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RESEARCH ARTICLE

Diversity of local knowledge on use of wild food and medicinal plants in communities around five biodiversity hotspots in Zimbabwe

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Abstract

This study documented use of wild food and medicinal plants in areas around five biodiversity hot spots in Zimbabwe. Data was collected using semi-structured interviews and focus group discussions in representative communities. About 89 wild food plants were used by the communities. Trees, shrubs, tubers/herbs, lianas/climbers and succulents constituted 65%, 11%, 12%, 8% and 4% respectively. Fruits were mostly harvested (52%) then leaves (28%), and others (roots/rhizomes/tubers, sap and fibres) (20%). Fruits were commonly consumed raw (96%) whilst others are processed into juices (4%), mostly collected by women and children. Fruits of *Adansonia digitata* L., *Vangueria infausta* Burch., *Uapacca kirkiana* Müll. Arg., *Berchemia discolour/zeyheri* (Klotzsch) Hemsl., *Vitex doniana* Sweet and leaves of *A. digitata* were most preferred plant species because of their taste and availability. However, some fruits such as *Vitex* spp. and *U. kirkiana* caused constipation and diahorrea respectively if consumed in excess. About 149 medicinal plant species belonging to 115 genera and 61 families were used for treating about 32 diseases and disorders. These were dominated by families; Fabaceae(16%), Meliaceae(5%), Apocenaceae(3%), Anacadaceae(3%) and Solanaceae (4%). About 45, 30, 25, 23, 13 species treat abdominal pains, toothache, women and gynaecological issues, sexually transmitted diseases and paediatric remedies respectively. Other species are used as aphrodisiacs (4) and treatment of cancer (4). Leaves (28%), roots(27%) bark(24%) and fruits(12%) were main parts used to prepare remedies. Cultural/Traditional knowledge plays an important role in valuing species in particular areas and associated conservation of food and medicinal plants.

Keywords Woodlands · Wild food · Zimbabwe · Traditional medicine · Treatment · Biodiversity

Introduction

Forest ecosystems such as Miombo woodlands are home to a diversity of plant species supplying timber and non-timber forest products such as food and medicinal products to local communities supporting over 90% of the people living in and around forested landscapes (Campbell 1996; Shackleton and Pullanikkatil 2018). The consumption of wild food plants is ancient in both developed and developing nations. Using the Food and Agriculture Organization of the United Nations (FAO) 1999, definition, the term wild food plants, are those food plants, "that grow spontaneously in self-maintaining populations in natural or semi-natural ecosystems and can exist independently of direct human action". Wild food plants are important throughout the world (FAO 1999) and are consumed in various ways because of their taste and impacts on human well-being (Guarrera and Savo 2016). For the African communities, the gathering and consumption of wild food plants is central to their livelihoods (Balemie and Kebebew 2006), playing a significant role in household incomes and food security (Bharucha and Pretty 2010). Rural communities are more dependent on wild food plants for dietary supplements providing nutritionally rich foods, sustaining communities in times of food shortages (Shumsky et al. 2014) and sometimes used to supplement relishes.

Apart from food, traditional/wild plant medical practices have been an established mode of health care in the African continent and Zimbabwe is not an exception. Plant parts such as bark, leaves, roots, seeds and fruit pulp have been traditionally used to treat human and livestock ailments. Throughout the world, local people utilise wild plants for

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medicinal purposes (Tardio and pardo-de Santayana 2008; Buchmann et al. 2010; Ugulu 2011, Wanjohi et al. 2020a). In Southern Africa, the impoverished rural communities use forest and woodland resources as the main source of health care delivery especially in areas where conventional medical facilities are beyond the reach of many. Mdluli (2002), showed that 85% of rural communities in Swaziland relied on natural herbs for their medical care.

The use of traditional medicines has been documented throughout Africa (Hostettmann et al. 2000; Gebauer et al. 2002; Maroyi 2013; Awuchi 2019; Wanjohi et al. 2020b). Species such as *Adansonia digitata,* have over 300 traditional uses including treating several ailments (Buchmann et al. 2010; Rahul et al. 2015). Furthermore, some species have been utilised commercially for exports in the form of oils, powder, fruit pulp or seeds (Sidibe and Williams 2002). Some communities have incorporated exotic species into their indigenous pharmacopoeia for treating several ailments (Maroyi 2017). The resource base is, however, threatened by several factors including over exploitation. In some cases, the natural stock of medicinal plants fails to meet demand leading to the over exploitation of some of the most popular species. The effects of over exploitation are exacerbated by population growth, clearing for agriculture, fuelwood needs, climate change and economic challenges mainly in the developing world. Other factors affecting the sustainability of the resource base are methods of collection and the number of collectors. This is possibly the reason why traditionally, medicinal plants species were not revealed to all people but were kept as a family secrete where they collect and process their remedies following certain principles of sustainable use (Shumba et al. 2009).

Some of the consequences of over exploitation are evidenced by the scarcity of species such as *Walburgia salutaris* (G. Bertol.) Chiov. in Swaziland and Zimbabwe, *Albizia brevifolia* Schinz in Namibia (Shumba et al. 2010) and *Prunus African* (Hook. f.) Kalkman in Zimbabwe (Jimu and Ngoroyemoto 2011). Botha et al. (2004) also found declining populations of *W. salutaris* in areas prone to fire and areas outside protected areas. Increased use of herbal medicines is likely to continue due to global and local economic challenges mainly for the developing world where greater proportions of the population rely on herbal medicines for preventive and curative care. However, there is a need for efforts to domesticate some of the important species threatened by habitat destruction and overexploitation.

In Zimbabwe, most ethnobotanical studies focused on some parts of the country and mainly dealt with medicinal species (Maroyi 2016a, 2017). Some studies have shown the importance of wild food plants in rural communities (Campbell 1986, 1987; Maroyi 2011). However, the documentation of the use of wild food and medicinal plants in areas around biodiversity hotspots is limited. Importance and use of many wild food plants are not fully exploited leading to their omission in national debates and accounting. In this regard, the documentation of local knowledge on use of wild plants by communities around biodiversity hotspots becomes critical as Zimbabwe is threatened by high rates of deforestation, estimated at 300, 000 ha per year (Forestry Commission 2016). This study, therefore, documented local knowledge on the use of wild food and medicinal plant species in communities around five biodiversity hotspots of Zimbabwe. The objectives were to: (1) identify wild food plants utilised in areas around five biodiversity hotspot areas of Zimbabwe, (2) determine how wild food plants are utilised by rural communities, (3) identify wild medicinal plants utilised in areas around five biodiversity hotspot areas of Zimbabwe and how they are utilised iv. assess prospects for conservation and sustainable utilisation of wild food plants.

Materials and methods

Study sites

The study was done in selected areas around five biodiversity hotspots of Zimbabwe, Nyanga (18° 00′ 00″ S; 32° 46′ 00″ E), Chimanimani and Nyanga (between 19°36′ and 20°04′ S), Chipinge (20°25′60″ S. 32°42′0″ E.), Mutorashanga in the great Dyke area (-30° 30′ E between 16° 30′ and 21° S) and Hwange (Latitude: -19.124054; Longitude: 26.592591). Nyanga, Chipinge and Chimanimani are in the eastern highlands of Zimbabwe and are part of the Afro-montane region. Altitude for Chipinge ranges from 900 to 1200 m above sea level whilst that of Nyanga is 1675–2592. Great dyke area is at 1264–1526 m above sea level whilst Hwange is at 1000 m asl.

The vegetation of the Chimanimani/Chipinge region is mainly sub-montane with scattered grasslands (Jimu and Ngoroyemoto 2011). A complex mosaic of vegetation types characterises the range dominated by forests, woodlands and grasslands. The geology is mainly the comprises of flat-lying shales, quartzites and intrusive dolerites. The soils are highly leached paraferallitic (Jimu and Ngoroyemoto 2011). The drainage pattern is characterised by deeply cut valleys. The region falls in agro-ecological regions I and II with annual rainfall ranging from 1741 to 2997 mm. Chipinge has an intact forest, the Chirinda Forest with unique trees such as *Argomuellera macrophylla* Pax*, Celtis mildbraedii* Engl.*, Chrysophyllum gorungosanum* Engl.*, Ficus chirindensis* C.C. Berg*, Khaya anthotheca* (Welw.) C. DC., *Strychnos mellodora* S. Moore and *Strychnos mitis* S. Moore. These trees are either only found in Chirinda Forest or are very rare in other parts of the country. Communities depend on subsistence farming and commercial fruit tree production. The Chirinda forest is a protected forest that is a source of

medicinal plants important for the local community. Similarly, communities in the Nyanga site also depend on subsistence farming. The area has some of the most important species such as *P. africana*.

The Great Dyke offers a unique geological phenomenon, holding various high value metallurgical ores, including platinum, nickel and chrome (Wild 1965). Serpentine soils are known to have an unusually high exchangeable Mg - exchangeable Ca ratio (Anderson and Talbot 1965). The Great Dyke is dominated by the miombo vegetation dominated by *Julbernardia globiflora* (Benth.) Troupin, *Brachystegia spiciformis* Benth, *B. boehmii* Taub and *B. allenii* Burtt Davy & Hutch. Communities engage in small scale mining and farming activities.

The Hwange biodiversity hotspot is located in the western section of the country. Communities at this site are located adjacent to Hwange National Park, which is the largest conservation area in Zimbabwe. The area is typical dystrophic savanna with nutrient-poor soils comprising of sandier soils that are well-drained and of variable depth but often shallow, medium-grained sands or loamy sands over strong brown gravelly loamy sands or sandy loams. The common tree species in the area include *Senegalia* sp, *Vachelia* sp., *Sclerocarya birrea* (A. Rich.) Hochst., *Lonchocarpus bussei* Harms, *V. infausta, Ziziphus mucronata* Willd., *Combretum imberbe* Wawra, *C. apiculatum* Sond, *Dichrostachys cinerea* (L.) Wight & Arn. and *Colophospermum mopane* (Benth.) J. Léonard. Communities depend on livestock farming with cropping constrained by poor rainfall. They obtain NTFPs from the adjacent protected area (National park).

Data collection and data analysis

Data on species used for food and medicine, along with use categories, were compiled from representatives drawn from 17 communities around five biodiversity hotspots in Zimbabwe in December 2018. A total of 102 informants who included men (44), women (50), traditional leaders (4) and traditional healers (4) participated in the surveys. Youths were also present in each meeting. Of the selected communities, utilisation by men, women and youths was studied using group discussions and key informant interviews. Around each hotspot area, separate groups of men and women participated in the research. Food and medicinal plant names were given using local plant names, part(s) used, methods of preparation, how they were administered and the diseases treated. Additional data were compiled from publications, books and herbarium specimens collected from the hotspot areas. Descriptive statistical analysis was used to describe the data on wild food and medicinal plants in the five biodiversity hotspots in Zimbabwe. The PAST program (Hammer et al. 2001) was used to determine similarities in the use of food and medicinal plants in the hotspots areas. Furthermore, data was used to developed a checklist data set on non-timber forest products used for food and medicines in the biodiversity hotspots. The checklist was then used to construct an occurrence data set using the specimen located in the National Herbarium and Botanical garden and published at GBIF.org (https://cloud.gbif.org/bid/resource?r=medicinal_plants&v=1.2).

Results

Use of wild food plants in communities around biodiversity hotspots

All community members (Men, women and children) utilised wild food plants throughout the year although the frequency was more during the rainy season than the other seasons as most of the wild fruits were available. Community members often resorted to wild food when they had limited financial resources or during drought periods. Women and girls used wild foods more frequently than others for personal and family consumption. The men rarely collected wild foods (e.g. fruits) for other family members whereas the women and girls collected and brought the fruits, leaves and roots to the homestead to prepare for the household.

A total of 89 wild food plant species belonging to 47 families and 65 genera were used as food by local communities in the five areas. The highest number of food plants were in the family Fabaceae (6%), Moraceae (6%), Annonnaceae, Euphobeaceae, Loganniaceae, Myrtaceae and Rhamnacea had 4% each. The number of species used for food in each hotspot is shown in Fig. 1.

There was a greater diversity of wild food plants in the great dyke than the other areas, followed by Chipinge with the least in Hwange.

Cluster analysis based on presence-absence of species showed that the species used in the Great Dyke area and Hwange were more similar than with the other areas

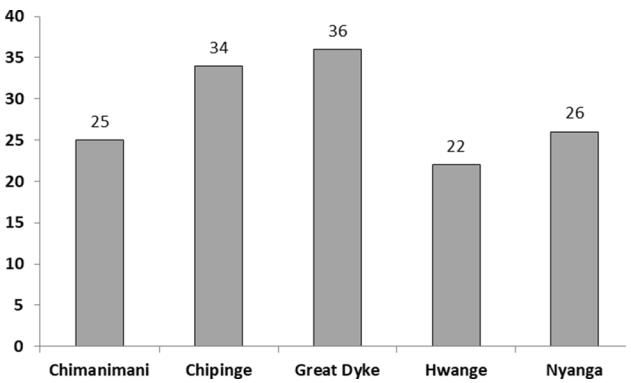

Fig. 1 Number of plant species by biodiversity hotspot area

although they were somehow similar to those used in Chipinge (Fig. 2). The vegetation types and the climatic conditions in Chipinge are linked to Afromontane forests yet the use of food species was similar to the drier areas of Hwange and Great Dyke.

Trees were the dominant form of wild food (63%) being higher than shrubs (13%), herbs (12%), lianas (7%) and succulents (4%) (Fig. 3).

The wild plant parts consumed as food were mostly fruits (81%), (taken fresh or dried (96%) and others crushed into powder (4%)) followed by leaves (15%), used to supplement household relish and others (roots/rhizomes/tubers, sap, flowers and fibres) (4%) taken raw or processed (Fig. 4). For some herbs, complete aerial parts are consumed.

Wild fruits had an important contribution to the livelihood of communities living in arid and semi-arid lands (Feyssa et al. 2012). Similarly, Ojelel and Kakudidi (2015) found fruit constituting 51% of wild food plant species whilst tubers/roots constituted 2% for communities in Uganda. The most popular fruit species in this study included: *A. digitata, S. birrea, Vitex payos* (Lour) Merr., *Lannea edulis* (Sond.) Engl. and *Berchemia discolor*.

Only two species were localised exotics, *Psidium guajava* L. and *Persia Americana* Mill., consumed as food and having medicinal properties as well. The leaves and roots of *Parinari curatellifolia* Planch. ex Benth, and *Rhoicissus tridentalis* (L.f.) Wild & R.B. Drumm. were used to add flavour and hasten the fermentation process of locally brewed beer. Fruit of S. *birrea* and *Z. mucronata* and juice of *Aloe* spp., were used to make local alcoholic drinks.

Non-alcoholic drinks were also prepared from fruits of several trees such as *A. digitata*. In another study, communities in Namibia and Angola also used the roots of *Boscia*

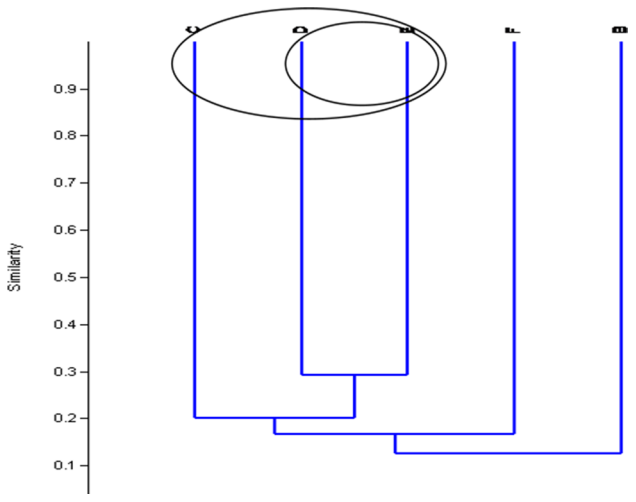

Fig. 2 Species use similarity for the five biodiversity hotspots in Zimbabwe B = Chimanimani; C = Chipinge; D = Great Dyke; E = Hwange; F = Nyanga

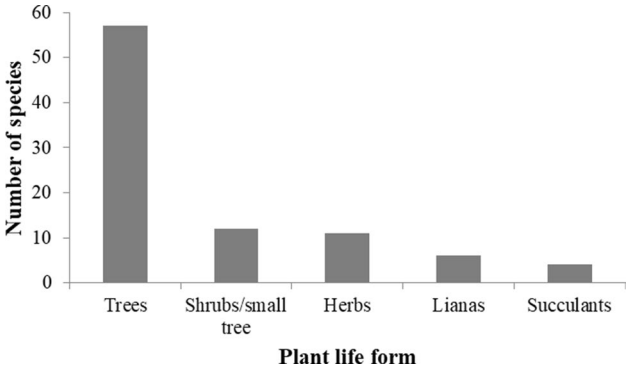

Fig. 3 Number of wild food plants species and their form used by communities around five biodiversity hotspots in Zimbabwe

albitrunca (Burch.) Gilg & Gilg-Ben. to improve fermentation and flavour of buttermilk (Bille 2013). *Mondia whitei* (Hook. f.) Skeels was used as an appetite stimulant whilst the seeds of *A. digitata* and *Trechilia dregeana* Sond/*emetica* Vahl can be crushed and added to relish. The sap of *Cissus integrfolia* (Baker) Planch. and some *Senegalia* and *Vachelia* species were extracted and used as a food additive whilst popular root species such as *Eriosema shirense* Baker f., *E. paucifloram* Klotzsch, *Hypoxis spp, Mondia whitei* and *Plectranthus esculentus* N.E. Br. were either cooked or eaten raw.

Use of medicinal plants by communities around biodiversity hotspot areas

Communities utilised about 149 medicinal plant species belonging to 115 genera and 61 families for medicines. These were dominated by the families; Fabaceae (16%), Meliaceae (5%), Apocynaceae (3%), Anacardiaceae (3%), Solanaceae (4%). Annonaceae, Asteraceae, Combretaceae,

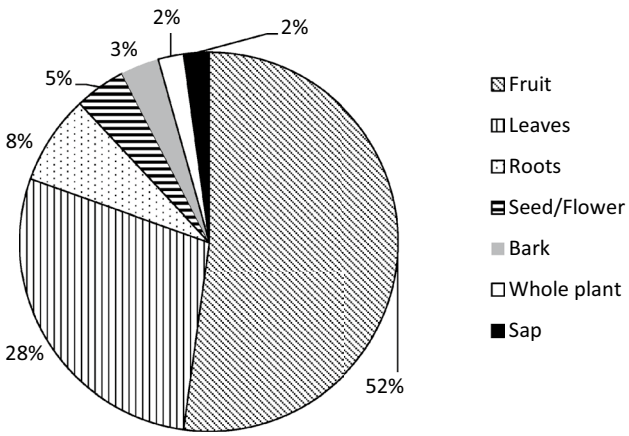

Fig. 4 The proportion of plant parts consumed as fruit, leaves and other parts

Euphorbiaceae, Loganiceae, and Rubiaceae, constituting 2% each whilst the other families contributed less than 2% each (< 2 species). Over 32 diseases and disorders were treated locally using wild and domesticated plants.

Table 1 shows some of the human ailments treated locally, the number of plant species and parts of the plant used. Some of the diseases not included in the list include chickenpox, snake bites, dandruff, headaches and cracked feet. Ten of the species were also unique for veterinary uses. Among the paediatric uses were treatments for fontanel, colic and other infant ailments. About 45 species were used to treat abdominal pains, 30 treat toothache, 25 were concerned with gynaecological issues of women, 23 were used to treat sexually transmitted disease, whilst 13 were paediatric remedies. Other species were used as aphrodisiacs (4) and treatment of cancer (4). About 10 species were used to treat livestock whilst others treat malaria, wounds and boils, colds and flu, pneumonia and anaemia.

The communities in Chimanimani utilise more medicinal plants than the other communities (Fig. 5). These treated 18 human diseases and disorders.

The communities mainly used the leaves, bark and roots of the plants although with a few species, fruit, fibre and sap were also important in providing medicines to local communities (Fig. 6).

Several ailments were treated using local knowledge that has evolved including the use of some exotic species such as

Table 1 Number of plants used for treatment of human ailments in the study area

Disease/disorder	Number of plants species	Parts used
Abdominal pains	45	B/L/R
Sexually transmitted diseases	23	B/R/L/Fr
Toothache and mouth sores	30	R/L/B
Wounds and boils	20	B/L/R
Gynaecological	16	B/L/R/S/sap
Colds/flu/coughs	15	L/R
Paediatric	13	R/B/L
Eyes and ears	10	Sap
Malaria	9	B/L/R
High blood pressure/heartburn and Cancer	7	B/L/S
Pneumonia	5	B/L/R/Fr/T
Backache	5	B/L/R
Aphrodisiac	4	B/Fr
Anaemia	4	B/L/R/S
Legs and bone problems	4	B/L/R/Fr/S
Appetite	3	B/L/R
Immune system booster	3	L

B = bark; L = leaves; R = roots; Fr = Fruit; Fi = fibre; S = seed; T = thorn

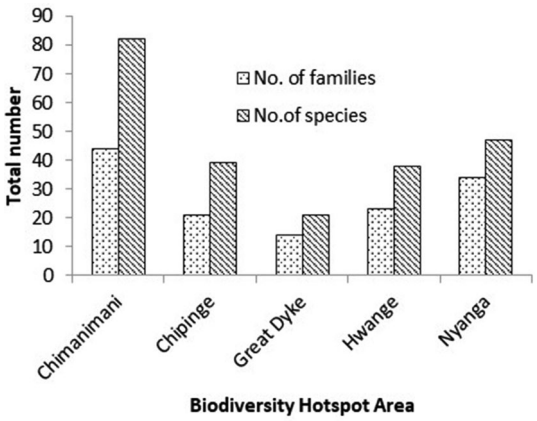

Fig. 5 The number of families and species utilised in each hotspot area

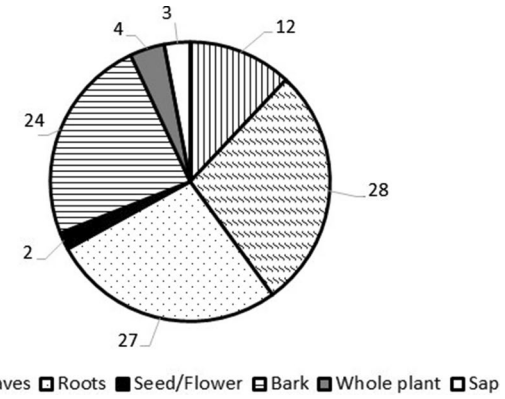

Fig. 6 The proportion of plant parts used for medicinal purposes in all hotspot areas

Eucalyptus species, Persia americana, Jacaranda mimosfolia D. Don, *Psidium guajava* L, *Melia azedarach* L, *Prunus persica* (L.) Batsch, *Carica papaya* L., *Moringa oleifera* Lour., *Musa* spp. and *Mangifera indica* L. The communities in Chimanimani used a greater diversity of medicinal plant species than the other areas (Fig. 7).

Six species that were common in at least three of the hotspot areas include *Cassia abbreviate, Aloe* species, V*angueria infausta, Pterocarpus angolenis, Ximenia caffra.*

Discussion

Use of wild food plants in communities around biodiversity hotspots

Results showed that men, women and children utilised wild food plants throughout the year and the foods were most important during the dry periods. Although wild foods are usually considered as primitive and generally an overlooked

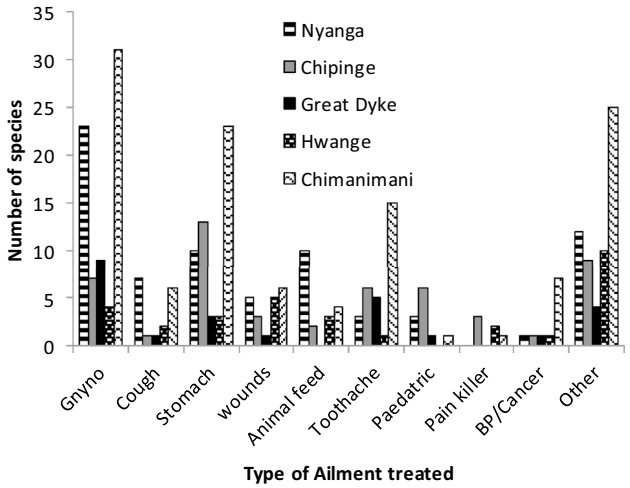

Fig. 7 Medicinal uses of plants in areas around five biodiversity hotspot areas

food source, they have potential to contribute to dietary diversity in areas with limited access to fresh produce (Stark et al. 2019) such as rural communities. In Africa, Urso et al. (2016) reported that communities in Namibia and Angola consumed wild foods when they had food shortages and mostly in drought periods. Women and girls used wild foods more frequently than the others for personal and family consumption.

The diversity of food plants was not uniform across the sites (Fig. 1). Maroyi (2011) documented 67 wild food plant species in Nhema communal lands of Zimbabwe whereas, other scholars in Africa found 66 and 62 species in Ethiopia and Uganda respectively (Balemie and Kebebew 2006; Agea et al. 2011). The numbers in this study are higher due to the coverage of areas with different centres of endemism, contributing to more diversity.

However, the utilisation of wild food plants by communities was somehow similar for some communities (Fig. 2). The vegetation types and the climatic conditions in Chipinge are linked to Afromontane forests whilst the Great Dyke and Hwange are miombo woodlands yet use of food species was similar. Cultural similarities can contribute to similarities in use of traditional plant foods. Trees species were used more than shrubs and herb species (Fig. 3). Other studies in Africa found lower percentage of trees than in this study (Maroyi 2011; Berihun and Molla 2017) maybe due to restrictions in the areas they were working on. In this study, five areas were considered for the study and if taken individually the numbers can be lower than other studies. The use of lianas and succulent plant species for food was rare in Hwange and Nyanga areas although the two areas have distinct vegetation types. Some of the wild food plants listed in this study were recorded elsewhere in the country (Maroyi 2011, 2017). Communities consumed wild foods mainly in the form of fruits (Fig. 4). Similarly, Ojelel and Kakudidi (2015) found fruit constituting 51% of wild food plant species whilst tubers/roots constituted 2% for communities in Uganda. Fruit of *Adansonia digitata* is rich in fibre, protein, calcium, phosphorus, magnesium, manganese, iron and sodium (Muthai et al. 2017) whilst *S. birrea* fruit contains protein, oil, magnesium, phosphorus and potassium (Hal et al. 2014). The pulp of *V. payos* is rich in carbohydrates, K, P, Na, Ca, Fe, Mn, Zn and vitamin C (Kimondo et al. 2012). Some communities add the juice of *Strychnos cocculoides* to maize porridge for nutrient (vitamin C, zinc and iron) and flovour enhancement. Nutritional composition and potential for *S, cocculoides* are described by Ngadze et al. (2017). Furthermore, wild food plants have been found to be more nutritious and pure, with no contaminants (Stark et al. 2019). Additionally, wild fruits have important contribution to the livelihood of communities living in arid and semi-arid lands (Feyssa et al. 2012).

Species such as *Aloes* and *Dracaena* have been commercialised in other places due to their nutritional properties (Antonio 2013). The health benefits of *Aloe* spp., particularly, *A. vera*, have been attributed to the polysaccharides contained in the leaf gel (Sharma et al. 2014). A food plant such as *Aloe vera* has complex chemical composition making it popular among communities and is known to have potentially active constituents containing vitamins, minerals, enzymes, sugars, lignin, amino acids, saponins and salicylic acids (Vogler and Ernst 1999; Sharma et al. 2014). Wild food plants have great potential to increase food and nutritional security in rural communities and to contribute to rural livelihoods.

Use of medicinal plants by communities around biodiversity hotspot areas

Communities around biodiversity hotspots utilise over 140 plant species from the forest to treat diseases in children, women and men (Table 1), with most of the species treating abdominal disorders. The use of medicinal plants was not limited to humans but extended to livestock especially chicken and cattle. Several studies showed the effectiveness of wild plants for ethno-veterinary uses (e.g. Maroyi 2013; Mudzengi et al. 2017). Roots and bark fruit trees such as *A. digitata, S birrea, L edulis, X. caffra, V. infausta, V. payos, P. curattelifolia* and *S. cocculoides* were also identified as having important medicinal properties of anti-fungul, anthelmintic, anti-hyperglycemic, antimalarial, antidiabetic, anti-amoebic, anti-hyperlipidemic, antiparasitic, antiproliferative, antimicrobial, non-mutagenic, antioxidant, insecticidal, and cytotoxicity activities. The use of wild fruit trees for medicines is supported by Kimondo et al. (2012), Hal et al. (2014), Maroyi (2016b), Braca et al. (2018) and Maroyi (2018, 2019).

The use of medicinal plants however, was not uniform across the hotspot areas (Fig. 5). Maroyi (2013) studied medicinal plants used in south central Zimbabwe and found 93 medicinal plants from 41 families whilst Maroyi (2012) found local people in Nhema area of Zimbabwe using 23 plant species belonging to 16 families as ethno-veterinary remedies. In this study only 10 species were used for ethno-veterinary purposes. Some of the species used in the study areas are also used in other parts of Zimbabwe (Maroyi 2016, 2017). Ngarivhume et al. (2015) also identified some 23 species for treatment of malaria while working in Chipinge, Zimbabwe.

Figure 6 showed that all parts of the plant are used for medicine with the bark and roots were commonly used. This is comparable to what was found in Kenya by Wanjohi et al. (2020b). Six species that were common in at least three of the hotspot areas include *Cassia abbreviate, Aloe* species, V*angueria infausta, Pterocarpus angolenis, Ximenia caffra* (Fig. 7), showing the similarity of traditional knowledge among Zimbabweans. The same species are also used in neighbouring countries of southern Africa and some of the studies focused on pharmacological and bioactive characteristics of these species. For example, *C abrreviata*, is known to possess antidiabetic, antioxidant and antimicrobial activity and the root and bark extract is rich in polyphenolics, particularly proanthocyanidins, alkaloids, tannins, anthraquinones, catechins and flavonoids (Mongala and Mafoko 2013; Sobeh et al. 2018), thus lending pharmacological support to the plant's traditional uses in all hotspot areas. *Aloe vera* has bioactive compounds known to effectively treat various ailments such as, allergies, burns, ulcers, rheumatoid arthritis, diabetes, rheumatic fever, diarrhoea, acid indigestion, skin diseases, dysentery, diarrhoea, inflammatory conditions of the digestive system and piles (Sharma et al. 2014). Maroyi (2018) showed that extracts of *V. infausta* root and bark contain some fatty acids, flavonoids, iridoid lactones and triterpenoids and is known to treat gastro-intestinal disorders, malaria, pneumonia, cough, menstrual problems, parasitic worms, chest complaints, snake bites, infertility, fever, candidiasis and abdominal pains. *Pterocarpus angolensis* is known to have tannins, flavonoids, saponins, terpenoids, terpenes, sesquiterpenoids and fatty acids (Chipinga et al. 2018; Santos et al. 2020) making it able to treat stomach problems, eyes, ring worm and skin disorders. Another common species was *Ximenia caffra,* is able to treat several ailments due to presence of secondary metabolites such as polyphenols, triterpenes, sterols, saponins, tannins, alkaloids, glycosides and polysaccharides (Maroyi 2016b).

The local people are not aware of the chemical composition of the plants but the traditional knowledge has shaped the use of medicinal plants through generations. Communities, however, identified some species as being rare and difficult to find nearby. Similarly, Shumba et al. (2010) stated that some important medicinal species were becoming scarce due to overexploitation. In Kenya, Mbuni et al. (2020) showed that sustainability of medicinal plants was threatened by deforestation and habitat loss. There is need for conservation measures to arrest possible loss of this valuable resource and knowledge in these communities. As pointed out by Awuchi (2019), the threat of extinction is more pronounced for medicinal plants that are harvested from the wild rather than from cultivation.

Conclusion

Communities around biodiversity hotspots utilise wild food and medicinal plants throughout the year as food (fruits, vegetables, teas, snacks, alcoholic and non-alcoholic drinks and jams) and medicines. Collection of wild food is by all members of the family but the women and girls also collect the wild food to the house for family consumption. Trees constitute the bulk of wild food and medicinal sources, obtained from fruits, leaves, sap, bark, roots and fibre. Fruits are the most common form of food utilisation although leaves, roots/tubers, sap and fibres are also utilised. Leaves, roots, bark/fibre and fruits provide most medicines. The families Fabaceae and Moraceae provide much of the wild food species whilst Fabaceae, Meliaceae and Solanaceae provide over 25% of medicinal uses. Despite the growth and spread of modernisation, communities around biodiversity hotspots have maintained their potential to use wild food and medicinal plants. The knowledge of wild food and medicinal plants is guaranteed to be preserved as long as threats of forest destruction are minimised. Sustainability of the forest resource can be achieved through preservation and domestication of some of the important food and medicinal plants. A strategy to cultivate some of the important medicinal plants is therefore, required. There is a need for studies that focus on phytochemical and nutritional profiles of the most popular plant species.

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Compliance with ethical standards

Ethical statement All procedures performed in studies involving human participants were per the ethical standards of the Research Council of Zimbabwe and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of interest L. Mujuru has no conflict of interest. L. Jimu has no conflict of interest. A. Mureva has no conflict of interest. A. Mapaura has no conflict of interest. I. W. Nyakudya has no conflict of interest. J. Muvengwi has no conflict of interest.

Informed consent Free prior informed consent was obtained from all individual participants included in the study.

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