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Forest as stronghold of Local Ecological Practice: currently used wild food plants in Polesia, Northern Ukraine

Running title: FOREST AS STRONGHOLD OF LOCAL ECOLOGICAL PRACTICE

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Abstract

Local Ecological Practice (LEP, e.g. the everyday practice of collecting and using plants, including wild food plants) is shaped by nature (available local resources) and culture (local knowledge on their usability) that includes a multitude of factors, among which language and geographical or cultural separation have been found to play crucial roles in affecting biocultural diversity. Also, proximity to the forest has been shown to increase the use of plants. We conducted ethnobotanical fieldwork within Eastern and Western regions of Ukrainian Polesia, during which we interviewed 118 people. Through semi-structured interviews, we recorded the distribution of the current uses of 70 wild food taxa. The analysis of use records revealed homogeneous distribution of use despite the geographical distance and different spoken dialects; however, we were able to single out the highly sylvan region of Eastern Polesia as the area with highest biocultural diversity for the use of wild food plants. The results suggest that in the context of the overall homogenization of local ecological knowledge, the continued existence of unintended contact with nature through living and working in the forest may be the primary factor maintaining the broader LEP in the sylvan area of Eastern Polesia.

Abstract in Ukrainian

Місцева екологічна практика (МЕП, що включає повсякденну практику збору та використання дикорослих рослин у їжу) формується природою (місцевими ресурсами) та культурою (місцеві знання про їх використання), що включає безліч чинників, серед яких мова та географічне або культурне відокремлення відіграють вирішальну роль у впливі на біокультурне різноманіття. Також показано, що близькість до лісу збільшує використання рослин. Ми проводили етноботанічні польові роботи у двох областях Українського Полісся, в ході яких ми провели інтерв'ю з 118 людьми. За допомогою напівструктурованих інтерв'ю ми задокументували поточне використання 70 таксонів дикорослих рослин у їжу. Аналіз записів про вживання свідчить про однорідний розподіл використання, незважаючи на географічне розташування та різні розмовні діалекти; однак, ми змогли виділити лісистий регіон Східного Полісся як територію з найвищим біокультурним різноманіттям використання дикорослих рослин у їжі. Результати свідчать, що в контексті загальної гомогенізації місцевих екологічних знань, продовження існування контакту з природою живучи та працюючи в лісі може бути основним чинником, який підтримує ширшу МЕП у лісовій зоні Східного Полісся.

Keywords: Local Ecological Practice; wild food plants; Ukraine; Polesia; ethnobotany; forest

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Introduction

The world's biocultural diversity (“the diversity of life in all its manifestations (biological, cultural, and linguistic) which are interrelated within a complex socio-ecological adaptive system” (Maffi and Woodley 2012)) is rapidly declining due to disappearing plant and animal species and the homogenization of cultures and languages. In order to mitigate this process, it is important to understand the possible strongholds for biocultural diversity. The use of wild food plants (e.g. plants growing without the direct human intention of cultivating them for food purposes) is a good example of biocultural diversity in action and a compact part of Local Ecological Practice (LEP). While Local Ecological Knowledge (LEK) is also dynamic (Gómez-Baggethun and Reyes-García 2013), we want to underline the fact that LEK can be passive (cf. Reyes-García et al. 2007), and that the term “knowledge” itself is often perceived as something passive. We thus decided to use the term LEP instead of LEK. Although the term LEP was defined in the 1990s (Ravi Rajan 1998) and, of late, it has occasionally been used in the context of social-ecological memory (Barthel et al. 2014) or food safety governance (McMahon 2013), it has not yet found its way into the ethnobiology literature.

The local use of wild food plants is now a popular research subject as it represents nutrition diversification, a so-called functional food option (Blades 2000) in times of abundance, as well as a security reserve during times of crop failure or human-induced famine (Redžić and Ferrier 2014; Vorstenbosch et al. 2017). The use of wild food plants is shaped by numerous factors, among which language has been found to play a crucial role in affecting biocultural diversity by limiting knowledge diffusion (Maffi 2005; Pieroni and Quave 2005).

Among other factors, geo-politics (i.e. changes to state borders, Sõukand and Pieroni 2016), ethnicity (Pieroni and Quave 2005), religion (Bellia and Pieroni 2016; Pieroni et al. 2011), socio-economic conditions (Stryamets et al. 2015) and remoteness (Bussmann et al. 2016) were found to have a strong influence on the use of wild food plants. The use of wild food plants, compared with the use of medicinal plants, is more homogeneously distributed within a population (Sõukand et al. 2017) and more evenly shared by different ethnic groups inhabiting the same ecological niche (Quave and Pieroni 2015) or the same ethnos divided by a state border (Sõukand and Pieroni 2016). Uses of wild food plants are mainly learned during childhood and nowadays are often subject to abandonment rather than valorization (Kalle and Sõukand 2016; Reyes-García et al. 2015).

Our recent studies conducted among the Bukovinian Hutsuls and Boikos in Ukraine have shown that state borders (between Ukraine and Romania) in close proximity are more effective diversifiers within the wild food domain than mountains separating ethnic groups and dialects (Pieroni and Sõukand 2017; Sõukand and Pieroni 2016). Moreover, our study comparing the use of wild food plants by Boikos and Hutsuls (Pieroni and Sõukand 2017) supported the possibility of a homogenizing and standardizing effect of agrarian reforms (including collectivization, amelioration, substitution of small-scale agriculture with an intensive one) and the obligation to work on collective farms in the former Soviet Union.

As the numbers of interviewees in our previously mentioned studies were relatively low, there was a need to increase the number of participants. Therefore, we decided to compare the current use of wild food plants within two regions of present-day Ukrainian Polesia which, due to vicissitudes of

the first part of the 20th century, were subjected to different socio-economic and political factors, as one region belonged to the Soviet Ukraine, while the other to Poland. Although both research sites now belong to one country (Ukraine), the Chernobyl disaster area lies in between them, dividing the region that extends over quite a large territory with similar ecological conditions and within presumably one ethnic group. The bird's-eye distance between the two research sites is circa 400 km, traversable in about 8 hours by car.

Polesia is also referred to as “the land of forest,” and this introduces an additional perspective. Several recent scholarly works conducted in rural Africa have found a correlation between the level of deforestation and the variety of the used wild food, the level of dietary diversity, and nutrient density (Maseko et al. 2017 and the references therein). Broegaard et al. (2016) demonstrated that “wild food contributed less to human diets in areas where pressure on land from commercial agriculture and conservation efforts was more intense.” These authors also suggested that the relationship between forest and land use change must be further investigated. Therefore, as locations of the villages in one of the selected regions provided the opportunity to differentiate based on proximity of the forest, we wanted to establish if proximity affects the extent of LEP.

The current research aimed to contribute to a better understanding of the factors affecting the practice of collecting food from the wild and particularly within the Post-Soviet realm. The specific objectives of the study were: a) to document the use of wild food plants in two separate research sites of Ukrainian Polesia; b) to quantitatively compare the results obtained from the two regions; and c) compare the results obtained from sylvan and woodless areas situated nearby, in order to evaluate whether “living within the forest” affects the use of plants and to what extent.

The current use of wild food plants in Ukraine (as well as neighboring regions of the Russian Federation and Belarus) remains a little-studied subject, limited to only five field-work based publications (Łuczaj et al. 2013; Pieroni and Sõukand 2017; Styramets et al. 2015; Sõukand and Pieroni 2016; Sõukand et al. 2017), two recently published studies based on archival sources (Kujawska et al. 2015; Łuczaj 2008) and the pionering work of Moszyński (1928) in a Polesia not yet divided by borders. Polesia is an important region because of its relative isolation and borderland status. The current study is therefore an essential addition to the existing literature.

Data and methods

The land of the forest

The Encyclopaedia of Ukraine describes the Polesia region as Ukraine's forest belt, covering approximately 100,000 sq km. Greater Polesia includes Polesia proper and several neighboring areas (including Chernihiv Polesia). The whole region is a uniform lowland plain with few higher elevations and valleys; large areas are covered with dunes. Polesia belongs to a temperate continental climate zone which has high humidity, and the region is characterized by foggy autumns, mild, snowy winters and warm but humid summers with an average annual temperature of around 7°C. Polesia is well supplied with water, with many lakes, especially in the western part, and nearly 70 percent consists of low fertility (podzolic) soils. Vegetation of the region belongs to the mixed forest subzone of the East European broad-leaved forest zone. Historically the region was completely covered with forest (dominated by *Pinus sylvestris* L., *Quercus robur* L. and *Betula* spp.) and marshland, but only one-third of present-day Polesia is occupied by forest due to

deforestation (which occurred in the second half of the 19th century) and the growth of swamps (Kubijovyč et al. 1993).

Both sites selected for comparison presently belong to the Ukrainian Polesia. The distance between Ljubeciv and Chernihiv is ca 600 km by car. People living in the Chernihiv region speak a mixture of Russian and a little Belarussian, and although they call themselves Ukrainians, very few speak standard Ukrainian. Those living in the Ljubeciv region speak a Polesian dialect, which is something between Ukrainian and Belarussian, very similar to standard Ukrainian. The second author, being fluent in both Ukrainian and Russian, routinely inquired about preferred language of the interview. Notably, without exception Ukrainian was the preferred language for the Ljubeciv region whereas in the Chernihiv region the interviewees preferred Russian. The Chernihiv region is technically on the borderland of Polesia proper and Chernihiv Polesia, which historically had similar ecological communities, but currently different extent of forestation. While the villages in the Ljubeciv region were all within about a 1-2 km distance from the nearest forest, the locations of the villages in the Chernihiv region provided the opportunity to differentiate based on proximity of the forest. The villages that we will later refer to as the “sylvan area” of Chernihiv were situated within the forest, while the villages of so-called “woodless area” were at least 5 km away from the nearest forested zone. The woodless area was the result of relatively recent deforestation (within the lifetime of oldest interviewees, many of them mentioning going to the woods during childhood, but now “the forest being too far away”).

Both sites have belonged to the Ukrainian side of the present-day Ukrainian-Belarus border since the 1940s, but were subjected to considerably different influences between the 1920s and 1940s. In 1921 the Peace Treaty of Riga ascribed all of eastern Polesia to the USSR, leaving western Polesia to Poland. This division resulted in the high Polonization of western Polesia with the Ukrainian language not recognized on an official level (Cichoracki 2014). At the same time, eastern Polesia was subjected to Holodomor, the artificial famine imposed in 1932-1933 by the Soviet regime across large areas, including all of eastern Polesia. Wolowyna et al. (2016) estimated the total direct loss from Holodomor in the Chernihiv region among rural populations to be 254 thousand (slightly less than 1%), which is relatively low compared to other regions.

Among the nearly 120 people approached, we succeeded in interviewing one survivor of the *Holodomor* and altogether over 30 people born before 1942, who remembered the hardships of the 1940s during WWII or after it. Many of them repeatedly stressed that it was the forest that saved them from starvation, and a few even testified that they do not remember extreme hunger in their villages due to the availability of forest foods.

Field study

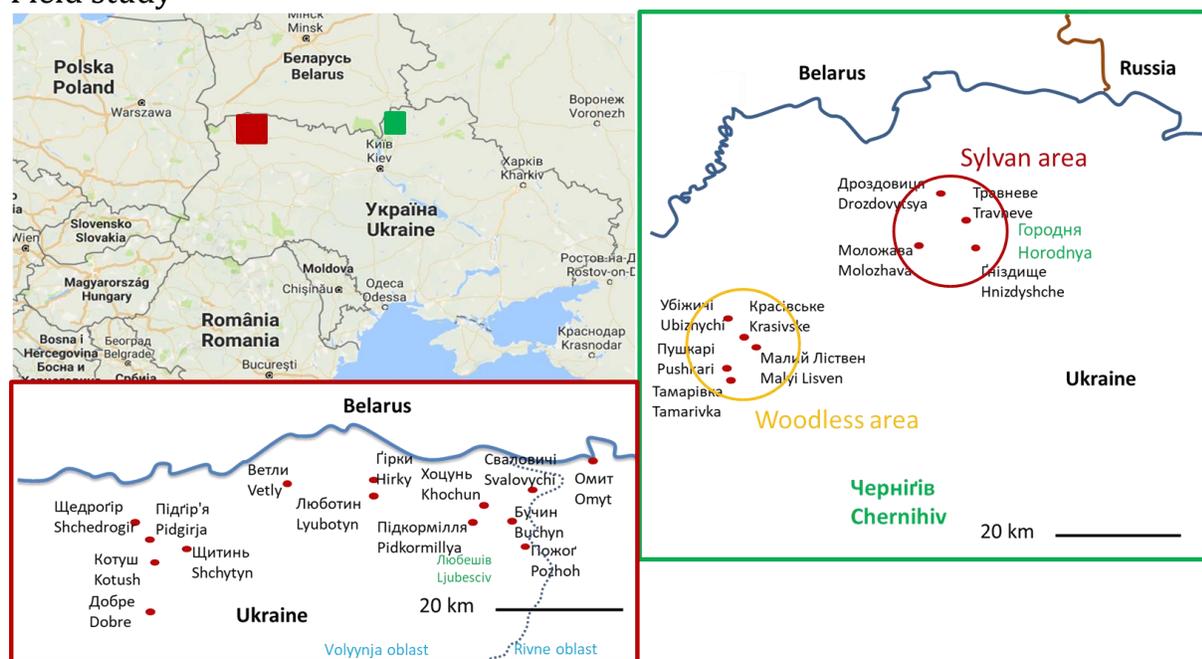


Figure 1. Map of the region.

We conducted the field study in October 2016 in 9 villages in the Chernihiv region and 14 villages in the Ljubeciv region of Ukrainian Polesia (Figure 1). The majority of 118 interviewees were approached on a pseudo-random basis (people working in their gardens or walking along the street), yet occasionally a snowball method was used to locate elderly people. We followed the ethical guidelines prescribed by the International Society of Ethnobiology (ISE 2008). Before beginning the interviews, the purpose of the research was explained and oral informed consent was obtained from the participant(s). The interviews (lasting from 0.5 to 1.5 hours) had a semi-structured format, with the subject of wild food plants approached through intuitive food categories (e.g., soups, preserves, salads, snacks, fresh fruits, fermentation, bread, recreational teas). In total 69 interviews were conducted, of which 37 were individual interviews, 26 interviews were conducted with two individuals, five interviews were carried out with three people, and one with four individuals (interviewees worked or lived together, or neighbors were encountered while visiting each other). In the case of group interviews, disagreements, as well as agreements, were carefully recorded. The interviews were recorded in order to better extract the data, but this was done so only with the permission of the interviewees and upon a promise not to disclose nor deposit recordings. In parallel (and in few cases where recording was not allowed), information was directly transcribed into field notebooks, which are deposited at the Folklore Institute Archives of the Estonian Literary Museum. All interviews were conducted anonymously, with only age, gender, and origin of the interviewee recorded. Only locally born people were interviewed. Men represented 29% of the sample; mean age of all interviewees was 60.5 years, and birth year ranged from 1924 to 2002. The majority of the interviewees from the Chernihiv woodless area and all interviewees from the Ljubeciv region are or were (before retiring) involved with the collective farm. Later private agricultural enterprises replaced collective farms. Conversely, more than half of the interviewees in the Chernihiv sylvan area were involved to a greater or lesser extent in

forestry work (as forest-managing collective farms and later enterprises were the primary employers in the region).

Local plant names were transcribed following the rules of standard Ukrainian and Russian using the Cyrillic alphabet.

We collected few voucher specimens (deposited at the Estonian University of Life Sciences herbarium (TAA), bearing numbers POLEG001-7 and herbarium numbers TAA0140964-70). As the time of the field visit was the off-season for live plant collecting, we accepted dried plant samples offered by the interviewees (deposited at the Folklore Archives of the Estonian Literary Museum, bearing numbers POLED001 – 45).

Whenever it was not possible to collect voucher specimens or receive dried plant samples, identification was made based on the folk botanical name and precise description of the plant. In a few cases, when interviewees did not differentiate taxa at the species level, it was identified at the genus level, even if we collected dried plant samples for some representatives of the genus (for example *Rumex* and *Rosa*). We followed this practice as there is no guarantee that interviewees, at some point in their lives, did not collect representatives of other local growing species belonging to the same genus. Taxonomic identification, botanical nomenclature, and family assignments followed the Flora Europaea (Tutin et al. 1964), The Plant List database (2013), and the Angiosperm Phylogeny Group IV (Stevens 2015).

Data analysis

Information was assembled into an Excel database following emic (interviewee defined) food categories. In sum, we defined 21 use-categories (additives to fermentation, beer, boiled for food, compote, dessert, drink, fruit water, jam, raw, juice, kvass, *okroshka* (or cold soup), pies, salad, snacks, soup, strong alcohol, syrup, tea, wine and wraps). The data was structured in detailed use-reports (DUR) reflecting the use of a plant part (e.g. fruits, leaves, aerial parts, flowers, etc.) prepared in a certain way (e.g. cooked, fresh) for a certain food category multiplied by the number of people mentioning such a use. We also calculated use instances (UI - the detailed use-report regardless of the number of people mentioning such a particular use) for comparison.

Further, we compared current UIs and taxa recorded for the Chernihiv and Ljubeciv research sites and also dividing the Chernihiv research site into two regions, sylvan and woodless areas, to address the question of the possible influence of the proximity of the forest. Jaccard Similarity Indices (JI) were calculated for used taxa and UI following the methodology of González-Tejero et al. (2008):

$$JI = (C/(A+B-C)) \times 100$$

where A represents the number of taxa/UI in sample A, B is the number of taxa/UI in sample B and C is the number of taxa/UI common to A and B.

Results

We recorded current uses for 70 taxa belonging to thirty-three plant families (Table 1), of which the most represented were Rosaceae (fourteen taxa), Ericaceae and Asteraceae (both eight taxa) and Lamiaceae (six taxa). The majority of the fruiting taxa were utilized in a wide variety of emic food uses. Of these taxa, the most versatile was *Vaccinium vitis-idaea* L., used in nine emic food

categories mainly related to (sweet) winter preserves but also recreational tea, followed by *Viburnum opulus* L., *Rubus idaeus* L., *Vaccinium oxycoccos* L., and *Vaccinium myrtillus* L., all used in eight food categories similar to the “leader.” *Vaccinium oxycoccos* was the only taxa for which solely fruits were used; for the others aerial parts, twigs and leaves (*Rubus idaeus*) or flowers and leaves (*Viburnum opulus*) were also used, mainly for making recreational tea. Among twenty other taxa used in more than two food domains, there were only five that do not produce so-called fleshy fruits, such as *Betula* spp. (buds and sap utilized in variety of ways), *Rumex acetosa* L. (leaves snacked on, eaten as a salad, or boiled and served as soup or a side-dish), *Armoracia* spp. roots ground for salad, soup or strong alcohol and used with or without leaves for lactofermenting cucumbers and tomatoes. The most popular taxa also included *Urtica dioica* L., the leaves of which are utilized mainly for recreational tea but also as soup or salad, and *Quercus robur*, the bark of which was used for seasoning strong alcohol and fresh leaves added to lactofermented cucumbers and tomatoes dominantly in the Ljubeciv area, where children also tried the sap.

The most popular used taxa was *Vaccinium myrtillus*, eaten by almost 80% of interviewees. This was followed by *Rumex acetosa* (70%), *Rubus idaeus* and *Armoracia* spp. (eaten by slightly more than 50%), and *Betula* spp., *Prunus* subgen. *cerasus* and *Fragaria vesca* L. (used by slightly less than 50% of the interviewees). The most popular uses within the food categories were a soup made with *Rumex acetosa* (over 65% of interviewees), snacks and jam made from *Vaccinium myrtillus* (around 50%), leaves and roots of *Armoracia* spp. as additives for lactofermentation (more than 40%) and the sap of *Betula* spp. as a drink (also more than 40% of interviewees). The most popular emic food category in which wild plants were represented was that of recreational tea (with forty-five used taxa). This was followed by the categories of wild snacks (twenty-seven taxa) and jams (nineteen taxa), and compotes and additives to strong alcohol (both sixteen taxa). Also, eight taxa were quite consistently used as additives to lactofermented cucumbers and/or tomatoes.

Past and/or uncommon uses

In addition to the currently used seventy taxa, four wild taxa were recalled as used only in times of hardship. Of these, the most often recalled were a soup made of the fresh aerial parts of *Chenopodium album* L., used in the Chernihiv sylvan and Ljubeciv areas, and the inflorescences of *Trifolium* spp. which were dried, milled and made into some kind of pancake during famine times in the Chernihiv region. Also, a few people recalled snacking on the roots of *Pastinaca sativa* L. in the past in the Ljubeciv region and one person recalled adding the seeds of *Carum carvi* L. to bread in times of need.

Some of the taxa currently still used also had some nearly forgotten food uses, which were recalled by only a few of our interviewees. For example, apple (*Malus* spp.) fruits fermented with rye straws or flour was recalled as last used during the 1960s in the Ljubeciv region. Likewise, hops (*Humulus lupulus* L.) were added to bread in times of need in the Ljubeciv region. In addition, flowers of *Robinia pseudoacacia* L. were eaten fresh and boiled during famine times in the Chernihiv sylvan area while leaves of *Tilia cordata* Mill. were similarly prepared and used in the woodless area of Chernihiv. Acorns of *Quercus robur* were added to bread during times of famine and leaves were put under bread when it was still widely baked at home in the Ljubeciv region. Also, historically the use of *Urtica dioica* seems to be more diverse than now, as few interviewees remember it being either snacked on fresh or dried, milled and made into a sort of pancake during famine times in the Chernihiv sylvan area, and boiled and served as a side-dish in the woodless area of Chernihiv. Furthermore, during times of famine the aerial parts of *Artemisia* sp. were added to pancakes.

Unfortunately, the elderly interviewee from the sylvan area of Chernihiv did not remember the method of preparation.

As an exception, we also included in the results the archaic use of cultivated red beet (*Beta vulgaris* L.), as we asked for additives to fermentation and this long-standing but disappearing tradition, which warrants documentation, was repeatedly mentioned by interviewees in the Ljubeciv region. Specifically, red beetroot was fermented with water and on Easter this *kvass* was added to horseradish salad, to color it, although the reasoning behind such a use seems to have been forgotten. On the rare occasions, kvass leftovers (pieces of fermented beetroot) were used in soups (*borsh*), instead of fresh beetroots which were usually used. It is also interesting to note that two interviewees recalled the use of *Vaccinium oxycoccos* or rye bread (in the absence of fruits) as a starter for the fermentation of sauerkraut, whereas others used *Vaccinium oxycoccos* in sauerkraut for color and taste only.

Comparisons between and within regions

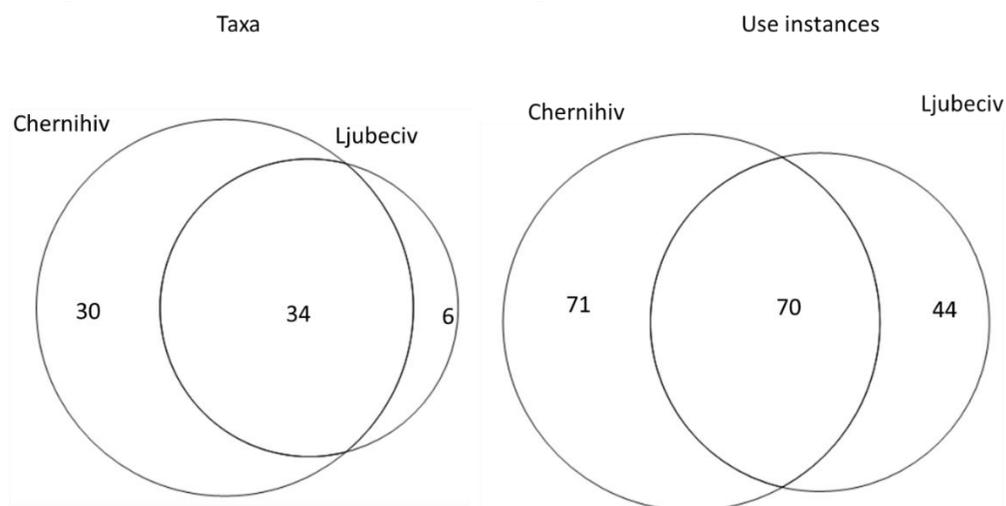


Figure 2. Venn diagrams for the division of taxa and current use instances between the two main study regions.

At first glance, the difference between regions looks considerable, with the Chernihiv region clearly dominating in terms of both the number of plants and uses (Figure 2). When we compare three regions (dividing Chernihiv into sylvan and woodless areas), the results are more homogenized, with the sylvan area leading in taxa and the Ljubeciv area in uses (which is probably due to double the number of interviewees in the latter region) (Figure 3).

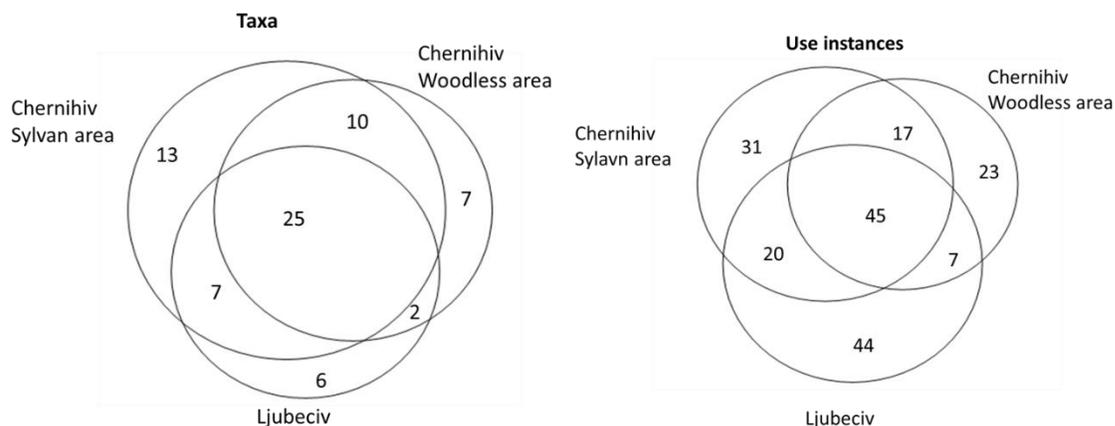


Figure 3. Venn diagrams for the division of taxa and current use instances among the three regions.

Comparison of Jaccard Similarity Indices shows even overlap between the different research sites. As expected there is highly significant overlap between the two areas of Chernihiv, as the distance between them is no more than 30 kilometers. Surprisingly, however, there is extensive overlap between the Chernihiv sylvan area and the Ljubeciv region (Table 2).

Table 2. Jaccard Similarity Indices for the various compared groups based on current use.

Compared groups	$J_{I_{\text{taxa}}}$	$J_{I_{\text{UI}}}$
Chernihiv and Ljubeciv	48.57	37.84
Chernihiv two areas	54.69	42.55
Chernihiv woodless area and Ljubeciv	47.37	32.25
Chernihiv sylvan area and Ljubeciv	53.23	39.13

As observed in Table 3, the demographic differences among the regions are minimal (like mean age in the Chernihiv sylvan region is slightly lower and the percentage of men in the sample is slightly higher in the Chernihiv woodless area). Yet, the number of used plants and UIs, as well as the mean number of plants and DURs per person, are at least 10% greater in the Chernihiv sylvan area. The number of UIs is lower in the Chernihiv sylvan area compared with the Ljubeciv region; however, this is likely due to the fact that twice as many people were interviewed in the latter region, and the total of UIs for the Chernihiv region is greater by at least 20%.

Table 3. Demographic and other numerical details of the regions.

	Chernigiv		Ljubeciv	Whole sample
	Sylvan	Woodless		
n of people	30	28	61	118
mean age	56	62	62	60.5

% of men in the sample	27	32	28	29
Mean no of used plants	13.3	11.6	10	10.8
Mean no of DURs	21.8	18.5	15.3	17
no of used plants	55	44	40	70
Uls	110	91	114	185

The differences in the number of plants used in one or two territories, however, decreases considerably, if we leave out the taxa mentioned by fewer than three people (Figure 4). While the seven most popular taxa are used quite evenly in all territories, some of the remaining plants are more characteristic of a specific region or area. For example, *Vaccinium oxycoccos* (as a snack, jam, and additive to sauerkraut) and *Quercus robur* (mainly used as an additive to lactofermentation) were predominantly used in the Ljubeciv region. The interviewees repeatedly stressed that cranberry *Vaccinium oxycoccos* habitats are, due to amelioration, scarce and distant from villages in the Chernihiv sylvan area (so they often buy them), while in Ljubeciv almost every village had its “own” bog within walking distance. However, *Quercus robur*, being present in the Chernihiv area, was not recognized as a component for fermentation in this region and thus was used only by a few individuals. Similar reasons also apply to the prioritized use of *Rubus fruticosus* L. and/or *Rubus caesius* L., which were used in all three territories, but most commonly in the Ljubeciv region where its habitats were close to the villages.

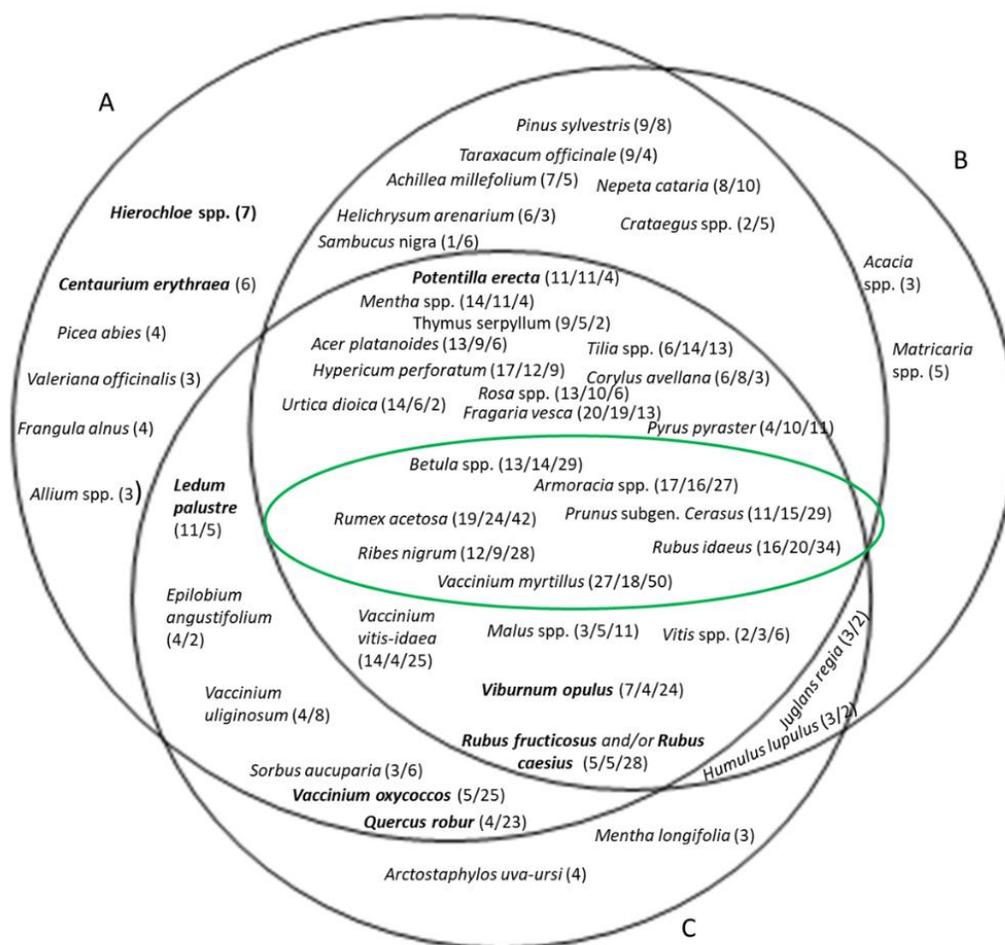


Figure 4. Taxa currently used in the three different regions. A = Chernihiv sylvan area (n=30); B = Chernihiv woodless area (n=28); C = Ljubeciv region (n= 61). In the overlapping area of all three regions, we included only taxa used by at least ten people in total, where the numbers of the people reporting uses are presented as (A/B/C). For the taxa used solely in one or two regions, only taxa with at least three users are represented, where the number of the people reporting uses are provided as (A/B), (A/C) and (B/C) respectively. The green area in the middle highlights the most widely used taxa that are most equally utilized. Names in **bold** represent borderline taxa used predominantly in one region.

The case of *Viburnum opulus*, which grew in all villages we visited, is especially compelling. In the Chernihiv region, people used it occasionally, but in the Ljubeciv region literally every second household had some variation of preserves made from its fruits. While all the interviewees in the Ljubeciv region referred to the use of *Viburnum opulus* as “traditional” and “local” and deriving from old people, they all admitted that their mothers never made anything from those fruits. Among the other plants, noteworthy regionally preferred taxa included *Ledum palustre* L. which was widely used for recreational tea in the Chernihiv sylvan area, but only occasionally in the Ljubeciv region.

In addition to a greater variety of used taxa, a notable difference also emerged in attitudes toward life in general. A humble thankfulness for being provided for and supported by both the forest and the state was mentioned by roughly half of the people in the sylvan area, while in the Ljubeciv

region we encountered only a few people with such an attitude and none in the woodless area of Chernihiv. We often heard comments in the sylvan area regarding the importance of the forest as a food-provider. Moreover, about 70% of the interviewees from the Chernihiv sylvan area reported selling forest berries, mushrooms, and dried herbs to vendors routinely visiting the region as an additional or only source of income.

The apparent tendency of the inhabitants of the sylvan area to be more open to the use of different traditionally used taxa as well as being eager to experiment with taxa introduced by the media also speaks to the influence of the forest. The lives of forest dwellers are centered more around the wild (working in the forest, collecting berries and mushrooms to sell), and thus they have more possibilities to make so-called unintended contact with nature and have greater trust in it. This is contrary to their close neighbors who visit the forest less often, mainly because they do not live within a short walking distance of the forest and, more importantly, they devote the majority of their time to agriculture and other activities not supporting unintended contact with nature. The example of *Viburnum opulus*, which was more often used in the Ljubeciv region, seems to be the exception that confirms the rule: it also grows extensively in the village and so villagers have direct contact with it, without the need to go foraging in distant areas.

Discussion

The number of recorded taxa (70) is relatively high, especially when compared with other regions in Ukraine, such as in Roztochya (western Ukraine) where Stryamets et al. (2015) recorded the use of 26 taxa. Similarly, we recorded only 35 taxa used among Boikos (Pieroni and Sõukand 2017) and 40 taxa among Hutsuls (Sõukand and Pieroni 2016). It is also higher than the number of taxa recorded in areas neighboring Ukraine: 44 taxa used by Ukrainians in Maramures (Łuczaj et al. 2015) and 58 taxa used in central Belarus (Sõukand et al. 2017). Yet it is important to note that a large number of the taxa (30) are used only in the Chernihiv region, whereas the number of taxa used solely in the Ljubeciv region is clearly comparable with neighboring regions. The large number of used taxa may be partially explained by the high number (sixteen) of taxa used exclusively for recreational teas, compared with, for example, the eight taxa used in Maramures (Łuczaj et al. 2015), 7 among the Boikos (Pieroni and Sõukand 2017) and 2 in central Belarus (Sõukand et al. 2017). The number of used taxa is also higher than the 58 mentioned by Rostafinski's respondents from Belarus in the 19th century (Łuczaj et al. 2013); however, differences in the nomenclature of the taxa show quite considerable erosion of nutritious foods collected from the wild, which are now substituted mainly by teas, snacks and additives (to fermented foods).

However, the results obtained in Polesia are still lower than the number of wild food taxa (89, Kalle and Sõukand 2016) utilized in Saaremaa, Estonia – although geographically and culturally distant, this region shared a common Soviet past from 1944 to 1991. In comparison with other post-socialist republics, the recorded number of used plants in Polesia was greater in some areas, as for example on the Dubrovnik coast where 55 taxa are used (Dolina and Łuczaj 2014), but lower in others, for example the 82 taxa used in southern Herzegovina (Łuczaj and Dolina 2015) or in coastal Croatia (80 in Poljica and 76 in Krk, Dolina et al. 2016).

The similarities among the taxa used in the different regions in this study are fewer than in the case of the Boykos and Hutsuls (69% overlap for taxa; Pieroni and Sõukand 2017), yet the overlap of uses is quite similar (around 39%). The overlap for all compared groups is higher than that between

Ukrainian and Romanian Hutsuls separated by state borders (overlap for taxa = 42%, overlap for uses = 27%; Sõukand and Pieroni 2016). Utilization of a smaller amount of resources has contributed to the greater difference in uses than in used taxa, especially when comparing the Chernihiv woodless area and the Ljubeciv region.

To include a comparison from outside the Soviet and socialist realm: the overlap between spring vegetable taxa used by Christian Assyrians and Yazidis or Sunni Muslim Kurds in Iraqi Kurdistan was around 34% and 32% respectively, regardless of the fact that the villages were situated close to each other (Pieroni et al. 2018).

Therefore, given that the distance between two the Polesia regions is at least three times that of the Boykos and Hutsuls, as well as the language difference between the eastern and western regions, which historically belonged (although for short time) to two different countries, and the recent Chernobyl disaster, which has physically divided Polesia, the findings support the idea of homogenization and standardization imposed by the centralized government.

Specific literary or other media influence is detectable in a few cases. For example, *Potentilla erecta* (L.) Raeusch., used extensively in central Belarus (Sõukand et al. 2017) was used predominantly in the Chernihiv region according to our interviewees. It was claimed, however, to have once been used in the Ljubeciv region, but now forgotten. In which case, popularization most likely supported the re-vitalization of an old local use. Also, the use of *Centaureum erythraea* Rafn was reported by several interviewees as of having literary origin, present only in two neighboring villages of the sylvan area of Chernihiv.

Even though the general erosion of LEP is clearly detectable in the documented use of wild food plants in Polesia based on currently reported past uses and the historical literature from closely neighboring regions, and the homogenizing influence of modern media sources is evident, the forested region still holds the potential for valorization (*sensu* Serrasoles et al. 2016). As Hernández-Morcillo et al. (2014) suggest, TEK in Europe has been constantly changing, and therefore as long as some parts of it are abandoned and new ones generated we can still talk about sustainable TEK/LEK/LEP. The situation is more problematic when new knowledge is not acquired because the mechanisms supporting acquisition no longer exist. In our study case, the forest, which not only provides wild food but is also the place for everyday work and interaction, seems to be one such supporting mechanism. Barthel et al. (2014) suggest that in urban environments, allotment gardens, which provide practice space for communities, serve as “incubators of social-ecological knowledge with experiences that can be accessed and transferred to other land uses in times of crisis, contributing to urban resilience.” We suggest that living in close proximity to the forest and interacting with it on a daily basis provides the training ground for not only the preservation of LEP, but also the base for experimentation with new ideas coming from a variety of sources, serving therefore as a stronghold for “rural resilience” of wild biocultural diversity.

Conclusions

The results of this study illustrate the significant overlap in LEP within three different regions in Ukrainian Polesia. While such homogenized use of plants within one ecological region may seem boringly repetitive at first glance, the reasons behind such homogenization may have significant implications for ethnobotanical theory. The results indicate that two regions with distinct dialects

and histories, which are also separated by a considerable distance, had only slightly less overlap than the areas within one region that share a common language and history, and are in close proximity to each other; the only considerable differences were the extent of forestation and the different occupational backgrounds within the area.

Despite the fact that during Soviet times LEP underwent considerable homogenization, as access to nature was limited because of obligatory work on collective farms, living within the forest, and hence having constant unintended contact with nature, preserved not only traditional uses but, more importantly, also nurtured natural curiosity and the desire to experiment with wild food ingredients. Collecting from the wild requires more time and effort than the use of cultivated species, and the high prevalence of condiments and plants used for recreational teas is a clear sign of the shift of the wild food domain to a secondary resource in human nutrition in present-day Ukraine.

Future research should pay closer attention to the influence that access to natural resources as well as the balance between work and leisure time (creating opportunities to access wild habitats) may have on the everyday use of wild food plants.

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