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Assessment of Indigenous Knowledge of Medicinal Plants Practice in Makhado Local Municipality, Limpopo Province

Mahlo SM* and Machaba TC

Department of Biodiversity, University of Limpopo, South Africa

***Corresponding author:** Mahlo SM, University of Limpopo, Department of Biodiversity, School of Molecular and Life Sciences, Private BagX1106, Sovenga, 0727, South Africa, Tel: +27152684139; Email: mamokone.mahlo@ul.ac.za

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Abstract

Medicinal plants are an important source of indigenous medical systems in South Africa and across the globe. The study aimed to investigate medicinal plants used for the treatment of various ailments by the traditional health practitioners and local people. An ethnobotanical survey was conducted to identify medicinal plants used by local people and traditional health practitioners to treat various ailments in Makhado Local Municipality, Vhembe District, Limpopo, South Africa. A questionnaire was designed to gather information on the local name of plants, plant parts used and the methods of preparation and administration by the traditional health practitioners. In our findings, sixty-three medicinal plants belonging to thirty-three families were identified to be used for the treatment of various diseases in humans. Specific parts of the plant used for medicinal purposes vary from species to species and from one traditional health practitioners to another. The dominant families were Fabaceae, Celastraceae and Euphorbiaceae. Of the sixty-three plant species identified, trees were the most predominant plant form (53%), followed by shrubs (23%), herbs (14%), and climbers (10%). Root, fruit, bark, leaves, seeds and in some instances the whole plant is used for the preparation of medicine while decoction and infusion were the general methods of preparation. The mode of administration of medicine was mainly oral. The most frequently used plant species were *Warbugia salutaris* (Bertol.f.) *Chiov, Sclerocarya birrea* (A.Rich) Hochst and *Eleondron transvaalense* (Burtt Davy) R.H. Archer. The results support the traditional use of medicinal plants by the local people and traditional health practitioners in Makhado Local Municipality for the treatment of various ailments in humans.

Keywords: Medicinal Plants; Ethnobotanical survey; Indigenous Knowledge System

Introduction

Plants are used as a source of medicine; almost 50% of all commercial drugs are derived directly from the plants [1]. Drug discovery from medicinal plants led to the isolation of early drugs such as, cocaine, codeine, digitoxin and quinine of which some are still in use [2]. In South Africa, some drugs were derived from plants such as fosbretabulin and platensimycin which are used as anti-cancer drugs [3]. However, other medicinal plant-derived drugs are introduced in the market, for example, arteether a potent anti-malarial drug, Galantamine and nitisinone are used to treat a rare inherited disease such as tyrosinemia [4]. Drugs such as aspirin, ephedrine, tubocurarine, atropine are produced from *Catharanthus roseus* worldwide [5]. Though the use of medicinal plants is increasing and their importance in drug discovery, the future of these medicinal plants is being threatened and need to be conserved [6]. Almost 13% of South Africa's plant taxa are threatened with extinction [7]. *Warbugia salutaris* is an example of a highly used medicinal plant in Southern Africa and is regarded as an endangered

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species [8]. The increasing demand for herbal medicines encourages traditional health practitioners and traders to destroy the natural population of important medicinal plants; these can lead to loss of genetic diversity and natural habitat destruction [9].

Measures should be taken on the conservation, sustainable use of plant species and passing the knowledge to the next generation [10]. These can be achieved by teaching the local people and the traditional health practitioners about the sustainable ways of harvesting medicinal plants. The education of people about the sustainable use and conservation can lay an important foundation for the conservation of natural habitats of medicinal plants [8]. The elders and women should be considered in the transmission of knowledge of medicinal plant usage. People should be encouraged to harvest plant parts such as leaves, seeds and fruits for herbal preparation because they could be less destructive. The process of using cultivated medicinal plants should also be encouraged. Hamilton [8] reported that the total number of species of medicinal plants cultivated on any scale is few; most medicinal plants are collected from the wild. However, the importance of introduced medicinal plants prevents overuse of indigenous plant species [11].

Ethnobotanical surveys and documentation of medicinal plants are crucial for gaining information and preserve knowledge about medicinal plants and their uses [12]. Medicinal plants are subjected to screening and such a process could provide a lead in the discovery of novel drugs. The majority of traditional medicinal plants have not been intensively studied in African countries [13]. Furthermore, indigenous knowledge is important in the conservation of cultural traditions, community healthcare and future drug development.

In this paper, a thorough ethnobotanical survey on various plant species for the treatment of various ailments by the local people and traditional health practitioners in Makhado Local Municipality will be investigated. Ethnobotanical surveys play an important role in gathering information about plant species used for medicinal purposes and also could lead to the development of new safer and cheaper drugs. It is therefore important to document the indigenous knowledge of medicinal plants for future generations before it gets lost.

Materials and Methods

Location and Demographics of the Study Area

The study was conducted in Muduluni, Tshikwarani, Ha-Madodonga, Maebane and Ha-Manavhela of Makhado Local Municipality in Vhembe District, Limpopo Province.

Climate

Makhado Local Municipality experiences rainfall mostly in mid-summer. Rainfall ranges between 185 mm and 495 mm per year. Winter usually lasts from June to August. Summers experience warm and often humid temperatures with the occasional afternoon thunderstorms. The average temperature for summer is around 30°C whilst the winter temperature varies between 20°C to 25°C. Higher temperatures are experienced in the west and north of the mountain range.

Vegetation

Makhado Local Municipality is located in the Lowveld and consists of savannah. The fauna and flora range from savannah plains to Mopani and thorn bushveld towards the south and west of Makhado and north of the mountain. Sub-tropical vegetation and even rainforests and lakes are found towards the east.

Data Collection

Ethnobotanical Survey: The ethnobotanical survey was conducted in Makhado Local Municipality, Vhembe District, Limpopo Province. Permission to conduct the research was obtained from local authorities, in order to access the communities. Before conducting the survey, the informants were given a consent form to complete before providing the information on the medicinal plants. Twenty informants (25 traditional health practitioners and 5 the local people) from different areas were selected using the snowball method. Data was collected using a semi-structured questionnaire and guided fieldwork with traditional health practitioners. A questionnaire was designed to gather information on the names of plants used for the treatment of human ailments, the source of these plants, the part/s of plants used, and methods of preparation of medications, diagnosis of different ailments and other information.

Plant Collection and Identification: Plants were collected from their natural habitat from Soutpansberg West Mountain and five local villages in Makhado Municipality, South Africa during April 2015-May 2016 with the help of traditional health practitioners. Collected plants were identified using the literature and herbarium. Voucher specimens were collected and deposited at the herbarium.

Data Analysis

Data were analysed using descriptive and inferential statistics such as percentages and frequencies. The frequency index of each plant species was calculated using the formula: FI= FC/N x 100, where FC is the number of participants who mentioned the use of the plant and N is the total number of informants.

Ethical Considerations

The current study was conducted in Makhado Local Municipality, and no samples were collected from animals or human beings. Each traditional healer was requested to sign a consent form approved by the University of Limpopo.

Results and Discussion

Demographic Information

Age and gender of informants: The informants were both male and female. It was found that female traditional health practitioners were dominant in the interview with 85% more than male 15%. Noticeably, the majority of healers were women and pensioners and most of them were using traditional healing practice through the ancestral calling. This is true despite a strong traditional belief that women should perform their duties at home, taking care of their families including children and elderly people. Previously, it was indicated that women have more knowledge about indigenous knowledge on the use of medicinal plants than men [14]. However, other findings reported that men were found to have knowledge of medicinal plants than women [15-16].

Most informants in this study were pensioners above the age of 65 and very few were young people between the ages of 35 and 45. These support the findings by Yineger, et al. [17] that older traditional health practitioners had greater knowledge of traditional medicine [18]. Most recently, it has been a concern that the indigenous knowledge on the use of medicinal plants is declining amongst the younger generation, which could be attributed to the low interest of the younger generation to inherit and use ethnomedicinal knowledge. Therefore, the transfer of indigenous knowledge is liable to erosion as it could vanish when knowledgeable elders pass on before the knowledge is transferred to individuals [19].

Educational Background

A survey revealed that 55% of the informants did not have formal education, 30% have acquired primary education while 15% received secondary education. The highest percentage of traditional health practitioners received primary education and few were illiterates in the study conducted in Eastern Cape Province of South Africa [20]. Other studies conducted in Ethiopia found that the majority of the informants were illiterate with 53% and those that could read and write were 33% while 13% attended grades one to four [17,21].

Experience

In our findings, most traditional health practitioners (65%) fall between 21-30 years of healing practice. Of the 20 traditional health practitioners consulted in this study, 35% have less than 10 years in healing practice. Lawal, et al. [20] found that in Eastern Cape Province of South Africa most informants had about 16-20 of experience in a traditional practice.

Consultation

Most traditional health practitioners have less than 15 consultations per month. The patients' returns if they happen not to be healed and traditional health practitioners do not have the same patients throughout; new patients also come for a consultation. People consult traditional health practitioners because they provide personalized health care that is customized to the needs, expectations of patients and also paying special respect for social and spiritual matters [22].

Legislation

A survey revealed that 75 % of traditional health practitioners were not registered with the Traditional Association for Healers. Only 25 % of traditional health practitioners were registered with the Association, the reason being that the Association has strict rules and not seeing the importance of being registered.

Methods of Plant Collection

Plant Collection

Most traditional health practitioners (60%) collect their plants from the wild while other healers cultivate some plants in their home gardens. Traditional health practitioners believe that cultivated plants have less healing powers than those found in the wild and also that the cultivated plants are contaminated with human behaviours and evil spirits. Previous studies indicated that most medicinal plants were harvested from the veld, and only a few plant species were harvested from cultivated areas [23,21]. In the current study, some traditional health practitioners are too old to collect their plant materials in the field and they prefer to buy their medicinal plants from the herbalist. In some instances, they rather hire someone to collect plants from the wild. Almost 10% of traditional health practitioners prefer self-collection. Shikwambana and Mahlo [24] found that self-collection was preferred than cultivation.

Plant species in the study area are mostly collected during winter. Traditional health practitioners collect their plants during winter because they also believe that during summer plant parts such as leaves have not reached the maturity stage to contain the healing activities, and also that the roots and bark will have more water content that will reduce the healing power. Early in winter, traditional health practitioners

collect the leaves before they are shed off from the mother plant. Mabogo, [25] reported that plant materials must be collected at the appropriate season as the active compounds of some plants vary from season to another.

Collected plants are dried in the sun, ground and put into the bottles for future use, while some plant material such as roots is dried without grounding. It was noted that traditional health practitioners store plant material in an open room on the floor for preservation. In some instances, they store plant material in the sun for an hour to avoid microbial growth. In contrast, Tabuti, et al. [26] reported that sun-drying makes medicinal plants to be potentially harmful as the fungi and bacteria may grow on the plant tissue, and due to that the process is done unhygienically on bare ground.

Traditional Healing Practice

Plant Part(S) Used: The roots were the most used plant part (49%), followed by the bark (23.3%), leaves (19.2%), bulbs and the seeds (2.7%) and the least were the stem and fruits (1%) (Figure 1). Similar results were found in other studies where the roots were frequently used plant part [27-29]. In contrast, other studies reported that the leaves were the most frequently used plant parts [24]. However, leaves do not cause any significant threat to the survival of individual plants as compared to other plant parts such as the roots, stem, bark and whole plant [30]. Herbalists and traditional health practitioners use underground plants part such as the roots and bark since they were reported to contain the highest concentration of potent healing agents [31]. The roots and other underground plant parts have a high concentration of bioactive compounds. However, harvesting the roots of herbaceous plants for medicinal purposes is not sustainable and this might have a negative impact on the survival and continuity of medicinal plants [32]. The fact that the usage of roots accounts for the highest percentage of all plant parts used in this study, may lead to the extinction of some medicinal plants.

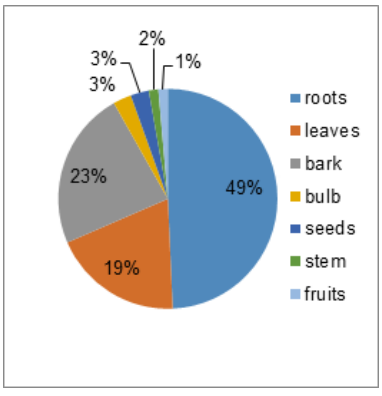

Figure 1: Plant Parts Used in Medicine.

Preparation and Treatment: The most common methods of preparation used by the traditional health practitioners are decoction (65%) and infusion (35%). The decoction is a method of choice when extracting tougher and more fibrous bark and roots because they have more water-soluble chemicals [18]. Other studies reported similar results indicating that decoction and infusion were the most frequently used methods of preparation of medicinal plants to treat various ailments [27,28]. Of all the modes of administration, the most frequently used was orally (36.9%), followed by external application 20%, bathing and mixing with soft porridge (10.8%), inhalation (9.2%), chewing (4.6%), gargling (3.1%), steaming, brushing and lotion or smear all with the lowest percentage (1.5%). The results also revealed that some medicinal plants were used in more than one mode of administration to treat various ailments, for example, a decoction of roots of *Ziziphus mucronata* is taken orally to treat diarrhoea, whereas the leaves are chewed and swallowed to relieve the pains.

Identified Medicinal Plants: In the current study, sixty-three plant species belonging to thirty-three families were identified as being used for the treatment of various ailments. The common names of plants, family names, scientific names, plant forms, plant parts used, method of preparation and administration are represented in Table 1. The most dominating families were Fabaceae 33%, followed by Celastraceae 15%, Capparaceae and Euphorbiaceae have the same percentage 12%, Anacardiaceae and Rutaceae 9%, the rest of the families have the lowest percentage of 3%. Similar results were found from other studies were Fabaceae and Euphorbiaceae were among the dominant families [33]. The most commonly used plants were *Warbugia salutaris* used for the treatment of sores. *Sclerocarya birrea* is used to treat ulcers. *Senna italica* is used to relieve backaches and to induce diarrhoea; *Elaeodendron transvaalense* is used to remove the evil spirits in people. Based on the literature, *E. transvaalense* was reported to be used to treat fever, diarrhoea, cramps and stomach cleanser [34]. *Asparagus buchananii* is used to stop a person from vomiting. In general, most medicinal plants in the current study were used for the treatment of stomach aches, diarrhoea, wounds, sore throat, ulcers, vomiting, toothaches and infertility.

Plant Forms: Of the sixty-three plant species found in this study, trees were the most predominant plant form (53%), followed by shrubs (23%), herbs (14%), and climbers (10%) (Figure 2). The most frequently used plants for medicinal purposes are tree species [35]. Other researchers found that trees were mostly used in Limpopo Province, and the use of trees and shrubs most frequently might be due to their availability throughout the year and they are relatively drought-resistant [31].

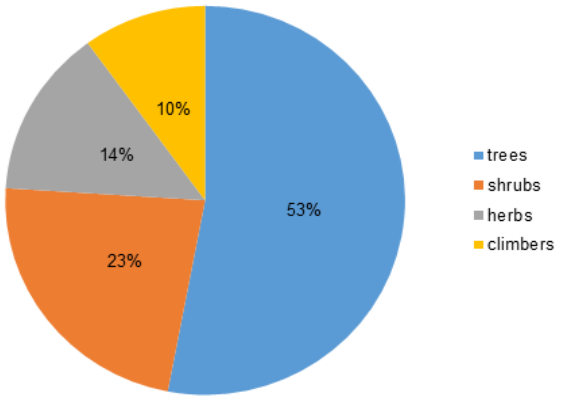

Figure 2: Plant forms used in medicine.

Frequency Index: The frequency index was directly proportional to the number of participants. These suggest that the higher the number of participants who mentioned a particular plant, the higher the frequency index. In this study, *Warbugia salutaris* was found to be the most frequently used species and is used in the treatment of sores, with a frequency index of 64.7% (Figure 3). *Warbugia salutaris* is also used as a remedy for influenza, coughs, sinus, skin complaints, aphrodisiac, backache, chest complaints, colds, malaria, diarrhoea, indigestion, fever, snake bites, pneumonia), venereal diseases, stomach ulcers [35].

Sclerocarya birrea was the second most frequently used species with a frequency of 58.8%, followed by *Elaedendron transvaalensis*. Based on the literature, S. birrea is used to treat wounds, ulcer infertility [25]. Previously, it was reported that *E. transvaalense* is used to remove evil spirits in humans, and in literature is used to treat *dysmenorrhoea* [36]. Senna italica is used to induce diarrhoea and also relieve the backaches. *Asparagus buchananii* is used to prevent vomiting, all with 52.9% frequency index. It was noted that *Withania somnifera, Adonsonia digitata, Peltophorum africanum, Capparis sepiaria* and *Ziziphus mucronata* had the same frequency index (47.1%). Previous work indicated that *W. somnifera* is also used for toning up the uterus of women who habitually miscarry [14]. The higher frequency index of these species indicates their importance for local communities [16]. The lowest frequency index (5.9%) was observed with *Tabernaemontana elegans, Bolusanthus speciosus, Cassine eucleiformis, Garcinia livingstonei, Crassula ovata, Heteropyxis natalensis, Ekebergia capensis, Acacia albida, Ochna holstii, Zanthoxylem leprieurii* and *Osyris lanceolata*.

Previous work reported that *Ekebergia capensis* is used to treat headaches and wounds [20,37], for the regulation of menstruation, and for treating venereal diseases, chronic cough, backache and skin disease [38]. However, in our findings, *Clausena anisata* was the least plant used while in literature it was found to be the species with the highest fidelity level and used by traditional health practitioners in Ethiopia to treat rheumatism [17] (Figure 3).

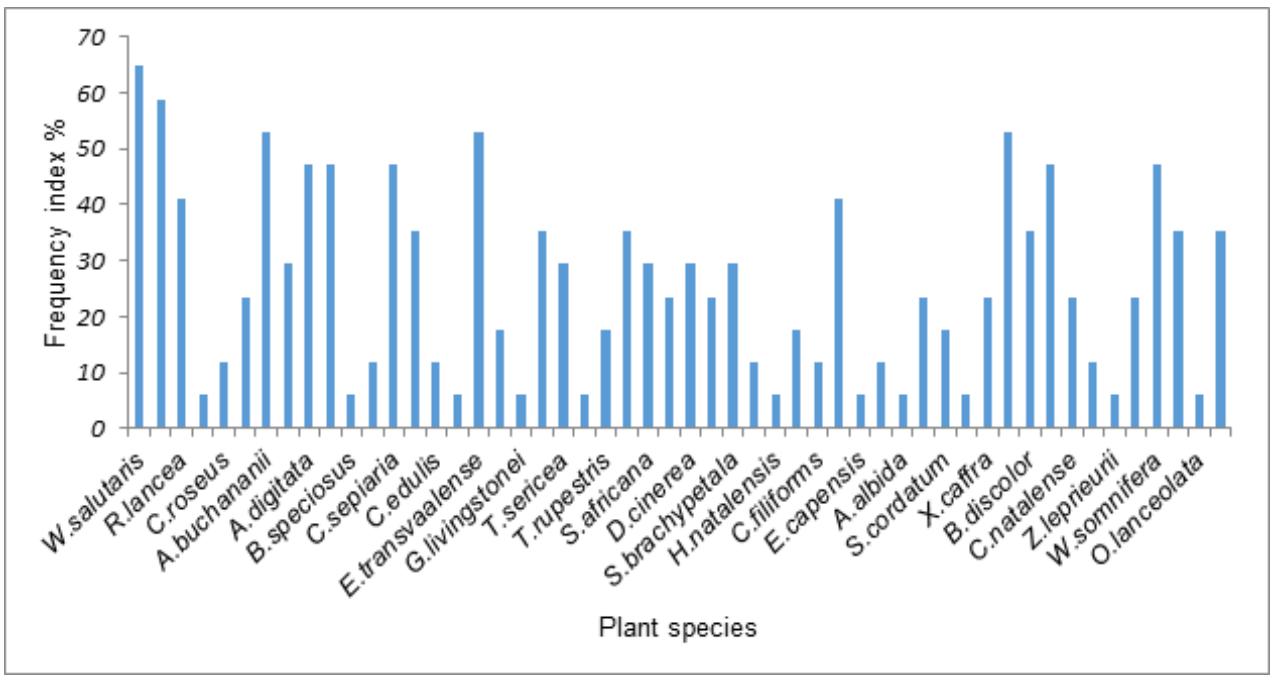

Figure 3: Frequency index of plant species used.

Family	Scientific name	Common name	Voucher number	Plant part(s) used	Uses	Mode of preparation	Plant form	Other medicinal uses in literature	References
Anacardiaceae	*Sclerocarya birrea* (A.Rich) Hochst	Mufula	TC1	Bark	Wound, infertility ulcers	The bark infusion is taken orally to treat ulcers	Tree	STIs, female infertility, sore eyes, diarrhoea and oral candidiasis	Mabogo, [25]
	Rhus lancea L. fil	Mushakaladza	TC2	Leaves	Measles and flu	The leaves are boiled and a decoction is used to bath a baby having measles, and also to steam a person having flu.	Tree	STIs	
	Schinus molle L.	Mubibiri	TC3	Leaves	Flu and sore throat	The decoction of the leaves is used to steam a person having flu covered with a blanket. A small amount of the decoction is taken orally to treat sore throat.	Tree	Malaria, jaundice, diarrheal, bloating and tonsillitis	Giday, et al. [30]
Annonaceae	*Tabernaemontana elegans* Stapf.	Muhatu	TC4	Roots	Bath	A decoction of roots is used for bathing to prevent various diseases.	Tree	Menorrhagia and sores	
Apocynaceae	*Catharanthus roseus* (L.)G. Don.	Unknown	TC5	Roots	Toothache and ulcer	A cold infusion is taken orally with a spoon to treat ulcers, and the infusion of roots is gargled to treat toothaches.	Herb	Stomach problems, breast cancer and hypertension	De Wet, et al. [37]

Asclepladaceae	*Pentarrhinum insipidum* E. Mey.	Phulule	TC6	Roots	Fat	A decoction of roots is used to bath a baby to grow stronger and fat.	Climber		
Asparagaceae	*Asparagus buchananii* Bak.	Mufhaladza-makole	TC7	Roots	Vomiting	A decoction of the roots is drunk using a cup to prevent vomiting.	Shrub	Amenorrhoea	Arnold & Gulumian [39]
	Albuca seineri (Engl. & K.Krause) J.C Manning & Goldblatt	Kgofakgofane	TC8	Bulb and leaves	Wounds (*tshifula*)	The decoction of the bulb is used externally on the wound	Herb		
Asteraceae	*Kleinia longiflora DC.*	Muvhale	TC9	Stem	Wounds and pains	The stem is ground and boiled and allowed to cool then applied *(u kanda*) on the wounds and painful part of the body.	Shrub	Menstrual disorder and mental illnesses	
Aizoaceae	*Carpobrotus edulis* (L.) L. Bolus	Unknown	TC10	Leaves	Toothache	The fleshy leaves are chewed and spit off to relief the toothache	Herb	Tuberculosis , candidiasis	Masevhe, et al. [31]
Bombacaceae	*Adansonia digitata* L.	Muvhuyu	TC11	Roots	Fat	The roots infusion is used to bath a baby to be fat.	Tree	Dysentery, diarrhoea	Chinsem,bu et al. [40]
Canellaceae	*Warbugia salutaris* (Bertol.f.) Chiov.	Mulanga	TC12	Bark	Sores	A decoction of the bark is taken orally to treat sores.	Tree	Malaria, Venereal disease, sinus, respiratory complaints, stomach pain, skin complaints, stomach ulcers and skin sores	Mabogo, [25]

Capparaceae	*Maerua angolensis* DC.	Mutambamme	TC13	Bark	Stomach pains	An infusion of the bark is taken orally to treat stomach aches.	Tree	Fever, pains, skin rashes, sores, womb cleansing and STIs	Mothana, et al. [41]
	Maerua edulis (Gilg & Gilg-Ben.) Dewolf.	Mutshalimela	TC14	Roots and bark	Venereal diseases	The decoction of both roots and bark is taken orally to treat venereal diseases.	Shrub	Ticks	Nyahangare, et al. [42]
	Maerua juncea Pax	Mukundulela	TC15	Roots	Flu, respiratory problem	The roots decoction is taken orally treat flu.	Climber/ shrub	Tuberculosis	Chinsembu, et al. [40]
	Capparis sepiaria Lam.	Muobadali	TC16	Roots and bark	Homestead protection, infertility	Infusion of bark and roots is used to treat infertility.	Shrub	Infertility, lice and bleeding after delivery	Giday, et al. [30]
Celastraceae	*Maytenus heterophylla* (Eckl. & Zeyh.) Robson	Tshipandwa	TC17	Leaves and roots	Stomach pains *(tshilala)*	A decoction of both leaves and roots is given orally to a baby to treat stomach aches.	Shrub	Epilepsy	Kokwar [43]
	Catha edulis (Vahl.) Endl.	Luthadzi	TC18	Roots and leaves	Sore throat, *Tshiunza*	The infusion from the roots is used to cook soft porridge for a baby. Leaves are chewed to treat sore throat	Tree	Thrush, mouth ulcers, tuberculosis, stomach trouble and impotence	Thring, et al. [10]
	Cassine eucleiformis (Eckl. & Zeyh.)	Munamu	TC19	Roots	Diarrhoea and vomiting	Roots infusion is taken orally for children to stop diarrhoea and vomiting.	Tree		
	Elaeodendron transvaalense (Burtt Davy) R.H. Archer	Mukuvha-zwivhi	TC20	Bark	Body cleansing	A bark decoction is used for bathing to remove evil spirits.	Tree	Female infertility and dysmenorrhoea	Van Wyk [36]

	Salacia rehmannii Schinz	Dira a di bonwi	TC21	Roots and bark	Lucky	Roots and bark are grounded and burnt, the smoke is inhaled to get lucky in things that one needs, e.g. jobs	Shrub	Magical powers	Mabogo [25]
Clusiaceae	*Garcinia livingstonei* T. Anderson	Muphiphi	TC22	Roots	Stomach pains	An infusion of the roots is used to treat stomach pains.	Tree	Contraceptives	Mabogo [25]
Combretaceae	*Combretum imberbe* Wawra	Mudzwiri	TC23	Roots and leaves	Sores and *tshiunza*	Decoction of the leaves is used to treat sores and infusion of the roots is used to prepare soft porridge for the baby to prevent stomach problems.	Tree	Male dysfunction, gonorrhoea, impotent and ticks	Nyahangare, et al. [42]
	Terminalia sericea Burch.ex DC.	Mususu	TC24	Roots and bark	Sores	An infusion of roots and bark are used to treat sores.	Tree	Infertility, leg pains diarrhoea, meningitis, gonorrhoea and syphilis	Stafford GI [44], Grierson DS, et al. [45]
Crassulaceae	*Crassula ovata* (Mill.) Druce	Mubulomu	TC25	Fleshy leaves	Toothache	The fleshy leaves are chewed and spit off to treat toothaches.	Shrub	Diarrhoea, disinfecting wounds, warts and diabetes	Van Wyk [35]
Cucurbitaceae	*Momordica balsamina* L.	Tshibavhe	TC26	Leaves	Hyper tension	The decoction of the leaves is taken orally to lower the blood level	Climber	Epilepsy	Stafford, et al. [44]
Euphorbiaceae	*Tragia rupestris* Sond.	Tshitondovhe	TC27	Roots	Teething	Ground roots are used to brush the gums of a baby to enhance teething.	Herb		

	Euphorbia inaequilatera Sond.	Maswi	TC28	Roots	Toothache	The root decoction is gargled to treat the pain and bleeding teeth	Herb	Malaria	Cheikhyou seff A [46]
	Bridelia micrantha (Hochst.) Baill.	Munzere	TC29	Roots and bark	Body cleansing	The roots decoction is used for bathing.	Tree	Gonorrhoea	Mabogo [25]
	Spirostachys africana Sond.	Muonze	TC30	Bark	Nose bleed	The bark is burnt and the smoke is inhaled to treat nose bleeding.	Tree	blood purification and kidneys	Mabogo [25]
Fabaceae	*Senna petersiana* (Bolle) Lock	Munembenembe	TC31	Roots	Vomiting and stomach ache	Roots infusion is taken orally to treat stomach aches and vomiting.	Tree	Infertility	Mabogo [25]
	Dichrostachys cinerea (L.)Wright &Arn	Murenzhe	TC32	Seeds and roots	Wounds and stomach problems	The powdered seeds are used to treat the wounds and a decoction of roots is prepared with soft porridge to treat stomach problems.	Tree	Oral candidiasis, stomach ache, dysentery, malaria and sores	Chinsembu, et al. [40], DeWet, et al. [37]
	Albizia tanganyicensis Baker.	Mulelu	TC33	Roots	Body cleansing	An infusion of roots is used externally for bathing.	Tree		
	Senna italica Mill.	Murunde latshotshi	TC34	Roots	Back pain and diarrhoea	A decoction of roots is used externally (*u kanda*) to relieve the back pains, and the decoction is taken orally to induce diarrhoea.	Herb		

	Schotia brachypetala Sond.	Mulubi	TC35	Roots and bark	Relief pain	A decoction of roots and bark is used externally (*u kanda*) to relieve the pains.	Tree	Heartburns, dysentery and sores	Mabogo [25], De Wet, et al. [37]
	Bolusanthus speciosus (Bolus) Harms	Mukamba	TC36	Roots	Mis-carriage	Roots infusion is taken orally to prevent miscarriage and if an overdose is taken a person might become drunk.	Tree	Venereal diseases and epilepsy	Mulaudz, et al. [38]
	Elephantorrhiza burkei Benth.	Gumululo	TC37	Roots	Stomach disorder	An infusion of ground roots is used to prepare a soft porridge for babies to treat stomach disorders. The ground roots are used for adults (*nowa i tshi kuma*)	Shrub	Venereal diseases, amenorrhoea and candidiasis	Mulaudzi, et al. [38], Masevhe, et al. [31]
	Elephantorrhiza elephantina (Burch.) Skeels	Tshisesana	TC38	Roots	Body cleansing, stomach problems	Infusion of roots is used for bathing and taken orally to treat stomach problems.	Shrub	Diarrhoea, impotence and shingles	De Wet, et al. [37].
	Peltophorum africanum Sond.	Musese	TC39	Bark	sore throat and diarrhoea	A decoction of the bark is taken orally to treat sore throat and stops diarrhoea.	Tree	Female infertility, STIs, leg pains, sore eyes, toothach, tuberculosis, coughs and dysentery	Muregi FW, [47] Chinsembu, et al. [40]

Table 1: Medicinal plants used in Makhado Local Municipality for the treatment of various ailments.

Conclusion

Local people and traditional health practitioners in Vhembe District still rely on medicinal plants as a source of primary health care. The survey revealed that more than twenty medicinal plants used to combat various diseases have not been documented in Makhado Local Municipality. It was noted that traditional health practitioners use bark and roots to prepare the remedies. This could lead to the extinction of some of the plants due to overexploitation and deforestation. Therefore, the sustainable way of plant collection should be taught to our traditional health practitioners and local people, more especially to conserve plants that are indigenous to South Africa. They should also be encouraged to cultivate

their traditional medicinal plants in their home gardens. The indigenous knowledge of medicinal plants should also be passed to the new generation because it was found that the young generation is less knowledgeable about the medicinal plants. The valuable knowledge regarding the folk medicinal uses of plants should be recorded before it is lost completely.

Availability of Data and Materials

All data and materials are contained and described within the manuscript. Complete data will be provided upon request from the corresponding author (mamokone.mahlo@ul.ac.za). Voucher specimens were collected and placed at the herbarium, University of Limpopo, South Africa.

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