

## Local plant knowledge of farmers' families in the Napf-region, Switzerland

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### Summary

This contribution presents preliminary results of an ongoing PhD project which aims to explore linkages between plant diversity and local plant knowledge in the Napf-region in Switzerland. The central part of the Napf is a cultural landscape listed in the Federal Inventory of Landscapes and Natural Monuments of National Importance. Cultural Domain Analysis was used to get an overview of known and used plant species. In total 51 family members of twelve farmer families were asked to list indigenous plants, followed by semi-structured interviews about the use of the species. Roughly 400 wild and cultivated plant species were listed. The most frequently mentioned were *Taraxacum officinale* agg. and *Rumex obtusifolius* L.. Mentioned use categories, with declining frequency, were food, medicine for humans and animals, decoration, handicraft, toys and customs. Statistical analysis on the influence of demographic factors like age, gender, education, cultural background and farming system on plant knowledge revealed that age is the most important factor to explain knowledge variation.

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### Keywords

ethnobotany, local plant knowledge, biocultural diversity, Napf-region, Switzerland

### Introduction

Research in the field of biocultural diversity demonstrates that biological and cultural diversity are inextricably linked and landscapes with their plant diversity coevolved based upon local peoples' land management strategies (e.g. MAFFI, 2001). A prerequisite for effective biodiversity conservation is therefore a better understanding of the interactions between local people and their environment.

In 2008 a PhD project was started to explore linkages between plant diversity and local plant knowledge in the Napf-region of Switzerland, a cultural landscape of national importance. The project aims at gaining insights into people and plant relationships in a mountainous area in central Europe, as a basis for applied projects in the fields of conservation, environmental awareness and education.

The present paper summarizes preliminary results and provides an overview of the local plant knowledge.

### Research area

The Napf-region, bounded by a circular valley structure, encompasses around 500 km<sup>2</sup> and belongs to the northern alpine foothills (Figure 1). It harbours 1,063 different plant species (WELTEN & SUTTER 1982, WOHLGEMUTH 1993). The central part of the region (1,61.4 km<sup>2</sup>) is registered in the Federal Inventory of Landscapes and Natural Monuments of National Importance, deserving to be protected and managed with the greatest possible care (BLN site Nr. 1311, 1983). In this inventory the *Napfbergland* is described as a „cultural landscape with exclusively solitary farms, shaped by pasture farming and plenter forestry“.

The border between the cantons of Berne and Lucerne runs across the summit of the Napf and divides the region in two parts with a protestant and a catholic background, respectively.



Figure 1: Research area: the Napf-region in Switzerland (map by author)

Because of the unique landscape, the cultural diversity and the solitary position of the farms which entail people to live in close contact with the environment, the Napf-region is well suited to provide new insights into biocultural diversity issues in mountainous central Europe.

## Methods

A stratified sample of 12 farms was chosen. In both, the protestant and the catholic part of the Napf-region, three organic and three conventional farms were randomly selected.

Each person living on every selected farm was asked for an interview. During August and September 2008 a total of 51 informants were interviewed comprising 28 men and 23 women, 10 to 71 years old. Overall, 27 of the informants live in the canton of Lucerne, 24 in the canton of Berne, 32 were interviewed on organic farms and 19 on non-organic farms.

The interviews were conducted individually. They consisted of a freelist, followed by a semi-structured interview (WELLER & ROMNEY 1988, BERNARD 2002). The informant was asked to list all indigenous plants he or she could think of and was then asked for the uses of every listed item.

In presence of the informants, the non-cultivated species were vouchered. The specimens were identified according to the Flora Helvetica (LAUBER & WAGNER 2007) and deposited at the Natural Museum of Luzern (NMLU) and the herbarium of the University of Zürich (Z).

The software packages Anthropac (BORGATTI 1996a) and SPSS 16.0 for Windows were used for Cultural Domain Analysis and statistical analysis (BORGATTI 1996b, BERNARD 2002). To detect variation of knowledge among the informants, the similarity of the answers was calculated and tested against sex, age, residence, religious background, farming system, family affiliation and agricultural formation by linear regression.

## Results

The 51 interviewees listed each between 7 and 108 plants (mean: 46.3;  $\pm 26.5$ ). They mentioned 439 different plant items (341 species, 37 varieties and subspecies, 55 generic terms; 8 undefined), including 185 cultivated plants and 10 fungi.

Only 14 species were mentioned by more than 50% of the informants (Table 1). The first place holds *Taraxacum officinale* which was named by 46 informants, followed by *Rumex obtusifolius* which was named by 39 informants. Of the 439 plants 223 were named only once or twice.

Table 1: The 14 most frequently named species and their uses in the Napf region in Switzerland (n=51)

| Species                    | Informants | Reported uses   |
|----------------------------|------------|---|
| Taraxacum officinale agg.  | 46         | <p><u>food&amp;fodder</u>: leaves for salad, flowers for jam and wine, root for coffee, forage plant for domestic animals and bees</p> <p><u>med</u>: leaves in salad cleaning the blood, root for tea (liver)</p> <p><u>deco&amp;play</u>: bouquets, several children's games (e.g. yellow make-up, whistles, blowing away the seeds, water pipes)</p> <p><u>other</u>: indicates by flowering resp. fruiting time for silage resp. hay harvesting</p>   |
| Rumex obtusifolius L.      | 39         | <p><u>food&amp;fodder</u>: alcohol made from roots</p> <p><u>med</u>: ointment from leaves against burns, fresh leaves relieving and cooling (varices, distortions, headache), tea from root for cows with "bad milk", seeds against diarrhea of cows, cows need to eat some for their fertility</p> <p><u>deco&amp;play</u>: leaves and green bugs to play with</p> <p><u>other</u>: roots loosen the ground, good compost</p>   |
| Rubus fruticosus agg.      | 34         | <p><u>food&amp;fodder</u>: fruits (eaten raw, jam, syrups, desserts, muesli), leaves in tea mixtures</p> <p><u>med</u>: tea of leaves (prostate, stomach ache), leaves against diarrhea of cows</p>   |
| Urtica dioica L.           | 32         | <p><u>food&amp;fodder</u>: leaves for cooking (spinach, soup, omelettes), dried plant good fodder, food for caterpillars</p> <p><u>med</u>: seeds good for immune system), tea of leaves (to clean the blood, drain the body, support the mind, for bladder and stomach, against fatigue)</p> <p><u>other</u>: manure and biological pest control in the garden, improves the soil</p>  |
| Abies alba MILL.           | 31         | <p><u>food&amp;fodder</u>: important food source for bees</p> <p><u>med</u>: branches fed to goats against worms</p> <p><u>deco&amp;play</u>: Christmas tree, advent wreath, branches for decoration</p> <p><u>other</u>: wood (firewood, construction, furniture, poles), branches to cover plants in the garden during winter, small dried twigs to light fire, shield between house and road, important for mistletoes, forest as place to relax</p>   |
| Picea abies (L.) H. KARST. | 31         | <p><u>food&amp;fodder</u>: jam of young leaves, important food source for bees</p> <p><u>med</u>: syrup of young leaves against colds</p> <p><u>deco&amp;play</u>: Christmas tree, branches for decoration, ornamental tree in the garden, cones to play with</p> <p><u>other</u>: wood (firewood, construction, furniture, cheese-boards, poles, shingles), cones to light fire, wood sold for cellulose production</p>  |
| Acer pseudoplatanus L.     | 30         | <p><u>food&amp;fodder</u>: important for bees</p> <p><u>deco&amp;play</u>: autumn leaves for decoration, fruits to put on nose and ears or to make propellers</p> <p><u>other</u>: hard and white wood (furniture, carving, construction, handles of tools, good firewood), shadow for grazing animals</p>  |
| Rubus idaeus L.            | 30         | <p><u>food&amp;fodder</u>: fruits (eaten raw, jam, syrups, desserts, muesli, vinegar, alcohol)</p> <p><u>med</u>: tea of leaves for pregnant women (facilitates birth)</p>  |
| Sambucus nigra L.          | 30         | <p><u>food&amp;fodder</u>: flowers deep-fried, puree of fruits eaten with potatoes, fruits for jam and liqueur, flowers for syrup and sparkling wine, goats eat the leaves</p> <p><u>med</u>: tea of flowers and syrup of fruits against colds, fever and cough, fruits in alcohol and then distilled also against colds, in the past in front of every stable an elder tree because it was said to prevent from hoof-and-mouth disease, stables in the past also fumigated with elder wood</p> <p><u>deco&amp;play</u>: small pieces of elder branches to make necklaces</p> <p><u>other</u>: leaves scare away mice</p> |
| Trifolium repens L.        | 29         | <p><u>food&amp;fodder</u>: high-protein forage plant (but if the cows eat too much, their horns will not grow nicely)</p> <p><u>deco&amp;play</u>: children suck nectar out of the flowers, leaves with four leaflets are dried as good luck charms (and occasionally given as a present to the girlfriend)</p> <p><u>other</u>: green manure</p>   |
| Trifolium pratense L. s.l. | 29         | <p><u>food&amp;fodder</u>: high-protein forage plant (mainly cultivated), nectar for bees</p> <p><u>deco&amp;play</u>: children suck nectar out of the flowers</p> <p><u>other</u>: green manure, nice to look at</p>   |

|                        |    |   |
|------------------------|----|---|
| Plantago lanceolata L. |    | <u>food&amp;fodder</u> : young leaves in salad, forage plant  |
|                        | 29 | <u>med</u> : tea of leaves (against colds, warming, expectorant), leaves grind and apply on wasp- and beestings, disinfecting on wounds, in Ricola candies  |
| Malus domestica BORKH. |    | <u>food&amp;fodder</u> : fruits (eaten raw, fed to the cows, eaten as pie, puree or dried, juice, to distill alcohol, for decoration), flowers important food for bees  |
|                        | 28 | <u>deco&amp;play</u> : beautiful when flowering, tree for climbing<br><u>other</u> : wood (firewood, occasionally for furniture), shadow for grazing animals  |
| Fagus sylvatica L.     |    | <u>food&amp;fodder</u> : fruits eaten   |
|                        | 26 | <u>deco&amp;play</u> : cupules of the fruits used to make necklaces or as decoration<br><u>other</u> : wood (very good firewood, for construction, furniture), sprouting leaves indicate spring, forest as place to relax |

Of the totally 439 plant items 368 were mentioned to have a use. *Taraxacum officinale* was by most informants (46) reported as useful species and got 85 use reports. It was followed by *Rubus fruticosus* (33/42), *Urtica dioica* (31/68), *Abies alba* (31/53), *Picea abies* (31/52).

The mentioned plant uses were assigned to 12 use categories. Food was the category with the most use reports (731), followed by fodder (433), medicine (292), and drink (277; Figure 2). The most broadly used species are *Abies alba* and *Picea abies*, occurring in nine use categories.

According to the regression analysis the plant lists were mainly influenced by age ( $R^2=0.483$ ,  $p<0.001$ ), professional education ( $R^2=0.356$ ,  $p<0.001$ ) and sex ( $R^2=0.254$ ,  $p=0.003$ ) of the informants

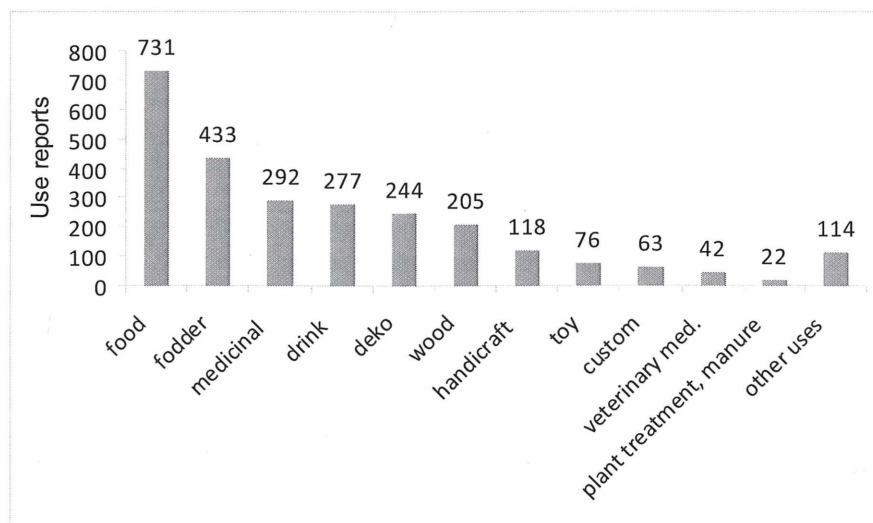


Figure 2: Use categories of the documented plant species in the Napf region, Switzerland (n=51)

## Discussion

A preliminary overview of the local plant knowledge reveals that the Napf-region is well suited for biocultural diversity research. While in a recent study 6,000 Swiss adolescents only knew five different plants (LINDEMANN-MATTHIES 2002), people in the Napf-region mentioned averagely 46 plants and therefore seem to have a broad plant knowledge. The two most cited species *Taraxacum officinale* agg. and *Rumex obtusifolius* L. are abundant species of the nutrient rich grassland in the Napf-region. Almost all (46) informants mentioned some uses for *Taraxacum*, but uses for *Rumex* were only occasionally indicated. This nasty grassland weed seems though to be of cultural significance: the general saying that farmers in the canton of Berne and Lucerne respectively handle it differently reflects the inner-Swiss cultural border following the Brünig-Napf-Reuss line (WEISS 1962). While the ethnotaxonomical knowledge of the people is mainly influenced by age, education and gender, further analysis of the use of culturally important plants may provide additional insight into cultural variation of plant knowledge and management (PFEIFFER & BUTZ 2005).

Most of the interview partners welcomed the present project and the idea to disseminate its results in the form of a popular book, which would contribute to the awareness and valuation of the local plant knowledge and plant diversity of the *Napfbergland*.

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