



# An ethnobotanical survey of medicinal plants used by the people in Nhema communal area, Zimbabwe

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## ABSTRACT

**Ethnopharmacological relevance:** This study documented the pharmaceutical importance of plant resources in Nhema communal area, particularly the significance of medicinal plants in primary health-care. This is reflected in the great diversity of plants used for medical purposes as well as in their wide range of medicinal applications. Such rich ethnobotanical knowledge and repository of medicinal plants reinforces the need for an evaluation of their biological activity as a basis for developing future medicines.

**Materials and methods:** In order to document information on medicinal plants used for primary health care and to maximize the collection of indigenous knowledge in Nhema communal area, nine traditional healers were identified using the Participatory Rapid Appraisal (PRA) approach. Data was collected through open-ended interviews with traditional healers, between January and May 2008.

**Results:** A total of 61 plant species representing 45 genera and 28 families were found to be commonly used in the treatment of 34 different human health problems. More than a third of the plant species were used for diarrhoea, which is a prevalent disease in the study area. The root was the most commonly used plant part while decoction was the most common method of traditional drug preparation.

**Conclusions:** Nhema communal area in the Midlands province, Zimbabwe is endowed with a strong culture of herbal medicine usage for primary healthcare. This is reflected in the number of medicinal plants used and the human ailments they treat. This preservation of indigenous knowledge is due to continued reliance on wild plant resources for primary healthcare by the local community. Deforestation and unsustainable rates of plant use are a serious threat on continued utilization of plant resources for primary healthcare.

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## 1. Introduction

The World Health Organization estimates that up to 80% of the people in developing countries still depend on local medicinal plants to fulfil their primary healthcare needs (WHO, 2002). In certain African countries, up to 90% of the population still relies exclusively on plants as sources of medicines (Hostettmann et al., 2000). An estimated 25% of prescription drugs and 11% of drugs considered essential by WHO are derived from plants and a large number of synthetic drugs are obtained from precursor compounds originating from plants (Rates, 2001). According to Konno (2004), easy accessibility, efficacy on treatment and affordable cost in getting health services are main reasons in preferring traditional medicine to modern medication. In sub-Saharan Africa, the ratio of traditional healers to the population is approximately 1:500, while medical doctors have a 1:40 000 ratio to the rest of the population (Richter, 2004). It is clear that traditional healers play an

influential role in the lives of African people and have the potential to serve as crucial components of a comprehensive health care strategy (Kambizi and Afolayan, 2001). According to Clarke (1998), traditional healers are deeply interwoven into the fabric of cultural and spiritual life, they are the first health practitioners to be consulted in up to 80% of cases (especially in rural areas), and they are present in almost every community, which means that they are easily accessible in remote areas where there are no health services.

Rural households in Zimbabwe are heavily dependent on the vegetation around them for traditional medicine (Gelfand et al., 1985). Out of the 5000 plant species growing in Zimbabwe, about 10% are used in traditional medicine (Gelfand et al., 1985). The last two decades have seen rapidly escalating livelihood problems in Zimbabwe, drought, difficult socioeconomic conditions, problems faced by the health delivery system, AIDS and a declining national economy (Campbell et al., 1998). The result has been an upsurge in the number of people using herbal medicine for primary healthcare. The popularity of and high demand for traditional medicines is evidenced by the mushrooming of herbal clinics and the modernization of the healing system both in the urban and rural areas (Mukamuri, 1998). This increase in demand puts a threat

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on natural resources. Knowledge on the use of medicinal plants is enormous but if this is not rapidly researched and recorded, indications are that it will be lost with succeeding generations (Hostettmann et al., 2000). Despite the increasing acceptance of traditional medicine in Zimbabwe (Gelfand et al., 1985; Mukamuri, 1998; Kambizi and Afolayan, 2001), this rich indigenous knowledge on traditional remedies is not adequately documented. The available knowledge on the use of plant preparations in traditional medicine is important but the dissemination of this valuable knowledge is progressively diminishing. In addition, the conservation of ethnobotanical knowledge as part of living cultural knowledge and practice between communities and the environment is essential for biodiversity conservation (Martin, 1995). Therefore, documentation of plants used in traditional medicine is urgent so that the knowledge can be preserved and plants conserved, and sustainably managed and utilized by the majority of the local people. In order to achieve this objective, an ethnobotanical survey was undertaken in Nhema communal area aimed at documenting medicinal plant uses and the associated indigenous knowledge held by the local people.

## 2. Materials and methods

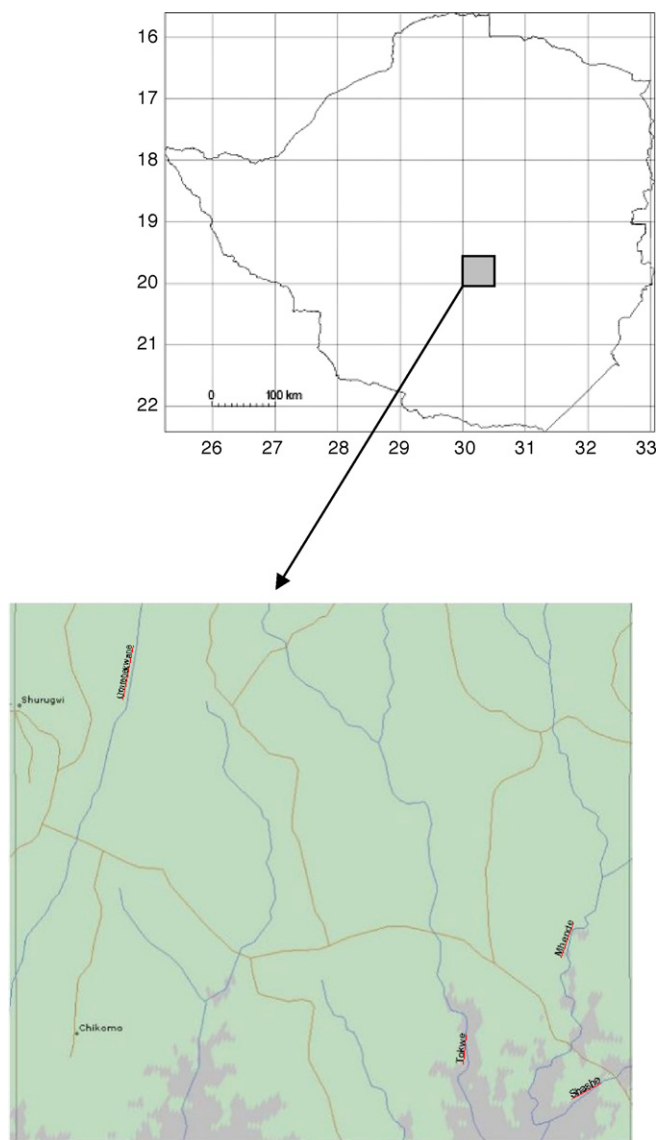
### 2.1. Study area

This paper is based on a case study in Nhema communal area (Fig. 1), centrally located in the Midlands Province of Zimbabwe. Nhema communal area lies between 19°57'S to 20°30'S latitude and 30°00'E to 30°58'E longitude. This district is categorized as one of the most severely deforested and densely populated areas in the country (McGregor, 1994). It is about 1200 m above sea level, with a mean annual rainfall of 700 mm, concentrated in the rainy season from November to March. In the hottest month, October, the mean temperature is 29 °C, and in the coldest month, July, the mean temperature is 9 °C. Severe mid-season dry spells and an unreliable start to the rainy season make the area marginal for maize, tobacco and cotton. Rainfall is the greatest physical constraint to agricultural production, falling during a single rainy season. The risk of crop failure due to drought is high. Soils are largely derived from granitic–gneissic rocks, giving rise to predominantly sandy soils, with a low water-holding capacity, low fertility, low pH, and deficiencies in nitrogen, phosphorus, and sulphur (McGregor, 1994). The most extensive vegetation type is drier miombo woodland, in which *Brachystegia spiciformis* and *Julbernardia globiflora* are dominant in terms of basal area, with patches of *Hyparrhenia* spp., *Eragrostis* spp., *Heteropogon* spp. and *Digitaria* spp. grasses.

The poorest families depend on the natural environment for resources such as construction timber, firewood and fencing materials, as well as their daily food which include insects, wild fruits and vegetables; and medicine. Inhabitants are highly dependent on traditional medicines because modern medicines are unavailable or unaffordable for most of the inhabitants. Nhema communal area lacks basic infrastructure such as tarred roads, piped water, and electricity is available to only 5% of households. There are no official population data at ward level, but rough calculations for this research suggest a population density of 28 people/km<sup>2</sup>. Traditional beliefs in Nhema communal area are still prevalent and are being practiced. Most people practice Christianity and African traditional religion concurrently though almost all claim to be Christians.

### 2.2. Data collection

The study was undertaken between January and May 2008. A total of 9 traditional healers were identified using the Participatory Rapid Appraisal (PRA) approach (Martin, 1995). PRA, though difficult to quantify, provides a valuable insight into the multiple meanings, dimensions and experiences of local people with



**Fig. 1.** Geographical location of the study area. *Top:* Map of Zimbabwe illustrating the geographical position of Nhema communal area. *Bottom:* Detailed map of study area.

traditional plant medicines. It captures information that standard plant use methods are likely to miss. Open-ended methods, such as unstructured interviews and discussion groups allow the emergence of issues and dimensions that are important to the community but not necessarily known to the researcher, thus allowing unanticipated themes to be explored by the interviewer (Miles and Huberman, 1994). Therefore, PRA was easily adopted and allowed real participation at the community level. Members of the local community were asked to give the names of the most renowned traditional healers in the study area. The traditional healers were professional practitioners who medicated the local people using ethnomedicinal plants and their products. Most were men over 40 years old (Table 1). Verbal informal consent was obtained from each individual traditional healer who participated in the study. The interviews and discussions were carried out in Shona, the local language since the author is a native speaker of the language. Data on the local names of the plants, the plant parts used, diseases treated by the plants, mode of usage and administration were collected in the field. Plants recorded in the results were mentioned by at least two traditional healers as treating the same disease in order to confirm its use.

**Table 1**  
Age and sex characteristics of traditional healers interviewed in Nhema communal area, Zimbabwe.

	Age (years)			Total
	21–40	41–60	61–80	
Female	0	1	1	2
Male	1	3	3	7

### 2.3. Plant collection and identification

Trips were made to the sites where traditional healers normally collect plants they use as traditional medicines. Plants said to be used as traditional medicines during the interviews were identified in the field by the traditional healers. Voucher specimens were collected during walks with traditional healers when encountered for the first time and again when they were flowering or fruiting, for easy identification. Specimens were processed using standard taxonomic procedures (Bridson and Foreman, 1998). Each specimen included important parts such as leaves, stems, flowers and fruits where available. For small herbaceous plants, the whole plants were collected. Specimens were deposited for future reference at the National Herbarium, Harare, Zimbabwe.

### 2.4. Data analysis

The majority of the data collected in this study were descriptive in nature, therefore, they were explained directly. Interview data were coded and sorted into themes. Inconsistencies and unique statements were noted and given particular attention. Recurrent themes were uncovered in this report by a process of systematic content analysis. In its broadest sense, different researchers have emphasized various aspects of content analysis, from its capacity to generate quantitative descriptions by analyzing word counts (Silverman, 1993) to its ability to help researchers draw inferences from a text by breaking that text into discrete units of manageable data that can then be meaningfully reorganized (Weber, 1990). The data were organized and analyzed with the SPSS programme. Information gathered through semi-structured interview was presented using percentages and ranking.

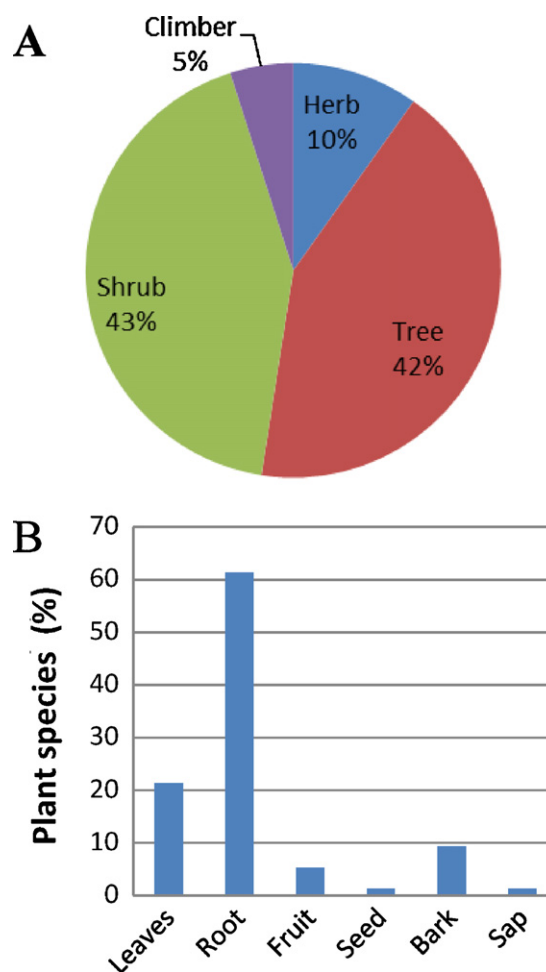
## 3. Results and discussion

### 3.1. Medicinal plant diversity

This study recorded sixty one (61) plant species as useful in traditionally managing various human diseases in Nhema communal area (Table 2). These medicinal plants were distributed among 28 families and 45 genera. The largest proportion of medicinal plants collected belonged to the family Fabaceae (9 species), followed by Anacardiaceae (7 species), Ebenaceae (4 species), Euphorbiaceae (4 species), Tiliaceae (4 species), Loganiaceae and Moraceae (3 species each). Other families were represented by one species each, as shown in Table 2. Fabaceae and Anacardiaceae families have the highest diversity of species used as herbal medicine probably because these are large families characterized by several species.

### 3.2. Use of traditional medicine in Nhema communal area

Traditional healers in the study area play an important role in primary healthcare of the local community as the majority of their clients came from resource poor families who cannot afford the modern healthcare services. According to traditional healers, the local people are still reliant on wild plants for primary healthcare due to the widespread belief in its effectiveness. These results correlate strongly with the findings made in Ethiopia where peo-



**Fig. 2.** Characteristics of the plants used as herbal medicines in Nhema communal area, Zimbabwe. (A) Growth habit represented in pie diagram and (B) plant part used represented in bar chart.

ple did not utilize western biomedical care where available in preference of traditional medicine (Addis et al., 2001). Similarly, Flatie et al. (2009) observed that some illnesses cannot be cured by modern health care but by traditional medicine. For instance, demon possession and infertility are typical health problems for which people visit traditional healers in Kalabo District, Zambia (Stekelenburg et al., 2005). Most treatments in Nhema communal area were performed in the homes of the individual traditional healers. Previous research on the use of traditional medicine in Zimbabwe (Mukamuri, 1998) showed widespread use of indigenous remedies by both rural and urban communities. These results correlate strongly with the findings of Teklehaymanot and Giday (2007) who found that continued reliance of many African people on traditional medicines is partly due to economic circumstances, which place modern health facilities, services and pharmaceuticals out of the reach of the majority of the population.

### 3.3. Plant parts used

Analysis of the growth forms of the medicinal plants used in Nhema communal area revealed that shrub and trees constituted the largest number or proportion with 43% and 42%, respectively, followed by herbs with 10% as shown in Fig. 2A. This could be due to the fact that these growth forms are available in almost all seasons as they are relatively drought resistant and are not affected by seasonal variations (Albuquerque, 2006). The plant parts used for making herbal preparations were the roots, leaves, bark, seeds,

**Table 2**  
List of medicinal plants reported as useful in traditionally managing human diseases in of Nhema communal area, Zimbabwe.

Plant species	Family name	Voucher number	Vernacular name	Habit	Part(s) used	Use(s)	Number of citations	Preparation and administration
<i>Acacia karroo</i> Hayne	Fabaceae	AM 472	Muhwa	Tree	Root	Convulsions	2	Crushed, mixed with hot water, extract drunk
<i>Albizia antunesiana</i> Harms	Fabaceae	AM 282	Muriranyenze	Tree	Bark	Constipation	3	Crushed, mixed with hot water, extract drunk
					Leaves	Purgative	3	Crushed, mixed with hot water, extract drunk
					Root	Diarrhoea	6	Crushed, mixed with hot water, extract drunk
						Aphrodisiac	7	Crushed, mixed with cold water, extract drunk
						Gonorrhoea	3	Crushed, mixed with cold water, extract drunk
<i>Aloe greatheadii</i> Schönland	Asphodelaceae	AM 325	Gavakava	Herb	Leaves	Infertility in women	2	Crushed, mixed with hot water, extract drunk
						Gonorrhoea	4	Hot water extract drunk three times a day
						Constipation	3	Crushed, mixed with hot water, extract drunk
						Diarrhoea	4	Crushed, mixed with water, extract drunk
<i>Ampelocissus africana</i> (Lour.) Merr.	Vitaceae	AM 339	Muzambiringa	Climber	Root	Diarrhoea	4	Crushed, mixed with water, extract drunk
<i>Ampelocissus obtusata</i> (Welw. ex Baker) Planch.	Vitaceae	AM 421	Muzambiringa	Climber	Root	Diarrhoea	3	Crushed, mixed with hot water, extract drunk
<i>Annona stenophylla</i> Engl. & Diels	Annonaceae	AM 307	Muroro	Shrub	Root	Boils	4	Paste applied on the boil
						Chest pains	4	Crushed, mixed with hot water, extract drunk
						Snake repellent	9	Mixed with roots of <i>Securidaca longipedunculata</i> and sprinkled around homestead
						Sexually transmitted diseases	5	Crushed, mixed with hot water, extract drunk
<i>Asparagus africanus</i> Lam.	Asparagaceae	AM 300	Rukato	Climber	Root	Pneumonia	4	Crushed, mixed with hot water, extract drunk
						Diarrhoea	5	Crushed, mixed with hot water, extract drunk
						To dilate the birth canal	8	Crushed, mixed with hot water, extract drunk
						Earache	2	Infusion dropped into the ear
<i>Azanza garckeana</i> (F. Hoffm.) Exell & Hillc.	Malvaceae	AM 493	Mutohwe	Tree	Root	Earache	2	Infusion dropped into the ear
<i>Berchemia discolor</i> (Klotzsch) Hemsl.	Rhamnaceae	AM 523	Nyii	Tree	Root	Abdominal pains	3	Crushed, mixed with hot water, extract drunk
<i>Brachystegia boehmii</i> Taub.	Fabaceae	AM 402	Mupfuti	Tree	Bark	Sexually transmitted diseases	2	Crushed, mixed with cold water, extract drunk
<i>Bridelia cathartica</i> G. Bertol.	Euphorbiaceae	AM 281	Mutsvoritsvoto	Shrub	Root	Infertility in men	3	Crushed, mixed with hot water, extract drunk
<i>Bridellia mollis</i> Hutch.	Euphorbiaceae	AM 533	Mutuzvidzembwa	Shrub	Root	Cough	2	Hot water extract drunk three times a day
<i>Carissa bispinosa</i> (L.) Desf. ex Brenan	Apocynaceae	AM 439	Muruguru	Shrub	Root	Diarrhoea	8	Hot water extract drunk three times a day
						Cough	4	Hot water extract drunk three times a day
						Diarrhoea	7	Crushed, mixed with hot water, extract drunk
<i>Carisa edulis</i> (Forssk.) Vahl	Apocynaceae	AM 363	Muruguru	Shrub	Root	Cough	5	Hot water extract drunk three times a day
<i>Cassia abbreviata</i> Oliv.	Fabaceae	AM 324	Muremberembe	Shrub	Root	Aphrodisiac	6	Crushed, mixed with hot water, extract drunk
						Abortion	3	Crushed, mixed with hot water, extract drunk
						Constipation	2	Crushed, mixed with hot water, extract drunk
						Diarrhoea	7	Crushed, mixed with hot water, extract drunk
						Gonorrhoea	6	Crushed, mixed with cold water, extract drunk
<i>Citrus limon</i> (L.) Burm. f.	Rutaceae	AM 318	Mulemoni	Tree	Fruit	Cough, Flu and fever	9	Extract of <i>Citrus lemon</i> fruit, <i>Eucalyptus</i> sp. and <i>Psidium guajava</i> leaves drunk
<i>Corchorus tridens</i> L.	Tiliaceae	AM 528	Derere	Herb	Root	Backache	2	Crushed, mixed with hot water, extract drunk
<i>Cucumis anguria</i> L.	Cucurbitaceae	AM 449	Muchacha	Herb	Fruit	Snake repellent	7	Pieces of fruit left around homestead
<i>Diospyros lycioides</i> Desf.	Ebenaceae	AM 513	Musumadombo	Shrub	Root	Infertility in women	3	Crushed, mixed with hot water, extract drunk
<i>Diospyros mespiliformis</i> Hochst. ex A.DC.	Ebenaceae	AM 333	Musuma	Tree	Root	Abdominal pains	3	Crushed, mixed with hot water, extract drunk
<i>Ekebergia benguelensis</i> Welw. ex C.DC.	Meliaceae	AM 446	Mudyavarungu	Tree	Bark	Infertility in men	2	Crushed, mixed with hot water, extract drunk
						Root	2	Crushed, mixed with hot water, extract drunk
						Dysmenorrhoea	2	Crushed, mixed with hot water, extract drunk
<i>Elephantorrhiza goetzei</i> (Harms) Harms	Fabaceae	AM 283	Ntorani	Shrub	Root	Abdominal pains	3	Crushed, mixed with hot water, extract drunk
						Bilharzia (Schistosomiasis)	3	A mixture with root of <i>Piliostigma thonningii</i> taken by mouth
						Diarrhoea	7	Hot water extract drunk three times a day
						Gonorrhoea	4	Crushed, mixed with hot water, extract drunk
<i>Erythrina abyssinica</i> Lam. ex DC.	Fabaceae	AM 288	Mutiti	Tree	Bark	Backache	3	Crushed, mixed with hot water, extract drunk
<i>Eucalyptus</i> sp.	Myrtaceae	AM 298	Mugamutiri	Tree	Leaves	Wounds	2	Wounds washed with infusion
						Cough, flu and fever	9	Extract of <i>Citrus lemon</i> fruit, <i>Eucalyptus</i> sp. and <i>Psidium guajava</i> leaves drunk



Table 2 (Continued)

Plant species	Family name	Voucher number	Vernacular name	Habit	Part(s) used	Use(s)	Number of citations	Preparation and administration
<i>Euclea crispa</i> (Thunb.) Sond. ex Gürke	Ebenaceae	AM 500	Muvhinji	Shrub	Root	Cough	2	Hot water extract drunk three times a day
<i>Euclea divinorum</i> Hiern	Ebenaceae	AM 401	Mushangura	Shrub	Root	Diarrhoea	5	Hot water extract drunk three times a day
<i>Ficus ingens</i> (Miq.) Miq.	Moraceae	AM 399	Mushahvi	Tree	Root	Cough	3	Crushed, mixed with hot water, extract drunk
<i>Ficus sur</i> Forssk.	Moraceae	AM 363	Muonde	Tree	Root	Syphilis	3	Crushed, mixed with water, extract drunk
						Diarrhoea	2	Crushed, mixed with hot water, extract drunk
<i>Ficus sycomorus</i> L.	Moraceae	AM 301	Muonde	Tree	Root	Cough	3	Crushed, mixed with hot water, extract drunk
<i>Flacourtia indica</i> (Burm. f.) Merr.	Flacourtiaceae	AM 383	Munhunguru	Shrub	Leaves	Diarrhoea	8	Leaves browsed by mouth
<i>Flueggea virosa</i> (Roxb. ex Willd.) Voigt	Euphorbiaceae	AM 557	Mushagahuwe	Shrub	Root	Pneumonia	3	Crushed, mixed with hot water, extract drunk
						Contraceptive	3	Decoction taken by mouth before sexual intercourse
						Snake bite (antidote)	4	Dried powder applied to bitten part
						Wounds	4	Powder applied on wounds
<i>Grewia bicolor</i> Juss.	Tiliaceae	AM 429	Mutewa	Shrub	Root	Diarrhoea	4	Hot water extract drunk three times a day
						Gonorrhoea	2	Crushed, mixed with hot water, extract drunk
<i>Grewia flavescens</i> Juss.	Tiliaceae	AM 512	Mubhubhunu	Shrub	Root	Menorrhagia	3	Crushed, mixed with hot water, extract drunk
<i>Grewia monticola</i> Sond.	Tiliaceae	AM 317	Mutewa	Shrub	Root	Diarrhoea	2	Hot water extract drunk three times a day
<i>Hoslundia opposita</i> Vahl	Lamiaceae	AM 325	Hwahwa hwe shiri	Herb	Leaves	Cataract	2	Infusion dropped into eyes
<i>Kirkia acuminata</i> Oliv.	Simarubaceae	AM 286	Mubvumira	Tree	Fruit	Snake bites (antidote)	5	Juice applied to bite
						Wounds	3	Juice applied to wounds
<i>Lannea discolor</i> (Sond.) Engl.	Anacardiaceae	AM 406	Mugan'acha	Tree	Root	Sore eyes	4	Infusion used as eye drops
<i>Lannea edulis</i> (Sond.) Engl.	Anacardiaceae	AM 510	Mutsambatsi	Shrub	Root	Diarrhoea	6	Hot water extract drunk three times a day
						Gonorrhoea	4	Cold water extract drunk three times a day
<i>Moringa oleifera</i> Lour	Moringaceae	AM 309	Moringa	Shrub	Leaves	Diarrhoea	5	Crushed, mixed with hot water, extract drunk
						Toothache	2	Tooth washed with decoction
<i>Nicotiana tobacum</i> L.	Solanaceae	AM 302	Fodya	Herb	Leaves	Wounds	5	Snuff applied to wounds
<i>Ozoroa insignis</i> Del.	Anacardiaceae	AM 299	Mubhedha	Shrub	Root	Diarrhoea	5	Hot water extract drunk three times a day
						Sexually transmitted diseases	2	Crushed, mixed with cold water, extract drunk
<i>Parinari curatellifolia</i> Planch. ex Benth.	Chrysobalanaceae	AM 297	Muchakata	Tree	Root	Constipation	3	Crushed, mixed with hot water, extract drunk
						Toothache	5	Teeth washed with infusion
<i>Peltophorum africanum</i> Sond.	Fabaceae	AM 309	Muzeze	Shrub	Bark, leaves or root	Syphilis	3	Crushed, mixed with cold water, extract drunk
						Diarrhoea	4	Hot water extract drunk three times a day
						Sore eyes	2	Infusion dropped into eyes
						Toothache	4	Boiled and steam directed into mouth
						Sexually transmitted diseases	3	Crushed, mixed with cold water, extract drunk
<i>Piliostigma thonningii</i> (Schumach.) Milne-Redh.	Fabaceae	AM 549	Musekesa	Tree	Bark, leaves or root	Cough	2	Hot water extract drunk three times a day
						Menorrhagia	3	Water extract drunk three times a day
						Convulsions	2	Hot water extract drunk three times a day
						Bilharzia	2	A mixture with root of <i>Elephantorrhiza goetzei</i> taken by mouth
<i>Pouzolzia hypoleuca</i> Wedd.	Urticaceae	AM 287	Munanzwa	Shrub	Root	To dilate the birth canal	8	Infusion instilled into the vagina
						Sexually transmitted diseases	4	Crushed, mixed with cold water, extract drunk
						Wounds	3	Powder applied on wounds
<i>Psidium guajava</i> L.	Myrtaceae	AM 323	Mugwavha	Shrub	Leaves	Cough, flu and fever	9	Extract of <i>Citrus lemon</i> fruit, <i>Eucalyptus</i> sp. leaves and <i>Psidium guajava</i> drunk
<i>Pterocarpus angolensis</i> DC.	Fabaceae	AM 284	Mubvamaropa	Tree	Bark	Earache	3	Infusion dropped into ear
						Menorrhagia	2	Crushed, mixed with hot water, extract drunk
					Root	Infertility in women	2	Crushed, mixed with hot water, extract drunk
					Sap	Sore eyes	4	Dropped into eyes
<i>Rhus longipes</i> Engl.	Anacardiaceae	AM 381	Mufokosiana	Tree	Root	Infertility in women	3	Crushed, mixed with hot water, extract drunk
						To dilate birth canal	4	Crushed, mixed with hot water, extract drunk
<i>Rhus pyroides</i> Burch.	Anacardiaceae	AM 345	Mufokosiana	Shrub	Root	Cough	3	Hot water extract drunk three times a day
<i>Rhus tenuinervis</i> Engl.	Anacardiaceae	AM 476	Mufokosiana	Shrub	Leaves	Menorrhagia	4	Crushed, mixed with hot water, extract drunk
<i>Ricinus communis</i> L.	Euphorbiaceae	AM 290	Mupfuta	Herb	Root	Toothache	4	Tooth washed with decoction
					Seed	Sore eyes	3	Oil taken by mouth

Table 2 (Continued)

Plant species	Family name	Voucher number	Vernacular name	Habit	Part(s) used	Use(s)	Number of citations	Preparation and administration
<i>Sclerocarya birrea</i> (A. Rich.) Hochst.	Anacardiaceae	AM 403	Mupfura	Tree	Root	Earache	5	Oil dropped into ear
<i>Securidaca longepedunculata</i> Fresen.	Polygalaceae	AM 285	Mufufu	Shrub	Root	Sore eyes Epilepsy Snake repellent	5 3 9	Boiled and steam directed into eyes Crushed, mixed with hot water, extract drunk Mixed with roots of <i>Annona stenophylla</i> and sprinkled around homestead
<i>Strychnos cocculoides</i> Bak	Loganiaceae	AM 478	Muzumwi	Tree	Root	Abdominal pains Aphrodisiac Gonorrhoea Infertility in men Sore throat	2 3 4 2 3	Crushed, mixed with hot water, extract drunk Crushed, mixed with hot water, extract drunk Crushed, mixed with hot water, extract drunk Crushed, mixed with hot water, extract drunk Crushed, mixed with hot water, extract drunk
<i>Strychnos madagascariensis</i> Poir.	Loganiaceae	AM 451	Mukwakwa	Tree	Root	Sore eyes	3	Infusion of leaves dropped into eyes
<i>Strychnos spinosa</i> Lam.	Loganiaceae	AM 340	Mutamba	Tree	Root	Abdominal pains	2	Crushed, mixed with hot water, extract drunk
<i>Vangueria infausta</i> Burch.	Rubiaceae	AM 400	Mudzvirungombe	Tree	Root	Diarrhoea	4	Crushed, mixed with hot water, extract drunk Hot water extract drunk three times a day
<i>Vitex payson</i> (Lour.) Merr.	Lamiaceae	AM 447	Mutsvubvu	Tree	Leaves	Cough	3	Burnt and smoke inhaled
<i>Ximения americana</i> L.	Oleaceae	AM 439	Mutengeni	Shrub	Leaves	Backache	3	Crushed, mixed with hot water, extract drunk
<i>Ximения caffra</i> Sond.	Oleaceae	AM 535	Munhengeni	Shrub	Leaves	Backache	3	Crushed, mixed with hot water, extract drunk
					Root	Aphrodisiac	2	Crushed, mixed with hot water, extract drunk
						Diarrhoea	6	Crushed, mixed with hot water, extract drunk
						Veneral diseases	3	Crushed, mixed with cold water, extract drunk
						Wounds	3	Powder applied on wounds
						Boil	3	Powder applied to boil
<i>Ziziphys mucronata</i> Willd.	Rhamnaceae	AM 319	Muchecheeni	Tree	Fruit and leaves Root	Abdominal pains Infertility in women Wounds	2 3 3	Crushed, mixed with hot water, extract drunk Crushed, mixed with hot water, extract drunk Powder applied on wounds

fruits and sap. The roots were the most frequently used (61.3%), followed by leaves (21.3%), bark (9.3%), fruit (5.3%), sap and seed with (1.3%) each (Fig. 2B). Traditional healers believe that roots are more effective than other plant parts. Studies elsewhere, have shown that the roots and other underground parts have high concentrations of bioactive compounds (Kunwar et al., 2006). Harvesting of roots for medicinal purposes is not sustainable, it threatens the survival of the majority of medicinal plants used in Nhema communal area. Thus, from the conservation point of view, the high utilization of roots of medicinal plant species in Nhema communal area put these plant species at a risk because of the damages inflicted on the plant species. It is well recognized by conservationists that medicinal plants primarily valued for their root parts and those which are intensively harvested for their bark often tend to be the most threatened by over-exploitation (Flatie et al., 2009).

### 3.4. Diagnosis and treatment of diseases

Interviews with traditional healers revealed different diagnosis and treatment methods of the ailments. The practitioners usually diagnosed each health problem by an interview and visual inspection of the patient. Patients are commonly interviewed for symptoms observed and the duration of the health problem. Changes in eye and skin colour, tongue infections, body temperature and status of sores were all visually inspected by the traditional healer and the remedy prescribed. Internal ailments were commonly treated by making the patient drink herbal preparations, wounds and skin infections were treated by applying and rubbing herbal preparations on the affected areas.

A wide variety of medical conditions were treated using remedies made from medicinal plants. Altogether, 61 plant species were used to treat 34 different human health problems in Nhema communal area (Table 2). Most of the plants used had more than a single therapeutic use, with 13 species (21.3%) used in the treatment of two ailments, 5 species (8.2%) treating three ailments, 6 species (9.8%) treating four ailments, 5 species (8.2%) treating five ailments and *Albizia antunesiana* used to treat six different ailments. The most cited species were: *Albizia antunesiana* (77.8%, aphrodisiac; 66.7%, diarrhoea), *Annona stenophylla* (100%, snake repellent; 55.6%, sexually transmitted diseases), *Asparagus africanus* (88.9%, to dilate birth canal; 55.6%, diarrhoea), *Carissa bispinosa* (88.9%, diarrhoea), *Carissa edulis* (77.8%, diarrhoea; 55.6%, cough), *Cassia abbreviata* (77.8%, diarrhoea; 66.7% aphrodisiac; 66.7%, gonorrhoea), *Citrus limon* (100%, cough, flu and fever), *Cucumis anguria* (77.8%, snake repellent), *Elephantorrhiza goetzei* (77.8%, diarrhoea), *Eucalyptus* sp. (100%, cough, flu and fever), *Euclea divinorum* (55.6%, diarrhoea), *Flacourtia indica* (88.9%, diarrhoea), *Kirkia acuminata* (55.6%, snake bite), *Lannea edulis* (66.7%, diarrhoea), *Moringa oleifera* (55.6%, diarrhoea), *Nicotiana tobacum* (55.6%, wounds), *Ozoroa insignis* (55.6%, diarrhoea), *Parinari curatellifolia* (55.6%, toothache), *Pouzolzia hypoleuca* (88.9%, to dilate birth canal), *Psidium guajava* (100%, cough, flu and fever), *Ricinus communis* (55.6%, earache), *Sclerocarya birrea* (55.6%, sore eyes), *Securidaca longepedunculata* (100%, snake repellent), and *Ximения caffra* (66.7%, diarrhoea). Similar results were obtained by Kambizi and Afolayan (2001), who examined the treatment of sexually transmitted diseases in northern Zimbabwe, showing wide use of *Cassia abbreviata* and *Lannea edulis* in the study area. The antibacterial activity of *Cassia abbreviata* against Gram-positive and Gram-negative bacteria has since been confirmed (Kambizi and Afolayan, 2001). On the other hand, many diseases were also treated using a wide range of plants (Table 3). The majority of plant species were used to treat diarrhoea (32.7%), followed by cough (19.7%), wounds (11.5%) and gonorrhoea (11.5%). Diarrhoea is a major concern not only in Zimbabwe but in Mozambique as well, where with dysentery and cholera usually results in high mortality rate if not treated

**Table 3**  
Distribution of plant species by category of disease.

Human disease	Plant species used to treat the disease
Abdominal pains	<i>Berchemia discolor</i> ; <i>Diospyros mespiliformis</i> ; <i>Elephantorrhiza goetzei</i> ; <i>Strychnos cocculoides</i> and <i>Strychnos spinosa</i> .
Abortion	<i>Cassia abbreviata</i> .
Aphrodisiac	<i>Albizia antunesiana</i> ; <i>Cassia abbreviata</i> ; <i>Strychnos cocculoides</i> and <i>Ximenia caffra</i> .
Backache	<i>Corchorus tridens</i> ; <i>Erythrina abyssinica</i> ; <i>Ximenia Americana</i> and <i>Ximenia caffra</i> .
Bilharzia	<i>Elephantorrhiza goetzei</i> and <i>Piliostigma thonningii</i> .
Boils	<i>Annona stenophylla</i> and <i>Ziziphus mucronata</i> .
Cataract	<i>Hoslundia opposita</i> .
Chest pains	<i>Annona stenophylla</i> .
Constipation	<i>Albizia antunesiana</i> ; <i>Aloe greatheadii</i> ; <i>Cassia abbreviata</i> and <i>Parinari curatellifolia</i> .
Contraceptive	<i>Flueggea virosa</i> .
Convulsions	<i>Acacia karroo</i> and <i>Piliostigma thonningii</i> .
Cough	<i>Bridelia mollis</i> ; <i>Carissa bispinosa</i> ; <i>Carisa edulis</i> ; <i>Citrus limon</i> ; <i>Eucalyptus</i> sp.; <i>Euclea crispa</i> ; <i>Ficus ingens</i> ; <i>Ficus sycomorus</i> ; <i>Piliostigma thonningii</i> ; <i>Psidium guajava</i> ; <i>Rhus pyroides</i> and <i>Vitex payos</i> .
Diarrhoea	<i>Albizia antunesiana</i> ; <i>Ampelocissus africana</i> ; <i>Ampelocissus obtusata</i> ; <i>Asparagus africanus</i> ; <i>Carissa bispinosa</i> ; <i>Carisa edulis</i> ; <i>Cassia abbreviata</i> ; <i>Elephantorrhiza goetzei</i> ; <i>Euclea divinorum</i> ; <i>Ficus sur</i> ; <i>Flacourtia indica</i> ; <i>Grewia bicolor</i> ; <i>Grewia monticola</i> ; <i>Lannea edulis</i> ; <i>Moringa oleifera</i> ; <i>Ozoroa insignis</i> ; <i>Peltophorum africanum</i> ; <i>Strychnos spinosa</i> ; <i>Vangueria infausta</i> and <i>Ximenia caffra</i> .
Earache	<i>Azanza garckeana</i> ; <i>Pterocarpus angolensis</i> and <i>Ricinus communis</i> .
Epilepsy	<i>Securidaca longepedunculata</i> .
Fever	<i>Citrus limon</i> ; <i>Eucalyptus</i> sp. and <i>Psidium guajava</i> .
Flu	<i>Citrus limon</i> ; <i>Eucalyptus</i> sp. and <i>Psidium guajava</i> .
Gonorrhoea	<i>Albizia antunesiana</i> ; <i>Aloe greatheadii</i> ; <i>Cassia abbreviata</i> ; <i>Elephantorrhiza goetzei</i> ; <i>Grewia bicolor</i> ; <i>Lannea edulis</i> and <i>Strychnos cocculoides</i> .
Menorrhagia	<i>Grewia flavescens</i> ; <i>Piliostigma thonningii</i> ; <i>Pterocarpus angolensis</i> and <i>Rhus tenuinervis</i> .
Infertility in men	<i>Bridelia cathartica</i> ; <i>Ekebergia benguelensis</i> and <i>Strychnos cocculoides</i> .
Infertility in women	<i>Albizia antunesiana</i> ; <i>Diospyros lycioides</i> ; <i>Pterocarpus angolensis</i> ; <i>Rhus longipes</i> and <i>Ziziphus mucronata</i> .
Dysmenorrhoea	<i>Ekebergia benguelensis</i> .
Pneumonia	<i>Asparagus africanus</i> and <i>Flueggea virosa</i> .
Purgative	<i>Albizia antunesiana</i> .
Snake bite (antidote)	<i>Flueggea virosa</i> and <i>Kirkia acuminata</i> .
Snake repellent	<i>Annona stenophylla</i> ; <i>Cucumis anguria</i> and <i>Securidaca longepedunculata</i> .
Sore eyes	<i>Lannea discolor</i> ; <i>Peltophorum africanum</i> ; <i>Pterocarpus angolensis</i> ; <i>Ricinus communis</i> ; <i>Sclerocarya birrea</i> and <i>Strychnos madagascariensis</i> .
Sore throat	<i>Strychnos cocculoides</i> .
Sexually transmitted diseases	<i>Annona stenophylla</i> ; <i>Brachystegia boehmii</i> ; <i>Ozoroa insignis</i> ; <i>Peltophorum africanum</i> and <i>Pouzolzia hypoleuca</i> .
Syphilis	<i>Ficus sur</i> and <i>Peltophorum africanum</i> .
To dilate birth canal	<i>Asparagus africanus</i> ; <i>Pouzolzia hypoleuca</i> and <i>Rhus longipes</i> .
Toothache	<i>Moringa oleifera</i> ; <i>Parinari curatellifolia</i> ; <i>Peltophorum africanum</i> and <i>Ricinus communis</i> .
Venereal diseases	<i>Ximenia caffra</i> .
Wounds	<i>Erythrina abyssinica</i> ; <i>Flueggea virosa</i> ; <i>Kirkia acuminata</i> ; <i>Nicotiana tobacum</i> ; <i>Pouzolzia hypoleuca</i> ; <i>Ximenia caffra</i> and <i>Ziziphus mucronata</i> .

promptly (Ribeiro et al., 2010). The use of herbal medicine in Nhema communal area seems to play a major role in controlling diarrhoea.

### 3.5. Herbal medicines and their preparation

Mono therapies based on preparations made from a single plant were the most dominant, although many remedies where more

than one plant was used were also common. Those that involved the use of two species included, for example, mixing the roots of *Annona stenophylla* and *Securidaca longepedunculata*, and the mixture sprinkled around homestead as snake repellent. Root mixture of *Elephantorrhiza goetzei* and *Piliostigma thonningii* was taken by mouth as a remedy for bilharzia (Schistosomiasis). Water extract of *Citrus lemon* fruit, *Eucalyptus* sp. and *Psidium guajava* leaves was drunk as a remedy against cough, flu and fever. A herbal concoction found to be widespread in Nhema communal area in a previous study by Maroyi (2009). The use of more than one plant species to prepare a remedy for ailments is attributed to the additive or synergistic effects that they could have during ailment treatment (Bussman and Sharon, 2006). Decoctions were the most common method of preparation, with plant parts generally prepared using hot or cold water (50 species, 83.3%) as the solvent. This is similar to what has been found in traditional Zimbabwean medicine (Gelfand et al., 1985). The medicinal plant preparations were administered to the local people of Nhema communal area through different routes including oral, topical, nasal and others. Oral (50 species) was the most commonly used route of administration, and was followed by topical (16 species) in the case of skin diseases or wounds, nasal and others (5 species).

In the study area, the recommended dosage differed among the traditional healers for treating the same health problem. During the interview and discussions with the traditional healers they indicated that the doses for liquid preparations were prescribed through estimation, in terms of a full, half or one fourth of a cup, depending on the age, physical condition of the patient being treated, type of illness and diagnosis of the disease. There is no standardized measure on the dose of herbal remedies in the study area. Dosages were estimated using lids, spoons, cups, glasses, pinches or handfuls. The amounts of remedy and prescription rates were generally dependent on the degree and duration of the ailment. The type of disease and level of its severity further decide the frequency of treatments. Traditional healers reported that they prescribed different doses of remedies for different age groups. Preferably, more amounts of remedies were given for adults than children to treat the same disease. Lack of standardization and quality control is seen as one of the main disadvantages of traditional medicine (Bekalo et al., 2009).

## 4. Conclusion

The number of medicinal plants and their potential applications in humans reflect the rich ethnomedicinal knowledge in Nhema communal area. The preservation of this knowledge is due to continued reliance on wild plant resources for primary healthcare by the local community. Wide use of herbal medicine by both young children and adults will result in passing on of this indigenous knowledge to future generations. A strong belief in the effectiveness of traditional medicine in the primary healthcare of Nhema community will contribute to the persistence of this knowledge in the local community. The pharmaceutical importance of medicinal plants in Nhema communal area and documented indigenous practices can contribute much to national drug development if it receives the attention it deserves. While traditional healers claimed a high level of efficacy from their herbal remedies, it is important to standardize the drug preparation, dilution, dosage and route of administration, so as to match western medicine procedures. The study results suggest that there is a need for validation of the reported species for their efficacy.

Since roots were the most widely used plant parts and plants were mostly collected from the wild, the risk of plant resources loss is high in Nhema communal area. Awareness programme should be made to the traditional leaders, traditional healers and the com-

munity at large to safeguard such a rich heritage of indigenous knowledge and medicinal plant use. This will assist in the sustainable utilization and conservation of the plant resources in the study area. Sustainable management of the herbal medicines must be balanced with the short-term needs of the people for their basic healthcare needs and protection of the natural resource base. Protection of the herbal medicines should be viewed as a longer-term goal for ensuring that the resource base is utilized wisely so that it can continue to provide benefits to the local community on a sustainable basis.

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