



## **Studying the Contribution of Wild Foods to Nutrition in Central Tunisia, the Sidi Bouzid Case Study: Preliminary Results, Methodological Challenges and Reflections on Linkages with Agricultural and Biodiversity Policies**

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The Sidi Bouzid case study is part of the MEDINA research project entitled “Promoting sustainable Mediterranean food systems for good nutrition and health”. The objective of the case study is to assess the contribution of wild foods and agriculture in providing healthy diets to women in an agricultural region of Tunisia and to propose policy options to preserve or improve dietary quality. Research questions specifically relating to wild foods are: What is their nutrition contribution? Which segments of the population use these foods?

### **Context:**

The Sidi Bouzid governorate of Central Tunisia experienced rapid agricultural development in the decades following independence (1956) as a result of large public investments in irrigation infrastructure. Since the 1990’s however public investment in irrigation was scaled down considerably while private investments in large farms for export have grown rapidly. Overuse of water resources due to deep drilling of aquifers by large farms is making access to irrigation more difficult for small-holder households causing loss of agricultural employment and out-migration. Meanwhile Tunisia is undergoing a nutrition transition and overnutrition is common in both the urban and rural sectors while micronutrient deficiencies are still prevalent.

### **Material and methods:**

The study is multidisciplinary and uses four methodological approaches: 1) an ethnobiological assessment, 2) food composition analyses 3) a nutrition survey and 4) an agricultural survey.

The qualitative ethnobiological study (April 2014) was carried out to identify wild foods consumed by the local population and to describe their availability and food uses. Key informants from local administrations, farms and a WEP vendor were interviewed. Seven focus group discussions were conducted. Samples of wild edible plants were collected, identified and deposited in the National Herbarium.

Nutritional analyses were performed on wild and cultivated edible plants for which compositional data were not available or scarce in the scientific literature.

A nutrition survey (November 2014-October 2015) is currently underway. It includes 4 rounds of dietary assessment (24-hour dietary recall and an FFQ of wild food consumption with a recall period of 3 months), an FFQ of physical activity (3 rounds) and anthropometric measures (2 rounds). Respondents are women of child bearing age (n=740) selected from the population of the governorate by stratified cluster sampling.

The quantitative agricultural survey will be carried out shortly (end of 2015) in the households of the rural stratum of the nutrition survey.

### **Preliminary results:**

The ethnobiological study identified 30 species of wild edible plants (WEPs) consumed by the population. Most of the WEPs are leafy vegetables. One-hundred and sixteen samples were deposited in the Tunisian National herbarium (INAT). Most WEPs were reported to be available during the winter and spring. The most widely consumed are fennel leaves, false-rocket, wild swiss chard, wild garlic, wild leak, cardoon and malva. Respondents believe that WEPs are healthy foods. They are mostly consumed fresh as part of traditional recipes (couscous, stews, flat bread). Traditional recipes were recorded.

The nutritional analyses show a high concentration of  $\beta$ carotene, folate, potassium and calcium in the dark green leafy vegetables.

**Methodological challenges:**

We faced several methodological and practical challenges in the study. Firstly, the distinction between wild and cultivated plants was not always straightforward; for example wild fennel (*Anethum graveolens*) seeds are planted and cultivated. Secondly, identification of WEPs by their vernacular name was sometimes difficult because different species had the same name. A photographic identification guide was developed to overcome this issue. Thirdly, due to security problems for accessing the field the number of samples of WEPs analyzed remains low and new analyses will have to be planned. Finally, the choice of dietary assessment protocol was difficult. Since different WEPs grow at different seasons, ideally dietary assessments should cover the whole year. Short term recall, often used in the published studies, risks underestimating the intake of wild foods. Retrospective assessments are preferable but are cumbersome and lack precision. We overcame this difficulty by using simultaneously a short recall method and an FFQ for the consumption of WEPs with repetitions in order to cover a whole year.

**Availability of wild foods and agricultural policies:**

WEPs are abundant in the environment of small farms of the Sidi Bouzid governorate. Irrigation tends to increase the availability of some WEPs which grow spontaneously in and around irrigated plots. Wild fennel, for instance has become more abundant and very popular with the development of irrigation. These abundant WEPs could be a key dietary resource for poor women who cannot easily access vegetables from markets. However, modern agricultural practices such as mechanization and use of herbicides decrease the availability of WEPs. The shift from small-holder farming to large farms producing for export will inevitably decrease the availability of WEPs and their contribution to nutrition.

**Tunisian policies for the conservation and use of biodiversity:**

Tunisia ratified the Convention on Biological Diversity in 1993. The first National Action Plan was developed in 1998 and a new plan is underway. Several inventories of biodiversity have been conducted at national level. Currently most in-situ interventions focus on biodiversity of food crops that have a high export value, for example local varieties of olive trees, date palms and durum wheat. There is to date a lack of recognition by policy decision makers of the potential role of wild edible plants for ensuring healthy diets in the context of the nutrition transition. The results of the MEDINA research project will help raise awareness of the nutritional and health potential of wild edible plants and of the need to consider them when developing health, agricultural and biodiversity policies.

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