

Utilisation of non-wood forest products in the Czech Republic

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Abstract. Utilisation of non-wood forest products in the Czech Republic is possible to divide to public use and commercial use. Non-wood forest products in public use are very popular among people during recreation activities. The most popular products are mushrooms and blueberry which are the main two forest products collected in forests. Forest berries and mushrooms are demanded and purchased by commercial companies. Medicinal plants are mostly collected for commercial use and there are companies engaged in purchase and plant processing to herbal teas or medicines. Christmas tree plantation is recently popular business activity. People prefer Christmas trees of exotic coniferous to local species obtained from first thinning.

Key words: mushrooms, forest berries, medicinal plants, Christmas trees.

Abstrakt. Wykorzystanie ubocznych produktów leśnych w Republice Czeskiej. Leśne produkty uboczne można podzielić na te do użytku publicznego i do wykorzystania komercyjnego. Uboczne produkty leśne w użytku publicznym są bardzo popularne wśród ludzi w czasie rekreacji. Najpopularniejsze produkty są grzyby i borówki – dwa główne produkty leśne zbierane w lasach. Jagody leśne i grzyby są pożądane i kupowane przez firmy komercyjne. Rośliny lecznicze zbierane są głównie do użytku komercyjnego, istnieją firmy zajmujące się skupem i przetwarzaniem roślin na herbaty ziołowe lub leki. Plantacja choinek jest ostatnio popularną działalnością. Ludzie wolą choinki z egzotycznych gatunków iglastych od lokalnych uzyskanych z pierwszej trzebieży.

Słowa kluczowe: grzyby, jagody leśne, rośliny lecznicze, choinki.

Introduction

Non-wood forest products (NWFPs) are very important part of forest ecosystem products for people, especially for inhabitants in countryside. Forest berries, mushrooms, Christmas trees, foliage or medicinal plants are typical non-wood forest products which are connected with forests. Mushrooms and forest berries are typical NWFPs which are popular among forest visitors. On the other hand these products have an economic value for forest owner and countryside inhabitants.

The gathering of berries is economically and socially important in this context because most of people collecting them belong to the poorest categories of rural population (unemployed, gypsy minorities). The berries and mushrooms are collecting for completing the inhabitants' winter food provision. The gathering may have not economic value, but a recreational one only, especially for the urban population (Bouriaud et al. 2005).

It was observed a slightly decreasing trend of collected amounts of NWFPs by households with an increase in the average monthly household income; the research did not prove any statistically significant relationship between the two aspects. The correlation coefficient for the total amount of collected NWFPs and the category of average monthly income per household member in the Czech Republic data sets reached a very low level (equal to -0.10). Therefore, it can be said that there is not a significant relationship between the amount of collected NWFPs and the average income of the households (Šišák 2006).

Collecting NWFPs is considered as a very important recreational activity. Only a small part of the population collecting NWFPs (about 12%) collect NWFPs to save money, and even a lower proportion of the population sell NWFPs in the market to increase their income, about 1.5% of those who pick NWFPs (Šišák 2006).

Materials and methods

Recreation picking is shown on the data of mushrooms and berries collection in the Czech Republic. Source data were obtained from Report of the Ministry of Agriculture (2013) and Czech Statistical Office (2013). Situation on market is based on author's market research.

Results and discussion

Free picking of NWFPs and dry branches for personal use in all forests with limitations for protected areas and Ministry of Defense forests is allowed in our forest act No. 289/1995 Coll. Regulation of commercial utilisation of NWFPs in forest act is missing.

Tab. 1. Forest fruits collection, mill. kg
Tabela 1. Zbiór owoców leśnych, mill. kg

Year	Forest Fruits						Total
	Mushrooms	Blueberries	Raspberries	Blackberries	Cranberries	Elderberries	
2000	23,8	8,7	4,1	2,7	0,7	1,8	41,8
2001	23,4	8,9	3,7	2,3	0,7	1,4	40,4
2002	21,2	10,9	3,6	2,1	0,9	2,1	40,8
2003	13,5	6,5	2,6	2,0	0,4	1,4	26,4
2004	13,7	6,1	2,1	1,5	1,8	1,4	26,6
2005	19,5	7,6	2,6	1,3	0,8	1,3	33,1
2006	26,0	9,4	2,9	1,5	1,0	1,3	42,1
2007	29,8	10,0	2,6	2,0	0,7	1,8	46,9
2008	15,2	4,6	1,1	0,6	0,5	0,9	22,9
2009	16,2	7,5	1,0	0,9	0,5	1,3	27,4
2010	24,7	9,4	2,1	1,8	0,3	0,7	39,0
2011	29,6	8,9	2,1	2,3	1,1	2,3	46,3
2012	32,8	6,8	3,4	3,2	0,3	2,2	48,8
Average	22,3	8,1	2,6	1,9	0,7	1,5	37,1

Mushroom picking is the most interesting activity of the Czech people in forest. Average picked yield of more than 22 mill. kg of mushrooms (Table 1) is approximately 2 kg per inhabitant of our country. It shows that mushrooms picking is very popular in the Czech Republic. Total yield of picked mushrooms depends on weather conditions of each year because mushrooms are very sensitive to correct portion of moisture and temperature.

Mushroom picking and trade is very popular and there are several companies which purchase mushrooms from our forests. Legal regulation allowed collecting mushrooms and other products just for personal use. Commercial utilisation is not mentioned in Forest act. Processing of mushrooms is legally regulated and a company which purchase, process and sell mushrooms or mushrooms products. These companies have to have certified workers who passed exam and are able to recognize 63 wild edible mushrooms, 22 planted species and 20 poison mushrooms species defined in Regulation No. 475/2002 Coll., of Ministry of Health. Import and export of mushrooms (Table 2, Table 3) is not so important and is lower than weight of collected mushrooms by inhabitants.

Tab. 2. Trade with *Boletus* sp.

Tabela 2. Handel Boletus sp.

Year	Import	Export
2005	2733	27
2006	1719	150
2007	1213	223
2008	338	10686
2009	285	130
2010	1704	3
2011	150	65
2012	3406	409

Tab. 3. Trade with *Cantharellus* sp.

Tabela 3. Handel Cantharellus sp.

Year	Import	Export
2005	3115	56
2006	1036	336
2007	924	
2008	1850	562
2009	1367	36
2010	1162	
2011	1076	
2012	6090	3260

Blueberries (average picked yield of more than 8 mill. kg) and raspberries (average picked yield of more than 2 mill. kg) are very popular due to excellent taste and flavour characteristics. These two berries are very important source of nutrients, vitamins and biologically active compounds for human health. If we compare amount of collected blueberries and raspberries with import of these berries (Fig. 1, Fig. 2) we see that it is just small portion of consumption in our country. There are several companies engaged in purchasing of forest fruits.

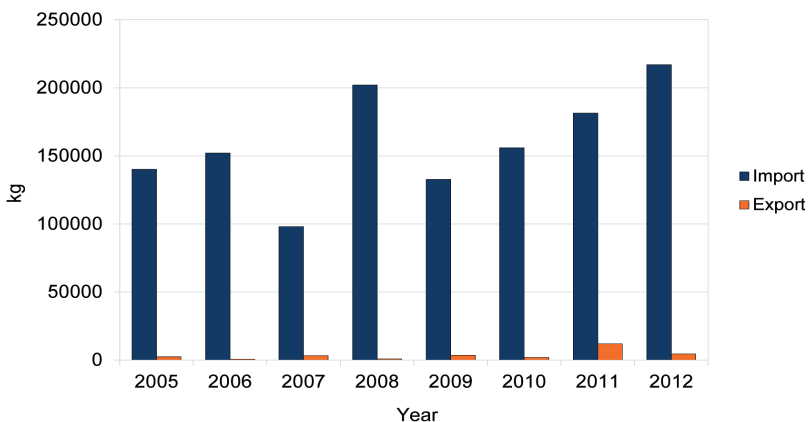


Fig. 1. Trade with blueberries
Ryc. 1. Handel borówką

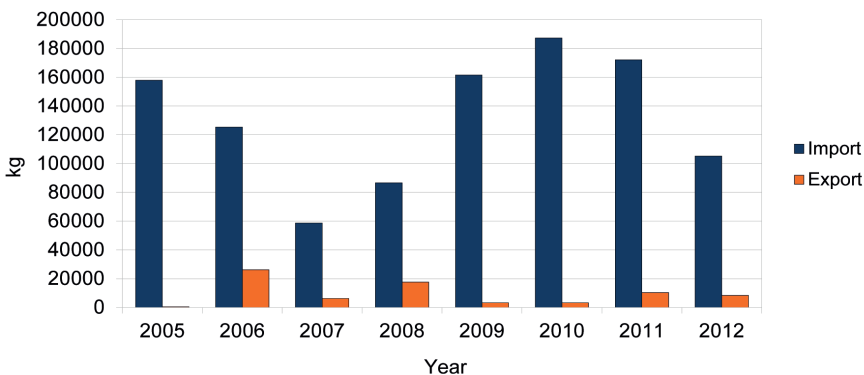


Fig. 2. Trade with raspberries
Ryc. 2. Handel malina

Economic value of forest fruits is showed in Table 4. Especially total value of recreationally picked forest fruits is really high and it should be potential income for local people. Income from NWFPs has potential for stabilizing of countryside inhabitants and encouraging of local economy. Economic value of forest fruits is about 30% of total incomes of forest sector from timber production.

Tab. 4. Forest fruits collection in current prices, mill. CZK

Tabela 4. Zbiór owoców leśnych w cenach bieżących, mill. CZK

Year	Forest Fruits						
	Mushrooms	Blueberries	Raspberries	Blackberries	Cranberries	Elderberries	Total
2000	2 087	628	290	218	66	72	3 361
2001	2 298	710	294	176	65	93	3 636
2002	1 922	821	261	162	89	111	3 366
2003	1 399	562	218	170	36	80	2 465
2004	1 420	538	198	138	194	102	2 590
2005	2 048	670	246	125	85	101	3 275
2006	2 677	849	257	130	103	103	4 119
2007	3 415	967	245	185	78	139	5 029
2008	1 968	430	106	63	71	57	2 695
2009	2 056	725	99	91	64	111	3 146
2010	2 950	920	215	187	35	63	4 370
2011	4 313	921	208	234	142	177	5 995
2012	5 241	762	422	382	45	222	7 074
Average	2 600	731	235	174	83	110	3 932

Forest fruits picking belongs to recreation activities closely connected with forest. The most popular activity based on survey among forest visitors (Report 2013) is picking of mushrooms, blueberries, raspberries and blackberries (Fig.3). Forest visitors supposed picking activities as active way of recreation (Šišák 2006).

Medicinal plants purchasing has long history and new companies are working in this market. Part of medicinal plants is utilised in pharmaceutical products and teas, what is defined in medical regulation. Medicinal plants with lower concentration of active substances should be use as a drinking tea. There are a lot of medicinal plants species and there is no precise statistics about production, export and import.

Christmass tree plantation is growing segment of NWFPs. People prefer Christmas trees of exotic coniferous to local species obtained from first thinning. Diferent fir species (*Abies nordmanniana*, *Abies Koreina*, *Abies concolor*, *Abies lasiocarpa* var. *Arizona*, *Abies veitchii*, *Abies magnifica* var. *Shastensis*, *Abies fraseri*, *Abies procera*) from Caucasus and North America are use on plantations together with our domestic coniferous species. Price of exotic fir Christmas trees are two time higher compare to spruce tree species.

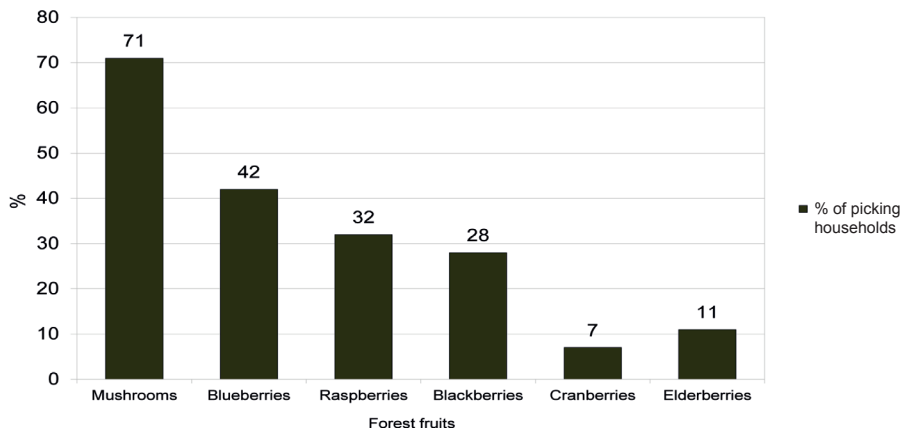


Fig. 3. Share of households picking forest fruits and mushrooms in 2012

Ryc. 3. Udział gospodarstw domowych zbierających owoce leśne i grzyby w 2012

Extracts from birch bark are well known substances with high potential of usage in medicine. New substances in birch bark were founded by research team of Charles University (Sarek et al 2005) and named betulinines. Betulinines have international patents labelled WO0190136, WO0190146, WO0190196. Betulinines are tested in hospital as potential new nature based medicament with anticancer activities.

Conclusion

Influence of recreation on total volume of picked forest products is very high. On the other hand non-wood forest products have high potential for commercial utilisation and countryside conservation. These products make easier possibilities for encouraging of local economy and inhabitants incomes. New possibilities are in extraction products from forest ecosystems. Birch extracts are good example of new way of forest utilisation.

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