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Biocultural Diversity Monitoring - The use and management of biodiversity of wild gathered plant species in the Biosphere Reserve Großes Walsertal (Vorarlberg, Austria)

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Summary

Biosphere Reserves are known for their rich biodiversity. In the Sevilla Strategy 1996 it is claimed to *"reflect more fully the human dimensions of Biosphere Reserves"* (UNESCO 1995). A three years project aims to document the inextricable link between biological and cultural diversity in the Biosphere Reserve *Großes Walsertal*. From the beginning, the research process is linked to local actors and initiatives. Based on the results from 36 *Freelist* interviews (*Cultural Domain Analysis*) about gathered plant species a questionnaire was developed to send pupils from primary schools out for interviewing their parents and grandparents about topics related to gathering plants. 506 men and women from the valley participated in the survey. Almost all 20 plant species from the questionnaire (96%) were known by local people, 81% of the listed plant species were answered to be used as food or drink, in folk medicine, for customs and ornamental purposes. Semi structured interviews combined with participatory observation deepened a qualitative understanding for the cultural context in which gathering of wild plant species is embedded. This investigation provides a baseline for an ongoing monitoring process of local peoples' knowledge about wild gathered plant species in the *Großes Walsertal* to support various local initiatives and the Biosphere Reserve Management in their efforts for sustainable conservation and use of Biosphere Reserve resources.

Keywords

biocultural diversity, ethnobotany, local knowledge, gathered wild plant species, participatory methods

Duration of the project

15.05.2008 – 30.04.2011

Area of study

Biosphere Reserve *Großes Walsertal*, Vorarlberg, Austria

Introduction

In the Biosphere Reserve *Großes Walsertal* the diversity of wild gathered plant species is closely linked to local peoples' culture, profession and preferences. The establishment of the *Großes Walsertal* as UNESCO Biosphere Reserve in 2000 certainly increased local people's awareness of the value of nature. This project aims to raise people's consciousness for the worth of their local knowledge about nature, especially plants gathered in the wild, and promotes inter-generational transmission of knowledge about these plant species and their uses. It shall also highlight the role of women as users of biodiversity and their distinct forms of local knowledge. The project supports local initiatives in the Biosphere Reserve in their efforts for sustainable conservation of biodiversity and the Biosphere Reserve Management in the sustainable management of Biosphere Reserve resources.

Methods

In summer 2008, the first phase of field research, 36 persons (2 male, 34 female between 27 and 89 years old) living in *Großes Walsertal* were asked to list all plants they know which are gathered in the Biosphere Reserve (*Freelisting, Cultural Domain Analysis*; Weller & Romney 1988, Bernard 2002, Vogl-Lukasser et al. 2006). Sampling of the respondents was done as *snowball sampling* through recommendation (Bernard 2002).

With the 20 most frequently mentioned plant species a questionnaire was developed for the second phase of field research to find out if these plant species are collected and used by the inhabitants

of the valley. In spring 2009 all primary schools in the *Großes Walsertal* were involved with a special program for the children. After prior informed consent of the school authorities and the parents, 189 pupils were sent out for interviewing their parents and grandparents. In total 506 respondents were accessed by these pupils (146 male, 360 female between 7 and 84 years old).

Additionally, semi structured interviews and participatory observation (BERNARD 2002) deepened a qualitative understanding for the cultural and historical context in which gathering of wild plant species is embedded (GRASSER 2006).

Data analysis was carried out in MS Access (Microsoft 2007a), MS Excel (Microsoft 2007b), Anthropac (BORGATTI 1996) and SPSS (SPSS Inc. 2006). Mann-Whitney and Kruskal-Wallis tests were applied to test if people with different sociodemographic characteristics have significantly different knowledge and habits of wild plant gathering.

Results

In the *Freelist* interviews 142 different plant species were mentioned as being gathered in the Biosphere Reserve *Großes Walsertal*. The 20 most frequently mentioned plants were *Alchemilla alpina, Alchemilla vulgaris agg., Calendula officinalis, Sambucus nigra, Achillea millefolium agg., Hypericum perforatum, Rhododendron sp., Urtica dioica, Rubus idaeus, Mentha sp., Plantago lanceolata, Arnica montana, Primula sp., Abies alba, Matricaria chamomilla, Thymus sp., Salvia officinalis, Trifolium pratense, Taraxacum officinalis, Vaccinium myrtillus* (Table 1).

Table 1: The most frequently mentioned wild gathered plant species in the Biosphere Reserve *Großes Walsertal* (Freelists, n=36, frequency >15, in total 892 plants were mentioned).

German Name	Scientific name	Frequency	Rank	Smith's S
Silbermantel	*Alchemilla alpina*	30	8.233	0.588
Frauenmantel	*Alchemilla vulgaris agg.*	30	8.800	0.575
Ringelblume*	*Calendula officinalis*	29	10.621	0.490
Schwarzer Holunder	*Sambucus nigra*	29	13.931	0.388
Johanniskraut	*Hypericum perforatum*	28	11.893	0.465
Schafgarbe	*Achillea millefolium agg.*	28	10.821	0.474
Alpenrose**	*Rhododendron sp.*	26	11.308	0.413
Brennnessel	*Urtica dioica*	23	11.348	0.382
Himbeere*	*Rubus idaeus*	22	15.227	0.301
Pfefferminze*	*Mentha sp.*	21	10.762	0.379
Schlüsselblume***	*Primula sp.*	20	12.050	0.343
Arnika	*Arnica montana*	20	10.400	0.350
Spitzwegerich	*Plantago lanceolata*	20	10.300	0.358
Kamille*	*Matricaria chamomilla*	19	15.789	0.235
Tanne	*Abies alba*	19	12.947	0.316
Salbei*	*Salvia officinalis*	18	14.611	0.228
Wilder Thymian	*Thymus sp.*	18	12.778	0.275
Rotklee	*Trifolium pratense*	17	12.588	0.266
Heidelbeere	*Vaccinium myrtillus*	16	17.250	0.167

* Respondents were asked for „wild species gathered". Nevertheless respondents also mention species i) gathered in the wild earlier and now grown in gardens and ii) cultivated species.

** Under the term *Rhododendron sp.* are sub summarized *Rh. ferrugineum* and *Rh. hirsutum* as the respondents do not seem to distinguish in their local name "Alpenrose" between these two species. Some respondents use it as the generic term, for some respondents they are just the same plant. Only a few would distinguish between *Rhodedendron ferrugineum* and call it "Alpenrose" and *Rhododendron hirsutum* and call it "Steinrösli".

*** Under the term *Primula sp.* are sub summarized *Primula elatior* and *Primula veris*. Only few respondents distinguished between Primula elatior which they call "Schlüsselblume" and *Primula veris* which they call "Himmelschlüssel". Usually the local name "Schlüsselblume" and "Himmelschlüssel" were used similarly.

In the survey done by pupils almost all of these 20 plants (96 %) were known by local people. 81 % of the listed plants were answered to be used for drinks and as food, in human folk medicine or veterinary folk medicine and in customs, a few for "other purpose" (e.g. fertilizer, decoration) (Figure 1, Table 2). First results show that women know (Mann-Whitney-Test, p=0,000) and use (p=0,000) more plants than men. Older people know (p=0,000) and use more than younger ones (p=0,014).

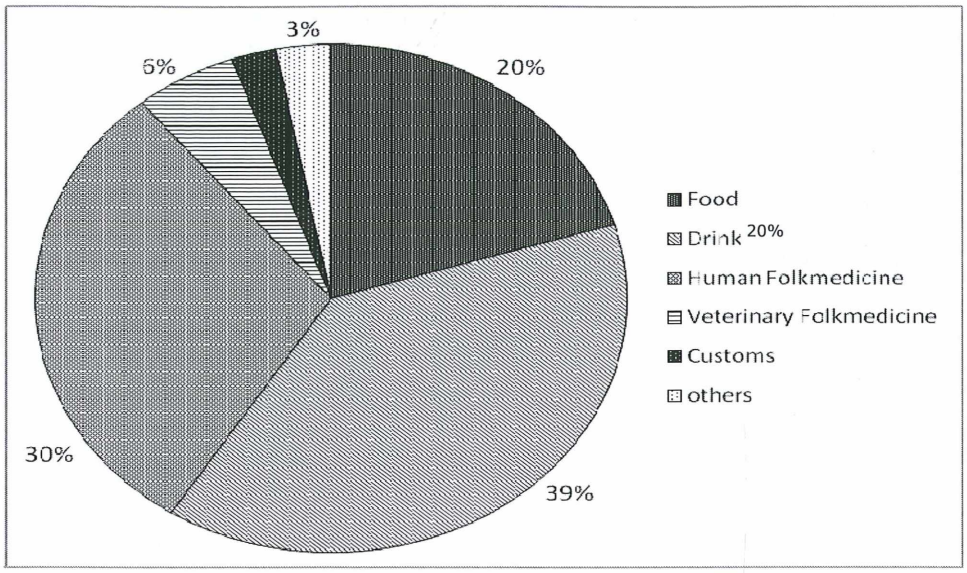

Figure 1: Percentage of mentions of different uses of plants classified according to different use in the Biosphere Reserve Großes Walsertal (Questionnaire, n=506)

Table 2: Use categories, examples of uses and of wild gathered plant species used in the Biosphere Reserve *Großes Walsertal* (Questionnaire, n=506, in total 2186 uses for the 20 plants were ticked, multiple answers possible)

Category of use	**% of mentions**	**Examples of use**	**Examples of used plants**
Drink	39%	tea	leaves from *Melissa officinalis*
		syrup	flowers from *Sambucus nigra*
		liqueur	berries from *Vaccinium myrtillus*
		schnapps	roots from *Gentiana lutea*
Human folkmedicine	30%	tea against cough	flowers from *Tussilago farfara* or *Primula veris*
		ointment	flowers from *Calendula officinalis*
		oil	*Hypericum perforatum*
		schnapps	flowers from *Arnica montanum*
Food	20%	"honey"	young sprouts from *Abies alba*
		"spinach"	*Urtica dioica*
		salad	leaves from *Taraxacum officinalis*
		spices	*Thymus sp.*
Veterinary folkmedicine	6%	tea against diarrhoea	flowers from *Matricaria chamomilla*
		ointment	
		oil	
		schnapps	roots from *Osthruthium peucedanum*
Customs	2%	„Alpabtrieb" incense	*Rosmarinus officinalis, Juniperus communis*
		blessed herbs (e.g. at Easter)	*Salix sp.*
others	3%	insecticides against moths	*Lavandula angustifolia*
		decorations such as bouquets	*Rhododendron sp.*
		flowers in salad bathing, hair washing	*Bellis perennis, Urtica dioica*
		herb-cushions	*Valeriana officinalis*
		"Krisimann"	*Prunus avis*
		incense in the beehouse for disinfection	*Tanacetum vulgare*

Additional comments in the questionnaire point out the importance of transmitting plant knowledge to the children (*"dass das Wissen über Kräuter und deren Verwendung den jungen Menschen weitergegeben wird"*). Interviewees also highlighted the great treasure of nature which has to be appreciated and which requires a respectful and sustainable management in use (*"dass die Kräuter, Gräser und Früchte der Natur geschätzt und in Ehren gehalten werden; dass auch unsere Kinder lernen, dass es etwas besonderes ist und unser Gott das alles uns gibt"*). They seem to have a great awareness for their environment and high ethical perception when gathering wild plants (*"dass meine Kinder behutsam mit der Natur umgehen"*). Therefore it often was mentioned to take good care of nature also when you are taking something away from it.

People's respect for plants is also demonstrated in traditional sayings:

"Vorr m a Holderbomm sött ma da Huad aobneh."

(translated as: "You should pull your hat and bow to an elder tree.")

As one example, people in the valley use the flowers, berries and leaves of the elder tree (*Sambucus nigra*) for different purposes and seem to adore it as a very beneficial and valuable, almost sacred plant. Furthermore, some respondents explain that if an elder tree is growing close to your house the lightning won't strike it. Hence, as shown with this example, plant knowledge and use is closely linked with cultural beliefs and values.

Conclusion

The intergenerational transmission of knowledge is an indicator for the value and vitality of knowledge. This has significant implications for the continued use, and thus sustainability, of aspects of culture that contribute to biodiversity conservation (Maffi 2008).

Involving schools in data collection raised the consciousness of many local people in the Biosphere Reserve *Großes Walsertal* concerning the issue of plant gathering and use. When children and grandchildren asked older people about plant gathering, the adults became aware that their knowledge is not "just common and nothing special", as they often mentioned, but absolutely worth to be transmitted. The children themselves got curious about plant gathering and started to perceive their surrounding nature with more open eyes. The results were disseminated to and through the children in schools and in the local newsletter from the Biosphere Reserve to carry on the discussion. The school project initiated a process of exchange and transmission of knowledge which is now continuing "by itself". Children are tomorrow's generation!

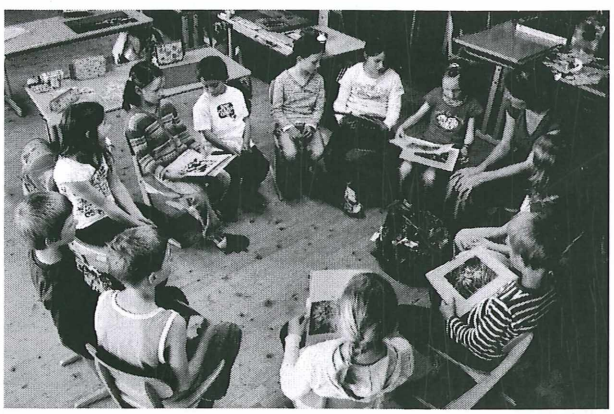

Figure 2: Discussing plant species by means of puzzle-pictures, dried and fresh gathered plant species and several products made from wild gathered plant species with children in the primary school Blons, Großes Walsertal (Photo: Stähele 2009)

Figure 3: Woman collecting „Bärlauch" (Allium ursinum) (Photo: Grasser 2009)

Figure 4: „Alpabtrieb"– going down with livestock from Alpe Laguz to Raggal (Photo: Grasser 2008)

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