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Review

The role of wild vegetables in household food security in South Africa: A review

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ABSTRACT

Wild vegetables are a common and important source of food and nutrition in the rural areas where they can be harvested from backyard gardens, animal houses or agricultural fields. These plant species which were initially primary sources of food in many societies have been marginalised in favour of exotic vegetables. Micronutrient deficiencies, especially in children, continue to be a global cause for concern and yet numerous reports have revealed the high nutritional value of wild vegetables. If they are incorporated into the diet, wild vegetables can alleviate some of the micronutrient deficiency concerns. In this paper, literature on ethnobotanical knowledge of wild vegetables in South Africa is reviewed with a view to reveal their potential role in household food security. The outcome of the literature search revealed only 103 plant species from a total of 33 families in five out of nine provinces. In South Africa the cultivation of these wild vegetables has so far been limited to only two provinces. These important plant foods are clearly underutilised although they potentially have a big role to play in food security. Wild vegetables need to be revitalised and brought back into the mainstream diet so that they can play their role in food security. More work needs to be done to document these important food plants in all the provinces of South Africa to create an updated inventory. If these species continue to be neglected and underappreciated, knowledge about them may soon be lost in time and never be recovered.

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1. Introduction

Undernourishment affects about 900 million people in the world and more than 2 billion suffer from micronutrient deficiencies (Fan, Ringler, Nkonya, & Stein, 2012). According to the United Nations' — Department of Economic and Social Affairs (UN-DESA), world population which is currently about 7.2 billion is expected to grow to about 9.6 billion by 2050 and much of this growth is expected to be concentrated in poor third world countries (DESA, 2013). Statistics South Africa (SSA) recently estimated South Africa's population to be 52.83 million with a growth rate of 1.34% (SSA, 2013a). The projected global population increase, poor management and increasing scarcity

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of resources is expected to drive food demand and fuel food insecurity in the coming decades by nearly 80% more meat and 60% more cereals (Fan et al., 2012; Rosegrant, Meijer, & Cline, 2008).

The production of more food using fewer resources to meet a growing world population and ensure food security becomes a topic that generates a lot of global interest. Since 1943 when the Food and Agriculture Organisation (FAO) convened the Hot Springs Conference and first raised concerns about food security, the definition of the term has evolved. The most recent definition of food security was coined at the 2006 World Food Summit: '*a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life*' (FAO, 2009). According to FAO (2009), to define food security, four aspects are often considered, viz, *food availability*, *access*, *utilisation* and *stability*. In fact food security is closely linked to agriculture. It has been reported that South Africa is food secure at national but not household level (Hart, 2009). Recent statistics also indicate that the number of people with limited access to food declined from 28.6 to 26.1% (representing over 13 million people) between 2010 and 2012 (SSA, 2013b). Although this indicates a decline in food insecurity, the number is too high especially under the backdrop that about 58% of the poor live in poor and marginalised rural communities (Turok, 2012).

Since the onset of the green revolution in the 1960s, agriculture has mainly focused on development and cultivation of staple food crops such as rice, wheat and maize. Although the green revolution saw a drastic increase in crop production in the industrialised countries, the development has widely been seen as modest in Africa (Hazell, Ramasamy, & Aiyasamy, 1991). Although the pros and cons of the green revolution are debatable, a majority of authors agree that food production increased drastically (Hazell et al., 1991; Tilman, Cassman, Matson, Naylor, & Polasky, 2002; Tsubota, 2002; Wharton, 1969). While the green revolution mainly focused on developing better staple crops like cereals and the conventional horticultural crops, the development and cultivation of minor plant species such as wild vegetables have been widely underplayed until recently. From time immemorial, wild vegetables have played a significant role as food supplements during times of drought and to fortify diets especially in hunter gatherer societies. Wild vegetables together with other wild plant foods are often referred to as the '*hidden harvest*' since they are simply collected from the wild (agricultural fields and swampy areas) and no effort is made to specifically cultivate them for food.

Women and children usually predominate gatherers of these important plant species. For example, a study of 135 different societies with various subsistence bases estimated that women provided 79% of total vegetal food collected (Barry & Schlegel, 1982; Howard, 2003). This has been reported in various parts of the world including South Africa (Cocks & Wiersum, 2003; Łuczaj, 2008; Maroyi, 2011a; Price, 1997; Scoones, Melnyk, & Pretty, 1992; Weingarten, 2006).

Although a variety of wild vegetables may be available in a locality, reports have shown that only a few selected ones are available for consumption (Hadjichambis et al., 2008; Rivera, Heinrich, Obon, & Inocencio, 2006). The ability of wild vegetables to provide the required nutrients in human physiology has been widely reported. They have been shown to possess superior nutritional qualities than the conventional vegetables such as spinach and cabbage (Aletor, Oshodi, & Ipinmoroti, 2002; Edmonds & Chweya, 1997; Flyman & Afolayan, 2008; Kayode, 2012; Lewu & Mavengahama, 2010; Odhav, Beekrum, Akula, & Baijnath, 2007). Notwithstanding this, the wealth of information available on the nutritional composition of wild vegetables alone is not enough to overcome food insecurity.

It is generally agreed that the question of food security requires an interdisciplinary approach to solving, bringing the agriculturalists and nutritionists together (Aragrande, Argenti, & Lewis, 2001; Global Food Security (GFS), 2013; Ingram, 2011; Maunder & Meaker, 2007; Rocha, 2007). According to Labadarios et al. (2008) the South African diet consists mainly of the staple food plants and is lacking in diversity and in turn leads to micronutrient deficiencies. The World Health Organisation (WHO) earlier reported that the consumption of fruits and vegetables is less than half of the recommended 400 g intake per day (WHO/FAO, 2003). However, some authors (Berti, Faber, & Smuts, 2014; Modi, Modi, & Hendriks, 2006; Uusiku, Oelofse, Duodu, Bester, & Faber, 2010) hypothesised that by including wild vegetable species in the diets, there is likely to be an improvement in micronutrient deficiencies. Reports have shown that there is a decline in the knowledge and consumption of wild vegetables (Hart & Vorster, 2006; Lewu & Mavengahama, 2010; Modi et al., 2006; Taleni, Nyoni, & Goduka, 2012; van Rensburg et al., 2007).

This topic has been a major focus of attention for more than a decade in South Africa. Therefore, the main thrust of this work is to review current literature on ethnobotanical information and existing knowledge on South African wild vegetables and their potential role to combat household food insecurity. We explore and reveal the current ethnobotanical information regarding the knowledge, availability, consumption patterns and cultivation of wild vegetables. We posit that if the consumption of wild vegetables is encouraged through their cultivation in home gardens, then food insecurity and malnutrition will be reduced. Furthermore, if seasonal wild vegetables are made available during offseason, this will increase access and bring food stability and therefore the household will become food secure all year round. Offseason vegetables can be made available by preservation when they are in season and/or cultivation in home gardens. A variety of wild vegetables are sometimes mixed to make a single dish that is consumed with a starch based relish. Furthermore, we attempt to highlight the areas of weakness of the current data and identify existing gaps that need attention so as to maximise the use of these wild food resources.

Information was gathered from online journal publications, books, conference proceedings, dissertations and reports. Using the Google search engine, the search terms that were used in this work included; '*wild vegetables*', '*ethnobotanical survey of wild vegetables in South Africa*', '*indigenous vegetables*', '*food security in South Africa*'. Data on wild vegetables including their family, scientific and local names, location, part of the plant used and their habit were gathered from a total of 11 relevant publications although this list may not be totally exhaustive. Literature on wild vegetables from other countries of the world has also been cited in this work as a comparison tool. This information can then be used as knowledge gap fillers and as a planning tool in the war against food insecurity by relevant stakeholders. For purposes of this review; the term 'wild vegetable' shall refer to species that are neither cultivated nor domesticated but are available for use as sources of food from their natural habitat, usually agricultural fields (Molla, Asfaw, Kelbessa, & van Damme, 2011). The term 'household' shall refer to all related and non-related family members who share meals and occupy the same housing unit (Cresce, Cheng, & Grieves, 2013).

2. Some wild vegetables of South Africa

The total number of species that were compiled from the current literature search is shown in Table 1. A total of 103 species from 33 families were reported by various sources from five provinces namely, Limpopo (58%), KwaZulu Natal (27%), Eastern Cape (22%), North West (27%) and Mpumalanga (3%). The number of species reported per family is shown in Fig. 1. These results indicate that the Limpopo province is leading in the consumption of wild vegetables followed by KwaZulu Natal and the North West although they differ by 31%. The Mpumalanga province that recorded the lowest proportions is 55% lower than what was recorded in Limpopo. These low figures may not be a true representation of the actual consumption rates and therefore may be an inaccurate portrayal of the food security situation in the provinces based on the use of natural resources to supplement the diet. This review is based on what has been documented; therefore, the figures could be higher than what they appear to be. There is therefore a need for extensive ethnobotanical surveys in the provinces with low statistics with a