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Research Article

Therapeutic uses of plant species for inflammation-related conditions in Limpopo province of South Africa: a mini-review and current perspectives

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Inflammation is part of a complex and efficiently regulated biological process in response to infections, injury and diseases. However, when impaired, the inflammatory response could result in undesirable effects as seen in chronic diseases such as tuberculosis (TB), type-2 diabetes mellitus (T2DM), some forms of sexually transmitted diseases (STI's) and cancer.This study was based on an ethno-botanical survey of literature citations of medicinal plants used to treat inflammation-related conditions in Limpopo province of South Africa.The results indicated that plant species belonging to different families are used to treat inflammation-related diseases and symptoms. Plant species belonging to the Fabaceae family are mostly used for these purposes, representing 16.1% of the recorded plants species. This was followed by the Asteraceae family (8.6%) and the Asparagaceae (4%). The root was the preferred plant part (50.9%) used for inflammation-related conditions, followed by the leaves (18.4%), stem bark (16.7%), whole plant (9.6%), the bulbs (3.5%) and the seed (0.9%) consecutively. The same plant species or a different part thereof is sometimes used to treat inflammation caused by different ailments. Traditional medicine continue to play a vital role in meeting the health care needs of people in under-resourced areas such as the Limpopo province of South Africa. However, a curious finding in this review is the dearth of information on the traditional uses and exploitability of a widely known plant species with demonstrated anti-inflammatory activities. Extracts from *Harpagophytumprocumbens* are well known for their anti-inflammatory activities. The plant species is available in the province, but little is known about its therapeutic uses, cultivation, harvesting or exploitation. Controlled harvesting of *H. Procumbens* could potentially provide the much needed income for the people in the areas of the Limpopo province where this plant species is available.

Keywords: Medicinal plants, Limpopo province, inflammation, Fabaceae

INTRODUCTION

Inflammation is a complex and highly regulated albeit beneficial biological process which is a component of the body's response to infections, injury and diseases (Adebayo et al, 2015). However, impaired or unabated inflammatory response is implicated in the progression and severity of infections and chronic diseases such as tuberculosis (TB), type-2 diabetes mellitus (T2DM), some forms of sexually transmitted infections (STI's) and cancer (Majeed et al, 2015; Falconer et al, 2012). Infection by *Mycobacterium tuberculosis,* the causative organism for TB remains a disease burden in developing countries, especially in poor communities. Globally, approximately one third of the human population has TB (Lyadova, 2012).

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Inflammation plays a key role in the progression of TB infections as well as in the survival of the pathogen in the host. Crucially, the prognosis of TB is highly dependent on the host-pathogen interaction (Majeed et al, 2015). This is because the pathogen utilizes the complex host defence system as an offensive tool to proliferate within the host (Lyadova, 2012) by inhibiting the synthesis of pro-inflammatory mediators that subsequently leads to host tissue destruction.

Sexually transmitted infections (STI's) are caused by micro-organisms such as bacteria, viruses and parasites. During infection, the invading organisms are recognized by the immune system, which, as part of the body's response to infection, initiates the inflammatory process. This leads to the symptoms associated with many STI's, such as redness, swelling and pain. The inflammatory process recruits more immune cells to the site of the infection thereby increasing the concentration of immune-competent cells in the area infected with the STI's. Although the inflammatory response is meant to help fight the infection, the recruitment of cells such as Cluster of differentiation 4 positive($CD4^+$)cells makesthem more susceptible to Human Immuno-deficient Virus (HIV) infection and replication (Giese et al, 2015).

On the one hand, chronic inflammation is considered as a causative factor in a variety of cancers. In general, the longer the persistence of inflammation, the higher the risk of cancer. Examples of inflammatory mediators include metabolites of arachidonic acid, cytokines, chemokines, and free radicals. Chronic exposure to these mediators leads to increased cell proliferation, mutagenesis, oncogene activation, and angiogenesis. The ultimate result is the proliferation of cells that have lost normal growth control, known as cancerous cells (Sun and Kato, 2016).

On the other hand, type 2 diabetes mellitus (T2DM) characterized by persistent hyperglycemia causes a chain of abrupt biochemical and physiological changes; whose hallmark isimmune dys-regulation that could contribute to prolonged inflammation which causes transformation of wounds into non-healing chronic ulcers (Falconer et al, 2012).

Pro-inflammatory cytokines such as interleukin (IL)-1β, IL-6 and tumour necrosis factor (TNF) are involved in thymus derived cell (T-cell) mediated immune response associated with infections (Canal et al, 2016). The persistent circulation of these potent drivers of inflammation has been detected in various chronic diseases such as arthritis, cancers and T2DM (Liu et al, 2016). If unabated, systemic inflammation is thus believed to potentially lead to persistent pain (Huang et al, 2016) and progressive loss of function of the affected tissues and organ (Huang et al, 2016; Perruccio et al, 2016).

In the Limpopo province, the vast majority of the people still depend on medicinal plants for their primary health care needs. Not surprisingly, the traditional care givers possess an inherently remarkable knowledge of plants identification and therapeutic uses. Various parts of medicinal plants are used for treating many diseases, and are often used either alone or in combination with other plant species or animal parts. The extracts are usually administered in the form of decoctions, concoctions or infusions for oral consumptions, enemas and inhalations, or as paste for topical applications on surface lesions including painful swellings and fractures (Havinga et al, 2010). In addition, several plant species are used in ethno-veterinary medicine to treat animal diseases such as diarrhoea and wound healing (Mathabe et al, 2006). One of the most widely exploited medicinal plants for painful symptoms associated with inflammation is *Harpagophytum procumbens* (Burch.) DC. ex Meisn. (Devil's Claw) from the Pedaliaceae family. For instance, *H.procumbens* products for osteoarthritis are used in the United States and are among the most frequently prescribed botanicals by medical herbalists in the United Kingdom (Conrozier et al, 2014). Numerous European studies conducted over the past twenty years support their safety and have found them to be non-inferior to other established pain treatments (Brendler et al, 2006; Brien et al, 2006; Cameron et al, 2009). There are no literature citations on the therapeutic uses of extracts of *H. procumbens* in the Limpopo province, although the plants species are available.

Therefore, the aim of this review was to investigate and collate information on medicinal plants used to treat inflammation-related conditions in the Limpopo province and to provide an update on the ethno-medical uses of the plant species as well as their phytochemistry.

MATERIALS AND METHODS

Study area

This study was focussed on the Limpopo province of South Africa which lies in the northern-most part of the South Africa in the Savanna biome, an area of mixed grassland and trees generally known as bushveld (GPS coordinates 23.4013° S, 29.4179° E). The five district/regions are the Waterberg, Capricon, Vhembe, Mopani and Sekhukhune. The Limpopo province (Figure 1) is one of the under-resourced of the nine provinces in South Africa, and consequently majority of the inhabitants rely on medicinal plants for their primary health care needs. The continued reliance on traditional form of therapy is further entrenched by factors such as low cost, ease of accessibility and innate adherence to traditional customs and beliefs. The principal home language is Sesotho, spoken by more than 50% of the 5.8 million inhabitants, followed by Xitsonga and Tshivenda (Statistics South Africa, 2016).

Ethno-botanical survey and data sourcing

An ethno-botanical survey of medicinal plants used to treat inflammation-related conditions in Limpopo province was conducted. The information was sourced from citations in search engines such as Google scholar, Web of science, Science Direct, Pubmed, Scopus etc.

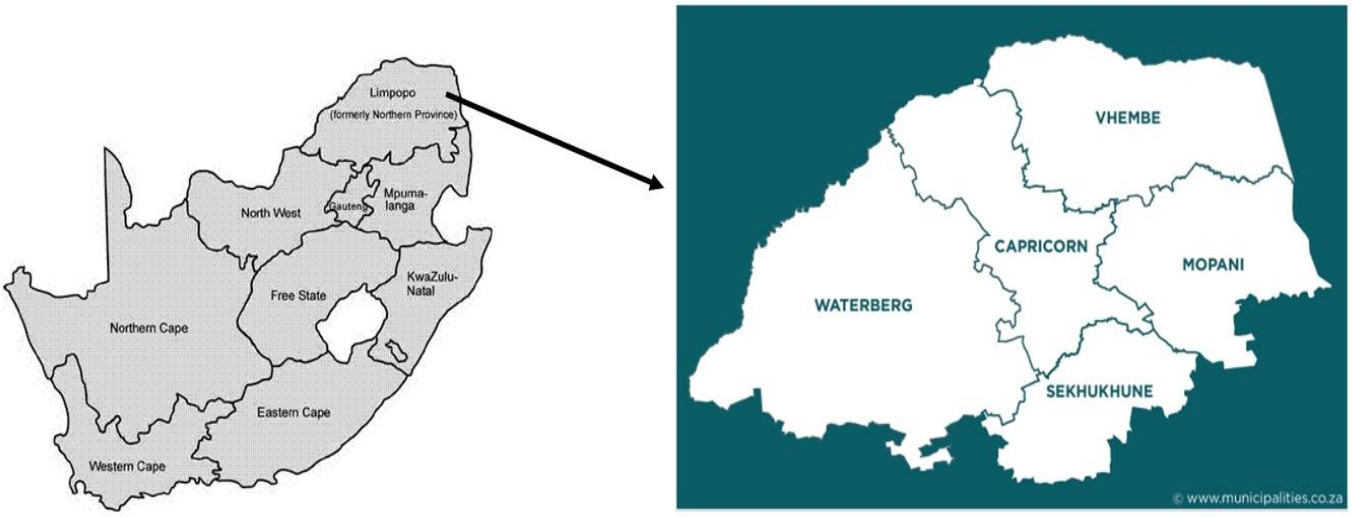

Figure 1. Map of South Africa and the five districts/regions of the Limpopo province, South Africa (www.municipalities.co.za)

RESULTS AND DISCUSSION

The continued utilisation of medicinal plants for therapeutic purposes is common practice in developing countries, especially in under-resourced areas such as the Limpopo province of South Africa.

Ethno-botanical survey of the therapeutic uses of medicinal plants by the various cultures of the Limpopo province including the Venda (Mulaudzi et al, 2012), Sepedi (Semenya et al, 2012a) and Tsonga (Luseba and van der Merwe, 2006; Mashabane et al, 2001)speaking people has been recorded. The study on the utilization of *Colophospermum mopane* (Kirk ex Benth.) Kirk ex J. Léonard from the Fabaceae family by the Vatsonga people in the Gazankulu region was recorded by Mashabane et al, (2001). The findings indicated that the plant is utilized medicinally by traditional healers in treating stomach ache, gout, diarrhoea, toothache and menstrual pain. An investigation 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 et al, (2012). Sixty-nine medicinal plants species were recorded by the survey with the plant parts most preferred being roots(Tshisikhawe et al, 2012). The finding suggests that plant material is still extensively used for medicinal purposes and they will continue to do so for a considerable time to come. Botha and Shackleton, (2004) previously conducted a study on the market profiles and trade in medicinal plants in the Limpopo Lowveld of South Africa. The findings indicated that 70 different species were identified representing 40 families. The study also indicated considerable local variation and complexities in the harvesting and marketing of medicinal plants.

A comprehensive list of the plant species was compiled and grouped according to their therapeutic uses for STI's (Table 1) (Mahwasane et al, 2013;Semenya et al, 2012a;Chauke et al, 2015), T2DM (Table 2) (Semenya et al, 2012b;Chauke et al, 2015;Semenya et al, 2012a;Mahwasane et al, 2013), and other painful conditions (Table 3) (Mathabe et al, 2006;Mulaudzi et al, 2012;Mahwasane et al, 2013; Chauke et al, 2015;Moeng, 2010) respectively. The results indicated that plant species belonging to different families are used to treat inflammation-related diseases and symptoms. Plant species belonging to the Fabaceae family are mostly used for these purposes, representing 16.1% of the recorded plants species (Figure 2). This observation is not surprising because the Fabacea family is considered to be the second largest family of medicinal plants used for therapeutic purposes (Gao et al, 2010). This was followed by the Asteraceae family (8.6%) as previously observed by Maroyi and Mosina, (2014) and the Asparagaceae (4%). Furthermore, an ethnobotanical survey of medicinal plants used for inflammation related conditions in South Africa had 20% of the selected plant species belonging to the Fabaceae family (Adebayo et al, 2015).Fabaceae is the most common family found in tropical rainforests and in dry forests in the Americas and Africa (Rahman and Parvin, 2014). Phytochemical investigation of plants species in the Fabaceafamily indicated that they frequently synthesize alkaloids, proanthocyanidins, and flavonoids such as kaempferol, quercitin and myricetin. These secondary metabolites are known to possess anti-microbial and anti-inflammatory activities. The Fabacea family are the only group that contains pterocarpans (Sun et al, 2015; Kaennakam et al, 2015), a class of iso-flavonoids with potent anti-cancer, analgesic and anti-inflammatory activities(Tan et al, 2016).

The root was the preferred plant part (50.9%) used for inflammation-related conditions, followed by the leaves

Table 1. Plant species used to treat sexually transmitted infections in Limpopo province of South Africa

Plant species	Family	Part used	District of Limpopo	References
Aloe marlothii	Asphodelaceae	Leaves/root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Callilepsislaureolia	Asteraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Carica papaya	Caricaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Carpobrotus edulis	Aizoaceae	Leaves	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Centellaasiatica	Apiaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Cussiniaspicata	Araliaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Englerophytummagalismontanum	Sapotaceae	Bark	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Ficuscarica	Moraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Gethyllisnamaquensis	Amaryllidaceae	Bulb	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Grewiaflavescens	Malvaceae	Root	Mopani	Chauke et al, 2015
Grewiavillosa	Malvaceae	Root	Mopani	Chauke et al, 2015
Helichrysumcaespititium	Asteraceae	Whole plant	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Hermanniaguartiniana	Sterculiaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Hypoxisiridifolia	Hypoxidaceae	Tuber	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
KirkiaWiimsii	Kirkiaceae	Tuber	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Lessertiamicrophylla	Fabaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Mimusopszeyheri	Sapotaceae	Leaf	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Moringaoleifera	Moringaceae	Seed and leaf	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Mormodicabalsamina	Cucurbitaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Mormodicacharantia	Cucurbitaceae	Leaves	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Opuntiaficus-indica	Cactaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Persea Americana	Lauraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Plumeria obtuse	Apocynaceae	Leaves	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Punitagranatum	Lythraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Schkuhriapinnata	Asteraceae	Whole plant	Vhembe	Mahwasane et al 2013
Tarchonanthuscamphoratus	Asteraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Triumfettaspp	Tiliaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b

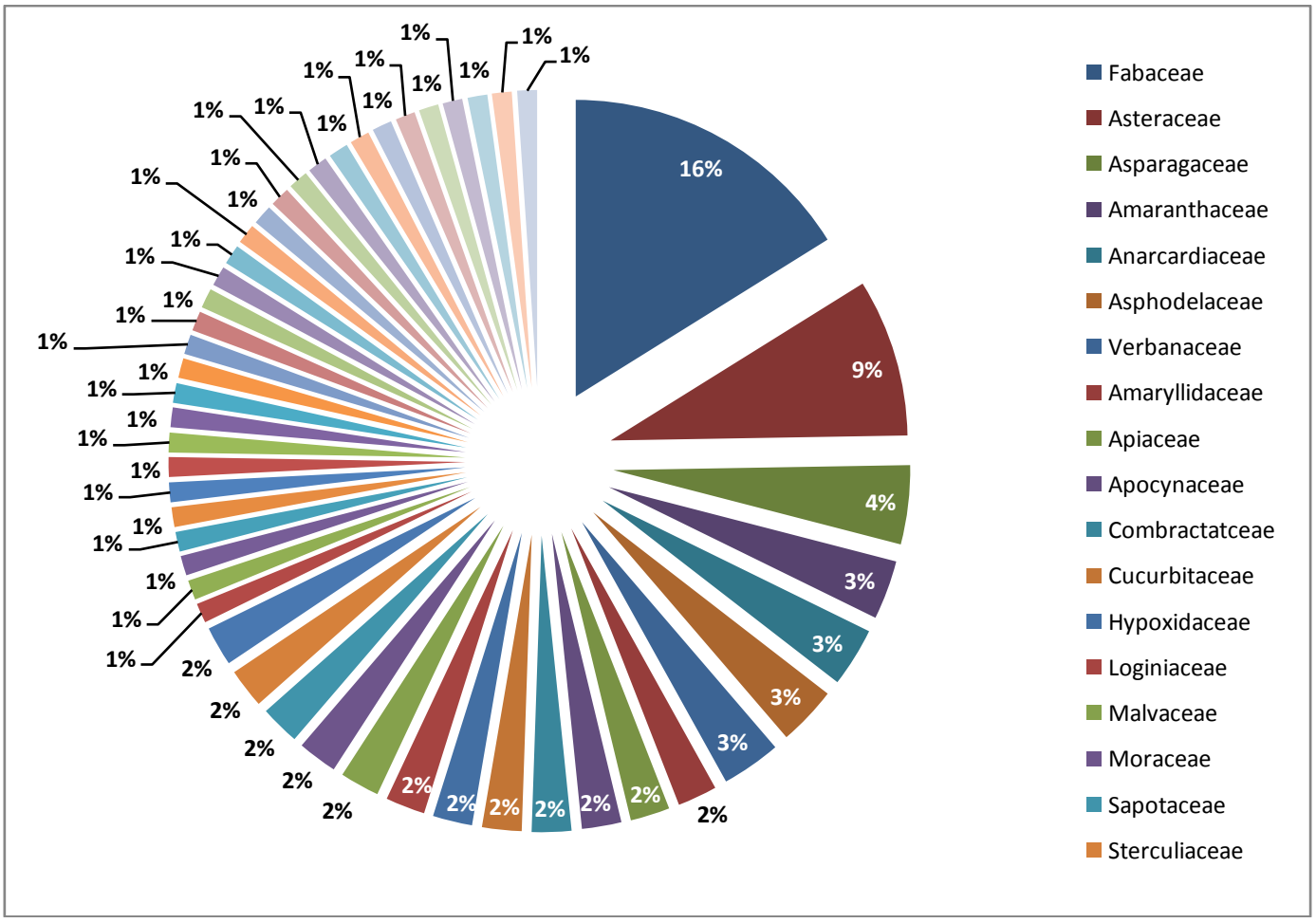

Figure 2. The percentage of plant species used for inflammation-related conditions grouped according to their families

Table 2. Plant species used to treat type-2 Diabetes mellitus in Limpopo province of South Africa

Plant species	Family	Part used	District of Limpopo	References
Aloe marlothii	Asphodelaceae	Leaves/root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Callilepsislaureolia	Asteraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Carica papaya	Caricaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Carpobrotus edulis	Aizoaceae	Leaves	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Centellaasiatica	Apiaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Cussiniaspicata	Araliaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Englerophytummagalismontanum	Sapotaceae	Bark	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Ficuscarica	Moraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Gethyllisnamaquensis	Amaryllidaceae	Bulb	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Grewiaflavescens	Malvaceae	Root	Mopani	Chauke et al, 2015
Grewiavillosa	Malvaceaee	Root	Mopani	Chauke et al, 2015
Helichrysumcaespititium	Asteraceae	Whole plant	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Hermanniaguartiniana	Sterculiaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Hypoxisiridifolia	Hypoxidaceae	Tuber	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
KirkiaWiimsii	Kirkiaceae	Tuber	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Lessertiamicrophylla	Fabaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Mimusopszeyheri	Sapotaceae	Leaf	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Moringaoleifera	Moringaceae	Seed and leaf	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Mormodicabalsamina	Cucurbitaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Mormodicacharantia	Cucurbitaceae	Leaves	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Opuntiaficus-indica	Cactaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Persea Americana	Lauraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012a
Plumeria obtuse	Apocynaceae	Leaves	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Punitagranatum	Lythraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Schkuhriapinnata	Asteraceae	Whole plant	Vhembe	Mahwasane et al 2013
Tarchonanthuscamphoratus	Asteraceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b
Triumfettaspp	Tiliaceae	Root	Capricon/Sekhukhune/Waterberg	Semenya et al, 2012b

(18.4%), stem bark (16.7%), whole plant (9.6%), the bulbs (3.5%) and the seed (0.9%) consecutively (Figure 3). This pattern of ethno-medicinal uses of plant parts was previously reported by Semenya et al (2012a) and Mahwasane et al (2013), suggesting that the same is applicable to the whole province of Limpopo. It should be

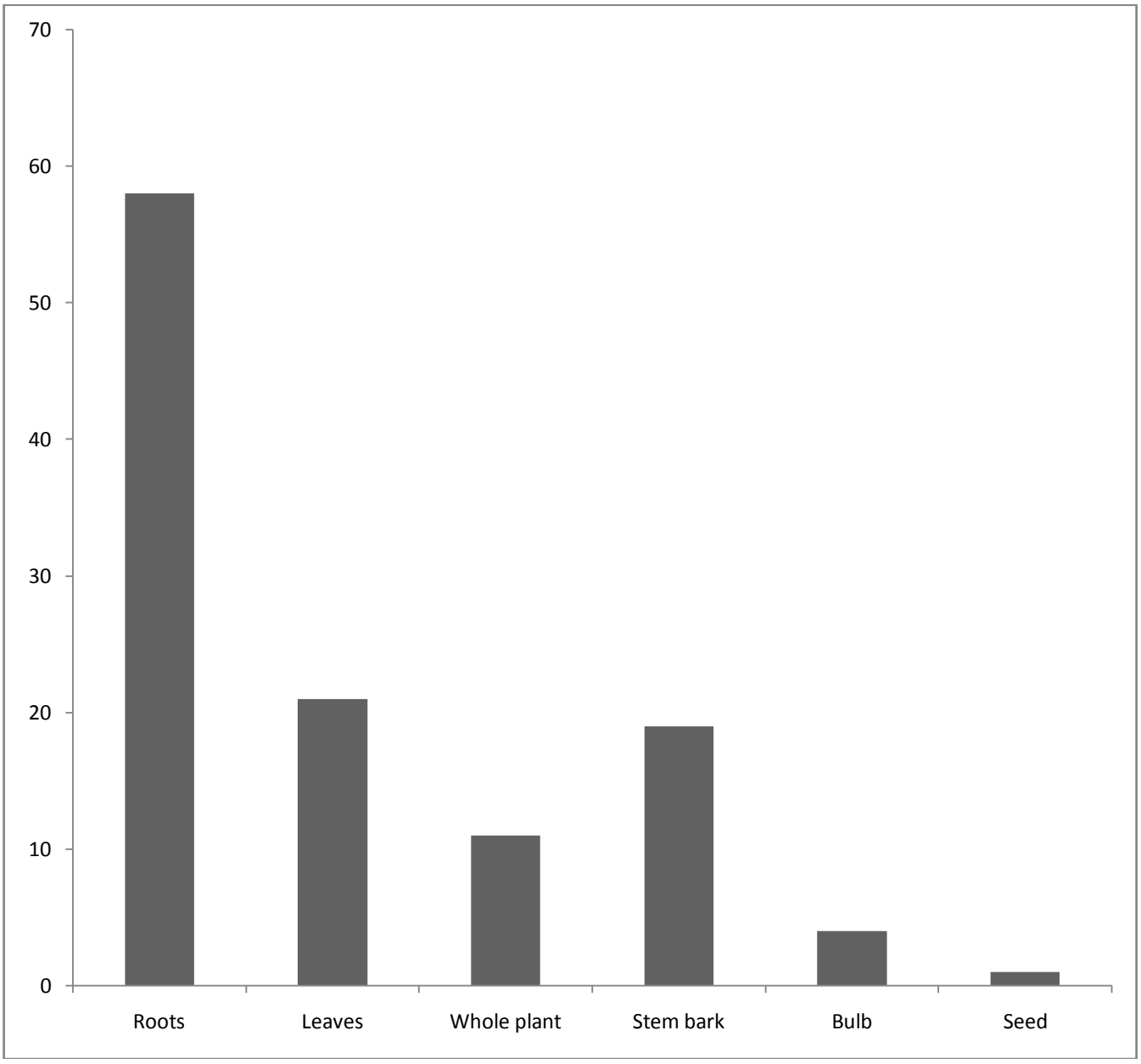

Figure 3. The plant-parts used for treating inflammation-related conditions

noted that the same plant species is sometimes used to treat inflammation caused by different diseases, and a different parts of same plant species could be used for different ailments. The parts of the plant species are usually prepared and administered in the form of decoctions, infusions, concoctions to be taken orally. In addition, the herbs may be prepared with oil as a paste to be applied externally in case of skin infections or wound dressings. Water is the most commonly used solvent for extraction, but locally available alcohol is sometimes used.

Many plant species are used in the LimpopoProvince; however a curiously ignored or overlooked plant species with known therapeutic property is *H.procumbens*. Devil's Claw plants are found in the western reaches of the Limpopo Province. According to the Limpopo Province Conservation Department officials, no harvesting takes place. There is a dearth of information on the numbers and location of Devil's Claw plants in the province, and no apparent information on the use of the plant by indigenous people. The Limpopo Province Conservation Authorities have indicated that Devil's Claw is found in a few nature reserves, such as Lanjan Nature Reserve, near the town of Alldays, but information on plant numbers and exact locations, as well as people's use of the resource is non-existent. The trade in secondary tubers of *H.procumbens* constitute the main source of income for many rural dwellers in Namibia (Mncwangi et al, 2012) where exports in 2009 was estimated at 1.06 million euros. Extract from the secondary tuber is used to treat fever, pain and arthritis, with many commercialised products developed from the extracts already on the markets.

Hence, there is a need to scientifically establish and explore the potential of developing a sustainable used of *H.procumbens* as a source of revenue generation for the Limpopo province of South Africa.

Table 3. Plant species used for pain relief in the Limpopo province of South Africa

Plant species	Family	Part used	District	Traditional uses	References
Acacia rehmanniana	Fabaceae	Leaves	Mopani	Headache	Chauke et al, 2015
Acanthus montanus	Acanthaceae	Root	Capricorn/Sekhukhune/Waterberg	Stomach aches	Semenya et al, 2012b
Alepideaamatymbica	Apiaceae	Root	Capricorn	Flu, colds	Moeng, 2010
Aloe greatheadii	Asphodelaceae	Leaf	Capricorn	Diarhhoea	Mathabe et al, 2006
Aloe spp	Asphodelaceae	Root	Capricorn	Flu, colds	Moeng, 2010
Annona senegalensis	Annonaceae	Root/bark/leaf	Vhembe	Pain/fever	Mahwasane et al 2013
Aptosimum linearize	Scrophulariaceae	Whole plant	Mopani	Toothache	Chauke et al, 2015
Artemisia afra	Asteraceae	Leaves	Capricorn	Flu, colds	Moeng, 2010
Asparagus cooperi	Asparagaeceae	Whole plant	Capricorn	Diarrhoea	Mathabe et al, 2006
Bauhibniagalpinii	Fabaceae	Root	Vhembe	Stomach pains	Mahwasane et al 2013
Bidenspilosa	Astaeraceae	Whole plant	Capricorn	Diarrhoea	Mathabe et al, 2006
Boweieavolubilis	Asparagaceae	Bulb/tuber	Vhembe	Pain relief	Aremu et al, 2015
Bulbinenatalensis	Asphodelaceaea	Leaf	Capricorn	Diarrhoea	Mathabe et al, 2006
Clerodendrummyricoides	Lamiaceaee	Leaves	Vhembe	Cold, cough	Mulaudzi et al, 2012
Callilepissalcifolia	Asteraceae	Roots	Capricorn	Flu, colds	Moeng, 2010
Carpobrotus edulis	Aizoaceae	Leaf	Capricorn	Diarhhoea	Mathabe et al, 2006
Combrectumimberbe	Combrectaceae	Root/stem bark	Mopani	Cancer	Chauke et al, 2015
Combrectumimberbe	Combrectaceae	Root	Capricorn	Diarrhoea	Mathabe et al, 2006
Crinum bulbispermum	Amaryllidaceae	Root	Capricorn	Flu, colds	Moeng, 2010
Diospyrosmespiliformis	Ebenaceae	Bark	Vhembe	Stomach pains	Mahwasane et al 2013

Table 3. Cont.

Elephantorrhizaburkei	Fabacea	Stem rhizome	Capricorn	Diarrhoea	Mathabe et al, 2006
Elephantorrhiza elephantine	Fabaceae	Stem rhizhome	Capricorn	Diarrhoea	Mathabe et al, 2006
Erythrinalysistemon	Fabaceae	Bark	Vhembe	Oedema	Mahwasane et al 2013
Guillemineadensa	Amaranthaceae	Whole plant	Capricorn	Diarhhoea	Mathabe et al, 2006
Gymnosporiasenegalensis	Celastraceae	Root	Capricorn	Diarrhoea	Mathabe et al, 2006
Plant species	Family	Part used	District	Traditional uses	References
Ilex mitis	Aquifoliaceae	Root	Capricorn	Diarrhoea	Mathabe et al, 2006
Indigoferadaleoides	Fabaceae	Whole plant	Capricorn	Diarrhoea	Mathabe et al, 2006
Lantana rugose	Verbanaceae	Root/leaves	Vhembe	Fever	Mahwasane et al 2013
Leonotisleonorus	Lamiaceae	Leaves	Capricorn	Flu, colds	Moeng, 2010
Lippiajavanica	Verbanaceae	Leaves	Capricorn	Flu, colds	Moeng, 2010
Mucunacoriacea	Fabaceae	Root	Vhembe	Toothache	Mahwasane et al 2013
Ozoroa insignis	Anacardiaceae	Stem bark	Capricorn	Diarhhoea	Mathabe et al, 2006
Piliostigmathonningii	Fabaceae	Root/leaves/bark	Vhembe	Stomach pains	Mahwasane et al 2013
Punicagranatum	Punicaceae	Root	Capricorn	Diarrhoea	Mathabe et al, 2006
Schkuhriapinnata	Asteracea	Whole plant	Vhembe	Oedema	Mahwasane et al 2013
Schotiabrachypetala	Fabaceae	Stem bark	Capricorn	Flu, colds	Moeng, 2010
Schotiabrachypetala	Fabaceae	Stem bark	Capricorn	Diarrhoea	Mathabe et al, 2006
Sclerocaryabirrea	Anacardiceae	Stem bark	Capricorn	Diarrhoea	Mathabe et al, 2006
Securidacalongepedunculata	Polygalaceae	Root	Capricorn	Flu, colds	Moeng, 2010
Senna obtusifolia	Fabaceae	Root	Vhembe	Swollen penis, Stomach ache	Mahwasane et al 2013

Table 3. Cont.

Siphonochilusaethiopicus	Zingiberaceae	Roots	Capricorn	Flu, colds	Moeng, 2010
Solarumsupinum	Solanaceae	Root	Capricorn	Diarhhoea	Mathabe et al, 2006
Spirostachysafricana	Euphobiaceae	Stem bark	Capricorn	Diarrhoea	Mathabe et al, 2006
Spirostachysafricana	Euphobiaceae	Stem bark	Vhembe	Colds, flu, fever	Mulaudzi et al, 2012
Strigaasaiatica	Orobanchaceae	Whole plant/root	Vhembe	Oedema	Mahwasane et al 2013
Syzygiumcordatum	Myrtaceae	Stem bark	Capricorn	Diarrhoea	Mathabe et al, 2006
Syzygiumcordatum	Myrtaceae	Leaves	Vhembe	Colds, fever	Mulaudzi et al, 2012
Tecomacapensis	Bignoniaceae	Root	Capricorn	Flu, colds	Moeng, 2010
Waltheriaindica	Sterculiaceae	Whole plant	Capricorn	Diarrhoea	Mathabe et al, 2006
Ximeniacaffra	Olacaceae	Stem bark	Capricorn	Diarhhoea	Mathabe et al, 2006
Ximeniacaffra	Olacaceae	Leaves	Mopani	Eye ache	Chauke et al, 2015
Zantedeschiaaethiopica	Araceae	Root	Capricorn	Flu, colds	Moeng, 2010
Zanthoxylumcapense	Rutaceae	Root	Capricorn	Flu, colds	Moeng, 2010

CONCLUSION

Traditional medicinal plays a vital role in meeting the health care needs of people in under-resourced areas such as the Limpopo province of South Africa. Plant species from different families are widely used to treat inflammation associated with several diseases such as T2DM, TB, STD's, and cancer. However, the most frequently used plants species for treating these ailments belongs to the Fabaceae family.

Currently, available information on the pharmacological activities of extracts of the plant species in the Fabaceae family includes antimicrobial andanti-inflammatory activities in invitro assay systems. Considering the wide range of medicinal plants used to treat inflammation-related condition, with same plant species often used to treat different ailments, it is imperative to continuously record and compile an ethno-medicinal list. The list provided in this review is not exhaustive, but it is an attempt at providing a comprehensive list of plant species used to treat inflammation-related conditions in the Limpopo province. Inflammation is involved in the pathogenesis and progression of many debilitating diseases such as arthritis, TB and rheumatic pain, hence it is not surprising that same plant species is often used to treat different diseases.

One of the findings in this review is the dearth of information on the traditional uses and exploitation of a widely known plant species with demonstrated anti-inflammatory activities. Extracts from the secondary tubers of *H.procumbens* are well known for their anti-inflammatory activities. The plant species is available in the province, but little is known about its therapeutic uses, cultivation, harvesting or exploitation. Harvesting and exploitation and exportation of extracts of the plant species could potentially be providing the much needed income for the people in the areas of the Limpopo province where this plant species is available.

Conflicts of interests

There are no conflicts of interest to be declared.

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