

**AN INVESTIGATION INTO THE TRADE OF MEDICINAL  
PLANTS BY *MUTHI* SHOPS AND STREET VENDORS IN  
THE LIMPOPO PROVINCE, SOUTH AFRICA**

by

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Dissertation submitted in fulfillment of the requirements for  
the degree

MAGISTER SCIENTIAE (Botany)

In the

Department of Biodiversity  
School of Molecular and Life Sciences  
Faculty of Science and Agriculture

University of Limpopo

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2010

## ABSTRACT

A study of the role played by *muthi* shops and street vendors on the trade of indigenous medicinal plants of the Limpopo Province was undertaken in order to develop strategies that will prevent further loss of wild population. This study further investigated the conservation status and *in situ* availability of targeted medicinal plants, as well as suitable methods to replace wild collections with cultivated ones. Existing environmental legislation was interrogated to ascertain its effectiveness in practice.

Nearly 231 medicinal plants were traded at the 16 investigated *muthi* shops and street vendors, accounting for a calculated 0.96 tonnes of plant material traded annually. Roots were the most preferred item traded. Open access communal lands are the main supply source for *muthi* markets, coupled with the destructive harvesting methods and involvement of unscrupulous middlemen in collecting medicinal material possesses a serious impact on the survival of medicinal plants. The above factors have already led to a significant decline in the availability of some species in the Limpopo Province.

The cultivation of the eight most frequently encountered medicinal species was investigated. Cultivation information provided by indigenous nurseries indicates that medicinal plant species can be cultivated.

Efforts to protect species through national and provincial legislation have been ineffective. Environmental laws were totally unknown by all of *muthi* traders interviewed. Unregulated exploitation of medicinal plants continued regardless of the fact that environmental compliance officers are aware of legislative protection given to specific species and plants in general.

Failure to stabilize the status of medicinal plants in Limpopo Province will have not only negative effect on the Province environment, but also on the overall health status of the majority of people living in Limpopo Province.

## ACKNOWLEDGEMENTS

I am grateful to my supervisor, Dr M.J. Potgieter, for his leadership, patience and excellent contributions throughout the course of my study.

This study would not have been possible without the willing and patient cooperation of the indigenous nursery managers and conservation officers and other stakeholders whom I approached during my surveys. In particular, I extend my sincere appreciation to all the traditional healers and traders I interviewed for sharing their work and insights with me, and most of all for trusting me in an environment that was hostile towards them and their activities. I would like to make special mention of Dr Tau (Traditional doctor), who was always willing to travel and discuss.

I express my gratitude to Ms Sonnette Krynauw (Formerly of the University of Limpopo) and Mr Eric Netshuingani (Thohoyandou Botanical Garden) for their assistance with the identification of specimens.

My appreciation goes to Mr D.E.N. Mabogo, Mr M.P. Tshisikawe and Mr M.L. Mankoe for constructive comments on this study.

Thanks to my wife (Pauline) for bearing with me at all times and coping when I was away for long periods especially during the weekends. I thank my parents, sisters, brothers and my ancestors for their unconditional support throughout my studies.

I express my appreciation to the following institutions for providing aid in the identification of plants: South African National Biodiversity Institute (Herbarium-Pretoria), Larry Leach Herbarium (University of Limpopo), and Thohoyandou Herbarium. Lastly I thank the Department of Economic Development, Environment and Tourism for using their equipment and time.

## DEDICATION

This dissertation is dedicated to my daughter Batsedi Bathabile Moeng for coping when I was away for long periods especially during the weekends. Daddy loves you a lot.

## DECLARATION

I declare that this dissertation hereby submitted to the University of Limpopo, for the degree of Master of Science in Botany has not previously been submitted by me for a degree at this or any other university; that this is my work in design and in execution, and that all material contained herein has been duly acknowledged

T.E Moeng

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# CHAPTER 1

## INTRODUCTION AND LITERATURE REVIEW



## **1.1 Introduction**

According to Cunningham (1985) and Shackleton *et al.* (2001), rural communities across the developing world depend greatly on indigenous natural resources for their medicinal needs. These resources are used both for medicinal purposes and to generate income. The World Health Organization estimated that 70-80% of the developing world population use traditional medicine (Olsen 1998). However, these resources are increasingly coming under pressure for reasons such as poverty, high population densities, uncontrolled access and destructive and unsustainable harvesting methods (Twine *et al.* 2003).

According to Marshall (1998), there has been an increase in medicinal plant trade at local, regional and international levels because the increase in urbanization has caused the subsistence-consumer to be distanced from harvesting areas. It has been estimated that in 1996, 20 000 tonnes of medicinal plants were consumed annually in South Africa (Mander 1998). This large amount has immensely increased pressure on habitats, resulting in numerous local extinctions (Botha *et al.* 2004). Indeed Cunningham (1998) reported that several plant species, such as wild ginger (*Siphonochilus aethiopicus*) and the pepper-bark tree (*Warburgia salutaris*) have been exploited to such an extent that they are seldom found in unprotected areas in South Africa.

## **1.2 Literature Review**

### **1.2.1 Demand for medicinal plants**

There is a world-wide trend of increasing demand, growing between 8-15% per year, for many popular, effective healing plant species in Europe, North America and Asia (Grunwald and Buttel 1996). According to Cunningham (1993), rapid urbanization and the importance of herbal medicines in African health care systems stimulated national and regional trade in Africa.

The rural sector of the black population of South Africa is particularly dependent on indigenous plant resources as these rural areas are characterized by high unemployment, insufficient government health services, and continued adherence to traditional belief systems (Huntley 1995). In spite of the fact that many rural communities have access to mobile clinics, the belief in the efficacy of herbal medicine is still strong, due to an inherent distrust in anything non

African. Furthermore, many rural communities still prefer cheaper traditional healing methods as opposed to the more expensive treatment by western practitioners (Grierson & Afoloyan 1999).

Medicinal plants have always played an important role within the traditional health care system of South Africa. It is estimated that in 1994 between 12 and 15 million or 60% of South Africans used traditional remedies from as many as 700 indigenous plant species (Meyer & Afoloyan 1995). The average South African consumer of traditional medicine uses 750 g of plant material a year. It is estimated that in South Africa, approximately 20 000 tonnes of indigenous plant material are used per annum (Mander 1998). The HIV and AIDS epidemic is also fuelling the demand for medicinal plants (Mander *et al.* 2007).

### **1.2.2 Trade in medicinal plants via *muthi* shops**

It is difficult to assess how many medicinal plants are commercially traded, either on a provincial, national or even an international level. This is due to considerable local variation and complexities in the harvesting and marketing of medicinal plants, which include both a national and international dimension that present challenges in the management of these plants (Botha *et al.* 2004). The bulk of the plant material is exported from developing countries while major markets are being established in developed countries (Mander *et al.* 2007). Ticktin (2005), estimated that about 4 000 to 6 000 botanicals are of commercial importance, and SCBD (2001) estimated that 5 000 to 6 000 botanicals are entering the commercial market world-wide.

People trading mainly in indigenous medicinal plants are reported to be local traditional healers (Tshisikhawe 2002). Although the harvest and trade of plants used by traditional healers in South Africa is strictly regulated via NEM:BA, poverty often forces rural inhabitants to act unlawfully as gatherers for the medicinal plant market, especially for those products where the legal harvest is tightly controlled or prohibited (Damn 2002). This has led to indiscriminant and unsustainable harvesting, causing many species to become threatened or extinct in the wild (Tshisikhawe 2002).

Research by Marshall (1998), Williams *et al.* (2001), Tshisikhawe (2002) and Botha *et al.* (2004) on *muthi* markets have indicated that the survival of medicinal plant species is jeopardized by excessive harvesting of wild populations, which increases the risk of loss of genetic diversity and

local extirpation. One of the main reasons for the scarcity of medicinal plants is commercial over-exploitation to meet urban demand (Cunningham 1992).

Ongoing observations of the medicinal plant trade indicate that since initial surveys in 1997 and 1998, markets have continued to be buoyant, with urban street markets remaining well patronized and market demand increasing (Mander *et al.* 2007). This is evident by a visible growth in the street trade of medicinal plants in both rural and urban markets in Mpumalanga and Kwazulu-Natal (Mander *et al.* 2007).

The Durban survey by Mander *et al.* (1998) estimated that 1 500 tonnes of plant material was consumed per annum in Durban. The average mass per plant product bought from the street vendors in Durban was 216.5 g and 83 g from *muthi* shops. It was reported by Mander *et al.* (1998) that customers buy on average 127.2 g of plant material per visit. At provincial level (Kwazulu-Natal), the estimation was approximately 4 339 tonnes per year (Mander *et al.* 1998).

To showcase the extent of trade in the Witwatersrand, Williams *et al.* (2001) surveyed 50 *muthi* shops. Results showed that 69.2% of the medicinal species being traded were harvested from Gauteng, North West, Limpopo and Mpumalanga. Twenty three species were found to be listed as threatened on the Red Data list. According to Williams *et al.* (2007), there is an inverse and disproportionate relationship between the price per kilogram and mass of the product sold. The smaller the quantity sold, the higher the price per kilogram.

A study by Dold and Cocks (2002) in the Eastern Cape showed that a minimum of 166 medicinal plant species were traded in *muthi* shops. This figure, however, includes only the top 10 most frequently sold species of each of the informants interviewed.

In Venda *muthi* shops, 69 medicinal plant species were recorded to be traded, with plants such as *Brackenridgea zanzebarica* (Yellow peeling plane) and *Warburgia salutaris* (Pepper bark tree) reported as threatened (Tshisikhawe 2002). In 1997, research by Botha *et al.* (2004) revealed that 70 different species, representing 40 families, were traded in the lowveld of the Limpopo Province.

### **1.2.3 Red Data species**

One of the goals of the IUCN Medicinal Plant Specialist Group is to identify the species that have become threatened by non-sustainable harvest and other factors. According to Victor (2002), 414 taxa are threatened with extinction from a total of 948 taxa assessed in South Africa. At least 40 South African plant species on the IUCN Red List are threatened in part by international trade.

In 1907, the first medicinal plant extinction was documented in South Africa due to unsustainable *muthi* harvesting (Crouch 2006). According to Donaldson (2006), two species of cycad in South Africa have been classified as extinct in the wild due to illegal harvesting. Cycad monitoring in several provinces, including Limpopo, has shown how populations have declined over the past 10 years due to illegal trade which include the *muthi* trade.

Trade statistics for medicinal plants can be used as indicators of risk to plant persistence in the wild (Williams *et al.* 2007). *Scilla natalensis* is listed as Insufficiently Known by Red Data List of Southern African Plants (Hilton-Taylor 1996). This species was reported by Mander (1997) to be commonly available in *muthi* shops where it was selling for as little as R4/kg. In contrast a locally scarce plant such as *Siphonochilus aethiopicus* which is listed as Not Threatened were selling for up to R800/kg. *Warburgia salutaris* which is listed as Vulnerable were reported by Cunningham (1992) to be ring-barked for *muthi* trade at a level which is unsustainable. This has resulted in the use of trees with smaller diameters and the importation of medicinal material. Williams *et al.* (2001) reported that from the 50 *muthi* shops surveyed, a total of 23 species were found to be listed as threatened on the Red Data list.

### **1.2.4 Environmental legislation**

South Africa's existing environmental policy and legislation could be traced to multilateral environmental agreements (Convention on Biological Activity and Convention in Trade of Threatened and Endangered Species). It is noteworthy that the Constitution of South Africa promotes the value of conservation, environment and the right to use of natural resources (Government of RSA 1996). This compels every South African citizen to promote, conserve and use natural resources in a sustainable manner (Constitution of RSA 1997).

The regulation of trade in threatened species is enhanced by the promulgation of the National Environmental Management: Biodiversity Act (NEM:BA 2004). The Act provides for the regulations to restrict trade in threatened species and further supports the implementation of Convention in Trade of Threatened and Endangered Species (CITES) in South Africa and control of trade in threatened species (Damn 2002).

In terms of the National Forests Act, forest trees or protected trees which includes several medicinal plants may not be cut, disturbed, damaged or destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold except under license granted by the Department of Water Affairs and Forestry (NFA 1998).

At the provincial level there are also nature conservation ordinances which place strict limits on trade in plants. The Limpopo Environmental Management Act (LEMA) prohibits any person without a permit to pick, sell, purchase, donate, receive as gift, be in possession of, import into, export or remove protected plants or specially protected in the Province ( LEMA 2004).

In KwaZulu-Natal, eight of the 10 species seen most often in trade are banned from harvest or purchase without authorization permits, and 23 of the 70 most-traded medicinal products purported to contain either “protected” or “specially protected” species (Mander 1997).

### **1.2.5 Financial extent of the trade**

In 2006 the value of the trade in raw medicinal plant materials in South Africa is estimated to be approximately 520 million Rand per year. An additional 2.6 billion Rand is estimated to be added through prescription of traditional plant medicines by traditional healers. In total, the traditional medicinal plants and products trade in South Africa is estimated to be worth 2.9 billion Rand per year (Mander *et al.* 2007).

Wild harvesting of medicinal plants is a chance for the poorest to generate a cash income, especially those people who do not have access to government social grants. However, local people generally get a low price for unprocessed plant material (Walter & Rakotonirina 1995), which include both plant and animal parts used for physical illness and for culturally related afflictions (Mander 1998). Much of the street market trade in medicinal plants is conducted

within the R5 to R10 range on sidewalks in urban areas near public transport nodes, and in informal market places on pension days in rural areas (Mander *et al.* 2007).

### **1.2.6 Cultivation of medicinal plants**

Biodiversity conservation in South Africa was based on a law enforcement approach, until recently, when it became increasingly evident that this approach has failed and that new methods are required. In response to meet the current demand that exceeds supply of medicinal plants, several efforts have been attempted to conserve the diversity of medicinal plants. One of the efforts is stimulation of cultivation as a means to relieve over-exploitation (Wiersum *et al.* 2006). Cultivation can reduce the threat to wild populations by making propagated plants more readily available. An example of this is the successful cultivation of some South African aloes as well as other medicinal plants such as *Siphonochilus aethiopicus* (Donaldson 2006).

Crouch and Edwards (2004) reported that the first systematic effort to stimulate cultivation of medicinal plants was initiated by the Durban Parks Department in 1983 by establishing a medicinal plant nursery at the Silverglen Nature Reserve. Since then, several initiatives have been undertaken to stimulate medicinal plant cultivation through establishment of medicinal plant nurseries.

Wiersum *et al.* (2006) stated that it is important that a participatory research approach is followed in which researchers should facilitate and stimulate experiments by the intended target groups rather than act as technology developers themselves. Furthermore, the selection of species as well as cultivation methods should as far as possible complement any existing local experiences on cultivation of medicinal crops (Wiersum *et al.* 2006).

Wiersum *et al.* (2006) showed that 42% of households in the Amatola region of the Eastern Cape are cultivating medicinal plant, in home gardens. Over 50 species of medicinal plants were found to be present in home-gardens. Species such as *Artemisia afra*, *Eucomis autumnalis* and *Drimia elata* are popular home-garden cultivates as they are regarded as easy to propagate because of their herbaceous nature and can provide quick yields (Wiersum *et al.* 2006).

### 1.2.7 Previous studies on medicinal plants in Limpopo Province

In the Limpopo Province, most of the people still depend on plants for traditional medicine, and possess a remarkable knowledge of the identity of plants and its uses to treat a wide range of physical and mental ailments (Rankoana 2001). The Limpopo Province is composed mostly of the Sepedi and BaPedi, VhaVenda and VhaTsonga tribes (Statistics South Africa 2004). Sepedi medicinal plants have been recorded by Hanekom (1967), Monnig (1967), Liengme (1981) and Rankoana (2001).

A study of plant-based medicines of the Dikgale community of the Limpopo Province was conducted by Rankoana (2001). The findings indicated that plant material is still extensively used for medicinal purposes and they will continue to do so for a considerable time to come. The entire plant is used in 14% of cases encountered. The most common plant parts used for medicinal purposes was listed as roots (35%), bark (21%), leaves (12%), bulbs (7%), branches (5%), stems (2%), seeds (2%) and thorns (2%). It was also recorded that when harvesting bulbs and tubers, the entire plant was usually removed and this resulted in the depletion of many such species. Ring barking of trees was strongly discouraged since it was reported that communities knew that this affect the plant detrimentally, portions of the bark were always cut from opposite sides of the trunk. Only small quantities of leaves were collected and when harvesting roots, only a small amount were removed, the remainder was covered with soil to assist the recovery of the plant.

A limited study by Liengme (1981) was done of the Vatsonga homeland, Gazankulu, to identify plants used by these people. The uses of almost 200 plants were recorded, which include medicine, food, building material, firewood, household utensils, implements, implement handles and toys.

The study on the utilization of *Colophospermum mopane* by the Vatsonga people in the Gazankulu region was done by Mashabane *et al.* (2001). The study investigated the utilization of *Colophospermum mopane* for firewood, building material and medicine. The findings revealed that the plant is utilized medicinally by traditional healers in treating stomach ache, gout, diarrhoea, tooth ache and menstrual pain. The findings also revealed that pertinent

ethnobotanical information is not conveyed from elderly people to younger generations, resulting in a need for educating younger people on mopane's importance and management.

A study by Mabogo (1990) looked at the ethnobotany of the Vhavenda. Findings of the study listed more than 245 species of mainly indigenous, but also some exotic plants. Information on the Vhavenda use of indigenous plants for food, medicine, firewood, building, art, as sources of oils and dyes, for shade and as ornamentals were documented. Results revealed that a traditional system of nature conservation in Venda has largely been responsible for the preservation of those plants considered to be important by the community.

Research on the trade of indigenous medicinal plants in the Venda region of the Limpopo Province together with their ethnobotanical importance and sustainable use was done by Tshisikhawe (2002). The study indicated that the growing trade in indigenous medicinal plants in South Africa is posing a threat to the conservation and preservation of many plant species. Trade in medicinal plants has become a way of making a living for some people and pharmaceutical companies. The medicinal flora of Venda consists of a variety of species, which potentially may provide therapeutic agents to treat different diseases.

Sixty-nine medicinal plants species were recorded by Tshisikhawe (2002) during the survey with the plant parts most preferred being roots. Of the medicinal plants found in the shops visited, 61% were in the form of roots, 22% in the form of whole plant, 15% in the form of barks, 1% in the form of fruits and the other 1% in the form of leaves. The plant parts most sensitive to harvest are the ones that are most exploited. It was recommended by Tshisikhawe (2002) that collectors must collect such parts with extreme care, to ensure plant survival and conservation.

Traditional healers still practice rituals of collecting medicinal materials, while in the field (Tshisikhawe 2002). These rituals possibly ensure that the plant from which materials are collected should not die to ensure that the medicine should work effectively. In some cases middlemen are also involved in the collection of medicinal plant materials, but they come at a cost which is included in the final pricing of medicine.

It was also reported by Tshisikhawe (2002) that conservation measures for *Brackenridgea zanguebarica*, regarded as threatened, have been put in place by proclaiming a reserve which

include a population of this species. Conservation authorities and headman ensure that no collection of medicinal plant materials from this reserve takes place. This system of managing natural resources by involving traditional leaders and the community was found to be very successful by the study.

Botha *et al.* (2004) conducted a study on market profiles and trade in medicinal plants in the Limpopo lowveld of South Africa. The findings showed that 70 different species were identified representing 40 families. The study also showed considerable local variation and complexities in the harvesting and marketing of medicinal plants. This represented both opportunities and challenges in the management of these plants, which need to be addressed simultaneously, particularly with respect to research requirement and development of predictive models and capacity. Cooperation in conservation strategies and policies were recommended as required at regional, national and international levels, while ensuring that management initiatives take into account local market conditions and the socio-economic realities facing both consumers and those who depend on the trade for their livelihoods (Botha *et al.* 2004).

Twine and Siphungu (2004) investigated the impact of harvesting of natural resources by outsiders in 10 villages across the South African lowveld savannas. The most extensively and intensively harvested resources were reported to be fuelwood, sand and medicinal plants. Most of the external harvesters came from nearby villages, but medicinal plants and wood for carving and furniture were also frequently harvested by people from urban areas.

A study in Bushbuckridge to showcase the significance of the local trade in natural resource products for livelihoods and poverty alleviation in South Africa was conducted by Shackleton (2005). The results illustrated that the interference regarding the potential of the trade to alleviate poverty depends on how poverty is defined and interpreted, and on whether the role of these products is assessed from a holistic livelihood perspective that includes notions of vulnerability, alternatives and choice, diversification and the needs of rural producers themselves.

Banda (2005) revealed the wealth of local agrobiodiversity resource knowledge that communities hold in the Limpopo Province. The survey also reported that in many ways climate change and not just variability is disrupting the livelihoods of resource poor communities in the Province and hence the need for more locally grounded and organized adaptive management

systems. The availability and promotion of such plant resources (e.g medicinal plant) provides communities with possibilities in fulfilling their practical needs.

Mulaudzi (2003) did a grounded theory study which was based on its theory of symbolic interactions to explore the indigenous knowledge and health practices of the Vhavenda in sexually transmitted diseases. The findings revealed a variety of terms used to identify STDs. Also emerging from results was that cultural gender roles in the Vhavenda society justify women as sole agents of STD's. It was evident that strategies for combating STDs will have to take into account popular beliefs and attitudes regarding views on STDs as well as the role and influence of traditional healers.

### **1.3 Motivation of study**

Other than the limited studies of Tshisikhawe (2002) and Botha *et al.* (2004) on the trade of indigenous medicinal plants there is no detailed and comprehensive scientific information on the analysis of trade on indigenous plants in the Limpopo Province. Indeed, the little knowledge (Tshisikhawe 2002; Botha *et al.* 2004) of the trade in the wider Limpopo Province points to a vibrant and sizeable trade, with contingent demands on the natural resource base. Furthermore Williams *et al.* (2000) and Tshisikhawe (2002) reported that some material traded in Gauteng markets originates from the Limpopo Province.

There is an urgent need to understand the complexity of the medicinal plant trade, and differentiate across products; trade chains and actors involved. Obtaining data on the trade of medicinal plants will enable policy-makers to understand the impact of current policies and regulations on economic development and biodiversity conservation. Market players need information to lobby for policy-change and reform of regulations concerning the trade on medicinal plants.

Due to the lack of comprehensive data on the trade in indigenous medicinal plants in Limpopo Province, very limited and potentially seriously flawed decisions are currently being made on the management and conservation of indigenous medicinal plants in the Limpopo Province with its concomitant impact on poverty levels.

## **1.4 Hypothesis**

This study tests the hypothesis that trade in medicinal plants in local markets may pose an ecological threat to conservation.

## **1.5 Aim and Objectives**

### **1.5.1 Aim**

This project aims to analyze the role *muthi* shops and street vendors play in supplying indigenous medicinal plants of Limpopo Province to customers.

### **1.5.2 Objectives**

Information on plant trade, collection and utilization will be gathered by means of a semi-structured questionnaire. Aspects to be investigated include amounts traded, pricing and extent of medicinal and botanical knowledge of traders and collectors. Species-specific information will include the taxonomic identity and volumes of traded species, purpose of use and part(s) used, as well as the extent of harvesting on the plant.

Further strategic objectives include:

1. Determining the conservation status (threatened, endangered, vulnerable or protected) and *in situ* availability of targeted medicinal plants. Information gathered will provide insight into the status of stocks in the wild as well as conservation strategies of traders and collectors.
2. The elucidation of suitable propagation methods to replace wild collections with cultivated ones.
3. Investigating existing environmental legislation to ascertain its effectiveness in practice.

## **1.6 Structure of the dissertation**

Chapter 1 introduces and sets the context for the study, providing insight into the background, discourses and practicalities that influenced the study from an international, national and provincial perspective. Chapter 2 outlines the approach, methods and analysis used. The results

are presented in the first part of Chapter 3. This was followed by a thorough synthesized of the information in the latter sections of Chapter 3. Chapter 4 analyses the research findings, providing recommendation for further research and concluding the discussion.

# CHAPTER 2

## MATERIALS

### AND

## METHODS



## 2.1 Study area

The study area includes the Capricorn (Ga-Chuenie and Polokwane), Mopani (Giyani and Tzaneen), Sekhukhune (Burgersfort and Nebo) and Waterburg (Bela-Bela and Mokopane) districts of the Limpopo Province. The Vhembe district was excluded because of the study by Tshisikhawe (2002) from that district.

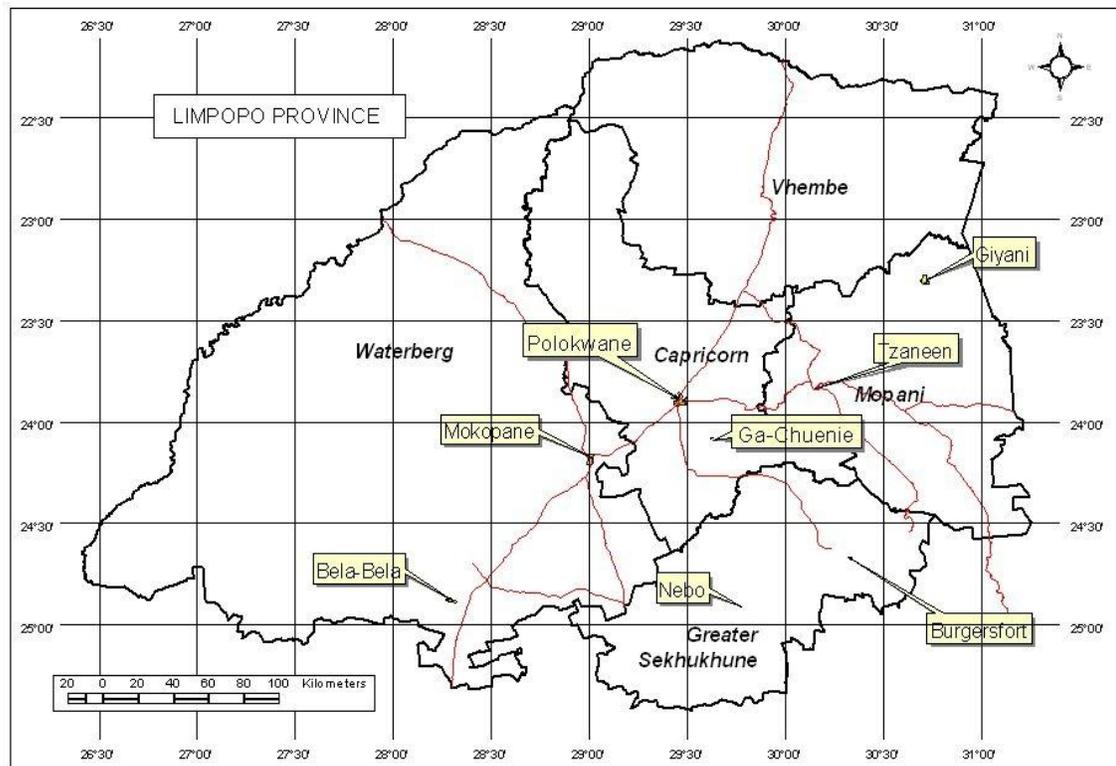


Figure 2.1: Map of Limpopo Province, showing district municipalities and localities of investigated *muthi* markets (Environmental Affairs Limpopo 2009).

## 2.2 Data collection

The survey was based on a questionnaire and market observations supplemented by field visits to collection sites and visits to nurseries. As most of the market is informal, the study was not able

to utilize any formally documented business data. This study, however, endeavored to capture information which traders had internalized.

### **2.2.1 Questionnaire and interview**

Medicinal plants displayed on shelves, in boxes, on pavements and those which are usually traded, but out of stock during the time of research, were documented by means of a semi-structured questionnaire (Appendix A) which included a datasheet. The largest section of the questionnaire was designed to capture information concerning supply and demand of medicinal plants. For example, *muthi* traders were questioned intensively regarding the species traded and impact on the condition of medicinal plants in the wild. The remaining sections were designed to capture broader market information, pertaining to geographical information (district and town locality), type of trader (*muthi* shop or street vendor), and personal information (gender, age, home language and level of education).

A major challenge was to develop an understanding of the quantitative characteristics in a market with no formally recorded trade information. Information on how many medicinal plants were bought daily, quantity of the medicinal plants in stock, how much is collected and sold from middle-men, proof of purchased materials and their prices and which species are sold frequently were not kept by traders. Due to a lack of any formally recorded quantitative data, the questionnaire was designed to capture quantitative information such as preferred plants parts and quantity of medicinal plants in stock.

Interviews took place either at the *muthi* shop and street vendor or on a pre-arranged time at their home. This last arrangement allowed shopkeepers to continue with their business during the day, due to the many customers.

## **2.3 Approach**

### **2.3.1 Market surveys**

In each district two *muthi* shops and two street vendors were visited, resulting in a total sample size of eight *muthi* shops and eight street vendors. Care was taken to select *muthi* shops and

street vendors in different parts of a district or town so as to eliminate any cross influential factors such as co-ownership or even co-trading between *muthi* shops and/or street vendors. *Muthi* shops and street vendors owners consisted mainly of traditional healers. In only three cases the situation was different in that owners were not traditional healers.

The trade markets were each visited twice (summer and winter) and the following information were collected for each species via the questionnaire: An inventory of plants on display, parts of plants used (recorded and weighed using OHAUS weighing instrument), its origin, its medicinal function(s), collector and cost per weight. Traders were also interviewed with regard to the type (herb, shrub or tree) of plant species they purchase or sell.

The survey attempted to capture the frequency of occurrence, the amount (kg) in sale, and the price the product sold for. To establish the frequency of occurrence, the number of times a species was encountered in *muthi* trade was recorded. To determine the plant mass of eight of the most frequently traded species, the whole item in trade was weighed. Price of the product was captured directly from either labels on the shelves and boxes or as provided by traders. Gross annual income from medicinal plants sales were based on the estimated income given by traders per month.

Vernacular names of plants were obtained either from a label on the shelf or from a name provided by the interviewee. Vernacular names were correlated to published ethnobotanical and ethnobiological accounts to ascertain scientific names in cases where the material was insufficient to obtain a scientific name. The language of the common name was also recorded to aid identification since some plants are not from the selected regions. Voucher specimens were collected in cases where vernacular names could not be linked to scientific names and were deposited at University of Limpopo herbarium. Some samples could only be identified by accompanying collectors on harvesting trips.

### **2.3.2 Harvesting methods**

It was necessary to ascertain whether the people selling plant materials were the ones responsible for collection, as most users and sellers know the application of the material without knowing the collection locality.

Traders involved in collecting were asked on their collection methods by means of the questionnaire. It was important to know the manner in which plants are harvested from the wild in order to determine whether the collection method promote sustainable harvesting. In addition the parts harvested were documented.

### **2.3.3 Conservation and sustainability**

#### **2.3.3.1 Conservation status**

The conservation status of plants was determined by documenting, via the semi-structured questionnaire, the current availability of plant species in the wild. Traders were questioned regarding their observation of current and previous availability of targeted species. Data recorded in the field were based on what species are harvested and harvesting methods.

#### **2.3.3.2 Red Data species**

In determining the conservation status of indigenous medicinal plants, the information collected on species in trade was collated and compared to the Red Data List of South Africa's plants (Victor 2002). Criteria ranged from critically, endangered, vulnerable, least threatened (concern) and protected by international, national and provincial legislation.

#### **2.3.3.3 Sustainability via propagation**

Medicinal plants identified as most used and/or threatened by trade were selected when reviewing available propagation methods for cultivation. Two indigenous nurseries in the province were visited in order to investigate appropriate propagation methods. An indigenous nursery in Mentz (Bolamahlo indigenous nursery) and another in Zebediela (Magadi indigenous nursery) were visited. During visits to these institutions two horticulturists were interviewed by means of a semi-structured questionnaire (Appendix B). Visits to indigenous nurseries were supplemented with a literature search to evaluate propagation methods.

Best methods were selected by assessing the degree of difficulty and time involved to propagate. Materials used or needed to complete the propagation process were also evaluated and compared.

### **2.3.4 Environmental legislation**

Environmental legislation such as the Limpopo Environmental Management Act (LEMA), National Environmental Management: Biodiversity Act (NEM:BA), National Environmental Management: Protected Area Act (NEM:PAA) and National Forest Act (NFA) were interrogated with regard to harvesting medicinal plants with the intention of commercial gains.

Four officials responsible for enforcing environmental legislation in the Limpopo Province were interviewed one-on-one using a semi-structured questionnaire (Appendix C) concerning the practical implementation of existing legislation and ultimately its effectiveness in practice.

### **2.4 Percentile and other calculations**

To calculate the percentage of formally protected species in each trader, the number of times a protected plant species was encountered was taken and divided by the total number of plant species for that trader and multiplied by 100.

To calculate the percentage of preferred plant material traded by each trader, the number of times a plant material is sold was taken and divided by the total number of plants for that trader and multiplied by 100.

To calculate the percentage of frequency of occurrence (Table 3.17), the number of times a species was encountered at the 16 *muthi* traders was taken and divided by the total number of *muthi* traders visited, and multiplied by 100.

To calculate the amount stocked annually, the monthly amount stocked for the eight frequently traded species was taken and multiplied by twelve (months in a year).

To rate the propagation technique and procedure for the eight frequently encountered species, the following rating was applied; between 0- 30% (more complicated process), between 31- 50% (fairly reasonable process), between 51- 80% (reasonable process) and between 81-100% (best and easy process).

# CHAPTER 3

# RESULTS



## **3.1 Social characteristics**

### **3.1.1 Gender**

Sixty-two percent of shop traders interviewed were males and 38% were females. Eighty-eight percent of street vendors were male and 12% female.

### **3.1.2 Age**

The majority of traders were older than 41 years (82%), with 12% between 31-40 and 6% between 21-30. Of those older than 41 years, 54% were street vendors and 46% *muthi* shop traders. All traders between 31-40 years were shop traders. Of those between 21-30 years, half were *muthi* shop traders and half street vendor traders.

### **3.1.3 Cultural group**

Seventy-five percent of the 16 surveyed traders were Sepedi compared to 13% who were English, Tsonga (6%) or Swazi (6%). *Muthi* shop traders were 63% Sepedi, 25% were English speaking, 12% were Swazi. For street vendors 88% were Sepedi and 12% were Tsonga.

### **3.1.4 Residence**

Sixty-two percent of the *muthi* traders who reside in rural areas were street vendors compared to 38% who were *muthi* shop traders. All other shop traders interviewed were urban dwellers.

### **3.1.5 Level of education**

Sixty-three percent of all *muthi* traders interviewed had secondary level of schooling compared to 37% with primary schooling. Seventy percent of shop traders had secondary schooling compared to 30% of street vendors. Of those having primary schooling, only 83% were street vendors and 17% shop traders.

## **3.2 Business information**

### **3.2.1 Income**

Thirty-seven percent of all interviewed traders made more than R 5000 per month compared to 13% who make between R 3001-R 5000, and 19% between R 1001-R 3000 and 31% making less than R 1000. Eighty-three percent of interviewed traders who made more than R 5000 per month were *muthi* shop traders compared to 17% who were street vendors. Of those making R 3001-R 5000 per month, 50% were *muthi* shop traders and 50% street vendors. Sixty-seven percent of *muthi* shop traders compared to 33% of street vendors made between R 1001-R 3000. Twenty percent of shop traders and 80% of street vendors made less than R 1000.

### **3.2.2 Customer information**

The general public comprised 88% of the customers of *muthi* trade with traditional healers making up the rest. The study showed that both *muthi* shop traders and street vendors were consulted equally (50% each) by the general public and traditional healers. Both shop traders and street vendors indicated that the majority of their customers bargain for price reductions.

### **3.2.3 Acquisition of medicinal plants**

In 88% of the cases both *muthi* shop traders and street vendors indicated that they would be willing to buy cultivated plants. Those that indicated that they were not prepared to buy such plants, believes that such plants were weak and that their healing power is destroyed by watering them. Cultivated plants are said to be recognized by their rich coloured leaves (dark) and with soft bark compared to wild plants that have dulled coloured leaves (half-dry) and bark that are hard in structure.

### **3.2.4 Permit system**

Sixty-three percent of the investigated *muthi* traders indicated that they do not need a permit to collect medicinal plants, compared to 25% who indicated that a permit is needed and 12% who indicated that they were unaware a permit is required for collecting medicinal plants. Fourty percent of *muthi* shop respondents indicated that they do not need a permit to collect compared to 60% of street vendors. Of those who pointed out that they need a permit to collect, 75% sold

their products at shops and 25% at street stalls. Fifty percent of both shop traders and street vendors expressed the view that they were unaware a permit was needed to collect.

None of the traders interviewed could produce a permit. Sixty-three percent alluded to the fact that it is not important to get a permit compared to 25% who indicated that it is complicated and difficult to obtain a permit and 12% who explained that they are uninformed as to where permits could be obtained. All investigated traders alluded to the unreasonable price of permit fee after the researcher mentioned the amount to them.

### **3.3 Knowledge of medicinal plants by traders**

All interviewed traders indicated that they have knowledge of medicinal plants, hence their dealings in this field. Eighty-two percent of the 16 traders interviewed were trained traditional healers compared to 18% who obtained their knowledge from their parents. Fifty-four percent of trained traditional healers interviewed owned shops and 46% owned street stalls. Thirty-three percent of those who acquired their knowledge from their parents owned shops and 67% owned street stalls.

All traders interviewed indicated that they are unaware of the Limpopo Environmental Management Act or Red data species. All traders pointed-out that they advise the customer on how to use medicinal plant material. All traders indicated that plants are never thrown away as they don't lose their healing properties over-time.

### **3.4 Species traded**

Plants are traded in a variety of forms, ranging from raw material (leaves, bark and roots) to unprocessed fragmented material (chips and slices), and semi-processed material (powders, extracts and teas). Most of the plants are mixed in store during preparation for medicinal use. Such products are usually bought in combination of either two or three plants, depending on the ailment. In some cases stocked parts from mammals, reptiles and birds constitute part of the blend (Figure 3.1).



Figure 3.1: Typical *muthi* shop, with product displayed in boxes.

Results from each *muthi* shop and street vendor are presented below. Bulbs, corms, rhizome and tubers are categorised as roots in the tables under part used.

#### 3.4.1 Trader 1: *Muthi* shop (Capricorn district)

Twenty-one different medicinal plants were recorded (Table 3.1), comprising 11 families and 16 genera, which include; Acanthaceae (*Sclerochiton ilicifolius*), Apiaceae (*Alepidea amatymbica*), Asteraceae (*Artemisia afra*, *Callilepis laureola*, *Callilepis salcifolia* and *Helichrysum kraussii*), Fabaceae (*Elephantorrhiza elephantina* and *Schotia brachypetala*), Geraniaceae (*Monsonia angustifolia*), Hyacinthaceae (*Drimia sanguinea* and *Eucomis pallidiflora*), Hypoxidaceae (*Hypoxis obtusa*), Icacinaceae (*Pyrenacantha grandiflora*), Polygalaceae (*Securidaca longipendunculata*), Verbenaceae (*Lippia javanica*) and Zingiberaceae (*Siphonochilus aethiopicus*). A further five plants could not be linked to a scientific name due to the small-sized

samples. Life form can be categorized as herbs (11 genera), shrubs (2 genera) and trees (3 genera).

The vast majority (76%) of stock were in the form of roots. This is followed by leaves which constitute 19% of the stock traded and bark (*Schotia brachypetala*) make up only 4% of the stock. Roots are used to treat a variety of ailments ranging from the physical (HIV/AIDS, female infertility and male impotence) to the metaphysical (charms and protection). Leaves are mostly used in the treatment of colds, flu and other ailments related to respiratory problems. Bark is used by this trader to treat colds and flu.

Most traded species have multiple medicinal applications. Only *Schotia brachypetala* (flu and colds) was found to have a singular use. *Siphonochilus aethiopicus* was found to be the most used species with seven applications, ranging from treatments of flu and colds to acting as charms and for protection to treating ulcers and *makgoma* (refer to Appendix G for an explanation of this term).

Of the most frequently traded plants weight varied from as little as 251.6 g for *Siphonochilus aethiopicus* to as much as 3.10 kg for *Drimia sanguinea*. Seven and a half kilogram of the most frequently traded plant material was measured collectively.

Ten percent of the species (*Securidaca longipendunculata* and *Siphonochilus aethiopicus*) are formally protected under provincial and national legislation. *Siphonochilus aethiopicus* is protected under the Limpopo Environmental Management Act and *Securidaca longipendunculata* under the National Forest Act.

The availability of some plants such as *Siphonochilus aethiopicus* has decreased to an alarming rate at local level. *Alepidea amatymbica* is indicated to be difficult to locate in the Limpopo Province. This trader identified a number (33%) of species that are scarce or becoming scarce in the market. However, the vast majority (67%) of the species sold by this trader is still readily available in the market.

Material such as corms, bulbs, rhizome and leaves and barks were generally sold in small quantities with unit prices ranging between R5 and R25. Common medicinal plants such as *Drimia sanguinea* and *Hypoxis obtusa* were sold for R10 per corm, while scarce medicinal plant

such as *Siphonochilus aethiopicus* were cut into smaller and more affordable pieces of rhizomatous at a unit price of R5. The most expensive medicinal plant recorded was *Securidaca longipendunculata* which sold for R25 per piece of root.

The most preferred medicinal plants (*Alepedia amatymbica*, *Drimia sanguinea*, *Eucomis pallidiflora*, *Hypoxis obtusa* and *Siphonochilus aethiopicus*) constitute 32% of this traders stock. Preference was based on plants sold most often to clients. At this shop, roots (76%) are the most preferred plant material traded, followed by leaves (19%) and bark (5%).

Table 3.1: Recorded detail of plants at Trader 1: *Muthi* shop.

Plant name (Scientific name or vernacular name)	Part used	Medicinal use of plants: 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5= charms, protection 6= others (Appendix F)	Total amount calculated in shop (most frequently traded plants) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Alepedia amatymbica</i>	Roots	1,5,6	336.8	Not threatened	Yes	10-00
<i>Artemisia afra</i>	Leaves	1,6	N.M.F.P*	Not threatened	No	10-00
<i>Callilepis laureola</i>	Roots	6	N.M.F.P*	Not threatened	Yes	7-00
<i>Callilepis salcifolia</i>	Roots	1,6	N.M.F.P*	Not threatened	Yes	7-00
<i>Drimia sanguinea</i>	Roots	4,5,6	3106.6	Not threatened	No	10-00
<i>Elephantorrhiza elephantina</i>	Roots	3,6	N.M.F.P*	Not threatened	No	10-00
<i>Eucomis pallidiflora</i>	Roots	2,4,6	947.6	Not threatened	Yes	10-00
<i>Helichrysum kraussii</i>	Leaves	5,6	309.6	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,5	1867.4	Not threatened	No	10-00
<i>Lippia javanica</i>	Leaves	1,6	N.M.F.P*	Not threatened	No	7-00
<i>Monsonia angustifolia</i>	Leaves	4,6	N.M.F.P*	Not threatened	No	10-00
<i>Pyrenacantha grandiflora</i>	Roots	5	N.M.F.P*	Not threatened	No	7-00
<i>Schotia brachypetala</i>	Bark	1	N.M.F.P*	Not threatened	No	7-00

\*N.M.F.P= Not Most Frequently Traded Plant

Continue...

Plant name (Scientific name or vernacular name)	Part used	Medicinal use of plants: 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5=charms, protection 6= others(Appendix F)	Total amount calculated in shop (most frequently traded plants) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Sclerochiton ilicifolius</i>	Roots	5,6	N.M.F.P <sup>*</sup>	Not threatened	Yes	10-00
<i>Securidaca longepedunculata</i>	Roots	1,4,6	892.5	Protected (NFA)	Yes	25-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	251.6	Protected (LEMA)	Yes	5-00
Leilane (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	9-00
Mowisabagolo (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	9-00
Mphera (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	9-00
Matsana (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	7-00
Lesitsamane (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	7-00

\*N.M.F.P= Not Most Frequently Traded Plant

During the collection of medicinal plants, most herbs such as *Siphonochilus aethiopicus*, *Eucomis pallidiflora* and *Hypoxis obtusa* were uprooted and the entire plant removed for usage. With shrubs such as *Lippia javanica* only a select number of leaves were removed. During the collection of shrubs such as *Sclerochiton ilicifolius* a selected number of roots were removed and with trees such as *Schotia brachypetala* bark were stripped.

### 3.4.2 Trader 2: Street vendor (Capricorn district)

Thirty-seven medicinal plants were recorded (Table 3.2), comprising 24 families and 33 genera which include; Acanthaceae (*Sclerochiton ilicifolius*), Agapanthaceae (*Agapanthus inarperthus*), Amaryllidaceae (*Boophone disticha* and *Crinum bulbispermum*), Araceae (*Zantesdeschia aethiopica*), Asparagaceae (*Asparagus aethiopica*), Asphodelaceae (*Aloe* sp and *Bulbine frutescens*), Asteraceae (*Artemisia afra*, *Callilepis laureola*, *Callilepis salcifolia* and

*Helichrysum kraussii*), Bignoniaceae (*Tecoma capensis*), Capparaceae (*Capparis sepiaria*), Combretaceae (*Combretum molle*), Dioscoraceae (*Dioscorea dregeana*), Dipsacaceae (*Scabiosa columbaria*), Fabaceae (*Elephantorrhiza elephantina*, *Erythrina lysistemon* and *Schotia brachypetala*), Geraniaceae (*Monsonia angustifolia*), Hyacinthaceae (*Drimia elata*, *Drimia sanguinea* and *Eucomis pallidiflora*), Hypoxidaceae (*Hypoxis obtusa*), Kirkiaceae (*Kirkia wilmsii*), Lamiaceae (*Leonotis leonorus*), Meliaceae (*Trichilla emetica*), Ochnaceae (*Brackenridgea zanzebarica*), Rutaceae (*Zanthoxylum capense*), Pittosporaceae (*Pittosporum viridiflorum*), Polygalaceae (*Securidaca longependunculata*), Portulacaceae (*Talinum caffrum*), Zamiaceae (*Encephalartos transvenosus*) and Zingiberaceae (*Siphonochilus aethiopicus*). A further two plants could not be linked to a scientific name due to the small-sized samples. Plant life form can be categorized as herbs (19 genera), shrubs (13 genera) and tree (1 genus).

The vast majority (70%) of the stock were in the form of roots. This is followed by bark which constitutes 20% of the stock traded and leaves making up 10% of the stock. Roots are used to treat a variety of ailments ranging from the physical (colds, flu, HIV/AIDS, female infertility and male impotence) to the metaphysical (charms and protection). Bark is mainly used by this trader to treat stomach problems, sores and wounds. Leaves are mostly used in the treatment of colds and flu and other ailments such as malaria and wound problems.

Most traded species have multiple medicinal applications. Only *Schotia brachypetala* (colds and flu) was found to have singular use. *Siphonochilus aethiopicus* were found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 102.2 g for *Helichrysum kraussii* to as much as 2.30 kg for *Drimia sanguinea*. The most frequently traded and used plants obtained a total weighting of 5.9 kg.

Table 3.2: Recorded detail of plants at Trader 2: Street vendor.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, cold 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5= charm,protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded plant) (grams)	Conservation status	Scarce in market	Price/unit ( Rand)
<i>Agapanthus inapertus</i>	Roots	6	N.M.F.P*	Not threatened	No	5-00
<i>Aloe</i> sp	Leaves	1,4,6	N.M.F.P*	Unknown	No	5-00
<i>Artemisia afra</i>	Leaves	1,6	N.M.F.P*	Not threatened	No	5-00
<i>Asparagus aethiopicus</i>	Roots	5,6	N.M.F.P*	Not threatened	No	10-00
<i>Boophone disticha</i>	Roots	5,6	N.M.F.P*	Not threatened	No	10-00
<i>Brackenridgea zanzebarica</i>	Bark	5,6	N.M.F.P*	Protected (LEMA)	Yes	20-00
<i>Bulbine frutescens</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Callilepis laureola</i>	Roots	6	N.M.F.P*	Not threatened	Yes	10-00
<i>Callilepis salcifolia</i>	Roots	1,6	N.M.F.P*	Not threatened	Yes	10-00
<i>Capparis sepiaria</i>	Roots / Bark	3,5,6	N.M.F.P*	Protected (LEMA)	Yes	10-00
<i>Combretum molle</i>	Bark	6	N.M.F.P*	Not threatened	No	5-00
<i>Crinum bulbispermum</i>	Roots	1,6	N.M.F.P*	Not threatened	Yes	10-00
<i>Dioscorea dregeana</i>	Roots	5,6	N.M.F.P*	Not threatened	No	10-00
<i>Drimia elata</i>	Roots	3,6	N.M.F.P*	Not threatened	No	10-00
<i>Drimia sanguinea</i>	Roots	4,5,6	2304.5	Not threatened	No	10-00
<i>Elephantorrhiza elephantina</i>	Roots	3,6	N.M.F.P*	Not threatened	No	10-00
<i>Encephalartos transvenosus</i>	Bark	5	N.M.F.P*	Specially protected (LEMA)	Yes	20-00
<i>Erythrina lysistemon</i>	Bark	6	N.M.F.P*	Not threatened	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

Continue...

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, cold 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5=charm,protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded plant) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Eucomis pallidiflora</i>	Roots	2,4,6	503.4	Not threatened	Yes	10-00
<i>Helichrysum kraussii</i>	Leaves	5,6	102.2	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,5	729.2	Not threatened	No	10-00
<i>Kirkia wilmsii</i>	Roots	6	564.4	Not threatened	No	10-00
<i>Leonotis leonorus</i>	Leaves	1,6	N.M.F.P*	Not threatened	No	10-00
<i>Monsonia angustifolia</i>	Leaves	4,6	N.M.F.P*	Not threatened	No	10-00
<i>Pittosporum viridiflorum</i>	Roots	6	N.M.F.P*	Protected (NFA)	No	10-00
<i>Scabiosa columbaria</i>	Roots	5	N.M.F.P*	Not threatened	No	10-00
<i>Schotia brachypetala</i>	Bark	1	N.M.F.P*	Not threatened	No	10-00
<i>Sclerochiton ilicifolius</i>	Roots	5,6	N.M.F.P*	Not threatened	Yes	10-00
<i>Securidaca longepedunculata</i>	Roots	1,4,6	1145.0	Protected (NFA)	Yes	20-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	521.1	Protected (LEMA)	Yes	5-00
<i>Talinum caffrum</i>	Roots	5,6	N.M.F.P*	Not threatened	Yes	10-00
<i>Tecoma capenses</i>	Roots	1,6	N.M.F.P*	Not threatened	No	10-00
<i>Trichilla emetica</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Zantedeschia aethiopica</i>	Roots	1,6	N.M.F.P*	Not threatened	No	10-00
<i>Zanthoxylum capense</i>	Roots	1,6	N.M.F.P*	Not threatened	No	10-00
Morutatshitsha (Sepedi)	Roots	6	N.M.F.P*	Unknown	No	10-00
Sefepabadimo (Sepedi)	Roots	5,6	N.M.F.P*	Unknown	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

Twenty-two percent of the species (*Brackenridgea zaquebarica*, *Capparis sepiaria*, *Encephalartos transvenosus*, *Pittosporum viridiflorum*, *Securidaca longependunculata* and *Siphonochilus aethiopicus*) were found that are listed as either “protected” or “specially protected” under provincially legislation or/and nationally legislation. Fourteen percent of the species are protected under the Limpopo Environmental Management Act and two under National Forest Act. *Encephalartos transvenosus* is listed as threatened under the Red Data list, protected under NEM:BA regulations (TOPS) and with an additional listing under Appendix 1 of CITES.

*Siphonochilus aethiopicus* is indicated to be collected in Mpumalanga and Swaziland due to its unavailability in the Limpopo Province. This trader identified a number (29%) of species that are scarce or becoming scarce in the market. However, the vast majority (71%) is still readily available in the market.

Material such as bulbs, corms, rhizomes, leaves and bark were generally sold in small quantities with unit prices varying between R5 and R20. Common medicinal plants such as *Drimia sanguinea* and *Hypoxis obtusa* were sold at a unit price of R10, while scarce medicinal plants such as *Siphonochilus aethiopicus* were cut into smaller but affordable rhizomatous pieces, selling at a unit price of R5. The most expensive plants were *Brackenridgea zaquebarica*, *Encephalartos transvenosus* and *Securidaca longependunculata* which sold for R20 per unit bark.

The most preferred medicinal plants (*Drimia sanguinea*, *Eucomis pallidiflora*, *Helichyrum kraussii*, *Hypoxis obtusa*, *Kirkia wilmsii*, *Securidaca longependunculata* and *Siphonochilus aethiopicus*) constitute 25% of this traders stock. Preference was based on plants sold most often to clients.

During the collection of herbs such as *Siphonochilus aethiopicus*, *Callilepis laureola*, *Monsonia angustifolia* and *Hypoxis obtusa* entire plants are uprooted. In the collection of shrubs such as *Sclerochiton ilicifolius* and trees such as *Kirkia wilmsii* a selected number of roots were removed. Plants placed on the ground and boxes full of such medicinal plants (Figure 3.2) have been observed in shops.



Figure 3.2: (A) Harvested swollen tubers of *Kirkia wilmsii* and (B) roots of *Callilepis laureola*.

### 3.4.3 Trader 3: Muthi shop (Capricorn district)

Thirty-nine medicinal plants were recorded at this shop, comprising 29 families and 35 genera, which includes; Acanthaceae (*Sclerochiton ilicifolius*), Agapanthaceae (*Agapanthus inarpetus*), Anacardiaceae (*Sclerocarya birrea*), Amaryllidaceae (*Boophane disticha* and *Crinum bulbispermum*), Araceae (*Zantedeschia aethiopicus*), Asparagaceae (*Asparagus aethiopicus*), Asphodelaceae (*Aloe* sp and *Bulbine frutescens*), Asteraceae (*Callilepis laureola*, *Callilepis salcifolia* and *Helichrysum kraussii*), Bignoniaceae (*Tecoma capensis*), Capparaceae (*Capparis sepiaria*), Combretaceae (*Combretum molle*), Dioscoraceae (*Dioscorea dregeana*), Dipsacaceae (*Scabiosa columbaria*), Fabaceae (*Elephantorrhiza elephantina*, *Erythrina lysistemon* and *Schotia brachypetala*), Geraniaceae (*Monsonia angustifolia*), Hyacinthaceae (*Drimia elata*, *Drimia sanguinea* and *Eucomis pallidiflora*), Hypoxidaceae (*Hypoxis obtusa*), Kirkiaceae (*Kirkia wilmsii*), Lamiaceae (*Leonotis leonorus*), Meliaceae (*Trichilla emetica*), Moraceae (*Ficus abutilifolia*), Ochnaceae (*Brackenridgea zaquebarica*), Rhamnaceae (*Ziziphus mucronata*), Rutaceae (*Zanthoxylum capense*), Pittosporaceae (*Pittosporum viridiflorum*), Polygalaceae (*Securidaca longipendunculata*), Portulacaceae (*Talinum cafferum*), Verbenaceae (*Lippia javanica*), Zamiaceae (*Encephalartos transvenosus*) and Zingiberaceae (*Siphonochilus aethiopicus*). A further two plants could not be linked to a scientific name due to the small-sized

samples. Plant life form can be categorized as herbs (19 genera), shrubs (13 genera) and trees (4 genera).

The vast majority (67%) of stock were in the form of roots. This is followed by bark which constitutes 19% of the stock traded with leaves making up 14% of the stock. Roots are predominately used to treat a variety of ailments ranging from the physical (HIV/AIDS, female infertility and male impotence) to the metaphysical (charms and protection). Bark is chiefly used by this trader to treat aching hands, arthritis and for protection. Leaves are mainly used to treat colds, flu, snake bites and high blood pressure.

Most traded species have multiple medicinal applications. Only *Schotia brachypetala* (colds and flu) was found to have singular use. *Siphonochilus aethiopicus* were found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Table 3.3: Recorded detail of plants at Trader 3: *Muthi* shop.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5= charm,protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Agapanthus inapertus</i>	Roots	6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Aloe</i> sp	Leaves	1,4,6	N.M.F.P <sup>*</sup>	Unknown	No	10-00
<i>Asparagus aethiopicus</i>	Roots	5,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Boophane disticha</i>	Roots	5,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Brackenridgea zanzebarica</i>	Bark	5,6	N.M.F.P <sup>*</sup>	Protected (LEMA)	Yes	25-00
<i>Bulbine frutescens</i>	Roots	6	N.M.F.P <sup>*</sup>	Not threatened	Yes	10-00
<i>Callilepis laureola</i>	Roots	6	N.M.F.P <sup>*</sup>	Not threatened	Yes	10-00
<i>Callilepis salcifolia</i>	Roots	1,6	N.M.F.P <sup>*</sup>	Not threatened	Yes	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

Continue...

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5= charm, protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Capparis sepiaria</i>	Roots /bark	3,6	N.M.F.P <sup>*</sup>	Protected (LEMA)	Yes	10-00
<i>Combretum molle</i>	Bark	6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Crinum bulbispermum</i>	Roots	1,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Dioscorea dregeana</i>	Roots	5,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Drimia elata</i>	Roots	4,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Drimia sanguinea</i>	Roots	4,5,6	2056.2	Not threatened	No	10-00
<i>Elephantorrhiza elephantina</i>	Roots	3,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Encephalartos transvenosus</i>	Bark	5	N.M.F.P <sup>*</sup>	Specially protected (LEMA)	Yes	25-00
<i>Erythrina lysistemon</i>	Bark	6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Eucomis pallidiflora</i>	Roots	2,4,6	1636.2	Not threatened	Yes	10-00
<i>Ficus abutilifolia</i>	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	10-00
<i>Helichrysum kraussii</i>	Leaves	5,6	90.3	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	1285.4	Not threatened	No	10-00
<i>Kirkia wilmsii</i>	Roots	6	3036.5	Not threatened	No	10-00
<i>Leonotis leonorus</i>	Leaves	1,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Monsonia angustifolia</i>	Leaves	4,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Pittosporum viridiflorum</i>	Roots	6	N.M.F.P <sup>*</sup>	Protected (NFA)	No	10-00
<i>Scabiosa columbaria</i>	Roots	5	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Schotia brachypetala</i>	Bark	1	N.M.F.P <sup>*</sup>	Not threatened	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

Continue...

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5=charm,protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Sclerochiton ilicifolius</i>	Roots	5,6	N.M.F.P <sup>*</sup>	Not threatened	Yes	10-00
<i>Sclerocarya birrea</i>	Roots/bark	1,6	N.M.F.P <sup>*</sup>	Protected (NFA)	No	10-00
<i>Securidaca longepedunculata</i>	Roots	1,4,6	932.2	Protected (NFA)	Yes	25-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	137.7	Protected (LEMA)	Yes	5-00
<i>Talinum caffrum</i>	Roots	5	N.M.F.P <sup>*</sup>	Not threatened	Yes	10-00
<i>Tecoma capenses</i>	Roots	1,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Trichilla emetica</i>	Roots	6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Zantedeschia aethiopica</i>	Roots	1,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Zanthoxylum capense</i>	Roots	1,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Ziziphus mucronata</i>	Bark	6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
Morutatshitsha (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	10-00
Sefepabadimo (Sepedi)	Roots	5	N.M.F.P <sup>*</sup>	Unknown	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

Of the most frequently traded plants weight varied from as little as 90.3 g for *Helichrysum kraussii* to as much as 3.036 kg for *Kirkia wilmsii*. The most frequently traded and used plants obtained a total weighting of 9.2 kg.

Eighteen percent of the species (*Brackenridgea zaquebarica*, *Capparis sepiaria*, *Encephalartos transvenosus*, *Pittosporum viridiflorum*, *Sclerocarya birrea*, *Securidaca longepedunculata* and *Siphonochilus aethiopicus*) were found that are listed as either “protected” or “specially protected” under provincially legislation or/and nationally. Ten percent of the species are

protected under the Limpopo Environmental Management Act and 7% under the National Forest Act. Only *Encephalartos transvenosus* is listed under the Red Data list, protected under NEM:BA regulations (TOPS) and with an additional listing under Appendix 1 of CITES.

*Bulbine frutescens* is indicated to have vanished in the local wilds of the Limpopo Province. *Talinum caffrum* was pointed-out to be difficult to locate due to its over-use. Twenty-nine percent of species were indicated as scarce or becoming scarce in the market. However, the vast majority (71%) is still readily available in the market.

Material such as roots, leaves and bark were generally sold in small quantities with unit prices ranging between R5 and R25. Common medicinal plants such as *Callilepis laureola* and *Drimia sanguinea* were sold at a unit price of R10, while scarce medicinal plants such as *Siphonochilus aethiopicus* were cut into smaller but affordable rhizomatous pieces selling for R5 per unit. The most expensive plants recorded were *Brackenridgea zanzebarica*, *Encephalartos transvenosus* and *Securidaca longipendunculata* which sold for R25 per unit of roots and bark.

*Artemisia afra*, *Capparis sepiaria*, *Drimia sanguinea*, *Hypoxis obtusa*, *Monsonia angustifolia*, *Securidaca longipendunculata* and *Siphonochilus aethiopicus* are the most preferred medicinal plants recorded. Preference was based on plants sold most often to clients.

During the collection of herbs such as *Siphonochilus aethiopicus*, *Callilepis laureola*, *Asparagus aethiopicus*, *Bulbine frutescens* and *Hypoxis obtusa* entire plants are uprooted. In collecting *Aloe* sp and *Leonotis leonorus* samples only a selected number of leaves are removed. In the collection of shrubs such as *Elephantorrhiza elephantina* and trees such as *Capparis sepiaria* and *Pittosporum viridiflorum* a number of selected roots and leaves are removed and bark stripped. *Brackenridgea zanzebarica* is collected from the Vhembe district. A levy to harvest is paid and the volumes harvested are controlled.

#### 3.4.4 Trader 4: Street vendor (Capricorn district)

Eight medicinal plants were recorded (Table 3.4), comprising 6 families and 8 genera which include; Fabaceae (*Peltophorum africanum* and *Schotia brachypetala*), Geraniaceae (*Monsonia angustifolia*), Hyacinthaceae (*Drimia sanguinea* and *Eucomis pallidiflora*), Hypoxidaceae

(*Hypoxis obtusa*), Kirkiaceae (*Kirkia wilmsii*) and Portulacaceae (*Talinum caffrum*). Life form can be categorized as herbs (5 genera) and trees (3 genera).

The vast majority (74%) of stock were in the form of roots. This is followed by bark which constitutes 13% of the stock traded and leaves 13% of the stock. Roots are used to treat a variety of ailments ranging from the physical (HIV/AIDS, male impotence, chest and respiratory problems) to the metaphysical (charms and protection). Bark is mainly used by this trader to treat colds and flu. Leaves are used to treat male impotence and are administered as a tea.

Most traded species have multiple medicinal applications. Only *Schotia brachypetala* (colds and flu) was found to have singular use. *Eucomis pallidiflora* was found to be the most used species with four applications, ranging from treatments of chest problems to mental illness. *Drimia sanguinea*, one of the preferred medicinal plants, is widely used to treat various ailments such as lack of libido and bad luck.

Of the most frequently traded weight varied from as little as 2.05 kg for *Eucomis pallidiflora* to as much as 7.224 kg for *Kirkia wilmsii*. The most frequently traded and used plants obtained a total weighting of 14.5 kg.

No protected species were recorded with trader 4. This trader identified a number (25%) of species (*Eucomis pallidiflora* and *Talinum caffrum*) that are scarce or becoming scarce in the market. However, the vast majority (75%) is still readily available in the market.

Material such as roots, leaves and bark were generally sold in small quantities with unit prices ranging between R10 and R15. Common medicinal plants such as *Drimia sanguinea*, *Kirkia wilmsii* and *Hypoxis obtusa* sold at a unit price of R10. The most expensive plant recorded was *Eucomis pallidiflora* which is sold for R15 per corm.

The most preferred medicinal plants (*Drimia sanguinea*, *Eucomis pallidiflora*, *Hypoxis obtusa*, *Kirkia wilmsii*, *Monsonia angustifolia* and *Talinum caffrum*) constitute 75% of this traders stock. Preference was based on plants sold most often to clients.

During collection herbs such as *Eucomis pallidiflora*, *Drimia sanguinea* and *Hypoxis obtusa* were uprooted and entire plants removed for usage. During the collection of trees such as *Kirkia*

*wilmsii* a number of roots were removed and with *Schotia brachypetala* pieces of bark were stripped.

Table 3.4: Recorded detail of plants at Trader 4: Street vendor.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5= charm, protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Drimia sanguinea</i>	Roots	4,5,6	2056.2	Not threatened	No	10-00
<i>Eucomis pallidiflora</i>	Roots	2,4,6	2050.5	Not threatened	Yes	15-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	4346.2	Not threatened	No	10-00
<i>Kirkia wilmsii</i>	Roots	6	7224.2	Not threatened	No	10-00
<i>Monsonia angustifolia</i>	Leaves	4,6	N.M.F.P*	Not threatened	No	10-00
<i>Peltophorum africanum</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Schotia brachypetala</i>	Bark	1	N.M.F.P*	Not threatened	No	10-00
<i>Talinum caffrum</i>	Roots	5	N.M.F.P*	Not threatened	Yes	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

#### 3.4.5 Trader 5: *Muthi* shop (Sekhukhune district)

Sixteen medicinal plants were recorded (Table 3.5), comprising 9 families and 13 genera which include; Asteraceae (*Artemisia afra* and *Helichrysum kraussii*), Fabaceae (*Elephantorrhiza elephantina* and *Erythrina lysistemon*), Capparaceae (*Capparis sepiaria* and *Boscia albitrunca*), Geraniaceae (*Monsonia angustifolia*), Hyacinthaceae (*Drimia sanguinea* and *Eucomis pallidiflora*), Hypoxidaceae (*Hypoxis obtusa*), Icacinaceae (*Pyrenacantha grandiflora*), Kirkiaceae (*Kirkia wilmsii*) and Zingiberaceae (*Siphonochilus aethiopicus*). A further three plants could not be linked to a scientific name due to the small-sized samples. Life form can be categorises as herbs (7 genera), shrub (1 genus) and trees (5 genera).

The vast majority (70%) of stock were in the form of roots. This is followed by leaves which constitute 18% of the stock traded and bark making up 12% of the stock. Roots are used to treat a variety of ailments ranging from the physical (HIV/AIDS, female infertility and male impotence) to the metaphysical (charm and protection). Leaves are mainly used to treat colds, flu, and male impotence. Bark is used by this trader to treat arthritis, stomach and kidney problems.

All traded species have multiple medicinal applications. *Siphonochilus aethiopicus* were found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 93.9 g for *Helichrysum kraussii* to as much as 1.89 kg for *Kirkia wilmsii*. The most frequently traded and used plants obtained a total weighting of 4.5 kg.

Nineteen percent of the species (*Boscia albitrunca*, *Capparis sepiaria* and *Siphonochilus aethiopicus*) are formally protected under provincial legislation and national legislation. *Capparis sepiaria* and *Siphonochilus aethiopicus* are protected under the Limpopo Environmental Management Act and *Boscia albitrunca* under the National Forest Act.

The availability of *Siphonochilus aethiopicus* has decreased to an alarming rate at local level. This trader identified a number (19%) of species (*Capparis sepiaria*, *Eucomis pallidiflora* and *Siphonochilus aethiopicus*) that are scarce or becoming scarce in the market. However, the vast majority (81%) is still readily available in the market. *Eucomis pallidiflora* is indicated to be seriously scarce in the Limpopo Province.

Material such as roots, leaves and bark were generally sold in small quantities with unit prices ranging between R5 and R10. Common medicinal plants such as *Drimia sanguinea* and *Helichrysum kraussii* sold at a unit price of R10, while scarce medicinal plants such as *Siphonochilus aethiopicus* were cut into smaller and more affordable rhizomatous pieces and sold at a unit price of R7. *Kirkia wilmsii* materials were sold for the low price of R5 per tuber.

The most preferred medicinal plants (*Artemisia afra*, *Capparis sepiaria*, *Drimia sanguinea*, *Eucomis pallidiflora*, *Hypoxis obtusa* and *Siphonochilus aethiopicus*) constitute 37% of this traders stock. Preference was based on plants sold most often to clients. *Drimia sanguinea*,

*Hypoxis obtusa* and *Siphonochilus aethiopicus* are amongst the preferred medicinal plants. The demand for such plants forces collectors to take as much as they can during collecting trips.

Table 3.5: Recorded detail of plants at Trader 5: *Muthi* shop.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4=male impotence 5=charm, protection 6=other (Appendix F)	Total amount calculated in shop (most frequently traded) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Artemisia afra</i>	Leaves	1,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Boscia albitrunca</i>	Roots	6	N.M.F.P <sup>*</sup>	Protected (NFA)	No	10-00
<i>Capparis sepiaria</i>	Roots /bark	3,6	N.M.F.P <sup>*</sup>	Protected (LEMA)	Yes	10-00
<i>Drimia sanguinea</i>	Roots	4,5,6	823.7	Not threatened	No	10-00
<i>Elephantorrhiza elephantina</i>	Roots	3,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Erythrina lysistemon</i>	Bark	6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Eucomis pallidiflora</i>	Roots	2,4,6	855.2	Not threatened	Yes	10-00
<i>Helichrysum kraussii</i>	Leaves	6	93.9	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	1265.7	Not threatened	No	10-00
<i>Kirkia wilmsii</i>	Roots	6	1898.6	Not threatened	No	5-00
<i>Monsonia angustifolia</i>	Leaves	4,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Pyrenacantha grandiflora</i>	Roots	5	N.M.F.P <sup>*</sup>	Not threatened	No	7-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	288.9	Protected (LEMA)	Yes	7-00
Setosadingaka (Sepedi)	Roots	5,6	N.M.F.P <sup>*</sup>	Unknown	No	10-00
Kgashi (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	10-00
Makgone (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

During the collection of medicinal plants, most herbs such as *Siphonochilus aethiopicus*, *Eucomis pallidiflora*, *Drimia sanguinea* and *Hypoxis obtusa* were uprooted and the entire plant removed for usage. During the collection of trees such as *Boscia albutruca* and *Erythrina lysistemon* a number of roots and pieces of bark were removed, respectively.

#### 3.4.6 Trader 6: Street vendor (Sekhukhune district)

Fifteen medicinal plants were recorded (Table 3.6), comprising 10 families and 12 genera which include; Asteraceae (*Artemisia afra* and *Helichrysum kraussii*), Fabaceae (*Elephantorrhiza elephantina*), Capparaceae (*Capparis sepiaria*), Celastraceae (*Pleurostyliia capensis*), Geraniaceae (*Monsonia angustifolia*), Hyacinthaceae (*Drimia sanguinea* and *Eucomis pallidiflora*), Hypoxidaceae (*Hypoxis obtusa*), Kirkiaceae (*Kirkia wilmsii*), Moraceae (*Ficus abutilifolia*) and Zingiberaceae (*Siphonochilus aethiopicus*). A further four plants could not be linked to a scientific name due to the small-sized samples. Life form can be categorized as herbs (7 genera), shrub (1 genus) and trees (4 genera).

The vast majority (75%) of stock were in the form of roots. This is followed by leaves which constitute 19% of the stock traded and bark making up six percent of the stock. Roots are used to treat a variety of ailments ranging from the physical (HIV/AIDS, female infertility and male impotence) to the metaphysical (charms and protection). Leaves are mainly used to treat malaria, stomach problems and male impotence. Bark is predominately used by this trader to treat female infertility and irregular menstruations.

Most traded species have multiple medicinal applications. None of the plant species were found to have singular use. *Siphonochilus aethiopicus* was found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 154.1 g for *Siphonochilus aethiopicus* to as much as 1.33 kg for *Kirkia wilmsii*. The most frequently traded and used plants weight 6 kg.

Thirteen percent of the species (*Capparia sepiaria* and *Siphonochilus aethiopicus*) are formally protected under the Limpopo Environmental Management Act.

Table 3.6: Recorded detail of plants at trader 6: Street vendor.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4=male impotence 5=charm, protection 6=other (Appendix F)	Total amount calculated in shop (most frequently traded plants) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Artemisia afra</i>	Leaves	6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Capparis sepiaria</i>	Roots /Bark	3,6	N.M.F.P <sup>*</sup>	Protected (LEMA)	Yes	10-00
<i>Drimia sanguinea</i>	Roots	2,5,6	944.6	Not threatened	No	10-00
<i>Elephantorrhiza elephantina</i>	Roots	3,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Eucomis pallidiflora</i>	Roots	2,4,6	845.2	Not threatened	Yes	15-00
<i>Helichrysum kraussii</i>	Leaves	5,6	1323.2	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	1421.3	Not threatened	No	10-00
<i>Kirkia wilmsii</i>	Roots	6	1334.2	Not threatened	No	10-00
<i>Monsonia angustifolia</i>	Leaves	4,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Ficus abutilifolia</i>	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	10-00
<i>Pleurostyliya capensis</i>	Roots	5,6	N.M.F.P <sup>*</sup>	Not threatened	No	10-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	154.1	Protected (LEMA)	Yes	5-00
Molope (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	10-00
Setosadingaka (Sepedi)	Roots	5,6	N.M.F.P <sup>*</sup>	Unknown	No	10-00
Molatsa (Sepedi)	Roots	6	N.M.F.P <sup>*</sup>	Unknown	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

The availability of *Siphonochilus aethiopicus* has decreased to an alarming rate at local level. *Capparis sepiaria* is indicated to be scarce in the market as the species grow in places which are perilous for humans to access. This trader identified a number (20%) of species that are scarce or

becoming scarce in the market. However, the vast majority (80%) is still readily available in the market.

Material such as roots, leaves and bark were generally sold in small quantities with unit prices ranging between R5 and R15. Common medicinal plants such as *Drimia sanguinea* and *Helichrysum kraussii* sold at a unit price of R10, while scarce medicinal plants such as *Siphonochilus aethiopicus* were cut into smaller and more affordable rhizomatous pieces and sold at a unit price of R5. The most expensive medicinal plant recorded was *Eucomis pallidiflora* which sold for R15 per corm.

The most preferred medicinal plants (*Artemisia afra*, *Capparis sepiaria*, *Drimia sanguinea*, *Eucomis pallidiflora*, *Hypoxis obtusa* and *Siphonochilus aethiopicus*) constitute 40% of this traders stock.

During the collection of medicinal herbs such as *Siphonochilus aethiopicus*, *Eucomis pallidiflora*, *Drimia sanguinea* and *Hypoxis obtusa* whole plants were uprooted and removed. During the collection of shrubs such as *Elephantorrhiza elephantina* and trees such as *Capparis sepiaria* roots were removed and bark stripped, respectively.

#### 3.4.7 Trader 7: Muthi shop (Sekhukhune district)

Fourteen medicinal plants were recorded (Table 3.7), comprising 12 families and 14 genera which include; Acanthaceae (*Sclerochiton ilicifolius*), Apiaceae (*Alepidea amatymbica*), Asteraceae (*Helichrysum* sp), Celastraceae (*Catha edulis*), Dioscoraceae (*Dioscorea sylvatica*), Fabaceae (*Crotalaria natalitia*), Hyacinthaceae (*Drimia sanguinea*, *Eucomis pallidiflora* and *Merwillia plumbea*), Hypoxidaceae (*Hypoxis obtusa*), Kirkiaceae (*Kirkia wilmsii*), Velloziaceae (*Xerophyta* sp), Zamiaceae (*Encephalartos transvenosus*) and Zingiberaceae (*Siphonochilus aethiopicus*). Life form can be categorized as herbs (9 genera), shrub (1 genus) and tree (1 genus).

The vast majority (86%) of stock were in the form of roots. This is followed by leaves and bark with each constituting seven percent of the stock traded, respectively. Roots are used to treat a variety of ailments ranging from the physical (colds, flu, HIV/AIDS and male impotence) to the

metaphysical (charms and protection). Leaves are used to treat wounds and to expel evil spirits. Bark is mainly used by this trader for protection against evil spirits and to protect homesteads.

All traded species have multiple medicinal applications. *Siphonochilus aethiopicus* was found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 127.4 g for *Siphonochilus aethiopicus* to as much as 1.964 kg for *Kirkia wilmsii*. The most frequently traded and used plants obtained a total weighting of 4.09 kg.

Modjadji cycad (*Encephalartos transvenosus*) is specially protected by LEMA and under NEM:BA regulations (TOPS) and with an additional listing under Appendix 1 of CITES. Other medicinal plant species which are protected include *Catha edulis* (NFA) and *Siphonochilus aethiopicus* (LEMA).

Thirty-five percent of plant species (Table 4.7) in the recorded list are regarded as scarce, and this includes Modjadji cycad which according to the Red Data list is indicated to be critically endangered. This trader identified a number (36%) of species (*Alepidea amatymbica*, *Catha edulis*, *Encephalartos transvenosus*, *Sclerochiton ilicifolius* and *Siphochilus aethiopicus*) that are scarce or becoming scarce in the market. However, the vast majority (64%) is still readily available in the market.

Material such as roots, leaves and bark were generally sold in small quantities with unit prices ranging between R5 and R20. Common medicinal plants such as *Drimia sanguinea* and *Hypoxis obtusa* sold at a unit price of R10, while scarce medicinal plants such as *Siphonochilus aethiopicus* were cut into smaller and more affordable rhizomatous pieces and sold at a unit price of R5. *Catha edulis* (root) was sold at a unit price of R15. The most expensive medicinal plant recorded was *Encephalartos transvenosus* which sold for R20 per piece of bark.

The most preferred medicinal plants (*Alepidea amatymbica*, *Catha edulis*, *Eucomis pallidiflora*, *Hypoxis obtusa* and *Siphonochilus aethiopicus*) constitute 35% of this traders stock.

During collections herbs such as *Merwillia plumbea* and *Drimia sanguinea* are uprooted. For shrubs such as *Sclerochiton ilifolius* roots were removed and for *Encephalartos transvenosus* bark were stripped.

Table 3.7: Recorded detail of plants at Trader 7: *Muthi* shop.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female iinfertility 4= male impotence 5= charm,protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Alepidea amatymbica</i>	Roots	1,5,6	374.9	Not threatened	Yes	10-00
<i>Catha edulis</i>	Roots	4,6	N.M.F.P*	Protected (NFA)	Yes	15-00
<i>Crotalaria natalitia</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Dioscorea sylvatica</i>	Roots	5,6	N.M.F.P*	Not threatened	No	10-00
<i>Drimia sanguinea</i>	Roots	4,5,6	945.3	Not threatened	No	10-00
<i>Encephalartos transvenosus</i>	bark	5	N.M.F.P*	Specially protected (LEMA); Critically endangered (NEM:BA); Appendix 1 (CITES)	Yes	20-00
<i>Eucomis pallidiflora</i>	Roots	2,4,6	723.4	Not threatened	No	15-00
<i>Helichrysum</i> sp	Leaves	5,6	210.4	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	1716.3	Not threatened	No	10-00
<i>Kirkia wilmsii</i>	Roots	6	1964.5	Not threatened	No	10-00
<i>Merwillia plumbea</i>	Roots	1,4,6	N.M.F.P*	Not threatened	No	10-00
<i>Sclerochiton ilicifolius</i>	Roots	5,6	N.M.F.P*	Not threatened	Yes	10-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	127.4	Protected (LEMA)	Yes	5-00
<i>Xerophyta</i> sp	Roots	6	N.M.F.P*	Not threatened	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

#### 3.4.8 Trader 8: Street vendor (Sekhukhune district)

Six medicinal plants were recorded (Table 3.8), comprising 4 families and 6 genera which include; Celastraceae (*Catha edulis*), Hyacinthaceae (*Drimia sanguinea*, *Eucomis pallidiflora* and *Merwillia plumbea*), Hypoxidaceae (*Hypoxis obtusa*) and Zingiberaceae (*Siphonochilus aethiopicus*). Life form can be categorized as herbs (5 genera) and shrub (1 genus).

All stock was in the form of roots. Roots are used to treat a variety of ailments ranging from the physical (colds, flu, HIV/AIDS, and male impotence) to the metaphysical (charms and protection).

All traded species have multiple medicinal applications. *Siphonochilus aethiopicus* were found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 98.6 g for *Siphonochilus aethiopicus* to as much as 802.3 g for *Drimia sanguinea*. The most frequently traded and used plants obtained a total weight of 2.2 kg.

Thirty-three percent (or two species) of the medicinal plant species of this trader were found to be protected. *Catha edulis* is protected under the National Forest Act and *Siphonochilus aethiopicus* under the Limpopo Environmental Management Act.

This trader identified *Catha edulis* and *Siphonochilus aethiopicus* as scarce or becoming scarce in the market. However, the vast majority (67%) is still readily available in the market.

Roots were generally sold in small quantities with unit prices ranging between R5 and R10. Common medicinal plants such as *Drimia sanguinea*, *Eucomis pallidiflora* and *Hypoxis obtusa* sold at a unit price of R10 per corm, while scarce medicinal plants such as *Siphonochilus aethiopicus* were cut into smaller and more affordable rhizomatous pieces and sold at a unit price of R5.

The most preferred medicinal plants (*Catha edulis*, *Eucomis pallidiflora*, *Hypoxis obtusa* and *Siphonochilus aethiopicus*) constitute 66% of this trader stock.

During the collection of medicinal plants, herbs such as *Drimia sanguinea*, *Eucomis pallidiflora*, *Hypoxis obtusa*, *Merwillia plumbea* and *Siphonochilus aethiopicus* were uprooted and the entire plant removed from usage. During the collection of shrub (*Catha edulis*) roots were removed.

Table 3.8: Recorded detail of plants at Trader 8: Street vendor.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4=male impotence 5=charm, protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Catha edulis</i>	Roots	4,6	N.M.F.P*	Protected (NFA)	Yes	10-00
<i>Drimia sanguinea</i>	Roots	4,5,6	802.3	Not threatened	No	10-00
<i>Eucomis pallidiflora</i>	Roots	2,4,6	592.7	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	743.4	Not threatened	No	10-00
<i>Merwillia plumbea</i>	Roots	1,4,6	N.M.F.P*	Not threatened	No	10-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	98.6	Protected (LEMA)	Yes	5-00

\*N.M.F.P= Not Most Frequently Traded Plant

### 3.4.9 Trader 9: *Muthi* shop (Waterberg district)

Fourteen medicinal plants were recorded (Table 3.9), comprising 12 families and 14 genera which include; Acanthaceae (*Sclerochiton ilicifolius*), Amaryllidaceae (*Clivia caulescens*), Apiaceae (*Alepidea amatymbica*), Asparagaceae (*Asparagus aethiopicus*), Asteraceae (*Artemisia afra* and *Callilepis laureola*), Celastraceae (*Pleurostyliia capensis*), Hyacinthaceae (*Drimia sanguinea*), Hypoxidaceae (*Hypoxis sanguinea*), Kirkiaceae (*Kirkia wilmsii*), Polygalaceae (*Securidaca longepedunculata*), Portulacaceae (*Talinum caffrum*) and Zingiberaceae (*Siphonochilus aethiopicus*). Life form can be categorized as herbs (10 genera), shrubs (2 genera) and trees (2 genera).

The vast majority (92%) of stock were in the form of roots. This is followed by leaves which constitute only 8% of the stock. Roots are used to treat a variety of ailments ranging from the

physical (colds, flu, HIV/AIDS, and male impotence) to the metaphysical (charms and protection). Leaves are mainly used to treat colds, flu, stomach problems and malaria.

All traded species have multiple medicinal applications. *Siphonochilus aethiopicus* were found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 103.9 g for *Siphonochilus aethiopicus* to as much as 3.10 kg for *Drimia sanguinea*. The most frequently traded and used plants obtained a total weight of 8.33 kg.

*Securidaca longepedunculata* and *Siphonochilus aethiopicus* are noted to be formally protected under provincial legislation and national legislation.

*Securidaca longepedunculata* which is protected under the National Forest Act and *Siphonochilus aethiopicus* which is protected under the Limpopo Environmental Management Act are also regarded as scarce in this informal market. This trader identified a number (31%) of species that are scarce or becoming scarce in the market. However, the vast majority (69%) is still readily available in the market.

Material such as roots and leaves generally sold in small quantities with unit prices ranging between R6 and R20. Common medicinal plants such as *Alepidea amatymbica*, *Drimia sanguinea* and *Hypoxis obtusa* were sold at a unit price of R10, while scarce medicinal plants such as *Siphonochilus aethiopicus* were cut into smaller and more affordable rhizomatous pieces and sold at a unit price of R6. The most expensive medicinal plants recorded were *Securidaca longepedunculata* which sold for R20 per piece of root, while *Talinum caffrum* and *Callilepis laureola* sold for R7 per bulb and tuber, respectively.

The most preferred medicinal plants (*Drimia sanguinea*, *Hypoxis obtusa*, *Securidaca longepedunculata* and *Siphonochilus aethiopicus*) constitute 30% of this traders stock.

Most of the medicinal plants recorded are herbs which are uprooted during collection and the entire plant removed for usage. During the collection of shrubs such as *Sclerchiton ilicifolius* and

trees such as *Securidaca longepedunculata* a number of roots were removed. With *Artemisia afra* only a selected number of leaves were removed.

Table 3.9: Recorded detail of plants at Trader 9: *Muthi* shop.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4=male impotence 5=charm, protection 6=other (Appendix F)	Total amount calculated in shop (most frequently traded plants) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Alepeidea amatymbica</i>	Roots	1,5,6	256.3	Not threatened	Yes	10-00
<i>Artemisia afra</i>	Leaves	1,6	N.M.F.P*	Not threatened	No	10-00
<i>Asparagus aethiopicus</i>	Roots	5	N.M.F.P*	Not threatened	No	7-00
<i>Callilepis laureola</i>	Roots	6	N.M.F.P*	Not threatened	No	7-00
<i>Clivia caulescens</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Drimia sanguinea</i>	Roots	2,5,6	2432.3	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	3101.3	Not threatened	No	10-00
<i>Kirkia wilmsii</i>	Roots	6	1711.4	Not threatened	No	10-00
<i>Pleurostyli capensis</i>	Roots	5,6	N.M.F.P*	Not threatened	No	6-00
<i>Sclerochiton ilicifolius</i>	Roots	5,6	N.M.F.P*	Not threatened	Yes	10-00
<i>Securidaca longepedunculata</i>	Roots	1,4,6	733.7	Protected (NFA)	Yes	20-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	103.9	Protected (LEMA)	Yes	6-00
<i>Talinum caffrum</i>	Roots	5	N.M.F.P*	Not threatened	No	7-00

\*N.M.F.P= Not Most Frequently Traded Plant

### 3.4.10 Trader 10: Street vendor (Waterberg district)

Three medicinal plants (all herbs) were recorded (Table 3.10), comprising 3 families and 3 genera which include; Hyacinthaceae (*Drimia sanguinea*), Hypoxidaceae (*Hypoxis obtusa*) and Zingiberaceae (*Siphonochilus aethiopicus*).

All stock was in the form of roots. Roots are used to treat a variety of ailments ranging from the physical (colds, flu, HIV/AIDS and male impotence) to the metaphysical (charms and protection).

All traded species have multiple medicinal applications. *Siphonochilus aethiopicus* was the most used species with seven applications, ranging from treatment of colds and flu, acting as charms, protection and treatment of ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 236.4 g for *Siphonochilus aethiopicus* to as much as 855.4 g for *Drimia sanguinea*. The most frequently traded and used plants obtained a total weight of 1.93 kg.

Table 3.10: Recorded detail of plants at Trader 10: Street vendor.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5=charm,protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded plants) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Drimia sanguinea</i>	Roots	4,5,6	855.4	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	842.6	Not threatened	No	10-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	236.4	Protected (LEMA)	Yes	5-00

\*N.M.F.P= Not Most Frequently Traded Plant

Only *Siphonochilus aethiopicus* is protected by the Limpopo Environmental Management Act. This trader identified *Siphonochilus aethiopicus* as scarce or becoming scarce in the market. However, the vast majority (67%) is still readily available in the market.

Plants were generally sold in small quantities of roots with unit prices ranging between R5 and R10. Common medicinal plants such as *Drimia sanguinea* and *Hypoxis obtusa* sold for R10 per corm, while scarce medicinal plants such as *Siphonochilus aethiopicus* were cut into smaller but affordable rhizomatous pieces and sold for R5.

*Drimia sanguinea*, *Hypoxis obtusa* and *Siphonochilus aethiopicus* were recorded as preferred medicinal plants. During the collection of these species the entire plant is removed.

#### 3.4.11 Trader 11: Muthi shop (Waterberg district)

Eighteen different medicinal plants were recorded (Table 3.11), comprising 14 families and 17 genera which include; Acanthaceae (*Sclerochiton ilicifolius*), Amaryllidaceae (*Clivia caulescens*), Apiaceae (*Alepidea amatymbica*), Asteraceae (*Artemisia afra* and *Helichrysum* sp), Canellaceae (*Warbugia salutaris*), Capparaceae (*Capparis sepiaria*), Celastraceae (*Elaeodendron transvaalense* and *Pleurostyliia capensis*), Ebenaceae (*Diospyros galpinii*), Hyacinthaceae (*Eucomis pallidiflora* and *Merwillia plumbea*), Hypoxidaceae (*Hypoxis obtusa*), Myrothamnaceae (*Myrothamnus flabellifolia*), Portulacaceae (*Talinum caffrum*), Thymelaeaceae (*Synaptolepis kirkii*) and Zingiberaceae (*Siphonochilus aethiopicus*). Life forms can be categorized as herbs (10 genera), shrubs (4 genera) and trees (3 genera).

The vast majority (83%) of stock were in the form of roots. This is followed by leaves which constitute 11% of the stock traded and bark making up the remaining 6%. Roots are used to treat a variety of ailments ranging from the physical (colds, flu, HIV/AIDS, female infertility and male impotence) to the metaphysical (charms and protection). Leaves are mainly used to treat colds, flu, stomach problems, and wounds and to expel evil spirits. Bark is predominately used by this trader to treat wounds, uterus problems and mental illnesses.

All traded species have multiple medicinal applications. *Siphonochilus aethiopicus* are the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Table 3.11: Recorded detail of plants at Trader 11: *Muthi* shop.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5=charm,protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded plants) ( grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Alepidea amatymbica</i>	Roots	1,5,6	184.3	Not threatened	Yes	10-00
<i>Artemisia afra</i>	Leaves	1,6	N.M.F.P*	Not threatened	No	10-00
<i>Capparis sepiaria</i>	Roots	3,6	N.M.F.P*	Protected (LEMA)	Yes	10-00
<i>Clivia caulescens</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Diospyros galpinii</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Elaeodendron transvaalense</i>	Roots	6	N.M.F.P*	Protected (NFA)	No	10-00
<i>Eucomis pallidiflora</i>	Roots	2,4,6	746.3	Not threatened	No	10-00
<i>Helichrysum</i> sp	Leaves	5,6	234.1	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	963.9	Not threatened	No	10-00
<i>Merwillia plumbea</i>	Roots	1,4,6	N.M.F.P*	Not threatened	No	10-00
<i>Myrothamnus flabellifolia</i>	roots	6	N.M.F.P*	Not threatened	No	7-00
<i>Pleurostyliia capensis</i>	Roots	5,6	N.M.F.P*	Not threatened	No	7-00
<i>Sclerochiton ilicifolius</i>	Roots	5,6	N.M.F.P*	Not threatened	Yes	10-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	176.4	Protected (LEMA)	Yes	5-00
<i>Synaptolepis kirkii</i>	Roots	6	N.M.F.P*	Not threatened	Yes	5-00
<i>Talinum caffrum</i>	Roots	5	N.M.F.P*	Not threatened	No	5-00
<i>Warbugia salutaris</i>	Bark	6	N.M.F.P*	Protected (NFA)	Yes	20-00

\*N.M.F.P= Not Most Frequently Traded Plant

Of the most frequently traded plants weight varied from as little as 176.4 g for *Siphonochilus aethiopicus* to as much as 963.9 g for *Hypoxis obtusa*. The most frequently traded and used plants obtained a total weight of 2.3 kg.

Forty-four percent of the species (*Capparis sepiaria*, *Elaeodendron transvaalense*, *Siphonochilus aethiopicus* and *Warburgia salutaris*) are noted to be formally protected under provincial legislation and national legislation. *Capparis sepiaria* and *Siphonochilus aethiopicus* are protected under the Limpopo Environmental Management Act, with *Elaeodendron transvaalense* and *Warburgia salutaris* protected under the National Forest Act.

This trader identified a number (35%) of species that are scarce or becoming scarce in the market. However, the vast majority (65%) is still readily available in the market. The availability of *Warburgia salutaris* has decreased to an alarming rate at a local level and indicated by trader to be difficult to locate in Limpopo.

Material such as roots, leaves and bark were generally sold in small quantities with prices ranging between R5 and R20. Common medicinal plants such as *Drimia sanguinea* and *Helichrysum kraussii* sold for R10 per corm, while scarce medicinal plants such as *Siphonochilus aethiopicus* and *Synaptolepis kirkii* were cut into smaller but more affordable rhizomatous pieces and sold at a unit price of R5. The most expensive medicinal plants recorded were *Warburgia salutaris* which sold for R20 per piece of bark.

The most preferred medicinal plants (*Alepidea amatymbica*, *Eucomis pallidiflora*, *Hypoxis obtusa* and *Siphonochilus aethiopicus*) constitute 44% of this traders stock.

During the collection of herbs such as *Siphonochilus aethiopicus*, *Eucomis pallidiflora* and *Hypoxis obtusa* the entire plant is uprooted. With *Artemisia afra* only a select number of leaves were removed. During the collection of shrubs such as *Sclerochiton ilicifolius* and trees such as *Warburgia salutaris* a number of roots were removed and pieces of bark stripped.

#### 3.4.12 Trader 12: Street vendor (Waterberg)

Six medicinal herbs were recorded (Table 3.12), comprising 5 families and 6 genera which include; Amaryllidaceae (*Clivia caulescens*), Asteraceae (*Helichrysum kraussii*), Hyacinthaceae

(*Eucomis pallidiflora* and *Merwillia plumbea*), Hypoxidaceae (*Hypoxis obtusa*) and Zingiberaceae (*Siphonochilus aethiopicus*).

The vast majority (83%) of stock were in the form of roots. This is followed by leaves which constitute 17% of the remaining stock traded. Roots are used to treat a variety of ailments ranging from the physical (colds, flu, wounds, burns, HIV/AIDS and male impotence) to the metaphysical (charms and protection). Leaves are mainly used to treat wounds and to expel evil spirits.

Table 3.12: Recorded detail of plants at Trader 12: Street vendor.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5=charm, protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded plant) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Clivia caulescens</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Eucomis pallidiflora</i>	Roots	2,4,6	510.6	Not threatened	No	10-00
<i>Helichrysum kraussii</i>	Leaves	5,6	106.5	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	766.3	Not threatened	No	10-00
<i>Merwillia plumbea</i>	Roots	1,4,6	N.M.F.P*	Not threatened	No	10-00
<i>Siphochilus aethiopicus</i>	Roots	1,5,6	101.2	Protected (LEMA)	Yes	5-00

\*N.M.F.P= Not Most Frequently Traded Plant

All traded species have multiple medicinal applications. *Siphonochilus aethiopicus* were found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 101.2 g for *Siphonochilus aethiopicus* to as much as 766.3 g for *Hypoxis obtusa*. The most frequently traded and used plants obtained a total weight of 1.48 kg.

*Siphonochilus aethiopicus* is formally protected under provincial legislation (Limpopo Environmental Management Act).

This trader identified a number (17%) of species (*Siphonochilus aethiopicus*) that are scarce or becoming scarce in the market. However, the vast majority (83%) is still readily available in the market. *Siphonochilus aethiopicus* is regarded as scarce in the trade.

Material such as roots and leaves were generally sold in small quantities with unit prices ranging between R5 and R10. Common medicinal plants such as *Merwillia plumbea* sold for R10 per corm, while scarce medicinal plants such as *Siphonochilus aethiopicus* were cut into smaller and more affordable rhizomatous pieces sold for R5.

The most preferred medicinal plants (*Eucomis pallidiflora*, *Hypoxis obtusa* and *Siphonochilus aethiopicus*) constitute 50% of this traders stock.

The entire plant is uprooted during the collection of herbs such as *Siphonochilus aethiopicus*, *Eucomis pallidiflora* and *Hypoxis obtusa*.

#### 3.4.13 Trader 13: Muthi shop (Mopani district)

Eight medicinal plants were recorded (Table 3.13), comprising 8 families and 8 genera which include; Apiaceae (*Alepidea amatymbica*), Celastraceae (*Catha edulis*), Fabaceae (*Dolichos falciformis*), Hypoxidaceae (*Hypoxis obtusa*), Ochnaceae (*Brackenridgea zanzebarica*), Polygalaceae (*Securidaca longepedunculata*) and Velloziaceae (*Xerophyta* sp). Life form can be categorized as herbs (3 genera), shrubs (3 genera) and trees (2 genera).

All stock was in the form of roots. Roots are used to treat a variety of ailments ranging from the physical (colds, flu, mental illness, HIV/AIDS and male impotence) to the metaphysical (charms and protection).

All traded species have multiple medicinal applications. *Brackenridgea zanzebarica* was found to be the most used species with four applications, ranging from treatments of aching hands to protecting and used as a catalyst for most medicine.

Of the most frequently traded plants weight varied from as little as 279.3 g for *Alepidea amatymbica* to as much as 1.0 kg for *Securidaca longipedunculata*. The most frequently traded and used plants obtained a total weight of 1.99 kg.

*Brackenridgea zanqueribarica* is protected under the Limpopo Environmental Management Act, while *Catha edulis* and *Securidaca longepedunculata* are protected under the National Forest Act.

This trader identified a number (50%) of species that are scarce or becoming scarce (*Alepidea amatymbica*, *Brackerindgea zanqueribarica*, *Catha edulis* and *Securidaca longepedunculata*) in the market. The other 50% is still readily available in the market.

Table 3.13: Recorded detail of plants at trader 13: *Muthi* shop.

Plant name (Scientific name or vernacular names)	Parts used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5=charm, protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded plant) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Alepidea amatymbica</i>	Roots	1,5,6	279.3	Not threatened	Yes	10-00
<i>Brackenridgea zanquebarica</i>	Roots/Bark	5,6	N.M.F.P*	Protected (LEMA)	Yes	20-00
<i>Catha edulis</i>	Roots	4,6	N.M.F.P*	Protected (NFA)	No	15-00
<i>Dolichos falciformis</i>	Roots	6	N.M.F.P*	Not threatened	Yes	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	710.5	Not threatened	No	10-00
<i>Rhoicissus tomentosa</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Securidaca longepedunculata</i>	Roots	1,4,6	1001.7	Protected (NFA)	Yes	20-00
<i>Xerophyta</i> sp	Roots	6	N.M.F.P*	Not threatened	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

Material such as roots and bark were generally sold in small quantities with unit prices ranging between R10 and R20. Common medicinal plants such as *Hypoxis obtusa* sold for R10 per corm,

while *Catha edulis* sold for R15 per piece of root. The most expensive medicinal plants recorded were *Brackenridgea zanzebarica* and *Securidaca longipedunculata* which sold for R20 per piece of root.

The most preferred medicinal plants (*Catha edulis*, *Hypoxis obtusa* and *Securidaca longipedunculata*) constitute 38% of this traders stock.

During the collection of medicinal herbs such as *Hypoxis obtusa* and *Xerophyta* sp. entire plants are uprooted. Collection of shrubs such as *Catha edulis* and trees such as *Securidaca longipedunculata* include the cutting of roots and stripping of bark.

#### 3.4.14 Trader 14: Street vendor (Mopani district)

Five medicinal plants were recorded (Table 3.14), comprising 5 families and 5 genera which include; Apiaceae (*Alepidea amatymbica*), Celastraceae (*Catha edulis*), Hypoxidaceae (*Hypoxis obtusa*), Polygalaceae (*Securidaca longipedunculata*) and Velloziaceae (*Xerophyta* sp). Plant life form can be categorized as herbs (3 genera), shrubs (1 genus) and tree (1 genus).

All stock was in the form of roots. Roots are used to treat a variety of ailments ranging from the physical (colds, flu, mental illness, HIV/AIDS and male impotence) to the metaphysical (charms and protection).

All traded species have multiple medicinal applications. *Securidaca longipedunculata* were found to be the most used species with seven applications, ranging from treatments of colds, flu, to mental illness.

Of the most frequently traded plants weight varied from as little as 491.32 g for *Alepidea amatymbica* to as much as 1.34 kg for *Securidaca longipedunculata*. The most frequently traded and used plants obtained a total weight of 2.74 kg.

*Catha edulis* and *Securidaca longipedunculata* are protected under the National Forest Act. *Securidaca longipedunculata* is protected by LEMA and recorded as scarce by the street vendor.

This trader identified a number (40%) of species that are scarce or becoming scarce (*Alepidea amatymbica* and *Securidaca longipedunculata*) in the market. However, the vast majority (60%) is still readily available in the market.

Roots were generally sold in small quantities with unit prices ranging between R10 and R20. Common medicinal plants such as *Hypoxis obtusa* sold for R10 per corm, while *Catha edulis* was sold for R15 per roots. The most expensive medicinal plant recorded was *Securidaca longipedunculata* which sold for R20 per piece of root.

The most preferred medicinal plants (*Catha edulis*, *Hypoxis obtusa* and *Securidaca longipedunculata*) constitute 60% of this traders stock.

The entire plant is uprooted during the collection of medicinal herb such as *Hypoxis obtusa*. Collection of shrubs such as *Catha edulis* and trees such as *Securidaca longipedunculata* include the cutting of roots.

Table 3.14: Recorded detail of plants at trader 14: Street vendor.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5=charm, protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded plants) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Alepidea amatymbica</i>	Roots	1,5,6	491.3	Not threatened	Yes	10-00
<i>Catha edulis</i>	Roots	4,6	N.M.F.P*	Protected (NFA)	No	15-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	914.4	Not threatened	No	10-00
<i>Securidaca longipedunculata</i>	Roots	1,4,6	1343.5	Protected (NFA)	Yes	20-00
<i>Xerophyta</i> sp	Roots	6	N.M.F.P*	Not threatened	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

### 3.4.15 Trader 15: Muthi shop (Mopani district)

Sixteen medicinal plants were recorded (Table 3.15), comprising 15 families and 16 genera which include; Apiaceae (*Alepidea amatymbica*), Asparagaceae (*Asparagus aethiopicus*), Celastraceae (*Catha edulis*), Fabaceae (*Dolichos falciformis* and *Peltophorum africanum*), Hyacinthaceae (*Drimia sanguinea*), Hypoxidaceae (*Hypoxis obtusa*), Icacinaceae (*Pyrenacantha grandiflora*), Meliaceae (*Trichilla emetica*), Ochnaceae (*Brackenridgea zanzebarica*), Polygalaceae (*Securidaca longepedunculata*), Portulacaceae (*Talinum caffrum*), Rutaceae (*Zanthoxylum capense*), Velloziaceae (*Xerophyta* sp), Vitaceae (*Rhoicissus tomentosa*), and Zingiberaceae (*Siphonochilus aethiopicus*). Plant life form can be categorized as herbs (8 genera), shrubs (4 genera) and trees (4 genera).

All stock was in the form of roots. Roots are used to treat a variety of ailments ranging from the physical (colds, flu, mental illness, HIV/AIDS and male impotence) to the metaphysical (charms and protection).

All traded species have multiple medicinal applications. *Siphonochilus aethiopicus* was found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 161.7 g for *Siphonochilus aethiopicus* to as much as 2.51 kg for *Drimia sanguinea*. The most frequently traded and used plants obtained a total weight of 6.35 kg.

Nineteen percent of the species were found to be listed as protected under the Limpopo Environmental Management Act (*Brackenridgea zanzebarica* and *Siphonochilus aethiopicus*) and the National Forest Act (*Securidaca longepedunculata*).

This trader identified a number (31%) of species (*Alepidea amatymbica*, *Brackenridgea zanzebarica*, *Dolichos falciformis*, *Securidaca longepedunculata* and *Siphonochilus aethiopicus*) that are scarce or becoming scarce in the market. However, the vast majority (69%) is still readily available in the market.

Table 3.15: Recorded detail of plants at trader 15: *Muthi* shop.

Plant name (Scientific name or vernacular names)	Parts used	Medicinal use of plants 1=flu, colds 2=HIV/AIDS, STD'S 3=female infertility 4= male impotence 5=charm, protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded plants) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Alepidea amatymbica</i>	Roots	1,5,6	275.4	Not threatened	Yes	10-00
<i>Asparagus aethiopicus</i>	Roots	5	N.M.F.P*	Not threatened	No	5-00
<i>Brackenridgea zanzebarica</i>	Roots/Bark	5,6	N.M.F.P*	Protected (LEMA)	Yes	30-00
<i>Catha edulis</i>	Roots	4,6	N.M.F.P*	Protected (NFA)	No	15-00
<i>Dolichos falciformis</i>	Roots	6	N.M.F.P*	Not threatened	Yes	10-00
<i>Drimia sanguinea</i>	Roots	4,5,6	2513.7	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	966.3	Not threatened	No	10-00
<i>Peltophorum africanum</i>	Roots	1,6	N.M.F.P*	Not threatened	No	5-00
<i>Pyrenacantha grandiflora</i>	Roots	5	N.M.F.P*	Not threatened	No	10-00
<i>Rhoicissus tomentosa</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Securidaca longepedunculata</i>	Roots	1,4,6	2441.6	Protected (NFA)	Yes	30-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	161.7	Protected (LEMA)	Yes	5-00
<i>Talinum caffrum</i>	Roots	5	N.M.F.P*	Not threatened	No	5-00
<i>Trichilla emetica</i>	Roots	6	N.M.F.P*	Not threatened	No	5-00
<i>Xerophyta</i> sp	Roots	6	N.M.F.P*	Not threatened	No	5-00
<i>Zanthoxylum capense</i>	Roots	1,6	N.M.F.P	Not threatened	No	10-00

\*N.M.F.P= Not Most Frequently Traded Plant

Material such as roots and bark generally sold in small quantities with unit prices ranging between R5 and R30. Common medicinal plants such as *Drimia sanguinea* and *Hypoxis obtusa* sold for R10 per corm, while *Catha edulis* sold for R15 per piece of root. The most expensive

medicinal plants recorded were *Securidaca longepedunculata* which sold for R30 per piece of root.

The most preferred plants medicinal plants (*Brackenridgea zaquebarica*, *Catha edulis*, *Drimia sanguinea*, *Hypoxis obtusa* and *Siphonochilus aethiopicus*) constitute 31% of this traders stock.

During the collection of medicinal herbs such as *Asparagus aethiopicus* entire plants were uprooted. In the collection of shrubs such as *Catha edulis* and trees such as *Securidaca longepedunculata* a selected number of roots were removed. Collection of material from trees such as *Brackenridgea zaquebarica* includes stripping pieces of bark.

#### 3.4.16 Trader 16: Street vendor (Mopani district)

Ten medicinal plants were recorded (Table 3.16), comprising 12 families and 10 genera which include; Apiaceae (*Alepidea amatymbica*), Celastraceae (*Catha edulis*), Fabaceae (*Dolichos falciformis*) Hyacinthaceae (*Drimia sanguinea*), Hypoxidaceae (*Hypoxis obtusa*), Icacinaceae (*Pyrenacantha grandiflora*), Meliaceae (*Trichilla emetica*), Rutaceae (*Zanthoxylum capense*), Polygalaceae (*Securidaca longepedunculata*) and Zingiberaceae (*Siphonochilus aethiopicus*). Plant life form can be categorized as herbs (5 genera), shrubs (3 shrubs) and trees (2 genera).

All stock was in the form of roots. Roots are generally used to treat a variety of ailments ranging from the physical (colds, flu, mental illness, HIV/AIDS and male impotence) to the metaphysical (charms and protection).

Most traded species have multiple medicinal applications. Only *Pyrenacantha grandiflora* (charms and protection) was found to have a single use. *Siphonochilus aethiopicus* was found to be the most used species with seven applications, ranging from treatments of colds and flu to acting as charms and for protection to treating ulcers and *makgoma*.

Of the most frequently traded plants weight varied from as little as 96.4 g for *Siphonochilus aethiopicus* to as much as 1.44 kg for *Hypoxis obtusa*. The most frequently traded and used plants obtained a total weight of 4.42 kg.

Thirty percent of the species (*Catha edulis*, *Securidaca longipedunculata* and *Siphonochilus aethiopicus*) of this trade are regarded as protected plants. *Siphonochilus aethiopicus* is protected under the Limpopo Environmental Management Act, and *Catha edulis* and *Securidaca longipedunculata* are listed as protected under the National Forest Act.

This trader identified a number (40%) of species (*Alepidea amatymbica*, *Dolichos falciformis*, *Securidaca longipedunculata* and *Siphonochilus aethiopicus*) that are scarce or becoming scarce in the market. However, the vast majority (60%) is still readily available in the market.

Roots generally sold in small quantities with prices ranging between R5 and R20. Common medicinal plants such as *Hypoxis obtusa* sold for R10 per corm, while *Catha edulis* sold for R15 per piece of root. Plants such as *Siphonochilus aethiopicus* were cut into smaller and more affordable rhizomatous pieces and sold for R5, while the most expensive medicinal plant (*Securidaca longipedunculata*) sold for R20 per piece of root.



Figure 3.3: Typical display of products by a street vendor.

The most preferred medicinal plants (*Catha edulis*, *Drimia sanguinea*, *Hypoxis obtusa* and *Siphonochilus aethiopicus*) constitute 40% of this traders stock. Fifty percent of the preferred medicinal plants are protected by environmental legislation.

The entire plant was uprooted during the collection of *Siphonochilus aethiopicus*. During the collection of shrubs such as *Catha edulis* and trees such as *Securidaca longipedunculata* a number of roots were removed.

Table 3.16: Recorded detail of plants at trader 16: Street vendor.

Plant name (Scientific name or vernacular names)	Part used	Medicinal use of plants 1= flu, colds 2= HIV/AIDS, STD'S 3= female infertility 4= male impotence 5= charm, protection 6= other (Appendix F)	Total amount calculated in shop (most frequently traded plants) (grams)	Conservation status	Scarce in market	Price/unit (Rand)
<i>Alepidea amatymbica</i>	Roots	1,5,6	845.2	Not threatened	Yes	10-00
<i>Catha edulis</i>	Roots	4,6	N.M.F.P*	Protected (NFA)	No	15-00
<i>Dolichos falciformis</i>	Roots	6	N.M.F.P*	Not threatened	Yes	10-00
<i>Drimia sanguinea</i>	Roots	4,5,6	832.5	Not threatened	No	10-00
<i>Hypoxis obtusa</i>	Roots	2,4,6	1442.4	Not threatened	No	10-00
<i>Pyrenacantha grandiflora</i>	Roots	5	N.M.F.P*	Not threatened	No	10-00
<i>Securidaca longipedunculata</i>	Roots	1,4,6	861.3	Protected (NFA)	Yes	20-00
<i>Siphonochilus aethiopicus</i>	Roots	1,5,6	96.4	Protected (LEMA)	Yes	5-00
<i>Trichilla emetica</i>	Roots	6	N.M.F.P*	Not threatened	No	10-00
<i>Zanthoxylum capense</i>	Roots	1,6	N.M.F.P*	Not threatened	No	10-00

\*N.M.F.P=Not Most Frequently Traded Plant

### 3.4.1 Frequency of species encountered

*Alepidea amatymbica*, *Drimia sanguinea*, *Eucomis pallidiflora*, *Helichrysum kraussii*, *Hypoxis obtusa*, *Securidaca longipedunculata*, *Siphonochilus aethiopicus* and *Kirkia wilmsii* were the eight most frequently encountered species of the 16 traders surveyed (Table 3.17). *Hypoxis obtusa* was stocked by all 16 visited traders. Twenty-three percent of species were only stocked by shop traders with *Molatsa* being stocked by only one street vendor. The remaining 77% of species encountered were stocked by both shop and street vendor traders.

Table 3.17: Frequency of species encountered in all surveyed shops.

Scientific name	Indigenous name	Frequency of species encountered (%) (Ranked)
<i>Hypoxis obtusa</i>	Monnamaledu	100%
<i>Siphonochilus aethiopicus</i>	Serokolo	81%
<i>Drimia sanguinea</i>	Sekanama	75%
<i>Eucomis pallidiflora</i>	Maphuma difala	63%
<i>Alepidea amatymbica</i>	Lesoko	50%
<i>Helichrysum kraussii</i>	Mpepo	50%
<i>Securidaca longipedunculata</i>	Mpesu	50%
<i>Kirkia wilmsii</i>	Modumela (Legaba)	44%
<i>Artemisia afra</i>	Lengana	38%
<i>Catha edulis</i>	Tshikwane	38%
<i>Monsonia angustifolia</i>	Special	38%
<i>Sclerochiton ilicifolius</i>	Molomomonte	38%
<i>Talinum caffrum</i>	Phonyokga / kgebeletswane	38%
<i>Capparis sepiaria</i>	Moupatladi	31%
<i>Elephantorrhiza elephantina</i>	Motshitshane	31%
<i>Asparagus aethiopicus</i>	Seboka	25%
<i>Brackenridgea zaquebarica</i>	Mutavhatsindi	25%

Continue...

Scientific name	Indigenous name	Frequency of species encountered (%) (Ranked)
<i>Callilepis laureola</i>	Phela	25%
<i>Merwillia plumbea</i>	Ingunduza	25%
<i>Pyrenacantha grandiflora</i>	Bjere	25%
<i>Schotia brachypetala</i>	Molope	25%
<i>Trichilla emetica</i>	Mmaba	25%
<i>Xerophyta</i> sp	Xiroda	25%
<i>Zanthoxylum capense</i>	Senokomaropa/ monokwane	25%
<i>Callilepis salcifolia</i>	Phelana	19%
<i>Clivia caulescens</i>	Mayime	19%
<i>Dolichos falciformis</i>	Vuma	19%
<i>Encephalartos transvenosus</i>	Mofaka	19%
<i>Erythrina lysistemon</i>	Mmale	19%
<i>Pleurostyliia capensis</i>	Moromelela	19%
<i>Agapanthus inapertus</i>	Leta-la-phofu	13%
<i>Aloe</i> sp	Sekgopa	13%
<i>Boophane disticha</i>	Titikwane	13%
<i>Bulbine frutescens</i>	Sehlare sa pekane	13%
<i>Combretum molle</i>	Mokgwethe	13%
<i>Crinum bulbispermum</i>	Mototse lelutla	13%
<i>Dioscorea dregeana</i>	Mabele a poo	13%
<i>Drimia elata</i>	Sekanama	13%
<i>Ficus abutilifolia</i>	Mphaya	13%
<i>Leonotis leonorus</i>	Lebake	13%

Continue...

Scientific name	Indigenous name	Frequency of species encountered (%) (Ranked)
<i>Peltophorum africanum</i>	Mosehla	13%
<i>Pittosporum viridiflorum</i>	Kgalagangwe	13%
<i>Rhoicissus tomentosa</i>	Phinda mshaye	13%
<i>Scabiosa columbaria</i>	Bekamina	13%
<i>Tecoma capenses</i>	Mopa-sitsane	13%
<i>Zantedeschia aethiopica</i>	Mothebe	13%
<i>Ziziphus mucronata</i>	Mokgalo	13%
Unidentified	Morutatshitsha	13%
Unidentified	Sefepabadimo	13%
Unidentified	Setsosadingaka	13%
<i>Boscia albitrunca</i>	Mohlopimolewa	6%
<i>Crotalaria natalitia</i>		6%
<i>Dioscorea sylvatica</i>	Mabele a poo	6%
<i>Diospyros galpinii</i>	Ndodemyama	6%
<i>Elaeodendron transvaalense</i>	Monomane	6%
<i>Lippia javanica</i>	Mosunkwane	6%
<i>Myrothamnus flabellifolia</i>	Pati ya tshwene	6%
<i>Sclerocarya birrea</i>	Morula	6%
<i>Synaptolepis kirkii</i>	Vuma bomvu	6%
<i>Warbugia salutaris</i>	Molaka	6%
Unidentified	Kgashi	6%
Unidentified	Leilane	6%
Unidentified	Lesitsamane	6%

Continue...

Scientific name	Indigenous name	Frequency of species encountered (%) (Ranked)
Unidentified	Makgone	6%
Unidentified	Matsana	6%
Unidentified	Molatsa	6%
Unidentified	Mowisabagolo	6%
Unidentified	Mphera	6%

### 3.4.2 Summary of amounts of species traded

An estimated 0.08 tonnes per month or 0.96 tonnes per year of plant material are stocked by the 16 *muthi* traders. Sixty-four percent of medicinal plants species were stocked by shops compared to 36% by street vendors. Shop traders (all eight) stocked a total amount of 47.16 kg compared to 40.05 kg at street vendors (all eight). Of these the greatest amount stocked per trader was recorded for trader 4 (*muthi* shop) at 15.67 kg compared to the 1.48 kg for trader 12 (street vendor).

### 3.4.3 Use of species traded

Plant material such as roots, leaves and bark are generally used to treat people suffering from common ailments such as colds, flu and cuts to rare ailments such as HIV/AIDS, womb problems and ulcers. Roots are mainly used for the treatment of female infertility and male impotence. Leaves are primarily used to treat colds and flu, while bark is mostly used to treat wounds.

Most of the medicines are prepared and taken in liquid form as infusions and decoctions. Powders are taken with either water (cold or luke-warm) or as a tea, or are rubbed into incisions made in the skin using a razor blade.

Herbs are primarily preferred and used for their roots, especially the swollen roots. Shrubs are also mainly used for their roots. In contrast with the above, trees are mostly used for their bark, with a few species being used for their leaves.

In most cases one plant part is used to treat more than one condition, while several plant parts can be used to treat the same condition. One species can be used for different ailments depending on its administration and application. Most of the related species are used to treat similar ailments.

#### **3.4.4 Red Data and scarce species**

This study indicated that 16% of plants species encountered in all 16 traders were listed as protected by provincial and national legislation. Ten percent of the listed species encountered were listed under the National Forest Act and 6% under the Limpopo Environmental Management Act. The majority of species encountered are regarded as not threatened due to deficient data on their distribution. Twenty-five percent of plant species are regarded by traders as scarce or becoming scarce.

### **3.5 Collection of medicinal plants**

The majority (94%) of shop traders interviewed indicated that they collect their own medicinal plants. Those who do not collect buy from dedicated collectors and/or also send employees to collect for them. All eight street vendors interviewed collect for themselves.

All traders who collect indicated that they are familiar with the area where they collect and travel more than 50 kilometers to obtain most of their plants. Most of these plants are collected from communal land, whilst a few are collected from protected areas and private land such as farms.

#### **3.5.1 Source of medicinal plants in Limpopo Province**

This study established that the vast majority of volumes of indigenous medicinal plants, which were traded mainly in provincial informal markets, are harvested from wild populations. The supply of important medicinal plants has declined leading to concerns by 81% of traders and all environmental compliance officers. Forty-four percent of traders indicated that they were using

smaller sized parts than before, due to shortage of normal sized plants in the wild. Thirteen percent of traders indicated that they are currently using different plant parts than before, due to a shortage of preferred parts. The researcher also observed that the same plant can be utilized for both its roots and bark.

Medicinal plants are harvested from a wide range of habitats (Table 3.18) in the province, including the threatened grassland, savanna woodlands and along the riparian vegetation. These habitats are located on communal lands, farms and protected areas. It was difficult to obtain a precise indication of how many species were harvested from specific habitats because traders were not precise on this question. However, the researcher observed that 75% of herbs are harvested from grasslands and 20% from the savanna woodlands, with the remaining 5% from the riparian vegetation. Eighty percent of shrubs and trees are harvested from the savanna woodlands and 20% from the riparian vegetation.

Table 3.18: Location of key supply areas for preferred medicinal plants.

Scientific name	Location of harvesting
<i>Artemisia afra</i>	Mountainous areas of province
<i>Capparis sepiaria</i>	Throughout the province especially on Savanna.
<i>Drimia sanguinea</i>	Throughout province especially on grassland patches of the Savanna.
<i>Eucomis pallidiflora</i>	Wolkberg mountains (Capricorn district), Burgersfort, Nebo (Sekhukhune district).
<i>Helichrysum kraussii</i>	Throughout province especially on grassland patches of the Savanna.
<i>Hypoxis obtusa</i>	Throughout province especially on grassland patches of the Savanna.
<i>Kirkia wilmsii</i>	Ga- Chuenie, Lebowakgomo, Moletjie, Polokwane (Capricorn district).
<i>Monsonia angustifolia</i>	Throughout province especially on disturbed/burned patches of the Savanna.
<i>Sclerochiton ilicifolius</i>	Strydom tunnel (Mopani district; former Bohlabela district; Mpumalanga).
<i>Securidaca longipendunculata</i>	Thengwe area (Vhembhe district).
<i>Siphonochilus aethiopicus</i>	Segopye (Capricorn district), Haenersburg (Mopani), Bushbuckridge (Mpumalanga), Swaziland.

The main source of medicinal plants in the Limpopo Province is from communal lands where there is generally easy access to natural resources. Ninety-four percent of shop traders and all street vendors harvest medicinal plants from communal lands. Plants which are no longer available in communal areas are harvested on privately owned farms and protected areas. Harvesting by all traders takes place with or without the consent of the landowner or environmental authority.

Preferred medicinal plants which are now becoming difficult to obtain in Limpopo are imported from neighbouring provinces such as Mpumalanga, with some plants being obtained from neighbouring countries such as Swaziland, Mozambique and Zimbabwe. The imports of plant species such as *Siphonochilus aethiopicus* and *Warbugia salutaris* takes place on an informal basis with no authorization. Collectors from neighbouring provinces and countries have family members working within Limpopo, thereby providing remote locations with market information and transport mechanism.

### **3.5.2 Collectors of medicinal plants**

The researcher observed that traditional healers perform rituals before harvesting in order to secure good quality medicinal plant material. Medicinal plants with magical properties are only harvested by people who are trained in harvesting rituals. During general talks between the researcher and traders it was indicated that magical medicinal plants are not collected from areas where people frequent, as it is believed this will diminish the effectiveness of the plant. Medicinal plants (*Agapanthus inapertus*, *Artemisia afra*, *Leonotis leonorus* and *Peltophorum africanum*) that treat simple ailment such as among other colds, headache and wounds are collected from areas where people frequent.

### **3.5.3 Harvesting methods**

A range of basic implements are used to harvest material. Underground parts (roots) are dug up using a metal rod, hoe or sharp instrument. Bark is stripped by using an axe or knife, and it has been observed by the researcher to be sustainable when not ring-barked. Trees that were bark-stripped continued to produce leaves and flowers. The leaves are harvested by picking the upper leaves by hand and in some instances by breaking branches to obtain these leaves.

During harvesting, all collectors say they don't remove the whole population of a species. During the winter months fewer roots are harvested when the aerial plant parts die back and the plants become less visible. The advent of summer and the development of leaves and flower buds, results in a reversal of this trend.

### **3.6 Plant conservation**

All *muthi* traders interviewed stated that in general medicinal plants in nature are declining in abundance. They indicated that the foremost reason for this decline is over-harvesting. To ensure some form of sustainability, 81% of traders (all being traditional healers) indicated that usually only a few plants are harvested in a specific area to allow species regeneration and to ensure population integrity. The remaining 19% (traditional healers and others) indicated that they are ignorant on how to ensure species and population stability.

Fifty-six percent of the traders indicated that they will be happy if trade can be regulated compared to 44% who are of the opinion that the trade should not be regulated. Regulation of trade was favoured by 62% of *muthi* shop traders, with 38% of *muthi* shop traders opposing it. Street vendors were equally divided over the matter of trade regulation. Traders who are against regulation stated that regulation will complicate issues and that their business might be removed from them. Those who support the regulation of the trade indicated that this will reduce the criminal element. They regard this as a specialist business that needs people who are able to relate to this type of practice.

All *muthi* traders indicated that if certain species are no longer available, they are in a quandary as to possible alternative options. However, there are in certain cases, substitute species that can be employed. Propagation and cultivation of plants is seen by all traders as a conservation strategy which can be used to assist in the conservation of medicinal plants. Paradoxically 12% indicated that they will not purchase cultivated plants.

### **3.7 Environmental legislation**

All interviewed environmental enforcement officers reported that indigenous medicinal plants are prohibited from trading without a permit to harvest and sell. Prohibition is further enhanced by giving certain species a ranking (specially protected protected and ordinary plants) according

to Limpopo Environmental Management Act (LEMA). They further indicated that the criteria used for prohibiting was done in terms of scarcity and distribution in the wild.

All officers indicated that they do undertake patrols through the province but not necessarily in *muthi* shops. Plant identification is done by them, and if necessary assistance can be obtained from knowledgeable colleagues. The public is the main source of information regarding non-compliance of legislation regarding medicinal plants. Other information is obtained via observation by officers during patrols. All officers indicated that the implementation of legislation on medicinal plants is difficult and confusing since the various legislations deal with plants in general, not specifically medicinal plants. They indicated that a special section in the various legislations need to be developed to deal with medicinal plants, as this is a special item on its own. Responsibility for the environment has been divided between three different government departments (Environmental Affairs, Water Affairs and Forestry, and Agriculture) including the relevant provincial authorities such as Department of Economic Development, Environment & Tourism and Department of Agriculture.

There are various other types of legal control (LEMA, NEM:BA and NFA) that are applied to plants in general which includes medicinal plants. Therefore, medicinal plants are highly regulated through a system of permits required for the collection, transporting and export of medicinal plants. There is even a total ban on the harvesting of species such as *Encephalartos transvenosus* which was traded by 19% of interviewed traders. These legal controls have proved to be difficult to enforce as there are usually few practical implementable restrictions to the illegal harvesting of medicinal plants in the wild especially on communal lands.

The Limpopo Environmental Management Act (LEMA) of 2004 deals with issues such as water, animals, plants, forests, land, agriculture, fisheries and pollution. This legislation regulates the utilization of wildlife, as well as the protection of the environment as a whole. LEMA provides for the Limpopo government to combat environmental crime and is structured in a broad format which deals with plants in general and does not specifically mention medicinal plants per-se.

According to the National Environmental Management: Biodiversity Act (NEM:BA), criteria followed to select species for the inclusion in the list for the threatened and protected species are: Critically endangered species (indigenous species facing a high risk of extinction in the wild);

Endangered species (indigenous species facing a high risk of extinction in the wild in the near future, although they are not a critically endangered species); Vulnerable species (indigenous species facing a high risk of extinction in the wild in the medium-term future, although they are not a critically endangered); Protected species (indigenous species of high conservation value or national importance that require national protection).

In terms of the National Forests Act (NFA) of 1998 certain types of tree species have/can be identified and declared as protected. Trees are protected for variety of reasons, and some species require strict protection while others require control over harvesting and utilization. The criteria used to select tree species for inclusion in the protected tree list are: Red List Status (rare or threatened species); Keystone Species Value (whether a species play a dominant role in an ecosystem's functioning); Sustainability of Use (whether a species is threatened by heavy use of its products such as bark and timber); Cultural or Spiritual Importance (outstanding landscape value or spiritual meaning attached to certain tree species); and other legislation (whether a species is already adequately protected by other legislation).

### **3.8 Cultivation methods for the eight most frequently encountered medicinal plants**

Cultivation information supplied by the two visited indigenous nurseries and an internet search indicated that most medicinal plant species can be cultivated. Both visited indigenous nurseries indicated that they propagate the plants themselves.

The techniques and procedures utilized to cultivate plant species such as *Alepidia amatymbica*, *Kirkia wilmsii*, *Securidaca longepedunculata* and *Siphonochilus aethiopicus* are more modernized and complicated.

#### *1. Alepidia amatymbica*

The plant is propagated from fresh seed sown in trays filled with a very well-drained seedling mix in late summer or early spring. Once sown, the seed should be lightly covered and kept watered until germination takes place. The seedlings are very prone to damping off and watering

should be carefully monitored. Once potted into individual containers, plants need to be grown until the underground stem develops, after which they can be planted into the soil.

The material needed to propagate this species is reasonable from acquiring seeds to planting seedlings into the soil. The only problem that is encountered in this process is the availability of water. The process requires that seeds should be kept on being watered until germination takes place. The overall procedure can be rated at thirty percent for best methods.

## 2. *Drimia sanguinea*

Propagation is by seed. Seeds can be sown immediately after harvest in summer. Seeds germinate readily. Germination occurs within 7 days.

Materials needed for propagating this species are simple. The process from acquiring seeds, germination and planting seedlings is as easy as done. The overall rating for this process is 90%

## 3. *Eucomis pallidiflora*

The plant can be propagated by offsets, seed and leaf cuttings. Seed is sown in spring, in deep containers, in a well-drained seedling mix. Seed germinates readily in 4-6 weeks. Young bulbs can be planted into garden in their third year when well-grown specimens may flower for the first time, although this species can take 4-5 seasons to flower. Shoots are produced rather slowly, and are best removed while the plant is dormant in late autumn or winter, kept cool and dry and planted in spring. Bulbs can also be produced by taking leaf cuttings. While the plant is in active growth, an entire leaf can be removed and cut into approximately 5 cm sections, each one 'planted' in sterilized well-drained potting soil and kept moist in a humid environment. Tiny bulbs should form after a month or two.

Acquiring of seeds is a problem because it takes four to five seasons for this species to flower. Once the flowers are acquired the process becomes easier as germination takes few weeks to undergo. The process is fairly reasonable (50%).

#### 4. *Helichrysum kraussii*

The plant can be propagated by seed and stem cuttings. It prefers light and well-drained soil which contained lots of compost. It must be watered moderately to avoid over-watering especially in winter as the plants tend to become infected with fungus.

Acquisition of seeds and stem cuttings is easier as the species flower every season. Acquiring of compost soil is a problem for those without it. The process needs monitoring of watering regime to avoid over-watering. The process is reasonable (75%).

#### 5. *Hypoxis obtusa*

The plant can be propagated by seeds. Seeds germinate better if sown soon after maturity. Plants spread quickly through multiplication of the rootstock to form a mass of plants. Plants are easy to maintain once established in a garden.

The acquisition of seeds is easy as the species flowers every season. Germination is quick when done correctly. The process is easy and is rated at 90%

#### 6. *Kirkia wilmsii*

The plant can be propagated from seed and truncheons. It prefers well-drained soil in a warm and sheltered position. The plant is drought-tolerant.

Acquisition of seeds is easy as the plant flowers every season and is drought resistant. The only problem with this tree is that it takes long for it to mature to a point that it can be used for medicinal purposes. The process are rated at 30%.

#### 7. *Securidaca longepedunculata*

The plant can be propagated by seeds and cuttings of the root shoots. The seeds can be soaked thoroughly and then planted in a sandy soil where the plants must remain, as they do not like to be disturbed. This tree can also be propagated by taking cuttings of the root shoots, as it does not grow well when transplanted.

This is very difficult plant to propagate. Acquisition of seeds can be easier but the problem is with preparing the correct medium to sown seeds. This tree is very sensitive to disturbance and needs a very passionate individual to propagate it. For a tree to grow into maturity it takes a long period. The processes for propagating this tree are rated at 20%.

8. *Siphonochilus aethiopicus*

Plants can be propagated from seed, which can take up to a year to germinate. Propagation of the plant is by dividing the rhizomes when plants are dormant in winter. Care must be taken not to remove or damage the roots when splitting the rhizomes. It prefers a rich, well-drained and compost-rich soil, in a warm, but shady position either in a container or in the garden.

Acquisition of seeds is a problem since this herb is currently scarce in the wild and seeds take a year to germinate. The propagation by dividing rhizomes is a problem because the plant is scarce in the wild and you might rather avoid splitting the rhizomes instead of damaging them. This herb prefers a specialized medium of soil and a shady area. The processes are rated at 20%.

# CHAPTER 4

## DISCUSSION



## **4.1 Social characteristics**

*Muthi* traders and traditional healers are regarded as keepers of ethnic plant knowledge by the community. Although the people of the Limpopo Province are culturally diverse, approximately 57% of the people speak Sesotho sa leboa (DEDET 2006), which explains why the surveyed *muthi* trade in the Province is dominated (75%) by Sepedi speaking people.

It has being reported by Mander *et al.* (2007) that 74% of medicinal plant traders in Gauteng, KwaZulu-Natal and Mpumalanga are women and of these 80% are rural dwellers. This study, in contrast, indicated that the trade in the Limpopo Province is dominated (75%) by adult males, with 81% being traditional healers who reside in rural areas. A possible reason for this gender dominance could be that the collection of medicinal plants may be risky for women as most plants are found in the mountainous areas which necessitate physical efforts and in addition, some plants are located on private fenced lands, which increase the likelihood of being caught by landowners (Loundou 2008). According to Cunningham (1993), the implication for this dominance by men is that traditional conservation practices which includes taboos and customs governing the gathering of medicinal plants are adhered to by the community.

## **4.2 Business information**

The 1999 Economic Development Strategy of the province (DFEAT 1999) highlights the fact that on the demand side, the province is faced with key developmental challenges of unemployment, high dependency ratios, poverty, skewed distribution of resources and high levels of illiteracy. It is estimated that 70% of people in South Africa's rural areas are poor (UNCCD 1994) with this being one of the most marginalized sectors in the South African society (Cunningham 1993).

Limpopo Province is regarded as one of the poorest provinces in South Africa, where poverty is common (34% poverty line), high unemployment rates prevail (32.4%) and limited economic activities exists (Statistics 2007). Unemployment (Shackleton and Shackleton 2000) and poverty (Loundou 2008) are among the driving forces for informal

trade of medicinal plants. Poverty leads to an over-utilisation of plants for short-term benefits (Rowe *et al.* 1992) and ultimately severe long-term degradation (Mac Neely *et al.* 1995), a situation which surely is happening in the Limpopo Province.

With 37% of the traders generating a monthly income of more than R 5 000 from selling medicinal plants in rural areas it is evident that the *muthi* trade plays a critical role in empowering some rural dwellers in the Limpopo Province. It could be argued that the trade of medicinal plants is a lucrative activity, which provides considerable returns to the extent that people involved would not seek other jobs opportunities in the formal sector (Loundou 2008). Furthermore, a lack of access to the *muthi* trade would leave them and their families without a living income. Initiation of natural resource management projects on communal lands could reduce the over-utilisation of medicinal plants. Subsequently this could increase the rate of house hold incomes, encourage sustainable utilization and ultimately promote efficient use of medicinal plant material.

### **3.3 Knowledge of medicinal plants**

The wealth of traditional knowledge regarding South Africa's medicinal plants is still largely confined to traditional healers (Cunningham 1993). This situation is supported by findings of this study which indicated that although 82% of traders interviewed were trained traditional healers, 18% obtained knowledge about medicinal plants from their parents. It can be speculated that limited information about medicinal plants by all sectors of society puts the knowledge base in jeopardy of being lost. This information is disappearing at an ever increasing rate as skilled traditional healers succumb to old age or other causes (Cunningham 1993). Because of the value of this knowledge, there is a need to preserve and record this anecdotal traditional knowledge on the use of medicinal plants.

Although all surveyed *muthi* traders have either primary or secondary schooling with adequate reading and writing skills, none have adequate knowledge of the intricacies of relevant environmental legislations. Legislations are usually written and designed in a complicated legal manner that needs a thorough interpretation to understand. In addition,

environmental legislations are not adequately rolled-out to the communities, especially marginalized communities, leading to the unauthorized utilization of natural resources without any consequences. This has resulted in the need for additional strategies to enforce, regulate and manage natural resource utilization.

The Department of Environmental Affairs and Tourism (1997) and the Convention of Biodiversity (2001) emphasized that lack of conservation knowledge and information about the value of biodiversity (DEAT 1997) are part of the major challenges threatening biodiversity conservation, an aspect supported by results from this study. It is therefore recommended that communal level environmental education and public awareness programmes focusing on medicinal plants be implemented for the successful execution of relevant legislation and other programmes. However, the immediate primary focus should be on lifting the legislation knowledge level of traditional healers (Botha *et al.* 2004) as they dominate the trade in the Province. For further discussions on the subject of plant conservation refer to section 6 of this chapter.

#### **4.4 Critical species**

Research by Tshisikhawe (2002) in the Venda region of the Limpopo Province revealed a total of 69 medicinal plant species being traded in *muthi* shops. In addition a total of 57 species and 12 unidentified specimens were identified by this study. Botha *et al.* (2004) also identified 70 different species traded in the Limpopo lowveld. Taking into account possible duplications, it can be said with a high degree of certainty that more than 178 species are being traded in the four districts of the Limpopo Province. A total of 16% or 11 of plants species were found to be listed as protected during this survey. These species were collected because traders needed them and regrettably, are unaware of which species are protected.

Enforcement of conservation legislation prohibiting the collection and sale of protected species has done little to remedy the situation (Mander 1998). In addition, education of traders in terms of protected species and research into sustainable harvesting of medicinal

plants will help both conservationists and resource-users to develop management guidelines for the collection of these critical species (Marshall 1998).

In South Africa, *Siphonochilus aethiopicus* is in danger of extinction following prolonged over-exploitation by the medicinal plant trade, despite being afforded legal protection (Crouch *et al.* 2000). This medicinal species was stocked by 81% of traders with six uses. The upcoming Red Data Book consider *Siphonochilus aethiopicus* as critically endangered (SANBI 2007) and this is supported by traders in this study who alluded to the fact that the species is scarce. The main problem is the destructive harvesting of the underground parts of these plants (Zschocke *et al.* 2000). The solution could be to encourage traders to collect and use alternative plant parts such as leaves instead of roots.

In this study *Warburgia salutaris* was stocked by only 6% of traders with four uses. According to Loundou (2008), economic harvesting has depleted populations of *Warburgia salutaris* from southern African forests. This study supports the above fact as traders indicated that *Warburgia salutaris* is scarce in the wild a possible reason why it was stocked by only 6% of the traders. According to SANBI (2007), *Warburgia salutaris* is listed as endangered in the upcoming updated Red Data Book. Debarking of trees such as *Warburgia salutaris* causes more damage to the plant as opposed to harvesting its leaves and fruits (Cunningham 1988). Plant part substitution should be an important strategy for the conservation of medicinal plants (Zschocke *et al.* 2000) and traders should be encouraged to consider this strategy.

*Encephalartos transvenosus* was found to be listed under the Red Data Book (Victor 2002), CITES appendices (CITES 2007) and considered as least concern in the upcoming updated Red Data Book (SANBI 2007). It was stocked by 19% of the traders and used for the purposes of charm and protection. In the Modjadji area of the Mopani district, however, they are still abundant in a nature reserve. The reason for this can be as a result of the heritage value attached to the species in that area and the fencing of this natural environment.

Results obtained by this study regarding the frequency of species encountered suggest an over-utilization and collection of *Hypoxis obtusa*. *Hypoxis* sp. was also reported to have a high occurrence at *muthi* shops in the Witwatersrand (Williams *et al.* 2000) and claims that it cures HIV/AIDS is one of the reasons why the plant is highly preferred. Again, the main problem is the destructive harvesting of the underground parts of these plants. The prevailing usage of the underground parts is not only restricted to the study area, but common to the southern African region which is contrary to the West African region where leaves are the common source of plant-based medicine (Cunningham 1993).

Species that were found most frequent in the *muthi* trade by this study include *Kirkia wilmsii* and *Securidaca longipendunculata* which are considered to be slow-growers by van Wyk *et al.* (1997). *Securidaca longipendunculata* has already been reported by Tshisikhawe (2002) to have a high occurrence in *muthi* shops in Thohoyandou. The latest claims in newspapers and national radio that these species have the same effect as Viagra will increase the current utilization, which may pose a serious threat to the survival of the species. Again, roots are the plant part harvested and this causes immense damage to this slow-growing plant.

Harvesting of herbs such as *Hypoxis obtusa*, *Drimia sanguinea* and *Siphonochilus aethiopicus* means total removal of a plant. *Siphonochilus aethiopicus* is already extinct from natural areas of KwaZulu-Natal (Williams *et al.* 2001) and possibly with time this will also happen in the Limpopo Province. The most vulnerable species are the popular, slow-growing, slow-reproducing species with specific habitat requirement and a limited distribution (Cunningham 1992). Cultivation of alternative supply sources of popular and high conservation priority species is therefore essential. Cultivation of such important plants can relieve pressure on the rare and slow-growing species and thus can also be an important production strategy that supports conservation (Cunningham 1993). Creating public awareness on the importance, value of medicinal plant resources and threats posed by unsustainable management and destruction of species habitats.

## **4.5 Collection of medicinal plants**

The majority (63%) of the *muthi* traders indicated that they don't see the need for a permit to collect and none of them had in their possession a permit. According to Botha *et al.* (2004), existing environmental legislation is currently ineffective in controlling various aspects of the informal trade medicinal plants due to inadequate enforcement. This raises the number of species being threatened as a result of uncontrolled collection (Cunningham 1993). For further discussions on aspects related to plant conservation refer to section 6 of this chapter.

### **4.5.1 Collection areas**

The main source of plants for the *muthi* trade in the Limpopo Province is from communal lands where there is generally easy access to medicinal plants. Different key locations for medicinal plant source were noted. The communal areas closest to the *muthi* markets have been the primary focus of harvesting activities. However, as preferred medicinal plants have been depleted in these near-by areas, harvesting of species starts to take place in more distant areas. A comparison between key harvesting locations identified by Cunningham (1988) and Mander (1998) showed the extent to which harvesting locations have shifted in years. According to Mander (1997), natural resources in communal lands are exploited with little or no control, a fact supported by results from this study. This is because following democratization after 1994, tribal authority control over land and natural resources weakened significantly (Shackleton *et al.* 1995). Ultimately this will have serious consequences in the future in terms of the availability of medicinal plants on communal lands.

It is thus recommended that communities develop management plans for these collection sites, while encouraging a value system that promotes respect for the environment and sustainable utilization of natural resources. This will result in conserving plant diversity, sustainable use and *in-situ* conservation. Through a community-based natural resource management mechanism, communities would be able to manage their environment on ecological principles and benefit economically from becoming stewards over wildlife and land. Community conservation activities could also lead to the re-establishment of grass

roots democracy and the freedom to control their destinies, which would further improve the socio-economic status of human communities in wildlife areas and by that, benefit conservation (Damn 2002).

Preferred medicinal plants which are now becoming difficult to obtain in Limpopo Province are imported from other Provinces such as Mpumalanga and neighbouring countries such as Swaziland, Mozambique and Zimbabwe. The imports of plant species such as *Siphonochilus aethiopicus* and *Warburgia salutaris* takes place on an informal basis with no authorization. According to Mander (1998), popular species such as *Alepidea amatymbica*, *Eucomis autumnalis* and *Warburgia salutaris* were becoming increasingly difficult to obtain in South Africa and as a result are imported from neighbouring countries such as Lesotho, Mozambique and Swaziland. The different sources of imports can be ascribed to the distribution of species. All of these species are still found in South Africa but the declining local supply has led to the importation of these species from countries where they are still common and easily accessible (Mander 1998). This in conjunction with a high degree of commercialization means that the current trade will not be sustainable in the long term in the absence of stronger local and national constitutional controls (Botha *et al.* 2004).

Conservation efforts must be directed at all areas vulnerable to over-exploitation (Cunningham 1993) and conservation authorities must involve the *muthi* traders in raising environmental awareness regarding the utilization of medicinal plants. Medicinal plant species most vulnerable to over-exploitation can be identified and assessed by combining the insights of *muthi* trading with scientific knowledge on plant biology and distribution. This requires intensive management inputs for managing sustainable use of vulnerable species in cases where demand exceeds supply (Cunningham 1993).

#### **4.5.2 Harvest**

A common practice is for traditional healers to collect medicinal material in ways that avoid undue damage to the plants or which promote regeneration (Tshisikhawe 2002). For example root of large trees such as the mountain seringa (*Kirkia wilmsii*) are

harvested with great technique with only the older tubers being harvested. Dependence on the local natural environment tends to result in a profound knowledge of local plants and their uses and related beliefs and practices that promote their continuing survival (Mabogo 1990).

This survey showed that 77% of plant parts used are in the form of roots, 13% in the form of bark, and 10% in the form of leaves. Roots are primarily targeted because they store the plants nutrients, while leaves produce nutrients (Sheat and Schofield 1995). One can conclude that *muthi* traders target plant material with concentrated nutrients. The removal of roots has little effect on the future population structure of the species in trees (Mckenzi *et al.* 1996). However, Magoro (2008) reiterates that harvesting by uprooting as seen when harvesting shrubs and herbs has a marked effect as surrounding plants seemed to be affected in terms of exposed parts or complete root systems of bulbs.

Present harvesting is indiscriminate, destructive and unsustainable for many geophytes species hence there's a need to provide a durable solution to this problem. Harvesting of bulbs should occur in summer season as this is the time when there are flowers and the plants are identifiable as different from other geophytes. Harvesting should be done by firstly loosening the soil with a pointed implement. This should be done a few centimeters away from the bulb avoiding damaging the bulb.

#### **4.6 Plant conservation**

Plant material traded annually in KwaZulu-Natal is estimated at 4 000 tonnes (Mander 1998) and in the Eastern Cape is estimated at 525 tonnes (Dold and Cocks 2002). More than 0.96 tonnes of plant material is stocked by only 16 *muthi* traders annually in Limpopo. It is currently unknown how many traders, shop traders and street vendors are currently in business in the Limpopo Province. Regardless of this low amounts, a wide range of plant species is showing indications of unsustainable use, with the size of the plant and/or plant parts decreasing, distances to harvesting sites increasing and some plants becoming unavailable in certain markets. The demand for medicinal plants is high and increasing. The root of this problem is socio-economic matters (Shackleton 2005). To

take pressure off dwindling wild stocks, medicinal plants need to be actively grown by the people who rely on them (Mander 1998) through the initiation of community based natural resource management projects.

Though the majority (66%) of *muthi* traders favours the idea of regulating their activities, one needs to be very careful in analyzing this. Biodiversity conservation in South Africa is based on a law enforcement approach, but it has become increasingly evident that this approach has failed and that new methods are required (Wiersum *et al.* 2006). Both customary and statutory laws will often be relevant to medicinal plant conservation. According to Pant (2002), each type of legal system has its merits and disadvantages and a critical question facing conservationists will often be on how these two systems can best be combined so that their positive elements are strengthened, while avoiding a process of mutual undermining.

Conservation authorizes, tribal authorities and local communities must enter into a partnership. An agreement should be established, which decrees that benefits from proper management of the permit system will would flow commensurately to all partners (Damn 2002). For example, money can be ploughed back via educational programmes.

It is proposed that, a new license system for harvesting medicinal plants be introduced as part of formalization of this trade. This proposed license can be used to compel collectors to comply with certain conditions before their license is renewed. For example, licenses can be set to be renewed on a quarterly (after 3 months) basis; renewals of licenses are to be accompanied with a list of proposed harvested area, volumes to be harvested and their availability at the collection sites (all provided by the harvester). Monitoring the sustainable harvesting of wild plants for medicinal purposes require a dedicated effort to evaluate within given habitats, in order to determine and review any management action, as well as to assess the outcomes and consequences of these actions on species and biodiversity (Damn 2002). Conservation authorities and tribal authorities must co-operate in order to achieve a true reflection and a data base for decision making.

It is recommended that:

1. The conservation authorities should assemble a physical database (comprehensive herbarium collection) of the Flora of the Limpopo Province by increased collecting activities within the Province. This will result in understanding and documenting medicinal plant diversity of the Province. Collection of plant material such as bulbs, tubers, corms and stem bark will aid in the identification of plants traded in *muthi* markets.
2. Conservation authorities in partnership with the two provincial universities should assess the conservation status of all medicinal plants encountered during plant collections and ethnobotanical surveys. This assessment can then be used as a basis for conservation management decisions and also for modeling of conservation related natural processes and proposed management practices, which will result in a more comprehensive understanding the extent of impact that the *muthi* trade have on plant diversity.
3. The *muthi* trade needs to be transformed, from informal to formal. This will allow government to fine and penalise those traders who contravene environmental legislation. All registered traders will belong to a user group umbrella, which will result in enabling government departments to contact and liaise with them directly.

#### **4.7 Environmental legislation**

Government policies in South Africa are viewed as discriminating against indigenous healing which includes medicinal plants (Marshall 1998). The reason for this might be that legislation in the past has concentrated on maintaining the status quo and neglected to provide local communities with viable alternatives to collecting customary plants. There is a wide range of legal control measures applicable to medicinal plants. These range from a total ban on the harvesting of some species without a possessing of a permit license to proclaiming areas with important plants as protected areas. However, legislation has done little to curb the medicinal trade historically (Dauskardt 1991), and numerous controls to reduce trade are not implemented effectively due to the informal nature of the *muthi* trade (Mander 1998).

There is little effective monitoring done of the illegal trade in medicinal plants because of limited resources available to conservation authorities, and the restricted levels of work carried out with user groups (Botha *et al.* 2004). It is thus recommended that the number of environmental enforcement officers in the Province needs to be increased and dedicated officers should be placed and given mandates to deal with this unique user group. Monitoring should be done as frequent as possible to avoid any oversight.

All officers indicated that the implementation of legislation on medicinal plants is difficult and confusing since the legislation deals with plants in general, not specifically medicinal plants. They indicated that a special section in the legislation needs to be developed to deal with medicinal plants alone, as this is a special item on its own. However, according to SANBI (2006), medicinal plants can be viewed not only as problems from the conservation perspective but also more positively as conservation opportunities. This is because the actual value of these plants for health care, income or cultural identity carries the potential for them to act as motivating forces for conservation for the species themselves and their habitats since other non medicinal species will be living in the habitats. Therefore, there is no need to have special section on the legislation that deals with medicinal plants only. The confusion in terms of this need to be cleared up with officers. They need to be workshopped with regard to this matter.

#### **4.8 Cultivation methods for the eight most frequently encountered medicinal plants**

Cultivation is usually recommended as a conservation measure for medicinal plants to provide alternative supplies for medicinal species in market demand (Dold and Cocks 2002). Community initiatives focusing on cultivation of medicinal plants can have potential to save species under threat. However, as reported by Crouch and Edwards (2004), local cultivation is hindered by several constraints, most notably lack of water for irrigation, but also difficulties with propagation and lack of experience with proper cultivation requirements with respect to soil and light conditions. Manageable cultivation methods need to be investigated in association with traditional healers due to their

thorough knowledge and experience of medicinal plants. The aim would be to have cultivation practices that will be able to replace the collection of wild plants rather than develop additional production sources (Wiersum *et al.* 2006). The high prices of some species make them potentially new crop plants for small-scale farmers and village home gardens (Dold and Cocks 2002).

It is therefore recommended that traditional healers be encouraged to develop their own homestead medicinal plant nurseries and gardens which will assist in decreasing the pressure on wild plants. This will further assist traditional healers and communities in making best possible use of their own experience in propagation, conservation strategies and in the preserving of indigenous knowledge. By so doing, the traditional healers and communities will be empowered and will support and own this initiative.

#### **4.9 Recommendations for further research**

The following topics are recommended for further research:

1. Sustainable harvesting of medicinal plants. This will assist both conservationists and resource -users to develop management guidelines for the collection of species of medicinal value.
2. Simple cultivation methods in association with traditional healers, due to their extensive knowledge and experience of medicinal plants, for critical species such as *Alepidea amatymbica* and *Securidaca longipendunculata* which are currently not under cultivation.
3. The amount of medicinal plant resources still available in private land and protected areas.
4. Appropriate structures in communities to support and manage access to natural resources.
5. Identify medicinal plants which would be acceptable substitutes for slow-growing or slow-reproducing species.
6. Investigate leaves and other aerial plant parts as substitutes for bark and roots.
7. Impact on the conservation of medicinal plants by traditional healers who operate their practices from their homes in rural areas.

#### **4.10 Conclusions**

This study has demonstrated that the *muthi* trade is a sector with potential for development, and providing traders with a viable source of income. The demand for medicinal plants is considerable, relative to the demand for western health care services. Subject to uncertainties in demographic and urbanization trends, the demand for medicinal plants is likely to rise, putting increasing pressures on remaining areas of natural vegetation. Of particular concern should be to manage the tensions between developing the trade and excessive harvesting which may have negative impacts on the medicinal plant base.

Current environmental legislation is unable to control the over-exploitation of medicinal plants and species prioritized for conservation. This will continue for sometime, as most traders view environmental legislation as a mechanism to limit their market ability. Limited resources available to conservation authorities, and the restricted levels of work carried out with user groups with regard to environmental legislation needs to be supported through environmental awareness programmes and *ex-situ* conservation methods which include simple cultivation techniques.

The main source of plants for *muthi* trade markets in Limpopo Province is from communal lands where there is generally easy access to natural resources. There is limited motivation to promote natural resource management on communal lands, because of a governance vacuum that now exists in many rural, communal areas and the transformation of a common-property regime to one of open access. Tribal authorities must therefore be part of the wildlife management authority of the Province.

The current harvesting techniques are destructive and are aimed at maximizing the harvest in order to maintain high levels of income. Plant stocks and the harvesting of these stocks are not well managed by medicinal plant traders. A wide range of plant species is showing indications of unsustainable use, with size of the plant parts decreasing and collection distances of stocks increasing.

The percentage of destructive parts in trade, the frequency of species in trade, multi-use of species for different ailments and the presence of conservation priority species in trade are matters of concern. Following Struhsaker (1998), who refers to sustainable harvest as activities involving the removal of a natural resources that do not deplete or compromise its ability to regenerate in the future, medicinal plants traded in Limpopo may not be sustainably harvested. Therefore, the trade in medicinal plants does pose an ecological threat to the conservation of plants in Limpopo Province.

There are, however, options for sustaining the supply of medicinal plants to the market. Firstly homeowners via their homegardens can plant/cultivate medicinal plant species and sell it to the *muthi* traders. This will benefit with homegardens products being used not from the natural veld thus by relieving pressure on nature, especially for high value products. As more of these products reach market the more the prices will fall and bigger products can be sold. They will be an income generation for homeowners in rural areas which will in turn alleviate poverty. Secondly, there are extensive areas on private property (e.g. game farms) that have not been extensively utilized. With effective management, these areas could supply a range of plants to the *muthi* markets in the long-term.

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# APPENDICES



## Appendix A

Questionnaire No.:

# An investigation into the trade of medicinal plants by *muthi* shops and street vendors in the Limpopo Province, South Africa

## Questionnaire

### 1. Geographical information

1. District:

1	Capricorn	2	Mopani	3	Sekhukhune	4	Waterberg
---	-----------	---	--------	---	------------	---	-----------

2. Town/ Village:

1	Polokwane	2	Ga-Chuenie	3	Giyani	4	Tzaneen
5	Burgersfort	6	Nebo	7	Bela-Bela	8	Mokopane

### 2. General information of owner

3. Nature of business:

1	Muthi shop	2	Street vendor
---	------------	---	---------------

#### A. Personal information

4. Gender:

1	Female	2	Male
---	--------	---	------

5. Age:

1	<20	2	21-30	3	31-40	4	>41
---	-----	---	-------	---	-------	---	-----

6. Home language:

1	Sepedi	2	Tsonga	3	Tshivenda	4	English	5	Other (specify) ..... .....
---	--------	---	--------	---	-----------	---	---------	---	-----------------------------------

7. Residence:

1	Rural	2	Urban
---	-------	---	-------

8. Level of education:

0	No formal education	1	Primary schooling	2	Secondary schooling and beyond
---	---------------------	---	-------------------	---	--------------------------------

#### B. Business information

1. Monthly income from selling:

1	<R1000	2	R1001-R3000	3	R3001-R5000	4	>R5001
---	--------	---	-------------	---	-------------	---	--------

**Customer information**

2. Who is your main customer base? (rank)

1	Traditional healers	2	General public	3	Other: specify
---	---------------------	---	----------------	---	----------------

3. How readily do your customers accept prices?

1	Bargain for lower price	2	Accept given prices	3	Leave if prices are too high
---	-------------------------	---	---------------------	---	------------------------------

4. Do you tell customers how to use medicinal plant material?

1	Yes	2	No
---	-----	---	----

**Acquiring medicinal plants**

5. Would you be willing to buy cultivated varieties of plants?

1	Yes	2	No
---	-----	---	----

6. If No, why not?

1	Not wild	2	Touched by lots of people	3	Unreliable	4	Weak
5	Other (e.g. contaminated by chemicals)						
	.....						
	.....						
	.....						

7. How would you recognise a cultivated medicinal plant compared to a plant that was harvested from the wild?

.....

.....

.....

.....

8. Do you throw medicinal plants away after losing their healing properties?

1	Yes	2	No
---	-----	---	----

9. How long can you keep the medicinal plants before they lose their healing properties?

1	1 Month	2	2 Months	3	3 Months	4	>4 months
---	---------	---	----------	---	----------	---	-----------

**Permit System**

10. Do you need a permit to collect?

1	Yes	2	No	3	I don't know
---	-----	---	----	---	--------------

11. Do you have a permit?

1	Yes	2	No
---	-----	---	----

12. If yes, where did you get it?

1	Tribal authority	2	DEDET-districts offices	3	DEDET-provincial offices	4	DWAF	5	Other specify ..... ..... .....
---	------------------	---	-------------------------	---	--------------------------	---	------	---	--

13. If No (permit), why not?

1	Don't know where to get it	2	Difficult/complicated to get	3	Is not important to get	4	Other specify ..... ..... .....
---	----------------------------	---	------------------------------	---	-------------------------	---	--

14. Is the price for a permit reasonable?

1	Yes	2	No
---	-----	---	----

### C. Knowledge on medicinal plants

1. Do you have any knowledge of medicinal plants?

1	No	2	Yes
---	----	---	-----

2. Where did you get your knowledge of medicinal plants?

1	I'm a trained traditional healer	2	Learned from my parents	3	Learned from friends	4	Other (specify)..... ..... .....
---	----------------------------------	---	-------------------------	---	----------------------	---	--

3. Do you have any knowledge of the Limpopo Environmental Management Act (LEMA)?

1	Yes	2	No
---	-----	---	----

4. Do you know about Red data species?

1	Yes	2	No
---	-----	---	----

### D. Collection of medicinal plants

1. Do you collect the plants yourself?

1	Yes	2	No
---	-----	---	----

2. If no, who collects?

.....  
.....  
.....

3. How do you know where the plants grow?

1	Familiar with the area	2	Ancestral guidance to the target area	3	Other (specify) ..... ..... .....
---	------------------------	---	---------------------------------------	---	--

4. How far is the collection site(s) for most of your plants?

1	<10km	2	10km-20km	3	20km-50km	4	>50km
---	-------	---	-----------	---	-----------	---	-------

5. Are your plants collected on:

1	Communal land	2	Private land	3	Both communal & private land	4	Other (specify) ..... ..... .....
---	---------------	---	--------------	---	------------------------------	---	--

6. How do you package newly collected medicinal plants?

1	Newspaper	2	Plastic bag	3	Bottle	4	Other ..... ..... .....
---	-----------	---	-------------	---	--------	---	----------------------------------

### E. Plant conservation

1. In your opinion, are stocks/plants in nature declining?

1	Yes	2	No
---	-----	---	----

2. If yes, what do you think is the possible reason(s) for this?

1	Over-harvesting	2	Agricultural activities	3	Housing & commercial development	4	Other (specify) ..... ..... .....
---	-----------------	---	-------------------------	---	----------------------------------	---	--

3. What do you do to ensure that there are plants to harvest in the future?

.....  
 .....  
 .....  
 .....

4. Do you think the trade should be regulated?

1	Yes	2	No
---	-----	---	----

5. If Not, why not?

.....  
 .....  
 .....  
 .....

6. If Yes, why?

.....  
 .....  
 .....  
 .....

7. What would you do if certain wild plants can no longer be found?

.....  
.....  
.....  
.....

8. Which conservation strategies can be implemented to assist in the sustainable use of medicinal plants?

1	Propagation & cultivation of plants
2	Revegetation/reforestation
3	Rehabilitation of damaged habitats caused by erosions
4	Permits to collect medicinal plants
5	Other (specify) ..... ..... .....

**F. Plant utilization**

Please list in the table below:

Plant name	Parts used	Medicinal use of plants	Total amount in shop (most frequently traded). grams	Conservation status	Scarce in market	Price/unit in Rands
Scientific and/or vernacular names	1=bark 2=stem 3=leaves 4=roots 5=fruits 6=flowers	1=flu, etc 2=HIV/AIDS, STD'S 3=female impotence 4= male infertility 5=charms, protection 6= other (specify)	grams		Yes or No	

THE DEPARTMENT OF BIODIVERSITY, UNIVERSITY OF LIMPOPO THANK YOU FOR PARTICIPATING IN THIS SURVEY.

**Questionnaire for Indigenous nurseries**

1. Name of nursery

.....  
 .....  
 .....

2. Location

.....  
 .....  
 .....

3. Do you cultivate plants by yourselves?

Yes	No
-----	----

4. Please provide us with the best methods for cultivating this plants?

Plant name	Cultivation procedure
<i>Alepidea amatymbica</i>	
<i>Drimia sanguinea</i>	
<i>Eucomis pallidiflora</i>	
<i>Helichrysum kraussii</i>	
<i>Hypoxis obtusa</i>	
<i>Kirkia wilmsii</i>	
<i>Securidaca longipendunculata</i>	
<i>Siphonochilus aethiopicus</i>	

THE DEPARTMENT OF BIODIVERSITY, UNIVERSITY OF LIMPOPO THANK YOU FOR PARTICIPATING IN THIS SURVEY.

## Appendix C

### Questionnaire for environmental enforcement officers

1. Which medicinal plants are prohibited to trade?

.....  
.....  
.....

2. Which criteria is used to prohibit such plants?

.....  
.....  
.....

3. Do you do patrols in *muthi* trading?

.....  
.....  
.....

4. If yes (Q3), who identifies plants during your patrols?

.....  
.....  
.....

5. If no (Q3), why no patrols?

.....  
.....  
.....

6. Who provides you with information regarding non-compliance of legislation regarding medicinal plants?

.....  
.....  
.....

7. Is the implementation of your legislation practical regarding medicinal plants?

.....  
.....  
.....

THE DEPARTMENT OF BIODIVERSITY, UNIVERSITY OF LIMPOPO THANK YOU FOR PARTICIPATING IN THIS SURVEY.

## Appendix D

Medicinal plant species identified. Species have been grouped according to families in an alphabetical sequence.

### Acanthaceae

Botanical name: *Sclerochiton ilicifolius* A. Meeuse  
Common name: Molomomonate  
Language of common name: Sepedi

### Agapanthaceae

Botanical name: *Agapanthus inapertus* P. Beav. subsp. *inapertus*  
Common name: Leta-la-phofu  
Language of common name: Sepedi

### Amaryllidaceae

Botanical name: *Boophane disticha* (L.F.) Herb.  
Common name: Titikwane  
Language of common name: Sepedi

Botanical name: *Clivia caulescens* R.A. Dyer  
Common name: Mayime  
Language of common name: Sepedi

Botanical name: *Crinum bulbispermum* (Burm.f.) Milne-Redh. & Schweikerdt  
Common name: Mototse lelutla  
Language of common name: Sepedi

### Anacardiaceae

Botanical name: *Sclerocarya birrea* (A. Rich.) Hochst. subsp. *caffra* (Sond.)  
Common name: Kokwaro  
Language of common name: Morula  
Sepedi

### Apiaceae

Botanical name: *Alepidea amatymbica* Eckl. & Zeyh. var. *amatymbica*

Common name: Lesoko  
Language of common name: Sepedi

### Araceae

Botanical name: *Zantedeschia aethiopica* (L.) Spreng.  
Common name: Mothebe  
Language of common name: Sepedi

### Asparagaceae

Botanical name: *Asparagus aethiopicus* L.  
Common name: Seboka  
Language of common name: Sepedi

### Aspholodelaceae

Botanical name: *Aloe* L.  
Common name: Sekgopa  
Language of common name: Sepedi

Botanical name: *Bulbine frutescens* (L.) Willd.  
Common name: Sehlare sa pekane  
Language of common name: Sepedi

### Asteraceae

Botanical name: *Artemisia afra* Jacq. ex Willd.  
Common name: Lengana  
Language of common name: Sepedi

Botanical name: *Callilepis laureola* DC.  
Common name: Phela  
Language of common name: Sepedi

Botanical name: *Callilepis salcifolia* Oliv.  
Common name: Phelana  
Language of common name: Sepedi

Botanical name: *Helichrysum kraussii* Sch. Bip.  
Common name: Mpepo  
Language of common name: Sepedi

### Bignoniaceae

Botanical name: *Tecoma capensis* (Thunb.) Lindl.  
Common name: Mopa-sitsane  
Language of common name: Sepedi

### Canellaceae

Botanical name: *Warburgia salutaris* (Bertol.f.) Chiov.  
Common name: Molaka  
Language of common name: Sepedi

### Capparaceae

Botanical name: *Capparis sepiaria* L. var. *subglara* (Oliv.) Dewolf.  
Common name: Moupatladi  
Language of common name: Sepedi

Botanical name: *Boscia albitrunca* (Burch.) Gilg & Gilg-Ben.  
Common name: Mohlopimolewa  
Language of common name: Sepedi

### Celastraceae

Botanical name: *Catha edulis* (Vahl) Endl.  
Common name: Lewane (Tshikwane)  
Language of common name: Sepedi

Botanical name: *Elaeodendron transvaalense* (Burt Davy) R.H. Archer  
Common name: Monomane  
Language of common name: Sepedi

Botanical name: *Pleurostyliia capensis* (Turcz.) Loes.  
Common name: Moromelela  
Language of common name: Sepedi

### Combretaceae

Botanical name: *Combretum molle* R. Br. ex G. Don  
Common name: Mokgwethe  
Language of common name: Sepedi

### Dioscoraceae

Botanical name: *Dioscorea dregeana* (Kunth) T. Durand & Schinz  
Common name: Mabele a poo  
Language of common name: Sepedi

### Dipsacaceae

Botanical name: *Scabiosa columbaria* L.  
Common name: Bekamina  
Language of common name: Zulu

### Ebenaceae

Botanical name: *Diospyros galpinii* (Hiern) De Winter  
Common name: Ndodemyama  
Language of common name: Swati

### Fabaceae

Botanical name: *Crotalaria natalitia* Meisn. var. *natalitia*  
Common name:  
Language of common name:

Botanical name: *Dolichos falciformis* E. Mey.  
Common name: Vuma  
Language of common name: Swati

Botanical name: *Elephantorrhiza elephantina* (Burch.) Skeels  
Common name: Motshitshane  
Language of common name: Sepedi

Botanical name: *Erythrina lysistemon* Hutch.  
Common name: Mmale  
Language of common name: Sepedi

Botanical name: *Peltophorum africanum* Sond.  
Common name: Mosehla  
Language of common name: Sepedi

Botanical name: *Schotia brachypetala* Sond.  
Common name: Molope  
Language of common name: Sepedi

### Geraniaceae

Botanical name: *Monsonia angustifolia* E. Mey. ex A. Rich.  
Common name: Special  
Language of common name: English

### Hyacinthaceae

Botanical name: *Drimia elata* Jacq.  
Common name: Sekanama  
Language of common name: Sepedi

Botanical name: *Drimia sanguinea* (Schinz) Jessop  
Common name: Sekanama  
Language of common name: Sepedi

Botanical name: *Eucomis pallidiflora* Baker  
Common name: Maphuma difala  
Language of common name: Sepedi

Botanical name: *Merwillia plumbea* (Lindl.) Speta  
Common name: Inguduza  
Language of common name: Zulu

### Hypoxidaceae

Botanical name: *Hypoxis obtusa* Burch. ex Ker Gawl.  
Common name: Monnamaledu  
Language of common name: Sepedi

### Kirkiaceae

Botanical name: *Kirkia wilmsii* Engl.  
Common name: Modumela (Legaba)  
Language of common name: Sepedi

### Icacinaceae

Botanical name: *Pyrenacantha grandiflora* Baill.  
Common name: Bjere  
Language of common name: Sepedi

### Lamiaceae

Botanical name: *Leonotis leonorus* (L.) R. Br.  
Common name: Lebake  
Language of common name: Sepedi

### Myrothamnaceae

Botanical name: *Myrothamnus flabellifolius* Welw.  
Common name: Pati ya tshwene  
Language of common name: Sepedi

### Meliaceae

Botanical name: *Trichilia emetica* Vahl. subsp. *emetica*  
Common name: Mmaba  
Language of common name: Sepedi

### Ochnaceae

Botanical name: *Brackenridgea zaquebarica* Oliv.  
Common name: Mutavhatsindi  
Language of common name: Venda

### Rhamnaceae

Botanical name: *Ziziphus mucronata* Willd. subsp. *mucronata*  
Common name: Mokgalo  
Language of common name: Sepedi

### Rutaceae

Botanical name: *Zanthoxylum capense* (Thunb.) Harv.  
Common name: Senokomaropa/ monokwane  
Language of common name: Sepedi

### Pittosporaceae

Botanical name: *Pittosporum viridiflorum* Sims  
Common name: Kgalangangwe  
Language of common name: Sepedi

### Polygalaceae

Botanical name: *Securidaca longependunculata* Fresen.  
Common name: Mpesu  
Language of common name: Venda

### Portulacaceae

Botanical name: *Talinum caffrum* (Thunb.) Eckl. & Zeyh.  
Common name: Phonyokga; Kgebeletswane  
Language of common name: Sepedi

### Thymelaceaceae

Botanical name: *Synaptolepis krikii* Oliv.  
Common name: Vuma bomvu  
Language of common name: Swati

### Vitaceae

Botanical name: *Rhoicissus tomentosa* (Lam.) Wild & R.B. Drumm.  
Common name: Mosunkwane  
Language of common name: Sepedi

### Velloziaceae

Botanical name: *Xerophyta* sp.  
Common name: Xiroda  
Language of common name: Tsonga

### Verbanaceae

Botanical name: *Lippia javanica* (Burm.f.) Spreng.  
Common name: Mosunkwane  
Language of common name: Sepedi

### Zamiaceae

Botanical name: *Encephalartos transvenosus* Stapf & Burtt Davy  
Common name: Mofaka  
Language of common name: Sepedi

## Zingiberaceae

Botanical name: *Siphonochilus aethiopicus* (Schweinf.) B.L. Burt  
Common name: Serokolo  
Language of common name: Sepedi

### Medicinal plants known by common names only due to insufficient material to make a taxonomic identification

Common name: Kgashi  
Language of common name: Sepedi

Common name: Leilane  
Language of common name: Sepedi

Common name: Lesitsamane  
Language of common name: Sepedi

Common name: Makgone  
Language of common name: Sepedi

Common name: Matsana  
Language of common name: Sepedi

Common name: Molope  
Language of common name: Sepedi

Common name: Morutatshitsha  
Language of common name: Sepedi

Common name: Mowisabagolo  
Language of common name: Sepedi

Common name: Mphaya  
Language of common name: Sepedi

Common name: Mphera  
Language of common name: Sepedi

Common name: Sefepabadimo  
Language of common name: Sepedi

Common name: Setsosadingaka  
Language of common name: Sepedi

## Appendix E

For the sake of this study the following numbers were attached to *muthi* shops and street vendors:

### Capricorn district

#### Polokwane

Trader 1= *Muthi* shop = Flora herb in EX-DECO shop (Mr Rangata)

Trader 2= Street vendor= Indian centre pavement ( Dr/Rev S.F Tau)

#### Ga-chuenie

Trader 3= *Muthi* shop = Monareng trading store

Trader 4= Street vendor = Cnr road from Polokwane to Lebowakgomo (Group of young men)

### Sekhukhune district

#### Nebo

Trader 5= *Muthi* shop = Re a phela herbs shop

Trader 6= *Muthi* shop = Tlou ga e lebale

#### Burgersfort

Trader 7= *Muthi* shop= Steel made shop (Mr. M.J Masinga), opposite CTM & Ellerines furniture shop

Trader 8= Street vendor = Gravel road next to taxi rank, road to Lydenburg

### Waterberg district

#### Mokopane

Trader 9= *Muthi* shop = T. albers General dealers

Trader 10= Street vendor = Taxi rank

#### Bela-Bela

Trader 11= *Muthi* shop = F.A *muti*

Trader 12= Street vendor = Taxi rank

## **Mopani district**

### **Giyani**

Trader 13= *Muthi* shop = Mulaudzi shop on Ceragen Complex opposite Shoprite

Trader 14= Street vendor = Next to Caltex garage

### **Tzaneen**

Trader 15= *Muthi* shop = Rainbow's shop (Thomas Mashatola), Opposite Taxi rank to Polokwane and Pick n Pay complex

Trader 16= Street vendor= Next to taxi rank to Lenyenye

Interviews were conducted with 13 traditional healers, two men and one woman. The following were interviewed per area: Bela-Bela (1 traditional healer and 1 man), Burgersfort (2 traditional healers), Ga- Chuenie (1 traditional healer and 1 man), Giyani (2 traditional healers), Mokopane (1 traditional healer and 1 woman), Nebo (2 traditional healers), Polokwane (2 traditional healers) and Tzaneen (2 traditional healers).

## Appendix F

List of plant with their uses, documented from the *muthi* shops.

### 1. *Agapanthus inarpertus*

- ✚ Treat chest problems
- ✚ Treat wounds \*6

### 2. *Alepedia amatymbica*

- ✚ Treat stomach problems\*6
- ✚ Treat colds
- ✚ Used to guard against evil spirits (fight enemies)

### 3. *Aloe sp*

- ✚ Used for potency and libido
- ✚ Treat to dress wounds\*6
- ✚ Treat colds and flu

### 4. *Artemisia afra*

- ✚ Treat colds and flu
- ✚ Treat stomach problems\*6
- ✚ Treat malaria\*6

### 5. *Asparagus aethiopicus*

- ✚ Used to please and bring back the angry and disperse ancestors\*6
- ✚ Used to bring luck

### 6. *Boscia albitrunca*

- ✚ Treat stomach problems
- ✚ Treat kidney problems\*6

### 7. *Boophone disticha*

- ✚ Treat wounds\*6
- ✚ Used in pleasing the ancestral spirits\*6

8. *Brackenridgea zaquebarica*

- ✚ Used as a catalyst for most medicine\*6
- ✚ Treat aching hands\*6
- ✚ Used to protect people and homestead against witchcraft
- ✚ Used to perform magic\*6

9. *Bulbine frutescens*

- ✚ Treat itches, craked lips and burn rashes\*6
- ✚ Treat ringworms\*6

10. *Callilepis laureola*

- ✚ Treat ulcers\*6
- ✚ Used to inhibit and destroy susceptiple micro-organism\*6
- ✚ Treat fungal infections\*6

11. *Callilepis salcifolia*

- ✚ Treat colds and flu in children
- ✚ Treat intestinal worms in children\*6
- ✚ Treat ulcers\*6

12. *Capparis sepiaria*

- ✚ Treat infertility in women
- ✚ Treat irregular menstruations\*6
- ✚ Used to purify by vomiting\*6
- ✚ It protects homes and cattle kraal
- ✚ Mixed with other plants to perform magic\*6

13. *Combretum molle*

- ✚ Treat stomach problems\*6
- ✚ Treat wounds\*6

14. *Crinum bulbispermum*

- ✚ Treat septic sores\*6
- ✚ Treat rheumatism\*6
- ✚ Treat colds

15. *Dioscorea dregeana*

- ✚ Treat mental-illness\*6
- ✚ Used to please ancestral spirits\*6

16. *Drimia elata*

- ✚ Used as blood purifier\*6
- ✚ Used for potency and libido

17. *Drimia sanguinea*

- ✚ Used as blood purifier\*6
- ✚ Used for potency and libido
- ✚ Used to bring luck\*6

18. *Elephantorrhiza elephantina*

- ✚ Used to abort a pregnancy\*6
- ✚ Treat irregular menstruations\*6
- ✚ Treat infertility in women

19. *Encephalartos transvenosus*

- ✚ Used to guard against evil spirits(fight enemies)
- ✚ Used to protect homestead

20. *Erythrina lysistemon*

- ✚ Treat arthritis\*6
- ✚ Treat earache sprains\*6
- ✚ Treat sores and wounds\*6

21. *Eucomis pallidiflora*

- ✚ Treat chest problems\*6
- ✚ Treat sexual transmitted diseases
- ✚ Mixed with other plants to be used as an aphrodisiac
- ✚ Treat mental-illness\*6

22. *Helichrysum kraussi*

- ✚ Treat wounds\*6
- ✚ Used to expel evil spirits\*6

23. *Hypoxis obtusa*

- ✚ Used as an aphrodisiac
- ✚ Mix with other plants to treat HIV/AIDS
- ✚ Used to please ancestral spirits\*6

24. *Kirkia wilmsii*

- ✚ Treat blood pressure\*6
- ✚ Used to thirst-quench\*6

25. *Leonotis leonorus*

- ✚ Treat colds and flu
- ✚ Treat high blood pressure\*6
- ✚ Treat snake bites\*6

26. *Lippia javanica*

- ✚ Treat colds and flu
- ✚ Used to repel mosquitoes\*6
- ✚ Used as an air freshener\*6

27. *Merwillia plumbea*

- ✚ Treat chest and respiratory problems\*6
- ✚ Used to purifier by vomiting\*6
- ✚ Used as an aphrodisiac

✚ Treat wounds, burns and sores\*6

28. *Monsonia angustifolia*

✚ Used as an aphrodisiac

✚ Taken as tea to provide energy\*6

29. *Peltophorum africanum*

✚ Treat chest and respiratory problems\*6

✚ Treat external wounds\*6

30. *Pittosporum viridiflorum*

✚ Used to clean womb\*6

✚ Treat ulcers\*6

31. *Pleurostyliia capensis*

✚ Used to protect homes and cattle kraals

✚ Used to perform magic\*6

✚ Treat bad-luck\*6

✚ Used to bring luck

32. *Pyrenacantha grandiflora*

✚ Used to guard against evil spirits (fight enemies)\*6

33. *Scabiosa columbaria*

✚ Used to guard against evil spirits (fight enemies)\*6

34. *Sclerochiton illifolius*

✚ Treat diabetics\*6

✚ Roots are chewed as sugar supplements\*6

✚ Used to bring good luck

✚ Used to perform magic\*6

35. *Schotia brachypetala*

- ✚ Treat colds and flu

36. *Sclerocarya birrea*

- ✚ Treat colds and flu
- ✚ Used to determine the sex of the baby\*6

37. *Securidaca longependunculata*

- ✚ Used as an aphrodisiac
- ✚ Treat mental-illness\*6
- ✚ Treat colds and flu

38. *Siphonochilus aethiopicus*

- ✚ Treat colds and flu
- ✚ Treat ulcers\*6
- ✚ Treat *makgoma(sepedi)*\*6
- ✚ It is regarded as catalyst for most medicines\*6
- ✚ Mixed with other plants to perform magic\*6
- ✚ Used to protect against bad luck\*6

39. *Talinum caffrum*

- ✚ Treat against evil spirits (fight enemies)\*6
- ✚ Used to bring luck
- ✚ Taken as emetic\*6

40. *Tecoma capensis*

- ✚ Treat pneumonia\*6
- ✚ Treat fever\*6
- ✚ Treat stomach problems and diarrhoea\*6

41. *Trichilla emetica*

- ✚ Used as blood purifier\*6
- ✚ Treat rheumatism\*6

42. *Warburgia salutaris*

- ✚ Treat wounds
- ✚ Treat mental-illness
- ✚ Treat uterus problems in woman
- ✚ Treat stomach pains

43. *Zantedeschia aethiopica*

- ✚ Treat asthma\*6
- ✚ Treat bronchitis\*6
- ✚ Treat wounds, sores and boils\*6

44. *Zanthoxylum capense*

- ✚ Treat colds and flu
- ✚ Treat bronchitis\*6
- ✚ Used to facilitate diarrhoea\*6

## Appendix G

### Glossary

#### ***Makgoma***

Assortment of ailments which follows a breach of particular taboo/s.

#### ***Muthi shop***

According to Mander (1998), *muthi* shops can be described as *African chemists*. It is translated from a Zulu name, meaning medicinal shop. *Muthi* shops are best described as shops where traditional medicine gatherers and/or Traditional healers trade their wares (Mander 1998; Dold & Cocks 2002). As most of the market is informal, only a few formalized traders keep records of transactions (Mander 1998).

#### **Roots**

Two kinds of root systems can be distinguished in flowering plants: tap root systems and adventitious root systems. Usually dicotyledons possess tap root systems and monocotyledons adventitious root systems. There are many different types of specialised roots which have evolved in both trees and plants which include bulbs, corms, rhizome and tubers.

#### **Street vendor**

When traditional medicine gatherers trade their wares on the streets and pavements of a business complex, it is called street vending (Mander 1998; Dold & Cocks 2002). In most cases, no record of transactions is kept in this kind of business as this is a cash-related industry (Mander 1998).