum contagiosum	(Asong et al., 2019)
Striga asiatica (L.) Kuntze	Orobanchaceae	Vhuri (V)	Whole plant/ roots	Decoction	Inhalation	Warts	(Mahwasane et al., 2013)
Strychnos henningsii Gilg	Loganiaceae	Umnonono (Z)	Bark	Unspecified	Unspecified	Erectile dysfunction	(Philander, 2011)
Strychnos madagascariensis Poir.	Loganiaceae	Amagulukungqa (Z)	Unspecified	Unspecified	Unspecified	Swollen testicles, aphrodisiac	(Mhlongo and Van Wyk, 2019)
Strychnos spinosa Lam.	Loganiaceae	Mowawa, Morapa (SEP)	Roots	Decoction	Unspecified	STI	(Chauke et al., 2015)
		Amahlala (Z)	Unspecified	Unspecified		Swollen testicles, aphrodisiac	(Mhlongo and Van Wyk, 2019)
Stylochaeton natalensis Schott	Araceae	Unspecified	Roots	Unspecified	Unspecified	Waist pain	(Rasethe et al., 2019)

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Table 2 (*continued*)

Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Syzygium cordatum Hochst.	Anacardiaceae	Umdoni (Z)	Bark	Decoction	Oral	Gonorrhoea	(De Wet et al., 2012)
Tabernaemontana elegans Stapf	Asteraceae	Umkhadlu (Z)	Leaves/roots	Decoction	Oral	Gonorrhoea	(De Wet et al., 2012)
Talinum crispatulum Dinter	Talinaceae	Unspecified	Roots	Unspecified	Unspecified	Kidney problem	(Rasethe et al., 2019)
Terminalia argentea Mart.	Combretaceae	Mososo (SEP)	Roots	Decoction	Unspecified	STI	(Chauke et al., 2015)
Thesium L.	Santalaceae	Witstorm (AFR)	Roots	Unspecified	Unspecified	Urinary system cleaning	(Nzue, 2009)
Trema orientalis (L.) Blume	Cannabaceae	umSekeseke (Z)	Fruits	Unspecified	Unspecified	Gonorrhoea	(Coopoosamy and Naidoo, 2012)
Tribulus terrestris L.	Zygophyllaceae	Mosehlo (SEP)	Whole plant	Decoction	Oral	Chlamydia	(Semenya and Potgieter, 2014b)
			Roots				(Semenya et al., 2013c)
Trichilia dregeana Harv. & Sond.	Meliaceae	Mutuhu (V)	Bark	Unspecified	Unspecified	Gonorrhoea, syphilis	Constant and Tshisikhawe, (2018)
		Umkhuhlu (Z)	Leaves	Decoction	Enema	Syphilis	(De Wet et al., 2012)
Trichilia emetica Vahl	Meliaceae	Mamba (SEP)	Bark	Unspecified	Unspecified	Kidney problems	(Rankoana, 2016)
		Mogotlho (MAP)	Roots			STI	(Shai et al., 2020)
Triumfetta Plum. ex L.	Malvaceae	Unspecified	Roots	Unspecified	Unspecified	HIV/AIDS	(Semenya and Potgieter, 2014b)
				Decoction	Oral		(Semenya et al., 2013a); (Semenya et al., 2013d)
							(Semenya et al., 2013b)
Typha capensis (Rohrb.) N.E.Br.	Typhaceae	Ibhuma (Z)	Unspecified	Unspecified	Unspecified	Sterility	(Mhlongo and Van Wyk, 2019)
Vachellia karroo (Hayne) Banfi & Galasso	Fabaceae	Rizaza (MAP)	Roots	Decoction	Unspecified	STI	(Tshikalange et al., 2016)
Vachellia permixta (Burtt Davy) Kyal. & Boatwr.	Fabaceae	Mosela phala (SEP)	Roots	Decoction	Oral	Chlamydia	(Mathibela et al., 2019)
Vangueria infausta Burch.	Rubiaceae	umthulwa (Z)	Unspecified	Decoction	Unspecified	Aphrodisiac	(Hutchings et al., 1996)
		Mmilo (SEP)	Roots			Sterility	(Chauke et al., 2015)
		Mabilo (MAP)		Unspecified		STI	(Shai et al., 2020)
Vangueria pygmaea Schltr.	Rubiaceae	Mmilofasane (MAP)	Leaves	Unspecified	Unspecified	STI	(Shai et al., 2020)
Vepris lanceolata (Lam.) G.Don	Rutaceae	Umozane (Z)	Unspecified	Unspecified	Unspecified	STI	(Coopoosamy and Naidoo, 2012)
Viscum capense L.f.	Santalaceae	Voelent, mistletoe (AFR)	Leaves	Unspecified	Unspecified	STI	(Philander, 2011)
Waltheria indica L.	Malvaceae	Motayabannyana (SEP)	Roots	Decoction	Oral	STI	(Chauke et al., 2015)
		Mokhutasela (SEP)				Chlamydia	(Mathibela et al., 2019)
				Unspecified			(Mongalo and Makhafola, 2018)
Warburgia salutaris (G.Bertol.) Chiov.	Canellaceae	insangu (Z)	Bark	Unspecified	Unspecified	Aphrodisiac, STI	(Hutchings et al., 1996)
		iSibhaha (Z)				STI	Ndawonde et al., (2007)
Withania somnifera (L.) Dunal	Solanaceae	Modikashope (TSW)	Whole plant	Unspecified	Unspecified	Molluscum contagiosum, syphilis, herpes simplex	(Asong et al., 2019)
		Koorshout (AFR)	Unspecified			Kidney failure	(Van Wyk et al., 2008)
Wrightia natalensis Stapf	Apocynaceae	umbengende (Z)	Roots/bark	Unspecified	Unspecified	Aphrodisiac	(Hutchings et al., 1996)

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Table 2 (*continued*)

Scientific name	Family	Common names[1]	Plant parts used	Preparation method	Administration mode	Conditions	References
Ximenia americana L.	Olacaceae	Unspecified	Root	Decoction, ground	Oral	STI, erectile dysfunction	(Semenya et al., 2013)
Ximenia caffra Sond.	Olacaceae	Umthunduluka (Z)	Roots	Decoction	Oral	Gonorrhoea	(De Wet et al., 2012)
		Unspecified				Sterility	(Maema et al., 2016a)
		Mochidi (SEP)	Leaves/roots	Unspecified		Kidneys, urinary tract problems	(Papo et al., 2022)
		Motshidikgomo (SEP)	Roots			STI	(Mongalo and Makhafola, 2018)
		Mabilofasane (MAP)	Leaves		Unspecified		(Shai et al., 2020)
Xysmalobium undulatum (L.) W.T.Aiton	Apocynaceae	Ishongwe (Z)	Unspecified	Unspecified	Unspecified	Aphrodisiac	(Mhlongo and Van Wyk, 2019)
Zantedeschia aethiopica (L.) Spreng.	Araceae	Unspecified	Roots	Unspecified	Unspecified	Chlamydia	(Rasethe et al., 2019)
Zanthoxylum capense Harv.	Rutaceae	amabelentombi (Z)	Roots	Unspecified	Unspecified	Sterility, aphrodisiac	(Hutchings et al., 1996)
		Senokomaropa (SEP)				HIV/AIDS	Semenya and Potgieter, (2014a) (Semenya et al., 2013a); (Semenya et al., 2013d)
Zanthoxylum davyi (I.Verd.) P.G.Waterman	Rutaceae	isimungumabele (Z)	Roots	Unspecified	Unspecified	STI, aphrodisiac	(Hutchings et al., 1996)
Zanthoxylum humile (E.A.Bruce) P.G.Waterman	Rutaceae	Monokwane (SEP)	Roots	Ground	Oral	Erectile dysfunction	(Semenya and Potgieter, 2014a)
				Ground, infusion		Erectile dysfunction, HIV/AIDS	(Semenya and Potgieter, 2014a); (Semenya and Potgieter, 2014b)
				Decoction		Aphrodisiac	(Semenya et al., 2013)
						HIV/AIDS	(Semenya et al., 2013a); (Semenya et al., 2013d) (Semenya et al., 2013b)
Ziziphus mucronata Willd.	Rhamnaceae	Mokgalo (SEP)	Roots	Decoction	Oral	Gonorrhoea	(Erasmus et al., 2012) (Semenya et al., 2012) (Semenya et al., 2013c)
						HIV/AIDS	(Mongalo and Makhafola, 2018)
				Infusion		Chlamydia, gonorrhoea	Semenya and Potgieter, (2014a) (Semenya et al., 2013a); (Semenya et al., 2013d)
				Unspecified		Sterility	(Maema et al., 2016a)
					Unspecified	STI	(Rasethe et al., 2019)

[1] Common names: AFR = Afrikaans, Ba-Balubedu, ENG = English, MAP = Mapulana, TSW = Batswana, V = Venda, SEP = Sepedi, X = Xhosa, Z = Zulu.

popular based on high number of citations (3−20), availability in provinces (2−7) and uses (2−12) for managing multiple health conditions in male (Table 2). The relatively high frequency of citation for most commonly used plants could indicate their effectiveness against diverse male diseases/conditions.

Furthermore, *H. hemerocallide*a (Ndawonde et al., 2007; Nzue, 2009; Philander, 2011; De Wet et al., 2012; Semenya et al., 2013a; Gail et al., 2015; Asong et al., 2019; Mhlongo and Van Wyk, 2019; Shabangu, 2021), *E. elephantina* (Semenya et al., 2013a; Mongalo and Makhafola, 2018; Asong et al., 2019; Mathibela et al., 2019; Rasethe et al., 2019; Thinyane and Maroyi, 2019; Mataha, 2021; Shabangu, 2021) and *C. papay*a (De Wet et al., 2012; Erasmus et al., 2012; Maroyi and Mosina, 2014; Maema et al., 2016a) are reported to be used for medicinal purposes by different societies thereby suggesting their dependency, effectiveness, and the existence of an immense amount of local knowledge. Hence, these plants are promising candidates to be prioritised for future studies on efficacy and safety.

Significance and insights embedded in local plant names

Plants are generally known by their local names in every part of the world. Local names of plants could be considered as the roots of traditional plant biodiversity knowledge (Khasbagan and Soyolt, 2008). These local names always comprise a segment of the daily vocabulary of a particular language. These local names may reflect a broad spectrum of information on local uses, ecology, physiology, anatomy, pharmacognosy, chemistry and several other aspects. Most often, the local names are given based on some salient features e.g., appearance, shape, size, habit, habitat, smell, taste, colour, utility and other peculiar characters. It describes some characteristic features of the plant, in which the communities are interested. Hence, local names depend on the way that the users perceive and interact with their environment (Leyew, 2011). These local names were the manifestations of human's long-standing association with their surroundings. The local nomenclatures are often concerned only with locally observed phenomena; most of the communities have a definite system of nomenclature of their flora (Singh, 2008). It may hold important information on traditional botanical knowledge, and material and non-material use of plants (Berlin, 2014). Even though local names can give some clues about the identity of a plant species in question, the present study indicated that local names are not exactly suitable for the final identification of the plant species.

In the present review, we compiled available local names of the listed plants used by the communities as recorded in the published articles. Local names were available for most of the plants in IsiZulu, Tshivenda, Setswana, IsiXhosa, Sepedi, Afrikaans, and English (Table 2). *S. italica* and *H. hemerocallidea*, for instance, have seven local names in six different provinces. Local names vary depending on the region. While *E. autumnalis* is recognised by five local names in four provinces, *A. adianthifolia* and *E. elephantina* are known by six local names in six provinces. *C. roseus*, *Alternanthera pungens*, *A. senegalensis*, *Artemisia annua*, *Vangueria infausta* known by four local names in four provinces, *C. papaya*, *Erythrina lysistemon*, *M. plumbea*, *S. birrea*, *X. caffra* known by three local names in four provinces (Table 2).

Sometimes, a plant was called by more than one name in the same region. For example, *H. hemerocallidea* is known by three local names in the areas of Limpopo Province. In other cases, the same local name is used for more than one species. For example, the name '*Sekaname/Sekanama*' is attributed to different species, including *Drimia elata* and *D. sanguinea*; '*Imphepho*' for *Helichrysum nudifolium* and *Helichrysum odoratissimum*, '*Kooigoed*' for *H. odoratissimum* and *Helichrysum crispum*. A similar observation was evident in the region of Azilal in Morocco (Powell et al., 2014). Therefore, it is possible that many plants with the same local name are generally interchangeably and used for the same purpose. These groups of plants may have different medicinal properties or phytochemicals. This variability in the local names is linked with the variability within and across cultures and regions. This heterogeneity is strongly related to the socio-linguistic background of the users and geographical location. Similar observations have been reported in other studies conducted in the Himalayas of Nepal (Ghimire, 2008) and in New York (Ososki et al., 2007). The descriptive word to denote that character may vary in different languages or dialects. Hence, different names may be assigned to the same plant in different languages and areas. This variability and diversity of local names indicated that the identification of plant species is not precise and not exactly suitable for the final identification of the plant species. In Oriental Morocco, an ethnobotanical study revealed toxicological problems due to the misleading names associated with them (Yamani et al., 2015).

Distribution of plant families used in managing male health conditions

The recorded 337 plants were distributed into 83 families with Fabaceae (37) and Asteraceae (37), Malvaceae (14), Asparagaceae (13), Solanaceae (13), Apocynaceae (12) and Amaryllidaceae (12) having the highest number of plants used to treat male urogenital and sexual-reproductive health conditions in South Africa (Fig. 2 and Table 2). These results are similar to other ethnobotanical reviews done in South Africa which support the high utilisation of plant families such as Fabaceae and Asteraceae for different disease conditions (Steenkamp, 2003; McGaw et al., 2020; Aremu and Pendota, 2021; Chakale et al., 2021; Ndhlovu et al., 2021; Bonokwane et al., 2022; Mongalo and Raletsena, 2022). The top 10 families constituted 49% of the total cited plants, while the remaining (51%) plants were from 73 families. Furthermore, 77% of families had low representation averaging 1–4 plants per family. According to Van Wyk (2020), numerous African-endemic or closely related endemic families are among the over-represented group and that the under-representation of other plant species may be caused by variations in their regional distribution patterns. The high use of Fabaceae and Asteraceae families might be attributed to their higher abundance in the study area or due to high bioactivity, diverse therapeutic applications, and a long history in traditional medicine (Sen and Samanta, 2015; Tali et al., 2019; Gras et al., 2021). Plant species from the top two families (Fabaceae and Asteraceae) possess aphrodisiac and fertility based on ethnobotanical surveys in Ethiopia (Kareru et al., 2006) and Southern Africa (Muriuki, 2011; Kaingu et al., 2013). The dominance of some families, especially Fabaceae and Asteraceae may be due to the extensive range of their distribution across global biomes (Schmelzer and Gurib-Fakim, 2013).

Pattern of plant parts used, preparation, and route of administration methods

Based on the reviewed ethnobotanical surveys, 15 plant parts were used in the preparation of medicinal plants used to manage urogenital and sexual-reproductive health conditions among males in South Africa (Table 2). The most common plant parts were roots (33.4%), leaves (16.6%), bark (8%) and bulbs (6%) (Fig. 3). The regular use of roots and leaves for managing healthcare needs is a characteristic feature of treatments in South African traditional medicine (Asong et al., 2019; Moroole et al., 2019). Likewise, the study conducted by Feyisa et al. (2022) indicated that roots and leaves are the most commonly used plant parts for treating urological and urogenital diseases in Ethiopia. The popularity of roots as the most preferred plant part could be due to several reasons. For instance, roots are often rich in phytochemicals relative to the other parts of the plants, perception by the traditional healers that greater healing power is contained in the roots when compared to other parts (Ajao et al., 2019). However, the use of the roots is not viable as it affects plant life and is considered to be highly detrimental to the survival of the whole plant if not done sustainably (Moyo et al., 2015). Plant parts such as fruits, seeds, bulbs, and flowers which are reported to accumulate bioactive compounds are less

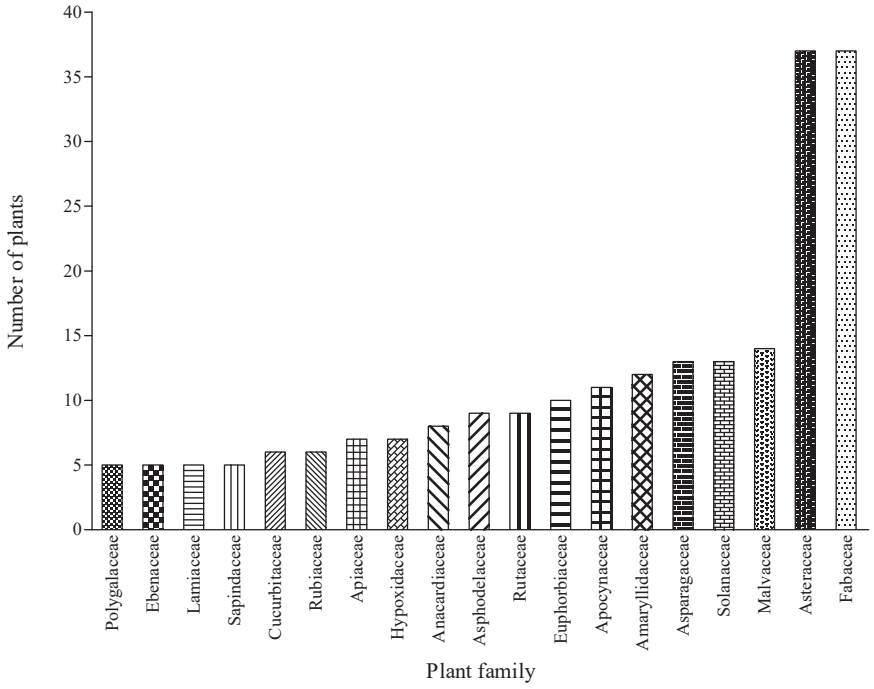

Fig. 2. The 19 dominant (with ≥5 mentions) plant families used for managing male urogenital and sexual-reproductive health conditions in South Africa. Each of the remaining 64 plant families were mentioned 1–4 plants (see Table 2 for details).

frequently used in managing male urogenital and sexual-reproductive health conditions in South Africa. In the review, approximately 18.1% of the plant parts used were not specified (Table 2 and Fig. 3). Therefore, in order to ensure a thorough inventory from ethnobotanical surveys, authors must include complete descriptions of plant parts (Heinrich et al., 2018).

The recorded plants were prepared in seven different ways, decoction (44.7%) and infusion (8.3%) were the dominant methods used for preparing medicinal plants to manage male urogenital and sexual-reproductive health conditions (Fig. 4). Decoction, which is the process by which plant material is boiled in a specific amount of water to extract its bioactive compounds and allow the mixture to cool before administration was reported as the preferred preparation method. The route is easy to prepare and inexpensive, which may be responsible for their dominance in managing male urogenital and sexual-reproductive health conditions (Younis et al., 2018). However, 38.1% of the methods of preparations were not specified. There was a trend to prefer the use of water as a solvent to extract medicinal compounds from plant parts (Table 2, Fig. 4). The use of water serves as a vehicle to administer the remedies, minimise discomfort, improve taste and reduce adverse effects such as vomiting and diarrhoea (Behailu, 2010; Tugume et al., 2016). This observation is consistent with the findings from other studies on erectile/sexual dysfunction (Valentin et al., 2020). The methods of preparation are important, and they differ depending on the type of plant species, ailments being treated, plant parts used, and the site of the ailment (Ahmed et al., 2018; Weckerle et al., 2018; Ndhlovu et al., 2021). Other methods of preparation such as infusion, ground, maceration, poultice, chewing and burning had low frequencies in the range of 0.3–8.3% (Table 2, Fig. 4). Furthermore, the variation in the methods of preparation for the medicinal plants might be associated with the difference in socio-cultural beliefs and ecological conditions (Dambisya and Tindimwebwa, 2003).

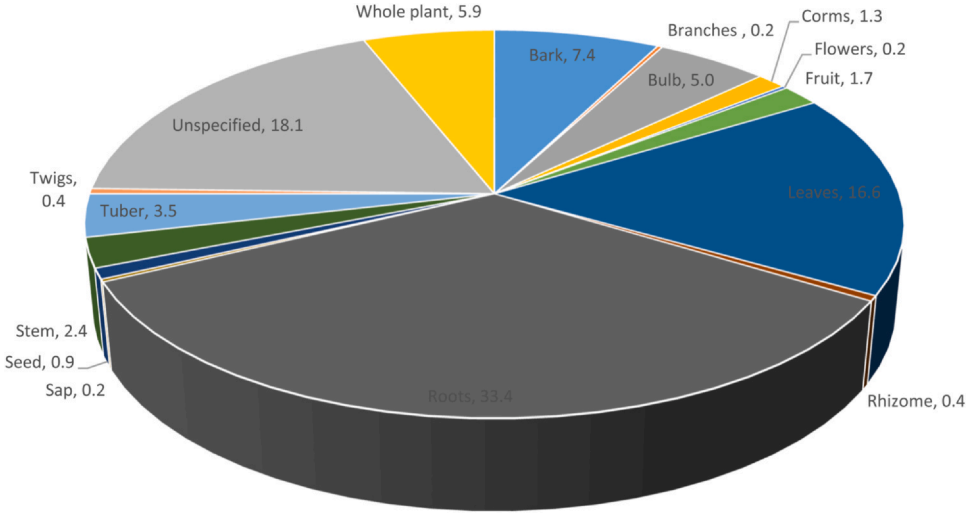

Fig. 3. Distribution (%) of plant parts used in managing male urogenital and sexual-reproductive health conditions in South Africa.

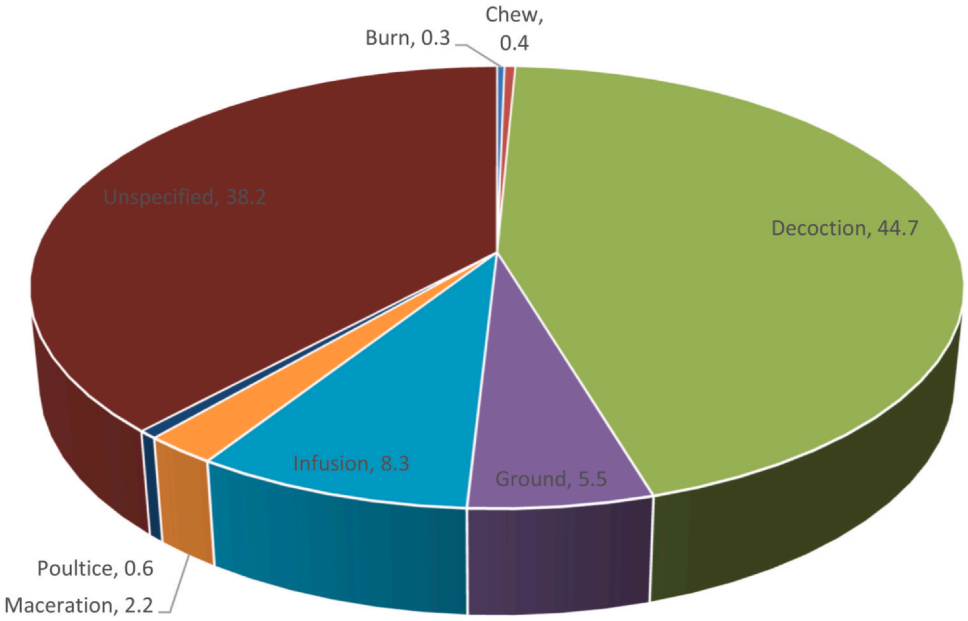

Fig. 4. Preparation method used in managing male urogenital and sexual-reproductive health conditions in South Africa.

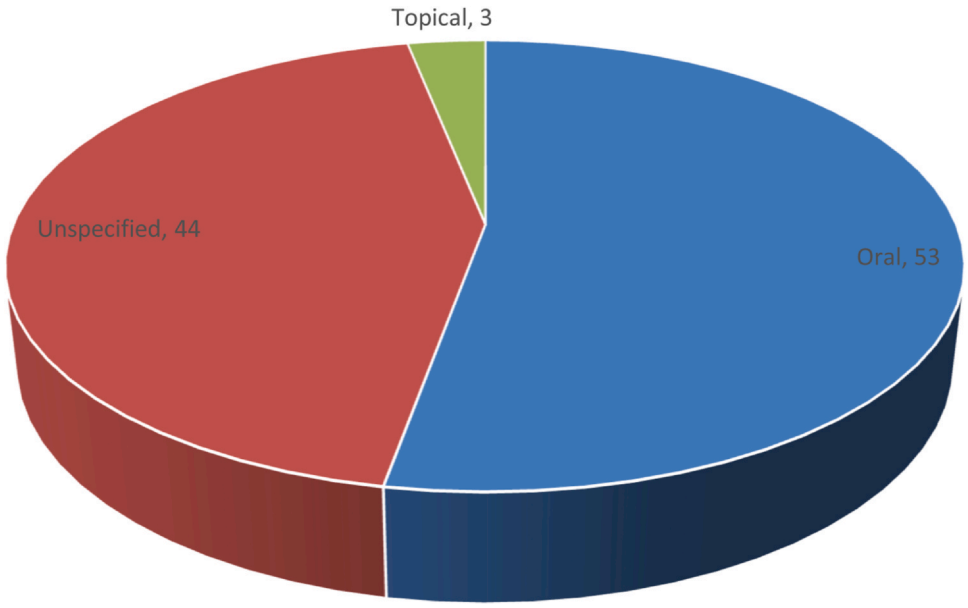

Fig. 5. Distribution (%) of the method of administrating medicinal plants in managing male health condition in South Africa.

Diverse routes of administration remedies such as enema, oral, paste and topical were reported (Table 2 and Fig. 5). Oral administration had 53% occurrence, which is consistent with the preferred mode of administration for conventional medicines (Alqahtani and Kazi, 2021). Oral administration is an effective, non-invasive, and convenient method of administration (Ahmed et al., 2018). Moreover, most of the products of decoction, infusion, and maceration are liquids, and these are easily taken orally. It is convenient, cheap, and amenable for a variety of dosage forms (Ahmed et al., 2018). Most of these remedies were taken with some food twice or three times per day and some additives including fats were also used, especially for topical application (Table 2 and Fig. 5). A similar study in the Naxi Dongba Sutras reported that wine and water were commonly used solvents (Li et al., 2021). Proper selection of plant species, and parts, as well as preparation and administration methods, are important in traditional healthcare systems (Bannister, 2006; Marshall, 2006).

Male health conditions/diseases managed with medicinal plants in South Africa

The increasing use of medicinal plants for managing male urogenital and sexual-reproductive health conditions may be attributed to cultural value and relatively easy access in many rural areas (Manhart et al., 2000; Thoma et al., 2021). Given the diverse spectrum of disorders and conditions addressed by medicinal remedies, the therapeutic uses quoted in the reviewed literature were classified into two different pathological groups (Tables 2 and 3), which fit best with the data collected in the present study and also partially taking into consideration previously standardised categorisations (Van Wyk et al., 2008; Mhlongo and Van Wyk, 2019). The classifications of diseases are often used as a proxy for estimating the epidemiological situation, particularly the preponderance of diseases and afflictions within a given community (Staub et al., 2015; Fakchich and Elachouri, 2021). Table 3

Table 3
Male urogenital and sexual-reproductive health conditions managed with medicinal plants in South Africa.

Categories	Conditions	Number of plants used
Sexual transmitted infections (STI)	Unspecified STI	66
	Gonorrhoea	62
	HIV/AIDS	55
	Chlamydia	35
	Genital warts	25
	Candidiasis	6
	Herpes simplex	3
	Molluscum contagiosum	3
	Syphilis	1
Urogenital systems	Aphrodisiac/erectile dysfunction	133
	Bladder and kidney problems	75
	Sterility	26
	Prostate problem	17
	Circumcision wound	6
	Pearly penile papules	4
	Penis enlargement	3
	Low sperm count	1
	Penile sores	1

HIV/AIDS, Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome.

presents 18 male urogenital and sexual-reproductive disorders that were extracted from the eligible studies and classified into two pathological groups (urogenital and sexually transmitted illnesses).

Overall, 266 plants were used for the treatment of urogenital systems (Table 3). Aphrodisiac/erectile dysfunction (133 plant species), bladder and kidney problems (75), sterility (26) and prostate problems (17) were the most commonly treated urogenital conditions. Aphrodisiacs/erectile dysfunction are forms of sexual dysfunction that can affect an individual or the quality of life of a couple. As a result, there will be a desire to activate sexual instincts and boost pleasure and performance (Malviya et al., 2011). Based on the reviewed eligible literature, various medicinal plants were used to treat aphrodisiacs and erectile dysfunction. Mhlongo and Van Wyk (2019) indicated that *Aloe maculata* All. and *Combretum apiculatum* Sond. are used for enhancing sexual desire. Additionally, decoctions from roots of *Athrixia phylicoides* DC. (Hutchings et al., 1996), *Ammocharis coranica* Herb. (Semenya et al., 2013a), *Bauhinia galpinii* N.E.Br. (Mahwasane et al., 2013), *B. latifolia* Spreng tubers (Shabangu, 2021), and various parts of *A. senegalensis* Pers. (Mahwasane et al., 2013) were utilised. Conditions related to prostate problems were reported to be treated with the bark of *P. africana* (Hook.f.) Kalkman (Coopoosamy and Naidoo, 2012), *H. hemerocallidea* (Shabangu, 2021) and the leaves of *Psoralea velutina* E. Mey., and *Relhania calycina* subsp. *lanceolata* K. Bremer (Philander, 2011). Kidney and bladder problems are important public health challenges globally (Abu-Aisha et al., 2009; Sumaili et al., 2009; Adeniyi et al., 2017). To address and mitigate these concerns, various medicinal plants have been reported from the eligible studies. Infusions derived from the leaves of *H. crispum* D. Don (Thring and Weitz, 2006), the roots of *B. latifolia* (Nzue, 2009; Philander, 2011), *Gunnera perpensa* L. (Nzue, 2009; Mhlongo and Van Wyk, 2019), the bulb of *H. hemerocallidea* (Philander, 2011) and *C. apiculatum* (Nzue, 2009; Mhlongo and Van Wyk, 2019) has been documented for its potential in preventing kidney and bladder problems. Various plant species have been utilised for treating erectile dysfunction and enhancing fertility. *B. latifolia* (Philander, 2011), roots of *A. coranica* Herb. (Semenya and Potgieter, 2013, 2014a), *Kohautia senegalensis* Cham. & Schltdl. (Magodielo, 2018), *A. senegalensis* (Rankoana, 2016), along with the leaves and seeds of *Anethum graveolens* L. (Asowata-Ayodele et al., 2016), and *Piliostigma thonningii* (Schumach.) Milne-Redh. (roots and leaves) (Tshikalange et al., 2016), were all prepared as decoctions for treating erectile dysfunction. Additionally, for addressing sterility, plants such as *A. senegalensis* (decoction) (Mahwasane et al., 2013), roots of *Datura stramonium* L. (Maema et al., 2016a), *Carissa bispinosa* Desf. (Chauke et al., 2015), and *Ficus sur* Forssk. (fruit and roots) (Hutchings et al., 1996) were used as enhancers.

A total of 253 plants were used for managing STI (Table 3). This pathological group is composed of sexual transmitted conditions such as candidiasis, syphilis, genital herpes or warts, chlamydia, HIV/AIDS and gonorrhoea. The STI with the high number of plants used were unspecified STI (66), followed by gonorrhoea (62), HIV/AIDS (55), chlamydia (35) and genital warts (25). To manage various STIs, the leaves of *A. senegalensis* (Gail et al., 2015), tuber of *Callilepis salicifolia* Oliv. (Semenya and Potgieter, 2014b) were used for HIV/AIDS and roots for chlamydia (Rasethe et al., 2019). Roots and leaves of *A. senegalensis* (Maroyi and Mosina, 2014; Maema et al., 2016a; Mathibela et al., 2019; Shai et al., 2020; Mataha, 2021) were either taken orally or as enema. The tuber decoction of *C. salicifolia* Oliv. (Erasmus et al., 2012), roots of *C. roseus* (L) G.Don (Erasmus et al., 2012), *C. papaya* L (Maema et al., 2016b) were used for gonorrhoea.

Leaves and roots of *C. roseus* (L) G.Don leaves (Asong et al., 2019; Maema et al., 2019) were taken for genital warts and syphilis. Sexually transmitted infections are a group of communicable diseases and the major mode of transmission is primarily through sexual contact (Garcia et al., 2023). An analysis of the literature on other settings in Africa showed that most of the observed plants in the present study were also reported in other regions to be used for the treatment of STIs (Amri and Kisangau, 2012; Chinsembu et al., 2015; Kibonde et al., 2018). Sexually transmitted infections are one of the most common reasons why people visit THPs and use herbal medicines in South Africa (De Wet et al., 2012; Hughes et al., 2021; Mutola et al., 2021).

In the review, it was evident that some plants were also used to manage conditions such as swollen testicles, pearly penile papules, circumcision wounds, penis enlargement, molluscum contagiosum and low sperm count (Tables 2 and 3). *Macrotyloma maranguense* (Taub.) Verdc., *R. communis* L., and *Agathisanthemum bojeri* Klotzsch roots were used for swollen testicles (Tshikalange et al., 2016) and *Senna obtusifolia* (L.) H.S. Irwin & Barneby roots was taken orally to treat swollen penis and testicles (Mahwasane et al., 2013). According to Asong et al. (2019), the roots of *Grewia flava* DC, *Pouzolzia mixta* Solms, *E. elephantina* and whole plant of *Helichrysum paronychioides* DC. Humbert is used to treat pearly penile papules. For circumcision wounds, infused ground leaves of *Burkea africana* Hook. (Semenya and Potgieter, 2014a), bulb of *B. disticha* Herb., and *Crossyne guttata* (L.) D.Müll.-Doblies & U.Müll.-Doblies are applied topical (Van Wyk et al., 2008; Philander, 2011). *Adansonia digitata* L. and *Choritaenia capensis* Benth., *E. lysistemon* Hutch. are used for penis enlargement (Tshikalange et al., 2016; Mataha, 2021). *Stapelia gigantea* N.E.Br., *Withania somnifera* (L.) Dunal and *C. apiculatum* Sond. are used for molluscum contagiosum (Asong et al., 2019). Decoction of *Callilepis laureola* DC. tubers is used to manage low sperm count (Semenya and Potgieter, 2014b).

Concluding remarks and future perspective

In this review, it was evident that there is substantial utilisation of medicinal plants for managing male urogenital and sexual-reproductive health conditions in South Africa, with a total of 337 plants belonging to 83 families from the 51 eligible studies. Two pathological groups (urogenital and sexually transmitted infections) with 18 male urogenital and sexual-reproductive conditions were most commonly treated. *H. hemerocallidea, E. elephantina, C. papaya*, and *C. roseus* were the most commonly used plant species. Roots, leaves, bark, and bulbs were the most common plant parts used, and the administration routes were predominantly unspecified, followed by decoction and infusion. Differences in the plant names used in many areas of South Africa must be considered, and expert opinion should be received before using plants to eliminate mis-identififcation. The

assessed eligible articles revealed the importance of ethnobotanical research to record the use of plants in managing male urogenital and sexual-reproductive healthcare needs. These traditions are widespread in South Africa and often form the core of primary male healthcare in many rural areas. Increasing the existing documentation of the ethnobotany across the ethnic groups in South Africa is essential as rapid assimilation with mainstream culture increases. Data collection aimed specifically at plants used in male healthcare needs remains limited and general ethnobotanical studies often overlook the variety and relative importance of plants used in male healthcare needs. Furthermore, the study highlighted the under-researched provinces as the Northern Cape and North West, indicating a need for detailed studies in these regions. Such investigations could yield valuable insights to promote the responsible and effective use of medicinal plants for the well-being of males. By expanding research efforts and promoting awareness of traditional medicinal knowledge, South Africa can harness the potential of its rich biodiversity to enhance healthcare practices. Despite the emerging focus on medicinal plant use for male healthcare needs throughout South Africa, the review has identified several gaps in the scientific literature. There is a need to adhere to good practices and guidelines, particularly for studies that follow standardised methods and procedures of conducting and reporting ethnobotanical and ethnopharmacological studies. Furthermore, providing accurate scientific nomenclature for plants, accurately recording and classification of the health conditions, and embracing indigenous research methodologies is pertinent to gaining in-depth cultural insight from the participants.

Ethics approval

This review article does not involve any clinical trials. The findings are based on a literature review (desktop research), and there are no patients or volunteers involved in this work.

Author contributions

MVC, ML & AOA: Conceptualization; MVC: Data curation, methodology, writing original draft preparation. ML & AOA: Supervision. ML & AOA: Writing, reviewing and editing.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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