

THE NATURAL FLORA PLANTS USE BY LOCAL INHABITANTS OF THE HISTORICAL RURAL LOCALITIES IN CHERNIHIV POLESIE (UKRAINE)

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Abstract:

This study is aimed to report and analyze the modern plants use in the historical rural localities of Chernihiv Polesie (Ukraine). The research materials were collected in two stages. At the first stage the main useful of the local natural flora were identified. At the second stage a sociological survey of adult local inhabitants on the plants use was conducted. The main groups of useful plants of the historical localities were established. The modern use of plants was analyzed. It was found that most plants were used by the local inhabitants for their own needs. However, certain edible, fodder and technical plants are a source of income for the local inhabitants. In the historical localities of Chernihiv Polesie all the traditional use of plants is primarily determined by the peculiarities of the vegetation (in particular, the predominance of pine, mixed forests and floodplain meadows) and financial incentives. This primarily applies to *Vaccinium myrtillus* gathering and laying hay in for the own use and sale. The local inhabitants use the plant resources lesser than the existing resource potential.

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Key words: resources, Polesie, historical localities, useful plants.

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INTRODUCTION

The world of plants is vital to a man. For thousands of years, many plants have been used in various kinds of economic activity, are indispensable foods, healing and health improving remedies. The wild edible plants play a significant role in the nutritional health of consumers by providing cheap sources of nutrients and income to improve livelihoods (Nyakoojo and Tugume, 2020). The plants are harvested for food, fuel and fodder for livestock fruits and vegetables (Wanjohi *et al.*, 2020). From a historical perspective, the relationship between mankind and plants are not only limited to the usage of plants for food, clothing and shelter but also concerns their utilization for religious ceremonies, ornamentation and healthcare (Karakaya *et al.*, 2019).

Socio-economic transformation, land-use change, over-exploitation of natural resources and climate change are factors contributing to the worldwide loss of biological resources and the associated traditional knowledge (Ramirez, 2007; Smith, 2018; Bhandari *et al.*, 2021). The global ecological crisis is too urgent to ignore local researcher input in advancing the understanding of ecosystems and species

(Lee *et al.*, 2021). Understanding the relationships between humans and their biomes, and the values given to natural resources by communities are foundations to equitable conservation of the biodiversity (Hanazaki *et al.*, 2013; Pretty *et al.*, 2009).

The problem of modern rational use and conservation of the natural flora species in the era of the information, technological surge and global climate change is relevant for every place of the Earth. In this regard, it is especially important to study the peculiarities of the modern use of the natural flora plants by local inhabitants in the historical areas. Klepacki (2016), who has done ethnobotanical research in the historical areas of Poland (Knyszyn Forest and Beskid Niski Mountains), points out that patterns of plant use show a continuation of some traditional uses and an acquisition of new ones from the universal, “urban” culture.

The state of the cultural flora of the Telehany region (a specific natural and historical region in the central part of the Belarusian Polesie) was established using ethnobotanical materials (Mialik and Zhytsianou, 2020). In the context of the rational use of meadow ecosystems in Polesie, which have been exposed to radioactive effect and have not been

used economically for a long time, the indicators of radio-nuclides and heavy metals in soil and plants predict a possibility of using *Solidago canadensis* L. as a honey resource in summer and autumn (Lukash *et al.*, 2021).

Special ethnobotanical scientific research in the Ukrainian Polesie historical areas, including the Chernihiv region, was not carried out. The Chernihiv Polesie in the Ukraine is a young geological and morphological region. However, human settlement and development of this area has a long history. The aim of our study is to report and analyze the modern plants use in the historical rural localities of the Chernihiv Polesie.

STUDY AREA

The Polesie is a physical-geographical province within the European mixed forest zone. The well-known natural features of the Polesie comprise the predominance of lowland relief, wide occurrence of sandy deposits, presence of many rivers with low banks, large forest area and a large

number of merous swamps. Natural complexes, if they do not occupy a large area, often change one another and it is characteristic for this region. The Chernihiv Polesie occupies the eastern part of the Polesie. The landscape features and anthropogenic influence are reflected in the modern regional vegetation (Danko *et al.*, 2021). The Chernihiv Polesie has an extensive hydrological network: the Dnipro River and its tributaries, among them the Desna River. The most famous historical localities of the Chernihiv Polesie (Fig. 1) are the city of Chernihiv and the rural localities Liubech, Sedniv, Shestovytsia and Tupyshiv, are set on the pine terraces of the Dnipro River, its tributaries (the first-order tributary of the Desna River, its tributaries (the first-order tributary of the Desna River, the second-order tributary of the Snow River and the third-order tributary of the Kriukov River).

The Liubech locality is situated on the left pine terrace of the Dnipro River, 60 km northwest of Chernihiv. The Slavic settlements in the area existed in the first centuries of our era. The first mention of Liubech, which is among the oldest cities on the Dnipro, dates back to 882 AD (Kudrytskyi, 1990). The Liubech locality includes the villages: Korobky



Fig. 1. The historical localities of the Chernihiv Polesie.

(132 inhabitants: Ukrainians, Belarusians), Manky (147 inhabitants: Ukrainians, Belarusians), Malynivka (124 inhabitants: Ukrainians, Belarusians), Pyshchyky (8 inhabitants: Ukrainians, Belarusians). The largest part of the Liubech locality is covered with forest, predominated with oak and pine. Oak and hornbeam-oak forests occupy shallow meso-relief lowerings. The species of the *Orchidaceae* and *Ophioglossaceae* families are a characteristic feature of the oak-pine and deciduous forest. The highest places in the pine terrace are occupied by a lichen pine forest. Among other vegetation types there are meadows and swamps, concentrated in the floodplain of the Dnipro River. The meadow vegetation is represented by real, swampy, peaty and steppe meadows. Due to the swamps draining, a significant part of them was transformed into peaty meadows. In the suburbs of Liubech there are also aquatic and coastal-aquatic phytocenoses, concentrated in the floodplain lakes of the Dnipro River.

The Shestovytsia locality is represented by the village of the same name, 18 km from Chernihiv on the right pine terrace of the Desna River. Translated from the ancient Lithuanian, Shestovytsia means an elevation over a swampy area. According to the archaeological research, Shestovytsia was founded in the 8–9th centuries. The Scythian and ancient Slavic mounds and settlements testify to the ancient origin of the area. The first written mention of Shestovytsia dates back to 1523 (Kudrytskyi, 1990). Nowadays, 455 people, ethnic Ukrainians, live in Shestovytsia.

The vegetation cover in the Shestovytsia locality is represented mainly by meadow phytocenoses. Real meadows located on the floodplain of the Desna River predominate. These meadows are formed mainly by cereal-herbaceous and cereal communities dominated by *Schedonorus pratensis* (Huds.) P. Beauv., *Poa pratensis* L., *Alopecurus pratensis* L., *Elytrigia repens* (L.) Nevski. Eutrophic sedge swamps, aquatic and coastal-water phytocenoses, as well as shrub communities occur in the lowerings of the Desna River floodplain. On the pine terrace of the Desna River, green-moss and lichen pine forest is fragmented, in which the endemic *Dianthus pseudosquarrosus* (Novak) Klovov grows.

The Sedniv locality is represented by the village of the same name, which is located 25 km from Chernihiv on the right bank of the Snov River. According to modern data, the settlement got the name Sedniv in the 7th century from the Danish colonizers. The prototype of the name is the Danish settlement of Seden. The Scythian and ancient Slavic mounds and settlements testify to the ancient origin of the locality. In chronicles, it was first mentioned in 1068 as an ancient Russian fortress city. Many burial mounds can still be seen around the city (Kudrytskyi, 1990). Nowadays, 1117 people, ethnic Ukrainians, Russians and Belarusians, live in the Sedniv locality.

The locality is situated on the pine terrace of the Snov River, on a loess "island" with a highly branched system of ravines, as well as on the floodplain of the Snov River. The natural vegetation of the locality is represented by a pine forest (on the pine terrace), deciduous forest (on the ravine

slopes), swampy and real meadows, eutrophic swamps, swampy alders and shrub communities with a predominance of the *Salix* species in the floodplain.

The Tupyshiv locality is situated on the right pine terrace of the Kriukov River, 50 km from Chernihiv. The ancient origin of the locality is evidenced by the ancient Slavic mounds and settlements. The first mention of Tupyshiv dates back to 1526 (Kudrytskyi, 1990). The Tupyshiv locality includes the villages: Tupyshiv (1400 inhabitants: Ukrainians, Belarusians, Russians), Burivka (593 inhabitants: Ukrainians, Belarusians, Russians), Bezykiv (29 inhabitants: Ukrainians, Belarusians, Russians), Nevklia (305 inhabitants: Ukrainians, Belarusians, Russians).

The locality is situated inside a large forest, which merges with the Belarusian and Russian forest in the north. The vegetation is dominated by oak-pine, birch-pine and pine forest, occurring in the flat area. The herbaceous-shrub layer of the forest phytocenoses is often dominated by *Vaccinium myrtillus* L. The forest of the Tupyshiv locality is well preserved and characteristic for numerous species of the *Lycopodiaceae* family and presence of a sphagnum swamp. Meadows, mostly peaty, and waterlogged places occupy small areas in the narrow floodplain of the Kriukova River.

According to the archaeological data, human opening of the territory of the Chernihiv Polesie began about 2000 years ago. It is known that since the end of the 13th and the beginning of the 14th century the forest landscapes in the region have been replaced by fields and pastures (Veremeichyk, 2010). Thus, in the Chernihiv Polesie the oldest economic activity are plant- and livestock-raising. Numerous crafts of the Chernihiv Polesie have the same history: gathering mushrooms, picking wild berries, laying medicinal plants, hunting, fishing and beekeeping (unique apiaries – boards – of wild forest honey are still preserved). By crafts we mean the activities aimed at extracting natural food and raw materials. In the Middle Ages, hand weaving and woodwork were among the most important crafts in the Chernihiv region. In the second half of the 19th century a willow wicker-work was common (Kudrytskyi, 1990). In the historical localities of the Chernihiv Polesie, not only the traditions of the conservative lifestyle have been preserved up to the present day, but also the use of the natural resources, namely plants.

MATERIALS AND METHODS

Research materials were collected in two stages. At the first stage, during the floristic and geobotanical research in 2013–2019, the main useful plants of the natural flora in the phytocenoses adjacent to the historical localities and the state of their resources were identified. The route method was used to establish the species diversity in the phytocenoses (Korchagin and Lavrenko, 1976). The routes were laid by making parallel rows in such a way as to fully and objectively explore the flora of the phytocenoses in the historical localities: the routes were parallel and the distance

between them could be 50–100 m dependent on the size of the territory and mosaic of vegetation.

The following criteria were used to determine the state of the useful plant resources:

- degree of triviality or rarity for the localities of phytocenoses in which the species grow;
- frequency of occurrence of the species in the phytocenoses of the locality (very often, often, sporadically, occasionally);
- projective plant cover in the phytocenosis;
- yielding capacity (for the plants, fruits of which are used) or productivity (for the plants, flowers, vegetative organs or the aboveground part as a whole of which are used).

Based on these criteria, a scale of the state of the natural flora resources in the historical localities of the Chernihiv Polesie was developed:

- 0 – the plant does not grow in the locality;
- 1 – the plant resources in the locality are very limited;
- 2 – the plant resources in the locality are insufficient for mass (widespread) use as raw materials;
- 3 – the plant resources in the locality are sufficient for mass (widespread) use as raw materials only for the own needs;
- 4 – the plant resources in the locality are sufficient for mass (widespread) use as raw materials not only for the own needs, but sometimes for profit;
- 5 – the plant resources in the locality are significant, which allows without restrictions to use it as raw materials for the own needs and for profit.

At the second stage of the research, during the ethnobotanical expeditions in 2019–2021, a sociological survey of adult local inhabitants on the use of the natural flora was conducted. The local inhabitants of all households with a quota of 1 person per household were interviewed, regardless of whether the household is a home to an extended family (consisting of several generations) or a nuclear family (consisting of parents and their unmarried children), as well as childless families and single people. The surveys were conducted by interviewing and recording the respondents' answers and stories (Fig. 2).

In general 2814 respondents were interviewed (73% of the total population of the historical localities of the Chernihiv Polesie).

RESULTS AND DISCUSSION

The main groups of useful plants and the state of their resources in the historical localities of Chernihiv Polesie are presented (Table 1).

In the group of edible plants in all the localities there are the largest resources of the *Sambucus nigra* L. (fruits) that forms the community of 200–600 m² in area, with a projective coverage of 30–60% (Lukash, 2019). One third of the local population in all the localities uses the fruits of *Sambucus nigra* and only for their own needs: for making jams, kvas and dried. Here is one of the recipes for the jam, recorded in the village of Burivka (the Tupyshiv locality).



Fig. 2. Aksynia Nesterenko, a resident the Shestovytsia locality, tells about the traditions of the plant use.

Separate the fruits from the twigs, wash, throw in a colander to drain the liquid. Crush the fruits. To 1 kg of crushed elderberry (*Sambucus nigra*) add 1 kg of chopped apples and 1 kg of plums. The mixture is poured 2 kg of sugar and mixed. Then cook it on low heat, and half an hour after boiling fill the jars up.

The resource potential of *Sambucus nigra* allows us to lay in the plant for profit. In 2021, in the Tupyshiv and Sedniv localities, the purchase of its fruits was organized. The fruits were collected mainly by children aged 10 to 15, who receive 0.5 \$/kg of collected raw materials (fruits with fruit-stems).

The significant resources of *Vaccinium myrtillus* are in the pine, birch-pine and oak-pine forest of the Liubech and Tupyshiv localities. In these localities there are the points of reception of the berries of this plant. That is why 100% of the local population gathers the *Vaccinium myrtillus* fruits in the forests for their own needs. The berries are eaten fresh, ground with sugar, mixed with milk and cream, used for cooking jams, compotes, wine, and used as a filling for dumplings and cakes. It was found that 14% of the population in the Liubech locality and 35% of the population in the Tupyshiv locality lay the fruits in for profit, namely they sell berries.

In small villages and hamlets of the Chernihiv Polesie, which are very far from the administrative centres, where there are problems to be employed, the funds earned in summer from laying blueberries (*Vaccinium myrtillus*) in make up half of the annual family budget. Mostly women are engaged in berry picking. According to the survey results and

observations, an experienced woman aged 35 in the season of maximum fruiting blueberries in July can collect from 50 to 80 kg of the berries per day. The purchase price in different years ranges from 1.5–2.5 \$/kg. In the Tupyshiv and Liubech localities the period of laying *Vaccinium myrtillus* in coincides with the period of emergence of fruiting bodies of the *Cantharellus cibarius* Fr. fungus (local name – Lysychky). The local population gather mushrooms in small quantities for their own consumption, but the main gathering goes for sale to purchasing companies at a price of 3.0–4.5 \$/kg. The value of *Cantharellus cibarius* is due to the fact that these mushrooms are one of the best sources of vitamin D₂ (ergocalciferol) and contain eight essential amino acids, vitamins A, B₁, PP, microelements (copper, zinc) (Buyck *et al.*, 2016).

In all the localities, no more than 20% of the local population lay *Rubus idaeus* and *Fragaria vesca* in for their own needs. *Rubus nessensis* is equally popular in the Liubech locality. However, this plant is rare in the forests and its resources are limited. *Vaccinium vitis-idaea* has limited resources. In the Liubech and Tupyshiv localities, single inhabitants lay this plant in for their own needs, not as edible but as medicinal: the fruits – in August–September, and the shoots – in autumn after fruit ripening or in spring after snow melting and before flowering. *Oxycoccus palustris* grows only in a single place (Sphagnum swamp) in the Tupyshiv locality. The local inhabitants are well aware of the beneficial properties of the fruits of this plant. From the stories of old inhabitants it is known that in the second half of the 20th century in autumn people lay the fruits in. Today *Oxycoccus palustris* is a regionally rare species, subject to protection and its gathering is prohibited.

Amelanchier spicata is not popular with the local inhabitants either as an edible or as a medicinal plant. The reason for such neglect of the fruits of this plant are misconceptions about the poisonous (5% of the population) or laxative (12% of the population) effect of its fruits. The people are not aware of the multivitamin properties of *Amelanchier spicata* and do not know that due to the high content of vitamin P, the consumption of *Amelanchier spicata* helps strengthen blood vessel walls and prevents cardiovascular diseases. However, the resource potential of this plant allows the local population to massively gather its fruits for their own needs.

Among medicinal plants in the Chernihiv Polesie *Chelidonium majus* has the largest reserves. As a medicinal herb, celandine is equated to ginseng in the number of medicinal properties. It is one of the few plants whose antitumor effect has been proven by science. It delays development of even malignant tumors and effectively kills bacteria that cause tuberculosis. It has a diuretic, anti-inflammatory, choleric, analgesic effect. It relieves spasms, cramps and inhibits the activity of pathogenic microorganisms, acts as a mild laxative. It requires careful use due to high activity and toxicity. The healing properties of *Chelidonium majus* are known to 100% of the respondents in all four localities and are used to treat skin diseases – remove warts, calluses, scabies, eczema and psoriasis. In the Sedniv locality the people's heal-



Fig. 3. Laying *Hypericum perforatum* in the Shestovytsia locality.

ers treat clouding of the cornea and spots on it with the fresh juice of celandine. However, the laying the raw celandine in for profit in any area is not carried out.

The second best known of the medicinal plants is St. John's wort, both species of which (*Hypericum maculatum* and *H. perforatum*) have medicinal properties. It is most actively used in the Shestovytsia locality (Fig. 3): for the treatment of diseases of the gastrointestinal tract, the herb of this plant was used at least once by 73% of the local population. In the second half of the 20th century St. John's wort was laid in on a technical scale in the Shestovytsia locality on the floodplain meadows of the Desna River.

Compared to other localities in the Liubech locality, the largest number of the local inhabitants (20%) systematically and traditionally lay raw materials of medicinal plants in for their own needs, among them *Helichrysum arenarium*, *Chamaerion angustifolium*, *Origanum vulgare* and *Potentilla erecta*. In the folk medicine *Helichrysum arenarium* is used in treating liver diseases. Despite a number of medicinal properties (antibacterial, analgesic, anti-inflammatory, diaphoretic) the extract of *Chamaerion angustifolium* is used to relieve stress, normalize sleep. The use of *Origanum vulgare* is connected with its expectorant and anti-inflammatory properties. The rhizomes of *Potentilla erecta* are used as an astringent, hemostatic and bactericidal agent in inflammatory processes of the gastrointestinal tract.

Group of plants	Plant species			Historical locality			
	Scientific name	Ukrainian scientific name [transliteration]	Vernacular name(s) [transliteration]	Liubech	Shestovytisia	Sedniv	Tupychiv
Edible plants	<i>Amelanchier spicata</i> (Lam.) K. Koch	Ірга колосиста [Irha kolosysta]	Нуда [Nuda]	3	3	3	3
	<i>Fragaria vesca</i> L.	Суниця лісові [Sunytsi lisovi]	Земляника, суниця [Zemlianika, sunitsa]	2	2	1	2
	<i>Oxycoccus palustris</i> Pers. (<i>Vaccinium oxycoccus</i> L.)	Журавлина болотна [Zhuravlyna bolotna]	Журавіна [Zhuravina]	0	0	0	1
	<i>Rubus idaeus</i> L.	Малина [Malyna]	Маліна [Malina]	3	1	2	3
	<i>Rubus nessensis</i> W.Hall	Ожина несійська [Ozhyna nesiiska]	Ведмежина [Vedmezhyuna]	2	0	0	0
	<i>Sambucus nigra</i> L. (fruit)	Бузина чорна [Buzyna chorna]	Бузіна [Buzina]	3	4	4	5
	<i>Vaccinium myrtillus</i> L. (fruit)	Чорниця [Chornytsia]	Ягода [Yahoda]	4	0	0	5
	<i>Vaccinium vitis-idaea</i> L. (fruit)	Брусниця [Brusnytsia]	Брусніка [Brusnika]	2	0	0	2
Medicinal herbs	<i>Achillea submillifolium</i> Klokov et Krytzka	Деревій майже звичайний [Derevii maizhe zvychainyi]	Серпоріз [Serporiz]	3	4	3	3
	<i>Acorus calamus</i> L.	Лепеха звичайна [Lepexha zvychaina]	Ягур, татарське зілля [Yahur, tatarske zillia]	4	4	4	2
	<i>Althaea officinalis</i> L.	Алтея лікарська [Alteia likarska]	Калачики [Kalachyky]	1	2	3	0
	<i>Chamaerion angustifolium</i> (L.) Holub (<i>Epilobium angustifolium</i> L.)	Хамерій вузьколистий [Khamerii vuzkolystyi]	Іван-чай [Ivan-chai]	2	1	2	2
	<i>Chelidonium majus</i> L.	Чистотіл великий [Chystotil velykyi]	Бородавник [Borodavnyk]	5	5	5	5
	<i>Gratiola officinalis</i> L.	Авран лікарський [Avran likarskyi]	–	1	2	2	0
	<i>Helichrysum arenarium</i> (L.) Moench	Цмин пісковий [Tsmyn piskovyi]	Сухоцвіт [Sukhotsvit]	3	2	2	3
	<i>Hypericum maculatum</i> Crantz	Звіробій плямистий [Zvirobii pliamystyi]	Звіробой [Zviroboi]	0	3	1	1
	<i>Hypericum perforatum</i> L.	Звіробій звичайний [Zvirobii zvychainyi]	Звіробой [Zviroboi]	3	2	1	2
	<i>Origanum vulgare</i> L.	Материнка звичайна [Materynka zvychaina]	Душиця [Dushytsia]	2	0	1	1
	<i>Potentilla alba</i> L.	Перстач білий [Perstach bilyi]	П'ятипал [Piatypal]	2	0	0	2
	<i>Potentilla erecta</i> (L.) Rausch.	Перстач прямостоячий [Perstach priamostoiachyi]	Калган [Kalhan]	3	1	1	2
	<i>Sambucus nigra</i> L. (inflorescences)	Бузина чорна [Buzyna chorna]	Бузіна [Buzina]	3	4	4	5
	<i>Vaccinium myrtillus</i> L. (shoots)	Чорниця [Chornytsia]	Ягода [Yahoda]	4	0	0	5
	<i>Vaccinium vitis-idaea</i> L. (shoots)	Брусниця [Brusnytsia]	Брусніка [Brusnika]	2	0	0	2
<i>Valeriana officinalis</i> L.	Валеріана лікарська [Valeriana likarska]	Валеріанка [Valerianka]	1	1	1	1	
Fodder plants	<i>Dactylis glomerata</i> L.	Грястиця збірна [Hriastytsia zbirna]	Сжа [Yezha]	4	5	4	3
	<i>Deschampsia caespitosa</i> (L.) P.Beauv.	Щучник дернистий [Shchuchnyk demystyi]	Щучка, курочка чи петух [Shchuchka, kurochka chy petukh]	3	3	4	5
	<i>Elytrigia repens</i> (L.) Nevski (<i>Elymus repens</i> (L.) Gould)	Пирій повзучий [Purii povzuchyi]	Пирей [Pyrei]	4	4	3	3
	<i>Lemna minor</i> L.	Ряска мала [Riaska mala]	Ряска [Riaska]	3	3	3	3
	<i>Lemna trisulca</i> L. (<i>Staurrogeton trisulcus</i> (L.) Schur)	Ряска триборозенчаста [Riaska tryborozenchata]	Ряска [Riaska]	3	3	3	3
	<i>Medicago falcata</i> L.	Люцерна серпоподібна [Liutserna serpopodibna]	Люцерна [Liutserka]	3	4	2	2

Group of plants	Plant species			Historical locality			
	Scientific name	Ukrainian scientific name [transliteration]	Vernacular name(s) [transliteration]	Liubech	Shestovytsia	Sedniv	Tupychiv
Fodder plants	<i>Medicago lupulina</i> L.	Люцерна хмелеподібна [Liutserna khmelepodibna]	Люцєрка [Liutserka]	3	4	3	2
	<i>Poa pratensis</i> L.	Тонконіг лучний [Tonkonih luchnyi]	Трава [Trava]	4	5	4	3
	<i>Schedonorus pratensis</i> (Huds.) P. Beauv. (<i>Festuca pratensis</i> Huds.)	Костриця лучна [Kostrytysia luchna]	Костриця, курочка чи петух [Kostrytysia, kurochka chy petukh]	5	5	4	3
	<i>Spirodela polyrrhiza</i> (L.) Schleid.	Спіродєла багатокорєнева [Spirodela bahatokoreneva]	Ряска [Riaska]	3	3	3	3
	<i>Trifolium pratense</i> L.	Конюшина лучна [Koniushtyna luchna]	Клевер красний [Klievier krasnyi]	4	5	4	4
Energetic plants	<i>Acer platanoides</i> L.	Клен гостролистий [Klen hostrolysty]	Кльон [Klion]	1	0	3	1
	<i>Betula pendula</i> Roth	Береза повисла [Bereza povysla]	Бяроза [Biaroza]	4	3	3	5
	<i>Carpinus betulus</i> L.	Граб звичайний [Hrab zvychainyi]	Граб [Hrab]	3	0	0	1
	<i>Quercus robur</i> L.	Дуб звичайний [Dub zvychainyi]	Дуб [Dub]	4	0	0	4
	<i>Pinus sylvestris</i> L.	Сосна звичайна [Sosna zvychaina]	Сосна [Sosna]	5	3	3	5
	<i>Populus tremula</i> L.	Осика [Osyka]	Осина [Osyna]	4	3	3	2
	<i>Robinia pseudoacacia</i> L.	Робінія звичайна [Robinia zvychaina]	Акація [Akatsiia]				
	<i>Salix fragilis</i> L.	Верба ламка [Verba lamka]	Вярба [Viarba]	2	2	2	2
	<i>Tilia cordata</i> Mill.	Ліпа серцелиста [Lyra sertselysta]	Ліпа [Lipa]	1	0	3	1
Techniacal plants	<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	Очерет звичайний [Ocheret zvychainyi]	Комиш [Komysh]	4	4	3	2
	<i>Salix viminalis</i> L.	Верба кошикова [Verba koshykova]	Лоза [Loza]	4	2	4	1
	<i>Salix</i> sp.	Верба [Verba]	Вярба [Viarba]	4	3	4	2
Ceremonial plants	<i>Acorus calamus</i> L.	Лепєха звичайна [Lepkha zvychaina]	Ягур, татарське зїлля [Yahur, tatarske zillia]	3	3	3	2
	<i>Dryopteris filix-mas</i> (L.) Schott	Щитник чоловїчий [Shchutnyk cholovychyi]	Папороть [Paprot]	1	1	1	1
	<i>Nymphaea alba</i> L.	Латаття билє [Latattia bile]	Водяна лїлія [Vodiana liliia]	1	1	1	0
	<i>Salix</i> sp.	Верба [Verba]	Вярба [Viarba]	4	3	4	2

Table 1. The resources of useful plants of the historical localities of Chernihiv Polesie.

In the villages of the Chernihiv Polesie, the recipes of making extract of kolhan (*Potentilla erecta*) on vodka are passed down from generation to generation. To obtain the extract with medicinal properties, it is necessary to properly lay its rhizomes in. A local historian and botanist Volodymyr Popruha has been laying the rhizomes of this plant in for several decades (Fig. 4). He emphasizes that it is better to dig them in spring or early autumn. The rhizomes should be thoroughly cleaned from soil and washed several times, then dried on the stove.

Vaccinium myrtillus and *Vaccinium vitis-idaea* are most demanded in the Tupychiv locality, where only 12% of the local population regularly lay medicinal plants in. Until the modern times, leaves of these plants have been used by local inhabitants as an ordinary tea, taking into account their tonic property. Modern use of blueberry shoots

and leaves is connected with a use of their decoctions for urolithiasis, diabetes and diarrhea.

In the Sedniv locality only few people, mainly the old inhabitants, are engaged in laying medicinal plants in. The most popular medicinal plants from the ancient times were: *Acorus calamus*, *Achillea submillefolium*, *Chamaerion angustifolium*, *Helichrysum arenarium*, *Hypericum perforatum*, *Origanum vulgare* and *Potentilla erecta*.

Results of the ethnobotanical expeditions justified that the population of all the localities was well aware that the decoctions of *Valeriana officinalis* have a calming effect on the central nervous system, improve the activity of the cardiovascular system and reduce blood pressure. However, due to decreasing resources of this plant during the last 40 years, people prefer the pharmacy forms of *Valeriana officinalis*. Local inhabitants do not know about the heal-



Fig. 4. A historian and botanist Volodymyr Popruha is laying the rhizomes of *Potentilla erecta* in (Liubech locality).

ing properties of *Althaea officinalis* (anti-inflammatory, enveloping and expectorant) and *Gratiola officinalis* (cardiotonic action). The local population in no locality lays medicinal plants in for profit.

All the historical localities of the Chernihiv Polesie are situated near the floodplain river complexes formed by millennia, where there are rich forage resources. That is why the local population is traditionally engaged in animal husbandry and keeps waterfowl (ducks, geese).

Keeping waterfowl belongs to the ecologically and economically sound management of the water landscape. The biological breeding of poultry under the conditions of free keeping of ducks and geese is a guarantee of a good market price and high quality of poultry products. The birds also actively promote the natural regulation of various species of insects and snails (Holzer, 2019).

In the historical localities of the Chernihiv Polesie waterfowl are kept in 40–65% of households. The fodder base in summer has sufficient resources of the *Lemnaceae* – *Lemna minor*, *Lemna trisulca* (*Staurogeton trisulcus*), *Spirodela polyrrhiza* family, spread in the floodplains.

The natural hayfields and pastures of the historical localities of the Chernihiv Polesie are meadows in the floodplains of the Dnipro, Desna, Snov, Kriukova rivers. Here, the local inhabitants traditionally grazes cattle (cows, horses, goats, occasionally sheep), mows the grass to feed these animals and rabbits. However, the phytocenotic com-

position and productivity of the meadows in the localities are different. This affects a use of certain species of forage plants.

In the Liubech and Shestovytsia localities in the floodplains of the Dnipro and Desna rivers, where floods periodically occur, real floodplain meadows dominate. The soils under such meadows are rich and a grass cover is high. They consist of mesophilic and hydromesophilic cereal-herbaceous communities. The floristic composition of such meadows is rich and can reach up to 50 species, mostly cereals – dominated by *Schedonorus pratensis* (*Festuca pratensis*), *Poa pratensis*, *Dactylis glomerata*, *Elytrigia repens*, co-dominated by members of the *Fabaceae* – *Medicago falcata*, *Medicago lupulina*, *Trifolium* genus. Such meadows are the most productive and their yielding capacity is 40–60 kg/ha.

Rich resources of cereals and legumes, large areas of the meadows in the Liubech and Shestovytsia localities allow without restrictions to use these plants as raw materials for the own livestock and for sale outside the region.

The Tupychiv and Sedniv localities are dominated by lowland peat and swamp meadows, which occupy swampy lowlands with peat and swamp soils. Under these conditions, meadow phytocenoses are formed mainly by *Deschampsia caespitosa* and the species of the *Carex* kind, which have low nutritional value – sedge leaves contain a lot of silica, which gives them hardness; when they are eaten, the mucous membranes of the digestive tract of animals are very irritated. Such meadows give the yield of up to 35 kg/ha.

The inhabitants of the Shestovytsia locality make the visual assessment of the hay quality during laying in (Fig. 5), which is based on the species composition of plants, the proportion of each plant component and the phenological stage in which the plants were mowed for hay. The hay with a higher content of legumes in terms of fodder quality is higher than cereals. Experienced mowers say that plants for hay should not be mowed at full bloom or fruit formation. The hay of early mowing (at the beginning of flowering plants) has the maximum content of protein, minerals, vitamins and is best digested by animals.

Both in the past and in the present building of churches, housing and farm buildings in the historical localities of the Chernihiv Polesie, the main material is a wood of *Pinus sylvestris* (Fig. 6).

From the ancient times people in the Chernihiv Polesie used trees as a source of energy for heating, cooking, making bricks and glass. Nowadays, due to high gas prices, the rural inhabitants completely or partially abandon gas and use firewood as an energy source. The most popular energy plant in the historical localities of the Chernihiv Polesie is *Pinus sylvestris*, which has a high content of resin that does not burn completely and pollutes a chimney and the interior of the furnace or oven with its remains. In the Shestovytsia locality birch, aspen and willow firewood is also used, in the Sedniv locality – linden, maple, robin and birch firewood, in the Tupychiv locality – birch and oak firewood, in the Liubech locality – oak, aspen, robin and



Fig. 5. The visual assessment of the hay quality in the Shestovytsia locality.

hornbeam firewood. The firewood of the deciduous species with hard wood (*Quercus robur*, *Betula pendula*, *Carpinus betulus*, *Robinia pseudoacacia*) provides a stable operating temperature in the furnace and a high specific heat value. Due to a low density of the soft wood (*Tilia cordata*, *Acer platanoides*, *Populus tremula*, *Salix fragilis*), a firewood burns quickly, does not form coal, but has a low specific heat value. 100% of the local population of the historical localities of the Chernihiv Polesie use firewood for heating. Sale of wood for building and firewood is carried out in the Tupyshiv and Liubech localities.

In the Chernihiv Polesie, a wickerwork has rich and ancient traditions and peculiarities. In contrast to the forest-steppe part of the Chernihiv region, where wicking from rye or wheat straw was widespread, in the Chernihiv Polesie willow, the bark of young linden (lyko) and birch (birch-bark, bast), coniferous and oak liber, the roots of fir, pine, etc. were used as raw materials for wicking household goods. People bent boxes for sowing and so on of shingles – thin plywood-like boards, which were chipped from thick logs, carefully planed and steamed in the oven. The modern local population of all the historical localities of the Chernihiv Polesie most often uses baskets made of *Salix viminalis*, less often – of other species of willows (*Salix*). The significant resources of this shrub in the Liubech and Sedniv localities allow people to use the plant not only for their own needs, but sometimes for profit. In recent decades, the demand for wicker products has grown significantly. The baskets are used for various purposes, including the yielding and storage of roots, bulbs, tubers, vegetables, fruits, grass, hay, as well as to gather mushrooms. Each



Fig. 6. The pine wooden church (Tupyshiv locality).



Fig. 7. The baskets for various purposes, made in different historical rural localities of the Chernihiv Polesie: Liubech (a, b), Shestovytsia (c, d), Sedniv (e, f), Tupychiv (g, h, i).

locality has its own characteristics of the size and shape of the baskets depending on their purpose (Fig. 7).

The baskets are most often made of vines with bark (so-called gray wicker-work), less often the bark is removed (white wicker-work). Nowadays, only a few craftsmen are engaged in the wicker-work. The largest number of willow wicker-work (18 men) is in the Sedniv locality, 5 – in the Liubech locality, and 3 – in the Shestovytsia and Tupychiv

localities. In the Sedniv locality, the craftsmen make baskets not only for their own needs, but also for sale.

In all the historical localities of the Chernihiv Polesie, willow vines have been traditionally used for the construction of turluk buildings and fences. Modern building materials have replaced vines. However, in the modern architecture of the villages of the Liubech locality one can see wicker fences made of willow.

Until the middle 20th century, the traditional houses for the historical localities of the Chernihiv Polesie were the huts under the reeds (*Phragmites australis*). According to the old inhabitants' evidences of the Tupyshiv locality, the technology of making a reed roof is described as follows: "Tie bundles of reeds, and then push one under another with the comb, and nullify". Nowadays, there are no houses with reed roofs in the modern buildings of the Chernihiv Polesie. Only in the Tupyshiv and Liubech localities one can see single uninhabited huts with reed roofs. *Phragmites australis* is used on the historical buildings. For example, in the village of Sosnytsia, both the house and the hut in the paternal estate of the famous cinematographer and writer Oleksandr Dovzhenko are covered with it.

The ceremonies related to plants played an important role in the calendar holidays in the Chernihiv Polesie. These rites were to ensure human health, strengthen the welfare of the family, increase the fertility of land and livestock, protect the economy from evil spirits (Voropai, 2009). Some of these ceremonies have survived to the present day. The properties of plants are often consolidated in the ritual consecration in the church. According to the popular belief, the willow twigs consecrated in the church on the last Sunday before Easter – Palm Sunday, acquired magical properties. People brought the consecrated willow into the house and beat the members of the family with it, most often children, saying: "Be as big as a willow, and healthy as water, and rich as earth" (Shestovytsia locality), "I'm not beating – the willow is beating, in a week there is Easter, nearby there is a red egg!" (Sedniv locality). In the Liubech locality, according to the national customs, the owners do not go to the house after the divine services, but plant a few branches outside the garden, "to grow to the glory of God, and us, the people, for use". The rest are brought to their own homes and put to the penance under holy images. In the Tupyshiv locality, the owners, sending the cattle to a summer pasture for the first time, must hit it with a willow branch to protect it from diseases and other calamities. After the "use", the sacred willow should never be trampled and thrown away. It should be burned.

The Green holidays (Trinity holiday) – a long tradition. People tried to ensure a good harvest and prosperity, and through the ceremonies to influence the nature (Voropai, 2009). On this holiday, the floor is sprinkled with calamus (*Acorus calamus*) in all the historical localities of the Chernihiv Polesie. This plant is believed to have a magical power and to protect against evil forces. In the Liubech locality, the tradition of decorating the yard and the house with green branches of various types of trees brought from the forest for this holiday has been preserved. In the Shestovytsia locality the wreaths are made of cereals (*Schedonorus pratensis* (*Festuca pratensis*), *Poa pratensis*, *Deschampsia caespitosa*) and weeds (*Leucanthemum vulgare* Lam., *Achillea submillefolium*, *Prunella vulgaris* L., *Campanula patula* L.).

On the night of July 6–7, Chernihiv Polesie celebrates the feast of Ivan Kupala, which symbolizes the worship of



Fig. 8. The participants of the ethnobotanical expedition convincingly prove that there is no flower in *Dryopteris filix-mas*, which is traditionally searched for by women and girls (Sedniv locality).

nature, sun, herbs and water. The merry traditional holiday is closely intertwined with pagan rituals and beliefs. It was customary earlier to make fire, swim in a river, collect herbs and look for a magical fern flower. The ancient traditions of the Kupala night are actively supported to this day. Thus, in the Sedniv locality the tradition of searching for a fiery flower of *Dryopteris filix-mas* has been preserved (Fig. 8).

The person who manages to pick it, gets a magical power that allows him to find hidden treasures, learn about the fate of people, heal the sick, understand the language of animals and birds. It is believed that it is not easy to get a mysterious flower that grows in forest ravines and is protected by evil spirits. On the feast of Ivan Kupala in the Liubech locality, while swimming in the floodplain lakes of the Dnipro River, people try to touch the "mermaid potion" (*Nymphaea alba*). The popular beliefs attribute to the plant the magical properties of defeating the enemy. In the Tupyshiv locality, the collection of medicinal herbs is started since the feast of Ivan Kupala.

According to a survey of the local inhabitants each family of the Orthodox faith (92% of the population) uses plants during religious holidays, including species of *Salix* and *Acorus calamus*, giving them magical properties after consecration.

CONCLUSIONS

In the historical localities of the Chernihiv Polesie, all the regional traditions of using the natural flora plants have been preserved (but to varying degrees). The modern use of plants is primarily determined by peculiarities of the vegetation (in particular, the predominance of pine, mixed forest and floodplain meadows) and financial incentives (possibility to obtain a monetary income from a sale of the collected raw materials). This primarily applies to *Vaccinium myrtillus* gathering in the Tupyshiv and Liubech localities, laying hay in for the own use and sale in the Shestovytsia locality. The resource potential of some edible plants (for example, *Amelanchier spicata* and *Sambucus nigra*) allows to use them both for the own needs and for making the profit more than of the existing amount. To a lesser extent, the modern use of the natural flora plants is influenced by the local traditions. This is especially true of medicinal and technical plants. However, a use of wood for building and heating purposes is a long-standing traditional way of using the local wood species, primarily *Pinus sylvestris*, in the Chernihiv Polesie. The traditions of using plants (including all species of *Salix* and *Acorus calamus*) in the orthodox church ceremonies are well preserved in all historical localities of the Chernihiv Polesie. In general, the local inhabitants of the historical localities of the Chernihiv Polesie use the plant resources less than their existing resource potential.

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