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Some Ethnoremedies Used for HIV/AIDS and Related Diseases in Swaziland

Oluwole O. G. Amusan*

University of Swaziland, Private Bag 4, Kwaluseni, Swaziland

Correspondence: * **amusan@uniswacc.uniswa.sz**

ABSTRACT

Swaziland is one of the countries hardest hit by the HIV/AIDS pandemic. Traditional medicine is one of the major ways by which the scourge is being addressed. Many traditional medical practitioners (TMPs) in the country claimed that they have efficacious traditional remedies for HIV/AIDS and related diseases but there is no scientific data in support of their claims. However, since the majority of the population patronise the practice and since many TMPs claimed that their patients obtained relief from ailments associated with HIV/AIDS and were able to return to work, therefore, a review of the remedies used by the TMPs for treating the disease was carried out and is the subject of this paper. Plant materials are the main ingredients for preparing traditional medicine used for treating the disease. Fifty seven herbal remedies acclaimed to be efficacious and safe for the treatment of HIV/AIDS and related diseases in Swaziland are reviewed. Preparation of the ethnomedicines involved the use of different organs of 54 medicinal plants from 31 families. The herbal remedies were part of the remedies obtained from renowned traditional medical practitioners (TMPs) in the ethnomedical surveys conducted in the country. Most of the plants used for preparing the remedies are indigenous to Swaziland. The indigenous plants used for treating infections associated with HIV/AIDS have tremendous potential to contribute in the search for novel compounds for therapeutic purposes because their compositions have not been scientifically explored. It is recommended that the plant species should be subjected to chemical and pharmacological screenings to validate the claims of the TMPs on the efficacy and safety of the species.

Keywords: efficacy and safety, ethnomedicines, pandemic disease, prevalence

CONTENTS

INTRODUCTION

Swaziland is a small country in Southern Africa which is located between latitudes 25.6° and 27.5° S and longitudes 30.6° and 32.3° E. The country shares border with The Republic of South Africa and Mozambique. It is land-locked and it has a land area of 17363 sq kilometres. The country has a mono ethnic population which speak siSwati. The most recent census of the country indicated that it has 1,018,449 inhabitants (CSO and Macro 2008). The people treasure their cultural heritage and they believe that any infringement of their customs and traditions will invoke divine wrath (Kasenene 1993). The country is one of the nations mostly affected by the HIV/AIDS pandemic. The effect of the disease has been so devastating for the country that it had to be declared a national disaster in 1999 by the Head of State, His Majesty King Mswati III. Since then anyone in leadership position in the country has been emphasising at almost every gathering be it, social, religious, national or even at local grassroot levels in the homesteads, the need for Swazis to eradicate the disease. In 2004 the United Nations had to declare Swaziland as a priority country for HIV/AIDS intervention because of the seriousness of the situation. The UNAIDS 2004 report on the global AIDS epidemic estimates that the number of deaths per year in Swaziland has increased to 17,000 and Life expectancy has dropped from 56 years in 1986 to 35 years in 2003. The total population of Swaziland is expected to increase to 1.58 million by 2015, which will be 41% below what would be the expected number in the absence of AIDS (Sithole 2007). The population is currently 1,018,449 (CSO and Macro 2008).

Herbal medicine is one of the major ways by which the pandemic has been addressed by people living with the disease. The purpose of this review is to highlight the uses of some of the indigenous herbal remedies for the management of HIV/AIDS and its associated diseases in the country with a view to exploring the possibility of any of the remedies providing a lead to novel products that would be effective for managing the disease.

STATUS OF HIV/AIDS IN SWAZILAND

The first case of HIV/AIDS in Swaziland was reported in 1986 and since then the disease has continued to spread. The prevalence rate of the disease in the country has been

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Mini-Review

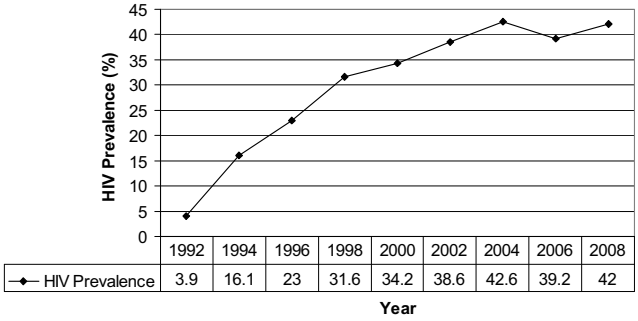

Fig. 1 Prevalence of HIV among pregnant women in Swaziland. Source: Swaziland Ministry of Health (2008).

under constant surveillance especially among pregnant women through the HIV sentinel surveillance. The HIV sentinel surveillance among pregnant women attending government and mission antenatal clinics, aged 15 to 49 years has been carried out every two years since 1992. Results of the surveillance showed that there was a rapid increase in its prevalence rate in the country until 2006 when there was a slight decline after which there was an increase again as shown in **Fig. 1**. The infection levels among pregnant women attending antenatal clinics increased rapidly from 3.9% in 1992 to 42.6% in 2004 and dropped to 39.2% in 2006 and picking up again to 42.0% in 2008 (Swaziland Ministry of Health 2008). The current infection level among pregnant women is therefore 42.0%. Apart from the constant surveillance of the prevalence rate among the pregnant women, a demographic survey involving all age groups and gender in the country was carried out recently to have a more realistic and true picture of the prevalence for the entire country. The survey, known as the Swaziland Demographic Health Survey (SDHS), came up with a prevalence of 25.9% among adults and a prevalence of 31.1% among women (CSO and Macro 2008).

The SDHS provided a very comprehensive data showing a breakdown of the prevalence of the disease for the various groups in the country. Results of the survey showed that prevalence of the disease varied for different age groups: It was lowest for those in the 10-14 years age group who had a prevalence of 2.6% and highest for those in 30-34 age group who had a prevalence of 44.6%. The prevalence rate also varied per gender: The highest prevalence among women was 49.2% and it was recorded for women of 25-29 age group, while the highest prevalence among men was 44.9% which was observed for men of 35-39 age group. Prevalence of the disease was also found to be significantly different for urban dwellers when compared with rural dwellers: Prevalence among the adult women of 15-49 years age group living in urban areas was 36.8% while women of the same age group dwelling in rural areas of the country had a prevalence of 29.1%. Similarly, adult urban men of 15-49 age group had a prevalence of 25.5% while the prevalence for rural men of the same age group was 17.3%. There was also regional variation in the prevalence rate: The Hhohho region had the highest prevalence rate of 29%, followed by Lubombo region with a prevalence of 26%, Manzini region had 25% prevalence, while Shiselweni region had the lowest prevalence of 23% (CSO and Macro 2008).

IMPACT OF HIV/AIDS PANDEMIC

The effect of the HIV/AIDS pandemic has been felt in almost every sphere of life in Swaziland. The effect of the pandemic has been very severe on the people, to say the least. It has led to thousands of deaths of middle age Swazis who were bread winners for their families. One of the direct results of the scourge is the very high number of orphans present in the country. The orphans are in tens of thousands in a country with a total population of just about one million. Results of the SDHS showed that 23.3% of the children below 18 years of age were orphans (CSO and Macro 2008). The current estimate of the number of orphans in the country is over 70,000 (Anonymous 2009). It has been projected that by 2010 the number of orphans would have increased to 120,000 (NERCHA 2004). Many homes are now headed by children as a result of the pandemic. It has had a serious impact on the economy of the country. It has been draining the economy because it is the most productive age group of the country that are the majority of the people living with the virus and dying from the pandemic. It has also led to low productivity as result of a lot of absenteeism from work due to illness. Those who are not infected with the virus are not spared from the effect of the disease as they have the great challenge of caring for orphans and the people living with the virus. The socio-economic implications of the pandemic, therefore, have been very severe in the country.

It is at the family level that the great impact of HIV/AIDS pandemic is felt the most. This is because the main burden of caring for orphans and vulnerable children (OVCs) rests primarily heavily on their immediate relatives who in most cases are grand parents. The burden rests heavily on the grand parents because they themselves are needy people as most of them are old and unemployed. The nation also feels the impact of the disease: It has been observed that it is a major obstacle to the economic and social progress of the country (Sithole 2007). The burden of caring for orphans and vulnerable children (OVCs) has also been felt by government because a large portion of the annual budget had to be committed every year to the care and education of orphans. Government has also been committing huge sums of money to different sectors created to address the pandemic. For example, government allocated E30 million for the implementation of the new national strategic plan of NERCHA and E29 million for the antiretroviral drugs rollout programme for the 2006-2007 financial year alone (Sithole 2007). Government has tried to mobilise every sector of the society including Non Governmental Organisations and Community Based Organisations in the war against the pandemic. In recognition of the importance of traditional medicine in the fight against HIV/AIDS and because NERCHA is a multisectoral body set up to coordinate the control of the disease, a traditional medical practitioner was appointed as a member of NERCHA (Mabuza 2007). One of the sectors in the country that directly feels the brunt of the pandemic is the health institution. The challenge posed by the pandemic on the formal health sector has been so enormous such that hospitals and clinics no longer have coping capacity for large numbers of patients and home management of the patients of HIV/AIDS had to be encouraged (Sukati 2002).

In quick response to the emergence of the disease in Swaziland, the government established the National AIDS Programme in 1989 to create awareness about the disease. Apart from creating awareness, government has also shown commitment in the eradication of the pandemic through many other measures and campaigns. One of the strategic measures taken by government to combat the disease was the establishment of the National Emergency Response Council on HIV/AIDS (NERCHA) in 2003 by an act of parliament with a mandate to coordinate and facilitate a national multisectoral response to the pandemic (NERCHA 2004). In spite of all these efforts made by government to combat the disease, the country continues to have high prevalence and it remains one of the sub-Saharan Africa countries that is hardest hit by the pandemic. The Minister of Health recently expressed his great concern at a community gathering about the fact that Swaziland's HIV prevalence continues to be one of the highest in the world in spite of all efforts made by government to curb the spread of the disease. He emphasised the need for men to be more involved in the fight against the scourge (Magagula 2009).

HERBAL MEDICINE IN SWAZILAND

The health care system in Swaziland is made up of two sectors: formal and informal. Latest statistics from the Ministry of Health showed that the formal sector is made up of 7 hospitals, 8 public health units, 12 health centres, 162 clinics and 187 outreach sites. In addition, there are 73 mission health facilities, 53 private clinics and 22 industry-supported health centres and clinics. This formal sector is serviced by a workforce of 184 doctors, 3070 staff nurses, 275 nurse assistants, 46 pharmacists and a number of allied health professionals and support staff (Swaziland Ministry of Health and Social Welfare 2006). The informal sector consists mostly of the traditional medical practitioners (TMPs). The informal sector is not regulated by government or any agency. The Orthodox Medical Practitioners who constitute the formal sector are in short supply and the workforce is unable to cope with the health challenges of the country, whereas, the TMPs number in their thousands and they constitute a large workforce. The ratio of TMPs to the population is 1:100 while that of doctors and nurses to the population is 1:5953 and 1:356 respectively (Swaziland Ministry of Health and Social Welfare 2006). The TMPs therefore constitute a formidable group in the country. They are very close to the people and this makes traditional medical practice to be more accessible to the people than conventional medicine. The popularity of traditional medicine in Swaziland has been highlighted in the past (Amusan 2008). Increase in the patronage of traditional medicine is likely to continue because of global economic downturn and as bodies like the World Health Organisation Africa Region continue to advocate for its promotion and its integration in the national health systems (Kasilo 2001).

Since such a large proportion of the population in Swaziland rely on traditional medicine for their medical care, one would expect information about the practice to be readily available but that is not the case. Documentation of the practice was lacking because of the perception of many elites about the practice; it has been viewed as been unscientific and primitive even though many people patronise the practice. Lack of documentation of the practice has contributed to the erosion and disappearance of indigenous knowledge used in the practice of herbal medicine (Mavimbela 2004). This anomaly has been addressed lately with the advocacy for the development of traditional medicine and its integration in the national health programme in the spirit of African renaissance. In 1996 the Inter African Committee of Experts on African Medicinal Plants and Traditional Medicine took a decision to conduct an ethnobotanical survey of Swaziland. This was in recognition of the vast biodiversity of the country and the popularity of traditional medicine. It was also part of the process of documenting indigenous knowledge on traditional medicine in the continent. The then Scientific Technical and Research Commission of the Organisation of African Unity (OAU/STRC) conducted the survey in 1998. The survey was undertaken by international experts from different parts of Africa along with scientists and TMPs from Swaziland. During the survey 86 different types of diseases were encountered and for which 190 recipes were obtained. Information about the diseases and herbal remedies for them was obtained from renowned TMPs from the four regions of the country. The survey led to the first major documentation of some knowledge and practices of traditional medicine in the country (Adeniji *et al* 2000). Herbal medicine is not peculiar to Swaziland. Since prehistoric times human being has relied on plant resources for the healing process. Ethnobotanical survey of traditional medicine is therefore very important because through ethnobotany both the current and past indigenous utilisation of plants by humans for a wide variety of primary survival and aesthetic purposes are dealt with (Cotton 1996). It is from the reports of the ethnobotany conducted in Swaziland that herbal remedies used for HIV/AIDS have been extracted for this review.

HERBAL MEDICINES FOR HIV/AIDS

Mdluli (2002) highlighted the major role of the TMPs and herbal medicine in the fight against the HIV/AIDS pandemic in the country. The TMP is the first port of call for the majority of sick people in Swaziland irrespective of the type of ailment. Traditional medicine is, therefore, usually administered to most patients in Swaziland ever before the patients seek medical assistance from conventional hospitals and clinics. Makhubu (2002, 2003) gave some sociocultural reasons for why most Swazis would take herbal remedies before consulting any orthodox medical personnel. The use of herbal remedies for HIV/AIDS and related diseases is so popular in Swaziland to the extent that one TMP claimed openly in a seminar on HIV/AIDS that he cured many people of HIV/AIDS and he showed samples of bottles of herbal remedies he used (Gule 2007). There have been many such claims by TMPs about the efficacy of traditional remedies for HIV/AIDS although there is no scientific data in support of the claims. However, since the majority of the population patronise the practice and since many TMPs claimed that their patients obtain relief from ailments associated with HIV/AIDS and were able to return to work, their claims should not be ignored but should be scientifically validated. Therefore a review of the remedies used by the TMPs for treating the HIV/AIDS and the associated diseases was carried out. The review was based on reports of all the ethnomedical surveys conducted in the country (Adeniji *et al*. 2000; Amusan *et al*. 2000, 2002, 2004, 2005a, 2005b, 2007). The use of herbal remedies as primary treatment for HIV/AIDS and related diseases is not peculiar to Swaziland; the same pattern of treatment for the disease has been reported for Africa as a whole (Mills *et al.* 2005). In Nigeria, for example, the leaf decoction of *Baissea axillaries* Hua (Apocynaceae) is used for the management of people living with HIV/AIDS and there is supportive scientific evidence in favour of its continuous usage (Abere and Agoreyo 2006). *Ageratum conyzoides* L. (Asteraceae) is another plant used for treating HIV in Nigeria (Igoli *et al*. 2005). *Ageratum conyzoides* is one the plants used in Swaziland as shown in **Table 1**. The plant is also used in Ghana in herbal medical practice and researchers have found it to have some remarkable antimicrobial properties (Hoffman *et al.* 2004). Some other documented uses of *Ageratum conyzoides* in herbal medical practice are for wound dressing, cuts, headaches, conjunctivitis, infertility, and urinary tract infection and ulcer (Iwu 1993 Amusan *et al*. 2005b).

Table 1 shows 57 herbal remedies used by the TMPs in Swaziland for treating HIV/AIDS and related illnesses. The recipes were prepared using plant resources as the main ingredients. The table indicates the medicinal plants used. The plants are arranged in alphabetical order of their scienti-fic names followed by the siSwati names, family, part of the plant used, and mode of administration and therapeutic use. Although the TMPs had no scientific way of diagnosing patients infected with HIV/AIDS, they recognised and could describe symptoms of diseases associated with the infection. Their treatment of the disease as with other diseases is symptomatic. Some of the diseases they identified as been associated with HIV/AIDS were diarrhoea, loss of weight, loss of energy, pubic lice, persistent cough, chronic penile ulcer, urethral discharge, gonorrhoea and other venereal diseases, rashes and sores all over the body. It was these diseases associated with AIDS the TMPs treated with their herbal remedies as shown in **Table 1**. They also had remedies that would boost the immune system of their patients. Most of the remedies were administered orally either in form of decoction, concoction or infusion. The TMPs claimed that the immune system of their patients improved greatly. Although they had no way of determining the immune status of patients but they claimed that evidence of the boosting of the immune system of their patients was through their physical observation of their patients becoming revigourised, gaining weight and being able

Table 1 Some medicinal plants used for HIV/AIDS and related diseases.

Botanical name	siSwati name	Family	Part used	Mode of administration and use
Acanthospermum australe (Loefl.) Kuntze	*Sanama*	Asteraceae	Leaf	Take infusion orally and apply topically ashes of burnt leaves for pubic lice
Acrotome hispida Benth.	*Sisefo*	Labiatae	Leaf	Take concoction orally for gonorrhoea
Agapanthus nutans F. M. Leight	*Hlakahla*	Amaryllidaceae	Root	Take concoction orally for chronic penile ulcer
Agathisanthemum bojeri Klotzsch	*Litfondvo (licimamlilo lelidvuna)*	Rubiaceae	Bulb	Take decoction orally for as tonic and immune booster
Ageratum conyzoides L.	*Matfodlwana*	Asteraceae	Leaf	Take infusion orally for urinary tract infection
Albizia adiantifolia (Schumach.) W. F. Wight	*Inhlangushiyane*	Fabaceae	Bark	Take concoction orally for skin rashes
Aloe marlothii A. Berger	*Inhlaba*	Asphodelaceae	Leaf	Apply fresh leaf juice on open sores all over the body
Anthospermum rigidum Eckl. & Zeyh.	*Sambulela*	Plantaginaceae	Leaf	Take decoction orally for pubic lice
Artemisia afra Jacq.	*Umhlonyane*	Compositae	Leaf	Take infusion orally for cough
Aster bakerianus Burtt Davy ex C. A. Sm.	*Ludlutjana*	Asteraceae	Root	Take decoction orally for internal sores in the lower abdomen in women
Breonadia salicina (Vahl) Hepper & J. R. I. Wood.	*Umhlume*	Rubiaceae	Bark	Take decoction orally for diarrhoea
Cardiospermum halicacabum L.	*Likhambilemamba*	Sapindaceae	Stem	Take decoction orally for venereal diseases
Cephalanthus natalensis Oliv.	*Umfomfo*	Rubiaceae	Root	Take decoction orally as immune booster
Cissus quadrangularis L.	*Umhlahlamphetfu*	Vitaceae	Stem	Take decoction orally for gonorrhoea
Coddia rudis Verdc.	*Silulwane*	Rubiaceae	Bulb and root	Decoction for sores
Combretum zeyheri Sond.	*Imbondvo lemhlophe*	Combretaceae	Root	Take concoction orally for diarrhoea
Conyza ulmifolia (Burm. F.) Kuntze	*Madacaza*	Asteraceae	Leaf	Take infusion orally for cough
Cyperus fastigiatus Rottb	*Insikane*	Cyperaceae	Leaf	Take infusion orally for lower abdominal pains
Dichrostachys cinerea (L.) Wight & Arn.	*Umzilazembe*	Mimosaceae	Bark and root	Take concoction orally for cough
Diospyros lycioides Desf.	*Mvuthuza*	Ebenaceae	Leaf	Take infusion orally and apply topically for pubic lice
Elephantorrhiza elephantina (Burch.) Skeels	*Intfolwane*	Mimosaceae	Root	Take decoction orally for diarrhoea
Faurea saligna Harv.	*Sicalaba*	Proteaceae	bark	Take decoction orally and as enema for cracking of skin in groin area
Grewia caffra Meisn.	*Liklolo*	Tiliaceae	Root	Take decoction orally for venereal diseases
Grewia hexamita Burret	*Umsiphane*	Tiliaceae	Root	Take decoction orally for venereal diseases
Gunnera perpensa L.	*Gobho*	Haloragaceae	Root	Take concoction orally for uncontrollable uterine bleeding
Hypoxis acuminata Baker	*Inkhofe lenkhulu*	Hypoxidaceae	Bulb	Take concoction orally as immune booster
Hyopxis argentea Harv. ex Bak	*Inkhofe*	Hypoxidaceae	Bulb	Take decoction orally as tonic and immune booster
Hypoxis hemerocallidea Fisch. & C.A. Mey.	*Lilabatseka*	Hypoxidaceae	Bulb	Take decoction orally as tonic, immune booster, diarrhoea and all illnesses related to HIV/AIDS
Jacaranda mimosifolia D. Don	*Jacaranda*	Bignoniaceae	Bark	Take decoction orally as tonic and immune booster
Lannea edulis (Sond.) Engl.	*Tintfoholoon*	Anacardiaceae	Root	Take decoction orally for diarrhoea
Lippia javanica (Burm. F.) Spreng.	*Umsutane*	Verbanaceae	Leaf	Apply infusion on pubic area for pubic lice
Melia azedarach L.	*Umsilinga*	Meliaceae	Root	Take decoction orally for diarrhoea
Opuntia ficus-indica (L.) Mill.	*Sitokofela*	Cactaceae	Leaf	Take decoction orally for continuous cough
Ozoroa sphaerocarpa R. & A. Fernands	*Imfuce*	Anacardiaceae	Bark	Infusion taken orally for diarrhoea
Pentanisia angustitifolia Hochst.	*Umgwamiso*	Rubiaceae	Root	Take concoction orally for sores all over the body
Pentanisia prunelloides (Klotzsch ex E. & Z.) Walp.	*Licimamlilo lelibovu*	Rubiaceae	Bulb	Take concoction orally as immune booster
Platycarpha glomerata (Thunb.) Less.	*Nkonka*	Asteraceae	Bulb	Take decoction orally as immune booster
Protea roupelliae Meisn	*Sicalaba lesimnyama*	Proteaceae	Bark	Take concoction orally for chronic penile ulcer
Protea roupelliae Meisn	*Sicalaba lesimnyama*	Proteaceae	Root	Take concoction orally for urethral discharge
Prunus persica (L.) Batsch	*Umpentjisi*	Rosaceae	Bark	Take concoction orally as tonic and immune booster
Psidium guajava L.	*Umgwava*	Myritaceae	Leaf and root	Take infusion orally for diarrhoea
Rhus pentheri Zahlbr.	*Inhlangushiyane*	Anacardiaceae	Bark	Take decoction orally for skin crack
Ricinus communis L.	*Umhlafutfo*	Euphorbiaceae	Leaf	Take infusion orally for sores all over the body
Scilla nervosa (Burch.) Jessop	*Ingcino*	Hyacinthaceae	Leaf	Take infusion orally for diarrhoea
Scilla nervosa (Burch.) Jessop	*Ndwendwendwe*	Hyacinthaceae	Bulb	Take concoction orally for venereal diseases
Sclerrocarrya caffra (Sond.) Kokwaro	*Umganu*	Anacardiaceae	Bark	Take decoction orally for diarrhoea
Syzygium guineense (Willd.) DC.	*Umcozi*	Myrtaceae	Bark	Take decoction orally for diarrhoea
Teucrium riparium	*Umnunu*	Lamiaceae	Root	Take decoction orally for diarrhoea
Tragia sonderi Prain.	*Imbabatane*	Euphorbiaceae	Root	Take decoction orally and apply topically on skin rashes
Trichilia emetica Vahl	*Umkhulu*	Meliaceae	Fruit	Squeeze fruit juice to sores
Urginea altissima (linn. F) Bak.	*Silulwane*	Hyacinthaceae	Bulb and root	Take decoction orally for sores
Urginea sanguinea Schinz	*Gibizisila*	Hyacinthaceae	Bulb	Apply powder on skin for skin problem
Vernonia oligocephala (DC.) Sch.Bip. ex Walp.	*Lihlunguhlungu*	Asteraceae	Root	Take decoction orally for diarrhoea and venereal diseases
Ximenia caffra Sond	*Umtfundvuluka*	Olacaceae	Whole plant	Burn and inhale smoke weight loss
Xysmalobium undulatum (L.) Aiton f.	*Lishongwe*	Asclepiadaceae	Root	Take concoction orally for diarrhoea and urethral discharge
Xysmalobium undulatum (L.) Aiton f.	*Lishongwe*	Asclepiadaceae	Bark	Take infusion orally for chronic penile ulcer
Ziziphus mucronata Willd.	*Umlahlabantfu*	Rhamnaceae	Bark	Take decoction orally for persistent cough

to return to work after the use of the herbal remedies.

Preparation of the ethnoremedies involved the use of different organs of 54 medicinal plants from 31 families. The Rubiaceae and Asteraceae were the two families to which most of the plants used for preparing the remedies in this study belong. The Rubiaceae family contained six species while Asteraceae contained five species. The Anacardiaceae and Hyacinthaceae families had four species each. Most of the species used were indigenous to Swaziland but a few species were exotic. Examples of the few exotic ones were *Jacaranda mimosifolia* and *Psidium guajava*.

The use of *Hypoxis hemerocallidea*

The most commonly used medicinal plant for the HIV/AIDS and related illnesses was *Hypoxis hemerocallidea.* The plant was formerly known as *Hypoxis roperi.* It is generally known as African potato and as *Lilabatseka* in siSwati. The use of *H. hemerocallidea* for treating HIV and related diseases is so widespread in Swaziland that the plant has become an endangered species in the country. The plant is used in herbal medicine not only for HIV/AIDS but also for urinary infections, prostatic hypetrophy and internal cancer (Watt and Breyer-Brandwijk 1962). The plant is used in Swaziland as an all purpose remedy apart from its use for HIV/AIDS and it has some molluscicidal properties (Amusan *et al.* 1995). The plant is, therefore, in great demand and is harvested in an unsustainable manner making it an endangered species in the country. The plant belongs to the Hypoxidaceae family. Two other members of this family which were reported by TMPs as remedies for AIDS and related diseases were *Hypoxis acuminata* and *Hypoxis argentea.* It is noteworthy that the methanol extract of *Hypoxis* species has been reported by other workers to be used for the treatment of AIDS patients (Hostettmann *et al*. 2000). *H. hemerocallidea* is also used widely in South Africa and other countries of the South African Development Community (SADC) for the treatment of HIV/AIDS. It is important to note that just as it is used as an immune booster in Swaziland, it is used for the same purpose by patients of HIV/AIDS in South Africa (Mills *et al*. 2005). Rooperol was reported as an anticancer and antiretroviral drug which has been obtained from *H. hemerocallidea* (Adeniji *et al.* 2004). The secondary metabolite that is present in *H. hemerocallidea* which is closely related to rooperol is hypoxoside. Drewes *et al.* (1984) reported the isolation of hypoxocide from *H. hemerocallidea*. Hypoxoside was first isolated from another species, *Hypoxis obtusa* (Marini Bettolo *et al.* 1982). *H. obtusa* has been reported to be used for treating venereal diseases (Iwu 1993). It is the hypoxoside, a glycoside of rooperol in the plant, which is converted to roperol in the body when *H. hemerocallidea* is taken. Rooperol is, therefore, the metabolite that is the active principle of *H. hemerocallidea* (Mills *et al.* 2005). Hypoxoside is deemed as a putative non-toxic prodrug which can be used for certain malignancies, HIV infections and inflammation (Albrecht 1996). *H. hemerocallidea* also contains glycosides of β-sitosterol and stigmasterol, which are known to boost the immune system in man (Bouic *et al.* 1996, 2001, Mills *et al.* 2005). The Ministry of Health of South Africa has recommended the use of *H. hemerocallidea* for the management of HIV and the member states of the SADC also supported the use (Mills *et al.* 2005).

DISCUSSION

The flora of Swaziland is very rich and diversified in terms of the number of species present. The country is said to be one of the African countries where the overall plant diversity is known to be at the highest level (Fuggle and Rabie 1992). The most recent checklist of the flora of Swaziland indicates 3678 taxa in 3441 species included in 1124 genera and 244 families (Braun *et al*. 2004). Swazis have been conscious of the values and importance of the biodiversity of the country for a long time and one of the areas of life where the flora has been utilised extensively is in health care. **Table 1** shows the variety of species used in Swaziland for just HIV/AIDS and related diseases. Plants constitute the main components of traditional medicine in Swaziland. The need to document information on medicinal uses of African plants cannot be overemphasised because of rapid deforestation and the passing away of custodians of the indigenous knowledge on the usage of the plants. Although Africa is endowed with a rich and diversified flora, Iwu (1993) reported that the continent has the highest rate of deforestation in the world and that many of the medicinal plants become extinct before they are documented.

The widespread use of *Hypoxis* species most especially *H. hemerocallidea* for the management of HIV/AIDS and related diseases in many countries lends some credence to the claim that the plant is efficacious in the management of HIV/AIDS. This has been corroborated by the scientific findings of workers from different sites that the plant species contains hypoxoside and phytosterols which are responsible for its therapeutic actions in its use for HIV and related diseases. Results of the chemical and biological screenings of the plant indicated that there is scientific basis for use of the plant in herbal medicine for the management of HIV/AIDS. Therefore there is great potential of developing drugs from the genus for effective treatment of the pandemic. However, it must be emphasised that there is no scientific evidence to prove that *H. hemerocallidea* or any of the herbal remedies is a cure for the disease. The high prevalence rate of the disease and the number of orphans in Swaziland and the SADC region are pointers to the fact that no cure has been found for the disease. The claim of cure by TMPs is yet to be substantiated. There is no direct correlation between the prevalence rate of HIV and the widespread use of herbal remedies in the country. Although the SDHS data showed higher prevalence rate of HIV for urban dwellers than rural dwellers in the country this could be linked more to differences in type of lifestyle of the people than the use of herbal remedies. There are many other medicinal plants used in other places for the management for HIV/AIDS and related diseases. An example is *Cannabis sativa* which has been found effective for HIV/AIDS self-care symptom management in the United States of America, Africa, and Puerto Rico (Corless *et al*. 2009). It is noteworthy that *Cannabis sativa* is also used for the management of HIV/AIDS in Swaziland. This was not taken seriously when Dlamini (2004) disclosed this at a workshop because *Cannabis sativa* is known to be a drug of addiction and is illegal for anyone in Swaziland to keep it without a licence. The development of active principles in the medicinal plants to drugs would add more value to the products of the bioresources than the concoctions and other forms in which the remedies are currently presented by the TMPs.

One of the mysteries surrounding traditional medical practice is the basis of selecting the plants used by TMPs for therapy. The plants were selected by the TMPs for treating their patients through their indigenous knowledge and not through any rational or scientific basis. The basis of selection is never disclosed to either the patients or the public. In most cases the composition of the remedies are never revealed neither are patients told the side effects. This situation is subject to abuse and is one of the major disadvantages of herbal medical practice. The lack of control or regulation of herbal medical practice in the country raises matters of some serious concern which have been highlighted in the past (Amusan 2008). Nyazema (2001) rightly pointed out that although the General Assembly of the United Nations adopted guidelines for consumer protection through its resolution 39/248 of 9 April 1985 which urged governments to develop or maintain adequate standards and regulatory systems in the area of pharmaceuticals the guidelines have never been applied to herbal medicines in many countries in Africa. In Swaziland, for example, there is no regulatory body for traditional medical practice. Even in many developing countries where there is legal framework for herbal medicine, sections for the protection of

consumers are either lacking or not implemented. An example cited by Nyazema (2001) is Zimbabwe. Consumers of herbal remedies are therefore exposed to dangers of toxicity, inappropriate dosage, exploitation by charlatans, and unhygienic and other unethical practices.

CONCLUSION

The indigenous plants used for treating infections associated with HIV/AIDS in Swaziland have tremendous potential to contribute in the fight against the pandemic because they possess genetic material still to be explored. Some of the herbs do provide some therapeutic benefits as reported for *Hypoxis hemerocallidea* but their use needs to be regulated and monitored. There is need to subject plant species used for treating HIV/AIDS to scientific investigation to establish the basis of their use. Scientific and technological exploitation of the indigenous knowledge on bioresources used in preparing the ethnoremedies could lead to novel products of great benefit in the fight against the HIV/AIDS pandemic as ethnobotanical information has been found very useful in the development of drugs in the past (Farnsworth *et al.* 1985; Farnsworth 1988). The technological exploitation of the genetic resources is best tackled through collaboration in a multidisciplinary manner involving expertise from different disciplines which often work in isolation. Governments in developing countries should demonstrate political will in the promotion of development of phytomedicines from abundant indigenous bioresources the countries are endowed with. Governments should also ensure that herbal medical practice is regulated like conventional medicine for the protection of the public.

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