Medicinal plant use at the beginning of the 21st century among the religious minority in Latgale Region, Latvia

Andra Simanova, Baiba Prūse, Raivo Kalle, Sophia Kochalski, Julia Prakofjewa, Ieva Mežaka, Andrea Pieroni, Signe Krūzkopa, Inga Holsta, and Renata Sõukand

Research

Abstract

Background: As identified by scholars, even when communities co-habit the same natural environment, there may be visible differences due to cultural factors, and thus local knowledge on medicinal plants evolves along with the culture. This paper addresses the complexity of medicinal plant use across different social groups situated in the same natural environment with a focus on a distinct religious minority: Old Believers.

Methods: This paper covers ethnobotanical data from 27 villages and populated areas in Dagda Municipality of Latgale, Latvia. The region is highly diverse, especially in terms of language and ethnic groups. In total, seventy-three interviewees were interviewed, of which nineteen represented Old Believers.

Results: The number of used taxa among Old Believers (40 taxa) was half of that used by the other local community members such as Latgalians (81) and the multi-ethnic group (77). Because of the scarcity of available materials on plant uses by Old Believers, we speculate that religious characteristics such as self-isolation from other cultures might be one of the reasons for such a difference. On the other hand, historical aspects such as migration and the subsequent need for adaptation to the local flora could also partly explain the low number of medicinal taxa in comparison to the other groups.

Conclusions: The study indicates that self-isolation, being a characteristic of Old Believers, potentially plays a role in medicinal plant use. We recommend further research to study in detail aspects of medicinal plant use in self-isolated communities within highly literate societies.

Keywords: Latgale, Old Believers, religious identity, ethnobotany, medicinal plant use

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Kopsavilkums

Pamatojums: Zinātnieki ir definējuši – pat, ja kopienas dzīvo viens enduskājā vidē, kultūras faktoru ietekmē starp tām var veidoties uzskatāmas
atšķirības. Tādējādi, attīstoties kultūrā, attīstās arī vientējās zināšanas par ārstniecības augiem. Šajā rakstā aplūkota ārstniecības augu pielietojuma komplicētība un dažādība trijās sociokultūras grupās, kas dzīvo vienā vidē, akcentējot religīisko minoritāti - vecticībniekus.

Metodes: Rakstā apkopoti etnobotāniskā pētījumā iegūti dati no 27 ciematiem un apdzīvotām vietām Dagdas novadā, Latgalē. Izvēlētāji ir augu līdzekļu izmantošanas cilvēki, kas dzīvo Latgalē, izlemta demogrāfiskā attīstības iekšējās vietās. Izmantojot dažādus atklājumu veidus, piemēram, observēšanu, intervijas, izveidojusies atvainojumu veidu, kas pastāv augstākā cēloņa ietvaros. Savukārt, etnobotāniskās lauka ekspedīcijas notika 2015. gada jūlijā un to laikā tika ievākti dati.

Rezultāti: Vekticībnieku grupa ir izmantojusi pusī (40 sugas) no tā augu sugu skaita, ko izmantojusi citi vientējās kolekcijas. Vecmīkļiekārta ir maz, autori pieļauj, ka reliģiskās iepašības, piemēram, pašizolācija no citām kultūrām, varētu būt viens no šādu atšķirību iemesliem. No otras puses, tādējādi arī etnobotāniskais izmantojums varētu izskaidrot zemo izmantoto ārstniecības augu pielietojumu skaitu.

Secinājumi: Pētījums rāda, ka pašizolācija, viena no vecticībnieku kultūrām, varētu būt viens no šādu atšķirību iemesliem. No otras puses, tādējādi autori akcentē, ka ir iespējams būtiski ieguvumi pētīšanā, izzinot augu pielietojuma aspektus tieši šādās lietās - pašizolētās kopienās, kas pastāv augstā izglītības, literāru un kultūras, kā arī sociālās atšķirības.
also a borderland between Latvia and Belarus and represents a diversity of nationalities (Latvians, Poles, Belarusians, Russians, and others; Dagdas novada pašvaldība 2012). In terms of language, the region also features a historical sub-type of the Latvian language – Latgalian (Saeima 1999). The distinctive historical marks of the region are still visible nowadays as the inhabitants have experienced numerous changes throughout history, including the Soviet regime (Nikodemus et al. 2018). The ethnic identity of Latgalian Old Believers was built on confessional (religious) grounds emphasising neighbours (outlanders) as strangers and a source of danger (Korolyova 2012). Old Believers in Latgale are constantly faced with a multilingual society, and they are surrounded by other ethnicities – Latgalians, Latvians, Belarusians, Poles, Lithuanians, etc. According to Korolyova (2012), the religious tolerance of Old Believers towards other ethnicities is higher than in the past (although they still consider their neighbours as “outlanders” if they do not share the same faith).

Recent attempts have been made towards recording the written folklore materials of Latvia (Sile et al. 2020). However, to the best of our knowledge, no ethnobotanical field studies have been conducted in the region regarding medicinal plant use. To add, some authors have pointed out that not enough attention has been paid to the interaction between Latgalian, Latvian and Russian languages (Jankovjak 2009). The statistics in 1925 showed that 25.6% of Poles and only 7.1% of Russians (including Belarusians) spoke Latvian, whereas 46.0% of Latvians spoke other languages (Pilipenko 2018).

The multi-cultural environment represents an ideal setting for contributing to the discussion on the complexity of medicinal plant use. To that end, we aim to: a) document local medicinal plant knowledge and practices, including a reflection on the potential sources of knowledge; and b) analyse the differences in medicinal plant uses, if any, among Old Believers and the other community groups. Our working hypothesis is that there are a limited number of medicinal plant uses for Old Believers in comparison with the other community members from the region.

**Materials and Methods**

*Region of the study site*

The Latgale region (Figure 1) of Latvia shares a border with Lithuania, Russia, and Belarus. The present-day territory of Latvia was historically part of Livonia (from the end of the 13th to the 16th century) (Purs & Plakans 2017), the Polish-Lithuanian Commonwealth, Sweden and the Russian Empire, with the Proclamation of Independence taking place in 1918 (Nikodemus et al. 2018). The entire territory of present-day Latvia experienced the same historical events and had a similar fate until the 17th century (see Birkerts 1926; Ivanovs & Soms 2007). However, the situation changed when Latgale was administratively isolated beginning in the mid-17th century, as the region was then controlled by Catholic Poland, and it started on a different path from that of the rest of the territory of Latvia (see Birkerts 1926, Ivanovs & Soms 2007, Purs & Plakans 2017).

**Figure 1. The local landscape. Credit: IM & IH.**

Latgalians, a tribe of Eastern Balts speaking a Baltic language variety, Latgalian (Lazdiņa & Marten 2012) or High Latvian dialect (Stafecka 2009), have inhabited the territory of Latgale and part of the Vidzeme region since the 6th or 7th century (Belasova et al. 2012). After the invasion of Germans in the 13th century, the borders of these lands changed (Kursīte 2005). During the last 800 years, Latgale has experienced several dramatic changes in socio-economic, political, cultural and spiritual conditions, being influenced by different rulers, including German (until 1561), Polish (1561-1772) and
Russian (1772-1918), that shaped the region with its tradition of multilingualism and cultural diversity (Marten 2012). In the 16th century, the Polish-Lithuanian Commonwealth introduced the Catholic faith in Latgale in contrast to the Reformation movement in other territories of Latvia. Jesuits introduced the use of Latgalian in the church, which later played a significant role in the preservation of the language and local traditions (Ivanovs et al. 2003).

The Latgalian written language was formed in the 18th century by Catholic priests. Latin script was banned in 1865, and widespread Russification took place in the region in numerous historical periods (Stafecka 2009) (e.g., until 1918 when Latgale became part of The Republic of Latvia, during Soviet Union times (Green 1997)). Russification contributed to the adoption of Russian customs and lexis by local Latgalians (Leikuma 2005, Stafecka 2005). This impact should be distinguished from interactions with other Russian groups, such as Old Believers, who established their settlements in Latgale after migration from Russia starting in the 18th century (due to a schism within the Russian Orthodox Church) (Žiko & Mekšs 1997). An especially beneficial situation for the formation of Old Believer settlements in Latgale developed after The Great Plague in 1710 when landowners supported the immigration of new inhabitants into abandoned lands (Nikonov 2000) (see Figure 2). Approximately 70,000 Old Believers are still living in Latvia (2011), mostly in the Latgale region, with 61 Old Believer congregations (Ivanova 2014, Russians of Latvia n.d.). Other sources place this number at 55,000 in 2017 (Pazuhina 2019). According to Gibson (2013, p.40): "identity was also determined to a large part by religion, for example, to be 'Polish' in the eastern areas of former Poland-Lithuania meant being of the Catholic faith."

![Figure 2. Photography by Михаил Кустинский (1866) of Old Believers in Daugavpils Region (Daugavpils aprīnķis), part of present-day Latgale [source: Vilnius University Library – digital collections].](image)

Each ethnic group, including Old Believers, develops its own way of using natural resources (Batocirenov & Tukacheva 2016). According to Lubickaja & Shevin (2017), human supremacy over nature, characteristic of Christianity, great respect and responsibility for the earth (deriving from pagan beliefs), and strict rules regarding the harvesting of natural products (including berries and medicinal plants) have preserved natural resources from excessive consumption by Old Believers. The rejection of modern medicine by Old Believers contributed to the development of ethnomedicine, and thus Old Believers became aware of the characteristics of local plants and learned to use them for their own purposes (Lubnickaja & Shevnin 2017). This is also supported by a study in other regions in which Old Believers maintained two positions: the traditional conceptual worldview and practices (sacred rituals) and the need to adapt to new realities (Prygarine 2004).
The socio-economic situation in Latgale region with a focus on Dagda municipality

The municipality of Dagda has a territory of 949.7 km² and shares a 44 km long border with Belarus. Parts of the municipality parishes are enclosed in Rāznas National Park. One of the primary natural resources of the area is the lakes (123 lakes in the municipality). Agricultural land, including meadows, fruit orchards, and arable land, comprise 39.3% of the available land of the municipality. The distance to the capital city is close to 300 km (Dagdas novada pašvaldība 2018). The topography of Dagda Municipality is relatively flat without massive summits (absolute height does not exceed 200 metres above sea level) (Dagdas novada pašvaldība 2012).

The number of inhabitants per 1 km² at the end of 2017 was 8, which in comparison is about 3.75% lower than the average for the whole country. The number of registered inhabitants in 2017 was 3740 men and 3868 women. In 2017, the poverty rate in the country (22.1%) was about 5% higher than the average rate in the European Union (EU) (16.9%). Geographical distance has been reported as one of the reasons for limited access to health care services (OECD 2019, OECD 2017, OECD 2016). Health expenditure per capita is the second-lowest in the European Union (1213 EUR in 2017), with only 57.3% covered by public funding (EU average: 79%) (OECD 2019).

The number of pensioners in 2017 was around 557,000, including old-age pensions, disability pensions, survivor's pensions, and service pensions. The average amount of an old-age pension in 2017 was 297.61 EUR per month (CSB 2017). The percentage of post-working age people among the inhabitants of Dagda Municipality was 22%, while around 14% were unemployed (OECD 2017).

Compared to the rest of the Latvian administrative regions, Latgale has the lowest gross domestic product per capita (CSB 2019). According to Country Health Profile, the average number of doctors in 2017 reached 3.2 per 1000 people, while in Latgale this number is only 2.2. In comparison, a newsletter from 1941 noted that the aim of the Latgale region (specifically Daugavpils County) was to provide one doctor for every 3000 inhabitants (Taisneiba (No 89) 1941). The available information on pharmacies in the region is scarce. However, in 1982 a pharmacy located in Dagda city celebrated its 100-year anniversary (Komunisma Ausma (Krāslava No 70) 1982). The municipality has family doctors and additional services such as public showers and washing facilities in Dagda city (Dagdas Novada Dome n.d., VSPC "Dagda" n.d.).

The unequal distribution of health workers is of great concern for rural areas (OECD 2019). In comparison, a newspaper in 1939 noted that doctors with practices in rural regions were content, even in areas where patients expressed sympathy towards doctors (Brīvā Zeme (No 176) 1939). In 2017, the municipality of Dagda had four feldsher and midwife aid points (Figure 3). The local newspaper announced in 2009 that the hospital in the only town of Dagda Municipality was renamed the Health and Social Service Centre (Ezerzeme 2009).

Field study

The analysis represented in this paper utilises ethnobotanical data from 27 villages and populated areas in Latgale, one of the four distinct regions of Latvia (Figure 3). Apart from Dubulji parish and Auguļova, all of the villages were located in Dagda Municipality.

The ethnobotanical fieldwork took place in July 2017, during which the data were collected using semi-structured interviews lasting from 30 minutes to 2 hours. The total number of interviewees providing information on wild plant medicinal uses was 69 out of 73 interviews. Seventeen interviewees were born before 1945. About 67% of the interviewees were women. The average age of women was 64 years. The average age of men was 59 years. The interviewees were asked questions regarding wild plant uses for food, followed by questions related to folk medicine. The interviewees were asked to free-list wild plant species used as medicine and then to name the wild plants they (or their family members) use now or have used in the past, as a remedy for specific diseases. People were interviewed at their homes and outside apartment buildings, on the street, or at the auto-shop, employing pseudo-random and snowball sampling methods.

Interviews were conducted in either Latvian or Russian, depending on which language the person was most comfortable with. The interviewees had the option to choose between Russian and Latvian for the interview, as the interviewing team was always bi-lingual.

The majority of the people interviewed lived in small farmhouses with limited access to the town shop and/or other supplies. From household to household, the gardens and surroundings differed with respect to maintenance (Figure 4). Nevertheless, even in considerably poorer conditions, the people interviewed were very hospitable, e.g., inviting us into their homes, offering coffee, etc.
The interviewee was guided by using lay people terminology for identifying the purpose of an application. The Code of Ethics of the International Society of Ethnobiology (ISE 2006) was followed, and informed oral consent was obtained from all interviewees. The interviews were recorded with the written permission of the interviewees for the purpose of transcription. Field notes were taken, and whenever possible, voucher plant specimens were collected, including dried plant samples. In the field, the plants were identified by two authors of the study based on the local flora (Priedītis 2014). The primary identifications were checked by Toomas Kukk, curator of the Estonian University of Life Sciences herbarium. Voucher specimens were deposited at the Estonian University of Life Sciences herbarium (TAA), bearing numbers LGA001-120 and herbarium numbers TAA0146373-495. The dried plant samples collected in small-sized sample bags were deposited at the Herbarium of DAIS at Ca' Foscari University of Venice (UVV), bearing numbers UVVDLGA001-71. Taxonomic identification, botanical nomenclature, and family assignments followed the Flora Europaea (Tutin et al. 1964 -1980), The Plant List database (2013), and the Angiosperm Phylogeny Group IV (Stevens 2017).

Data analysis
The collected data from notebooks and recordings were entered in a Microsoft Excel spreadsheet according to medicinal categories as defined by interviewees. The data was further structured in detailed use-reports (DUR) reflecting the use of a plant part (e.g., flowers, roots, leaves, aerial parts, etc.) prepared or applied in a certain way (e.g., boiled, topical application) for a specific medicinal category, multiplied by the number of people mentioning such a use. Use Instances (UI - the...
detailed use-report regardless of the number of people mentioning such a particular use), which were calculated for comparison, were derived from the emic categories. A total of 113 emic medicinal use-categories were identified, including burns, earache, heart problems, etc. The names of the diseases and symptoms are literal translations in English from Latvian and Russian. Besides that, whenever possible, for comparative purposes, ICPC-2 (International Classification of Primary Care 2nd Edition 2003) medicinal categories were provided for each emic category (e.g., respiratory, neurological disease, etc.; Figure 9) and applied in the network analysis. Some emic medicinal use-categories such as fright were not part of the ICPC-2 classification and therefore assigned by the authors to the cultural bond category. Additionally, beauty procedures and other cosmetic-related uses were assigned by the authors to the cosmetics category. The emic use against fleas was included within the other uses category, not part of the ICPC-2 classification system.

Two-time divisions were utilised: a) past, including temporal, uses: referring to applications which were used previously but no longer, e.g., due to loss of the plant, use of medication from the pharmacy, used during childhood; b) current uses: referring to applications which are used now regardless of when the use started.

Plants and their uses can also be viewed as nodes in a network linked together by DUR. This perspective allows for the interpretation and analysis of the data with graph theory. In the network, each plant family is linked with all of its uses (ICPC-2 medicinal categories). The number of different connections corresponds in the language of social network analysis (SNA) to “degree” (Wasserman & Faust 1994) and effectively represents a measure of the diversity of a plant's possible uses. DUR are the strength of the links or "weight" in the SNA language (Wasserman & Faust 1994). SNA allows not only to differentiate between frequently and rarely mentioned plants/medicinal categories but also between specialized applications (plants/medicinal categories with predominantly high weight links/high DUR) and generalized applications (plants/medicinal categories with predominantly low weight links/low DUR). For the analysis, use networks for plant families in combination with the ICPC-2 medicinal categories were created using R (v. 3.5.1), the R Packet igraph (Csárdi 2019), and the Gephi analysis tool for SNA (Bastian et al. 2009).

For comparative purposes, the interviewees who did not identify themselves as Old Believers (OB) nor followed the Old Believer Eastern Orthodox Christian faith were assigned to one of the following two groups:

a) Latgalian (LG) group: those study participants who were Catholic, spoke fluent Latvian and/or Latgalian, chose Latvian as the preferred language of communication and claimed to come from the Latgale region, even if, on the rare occasion, one of their parents was of non-Latgalian origin;

b) Mixed (MIX) group: the remaining interviewees were assigned to this group, which consisted of people who had very diverse ethnic, linguistic, and spatial origins but chose Russian as the preferred language for the interview.

The authors compared the total number of DUR, UI, taxa and network links for all three groups.

Given the likelihood that people used various species of the same genus equally in different stages of life, some species that botanically belonged to the same genus were gathered into a species pluralis (also for related calculations), such as Symphytum spp. including Symphytum asperum, Symphytum officinale; Mentha sp. (e.g., Mentha x piperita, Mentha x piperita var Piperita, Mentha longifolia, Mentha suaveolens); Trifolium spp. including Trifolium medium, Trifolium pratense; Urtica spp. including Urtica dioica and Urtica urens, and Paeonia spp. including Paeonia lactiflora. In particular, the interviewees mixed Matricaria chamomilla with Leucanthemum vulgare, and thus the taxa were treated separately when an herbarium specimen had been added, otherwise Matricaria spp. represented all similar taxa, if not noted differently.

Results and Discussion

Overview

In total, 116 plant taxa belonging to 51 families were named for medicinal use (both past and current), of which 35 were cultivated plant species (Table 1). The top five most used families with the highest number of DUR (including past and current uses) were: Asteraceae (174), Rosacea (74), Betulaceae (61), Ericaceae (47), and Lamiaceae (40). The highest numbers of taxa per family were observed for Asteraceae (20 taxa), Rosacea (12 taxa), and Lamiaceae (7 taxa). The highest number of DUR on the taxon level were found in Betula spp. (59), Matricaria chamomilla (41), Urtica spp. (31), Plantago major (31), Achillea millefolium (29), and Quercus robur (28). In comparison, yarrow, chamomile and greater plantain are the most frequently mentioned in folklore sources. According to Sile et al. (2020), the highest number of medicinal plants cited in Latvian folk records is Achillea Millefolium L. (90), followed by Matricaria chamomilla.
(89), *Allium cepa* L. (69), *Artemisia absinthium* L. (62), *Plantago major* L. and *Plantago lanceolata* L. (56).

Of the 113 emic categories, the following were the most well-represented: healthy (114 DUR/30 taxa), cold (63/20), stomach-ache (40/18), and wounds (40/13). Of the 19 ICPC medicinal categories, the top five (including past and current uses) were: general health (242 DUR /61 taxa), respiratory (132/35), digestive (91/34), musculoskeletal (78/24) and dermatological (70/17).

Table 1. Medicinal use of plants in Dagda Municipality as named by the interviewees among OB, LG, MIX

| Latin name                        | Local names                  | Wild / Cultivated | Used part | Preparation | Uses               | LG | MIX | OB |
|-----------------------------------|------------------------------|-------------------|-----------|-------------|--------------------|----|-----|----|
| *Acorus calamus* L., Acoraceae (LGA013) | aир*, аир, калмес, трогснік^ | W                 | leaves    | fresh       | against fleas /2   | 1  | 1   |    |
|                                   |                              |                   | roots     | dried       | healthy            | 1  |      |    |
|                                   |                              |                   | fresh     | against fleas |                   | 1  |      |    |
|                                   |                              |                   |          |             | liver diseases 1   |    |      |    |
| *Viburnum opulus* L., Adoxaceae (LGA023) | калина, красная калина, ирбенілійс, ирбенес | W                 | fruits    | fresh       | healthy            | 1  |      |    |
|                                   |                              |                   |          |             | heart problems 1   |    |      |    |
|                                   |                              |                   |          |             | cough              | 1  |      |    |
|                                   |                              |                   |          | stored with honey |                 |    |      |    |
|                                   |                              |                   | tea       | healthy     |                   | 1  |      |    |
|                                   |                              |                   | twigs     | tea         | cold               | 2  |      |    |
|                                   |                              |                   |          |            | cough              | 1  |      |    |
| *Atriplex sp.*, Amaranthaceae      | лебеда                        | W                 | aerial parts | tea         | healthy            | 2  |      |    |
| *Beta vulgaris* L., Amaranthaceae  | бурак                        | C                 | roots     | cooked      | constipation       | 1  |      |    |
| *Allium cepa* L., Amaryllidaceae   | сіпос, лук , луковая шелуха   | C                 | bulbs     | cooked      | asthma /1         |    |      |    |
|                                   |                              |                   |          |             | topical application | 1 |      |    |
|                                   |                              |                   | inflorescences | decoction | boils              |    |      |    |
|                                   |                              |                   | skin      | decoction   | hair care          | 2  | 1   |    |
|                                   |                              |                   | aerial parts | tea         | appendicitis       |    |      |    |
| *Allium sativum* L., Amaryllidaceae | кіплюки, чеснок           | C                 | bulbs     | eaten       | healthy            | 1  | 1   | 1  |
|                                   |                              |                   |          |             | high cholesterol   | 1  |      |    |
|                                   |                              |                   |          | fresh, topical application |        |    | 1   |
|                                   |                              |                   |          | toothache   |                  | 2  | 3   | 2  |
|                                   |                              |                   |          | veins       |                  |    | 1   |    |
|                                   |                              |                   |          | wounds      |                  | 1  |      |    |
|                                   |                              |                   |          | tincture, massage |              |    |      |    |
| *Anethum graveolens* L., Apiaceae  | кроп^, дилліте (дилле), диллес, укрон | C                 | leaves   | tea         | insomnia           | 1  |      |    |
|                                   |                              |                   | seeds    | tea         | stomach-ache       | 1  |      |    |
|                                   |                              |                   | aerial parts | tea         | constipation       | 1  |      |    |
|                                   |                              |                   |          |            | diarrhoea          | 1  |      |    |
| *Carum carvi* L., Apiaceae (LGA061, LGA107) | тмин, кімене, кімене, савважас кімене | W                 | seeds     | ground, used with honey |         |    |      |    |
|                                   |                              |                   |          | tea         | appendicitis       |    |      |    |
|                                   |                              |                   |          |             | stomach-ache 2     |    | 1   |    |
|                                   |                              |                   |          |             | to increase milk production in women | 2  |      |    |
|                                   |                              |                   |          |             | women's diseases   | 1  |      |    |
|                                   |                              |                   |          | tea         | appendicitis       |    |      |    |
| Name                                                                 | Part(s)     | Preparation                     | Uses                                                                 |
|---------------------------------------------------------------------|-------------|---------------------------------|----------------------------------------------------------------------|
| *Daucus carota* L. subsp. *sativus* (Hoffm.) Arcang., Apiaceae      | aerial parts | post surgery                    | stomach-ache                                                        |
|                                                                     | roots        | fresh, ground                   | softens hands                                                       |
|                                                                     |              | roasted, tea                    | cold                                                                |
| *Heracleum sosnowskyi* Manden., Apiaceae                            | young flowers| dried                           | prostate health                                                     |
| *Levisticum officinale* W.D.J.Koch, Apiaceae                        | leaves       | fresh                            | to increase sexual ability                                          |
| *Achillea millefolium* L., Asteraceae                              | flowering    | tea                              | cold                                                                |
|                                                                     | aerial parts | headache                         | 2                                                                   |
|                                                                     |              | sore throat                      | 1                                                                   |
|                                                                     |              | stomach-ache                     | 3/1                                                                 |
|                                                                     |              | tuberculosis                     | 1                                                                   |
|                                                                     |              | appetizer                        | 1                                                                   |
|                                                                     |              | diarrhoea                        | 1                                                                   |
|                                                                     |              | healthy                          | 1                                                                   |
|                                                                     |              | panacea                          | 2                                                                   |
|                                                                     |              | women's diseases                 | 1                                                                   |
| *Arctium tomentosum* Mill., Asteraceae                             | leaves       | fresh, topical application       | bleeding                                                            |
|                                                                     |              | wounds                           | 3/1                                                                 |
|                                                                     |              | tea                               | healthy                                                             |
|                                                                     |              | lung diseases                     | 1                                                                   |
|                                                                     | roots        | dried                            | joint pain                                                          |
|                                                                     |              | aerial parts                     | dried, ground, topical application                                 |
|                                                                     |              | wounds                           | 1                                                                   |
|                                                                     |              | tea                               | stomach-ache                                                       |
|                                                                     |              | mixture                          | gail-bladder problems                                              |
|                                                                     |              | backache                         | 1                                                                   |
|                                                                     |              | bruises                          | 1                                                                   |
|                                                                     |              | joint pain                       | 3/6                                                                |
|                                                                     |              | pain                              | 1/1/2                                                              |
|                                                                     |              | spondylosis                      | 1                                                                   |
|                                                                     |              | swelling                         | 1                                                                   |
|                                                                     | roots        | decoction                        | hair care                                                          |
|                                                                     |              | tea                               | men's diseases                                                     |
|                                                                     |              | mixed                            | 2/1                                                                |
|                                                                     |              | against insects                  | 2                                                                   |
|                                                                     | aerial parts | tea                               | stomach-ache                                                       |
|                                                                     |              | bath or topical application      | 2/1/1                                                              |
| *Artemisia absinthium* L., Asteraceae                              | roots        | tea                               | joint pain                                                          |
|                                                                     | aerial parts | tea                               | healthy                                                             |
|                                                                     |              | whisked in sauna                 | joint pain                                                          |
|                                                                     |              | crown                            | 1                                                                   |
| *Bidens tripartita* L., Asteraceae (LGA018)                         | aerial parts | decoction; topical application   | allergies                                                           |
|                                                                     |              | bath or topical application      | 1/1/1                                                              |
|                                                                     |              | allergy                          | 1/1/1                                                              |
|                                                                     |              | skin inflammation                | 1                                                                   |
|                                                                     |              | around the mouth in              | 1                                                                   |
| Plant Name                               | Description                                      | Application                  | Conditions                                      |
|-----------------------------------------|--------------------------------------------------|------------------------------|-------------------------------------------------|
| **Calendula officinalis** L., Asteraceae | fresh hair care                                  | toddlers using a pacifier    |                                                 |
|                                        | tea, rinsing                                     | eye infection                |                                                 |
| **Cirsium heterophyllum** (L.) Hill, Asteraceae | mārdadzis                                      | aeral parts                  | cancer                                          |
| **Cyanus segetum** Hill, Asteraceae     | rudzupuķes, василичь, василёк                  | flowers                      | diarrhoea                                       |
|                                        | W aerial parts                                   | tea                          | healthy                                         |
|                                        |                                                 |                             | 1                                               |
|                                        |                                                 |                             | insomnia                                        |
|                                        |                                                 |                             | 1                                               |
| **Erigeron acris** L., Asteraceae       | jānīši                                           | flowers                      | bleeding                                        |
|                                        | W aerial parts                                   | tea                          | healthy                                         |
|                                        |                                                 |                             | 1                                               |
|                                        |                                                 |                             | women's diseases                                |
|                                        |                                                 |                             | 1                                               |
| **Helianthus tuberosus** L., Asteraceae | topinambūrs                                     | C leaves                     | pain                                            |
| **Helichrysum arenarium** (L.) Moench, Asteraceae | бессмерник                              | W flowering aerial parts    | healthy                                         |
|                                        |                                                 | tea                          | 1                                               |
| **Leucanthemum vulgar** (Vaill.) Lam., Asteraceae | ромашус                                        | W aerial parts               | fever                                           |
|                                        |                                                 | tea                          | 2                                               |
| **Matricaria chamomilla** L., Asteraceae | kumelite, rumaška*, romашка*, kumelītes,       | C flowers                    | bath                                            |
|                                        | romaška*, romашечка, kumeleīts*, kumeleītes*    |                             | diathesis in children                          |
|                                        |                                                 |                             | /2                                              |
|                                        |                                                 |                             | /1                                              |
|                                        |                                                 | decoction                    | hair care                                       |
|                                        |                                                 |                             | 3                                               |
|                                        |                                                 |                             | 1                                               |
|                                        |                                                 | tea                          | antimicrobial                                   |
|                                        |                                                 |                             | 1                                               |
|                                        |                                                 |                             | inflammation                                     |
|                                        |                                                 |                             | 1                                               |
|                                        |                                                 |                             | appetizer                                       |
|                                        |                                                 |                             | 2                                               |
|                                        |                                                 |                             | calming                                        |
|                                        |                                                 |                             | 1                                               |
|                                        |                                                 |                             | cold                                           |
|                                        |                                                 |                             | /1                                              |
|                                        |                                                 |                             | 2                                               |
|                                        |                                                 |                             | 1                                               |
|                                        |                                                 |                             | disinfection                                    |
|                                        |                                                 |                             | fever                                          |
|                                        |                                                 |                             | 1                                               |
|                                        |                                                 |                             | healthy                                        |
|                                        |                                                 |                             | /2                                              |
|                                        |                                                 |                             | /1                                              |
|                                        |                                                 |                             | 2                                               |
|                                        |                                                 |                             | indigestion                                     |
|                                        |                                                 |                             | 2                                               |
|                                        |                                                 |                             | organism cleansing                              |
|                                        |                                                 |                             | 1                                               |
|                                        |                                                 |                             | refreshing                                      |
|                                        |                                                 |                             | /1                                              |
|                                        |                                                 |                             | stomach-ache                                    |
|                                        |                                                 |                             | /1                                              |
|                                        |                                                 | tea, rinsing                  | eye infection                                   |
|                                        |                                                 |                             | 3                                               |
|                                        |                                                 |                             | 4                                               |
|                                        |                                                 |                             | sore throat                                     |
|                                        |                                                 |                             | 2                                               |
|                                        |                                                 |                             | /1                                              |
| **Matricaria discoidea** DC., Asteraceae | подорожник                                      | W flowers                    | fresh, topical application                      |
|                                        |                                                 |                             | wounds                                          |
|                                        |                                                 |                             | 1                                               |
| Scientific name | Local name | Part Used | Preparation | Medicinal Uses |
|----------------|------------|-----------|-------------|----------------|
| Petasites spurious (Retz.) Rchb., Asteraceae (LGA022) | [did not know the local name] | leaves | fresh, topical application | pain |
| Pilosella officinarum Vaill., Asteraceae (LGA054) | valasgik* | aerial parts | boiled in milk, topical application | skin diseases |
| Tanacetum vulgare L., Asteraceae (LGA093) | biķrēsēņš, pīņka, bišu krišēņs* | inflorescences | tea | gastritis |
| | | | | helminthic infections | 2/1 1/2 |
| | | seeds | tea | stomach-ache |
| | | aerial parts | fresh, topical application | trauma |
| Taraxacum officinale (L.) Weber ex F.H.Wigg., Asteraceae (LGA015) | одуванчик, пінене, пінені festive, 1 | leaves | decoction, vapour | haemorrhoids |
| | | | fresh | allergies |
| | | roots | tea | constipation |
| | | sap | topical application | bee sting |
| | | aerial parts | tea | cold |
| Tripleurospermum inodorum (L.) Sch.Bip., Asteraceae | ромашу | aerial parts | tea | fever |
| Tussilago farfara L., Asteraceae (LGA001, LGA081) | мат’-ї-манечка, маліле, мац’ і мац’їха*, саліпе* , маліліпене, мац’и мацана* | flowers | tea | cold |
| | | | | cough |
| | | | leaves | cooked | soup | 1/1 1/1 |
| | | | fresh, topical application | bruises | 2 |
| | | | | headache | 1 |
| | | | | joint pain | 2 2 |
| | | | | muscle pain | 1 |
| | | | | scars | 1 |
| | | | | tea | asthma |
| | | | | cough | 1 1/1 |
| | | | | medicinal | 1 |
| | | | | sore throat | 1 |
| Alnus incana (L.) Moench, Betulaceae | ольха | buds | tea | asthma |
| Betula spp. including B. pendula Roth, Betulaceae (LGA095, DLGA002b, DLGA006b, DLGA070) | берёза, бёрз | buds | eaten | cold |
| | | | tea | healthy |
| | | | tincture, topical application | joint pain | 2 1 |
| | | | leaves | fresh, topical application | headache | 1 |
| | | | | joint pain | 1 |
| | | | tincture, topical application | joint pain | 1 |
| | | | | | sap | decoction | hair care |
| | | | | | fresh | vitamins |
| | | | | | twigs | fresh, topical application | joint pain |
| | | | | | | whisked in | hair care |
| | | | | | | sauna | 1 1/1 11/2 11/2 |
| | | | | | | | joint pain | 1 1 |
| Corylus avellana L., Betulaceae (DLGA025) | хлещина, орешник крещина | twigs | tea | cholesterol |
| Symphytum asperum Lepech., | живокость, окопник | roots | tea | broken bones |
| Family                  | Species                                      | Habitat            | Part(s)                  | Use                              | Notes        |
|------------------------|----------------------------------------------|--------------------|--------------------------|----------------------------------|--------------|
| Boraginaceae           | Symphytum officinale L.                      | W                  | roots                    | tea                              | broken bones|
|                        | Armoracia rusticana P.Gaertn., B.Mey. & Scherb., Brassicaceae | C/W                | leaves                   | fresh, topical application       | joint pain   |
|                        | Brassica oleracea var. capitata f. alba DC., Brassicaceae | C                  | leaves                   | fresh, topical application       | bruises      |
|                        | Sinapis alba L., Brassicaceae                | P                  | seeds                    | pulverized                       | cold         |
|                        | Humulus lupulus L., Cannabaceae             | W                  | cones                    | tea                              | insomnia     |
|                        | Valeriana officinalis L., Caprifoliaceae     | W                  | roots                    | dried                            | fever        |
|                        | Saponaria officinalis L., Caryophyllaceae    | W                  | roots                    | fresh                            | instead of soap|
|                        | Stellaria media (L.) Vill., Caryophyllaceae   | W                  | aerial parts             | tea                              | healthy      |
|                        | Crassula ovata (Mill.) Druce, Crassulaceae   | C                  | leaves                   | fresh                            | bruises      |
|                        | Sedum roseum (L.) Scop., Crassulaceae        | C                  | aerial parts             | eaten                            | better mood  |
|                        | Cucumis sativus L., Cucurbitaceae            | C                  | fruits                   | fresh, topical application       | rejuvenating |
|                        | Juniperus communis L., Cupressaceae          | W                  | twigs                    | fresh                            | against fleas|
|                        | Elaeagnus rhamnoides (L.) A.Nelson, Elaeagnaceae | C                  | flowers                  | tea, rinsing                      | eye infection|
|                        | Equisetum arvense L., Equisetaceae (LGA016) | W                  | aerial parts             | dried                            | stomach-ache |

Note: The table lists various plants, their families, specific species, and their uses, along with notes on the conditions they are used for.
| Species                                      | Part(s)         | Use(s)                                      | Medicinal Uses |
|----------------------------------------------|-----------------|---------------------------------------------|----------------|
| *Arctostaphylos uva-ursi* (L.) Spreng., Ericaceae | Fruits, aerial parts | dried, fresh, medical | stomach-ache, eye problems, diarrhea, cold, fever, tincture, healthy, thickening of blood, hypertension |
| *Vaccinium myrtillus* L., Ericaceae           | Fruits, aerial parts | fresh, dried, infused in strong alcohol    | stomach-ache, eye problems, medical, diarrhea, cold, fever, healthy, thickening of blood, hypertension |
| *Vaccinium oxycoccos* L., Ericaceae           | Fruits, aerial parts | fresh, dried, infused in strong alcohol    | stomach-ache, eye problems, medical, diarrhea, cold, fever, healthy, thickening of blood, hypertension |
| *Vaccinium uliginosum* L., Ericaceae          | Fruits          | fresh                                      | constipation |
| *Vaccinium vitisidaea* (DLGA066)              | Fruits, leaves   | fresh, tea                                 | diuretic, healthy, hypertension |
| *Quercus robur* L., Fagaceae                 | Bark, twigs      | dried, tincture                            | toothache, healthy, joint pain, cold |
| *Pelargonium graveolens* L'Hér, Geraniaceae   | Leaves, twigs    | fresh, topical application                 | earache, healthy, joint pain, cold |
| *Ribes nigrum* L., Grossulariaceae (LGA106)  | Fruits, twigs    | eaten, tea                                 | hypertension, cold, diarrhea |
| *Philadelphus coronarius* L., Hydrangeaceae   | Leaves          | tea                                         | heart problems |
| *Hypericum spp.* including *H. maculatum* Crantz | Aerial parts     | fresh                                      | wounds, cleansing blood, cold |
| Name                                      | Part            | Form   | Treatment/Condition          | Notes                       |
|-------------------------------------------|-----------------|--------|------------------------------|-----------------------------|
| Hypericum perforatum L., Hypericaceae    | aerial parts    | tea    | heart problems               | 1/1                         |
|                                           |                 |        | hypertension                 | 1/1                         |
|                                           |                 |        | indigestion                  | 2                           |
|                                           |                 |        | pain                         | 1/1                         |
|                                           |                 |        | panacea                      | 2                           |
|                                           |                 |        | sore throat                   | 1                           |
|                                           |                 |        | stomach-ache                 | 2                           |
| Leonurus cardiaca L., Lamiaceae          | C aerial parts  | tea    | calming                      | 1/2                         |
|                                           |                 |        | heart problems               | 2                           |
|                                           |                 |        | hypertension                 | 1/1                         |
| Mentha sp. (eg M. × piperita L., M.    | leaves          | fresh  | bad breath after smoking     | 1                           |
| longifolia (L.) Huds., M. suaveolens     |                 |        | tea                          | 3/3                         |
| Ehrn.), Lamiaceae (LGA052, DLGA035)      |                 |        | calmist                      | 1                           |
|                                           |                 |        | cold                         | 1                           |
|                                           |                 |        | healthy                      | 1/2                         |
|                                           |                 |        | hypertension                 | 1/2                         |
|                                           |                 |        | insomnia                     | 1                           |
| Nepeta cataria L., Lamiaceae             | W aerial parts  | tea    | calming                      | 1                           |
|                                           |                 |        | heart problems               | 1                           |
|                                           |                 |        | hypertension                 | 1                           |
|                                           |                 |        | insomnia                     | 1                           |
| Origanum vulgare L., Lamiaceae           | W aerial parts  | tea    | better mood                  | 1                           |
|                                           |                 |        | calming                      | 1                           |
| Prunella vulgaris L., Lamiaceae          | W aerial parts  | tea    | blessed in church on         | 1                           |
|                                           |                 |        | Midsummer’s Day, tea         |                             |
|                                           |                 |        | dried                        | 1                           |
|                                           |                 |        | tea                          |                             |
|                                           |                 |        | cough                        | 1                           |
|                                           |                 |        | sore throat                   | 1/1                         |
|                                           |                 |        | tea, rinsing                  |                             |
| Thymus serpyllum L., Lamiaceae           | W aerial parts  | tea    | bronchitis                   | 1                           |
| Phaseolus vulgaris L., Leguminosae       | pods            | tea    | diabetes                     | 1                           |
|                                           |                 |        | high blood sugar             | 1                           |
| Trifolium spp., including T. medium L., | W inflorescences| tea    | heart problems               | 1                           |
| T. pratense L., Leguminosae   (DLGA066a)|                 |        |                             |                             |
|                                           |                 |        | aeral parts                  |                             |
|                                           |                 |        | blessed in church on         | 1                           |
|                                           |                 |        | Midsummer’s Day, smoked      |                             |
|                                           |                 |        | tea                          |                             |
|                                           |                 |        | cold                         | 1                           |
|                                           |                 |        | epilepsy                     | 1                           |
|                                           |                 |        | women's diseases             | 2                           |
| Vicia faba L., Leguminosae               | C leaves        | fresh  | wounds                       | 1                           |
|                                           |                 |        | topical application          |                             |
| Linum usitatissimum L., Linaceae         | C seeds         | decoction | diabetes                     | 1                           |
|                                           |                 |        | diarrhoea                    | 1                           |
|                                           |                 |        | hot compress                 |                             |
|                                           |                 |        | sore throat                  | 1/1                         |
| Tilia cordata Mill., Malvaceae           | W inflorescences| tea    | beauty treatment             | 1                           |
|                                           |                 |        | cold                         | 9/4 2                       |
|                                           |                 |        | healthy                      | /1                          |
|                                           |                 |        | twigs                        |                             |
|                                           |                 |        | whisked in sauna             | 1/2                         |
| Common Name | Scientific Name | Family | Part | Preparation | Condition | Quantity |
|-------------|-----------------|--------|------|-------------|-----------|----------|
| Ficus carica L. | *Ficus carica* L. | Moraceae | leaves | tincture, topical application | joint pain | 1 |
| Syzygium aromaticum (L.) Merr. & L.M.Perry, Myrtaceae | *Syzygium aromaticum* (L.) Merr. & L.M.Perry | Myrtaceae | flower buds | dried | toothache | 1 |
| Syringa vulgaris L., Oleaceae | *Syringa vulgaris* L. | Oleaceae | flowers | tincture, topical application | joint pain | 2 |
| Epilobium angustifolium L., Onagraceae | *Epilobium angustifolium* L. | Onagraceae | leaves | tea | strengthening of organism | 1 |
| Paonia spp. including *P. lactiflora* Pall., Paeoniaceae | *Paonia* spp., including *P. lactiflora* Pall. | Paeoniaceae | flowers | dried, smoked | epilepsy | 1 |
| Chelidonium majus L., Papaveraceae | *Chelidonium majus* L. | Papaveraceae | sap | fresh | warts | 2 |
| Papaver somniferum L., Papaveraceae | *Papaver somniferum* L. | Papaveraceae | seeds | eaten | epilepsy | 1 |
| Picea abies (L.) H.Karst. , Pinaceae | *Picea abies* (L.) H.Karst. | Pinaceae | buds | tincture | bronchitis | 2 |
| Pinus sylvestris L., Pinaceae | *Pinus sylvestris* L. | Pinaceae | buds | tea | asthma | 1 |
| | | | | | cold | 1 |
| | | | | | cough | 2 |
| | | | | | tea, gargle | sore throat | 1 |
| | | | | | tincture | joint pain | 1 |
| | | | | | resin | ointment | wounds | 1 |
| | | | | | twigs | whisked in sauna | healthy | 1 |
| | | | | | needles | decoction, foot bath | calming | 1 |
| | | | | | resin | ointment | wounds | 1 |
| | | | | | twigs | brought into the home | prophylactics | 1 |
| Plant Name                        | Family          | Part(s) Used                                      | Use(s)            | Application            | Remarks          |
|----------------------------------|-----------------|--------------------------------------------------|-------------------|------------------------|------------------|
| *Piper nigrum* L., Pipercaceae   |                  | P seeds dried                                    | healthy           | 2                      |                  |
| *Plantago major* L., Plantaginaceae (LGA062, LGA071, LGA113) |      | W leaves fresh, topical                          | bruises           | 1                      |                  |
|                                  |                 |                                                  | cuts              | 2                      |                  |
|                                  |                 |                                                  | pain              | 1                      | 2                |
|                                  |                 |                                                  | wounds            | 5                      | 8                |
|                                  |                 |                                                  | tea               | cough                  | 2                |
|                                  |                 |                                                  | stomach-ache      | 1                      |                  |
| *Avena sativa* L., Poaceae       |                  | C grain porridge                                | constipation      | 1                      |                  |
|                                  |                 | stem bath                                       | skin diseases     | 1                      |                  |
| *Briza media* L., Poaceae        |                  | W aerial parts tea                              | diuretic          | 1                      |                  |
| *Polygonum vulgaris* L., Polygalaceae (LGA082) |      | W flowers bath                                  | sleep problems    | /1                     |                  |
|                                  |                 |                                                  |                   |                        |                  |
| *Polygonum arenastrum* Boreau, Polygonaceae (LGA110) |      | W leaves fresh                                  | nosebleed         | 1                      |                  |
| *Polygonum aviculare* L., Polygonaceae |      | W aerial parts tea                             | gall-bladder      | problems               | 1                |
| *Rumex longifolius* DC., Polygonaceae (LGA032) |      | W flowers tea                                   | diarrhoea         | 1                      |                  |
| *Rumex spp.* including *R. thrysilloides* Fingher., *R. acetosa* L., Polygonaceae | | W flowers tea                                  | stomach-ache      | /1                     |                  |
|                                  |                 | leaves tea                                      | cough             | 1                      |                  |
|                                  |                 | dried backache                                  | joint pain        | 2                      |                  |
|                                  |                 | tincture                                        | healthy           | 2                      |                  |
|                                  |                 | whisked in sauna                                |                  |                        |                  |
| *Polypodiopsida*                 | Polypodiopsida  | W aerial parts dried                            | hypertension      | 1                      |                  |
|                                  |                 |                                                  | bronchitis         | 1                      |                  |
| *Primula elatior* (L.) Hill, Primulaceae (DLGA027, DLGA037) | | W inflorescences tea                           | antimicrobial     | 1                      |                  |
| *Primula veris* L., Primulaceae (DLGA063, DLGA021) |      | W inflorescences tea                           | antiviral          |                        |                  |
|                                  |                 |                                                  | bronchitis         | 1                      |                  |
| *Alchemilla vulgaris* auct. (coll.), Rosaceae (LGA049, LGA118) | | W inflorescences tea                           | antiviral          |                        |                  |
|                                  |                 |                                                  | heart problems    | 1                      |                  |
| *черная арония,*                | C fruits eaten  |                                                  | eye infection      | 1                      |                  |

1 = 1
| Plant Name                      | Common Name | Part Used | Uses                                                                                                                                 |
|--------------------------------|-------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------|
| *Aronia melanocarpa* (Michx.) Elliott, Rosaceae | aronia, арония | tea       | promotes the bloodstream                                                                                                          |
| *Craegeus sp.*, Rosaceae       | bokýryšnik  | flowers   | heart problems                                                                                                                    |
| *Filipendula ulmaria* (L.) Maxim., Rosaceae (LGA077) | медуницa^, ви́грє́зї, vejgríškis^, медуница | flowers   | headache                                                                                                                          |
|                                |             | aerial    | sore skin between the fingers                                                                                                    |
|                                |             | parts     | tea                                                                                                                                |
|                                |             |          | calming                                                                                                                          |
| *Potentilla anserina* L., Rosaceae | лапчатка, гуси́нье лапки | aerial    | healthy                                                                                                                          |
|                                |             | tea       | heart problems                                                                                                                   |
| *Potentilla erecta* (L.) Ræusch., Rosaceae | дубрі́вка, kaigan^, retējs | roots     | medicinal purposes                                                                                                               |
|                                |             | tincture  | stomach-ache                                                                                                                     |
|                                |             | aerial    | tea                                                                                                                                |
|                                |             | parts     | diarrhoea                                                                                                                         |
| *Prunus domestica* L., Rosaceae | сли́вка      | C fruits  | dried                                                                                                                            |
| *Prunus padus* L., Rosaceae (DLGA067) | iеvas       | W fruits  | tea                                                                                                                                |
|                                |             |          | diarrhoea                                                                                                                         |
| *Rosa spp.*, Rosaceae          | шиповник    | W fruits  | dried                                                                                                                            |
|                                |             |           | insomnia                                                                                                                         |
|                                |             | tea       | healthy                                                                                                                          |
|                                |             | twigs     | tea                                                                                                                                |
|                                |             |           | healthy                                                                                                                         |
| *Rubus idaeus* L., Rosaceae (DLGA012, DLGA033) | малина, mežа avenes, avenes, oveńis*, rjabina* | W fruits  | jam                                                                                                                                |
|                                |             |           | cold                                                                                                                             |
|                                |             | twigs     | tea                                                                                                                                |
|                                |             |           | cold                                                                                                                             |
| *Rubus nessensis* Hall, Rosaceae (LGA005) | kazene, melnās avenes | W fruits  | tea                                                                                                                                |
|                                |             |           | cold                                                                                                                             |
| *Sorbus aucuparia* L., Rosaceae (LGA083) | рі́бі́на, piládzis, бержмòкслís*, rjabina* | W fruits  | fresh                                                                                                                            |
|                                |             |           | cough                                                                                                                            |
|                                |             | twigs     | whisked in sauna                                                                                                                 |
|                                |             |           | healthy                                                                                                                         |
| *Citrus limon* (L.) Osbeck, Rutaceae | ли́мон      | P fruits  | eaten                                                                                                                            |
|                                |             |           | thickening of blood                                                                                                              |
|                                |             |           | added to hot drink                                                                                                               |
|                                |             |           | bronchitis                                                                                                                       |
|                                |             |           | cough                                                                                                                            |
|                                |             |           | hair care                                                                                                                        |
| *Populus balsamifera* L., Salicaceae | топу́лі*, торо́й, тополь, papele, apсе | W buds    | as additive in ointment                                                                                                          |
|                                |             |           | wounds                                                                                                                          |
|                                |             |           | dried                                                                                                                            |
|                                |             |           | veins                                                                                                                            |
|                                |             |           | infusion in olive oil                                                                                                            |
|                                |             |           | hair care                                                                                                                        |
|                                |             | ointment  | hair care                                                                                                                        |
|                                |             |           | infected wounds                                                                                                                  |
|                                |             | tincture  | healthy                                                                                                                         |
|                                |             |           | 1 1 1                                                                               |
| *Populus tremula* L., Salicaceae | апсе        | W twigs   | whisked in sauna                                                                                                                 |
|                                |             |           | healthy                                                                                                                         |
| *Salix spp.*, Salicaceae       | purva vítols, верба | W bark    | topic application                                                                                                                |
|                                |             |           | wounds                                                                                                                          |
|                                |             | young     | leaves                                                                                                                           |
|                                |             |           | tea                                                                                                                                |
|                                |             |           | diabetes                                                                                                                         |

1. Various uses indicated.
| Plant Name                                      | Part(s) | Form   | Use                      | Cites |
|-----------------------------------------------|---------|--------|--------------------------|-------|
| Acer platanoides L., Sapindaceae              | kļavas, клён, kaštans* | fresh | organism cleansing vitamins | 2     |
| Aesculus hippocastanum L., Sapindaceae        | kastagi, kaštans* | conkers | tincture, topical application joint pain | 3 1 1/1 |
| Aesculus hippocastanum L., Sapindaceae (LGA025, LGA076) | flowers, | boiled, topical application | headache | /1 |
| Verbascum thapsus L., Scrophulariaceae        | deviņvīru spēks | roots | tea joint pain | 1     |
| Capsicum annuum L., Solanaceae                | перец | fruits | fresh strengthening of organism | 1     |
| Solanum tuberosum L., Solanaceae              | kartupelis, картошка | tubers | boiled, topical application cough | 2     |
| Solanum tuberosum L., Solanaceae              | boiled, vapour inhaled | cold | stuffy nose | 2     |
| Solanum tuberosum L., Solanaceae              | fresh, topical application | eye problems | 2     |
| Urtica spp. including U. dioica L., U. urens L., Urticaceae (LGA058, LGA059) | leaves | fresh, topical application | boils | 1     |
| Urtica spp. including U. dioica L., U. urens L., Urticaceae (LGA058, LGA059) | aerial parts | boiled in milk, topical application | for specific illness - polosņik (RU) | /1 |
| Viola sp., Violaceae                           | lauku atraintnīte | aerial parts | tea itching from scabs | /1 |
| Aloe arborescens Mill., Xanthorrhoeaceae       | стопетник, anoa, алоэ, stolettjiks*, alveja, аноа | leaves | fresh, topical application cuts | 1     |
| Aloe arborescens Mill., Xanthorrhoeaceae       | prepared with honey | bronchitis | | 1 |
| Aloe arborescens Mill., Xanthorrhoeaceae       | | healthy | | 1 |
| Aloe arborescens Mill., Xanthorrhoeaceae       | | stomach-ache | | 1 |
| Aloe arborescens Mill., Xanthorrhoeaceae       | | cough | | 1 |
| Aloe arborescens Mill., Xanthorrhoeaceae       | | tincture | healthy | 1 |

Abbreviations: C – cultivated, W – wild, P – purchased; LG – Latgalians, MX – Mixed (non-Old Believers), OB – Old-believers; /X – refers to uses from the past; ^^Latgalian dialect origin borrowed by Latvian speakers; *Latvian-speaking respondent providing Russian plant name, **Russian language origin borrowed by Latgalians speakers, *Latgalian name, rest – names in Latvian language.
The very small numbers for each use reflect a similar pattern, as identified in a study in Belarus (Sõukand et al. 2017). This may be explained by individualization in the medicinal use of plants; yet numerous single plant uses can also signal the erosion and/or transformation of knowledge once shared within the community (Sõukand et al. 2017).

The most common plant parts used as medicine (including past and current uses) for OB were: aerial parts in general, including leaves and twigs, followed by fruits, flowers, roots, etc. The most frequent preparation techniques of OB (including past and current uses) included: tea, whisked in sauna, and topical application.

Several plant taxa were included in bouquets by Catholic interviewees (a mix of plants, such as *Prunella vulgaris* and *Trifolium* spp.) to be blessed in Church on Midsummer's Day and either prepared as a tea or burned in the room as a panacea (Figure 5). An OB (born 1968) recalls a past use of mixing two plants namely *Ribes nigrum* and *Rubus idaeus* in order to treat children with a high temperature.

Figure 5. Dried herbs in the homes of interviewees. Credit: BP & RS & IM.

**The combinations of current and past uses: plant families vs. medicinal categories**

There were 184 different combinations of plant families and ICPC-2 medicinal categories. The ten most commonly mentioned combinations were Asteraceae [synonym Compositae] contributing to general health (47 DUR), and the digestive (31), musculoskeletal (23), and respiratory (23) ICPC-2 categories. General health was also most commonly cited to be helped by Betulaceae (47), Fagaceae (22) and Rosaceae (21). Plantaginaceae (23) was seen to have dermatological effects, Geraniaceae to help with the ear (20) and Rosaceae to have respiratory effects (19).

The connections between plant families and medicinal ICPC-2 categories are presented as a network (Figure 6), in which the strength of the link corresponds to the DUR, and a bigger node size corresponds to a higher number of DUR. Large green bubbles in the network are commonly used plants, while large yellow bubbles represent often mentioned medicinal categories. Small bubbles are the plants/medicinal categories that were rarely mentioned.

As indicated by the strength of the links, the three plant families with the most specific use(s) were Geraniaceae (used for problems with the ear), Asteraceae (general health, digestive, musculoskeletal and respiratory) and Betulaceae (general health). An example of a non-specifically used plant category is that of Leguminosae, which exhibits 10 DUR associated with seven different ICPC categories. Most medicinal categories were somewhat unspecific, meaning that they had many possible treatments. The category with the lowest number of specific plant treatments was psychological issues.

**Past uses and knowledge**

Of all the plant taxa, eight were only used in the past: *Alnus incana*, *Helichrysum arenarium*, *Melissa officinalis*, *Papaver somniferum*, *Polygala vulgaris*, *Populus tremula*, *Saponaria officinalis*, and *Viola sp.* Among the emic diseases, 12 were only mentioned as past applications, e.g., infected wounds (*Populus balsamifera*). A woman born in 1938 noted, "when there was no commercial soap available, bodies were rubbed with this grass instead of soap", referring to the use of *Saponaria officinalis*. Also, a woman born in 1959 recalled the use of *Paeonia* spp. roots against fright, which was knowledge she received from her grandmother.

The source of knowledge varied from person to person (Table 2), with the number of taxa mentioned by an interviewee reaching as high as 29. Interviewees recalled having gained knowledge from older relatives and through literature, e.g., local newspapers, books from 1974 and more recent editions. As identified by Mattalia et al. (2020) the transmission of knowledge on plant uses may differ across borders even if culture and linguistic backgrounds are shared. In addition, a similar diversity of sources of knowledge transmission has been noted for Ukrainian Hutsuls (Mattalia et al. 2020).
Additionally, the interviewees had their own selection of notes from newspapers (e.g. Rēzeknes Vēstis) regarding the medicinal application of plants (Figure 7 – left side). For example, a woman born in 1938 possessed a self-made encyclopaedia from various sources. The women added that she thinks plants are saving her life, and she does not believe in doctors and synthetic medication (Figure 7 – right side, Mixed group).

One source of local ecological knowledge among Latgalians could be information in the Latgalian language about medicinal plants that was published in the regional press during both political periods – the independent Republic of Latvia (1918-1939; for example, newspapers such as Latgolas Zemkūpis, and the Soviet Union (1940-1990; newspapers such as Taisneiba, Pa Stajīna Ceļu (Rēzekne), Ausma (Rēzekne region), Zarja Kommunizma (Krāslava region)). The collection and cultivation of medicinal plants were included in the agricultural plans of the Soviet Union (Taisneiba (No 60) 1941). During the 1940s, calls were published in the local press for the collection of medicinal plants to meet the needs of the pharmaceutical industry. The press recommended involving children (during excursions and holidays) in the activities of plant collecting and cultivating, especially members of the Pioneer Organization (Pa Stajīna Ceļu (Rēzekne No 62) 1947).

The head of the regional trading department stated that the collecting of wild medicinal plants had decreased among citizens, and as a result, there were not enough prepared medicinal plants in drugstores to meet the needs of consumers in 1957.
The vice-director of Dagda’s Society of Consumers indicated that 40% of all medications produced in Latvia in 1965 were made from medicinal plants, and it was promised that bonuses would be paid to the most diligent harvesters of these plants (Zarja Kommunizma (Krāslava No 24) 1965).

Table 2. An overview of the popular-scientific books and other sources used by respondents. Credit: IM & BP & IH.

| Photo of the source | Name of the book, author and year | Main components |
|---------------------|-----------------------------------|-----------------|
| ![Photo of the source](image1.jpg) | Rubine, H.; Ozola, S. Eniņa, V. (1974). Ārstniecības augu sagatavošana un lietošana. | Informative literature on plant uses. |
| ![Photo of the source](image2.jpg) | Даников, Н. И. (2006). “Ваш травник”. | Recipes for preparing medicinal remedies from plants. |
| ![Photo of the source](image3.jpg) | Kerstina, L. (2007). Lielais dabas ceļvedis bērniem. | A translation from German; informative literature for children regarding animals and plants. |
| ![Photo of the source](image4.jpg) | Reader’s Digest (2011). 1001 Padoms Jūsu veselībai. | Informative literature on home "first aid kits". |
| ![Photo of the source](image5.jpg) | Reader’s Digest Association. (2012). Dabiski līdzekļi tavai veselībai. | A translation from English; about natural sources for health. |
| ![Photo of the source](image6.jpg) | Tereško, A. (2014). Dieva dārza ārstniecības augi. | Informative literature on the art of tea preparation and provides advice on how to regain health. |
Some newspapers introduced medicinal plants and their preparation, including collecting, proper drying, etc. For example, in an article published in Latgalian, agronomist Pēteris Dindonis (Taisneiba (No 66) 1940) described the cultivation of buldurjōņu or valerjanu (Valeriana officinalis) roots and their use to treat nerve pain, spasms, epilepsy, insomnia, anxiety, and weakened heart rate. These uses of Valeriana officinalis differ slightly from the ones noted in our field material. The autumnal medicinal plant reteji (Potentilla erecta, pulverized, used to treat diarrhoea) has also been noted in a Latgalian language newspaper. For Potentilla erecta, preparation differs as our field material mentions tincture and tea but no pulverization. Other newspaper articles have described the use of Kālmenes or skaļbes (Acorus calamus) to alleviate toothache, tincture for stomach diseases) and Tauku sakne (Symphytum officinale) to treat diarrhoea and respiratory diseases (Taisneiba (No 69) 1940). These applications of Symphytum officinale and Acorus calamus also differ from that of our field data (Table 1).

The series of articles in the magazine Dzeive published by several authors during their exile after World War II (e.g., Leonards Latkovskis (1972, The United States of America) and V. Bojārs, Canada) from the 1950s to the 1970s promoted the heritage value of such wild and cultivated plants traditionally used in Latgalian culture (e.g. Latkovskis 1963, Bojārs 1970, Latkovskis 1972, Latkovskis 1973) (e.g., bārzs (Betula spp.)). This also appears in our data set, as Betula spp. stands out as one of the main taxa used across the Latgalian group.

Latgaliens more often spoke several languages (for example, an informant in the Dagda region (1942) spoke Latgalian, Latvian, Russian and Belarusian, using them to communicate with neighbours). In this way, the Latgalian language was more highly influenced by borrowed lexis than the Russian spoken by Old Believers. This can be observed in borrowed plant names (for example, krop, tisočulīstījiks, topuļi, kaštans, stoļētījiks, romaška, padarožņiks etc.; Table 1).

**Comparison of current uses among the groups**

The current use of plants consists of 108 taxa belonging to 49 families. The most well-represented families were: Asteraceae (19 taxa/147 DUR), Rosaceae (12/66), Betulaceae (2/55), Ericaceae (5/35), and Lamiaceae (6/35), while the most used taxa for medicinal applications included: Betula spp. (54 DUR), Matricaria chamomilla (32), Plantago major (31), and Urtica spp. (29) (Table 3). Table 3 presents the mean numbers of all three groups and the total numbers for DUR and taxa.

**The differences and similarities among the groups based on families and taxa**

The Latgalian group stands out with regard to the large number of taxa used, whereas Old Believers exhibit a comparably lower number of used taxa (Figure 8, Table 3). This might be explained by the general nature of Old Believers and their conservative views on customs and religion (Zielińska 2017), as well as the nature of isolation (Gibson 2016).
Table 3. Descriptive overview among the groups.

| Groups       | Number of interviewees reporting medicinal current and past uses | Total number of taxa (families) for current uses | Total number of taxa (families) for current and past uses | Average number of taxa per interviewee for current uses | Min/Max value value of taxa by interviewees | Total number of DUR for current and (past) uses | Number of DUR for current and (past) uses | Average number of current DUR per interviewee | Min/Max value of DUR by interviewees |
|--------------|-----------------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------------|-----------------------------------------------|---------------------------------------------|-----------------------------------------------|---------------------------------------------|
| Old Believers (n=^19) | 17                                                             | 108 (49)                                      | 40 (27)                                                  | 116 (51)                                                 | 54 (36)                                     | 7 ± 4                                          | 710 (846)                                   | 125 (165)                                    | 8 ± 5                                        | 2/19                                        |
| Latgalians (n=^28)         | 27                                                             | 81 (41)                                       | 90 (45)                                                  | 9 ± 8                                                     | 1/29                                        | 303 (362)                                    | 12 ± 11                                     | 1/42                                         |                                             |
| MIX (n=^26)                  | 25                                                             | 77 (41)                                       | 79 (42)                                                  | 9 ± 7                                                     | 1/22                                        | 282 (319)                                    | 12 ± 10                                     | 1/29                                         |                                             |
| Mean number                  |                                                                | 66 (36)                                       | 74 (41)                                                  |                                                           |                                             |                                               |                                             |                                              |                                             |

Abbreviations: ^Total number of interviewees. Only interviewees reporting plants as a medicinal remedy were considered for further analysis.
Diversity among the groups regarding the unique taxa used for treating diseases is evident (Table 3, Figure 8). The Latgalian group exhibited 23 unique species not shared by the other groups, followed by the Mixed group with 18 taxa and Old Believers with 8 taxa. The lower number of taxa for the latter group can perhaps be explained by different prohibitions imposed in the Old Believer faith, which may have influenced the local tradition of plant use (Svalova 2019). Plants with intoxicating or stimulating effect, for example, black tea (grown in China) and хмель (Humulus lupulus L.), were prohibited and were considered sinful and cursed by Satan, according to the folk beliefs and superstitions of Old Believers (Pigin 2014).

Additionally, for the Latgalian group, there appears to be distinct markers of used taxa among the interviewees, e.g., Alchemilla vulgaris and Achillea millefolium. As for the remaining taxa, Betula spp., Matricaria chamomilla, and Plantago major stand out as widely shared among the three groups.

Differences and similarities based on disease categories among the three groups

The Latgalian group did not mention the use of any taxa for endocrine-related diseases (e.g., diabetes). However, according to SPKC meta-data, the number of diabetes cases is increasing every year in the Latgale region, and in Dagda Municipality, the number of diabetes mellitus cases is 358-448/10,000 inhabitants (473 - the average in Latvia) (SPKC 2019, CSB 2017). For most disease categories, Latgalians provided a larger number of taxa in comparison to the other groups (Figure 9).

Old Believers did not name any taxa for male genital, blood, urological, or neurological diseases. However,
this may also be linked to the fact that male- and female-related illnesses are sensitive topics not often discussed openly. Additionally, when it comes to sicknesses, Old Believers are very faithful and place their trust in God (Polek 1900). A woman born in 1957 representing Old Believers added that "she does not believe in the power of medicinal plants, but sometimes she accepts using some of them."

Taking into account the opportunities available at the beginning of the 21st century (e.g. for individuals from closed communities to move around and educate themselves elsewhere), the authors tested whether there would be any decrease in taxa if only Old Believers who had not been out of the region and did not have a higher education were considered. The number of interviewees dropped from 17 to 7, as did the number of taxa and families to 18 and 16, respectively. The average number of taxa mentioned dropped from 7 to 5, with a maximum of 7. This provides the grounds for further analysis as the results indicate that having been isolated in the past also influences the new generation's choices in more open societies.

Additionally, the experience of communication among neighbours is based on Old Believer religious prohibitions and principles passed down through the centuries. According to Korolyova (2012), the tolerance Old Believers in the region towards other ethnicities nowadays is greater than in the past (although they still consider their neighbours as "outlanders" if they do not share the same faith). In comparison, during an ethnolinguistic study (conducted in 2016 by researchers from the Institute for Slavic Studies of the Russian Academy of Sciences and Daugavpils University (Pilipenko 2018)) informants stressed that they speak Russian with their Latgalian neighbours: "По-русски! Никто тут не каял на латышском, этого бьеда, никогда!" (83-year-old OB woman from Andrupene parish). When speaking about their neighbours, Old Believers used the terms Latgaliens and Latvians as synonyms. Some of the interviewees admitted that the Latgalian language was also used by Old Believers, although it was not common. Moreover, informants reported that especially during the Soviet period Latgalians felt uneasy speaking their native language, as it was characterized as a mixed language (Pilipenko 2018). To add, less specific application on the family level is noted for the Latgalian group (density: 0.16) in comparison to Old Believers (density: 0.13). For the Mixed group, the density of links was 0.14. This indicates that the Latgalian group tends to apply the same plant family for treating various diseases,
whereas Old Believers hold distinct uses for certain plant families. There also appears to be distinct plant families that are only used for treating specific diseases among all three groups, such as Geraniaceae for earache.

Conclusions
The results corroborate the recent findings of other scholars that a similar environment and proximity of communities do not result in identical medicinal plant uses. Nevertheless, the differences were relatively small. As expected, Old Believers used fewer medicinal taxa than the rest of the neighbouring communities. In comparison to other groups, Old Believers also exhibited a limited number of applications for medicinal plants.

The data adds support to the argument that self-isolation from other cultures influences one’s willingness to absorb the knowledge of other cultures. The transmission of ethnobotanical knowledge has occurred mainly orally among Old Believers, while the other two groups have made use of different sources more often (especially published media and books). This may reveal the impact of cultural peculiarities of the Soviet Union where knowledge gained from books was highly esteemed.

The authors also stress the importance of addressing cultural factors, even in relatively small municipalities. This study provides the grounds for further analysis regarding religious minorities and medicinal plant uses.

Declarations
List of abbreviations: OB = Old Believers, LG = Latgalians, MIX (MX) = Mixed group
Ethics approval and consent to participate: All participants provided prior oral informed consent. No personal data was collected.
Consent for publication: Not applicable.
Availability of data and materials: The data that support the findings of this study are available from the corresponding author upon reasonable request.
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Authors’ contributions: BP, RS and RK designed the study; AS, BP and RS drafted the manuscript; RK, RS, BP, AS, IM, IH, SKr conducted the field research; AP, JP and SKo interpreted the data and AP, JP, SKo, IM critically revised the manuscript for important intellectual content. All authors read and approved the final manuscript.

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