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Full Length Research Paper

Utilization of wild vegetables in four districts of northern KwaZulu-Natal Province, South Africa

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A study was conducted in northern KwaZulu-Natal Province, South Africa to gather information on the availability and extent of utilization of wild vegetables within some communities. The study revealed that wild vegetables were important in the diets of most rural people in northern KwaZulu – Natal. They were consumed as relish, although they were not being cultivated. The method of acquiring these vegetables was by gathering them from homesteads and the wild. These vegetables were also believed to be medicinal. The local names of wild vegetables varied among villages in the same district such that one vegetable in one village was given to a different species of vegetable in another village. They were reportedly abundant during summer and there was a decrease in availability off-season leaving vulnerable families who rely on them with a food shortage.

Key words: Northern KwaZulu-Natal, wild vegetables, respondents, poverty, malnutrition, domestication, cultivation.

INTRODUCTION

According to the South African National Census of 2001, KwaZulu Natal (KZN) province has the highest population (21%) with a GDP lower than the national average (Pauw, 2005; Mohamed, 2007). Agricultural households earn less than their non-agricultural counterparts, and poverty rates among this sector of the population were found to be very high (81.2%) compared to non-agricultural households (49.5%). Poverty rates vary between racial groups with the Africans (blacks) who constitute the bigger percentage of the population being the worst affected (poverty rate of 64.4%). Poverty is more in rural areas (78.2%) than in urban areas (28.9%); therefore, hunger and malnutrition are still prevalent in many rural and urban settlements (Pauw, 2005; van den Heever, 1995; Modi et al., 2006).

A major cause of malnutrition has been found to be vitamin and trace element deficiencies; a phenomenon described as hidden hunger (Tisdale et al., 1990). In the case of northern KZN, these affected populations live in areas rich in highly nutritious wild vegetables, which not only provide abundant nutrients, but also prevent and cure certain ailments. In sub Saharan Africa for instance, wild vegetables are important dietary components as they are used to prepare sauces and relish that accompany carbohydrate staples like *pap/phuthu* in South Africa, *sadza* in Zimbabwe, *fufu* in West Africa and *ugali* in east African countries.

A previous study conducted in Ndunakazi, KZN, showed that 44% of pre-school and 52% of primary school children were vitamin A deficient (Faber and Benade, 2003). The study also revealed that the diet lacked variety whilst the intake of vitamin A and carotene rich foods was low. The diet is mostly made up of *phutu* with legumes (mostly beans). Wild vegetables can bring variety, vitamins and other nutrients (Faber et al., 2002; Faber and Benade, 2003). They are inexpensive yet high quality sources of nutrition especially for low income and marginalised sectors of the economy (Smith and

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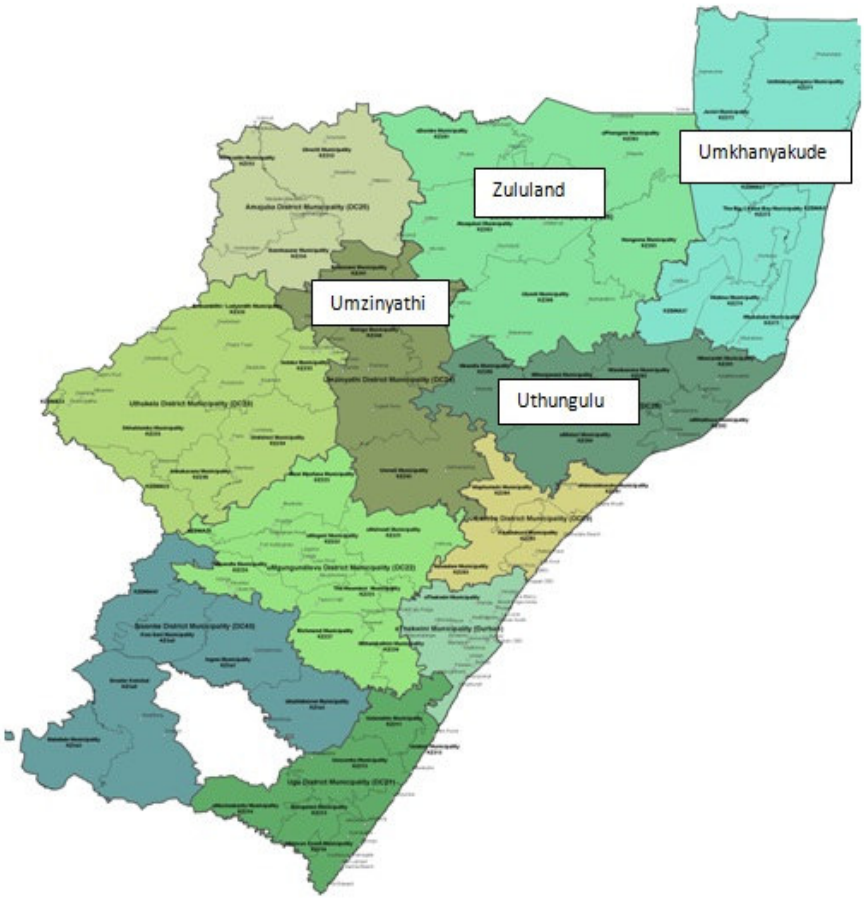

Figure 1. Map of KwaZulu-Natal showing the district municipalities from which study villages were selected.

Ezyaguirre, 2007). These vegetables are also believed to be medicinal. Common wild vegetables like *Amaranthus* spp., *Galinsoga parviflora*, *Tulbaghia violacea* have been evaluated at the University of KwaZulu Natal and have shown promise in the management of diseases like hypertension among others (Mackraj, 2007).

The cultivation of wild vegetables has declined drastically because of the excessive cultivation of field crops, which includes chemical elimination of wild vegetables as they are considered as weeds (Odhav et al., 2007; van Rensburg et al., 2007; Kwapata and Maliro, 1995; Lewu and Afolayan, 2009). They are underutilised in favour of non-native vegetables (Rubaihayo, 1992). Shackleton (2003) concluded that there was no enough importance attached to the value of wild plants in household food security by governments, extensionists and development planners.

The decline in the use of wild vegetables by many rural communities has resulted in poor diets and increased incidences of nutritional deficiencies (Smith and Ezyaguirre, 2007; Madisa and Tshamekang, 1995). Dietary utilisation of non-domesticated plants has received little research attention (Mauyo et al., 2008) and this has led to a narrowing of the food base with attendant malnutrition. As a result, there are many gaps in knowledge with respect to production requirements for wild vegetables. These gaps range from lack of germplasm from which genetic material for the development of new cultivars and improvement of current cultivars can be obtained, to lack of information on production practices (Smith and Azyaguirre, 2007).

The objective of this study was to gather information on the occurrence, extent of utilisation, cultivation and attitudes towards these vegetables in four districts of northern KwaZulu-Natal.

MATERIALS AND METHODS

Study area

The research was conducted amongst the predominantly Zulu speaking people living in four districts of northern KwaZulu-Natal Province, South Africa. The surveys were conducted in selected villages in Umzinyathi, uMkhanyakude Uthungulu and Zululand district municipalities (Figure 1). The four districts selected for this

Table 1. Socio-economic data of respondents from four districts in KwaZulu-Natal.

Attribute	Frequency	Percent
Household size		
1 – 3	9	9.0
4 – 7	46	46.5
8 – 9	16	16.2
10 -13	14	14.1
>13	9	9.1
Employment status of household head		
Not employed but on pension	35	35.4
Not employed not on pension	21	21.2
Self employed	6	6.1
Vegetable vendor	5	5.1
Employed (wage/salary earner)	32	32.3
Income		
No income	11	11.1
Not disclosed	9	9.1
R100 –R500 (US$13 – 67)	8	8.1
R501 – R1000 (US$68 – 133)	24	24.2
R1001 – R2000 (US$134 – 268)	24	24.2
R2001 – R3000 (US$269 – 667)	3	3.0
>R3000 (>US$667)	20	20.1

study lie approximately within latitude 27° S and 29° S and longitude 30° E and 33° E (DEAT, 2000). The province of KwaZulu is characterized by diverse climatic conditions due to large variation in topographical features, such as the altitude that ranges from sea level at the shoreline to over 3000 m at the western border along the Drakensberg Mountains. Rainfall ranges from 500 mm to over 1500 mm per annum (DEAT, 2000). The coastal region is associated with humid and warmer temperatures.

The survey

The study involved the use of Rapid Rural Appraisal technique based on a structured questionnaire to collect both quantitative and qualitative data (Marshall and Newton, 2003; Lewu et al., 2007). One respondent was interviewed per household and a total of 99 respondents were interviewed individually. The survey was conducted over a period of two months (April – May, 2009). Information collected included socio-demographic data (name, gender of household head, age, household size, household age, income, occupation); names of wild vegetables used; ecologies from which they were collected; plant parts eaten; preferences; vegetables used for medicinal purposes and propagation methods and conservation practices.

Local names of collected vegetables were matched with scientific nomenclature following guidelines outlined by earlier workers (Flyman and Afolayan, 2006a; Modi et al., 2006; Odhav et al., 2007; Zobolo et al., 2008). Where the local names could not be matched with scientific names, only the local names have been presented. Being predominantly Zulu speaking communities, all questionnaires were administered in *isi*Zulu.

RESULTS

Many aspects of traditional culture are still preserved in these former homeland areas and most of the inhabitants are mainly dependent on farming, natural resources and pension payments for subsistence. According to the socio-demographic data collected in this study, household size ranged from 1 to 21 members. Thirty five percent of respondents were aged 60 years and above. Thirty nine percent had primary school education, 26% had secondary school education, while 26% never passed through western education. The socio-economic status of the respondents is presented in Table 1.

Access to wild vegetables

Diversity of wild vegetables utilised

The collective name for wild vegetables across all the districts is *imfino.* The study also noted that the name *imfino* is also used to identify domesticated green leafy vegetables like pumpkins (*Cucurbita* spp.) and cowpea (*Vigna unguiculata*).

Ninety eight of the respondents utilise wild vegetables mainly as a relish and for medicinal purposes as well. The majority of respondents (62%) indicated that they

Table 2. Use of wild plants as food and medicines in selected villages in Umzinyathi, Umkhanyakude, Uthungulu and Zululand districts, northern KwaZulu-Natal.

Vegetable eaten	Plant part eaten	Medicinal	Ailments treated
1. Imbuya*(Amaranthus* spp.)	Leaves	na	
2. Imbilikicana(Chenopodium album)	Leaves	X	Diarrhoea
3. Uqadolo(Bidens pilosa)	Leaves	X	Stomach aches, influenza
4. Isishukelana(Galinsoga parviflora)	Leaves	na	
5. Intsungu(Mormodica foetida)	Leaves	X	High blood pressure, diabetes
6. Imbati(*Urtica dioica or urens*)	Leaves	X	Headaches
7.*Umsobo Solanum nigrum*			
8. Intebe	Leaves	na	
9. Umayebabo	Leaves and roots	na	
10.Uvovo	Leaves	X	Coughing
11. Inkalane	Leaves	X	Coughing, diarrhoea, cleaning digestive system
12. Amasosha	Leaves	X	Diarrhoea, vomiting, stomach aches

utilise the first 7 vegetables listed in the Table 2, whilst the most commonly preferred being imbuya (*Amaranthus* spp) (representing 78% of the respondents interviewed) followed by *uqadolo* and *imbilikicana.*

In addition to those in Table 2, the following plant species were also mentioned as vegetables, but are utilised on a smaller scale: *amakhowe, ikabekabe, izigagane, umsashane*. An interesting aspect of the findings was that various vegetables species are mixed for consumption; a practice respondents reported improves the taste of the relish.

Medicinal uses of wild vegetables

Some of the vegetables are used as medicines for the treatment, prevention or management of various ailments. For instance, *intsungu* (*Mormodica foetida)* was the most cited as a medicine and is used mostly to manage high blood pressure as indicated by 37% of respondents. However, the survey revealed that almost all of the wild vegetables are believed to have some form of medicinal and therapeutic properties when compared with exotic vegetables and as such, there is no formal categorisation into medicines and vegetables.

Method of acquisition of wild vegetables and frequency of collection

The majority of respondents (81%) gathered vegetables, which grow as weeds or volunteer crops in their fields and home gardens, as well as the veldt and the mountains (Figure 1). Ten percent indicated that they bought, and 8% collected and bought depending on availability. Whilst most respondents indicated that they harvested leaves, obtaining information on the frequency of harvesting was not possible as respondents do not measure the amounts of these wild vegetables. As a result, daily, weekly, monthly and yearly consumption patterns and estimates could not be established through this survey. Collection does not follow a regular pattern as the survey revealed that people consumed more when the vegetables were available.

Place and season of wild vegetable collection

Vegetables were gathered from various habitats. Seventy four percent of respondents collected from their own cultivated fields, gardens and homesteads (disturbed land) (Figure 2) with some indicating that they harvested from their neighbours' fields when they could not harvest enough from their own, perhaps suggesting that the population of these vegetables may be declining. Forty one percent indicated that they collected vegetables all year round specifically from their fields and gardens during summer and from wetlands and gardens during off-season. They also indicated that some vegetables are available only in summer while a few are available all year round.

Cultivation of wild vegetables

Seventy six percent of respondents do not cultivate wild vegetables; while 22 % who indicated that they cultivated grew *izintanga* (pumpkins – *Cucurbita* spp) although referred to as *imfino*, are not wild vegetables. None of the respondents kept seed of the wild vegetables. Various responses were given on the conservation effort of wild vegetables in the study area. Fifty three percent of

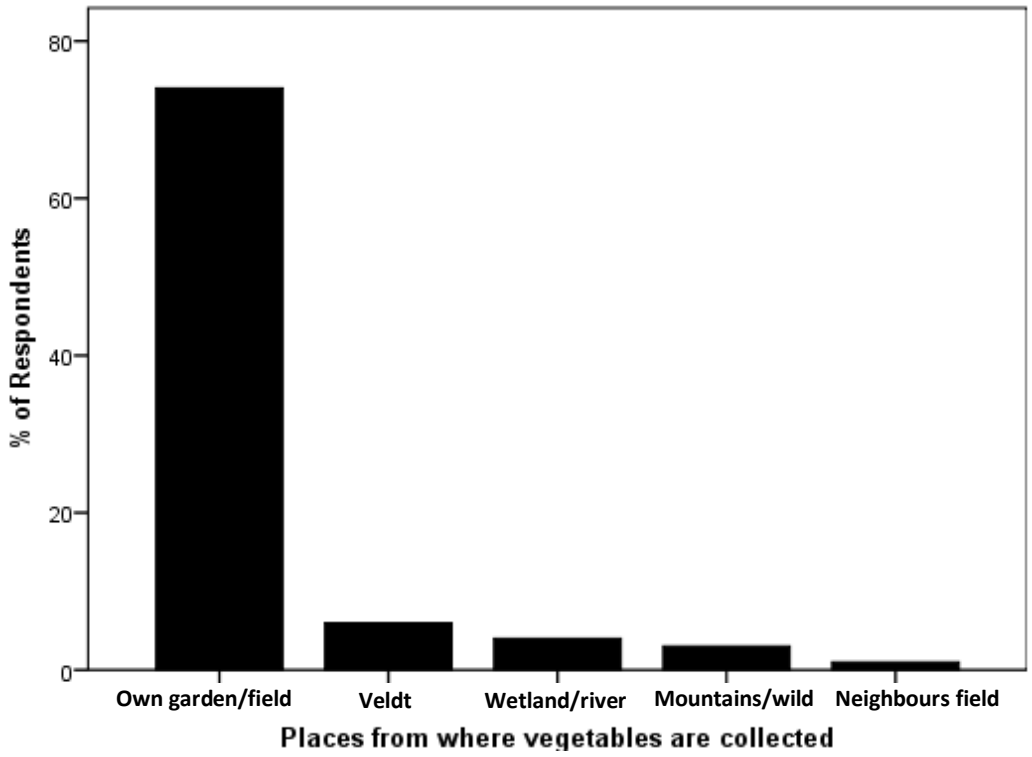

Figure 2. Places where respondents collected wild vegetables in the studied communities.

respondents observed that wild vegetables occur as weeds on their cultivated land and believe seeds of these species are stimulated to germinate by land cultivation.

Attitudes towards wild and exotic vegetables

Ninety eight percent of respondents utilise cabbage as relish, however, 76% preferred wild vegetables to cabbage if they were readily available. Among other reasons, respondents preferred wild vegetables to cabbage because it was believed that cabbage 'causes disease', it is expensive, requires inputs to cultivate, has a disagreeable smell, is not delicious and requires food additives to taste good. Respondents further reported that wild vegetables are free, easy to cook, could taste well even without cooking oil and food additives. They also claimed that wild vegetables are highly nutritious, prevent and cure some diseases.

Quantities consumed and trade in wild vegetables

A small proportion of respondents (7%) indicated that they sell wild vegetables. However, they did not quantify the amount harvested as no records are kept, but some gave an estimate of the income accruing from the selling of the vegetables ranging from R100 to R400 per annum.

DISCUSSION

This study revealed that people in the study area utilise wild vegetables mostly as a relish. Most people gather the vegetables from the wild and those who indicated that they do cultivate *imfino* identified *Cucurbita* spp. and *V. unguiculata* as the cultivated species. Although these species are known as *imfino*, they are not gathered from the wild as they are already domesticated. The local taxonomy of wild vegetables varies as was also reported by Jansen van Rensburg et al. (2007). For instance, in Melmoth (northern KwaZulu-Natal) we noted that respondents identified *Bidens pilosa* as *imfino* yet in other villages, which is known as *uqadolo* and the name *imfino* is a collective term for all wild vegetables. This suggests that local nomenclature/taxonomy of the same species varies from place to place or between communities in the same locality. It is important that wild vegetables are correctly identified by their botanical and local names. This characterisation provides the basis for identifying the variation in nutrients and health protecting traits among cultivars within a species (Smith and Ezyaguirre, 2007).

The major part of the vegetables consumed by respondents is leaves; although some occasionally

harvest roots and tender stems. Young growing points (shoots) have also been observed to be harvested (van Rensburg et al., 2007). The consumption pattern of the vegetables shows that more vegetables are consumed in summer compared to winter season. The major reason for this difference has been suggested to be the relative availability of wild vegetables in summer than in winter. This finding is similar to an earlier study by Shackleton (2003) who reported that consumption in winter was less than in summer. Based on the current study, the collection pattern indicates that the vegetables are in demand all year round and that consumption is only limited by availability. Certain difficult circumstances like famine also cause the consumption of other wild plants, which are not ordinarily consumed vegetables. Flyman and Afolayan (2006b) and Odhav et al. (2007) reported that certain wild vegetables were consumed only during scarcity and famine. A study by Modi et al. (2006) at Ezigeni, KwaZulu –Natal revealed that the availability of wild vegetables suddenly declined in May and became scarce between July and August and only increased as the season progressed from August to October. The sudden manner in which these vegetables become unavailable, leaves many vulnerable families exposed to hunger between the months of May to November. In a study in Limpopo province, Dovie et al. (2007) found out that wild edible herbs within the homesteads were tightly controlled by the corresponding household, although some allowed other households to harvest them from time to time depending on how they related to one another. Some are collected from the veldt, wetlands and woodlands and mountains. The aforementioned findings suggest the need to be able to make these wild vegetables available during the off-season months. This could be achieved through cultivation of these vegetables at home so that families have greater control of the availability rather relying on natural and mostly unpredictable availability.

van Rensburg et al. (2007) noted that women are more involved in the preservation of wild vegetables. They select them and leave them undisturbed during weeding. Some communal farmers are also aware of the relationship between animal manure application and the proliferation of wild vegetables. This was revealed by the respondents (4%) who said that they applied manure to stimulate the growth of the wild vegetables. Ninety percent gather these vegetables within 2 km from their homesteads and they collect them from the same place every year, perhaps indicating that the populations of these wild vegetables are not increasing or spreading beyond their natural habitats. Respondents observed that the amounts of wild vegetables varied directly with seasonal rainfall; with the tendency of increased growth and increased plant numbers during the rainfall season. However the population dynamics of the species is not well understood by the respondents. In the study by Dovie et al. (2007) in Limpopo, 79% of respondents perceived wild vegetables to be less available than in previous decades in terms of both amount and species diversity.

Studies on wild vegetables by other researchers suggest that women are the major participants in the gathering of wild vegetables (Vorster et al., 2007; van Rensburg et al., 2007). This current study revealed that youths were not willing to harvest or consume wild vegetables. Respondents gave several reasons for the unwillingness of youths to consume wild vegetables. Some of the reasons were that collecting wild vegetables is time consuming, as confirmed by empirical studies in the Eastern Cape by Shackleton (2003) who found out that harvesting time ranged from 2 h 30 min per week at one locality and 3 h 45 min per week in another locality. The amount of vegetables gathered was however, not indicated.

While the youths believe that gathering of wild vegetables was a special preserve for the poor and old, the elders in the community reported that youth are lazy and do not have enough knowledge of wild species; with the tendency of mixing wild vegetables with poisonous species (e.g. *iloyi*)

Some previous studies have been able to quantify the frequency of utilisation (Nesamvuni et al., 2001; Steyn et al., 2001; Shackleton, 2003). Shackleton (2003) used empirical methods and quantified the amount of vegetables consumed at KwaJobe in KwaZulu-Natal and found this to range from 76.9 to 108.5 kg per household per annum; with a farm gate price of R2.65 per kg. The study by Nesamvuni et al. (2001) indicated servings of 180 to 270 g consumed once a week, while in their study Dovie et al. (2007) estimated consumption to be at 15.4 ± 2.5 kg per household per annum; with a gross monetary value of $182.9 ±33.1 per household per annum.

Conclusions

Wild vegetables play an important role in the daily lives of most rural people in northern KwaZulu – Natal. They are widely consumed as a relish although they are not being cultivated; their methods of acquisition being gathering from homesteads, cultivated lands, the veldt and woodlands. These vegetables are also believed to be medicinal, although there is variability in the knowledge of the ailments treated. The local taxonomy or naming of these vegetables varies from villages in the same district such that one vegetable in one village is given to a different species of vegetable in another village. Wild vegetables are abundantly available during summer and there is a decrease, even no-availability during winter and the dry season, leaving some vulnerable people who rely on them in a state of food deficit and shortage. There is need for domestication and cultivation of wild vegetables

to ensure a continuous and regular availability of these species throughout the year.

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