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Abstract

Background: Medicinal plants in South Africa are sources of medicine which is administered to cure existing disease in humans and livestock. Plant-derived decoctions, infusions and powders are administered to cure diseases in humans across gender and age groups. The present study was conducted to describe curative medicine derived from indigenous plants.

Materials and Methods: Structured-interviews with 100 respondents were conducted to elicit data about the indigenous plant-derived medicines administered to cure disease in human beings.

Results: Thirty eight species of medicinal plants belonging to 28 families were identified and recorded as sources of medicine administered for curative purposes. Sources of medicine were mostly herbs followed by shrubs, trees, creepers and aloe collected from the communal land. The leaves, bark, roots and bulbs were prepared into decoctions and infusions administered orally and by inhalation and ritual bath to cure varieties of diseases.

Conclusion: A rich medical ethnobotanical knowledge is observed. Curative care is offered by traditional health practitioners and ordinary community members with knowledge of plant-derived medicines. The plant-based medicines identified in the study could be tested of their efficacy, validated and used to promote primary health care services at household level.

Key words: Primary health care, remedial care, traditional health practitioner, plant medicine, Sekhukhune.

Introduction

Indigenous plant-derived medicine is the mainstay of primary health care among people who have the indigenous knowledge of plant properties and their health potential. The World Health Organization estimates that between 70-80% of the population in developing countries depends on local medicinal plants to fulfill their primary health care needs (WHO 2002). Muthee et al. (2011) found that a large percentage of the African population depends on herbal remedies for their primary health care requirements. In South Africa, more than 24000 plant species are exploited for medicinal purposes by 27 million people out of a total population of 47 million (Pallant and Steenkamp, 2008; McConnachie et al., 2013). Traditional health care in South Africa is dependent on the preparation and administration of decoctions, infusions and ritual baths to cure existing disease in human beings (Moeng and Potgieter, 2011; Coopoosamy and Naidoo, 2012; Rankoana, 2012; Van der Hoeven et al., 2013; Semenya and Potgieter, 2014; Van Vuuren, 2014).

Traditional medicine is often regarded as plant-derived medicine that contains mixtures of chemical compounds that act individually or in combination on the human body to prevent disorders and restore or maintain health (Van Wyk B-E and Wink, 2004). Plant-derived medicines are reservoirs of curative medicine. There is recent evidence from fewer studies about their use to cure tuberculosis (Gree et al., 2010; Narwadiya et al. 2011; Lawal et al., 2014) respiratory infections (York et al., 2012), HIV and AIDS (Chinsebu and Hedimbi, 2010; Omoruyi et al., 2012), reproductive health (Hossan et al. 2010) and skin disorders (De Wet et al., 2013; Afolayan et al., 2014).

The present study was designed to examine the indigenous plant-derived medicines administered to cure disease by the members of Mohlaletsi community in Sekhukhune District of Limpopo Province, South Africa. The goal of the study was to identify and document the indigenous plant species which are harvested and prepared to make medicine which is administered to cure disease in human beings. The findings of this study could be useful in developing monographs of medicinal plants which are used to make curative medicine.

Methods and Materials

Study Area

An ethnobotanical study was carried out in Mohlaletsi community in the Limpopo Province. The community is rural and covers an area of 13,235 km² with a population of about 15,881 and an average density of 87 people per km². The people speak *Sepedi*; the official language taught in schools in the area of the former Lebowa Homeland. Dwelling units consist of a mixture of traditional mud huts and conventional brick houses. Infrastructure is under development and roads are repaired, schools are improved and increased in number and health facilities are made accessible to everyone. Despite the widespread use of hospitals and clinics for provision of primary health care needs, some community members still seek curative care from traditional health practitioners. The practitioners are custodians of cultural values and have knowledge about the health conditions of their community (Rankoana, 2012; Semenya and Potgieter, 2014).

The study is based on fieldwork carried out with the assistance of Masters students in the Department of Sociology and Anthropology between January and December 2013. Data were collected from a sample of 100 community members selected in Mohlaletsi community. This sample was constituted by 95 community members and 5 traditional health practitioners. Community members were randomly selected to participate in the study. Traditional health practitioners were purposely selected in the community to share knowledge about the use of plant-derived medicines to cure existing disease in their community members. Data were collected from 46 men and 54 women in Mohlaletsi community. Traditional health practitioners were 1 male and 4 female. All the respondents were aged between 22 and 93 years. Throughout the study, the identities of the respondents were kept anonymous and the information collected was treated confidential until the end of the study. The study was conducted with the full consent of the respondents and understanding that the information collected during the study will not be used for any purpose other than publication of the results in the form of manuscript. Traditional health practitioners' trade secrets were respected.

Information was collected through structured interviews. The interview schedule was developed and validated by the School of Social Sciences Senior Degrees and Ethics Committee to collect information about the indigenous plant-derived medicines which are administered to treat human diseases. The interviews were conducted in *Sepedi*, the local dialect. The research questions were about the local names of the plant species, their habitat, parts of the plant species used, methods of preparation, administration methods and the names of disease treated. The voucher specimens for each of the plant species identified during the study were collected and submitted to the University of Limpopo Herbarium for identification. The voucher specimens have been deposited in the Herbarium. The specimens were given numbers to facilitate data analysis.

Data Analysis

Microsoft Excel 2007 version was used to generate descriptive data. A spreadsheet was used to develop a checklist of all indigenous plant species identified by the respondents. The species were recorded in their botanical names followed by the vernacular and family names. The plant parts used, preparation and administration methods and the types of diseases treated were captured.

Table 1: Plant-derived medicines administered to cure disease

Botanical name	Vernacular	Family	Part used	Condition treated
<i>Aloe ferox</i> Mill.	<i>sekgophana</i>	Asphodelaceae	leaf	stomach-ache, external sores
<i>Artemisia afra</i> Jacq.ex. Will.	<i>lengana</i>	Asteraceae	leaf	cough, flu, bronchitis, constipation
<i>Asclepias fruticosa</i> Herba.	<i>fore</i>	Asclepiadaceae	stem	tuberculosis
<i>Asparagus densiflorus</i> 'Sprengeri'	<i>lefalatša-maru</i>	Asparagaceae	root	impotency
<i>Bridelia micrantha</i> (Hochst) Baill.	<i>motsere</i>	Euphorbiaceae	bark	diarrhoea
<i>Cadaba aphylla</i> (Thinb) Wild.	<i>monna-motsho</i>	Capparaceae	root	asthma
<i>Carrisa bispinosa</i> L. Desf.	<i>mothokolo</i>	Apocanaceae	root	underweight in children, infertility, impotency
<i>Crinum macowanii</i> L.	<i>letotse</i>	Amaryllidaceae	leaf	blood, kidney, cough
<i>Dicoma gerrardii</i> (Harv. Ex. FC. Wilson)	<i>phelalegolana</i>	Asteraceae	root	cough,
<i>Dombeya rotundifolia</i> (Hochst) Planch	<i>mohlabaphala</i>	Sterculiaceae	bark	diarrhoea
<i>Elephantorrhiza elephantine</i> Burkei Benth.	<i>mošitšana</i>	Fabaceae	root	diarrhoea
<i>Eucomis autumnalis</i> (Mill) Chitt.	<i>mathuba-difala</i>	Hyacinthaceae	bulb	urinary disease, fever, venereal disease
<i>Euphorbia tirucalli</i> L.	<i>mohloko</i>	Euphorbiaceae	leaf	snakebite
<i>Faidherbia albida</i> (Delile) A.Chev.	<i>mokgaba</i>	Fabaceae	branch	infertility
<i>Gnaphalium helichrysum</i> L.	<i>mohlhlaila</i>	Asteraceae	leaf	indigestion
<i>Haemanthus sp.</i>	<i>lehome</i>	Amaryllidaceae	bulb	cough
<i>Harpagophytum procumbens</i> (Burch) DC ex. Meisin.	<i>mompate</i>	Pedaliaceae	leaf	indigestion, ease birth
C.F Hypoxix L.	<i>phela</i>	Hypoxidaceae	tuber	cough

<i>Ilex mitis</i> L.	<i>monamane</i>	Aquifoliaceae	bark	indigestion
<i>Ipomoeia albivenia</i> sp.	<i>leselahlolo</i>	Convolvulaceae	fruit	stopper
<i>Kleinia longiflorus</i> DC.	<i>mmale</i>	Euphorbiaceae	stem	sore eyes, protective medicine, toothache
<i>Lippia javanica</i> (Burm F.)	<i>mosunkwane</i>	Verbenaceae	leaf	cough, fever
<i>Lycium</i> sp.	<i>ngangi</i>	Solanaceae	root	stomach-ache, headache
<i>Peltophorum africanum</i> Sond.	<i>mosehla</i>	Fabaceae	bark	stomach-ache
<i>Raphionacme</i> sp.	<i>tsema</i>	Periplocaceae	bulb	accelerate growth
<i>Rhoicissus tridentata</i> (L.F.) Wild & Drumm.	<i>mopidikwa</i>	Vitaceae	root	bladder, kidney
<i>Ricinus communis</i> L.	<i>mohkure</i>	Euphorbiaceae	leaf	external wounds
<i>Sansevieria hyacinthoides</i> (L.) Druce	<i>mokgotle</i>	Dracaenaceae	root	haemorrhoids
<i>Scilla natalensis</i> Planch.	<i>letlojja</i>	Liliaceae	bulb	flu, diarrhoea, swollen legs
<i>Sclerocarya birrea</i> (A. Rich) Hochst.	<i>morula</i>	Anacardiaceae	bark	stomach-ache, impurity, ringworms, dysentery
<i>Senna italica</i> Mill.	<i>morotela-tšhoši</i>	Caesalpiniaceae	root	infertility
<i>Siphonochilus aethiopicus</i> (Schweif) B.L Burt	<i>serokolo</i>	Zingiberaceae	bulb	defilement,
<i>Solanum panduforme</i> Bergens.	<i>thola</i>	Solanaceae	root	impotency
<i>Syzygium cordata</i> Hochst. ex.	<i>montlho</i>	Myrtaceae	root	TB, respiratory disease
<i>Trichilia emetic</i> Vahl.subsp.	<i>mmaba</i>	Maliaceae	bark	Stomach-ache, dysentery, indigestion, kidney
<i>Urginea sorguinea</i> Shinz.	<i>sekanama</i>	Hyacinthaceae	bulb	blood diseases
<i>Warbugia salutaris</i> Bertol)	<i>molaka</i>	Canellaceae	bark	TB, cough, intestinal worms, rheumatism, arthritis
<i>Ziziphus mucronata</i> Willd.	<i>mokgalo</i>	Rhamnaceae	leaf	septic swelling, dysentery

Results and Discussion

Frequency of Identification of Sources of Plant-Derived Medicine

Medical ethnobotanical information of 38 medicinal plants belonging to 28 families was collected. The species were collected from the local wild and fields. Traditional health practitioners identified all 38 species and their medicinal uses. Of the remaining respondents, men identified 13 and women 25 species. The influence of gender and age on medicinal plant knowledge was observed. The majority (67%) of the plant species were identified by women aged between 59 and 93. The remaining percentage (33) was identified by men and women aged between 22 and 71. Awas (2007) supports these findings by showing that older people have extensive knowledge of medicinal plant use whereas Farooq et al. (2014) found that 75% of folk medicinal knowledge was derived from informants above the age of 55 years, while 25% was derived from informants between the ages of 37 and 50 years.

Of the 38 species documented, the species belonging to the family Asteraceae (*Artemisia afra*, *Dicoma gerrardii*, *Gnaphalium helichrysum*) were most frequently identified, followed by Euphorbiaceae (*Bridelia micrantha*, *Euphorbia tirucalli*, *Kleinia longiflorus*, *Ricinus communis*) and Fabaceae (*Elephantorrhiza elephantine*, *Faidherbia albida*, *Peltophorum africanum*). Of most interest was that species within the Asteraceae family were all sources of medicine to cure cough and indigestion. These findings are corroborated by ethnobotanical studies conducted by Jeruto et al. (2008), Okello et al. (2009) and Kipkore et al. (2014). The studies revealed Asteraceae, Euphorbiaceae and Fabaceae as the families with the highest number of reported sources of medicine administered by traditional health practitioners to cure diseases that attack human beings. Of the 38 plant species identified, 18 species were sources of curative medicine with more than one use. The sources of medicine administered for cough were also used to treat flu, fever, bronchitis and tuberculosis. The medicine administered for stomach-ache was also used to treat dysentery and indigestion.

The Plant Parts Harvested to Make Plant-Derived Medicine

The plant parts mostly harvested for preparation of curative medicine were the roots (11), leaves (9), bark (8), bulb (6), stem (3) followed by tuber, fruit and branch. The plant parts were harvested and prepared in different methods according to the plant part used and the disease to be treated. Exploitation of different plant parts for medicinal purposes is corroborated by scientists who attest that plant parts such as leaves, roots, bark and fruits are the major plant parts exploited to make curative medicine (Ahmad et al., 2014; Belayneh and Bussa, 2014; Lawal et al., 2014).

The bark and roots were infused into water to make the medicine ingestible orally or anally for treatment of cough, constipation and stomachache. Leaves, bark and or roots were boiled and the resulting medicine was administered orally to treat tuberculosis and cough. Plant parts were often boiled or infused into water and the resulting liquid was used to make a ritual bath to treat impotency and infertility. The bark and roots were grounded into a fine powder which was licked raw, mixed with fat or put into food to treat backache and cancer. Sometimes, incisions were made in the skin and the powdered medicine was rubbed into the incisions. The leaves were chewed and the resulting substance was used to treat pulsating fontanel and abscess. The scales, leaves and roots were boiled and the patient was let to inhale the steam for treatment of insanity, headache, blood-related diseases and defilement. These preparation methods were encountered in other ethnobotanical studies. Afolayan et al. (2014) observe twelve methods of preparation of medicine among which decoctions and infusions (Joshi et al., 2011) are most frequently identified. For Belayneh and Bussa (2014), diversification in remedial preparation is an indication of deep-rooted, long-lasting practice and know-how of traditional medicinal plants by rural communities. Administrations methods are corroborated by De Wet and Ngubane (2014) that oral administration of plant-derived medicine is the most preferred administration method among the Zulu in South Africa. The common measurement reported for decoctions and infusions was a tea-cup. This dosage form is consistent with the measurements of extracts and infusions prescribed by Bapedi traditional health practitioners by a metal tea-cup (250ml) to treat tuberculosis (Semenya & Maroyi 2013) and a ½ tea-cup for the treatment of intestinal worms and venereal diseases in Tanzania (Augustino et al. 2014).

Diseases Cured by Plant-Derived Medicine

The responses about the types of diseases cured by administration of plant-derived medicine showed that the most common diseases cured were cough, indigestion, kidney disease, diarrhoea, stomach-ache, dysentery, impotency and infertility. Fewer respondents (30%) identified ritual defilement as another health condition cured by plant-derived medicine. The responses further showed that seven species were used to make medicine to treat cough, five for kidney diseases, five for indigestion, four for diarrhoea, four for stomach-ache, three for dysentery, three for impotency, three for infertility, three for birth control, two for blood disease and three for tuberculosis. Fewer species (11%) were used singly to treat disease. This diversity of human disease strengthens the notion that traditional medicine and traditional health practitioners offer primary health care to the majority of people in the Limpopo Province (Walwyn and Maitshotlo, 2010; Rankoana, 2012; Mahwasane, 2013; Semanya and Potgieter, 2014).

Conclusion

A rich medical ethnobotanical knowledge is observed in the study. Curative care is offered by traditional health practitioners and ordinary community members with knowledge of plant-derived medicines. Fewer diseases treated by plant-derived medicine could be classified as natural diseases. Examples are flu, cough, measles, mumps and headache which are treated by the health practitioners, elders and community members who have knowledge of medicinal plant use. The plant-based medicines identified in the study could be tested of their efficacy, validated and used to promote primary health care services at household level.

References

1. Afolayan, A.J., Grierson, D.S., & Mbeng, W.O. (2014). Ethnobotanical survey of medicinal plants used in the management of skin disorders among the Xhosa communities of the Amathole District, Eastern Cape, South Africa. *J. Ethnopharmacol.* 153: 220–232.
2. Ahmad, M., Sultana, S., Fazi-i-Hadi, S., Ben-Hadda, T., Rashid, S., Zafar, M., Khan, M.A., Khan, Z.M.P., & Yaseen, G. (2014). An ethnobotanical study of medicinal plants in high mountainous region of Chail valley (District Swat-Pakistan). *J. Ethnobiol. Ethnomed.* 10:36.
3. Awas, T. (2007). Plant diversity in Western Ethiopia: Norway, PhD thesis. University of Oslo. Ecology, Ethnobotany and Conservation.
4. Belayneh, A., & Bussa, N. (2014). Ethnomedicinal plants used to treat human ailments in the prehistoric place of Harla and Dengego valleys, Eastern Ethiopia. *J. Ethnobiol. Ethnomed.* 10:18.
5. Chisembu, K.C., & Hedimbi, M. (2010). An ethnobotanical survey of plants used to manage HIV/AIDS opportunistic infections in Katima Mulilo, Caprivi region, Namibia. *J. Ethnobiol. Ethnomed.* 6:25–33.
6. Coopoosamy, R.M., & Naidoo, K.K. (2012). An ethnobotanical study of medicinal plants used by traditional healers in Durban, South Africa. *Afri. J. Pharm.* 6:818–823.
7. De Wet, H., Nicki, S. & Van Vuuren, S.F. (2013). Medicinal plants used for the treatment of various skin disorders by a rural community in northern Mpumalanga, South Africa. *J Ethnobiol. Ethnomed.* 9:51.
8. Farooq, U., Abaas, G., Saggoo, M.I.S., & Dar, M.A. (2014). Ethnobotany of some selected Monochlamydae plant species from the Kashmir Himalaya, India. *J. Med. Plant. Res.* 23:834–839.
9. Green, E., Samie, A., Obi, C.L., Bessong, P.O., & Ndip, R.N. (2010). Inhibitory properties of selected South African medicinal plants against mycobacterium tuberculosis. *J. Ethnopharmacol.* 130 1: 151–157.
10. Jeruto, P., Lukhoba, C., Ouma, G., Otieno, D., & Mutai, C. (2008). An ethnobotanical study of medicinal plants used by the Nandi people of Kenya. *J. Ethnopharmacol.* 2: 370–376.
11. Joshi, K., Joshi, R., & Joshi, A.R. (2011). Indigenous knowledge and uses of medicinal plants in Macchegaun, Nepal. *Indian J. Trad. Know.* 2: 281–286.
12. Kipkore, W., Wanjohi, B., Rone, H., & Kigen, G. (2014). A study of the medicinal plants used by the Marakwet community in Kenya. *J. Ethnobiol. Ethnomed.* 10:24.
13. Lawal, I.O., Grierson, D.S., & Afolayan, A. (2014). Phytotherapeutic information on plants used for the treatment of Tuberculosis in Eastern Cape Province, South Africa. *Ev. Comp. Alt. Med.* 2014.

14. Mahwasane, S.T., Middleton, L., & Boaduo, N. (2013). An ethnobotanical survey of indigenous knowledge on medicinal plants used by the traditional healers of the Lwamondo area, Limpopo Province, South Africa. *S Afr. J. Bot.* 88: 69–75.
15. McCannachie, M., Cowling, R.M., & Van Wilge, B.W. (2012). Evaluating the cost- effectiveness of invasive alien plant control: A case study from South Africa. *Biol Conserv.* 155: 128–135.
16. Moeng, E.T., & Potgieter, M.J. (2011). The trade of medicinal plants by .muthi shops and street vendors in the Limpopo Province, South Africa. *J Med Plant Res.* 5: 558–564.
17. Muthee, J.K., Gakuya, D.W., Mbria, J.M., Kareru, P.G., Mulei, C.M., & Njonge, F.K. (2011). Ethnobotanical study of anthelmintic and other medicinal plants traditionally used in Loitokitok District of Kenya. *J Ethnopharmacol.* 135: 15–21.
18. Okello, S.V., Nyunja, R.O., Netondo, G.W., & Onyango, J.C. (2009). An ethnobotanical study of medicinal plants used by Saboats of Mount Elgon Kenya. *Afr. J. Trad. Complement. Alt. Med.* 1:1–10.
19. Omoruyi, B.E., Bradley, G., & Afolayan, A.J. (2012). Ethnomedical survey of medicinal plants used for the management of HIV/AIDS infection among local communities of Nkonkobe Municipality, Eastern Cape, South Africa. *J. Med. Plant. Res.* 6:3603–3608.
20. Pallant, C.A., & Steenkamp, V. (2008). In vitro bioactivity of Venda medicinal plants used in the treatment of respiratory conditions. *Hum. Experi. Toxicol.* 27: 859–866.
21. Rankoana, S.A. (2012). The Use of Indigenous Knowledge for Primary Health Care among the Northern Sotho in the Limpopo Province. Ph. D. Thesis, Unpublished. Sovenga: University of Limpopo.
22. Semanya, S.S., & Potgieter, M.J. (2013). Sexually transmitted infections and their diagnoses: Bapedi experience. *Afri. Health. Scis.* 4: 1041–1047.
23. Semanya, S.S., & Potgieter, M.J. (2014). Bapedi Traditional healers in the Limpopo Province, South Africa: Their socio-cultural profile and traditional healing practice. *J Ethnobiol. Ethnomed.* 10:4.
24. Van der Hoeven, M., Osei, J., Greeff, M., Kruger, A., Faber, N., & Smuts, C. (2013). Indigenous and traditional plants: South African parents' knowledge, perceptions and uses and their children's sensory acceptance. *J. Ethnobiol. Ethnomed.* 9:78.
25. Van Vuuren, S. (2014). Microbial contamination of traditional medicinal plants sold at the Faraday *muthi* market, Johannesburg, South Africa. *S Afr. J. Bot.* 94: 95–100.
26. Van Wyk, B-E., & Wink, M. (2004). *Medicinal Plants of the World*. 1st edition. Pretoria: Briza Publications.
27. Walwyn, D., & Maitshotlo, B. (2010). The role of South African traditional health practitioners in the treatment of HIV/AIDS: A study of their practices and use of herbal medicines. *Ethiopian J. HIV. Med.* 11–16.
28. World Health Organization, 2002. *WHO Traditional Medicine Strategy 2002–2005*. Geneva: World Health Organization.
29. York, T., De Wet, H., & Van Vuuren, S.F. (2011). Plants used for treating respiratory infections I rural Maputaland, KwaZulu-Natal, South Africa. *J. Ethnopharmacol.* 135: 696–710.