

## An evaluation of additional uses of some wild edible fruit plants of the Vhembe District Municipality in the Limpopo Province, South Africa

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*Received 25 November 2016, revised 18 September 2017*

The current study documented and evaluated other uses of wild edible fruit plants in one of the district municipalities of South Africa. Data on indigenous uses of wild edible fruit plants collected through a series of semi-structured interviews with 160 informants is presented. Of the 92 wild edible fruit plant species belonging to 20 different plant families, 27 plant species were reported to have other uses. Other use categories mentioned during the interviews were food, medicinal, beverages, construction, firewood, cosmetic, dye and artifacts.

**Keywords:** Informants, Multiple uses, Use categories, Vhembe District Municipality, Wild edible fruit

**IPC Int. Cl.<sup>8</sup>:** A61K 36/00, A23N 12/00, A23N 1/00, A47J 19/00, A23L 21/10, A23L 2/02, A47G 19/26, A47J 39/02

Biodiversity is highly significant in securing different fundamental human needs<sup>1</sup>. Millions of people, mostly in developing countries gathered plant resources to fulfill various daily requirements since time immemorial. It has also been pointed out that most people in developing countries derived a substantial part of their subsistence and income from wild plant products<sup>2</sup>. These natural products also make a significant contribution to the human and animal food web and are often a means of survival for millions of poor rural households<sup>3-7</sup>. It is predominantly paramount to consider the fact that wild plants can be utilized in many different important ways. Not only do wild edible fruit plants contribute to the nutritional value of human diet, but they can also provide many other uses. Some are medicinally important<sup>8,9</sup>, whilst others are used for purposes such as beverage production<sup>10</sup>. Multiple uses attest to the importance of these plants for subsistence and as a part of local cultural heritage<sup>11</sup>. Many researchers documented the use of wild foods, in resolving food insecurity and as one of the major coping mechanisms at times of food shortage and famine<sup>12-19</sup>. Indigenous wild fruits remain one of the major options for coping with hunger and nutritional deficiency in diets of poverty stricken communities in

Southern Africa. Some uses of indigenous food plants were also documented on the ethnobotany of *Vhavenda* an indigenous community of Vhembe District Municipality<sup>8</sup>. Additionally, some 41 wild food plant species which can be used to produce traditional beverages were also documented from the same region<sup>10</sup>. The aim of the study was therefore to document and evaluate the uses of wild edible fruit plants of the Vhembe district.

### Methodology

The current study was conducted in the Vhembe District Municipality of the Limpopo Province, South Africa. Vhembe District covers about 2771 km<sup>2</sup> and has an average altitude of 400 m above mean sea level<sup>20</sup>. Vhembe District Municipality lies between 22°56'S and 30°28'E. It is divided into four local municipalities namely Makhado, Mutale, Musina and Thulamela<sup>21</sup>. It shares borders with Botswana in the North-west, Zimbabwe in the North and Kruger National Park in the East (Fig. 1)<sup>10</sup>. The mean annual rainfall ranges of between 378 mm and 810 mm has been recorded in the area<sup>21</sup>. The state of climatic conditions in most parts of Vhembe District Municipality supports a variety of natural vegetation types. Such vegetation types include the North-eastern mountain bushveld, mixed bushveld, sour mixed bushveld as well as mopane bushveld<sup>22</sup>. All these

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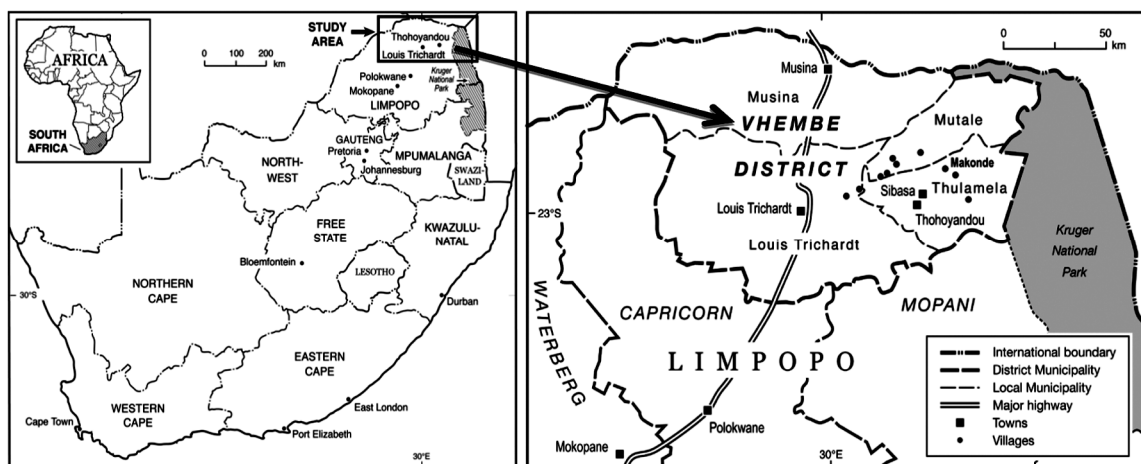


Fig. 1 — A map showing the location of the study area.

vegetation types are located within the savanna biome of the Limpopo Province<sup>23</sup>. In addition, there are some woodlands stretching along the Soutpansberg mountain range that have thickets and pockets resemblance of the well-developed Afromontane forests<sup>21</sup>.

The study focused on Tshivenda speaking inhabitants of the selected rural villages within the four local municipalities of the Vhembe District (Table 1). An ethnographical approach and purposive sampling were used during data collection. Due to enormous changing of lifestyles in most rural areas that are gradually becoming urbanized, purposive sampling was used in order to capture indigenous information about different uses of wild edible fruit plants from different informants of different age groups. Subsequently, ten informants were sampled in each community of the selected villages and interviewed using semi-structured interviews. Prior informed consent was obtained before interviews. The information on fruit plants documented for this research included family names, scientific names, local or vernacular names of plants, growth habit, other additional uses, and plant parts utilized for those other uses. Voucher specimens collected were identified and deposited to the University of Venda Herbarium. Photographs of the plants and edible parts were taken using Fujifilm Digital Camera FinePix HS10. Scientific names and more taxonomic information were verified using the International Plant Names Index (IPNI)<sup>24</sup>.

## Results and discussion

### Informants' profile

A total of 160 informants participated in this study with the majority being females ( $n = 107$ ). This type of

Table 1— Outline of the local municipalities, the studied villages and their locations within the municipalities

Name of the local municipality	Villages	Coordinates of the study villages
Makhado	Ha-Nthabalala	-23,286352 ; 29,958219
	Ha-Madodonga	-23,086033 ; 29,683193
	Tshakhuma	-23,060434 ; 30,308650
	Ha-Masia	-23,216520 ; 30,330353
Mutale	Pile (Dzimauli)	-22,590940 ; 30,435505
	Tshivhongweni	-22,568836 ; 30,594393
	Ha-Makuya	-22,637461 ; 30,874103
Musina	Mutele A	-22,478291 ; 30,870107
	Madimbo	-22,448918 ; 30,562196
	Malale	-22,392859 ; 30,588908
	Tshikhudini	-22,467727 ; 30,595178
Thulamela	Tanda	-22,451758 ; 30,586934
	Vondo	-22,912577 ; 30,390894
	Ha-Begwa	-22,778123 ; 30,806271
	Gondeni (Sterkstroom)	-22,914769 ; 30,608938
	Mukula (Tshirunzini)	-22,860016 ; 30,648178

participation was expected, because women are usually responsible for ensuring that the households have access to food. Table 2 describes the characteristics of these informants. Informants were categorized into three groups of young ( $n = 74$ ), middle aged ( $n = 57$ ), and elderly ( $n = 29$ ). More than half of the informants (55.63 %) had secondary education, even though not all of them reached the exit level. Unemployment rate among the informants was found to be very high at 66.3 %.

### Indigenous wild edible fruit plant species inventory

During the research, a total number of 92 wild edible fruit plant species were documented and

Table 2 — Profile of informants (n = 160)

Personal Information	Frequency (n)	Percentage (%)
Age (yrs)		
15 – 35	74	46.3
36 – 64	57	35.6
65 and older	29	18.13
Gender		
Males	53	33.13
Females	107	67
Educational level		
No education	21	13.13
Primary education	40	25
Secondary education	89	55.63
Tertiary education	10	6.3
Work status		
Employed	10	6.3
Unemployed	106	66.3
Self employed	8	23
Retired/Pensioner	36	5

identified. Twenty seven of the documented plant species were found to have more other uses. Table 3 summarizes the information about the 27 wild edible fruit plants that have additional uses.

Wild plant species documented during the study were representative of 21 different plant families (Table 1 & Fig. 2). The most widely represented families were Annonaceae (n = 3), Apocynaceae (n = 2), Tiliceae (n = 2), Anacardiaceae (n = 2), and Loganiaceae (n = 2). Most of the families quoted in the study (n = 16) are represented by only one species (Fig. 2).

#### Other use categories

Fig. 3 illustrates number of uses per plant species and *Sclerocarya birrea* (A. Rich.) Hochst was the one with remarkably many other uses as compared to other 27 documented wild edible fruit plants. *Sclerocarya birrea* commonly known as *Marula* is a tropical tree that mainly grows in Southern Africa and it contributes a lot to local communities because of its high nutritional and commercial values<sup>25</sup>. It was not puzzling to find many additional uses from *Marula* tree. The tree is also regarded as a multipurpose tree from Southern Africa, used by local people for its fruit, cosmetic oil from the seed and for medicinal products from the bark and leaves<sup>26</sup>. Amongst the 21 plant families identified during the study, members of the 9 families were found to have medicinal properties (Table 4). The 9 families include Apocynaceae (2), Loganiaceae (1), Anacardiaceae (1), Annonaceae (2), Meliaceae (1), Ebenaceae (1), Rubiaceae(1), Sapindaceae(1), and Olacaceae(1). The main parts used for medicine from these plant species are roots (6 species), followed by fruits (4 species)

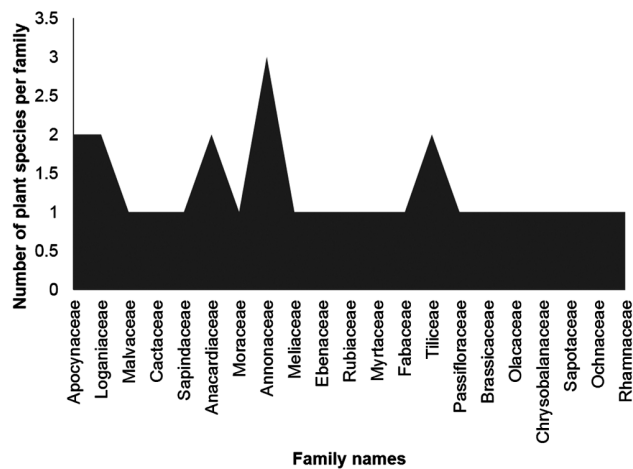


Fig. 2 — A graph showing number of plant species per identified families.

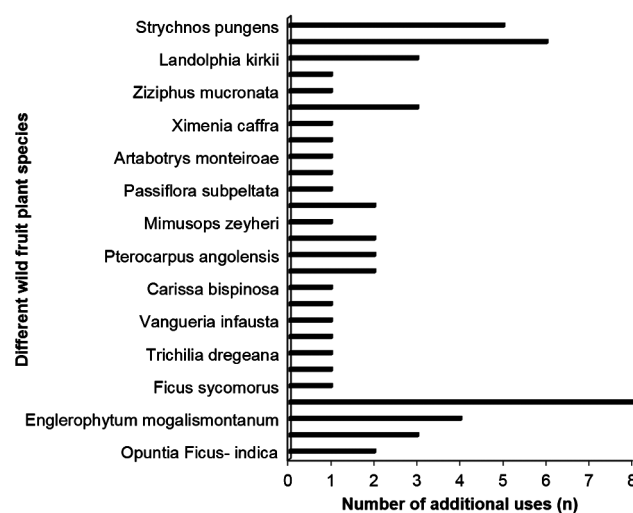


Fig. 3 — A graph showing number of other uses per plant species.

and lastly usage of the barks of only one plant species. Results shown in Table 4 strengthen the uniqueness of *Marula* tree as three of its parts (the roots, fruits and inner bark) are utilized medicinally.

Medicinal properties are not the only additional use of wild edible fruit plants; they can also have other use categories such as food, beverages, construction, firewood, cosmetic, dye and artifacts. Thirty-four percent of the 27 documented plant species are utilized as firewood. As revealed in Fig. 4 the second mostly reported use category was for food stuffs at 32 %. Food stuffs cited include cooking oil that is extracted from nuts of *Marula* tree, cooking soda made from the skin of *Marula* fruits, candies produced from the pulp of the *Marula* fruits, jam made from prickly pear fruits and *Marula* kernels that can used as snack or for seasoning purposes. Besides

Table 3 — Information on 27 wild edible fruity plants species with additional uses

Families and scientific name	Vernacular and common name	Number of additional uses	Voucher number
Anacardiaceae <i>Sclerocarya birrea</i> (A.Rich.) Hochst. subsp. <i>caffra</i> (Sond.) Kokwaro	<i>Mufula</i> (V), Cider tree/Marula (E)	8	MMG45
Anacardiaceae <i>Lannea discolor</i> (Sond.) Engl.	<i>Munie</i> (V), Tree Grape, Wild plum (E)	2	MMG43
Annonaceae <i>Annona senegalensis</i> Pers.	<i>Muembe</i> (V), Custard apple (E)	1	MMG33
Annonaceae <i>Artabotrys brachypetalus</i> Benth.	<i>Mudzidzi</i> (V), Purple Hook-berry (E)	1	MMG37
Annonaceae <i>Artabotrys monteiroae</i> Oliv.	<i>Mudzidzi</i> (V), Red Hook-berry (E)	1	MMG40
Apocynaceae <i>Landolphia kirkii</i> T. dyer	<i>Muvhungo</i> (V), Rubber Vine/San Apricot-vine (E)	3	MMG35
Apocynaceae <i>Carissa bispinosa</i> (L.) Desf. ex Brenan	<i>Murungulu</i> (V), Fork-spined Carissa/ Red NumNum (E)	1	MMG42
Brassicaceae <i>Boscia albitrunca</i> (Burch.) Gilg & Gilg-Ben	<i>Muthobi</i> (V), Sheperd's tree (E)	1	MMG59
Cactaceae <i>Opuntia ficus-indica</i> L.	<i>Mudoro</i> (V), Prickle pear/ Spineless Cactus (E)	2	MMG50
Chrysobalanaceae <i>Parinari curatellifolia</i> Planch. ex Benth.	<i>Muvhula</i> (V), Mobola Plum/Cork tree (E)	3	MMG41
Ebenaceae <i>Diospyros lycioides</i> Desf. Subsp. <i>sericea</i> (Benth.) De winter	<i>Musuma</i> (V), Quilted Bluebush (E)	1	MMG44
Fabaceae <i>Pterocarpus angolensis</i> DC.	<i>Mutondo</i> (V), Blood wood (E)	2	MMG62
Loganiaceae <i>Strychnos pungens</i> Soler	<i>Mukwakwa</i> (V), Spiny-leaved Wild Orange (E)	5	MMG46
Loganiaceae <i>Strychnos spinosa</i> Lam.	<i>Muramba</i> (V), Monkey orange (E)	3	MMG79
Malvaceae <i>Adansonia digitata</i> L.	<i>Muvhuyu</i> (V), Cream of tartar tree (E)	2	MMG47
Meliaceae <i>Trichilia dregeana</i> Sond.	<i>Mutshikili</i> (V), White Mahogany (E)	1	MMG54
Moraceae <i>Ficus sycomorus</i> L. subsp. <i>sycomorus</i>	<i>Muhuyu</i> (V), False Cluster Fig (E)	1	MMG52
Myrtaceae <i>Psidium guajava</i> L.	<i>Mugwavha</i> (V), Apple Guava/ Yellow Guava (E)	2	MMG57
Ochnaceae <i>Ochna pulchra</i> Hook. F.	<i>Murombe</i> (V), Wild Pear (E)	1	MMG51
Olacaceae <i>Ximenia caffra</i> Sond. var. <i>caffra</i>	<i>Muthanzwa</i> (V), Blue Sour Plum (E)	1	MMG56
Passifloraceae <i>Passiflora subpeltata</i> Ortega	<i>Mufuranta</i> (V), Wild granadilla (E)	1	MMG61
Rhamnaceae <i>Ziziphus mucronata</i> Willd. subsp. <i>mucronata</i>	<i>Mutshetshete/Mukhalu</i> (V), Buffalo thorn (E)	1	MMG60
Rubiaceae <i>Vangueria infausta</i> Burch	<i>Muzwilo</i> (V), Velvet Wild-medlar (E)	1	MMG38
Sapindaceae <i>Englerophytum magalismontanum</i> (Sond) Heine & J.H Hemsl.	<i>Munombelo</i> (V), Milkplum (E)	4	MMG36

(contd.)

Table 3 — Information on 27 wild edible fruity plants species with additional uses (contd.)

Families and scientific name	Vernacular and common name	Number of additional uses	Voucher number
Sapotaceae <i>Mimusops zeyheri</i> Sond.	<i>Thaladzi/Mbubulu</i> (V), Red milkwood (E)	1	MMG31
Tiliaceae <i>Grewia villosa</i> Willd.	<i>Mupunzu</i> (V), Mallow raisins (E)	1	MMG74
Tiliaceae <i>Grewia microthyrsa</i> K. Schum. ex Burret	<i>Mufuka</i> (V), Sand Raisin (E)	1	MMG53

V = Venda vernacular name as mentioned by informants during the survey.  
 E = English common names of the mentioned wild edible plant species

Table 4 — List of wild edible plants species that are also used medicinally

Family	Scientific name	Vernacular name	Plant parts used and illnesses cured
Anacardiaceae	<i>Sclerocarya birrea</i> (A.Rich.) Hochst. subsp. <i>caffra</i> (Sond.) Kokwaro	Mufula	Roots have medicinal properties, Liquid from the fruit heals earache, Roots are used for stomach ache and inner bark is used to cure colds and flu.
Annonaceae	<i>Annona senegalensis</i> Pers	Muembe	Heal children's' stomach problems.
Annonaceae	<i>Artabotrys monteiroae</i> Oliv.	Mudzizi	The roots are used to treat cows with stomach problem.
Apocynaceae	<i>Landolphia kirkii</i> T. dyer	Muvhungo	Roots have medicinal purposes.
Apocynaceae	<i>Carissa bispinosa</i> (L.) Desf.ex Brenan	Murungulu	Roots have medicinal properties.
Ebenaceae	<i>Diospyros lycioides</i> Desf. Subsp. <i>sericea</i> (Benrh.) De winter	Musuma	Fruits are used to cure wounds.
Loganiaceae	<i>Strychnos pungens</i> Soler.	Mukwakwa	Roots have medicinal purposes.
Meliaceae	<i>Trichilia dregeana</i> Sond.	Mutshikili	Bark used as laxative and the fruits heal earache.
Olacaceae	<i>Ximenia caffra</i> Sond.var. <i>caffra</i>	Muthanzwa	Pain killer (boil the roots and drink the decoction).
Rubiaceae	<i>Vangueria infausta</i> Burch	Muzwilu	Fruits used to lessen the intensity of the period pain.
Sapindaceae	<i>Mimusops zeyheri</i> Sond.	Mububulu	Medicine.

the use of wild edible plants cited for the above mentioned food stuff, there are other uses as well. For example, other wild edible plants were found to be used for beverage production. Based on information of the wild fruit plant species mentioned by informants to be utilized as beverages, there is a clear agreement with other findings<sup>10</sup>. Most of plant species mentioned in their work were also mentioned during the current study.

### Conclusion

The current research outlined the indispensability of wild edible fruit plants as they can be utilized in many beneficial ways. Conducting this type of research helped to prevent the loss of indigenous knowledge on the apparent other uses of wild fruit plants. Since these play a paramount role in the lives of rural communities, the development of appropriate conservation, cultivation and harvesting strategies is suggested. The participation of local community, conservers, educators and other stakeholders in the field of conservation, documentation and application of local indigenous knowledge on the use of medicinal and edible wild fruit plants should be

reinforced. Nevertheless, despite the rich indigenous knowledge on the medicinal use of wild plants which has been well documented; more research particularly to serve the concern on socio-economic, cultural, traditional and nutritional aspects of wild edible plants still require adequate attention.

### Acknowledgement

The authors wish to thank the local communities of Vhembe District municipality for their participation in sharing their wisdom to enrich our understanding of wild edible fruit plants. Financial support from the University of Venda is gratefully acknowledged.

### References

- 1 Ehrlich PR & Ehrlich AH, The value of biodiversity, *AMBIO*, 21 (1992) 219-226.
- 2 Schippmann U, Cunningham AB & Leaman DJ, Biodiversity and the Ecosystem Approach in Agriculture, Forestry and Fisheries. FAO, Rome. Impact of cultivation and gathering of medicinal plants on biodiversity: Global trends and issues, 2002.
- 3 Belcher B, Perez RM & Achdiawan R, Global patterns and trends in the use and management of commercial NTFPs: implications for livelihoods and conservation, *World Dev*, 33(9) (2005) 1435-1452.

- 4 Ficher M, Household welfare and forest dependence in Southern Malawi, *Environ Dev Econ*, 9(2) (2004) 135-154.
- 5 Narendran K, Murthy IK, Suresh HS, Dattaraja HS, Ravindranath NH & Sukumar R, Non-timber forest product extraction, utilization and valuation: A case study from the Nilgiri Biosphere Reserve, Southern India, *Econ Bot*, 55(4) (2001) 528-538.
- 6 Scherr SJ, White A & Kaimowitz D, A new agenda for forest conservation and poverty reduction: Making markets work for low income producers. Washington DC, Forest Trends and Jakarta, Indonesia CIFOR, 2004.
- 7 Chadare FJ, Gayet DP, Azokpota P, Nout MJR, Linneman AR, Hounhouigan JD & Van Boekel MAJS, Three traditional fermented baobab foods from Benin, *mutchayan*, *dikouanyouri*, and *tayohounta*: Preparation, properties, and consumption, *Ecol Food Nutr*, 49 (2010) 279-297.
- 8 Mabogo DEN, The ethnobotany of the Vhavenda, Master of Science thesis, (University of Pretoria, Pretoria, South Africa), 1990.
- 9 Tshisikhawe MP, Trade of indigenous medicinal plants in the Northern Province, Venda region: Their ethnobotanical importance and sustainable use, M.Sc dissertation, University of Venda, Thohoyandou, 2002.
- 10 Rampedi IT & Olivier J, Traditional Beverages Derived from Wild Food Plant Species in the Vhembe District, Limpopo Province in South Africa, *Ecol Food Nutr*, 52 (2013) 203-222.
- 11 Shrestha PM & Dhillion SS, Diversity and traditional knowledge concerning wild food species in a locally managed forest in Nepal, *Agroforest Syst*, 66 (2006) 55-63.
- 12 Abbink J, Meen ritual, medicinal and other plants: a contribution to south-west Ethiopian Ethnobotany, *J Ethiop Stud*, 26 (2) (1993) 1-21.
- 13 Bell J, The hidden harvest. In seedling, the quarterly newsletter of Genetic Resources Action International (GRAIN) (1995). [www.grain.org](http://www.grain.org).
- 14 Edwards SB, Traditional tree crops in Ethiopia. Historical records and economic development. Proceedings of the second Natural Resources conservation conference, 10-13 May 1990. Addis Ababa, Institute of Agriculture Research, 1992.
- 15 Guinand Y & Dechassa L, Indigenous Food Plants in southern Ethiopia: Reflections on the Role of 'Famine Foods' at the Time of Drought, United Nations Emergencies Unit for Ethiopia (UNEUE), Addis Ababa, 2000.
- 16 Mojeremane W & Tshwenyane SO, *Azanzagarkeana*: a valuable edible indigenous fruit tree of Botswana, *Pak J Nutr*, 3(5) (2004) 264-267.
- 17 Motlhanka DMT, Motlhanka P & Selebatso T, Edible Indigenous Wild Fruit Plants of Eastern Botswana, *Int J Poult Sci*, 7(5) (2008) 457-460.
- 18 Getachew A, Kelbessa U & Dawit D, Ethnobotanical study of edible indigenous plants in some selected districts of Ethiopia, *J Hum Ecol*, 33(1) (2005) 83-118.
- 19 Redzic SJ, Wild edible plants and their traditional use in human nutrition in Bosnia-Herzegovina, *Ecol Food Nutr*, 45(3) (2007) 189-232.
- 20 Lombard Z, Dalton DL, Venter PA, Williams RC & Bornman L, Association of HLA-DR, -DQ and Vitamin D receptor alleles and haplotypes with tuberculosis in the Venda of South Africa, *Hum Immunol*, 67 (2006) 643-654.
- 21 Limpopo State of the Environment Report (LSOER), State of the environment report (2004), <http://www.environment.gov.za/soer/reports/limpopo.html>. Retrieved 10/05/2016.
- 22 Venter SM & Witkowski ETF, *Baobab (Adansonia digitata L.)* Fruit production in communal and conservation land-use types in southern Africa, *Forest Ecol Manage*, 261 (2011) 630-639.
- 23 Acocks JPH, Veld Types of South Africa, 3<sup>rd</sup> edn, Memoirs of the Botanical Survey of South Africa, No. 57 (1988).
- 24 International Plant Names Index (2016). <http://www.ipni.org/>. Retrieved 11/07/2016.
- 25 Mokgolodi NC, Ding Y, Setshogo MP, Ma C & Liu Y, The importance of an indigenous tree to Southern African communities with specific reference to its domestication and commercialisation: a case of the marula tree, *Forest Stud China*, 13 (2011) 36-44.
- 26 Van Hal HP, Processing of *marula (Sclerocarya birrea subsp. caffra)* fruits: A case study on health-promoting compounds in marula pulp, PhD thesis, Wageningen University, Wageningen, The Netherlands, 2013.