Human Ecology (2025) 53:597–616
https://doi.org/10.1007/s10745-025-00614-9

Exploring Landscapes Through Folk Perception (Case Study – Slovakia)

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Accepted: 15 July 2025 / Published online: 2 September 2025
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Abstract
Folk songs have long played a vital role in people's lives. They reflect the daily activities and desires of local communities and also preserve traditional knowledge about landscapes, plants, animals, and land management. I reviewed 4,137 Slovak folk songs and analyzed the sections containing information about landscape features. This data was used to create a dataset listing all the landscape features mentioned and their associated plants. Landscape elements were featured in 1,542 songs, encompassing 73 landscape features and 59 plant taxa. The most commonly mentioned plants were *Trifolium* sp., *Prunus persica* L., *Fagus sylvatica* L., *Quercus* sp., and *Acer* sp. Slovakia's forested and mountainous landscape is well represented in folk songs, with forest and mountain features accounting for 42.54% of references. Among agricultural environments, grasslands were the most frequently mentioned (14.65%), followed by fields (10.31%). Rivers were the water features most frequently referenced, accounting for 7.1% of mentions. The Danube River was particularly prominent, accounting for 5.47% of all mentions and being the most frequently cited landscape feature specifically named.

Keywords Folk songs · Ethnoecology · Biocultural heritage · Landscape elements · Slovakia

Introduction

Building on generations of local knowledge and experience, which have fostered a strong sense of belonging and deep attachment to the environment or place, people have developed a unique agricultural system and landscapes (Howard et al., 2008; Van Oosten & Hijweege, 2012). I recognize these as biocultural heritage (Murray et al., 2019) or biocultural refugia (Barthel et al., 2013). One way to study these rapidly vanishing landscapes is through the concept of biocultural diversity, defined as the variety of life—biological, cultural, and linguistic—that exists within a complex socio-ecological adaptive system (Maffi, 2005). This concept helps identify shifts in human–nature relationships and reconnects people with nature (Vierikko et al., 2016). Often, cultural knowledge and wisdom, when applied in specific contexts, can support biological diversity (Anderson, 2005; Berkes, 2012; Cuerrier et al., 2012). Expressions of biocultural diversity are evident in tangible cultural heritage objects (Agnoletti et al., 2015), as well as in various forms of intangible heritage, including place names, local songs, proverbs, dances, and traditions (Ibarra et al., 2013).

Folk songs are not only part of cultural heritage but also valuable sources for understanding the relationship between people and their environment (Fischer, 2022). They serve as repositories of traditional ecological knowledge, closely linked to nature, and stand as a legacy in their own right. However, they also carry many hidden meanings or messages. They embody vital social, physical, emotional, and spiritual connections to local natural conditions (Fernández-Llamazares & Lepofsky, 2019). Traditional music can shed light on long-forgotten practices and reveal local people's attitudes toward their surroundings. The songs offer insights into what rural inhabitants have experienced over centuries and can act as mirrors into the collective and individual souls of the village community (Fišer, 2022; Elscheková, 1995). Still, they should not be seen as simple reflections (Elbourne, 1976) but rather as repositories of the unique perspectives on life and the environment they provide (Martin, 1995). However, previous detailed analyses of song texts have mainly focused on ethnobotanical knowledge and biocultural memory (e.g., Sobotka, 1879; Cardaño & Herrero, 2014; Herrero & Cardaño, 2015; Ivanova et al., 2021; Fišer, 2022; Baránková, 2022).

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Ethnoecological studies document the complex knowledge systems within various cultures, emphasizing the important role local knowledge plays in biodiversity conservation, landscape management, and adapting to environmental changes (Molnár, 2012). According to Chandler (1994), local peasant knowledge closely resembles the understanding gained through systematic scientific research. Landscape ethnoecology examines the ecological foundation of how people derive their livelihoods from the land, taking into account their interactions with specific landscape features (Johnson & Hunn, 2012). The extensive cultural and linguistic diversity in how landscapes are divided into named categories, the different meanings assigned to these categories, and the tangible impacts on management make landscape categorizations a key topic for interdisciplinary research.

Studying folk habitat classification seems more challenging than, for example, species classification because understanding habitats is often more implicit and varied (Johnson, 2010; Ellen, 2010). Additionally, cross-cultural comparisons of local habitat classifications are limited by the absence of a comprehensive, cross-continental habitat taxonomy (Mark et al., 2010) and by many synonymous names (Newmaster et al., 2006; Molnár, 2012). Some dialects refer to geographic features that others do not recognize (Macfarlane, 2015; Wartmann & Purves, 2017), or the same term can have different meanings in different contexts. People also categorize habitats at different spatial scales, leading to overlaps (Molnár, 2012). Still, conducting ethnoecological research on landscapes reveals local knowledge about habitats, including valuable information and wisdom that can support vegetation science, conservation, and environmental education (Johnson & Hunn, 2012). Most ethnobotanical landscape studies come from Indigenous communities (e.g., Johnson, 2000; Mihas, 2015; Wartmann & Purves, 2017), whereas studies involving modern European societies are comparatively less common (e.g., Molnár, 2012; Trushkova et al., 2019).

I propose a unique approach to exploring ethnoecological landscape categories by analyzing folk songs from Slovakia. While ethnoecological research often depends on questionnaire surveys to examine landscapes from an ethnoecological perspective, using folk songs provides a distinct and valuable source of ethnoecological data that has been preserved in its original form for nearly 150 years. Understanding these songs requires knowledge of local culture and language, as well as the ability to interpret symbolic and metaphorical expressions. I aim to investigate the ethnoecological aspects of Slovak cultural identity, emphasizing the complex relationships between landscapes and various musical genres, as well as the connections between landscapes and associated plant species.

Materials and Methods

Study Area - Geographical Information and Historical Background

Slovakia is situated in Central Europe (Fig. 1). It belongs to the Alpine-Himalayan system, which is divided into the Carpathians and the Pannonian Basin. The tallest peak is Gerlachovský štít, rising to 2,655 m in the High Tatras Mountains. The lowlands are found in the southern and southeastern parts of the country, with the lowest point at 94 m above sea level, located at the confluence of the Bodrog River. Major rivers include the Danube, which borders Austria and Hungary; the Váh, the country's longest river; the Hron; the Bodrog; the Morava; and others. Most natural lakes are glacial in origin and are mainly located in the High Tatras Mountains. Additionally, Slovakia has over 230 waterfalls of varying sizes and more than 7,100 documented caves (Čech et al., 2021).

Arable land accounts for 28.61%, grasslands 17.29%, and forests 41.40% (Statistical office of the Slovak Republic, 2021). According to the report on the forest sector (Ministry of Agriculture and Rural Development SR, 2023), broadleaved forests are predominant at 54.6%, mixed broadleaf and coniferous forests cover 20.2%, and conifers make up 25%. The most common forest tree species are European beech (35.1%), followed by spruce (21.3%), and sessile and pedunculate oak (10.4%). The current composition of tree species in Slovak forests has partially shifted from the original distribution. These changes have occurred over several centuries of human activity, mainly favoring more productive and economically valuable species (such as spruce, pine, and larch), and through the natural spread of certain species (for example, European hornbeam, Turkey oak, or black locust) (Ministry of Agriculture and Rural Development SR, 2023).

At the turn of the nineteenth and twentieth centuries, Slovakia was part of the Austro-Hungarian Empire, and the region was divided into historical counties (Fig. 2). Several counties only covered part of present-day Slovakia, extending into what is now Hungary, Austria, Ukraine, and Poland.

Figures 2, 3, 4, 5, and 6 were digitized into a polygon GIS layer, and all maps were produced using ArcMap 10.3 software (ESRI, 2016).

Songs Selection

The Slovak folk songs collection is the most comprehensive collection of folk music in Slovakia. It was initiated by 63 volunteers, including teachers, priests, and musicians. Between 1880 and 1926, 1,977 folk songs were published under the title *Slovenské spevy*, attracting interest not only

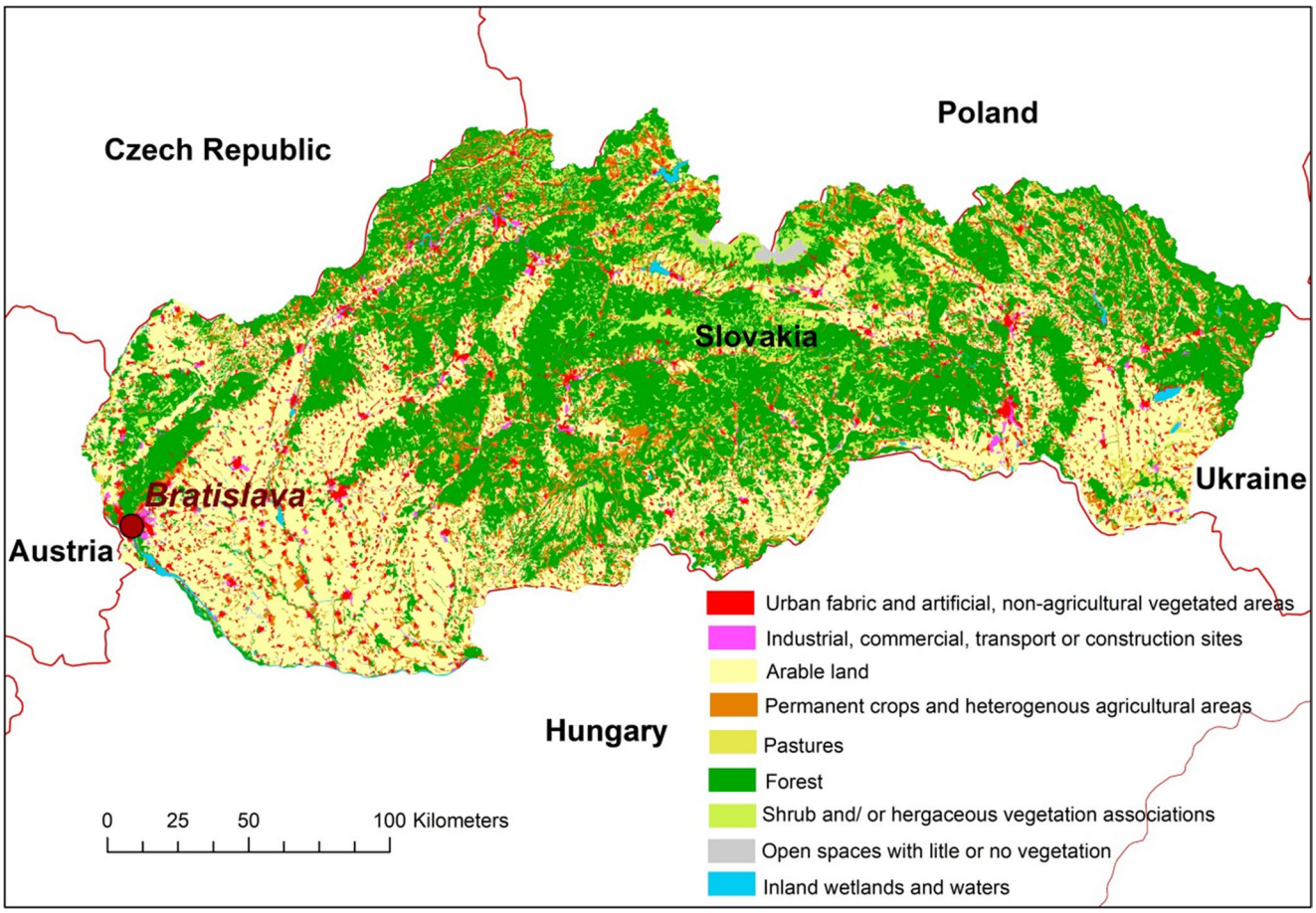


Fig. 1 Location of Slovakia and its land cover, according to the European Environmental Agency & Copernicus Land Monitoring Service (2019)

among Slovak scholars but also from foreign collectors. The discovery of over 2,100 unpublished songs led to the detailed collection being published in six volumes as a second edition (Galko, 1972, 1973, 1976, 1978, 1981, 1983), which I used for analysis. The first three volumes contain all the songs from the first edition, while the subsequent three volumes include unpublished songs and a selection from the first three volumes with notable differences from their manuscript versions. Overall, the collection includes 4,137 songs from various regions throughout Slovakia. Editors chose songs based on personal opinions and aimed for variety. Besides Slovak folk songs, the collection also features several gypsy songs and Slovak songs from Hungary and the former Yugoslavia.

Landscape Identification and Data Analysis

Altogether, 4,137 songs from the mentioned songbooks were carefully reviewed, and all sentence segments containing information about landscape elements and plants related to landscape features were recorded. These segments were then further analyzed. A database was created in Microsoft Excel, including data about the songs and landscape elements (Table 1).

Some duplicity was observed in the song texts. In such cases, songs with more than 50% duplicate verses were only examined if new landscape elements were mentioned. If a particular landscape element appeared multiple times in the same song, for example, due to the repetition of verses, it was only recorded once per song. However, if a single folk song mentioned multiple landscape elements, all of them were recorded.

I did not record all cited plant species because that was the focus of another study (Baránková, 2022). Instead, individual plant species were only analyzed if they were mentioned in connection with specific landscape elements, such as forest stands, which are often referred to by the dominant tree species, e.g., yew groves, birch forests, and so on.

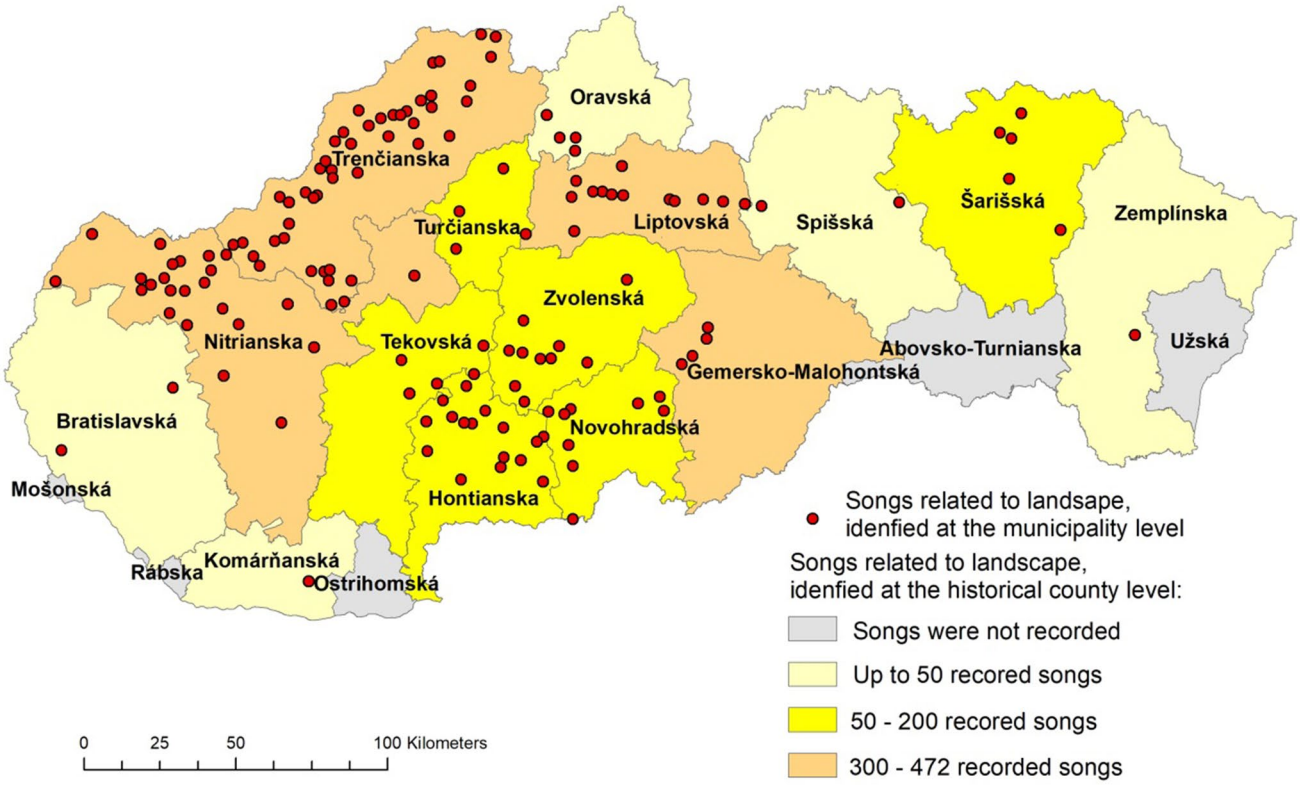


Fig. 2 Administrative division of present-day Slovakia from 1882 to 1922 (based on Žudel, 1984), along with the depiction of folk songs linked to the landscape, identified at the level of historical counties and municipalities

Results

Geographical Perspective

Out of 1,542 songs containing landscape information, the majority were identified at the municipality level (69.4%), followed by regional level identification (24.5%). Songs without records of origin accounted for 6.1%. Folk songs, except for four regions in the southern part of Slovakia (Abovsko-Turnianska, Užská, Ostrihomská, Rábska, and Mošonská historical counties), originated from all other regions of Slovakia. The most references to landscapes were recorded from the Nitrianska historical county (21.34%), which was also the largest, followed by the Trenčianska historical county (18.76%).

Landscape Elements

References to landscape elements were identified in 1,542 tracks, corresponding to 37.27% of the analyzed song sample. A total of 2,212 individual mentions of landscape elements were recorded. Aside from the 25 basic landscape elements, some of which were specified in more detail, the songs also referenced general terms such as "world" and "country." Overall, 73 specific landscape elements and general terms were identified (Table 1). They were grouped into four main categories (Fig. 3, Table 2):

1) Landscape in general
2) Natural landscape
3) Agricultural landscape
4) Waterscape

Landscape in General

The landscape was usually described as either a country or a world. Based on historical counties, it was most often noted in the Bratislavská historical county (Fig. 4).

World In the songs where the world was mentioned, the focus was on highlighting distance and size, such as in phrases like "to go into a wide world" (11 citations) or

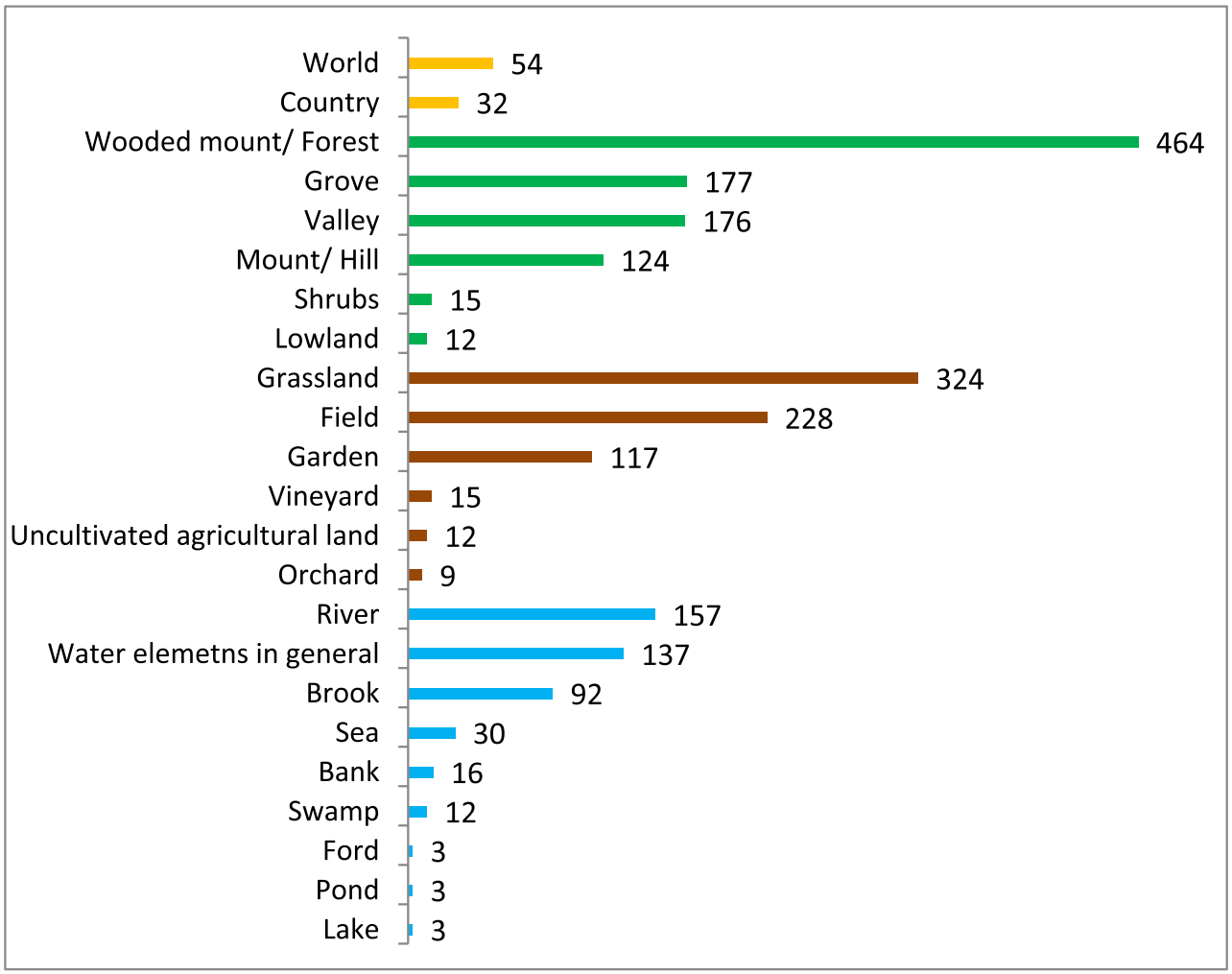


Fig. 3 Landscape elements identified in Slovak folk songs. Main categories are distinguished by colors (orange – landscape in general, green - natural landscape, brown - agricultural landscape, blue – waterscape)

"there's no lovelier place in the whole wide world" (7 citations). Plant species associated with this category were not recorded.

Country It was most frequently referenced in military songs (12 mentions), with an emphasis on the concept of home or homeland (e.g., "our country," "Hungarian country"). However, mentions of Turkish or Czech countries or landscapes also occurred. Additionally, the concept of a foreign country (9 mentions) was represented, as seen in phrases such as "my mom sent me to a foreign country" or "it is not good in a foreign country." Also, this category was not limited to any plant species.

Natural Landscape Elements

The natural landscape consisted of wooded mountains/forests, groves, valleys, monts/hills, shrubs, and lowlands. Water features were evaluated separately. Natural landscapes were prominently mentioned in the Gemersko-Malohontská, Liptovská, Oravská, and Zvolenská historical counties (Fig. 4).

Wooded Mount/Forest

The term *hora*-wooded mount was used to describe a mountainous, mostly forested area. This landscape was the most common among all identified landscape elements. Green, wooded mounts were mentioned most frequently (61 citations), and their height was noted in 20 of these citations. Activities related to wooded mounts were most often associated with crossing through or over them (75 mentions), creating a sense of distance and solitude. Wooded mounts were also linked to the setting or rising sun behind or over them (15 references). Negative feelings were connected to wooded mounts in five cases, described as dark and inaccessible "black wooded mount" or as remote places like "distant wooded mount." However, they were more often depicted positively through diminutives (26 mentions). Regarding mountains, 15 plant species were mentioned 39

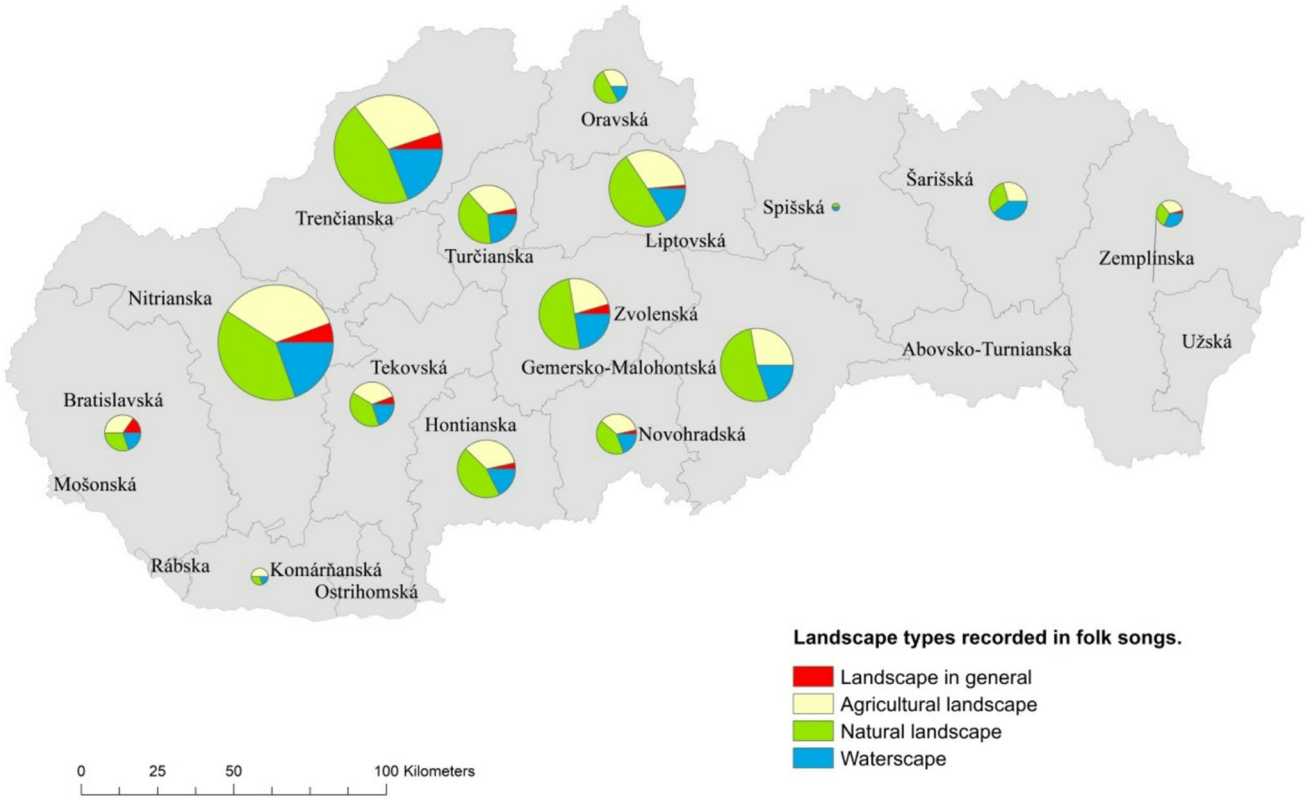


Fig. 4 Representation of landscape types across historical regions based on Slovak folk songs

times, mostly forest trees such as maple (*Acer* sp.), beech (*Fagus sylvatica* L.), linden (*Tilia* sp.), oak (*Quercus* sp.), and fir (*Abies alba* Mill.).

The term *les*–forest was mentioned in songs either generally as "forest" (40.37%) or specified according to the dominant tree species (59.63%). European beech (*Fagus sylvatica* L.) and oak forests (*Quercus* sp.) were the most mentioned, each at 14.68%, followed by birch (*Betula* sp.) at 12.84%. Other types of forests, such as maple (*Acer* sp.), fir (*Abies alba* Mill.), pine (*Pinus* sp.), wayfarer or guelder rose (*Viburnum* sp.), and spruce (*Picea abies* (L.) H. Karst.), were mentioned less often. The forest was primarily perceived as a green forest; however, references to it as a dark forest, conveying negative emotions, were also recorded. Other descriptions of forest—such as dense, deserted, quiet, or vast—were only occasionally mentioned.

Grove A grove is a small natural forest or young growth, mainly consisting of deciduous trees. In 57% of cases, the grove was associated with the idea of "being green." Folk songs often mention groves, such as guelder rose groves or yew groves. Among all landscape features, groves were most commonly referenced using diminutive forms (57%). This element was most often linked to the meaning of going to the grove (53 citations) and being there (10 mentions). Agricultural activities like grazing, mowing, and plowing in or near the grove were also recorded (13 cases). The grove symbolized youth and strength, but in six instances, there was also a desire to be buried in a grove. We identified eight wild and cultivated plant species, including yew (*Taxus baccata* L.), guelder rose (*Viburnum* sp.), strawberry (*Fragaria* sp.), sweet marjoram (*Origanum majorana* L.), and rosemary (*Rosmarinus officinalis* L.).

Valley Historically, valleys, like mountains and forests, symbolized barriers that had to be crossed. The act of crossing, wandering, or seeking refuge in a valley appears in 22.16% of songs that mention the valley. The second most common meaning relates to natural phenomena, occurring in 8.52% of cases (such as "the wind blows through the valley," "water flows through the valley," "the sun sets behind the valley," etc.). The most frequent association with

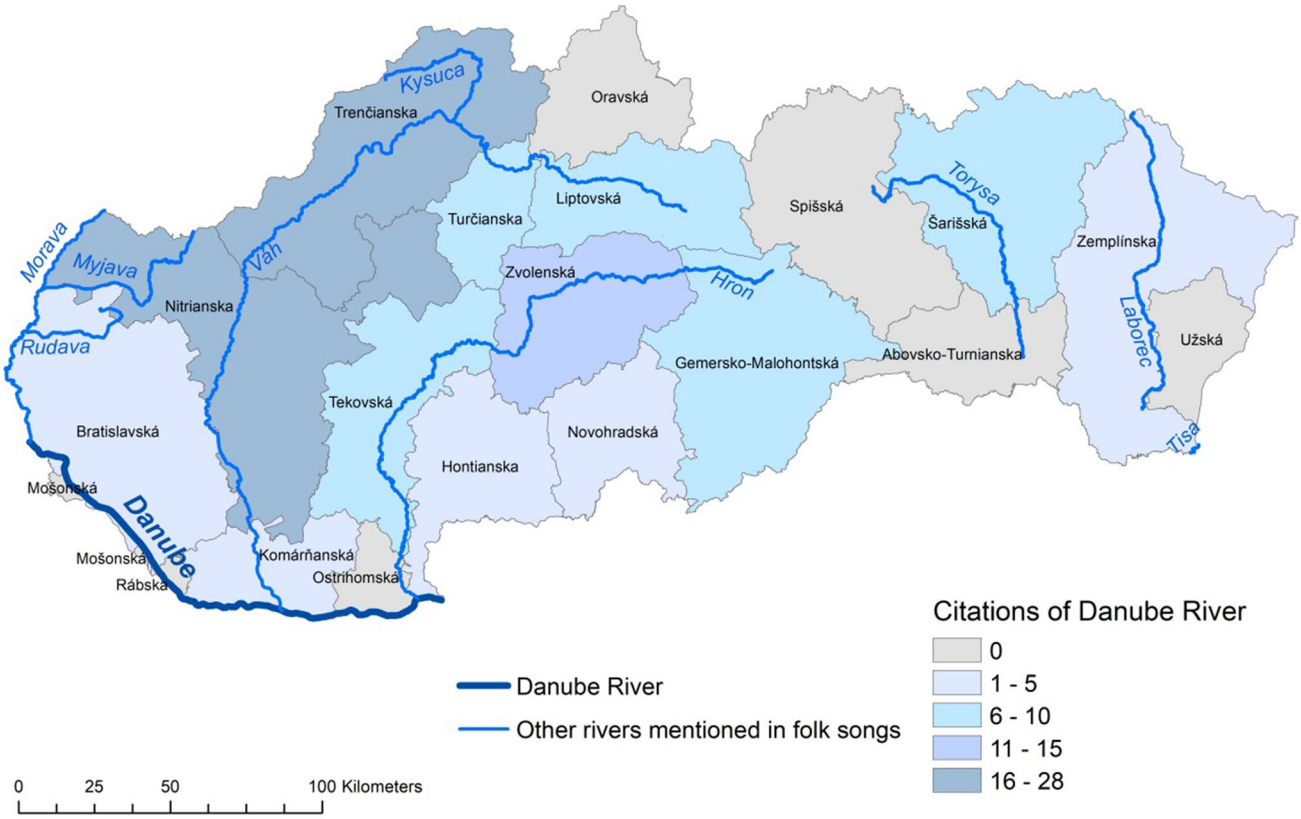


Fig. 5 Rivers featured in folk songs and references to the Danube River, organized by historical counties

valleys is represented by the phrase "deep valley" in 9.66% of instances. Among wild plants, raspberries (*Rubus idaeus* L.) and cultivated crops like rye (*Secale cereale* L.) or clover (*Trifolium* sp.) are mentioned.

Hill/Mount The word 'hill' was most commonly associated with the expression "going over the hill," which appeared in 27.59% of cases. In 6.9% of instances, it was connected to death ("lies dead on the hilltop"), and in another 6.9%, it was linked to standing on the hilltop and looking around or at someone ("she stood on the little hill and looked at me"). Only four plant species were mentioned infrequently: European beech (*Fagus sylvatica*, L.), sweet cherry (*Prunus avium* L.), clover (*Trifolium* sp.), and mountain pine (*Pinus mugo* Turra).

Mountains also encompass ranges and bare rock formations. References to specific mountains or peaks can be found in songs. Kriváň, considered a symbol of Slovakia, was mentioned most often (nine times) and is located in the highest mountain range in Slovakia and the entire Carpathian arc—the High Tatras (Tatras, including the High and Low Tatras, were cited six times). Additionally, there were mentions of other mountains such as Kráľová Hoľa, Sitno, or Devín, but to a lesser extent. Connections of mountains with crossing through them were mentioned in 15.87%, and there were references to the stars, moon, and sun rising or setting in 14.29%. In 17.46%, they were described as a "high mountain." Only three plant species were linked to this element - European beech (*Fagus sylvatica*, L.), maple (*Acer* sp.), and hemp (*Cannabis sativa* L.).

Shrubs were mentioned in the context of passing through, growing, or blossoming. These habitats were generally referenced or connected to specific plant species, such as willow (*Salix* sp.), hawthorn (*Crataegus* sp.), and hazel (*Corylus avellana* L.), as seen in phrases like "he escaped into the willows" or "there is a dry hazel shrub."

Lowland Among natural landscape elements, the lowland was mentioned the least in the songs. Alluvial plains were also included in the lowlands. This category could also refer to grasslands or fields, but this was not distinguishable in the songs. Lowland was mostly described as a beautiful plain, but it was also mentioned in the opposite sense in a

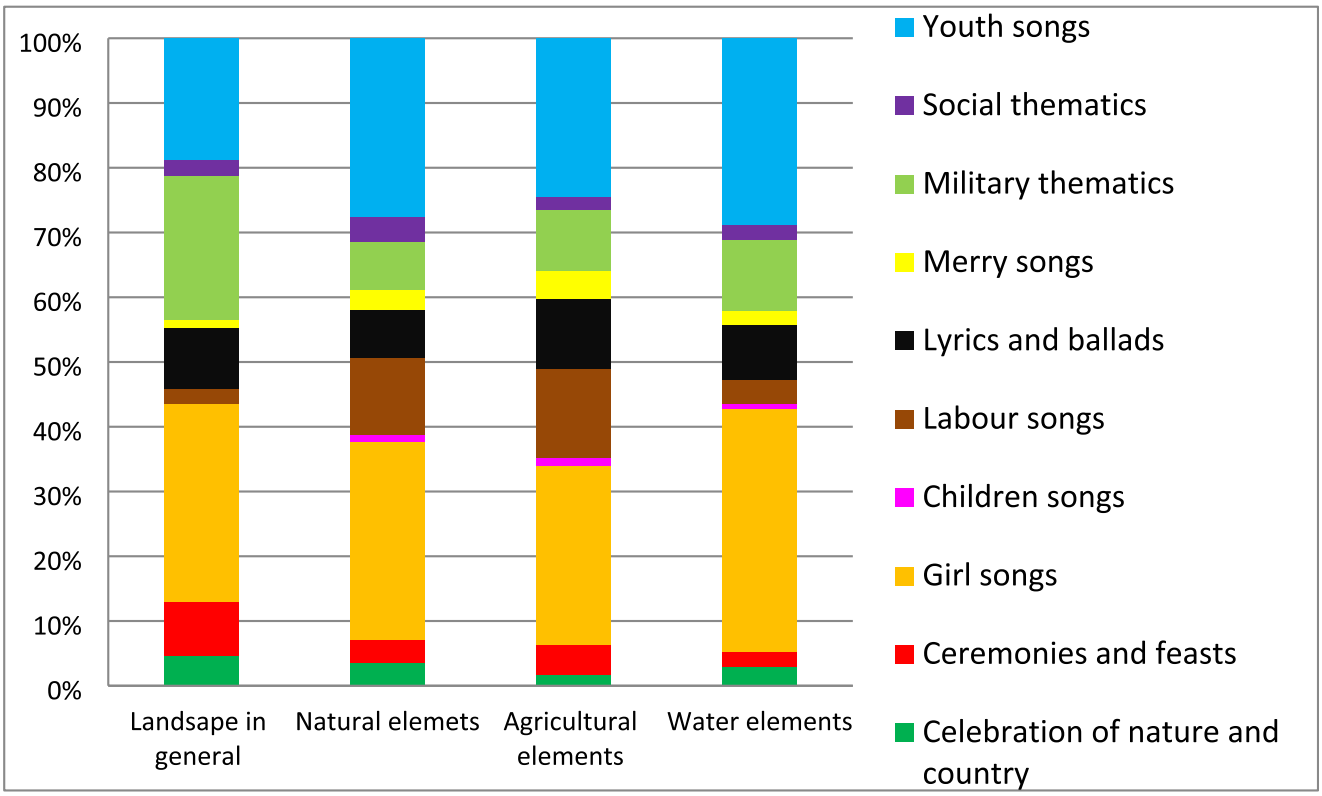


Fig. 6 Folk song genres featuring landscape elements

Table 1 Analyzed categories of folk songs

Category	Sub-category
Data about the song	Historical county or municipality (if specified)
	Song genre: - Girl's songs - Youth's songs - Children's songs, including lullabies, games, and children's songs - Labor songs, including hunting songs, pastoral songs, and other work-related songs such as harvest and hay songs - Lyrics and ballads - Merry songs - Military themes - Social themes including songs about forest robbers, alcoholism, widows, and orphans - Celebration of nature and the countryside - Ceremonies and feasts, including religious songs for annual ceremonies and family customs
Data about landscape elements	Type of landscape element (landscape in general, natural landscape, agricultural landscape, and waterscape)
	Activities associated with landscape features (e.g., jump over the brook, walk through the forest, etc.)
	Characteristics associated with landscape features (dark forest, deep river, vast field, etc.)
	Perception of the landscape elements (positive, negative, neutral)
	Plant species mentioned in connection with individual landscape elements

shepherd's song, "better in the valley than on the plain." No specific plant species were associated with the lowland.

Agricultural Landscape Elements

The agricultural landscape, including grasslands, fields, gardens, vineyards, orchards, and uncultivated land, was the most frequently mentioned in Komárňanská and Nitrianska historical counties (Fig. 4).

Grasslands The songs mentioned various categories within grasslands, such as general grasslands, meadows—particularly clover meadows—and pastures, which included grassy uplands—*hoľa*—and greensward. Grassy hills or mountain slopes, mainly grazed by sheep, known as *grúň*, were also part of this category. Grasslands were often associated with the color green, mentioned in connection with it in 40.97% of cases in the grassland category. They were also linked to grassland management, including mowing and hay raking (22.53%) and grazing (5.56%). Additionally, grasslands were referenced in relation to "walking on them" (9.9%) and "growing" in 6.17%, as in "grass grows on the landlord's field." Among the five plant species identified, clover

Table 2 Landscape elements and plants linked to landscape features mentioned in Slovak folk songs

Type of landscape	Basic landscape elements	Specific landscape elements (in English)	Specific landscape elements (in native language - Slovak)	Total landscape mentions	Plant species connected to landscape elements	Total plant species mentioned
	World	World	Svet	54		
Landscape in general	**Country/Land**	Landscape − 10, Hungarian country − 7, Hungarian land, Turkish land − 2, Czech land, Austria (in dialect)	Krajina − 10, uhorská krajina − 7, uhorská zem, turecká zem − 2, česká zem, Rakúsy	22		
		Foreign country − 3, foreign region − 2, foreign country − 3, foreign land − 2	Cudzina − 3, cudzí kraj − 2, cudzia krajina − 3, cudzia zem − 2	10		
Natural landscape	**Wooded mount/Forest**	Wooded mount − 311, wooded mount (t) − 17, wooded mount (s) − 6, wooded mount (t) − 3, wooded mount connected with local names − 4	Hora − 311, horička − 17, hôrka − 6, horenka − 3, hora s miestnym názvom − 4	341	Savin (*Juniperus sabina* L.), European beech (*Fagus sylvatica* L.) − 2, clover (*Trifolium* sp.)- 4, oak (*Quercus* sp.), pea (*Pisum sativum* L.) − 3, maple (*Acer* sp.) − 4, linden (*Tilia* sp.) − 2, oat (*Avena sativa* L.) − 3, rye (*Secale cereale* L.) − 7	27
		Scots pine wooded mount, Scots pine wooded mount in local name, Scots pine wooded mount (t) − 2	Borová hora, borina, borovenka − 2	4	Scots pine (*Pinus sylvestris* L.) − 4	4
		European beech wooded mount	Bukovina	1	European beech (*Fagus sylvatica* L.)	1
		Maple wooded mount − 3	Javorová hora − 3	3	Maple (*Acer* sp.).- 3	3
		Common silver fir wooded mount − 3	Jedľová hora − 3	3	Common silver fir (*Abies alba* Mill.) − 3	3
		Periwinkle wooded mount	Zimozeleňavá hora	1	Periwinkle (*Vinca minor* L.)	1
		Foothills	Podhorie	1		
		Clearing	Rúbanina	1		
		Forest − 49, forest (s), forest (t)	Les − 49, lesík, lesíček	51	Birch (Betula sp.), Scots pine (Pinus sylvestris L.), maple (*Acer* sp.) − 2, linden (*Tilia* sp.)	5
		Oak forest − 10, oak forest − 3, oak forest − 2, oak forest	Dubina − 10, dúbrava − 3, dúbravina − 2, dubie	16	Oak (*Quercus* sp.) − 16	16
		Beech forest − 10, beech forest (s), beech forest − 4	Bučina − 10, bučinka, bukovina − 4	15	European beech (*Fagus sylvatica* L.) − 15	15
		Birch forest − 13	Brezina − 13	13	Birch (*Betula* sp.) − 13	13
		Maple forest − 4, maple forest, maple forest	Javorina − 4, javorie, javorový les	6	Maple (*Acer* sp.) − 6	6
		Common Silver Fir forest – 3, common silver fir (t) − 2	Jedlina − 3, jedľovinka − 2	5	Common Silver Fir (*Abies alba* Mill.) − 5	5
		Wayfarer or guelder rose forest − 2	Kalinový les − 2	2	Wayfarer or guelder rose (*Viburnum* sp.) − 2	2
		Norway spruce forest	Svrčina	1	Norway spruce (*Picea abies* (L.) H. Karst.)	1

Table 2 (continued)

Type of landscape	Basic landscape elements	Specific landscape elements (in English)	Specific landscape elements (in native language - Slovak)	Total landscape mentions	Plant species connected to landscape elements	Total plant species mentioned
	Grove	Grove −82, grove (s) −38, grove (t) −50	Háj −82, hájik −38, hájiček −50	170	Common juniper (*Juniperus communis* L.), European beech (*Fagus sylvatica* L.) −2, strawberry (*Fragaria* sp.), sweet marjoram (*Origanum majorana* L.), rosemary (*Rosmarinus officinalis* L.) −2	7
		Yew grove (s), yew grove (t)	Hájik tisový, hájiček tisový	2	European yew (*Taxus baccata* L.) −2	2
		Marjoram grove (s) −2	Hájik majeránový −2	2	sweet marjoram (*Origanum majorana* L.) −2	2
		Viburnum grove (s), viburnum grove (s)	Hájik kalinkový, hájik kalinový	2	wayfarer or guelder rose (*Viburnum* sp.) −2	2
		Beech grove	Hájik bukovina	1	European beech (*Fagus sylvatica* L.)	1
	Valley	Valley −133, valley (s) −6, valley (t) −5, valley (t) −4, valley −19, valley connected with local names −4	Dolina −133, dolinka −6, dolinečka −5, dolinôčka −4, doly −19, dolina s miestnym názvom −4	171	Pea (*Pisum sativum* L.), spring grains (*Poaceae* family), wayfarer or guelder rose (*Viburnum* sp.), common red raspberry (*Rubus idaeus* L.) −3, common reed (*Phragmites australis (*Cav.) Trin. ex Steud.), rye (*Secale cereale* L.) −2	9
		Valley −4	Údolie −4	4		
		Gorge	Úvalina	1		
	Hill/Mount	Hill (s) −48, hill (s) −2, hillock −3, hillock (s) −3, hillock (t) −2	Vršok −48, vrštek −2, kopec −3, kopček −3, kopeček −2	58	European beech (*Fagus sylvatica* L.), sweet cherry (*Prunus avium* L.) clover (*Trifolium* sp.), mountain pine (*Pinus mugo* Turra)	4
		Mount −9, mount names: Kriváň −9, Tatry −6, Kráľova hoľa −3, Biele hory −2, Javorníky −2, Sitno −2, Poľana, Trenčianska skala	Vrch −9, Kriváň −9, Tatry −6, Kráľova hoľa −3, Biele hory −2, Javorníky −2, Sitno −2, Poľana, Trenčianska skala	35	European beech (*Fagus sylvatica* L.)	1
		Maple mount	Vrch javorový	1	Maple (*Acer* sp.)	1
		Rock −21, rock, rocks	Skala −21, skalie, skaliny	23		
		Reef	Bralo	1		
		Mountain side −6	Úboč −6	6	Hemp (*Cannabis sativa* L.) −2	2
	Shrubs	Shrub	Kríak	1		
		Thorny shrubs −3, thorny shrubs	Tŕnina −3, tŕnie	4		
		Thorny howthorns	Hložie tŕňové	1	Hawthorn (*Crataegus* sp.)	1
		Common hazel shrubs −5, common hazel shrubs (s)	Lieština −5, lieštinka	6	Common hazel (*Corylus avellana* L.) −6	6
		Willow shrubs	Vrbina −3	3	Willow (*Salix* sp.) −3	3
	Plain	Flatland −5, flatland (t) −4	Rovina −5, rovinečka −4	9		
		Alluvial plain −2	Niva −2	2		
		Flatland	Podolie	1		

Table 2 (continued)

Type of landscape	Basic landscape elements	Specific landscape elements (in English)	Specific landscape elements (in native language - Slovak)	Total landscape mentions	Plant species connected to landscape elements	Total plant species mentioned
Agricultural landscape	**Meadow**	Meadow − 59, meadow (s) − 35, meadow − 2, Meadow connected with local name − 6, lord´s meadow	Lúka − 59, lúčka − 35, lúčina − 2, lúka with local names − 6, panská lúka	103	Common reed (*Phragmites australis* (Cav.) Trin. ex Steud.), vine (*Vitis vinifera* L.)	2
		Mountain meadow − 3	Poľana (3)			
		Clover − 20, clover (s) − 11, clover, clover grasses	Ďatelina − 20, ďatelinka − 11, ďateľ, ďatelinové trávy	33	Clover (*Trifolium* sp.) − 33	33
		Aftermath − 7, aftermath (s) − 2	Otava − 7, otavka − 2	9		
		Grass (to mow) − 29, grass (to mow) (s) − 8	Tráva − 29, trávička − 8	37	Clover (*Trifolium* sp.)	1
	Pasture	Sward − 14	Pažiť- 14	14	Rosemary (*Rosmarinus officinalis* L.)	1
		Mountain pasture − 10	Hoľa − 10	10	European beech (*Fagus sylvatica* L.) − 2	2
		Grass (to graze) − 2, grass (to graze) (s)	Tráva − 2, trávička	3		
	Other type of grassland	Grassy hill/mountain slope − 8, grassy hill/mountain slope (s), grassy hill/mountain slope (t)	Grúň (8), grúnik (2), grúničok	11	European beech (*Fagus sylvatica* L.)	1
		Grass − 56, grass (s) − 36, grass − 6, greenery − 4	Tráva − 56, trávička − 36, zelina − 6, trávniček − 4	104		
	Field	Field − 177, field connected with local names − 19, field (t) − 2, lord ´s field, field − 14, field (s) − 2, lord ´s field, ground (s)	Pole − 177, pole s miestnym názvom − 19, políčko − 2, panské pole, roľa − 14, rolička − 2, panská roľa, zemička	217	Common juniper (J*uniperus communis* L.), peach (*Prunus persica* L.) − 3, common pear (*Pyrus communis* L.) − 22, apple tree (*Malus domestica* Borkh.), Common corncockle (*Agrostemma githago* L.) − 4, linden (*Tilia* sp.) − 5, knapweed (*Centaurea* sp.), crabapple (*Malus sylvestris* (L.) Mill.), goat willow (*Salix caprea* L.) − 3, rose (*Rosa* sp.), dog rose (*Rosa canina* L.), spelt (*Triticum spelta* L.), poplar (*Populus* sp.)	49
		Specific type of arable land exploitation, specific type of arable land exploitation (s) − 3, specific type of arable land exploitation − 2	Kopanina, kopanička − 3, kopanica − 2,	6	Pea (*Pisum sativum* L.), sweet basil (*Ocimum basilicum* L.), rosemary (*Rosmarinus officinalis* L) − 2	
		Turning headland − 3	Úvrať − 3	3	Rye (*Secale cereale* L.)	1
		Furrow, furrow (s)	Brázda, brázdejka	2		

Table 2 (continued)

Type of landscape	Basic landscape elements	Specific landscape elements (in English)	Specific landscape elements (in native language - Slovak)	Total landscape mentions	Plant species connected to landscape elements	Total plant species mentioned
	Garden	Garden − 50, garden (s) − 30, garden (t) − 15, garden (t) − 2, garden (t), garden (t), Lord's garden − 9, priest´s garden, garden connected with village names − 8 (Nitra, Oščadnica, Píla, Prešpork, Prievidza, Tisovec − 2, Zvolen)	Záhrada − 50, záhradka − 30, záhradôčka − 15, záhradenka − 2, záhradienka, záhradečka, panská záhrada − 9, kňazova záhrada, záhrada + názov obce − 8 (nitrianska, oščadnická, pilianska, prešporská, prievidzká, tisovská − 2, zvolenská)	117	Sweet basil (*Ocimum basilicum* L.) − 3, horsebean (*Vicia faba* L.), violet (*Viola* sp.) − 4, carnation (*Dianthus* sp.) − 2 common pear (*Pyrus communis* L.) − 3, horse-radish (*Armoracia rusticana* G. Gaertn., B. Mey. & Scherb), apple tree (*Malus domestica* Borkh.) − 3, lily (*Lilium* sp.) − 3, common flax (*Linum usitatissimum* L.), sweet marjoram (*Origanum majorana* L.) − 5, rosemary (*Rosmarinus officinalis* L.) − 6, rose (*Rosa* sp.) − 5, plum tree (P*runus domestica* L.) − 3, lettuce probably (*Lactuca sativa* L. - probably), sour cherry (*Prunus cerasus* L.), tulip (*Tulipa* sp.)	43
	Vineyard	Vineyard − 12, vineyard − 3	Vinohrad − 12, vinica − 3	15	Pea (*Pisum sativum* L.)	1
	Uncultiva-ted land	Field boundary − 4	Mädza − 4	4	Sweet cherry (*Prunus avium* L.), knapweed (*Centaurea* sp.), wheat (*Triticum aestivum* L.)	4
		Fallow land − 7	Úhor − 7	7	Pea (*Pisum sativum* L.)	
		Furrow	Prieloh	1		
	Orchard	Orchard − 5, sour cherry orchard − 2, orchard (folk name) − 2	Sad 5, sad višňový − 2, štepnica 2	9	Sweet basil (*Ocimum basilicum* L.), goat willow (*Salix caprea* L.), rose (*Rosa* sp.), sour cherry (*Prunus cerasus* L.) − 2	5
Waterscape	**River**	River − 6, names of rivers: Dunaj − 103, Dunaj (s) − 11, Dunaj (t), Dunaj water − 4, Dunaj water (s) − 3, Váh − 9, Morava − 4, Tisa − 4, Hron − 3, Myjava − 3, Torysa − 2, Kysuca − 2, Laborec, Rudava	Rieka − 6, Dunaj − 103, Dunajok − 11, Dunajíčok, dunajská voda − 4, dunajská vodička − 3, Váh − 9, Morava − 4, Tisa − 4, Hron − 3, Myjava − 3, Torysa − 2, Kysuca − 2, Laborec, Rudava	157	Common pear (*Pyrus communis* L.), wayfarer or guelder rose (*Viburnum* sp.), lily (*Lilium* sp.) linden (*Tilia* sp.), tulip (*Tulipa* sp.), rye (*Secale cereale* L.)	6
	Water generally	Water − 112, water (s) − 24. water (t)	Voda − 112, vodička −24, vodienka	137	Strawberry (*Fragaria* sp.), common flax (*Linum usitatissimum* L.), linden (*Tilia* sp.)	3
	Brook	Creek, creak (s), brook, brook (s) − 2, brook (t), brook (t)	Potok − 24, potôčik − 23, jarok − 15, jarčok −2, jaroček, jarôčik	66	Violet (*Viola* sp.), maple (*Acer* sp.) forget-me-not (*Myosotis* sp.) goat willow (*Salix caprea* L.), rose (*Rosa* sp.)	5
		Swift water − 5, swift water (s) − 4, swift stream, swift brook	Bystrá voda − 5, bystrá vodička − 4, bystrina, bystrý potok	11		
		Flowing water	Tečúca voda	15	Tulip (Tulipa sp.)	1

Table 2 (continued)

Type of landscape	Basic landscape elements	Specific landscape elements (in English)	Specific landscape elements (in native language - Slovak)	Total landscape mentions	Plant species connected to landscape elements	Total plant species mentioned
	Sea	Sea − 26, Red sea − 4	More − 26, Červené more − 4	30	Maple (*Acer* sp.), wayfarer or guelder rose (*Viburnum* sp.), rose (*Rosa* sp.)	3
	Bank	Bank- 13, bank	Breh − 13, nábrežie	14		
		Grassy bank − 2	Sihoť − 2	2		
	Swamp	Swamp − 6, swamp, fen − 5	Močiar − 6, močarina, barina − 5	12	Lily (*Lilium* sp.), yellow marsh-marigold (*Caltha palustris* L.)	2
	Ford	Ford − 3	Brod − 3	3		
	Pond	Pond, pond (s) − 2	Rybník, Rybníček − 2	3		
	Lake	Lake − 2, lake (s)	Jazero − 2, jazierko	3	Linden (*Tilia* sp.) − 2	1
				2212		**307**
	s - small or expressing positive feelings, *t - tiny*, *or expressing positive feelings*					

(*Trifolium* sp.) was the most frequently mentioned, appearing 34 times.

Field Among the elements of the agricultural landscape, the field emerged as the second most prominent feature, along with its components such as furrows and furrow slices. Songs highlighted the broadness of the field in 28.7%, and to a lesser extent, its flatness and greenery. Activities related to the field were dominated by "going to the field" (23.04%), standing in the field - mainly among tree species like pear, lime, and rose- and occasionally a chapel or soldier (8.26%), as well as plowing (6,52%). Other agricultural activities, like weeding, grazing, sowing, and harvesting, were mentioned less frequently. The field was also referenced in the context of flying birds overhead (5.22%). Various tree species were associated with fields, with the common pear (*Pyrus communis* L.) being the most frequent. It was used in expressions like "be alone like a pear in the field" (9.57%). Among other trees were linden (*Tilia* sp.), peach (*Prunus persica* L.), willow (*Salix* sp.), and apple tree (*Malus domestica* Borkh.), among others. Herbaceous species included corn cockle (*Agrostemma githago* L.), cornflower (*Centaurea* sp.), rosemary (*Rosmarinus officinalis* L.), and peas (*Pisum sativum* L.).

Garden This word was mentioned in general, as a lord's garden (7.76%) or as gardens specified by names of towns or villages (6.9%), such as the garden of Tisovec, the garden of Oščadnica, and others. Gardens were associated with activities like entering or jumping into the garden (19.83%), looking toward the garden (6.03%), sitting in it (5.17%), planting (5.17%), grafting (3.45%), building it—such as repairing, weeding from the rods, fencing (6.03%)—and sunshining (6.03%). A total of 18 plant species were mentioned, with rosemary (*Rosmarinus officinalis* L.) being the most common, followed by rose (*Rosa* sp.), sweet marjoram (*Origanum majorana* L.), and violet (*Viola* sp.). Other species were mentioned less frequently.

Vineyard Viticulture regions are located in southern and eastern Slovakia. Because of their specific location within a relatively small area, they were used as an example for further analysis to determine whether, and to what extent, folk songs reflect the historical landscape. Of the eight vineyards mentioned in the songs at the municipal level, only one - the village of Pukanec - still engages in winemaking today. However, based on military topographic maps from the 1950 s, four more locations were confirmed to have vineyards within the village boundaries or nearby villages such as Čabradský Vrbovok, Chtelnica, Solčany, and Kúty. In songs, vineyards are associated with activities such as mowing, digging, and planting (mentioned five times), as well as selling, as exemplified by the line "I will not sell the vineyards because I like them." The grapevine (*Vitis vinifera* L.) is linked to vineyards through its name, but was not explicitly mentioned. Only one other plant species—the pea (*Pisum sativum* L.)—was mentioned.

Uncultivated Land In songs, this type is referred to as fallow land, boundary, or clearing. It was associated with agricultural practices like grazing oxen or plowing. Four plant species were noted: centaury (*Centaurea* sp.), wheat

(*Triticum aestivum*), pea (*Pisum sativum* L.), and sweet cherry (*Prunus avium* L.).

Orchard Among the features of the agricultural landscape, it was mentioned the least. They were noted, for example, in terms of their size, density ("the orchard is so dense, no bird flies over it"), and flowering. Several plant species were recorded, including sweet cherry (*Prunus avium* L.), rose (*Rosa* sp.), sweet basil (*Ocimum basilicum* L.), and willow (*Salix* sp.).

Waterscape

The waterscape includes various water features such as rivers, streams, the sea, ponds, lakes, swamps, and brooks. Although banks are transitional zones between land and water, they are also classified as part of the waterscape. The waterscape was most often mentioned in the eastern Slovak historical counties (Figs. 5 and 6.

Rivers Out of the total, ten Slovak rivers were mentioned, with the Danube being the most frequently cited (121 times). The Danube is the largest river in Slovakia. It flows through the southern part of the country for 172 km and forms the border with Hungary for 150 km. The Danube is often mentioned even from other historical regions far from it, such as Liptovská or Šarišská county (Figs. 5 and 6), and is associated with words like quiet, wide, clean, or deep.

The Váh is the longest river in Slovakia, measuring 403 km. It was mentioned nine times, more often than the Morava, Tisa, Hron, Kysuca, Myjava, Torysa, Rudava, and Laborec rivers. In 22.29% of cases, the river was associated with activities such as going to the river, crossing it by swimming, fording, or jumping over it. In 14%, it was linked to falling into the river, throwing someone in, or drowning. In 9.55%, the river was mentioned in connection with washing and laundry.

Water in General In the song texts, water is often mentioned broadly, and from the context, it is not possible to determine whether it refers to a river, stream, or stagnant water. It was most commonly referenced as "water flows" in 26.28%, which could indicate a river or brook. Only two references might - but might not - symbolize a waterfall, as they were described as "flowing water from the rock". Water was further specified with descriptors like clear, cold, murky, clean, deep, or quiet (21.9%). Most frequently, water was associated with the activity of "going or being by the water" (16.06%), for example, in the song "my dear is behind the water," implying a challenging obstacle or distance. Water was more often mentioned in connection with throwing something into it (9.49%) or for doing laundry.

Brook In 41.30% of mentions, it appeared in the diminutive form, which may indicate either a small stream or positive feelings. In 15 songs, it was described as clear, clean, and fast-flowing; however, the opposite was also noted, being described as murky (five citations). Most often (in 29 songs), this landscape feature was used in conjunction with the verb "to flow," and in nine songs, phrases such as "the water took" or "to throw something in the water" were recorded. The phrase "to be by the stream" appeared more frequently (eight times). Plant species associated with this element included violet (*Viola* sp.), maple (*Acer* sp.), forget-me-not (*Myosotis* sp.), tulip (*Tulipa* sp.), willow (*Salix* sp.), and rose (*Rosa* sp.).

Sea Although Slovakia is landlocked, the sea still features in the songs, with four songs specifically mentioning the Red Sea. This landscape element is used to convey distance, like "coming to the edge of the sea," and the feeling of being separated. Girls often express a strong determination to reach or hold on to their loved ones at any cost, even if it means crossing the sea for love. This motif is commonly found in girls' songs, enhancing their romantic tone. Another example of metaphorical language describes a situation where a person can only become a partner or spouse if they complete an impossible task, such as carrying sand out of the sea. This highlights the impossibility of fulfilling the condition and, therefore, the impossibility of achieving love or marriage with the loved one.

Bank This landscape element often appears in sad or sentimental songs, showing a person lying on the riverbank. Other uses of the word "bank" include descriptions like "she walked on the bank" or "she plucked grass on the bank." No specific plant species were recorded.

Swamp It was mentioned, for example, in the shepherd's song, where he advises other shepherds not to graze sheep in the marshes because harmful herbs grow there, or in the youth's song, when the latter sings that he would go to a girl, but there is a large swamp in front of her house. Among the

plant species mentioned are marsh marigold (*Caltha palustris* L.) and lily (*Lilium* sp.).

Ford It was only mentioned in girl songs related to crossing a ford. Associated plant species were not recorded.

Pond The pond was mentioned only in three songs in connection with "going to the pond" or „to fall into the pond," without mentioning associated plant species.

Lake Historically, there were relatively few natural lakes, mainly located in the Tatra Mountains, which are of glacial origin. The development of artificial water bodies started with the expansion of the mining industry. In songs, a lake was mentioned as a place for swimming with a goose on it and a standing linden tree nearby.

Naming Landscape Elements

In the Slovak language, diminutives are often used in naming landscape features, formed by adding specific suffixes to nouns that indicate small size, such as "-čka" (e.g., lúčka – small meadow), "-ička" (horička – small, wooded hill), "-ičko" (políčko - small field), "-ik" (hájik – small grove), and "-ík" (lesík – small forest). However, diminutives also serve to express positive emotional feelings. Landscape elements expressed in diminutives represent a positive relationship of humans toward the landscape feature. Therefore, it is often impossible to distinguish whether the diminutive is used to indicate small features or if it is used to express a positive attitude toward the particular feature.

Because diminutives are used in some landscape terms in folk songs, distinctions are not always clear, such as between *vrch* (mount) and *kopec* (hill). In traditional usage, *vrch* refers to a mountain; however, when a diminutive like *vŕšok* is used, it can mean a hill. This linguistic phenomenon demonstrates the flexibility and variability of folk terminology, which adapts to local perceptions of the landscape.

For more precise naming of landscape features, combinations of two or more nouns were also used, typically the name of the landscape feature and the dominant plant. This method was applied only to forests, wooded hills, groves, and meadows. For example, "spruce forest," "maple wooded hill," "yew grove," and "clover meadow." Occasionally, nominalization was also used to create adjectival landscape terms as nouns. For instance, from the adjective *bystrý* (swift), the noun *bystrina* (swift stream) was formed.

Song genre.

Songs that incorporate landscape features were analyzed by genre. I identified ten different genres (Fig. 6) and assessed how each landscape element group was represented across these genres.

Compared to other types of landscapes, the landscape in general had a higher frequency in songs with military themes, such as "we must shed our blood for our country." Additionally, ceremonies and celebrations like weddings were common themes, as shown in a song where "she married off her daughter to a foreign country." Nature was also celebrated, with references to falcons flying over the countryside.

Social themes were most prominently represented in natural landscapes, as illustrated in robber song "robber is going through the birch grove."

Labor songs were more associated with agricultural elements, often featuring expressions such as "mowing the grass in the meadow" or "he goes to plough a wide field," as well as with ballads like "they killed him in a field." In merry songs, like "I will sell the field, and will buy a new skirt," agricultural landscapes were also more commonly represented.

In waterscape, the girl (e.g., "she stood by the Danube, crying sorrowfully") and youth songs (e.g., "he was jumping over the village ditches") were the most common among song genres.

Discussion

Perception of Landscape Features

Slovak folk songs often celebrate the beauty and diversity of the landscape. Using vivid descriptions and evocative metaphors, they capture its essence and importance in shaping community identity. Exploring landscape features through folk songs may not reveal all aspects that people recognize in the land. For example, I found no references to caves in the songs. However, this does not mean people did not notice them. Instead, it suggests a cultural preference for specific elements that resonate more with local lifestyles and are more relevant to folk art or daily life.

The landscape in general was most often mentioned in the Bratislava historical region. Compared to other parts of Slovakia, this area had the closest connections to the outside world, largely due to its strategic location near Vienna and Budapest. Bratislava was a multiethnic city with large German, Hungarian, and Jewish communities, which enhanced its international atmosphere. Additionally, the city held significant political and administrative importance as one of the key centers of the Kingdom of Hungary, hosting royal coronations (Pálffy, 2006). All these factors contributed to a stronger awareness of foreign cultures.

Natural landscapes were most often referenced in the historical counties of Gemersko-Malohontská, Liptovská, Oravská, and Zvolenská, known for their mountains and

dense forests. This landscape pattern has persisted mainly over time, although, like in other Slovak regions, it has been shaped by modern development and human activity. The most commonly mentioned term was the wooded mountain — *hora*. It was frequently associated with wild, densely wooded nature. However, it sometimes referred to areas that included mountainous terrain, not just the forest itself. *Hora* often conveyed ideas of something bigger, more formidable, or mysterious, and in folk songs, it was often seen as a refuge (e.g., for robbers or shepherds) and a source of wood. In contrast, the term for forest—*les*—is less mystical and wild compared to a mountain and is more connected to daily activities and familiar surroundings. *Hora* and *les* can be viewed as synonyms with slight differences in meaning. The frequent mention of wooded mountains or forests in folk songs also reflects the character of the Slovak landscape, as forests covered about 38% of Slovakia's territory at the start of the twentieth century (Vadkertyiová, 1975). Similar findings were reported from Bulgaria by Ivanova (2021), who observed that the most common plant-related references in songs were for forests (appearing in heroic and rebel songs).

The agricultural landscape was mainly mentioned in the Komárňanská and Nitrianska historical counties. The fertile soil and warm climate of the Danube Plain have made, and continue to make, these areas ideal for crop cultivation, establishing them as some of Slovakia's most important agricultural regions for centuries. Among agricultural features grasslands were the most frequently cited. In mountainous areas, the importance of fields was comparable to that of meadows. As early as 1792, Juraj Fándly's book *Piľní domajší a poľní hospodár* emphasized the significance of meadows for domestic farming and provided practical guides for their maintenance, comparing their importance to arable land. Fields were the second most mentioned agricultural feature, valued as the primary source of food. In songs, people often expressed their admiration for the vastness of the land. In 1900, arable land accounted for approximately 40% of the country's land area (Vadkertyiová, 1975).

The viticultural landscape, one of the oldest types of European agricultural landscapes, creates a distinctive sense of place in several Slovak regions through its unique function and appearance (Štefunková & Hanušin, 2019). Vineyard cultivation and wine production in Slovakia are documented by written sources dating back to the early eleventh century. In the past, vineyards covered much larger areas (Lieskovský et al., 2013), but by the end of the Middle Ages, many had been abandoned (Popelková, 2006). Today, they are mainly found in some areas of southern and eastern Slovakia, covering 8,012 hectares (Rozborilová, 2019). Using the example of the vineyards mentioned in folk songs identified at the municipal level suggests that folk songs may reflect the historical memory of the landscape. However, their content needs to be verified through historical sources such as old records, maps, and other documents. Since folk songs spread orally to more distant regions, they may reflect the local reality only to a certain extent.

Water landscapes were most frequently noted in the eastern Slovak historical regions, where rivers like the Bodrog, Laborec, and Ondava, along with former wetlands, significantly shaped the terrain. Water features were more prevalent in these areas than in other parts of Slovakia. The region's wetlands have been drained mainly due to agricultural land reclamation during the socialist era.

Landscape features were most frequently mentioned in connection with crossing them. References are also related to agricultural activities, such as mowing and grazing, or linked to natural phenomena, such as the sun shining or the wind blowing. This supports Truskhova et al. (2019), who suggested that Slavic cultures have unique ways of connecting with nature through natural objects and phenomena like the sun, wind, and rain, which were very important to them. Additionally, references to the growth and development of plants or the flight of birds often appeared.

Symbolic Significance of Specific Landscape Features and Related Plant Species

Slovak folk songs offer a rich source of information about the symbols associated with landscape elements and plants, as well as their meanings. For example, the color green in the songs symbolized happiness and love and was often associated with green groves and meadows, representing prosperity and abundance. The roaring mountains and forests symbolized youth that would not return, expressing a deep emotional reflection on the passing years and the loss of youth through the natural environment (Sobotka, 1879). Wooded mountains were also frequently mentioned with awe for their remoteness and impassability, creating a sense of separation and acting as barriers to loved ones meeting. However, they also provide peace and inspiration.

Water elements in Slovak folk songs also symbolize a wide range of meanings – from love and longing to sorrow and death.

– Water often symbolizes the willingness to overcome any obstacle for love, such as in the song "I would jump to the Danube for you," or it expresses sorrow over a love that is ending: "through Petrovec, the muddy water flows, my dear is leaving me," and "the water flows, love fades, like the water between the mountains." In folk songs, mainly the sea is seen as an insurmountable obstacle, representing distance and longing for a loved one.

- Many folk songs depict water as the setting for a tragic ending caused by unrequited love. For example, "the wide Danube and a stone around the neck, because you separated a black-eyed couple," or in the song, "she threw herself into the Danube." This motif is common in ballads, where an unfortunate young man or maiden ends their life in the water.
- Water was also associated with the feminine principle and passion, sometimes even featuring erotic motifs hidden in metaphors. For example, in the song, "the quiet water fell into the Danube, many a maiden was disappointed," or "maidens' virtue runs down the Váh River."
- In some songs, water symbolizes a journey and discovery - "a raft on the water, the raftsman by the oar," or "when they won't let us be together, there is freedom in wandering to the quiet Danube."

Additionally, individual plant species were symbolically associated with various emotions and meanings. The tree was one of the most common and symbolically rich symbols. It was believed to be the home of divine beings and natural forces. The deciduous tree symbolized rebirth, while the coniferous tree was linked to immortality (Klepáčová, 2003).

The maple tree was often associated with human misfortune (Sobotka, 1879). In Slovak songs, it appears alongside landscape features to symbolize loneliness ("the forest is sad without a maple tree, sadder is a girl without a lover") or separation and distance ("mother married me off beyond the maple forest").

The oak symbolized strength and ruggedness (Sobotka, 1987). In folk songs, it was personified as a strong and sturdy man, but it also represented sorrow ("my youth fades like a leaf in the oak forest").

The beech tree was often associated with the spring awakening of nature in folk songs ("let's go boys, let's go for a robbery, the beech is starting to unfold").

Linden trees were very popular among the Slavs. People often planted them near churches, chapels, or homes. In songs, they were almost always used in diminutive forms, which signified intimacy and closeness. A single linden in a field represented an orphaned girl or a girl who was unhappy in love (Sobotka, 1879) (e.g., "in the wide field stands a pretty green linden, beneath it my dear one, who is tearful").

Like the linden, the common silver fir was often used in diminutives to symbolize beauty ("there is no lovelier forest than a common silver fir one"). It frequently represented a girl and her sorrow or longing (Sobotka, 1879) (e.g., "fir forest, why do not you green, poor girl, why don't you marry?"). The common silver fir symbolizing a beautiful girl was also reported from Bulgaria (Ivanova, 2021).

Hazel also received more prominent representation. In national poetry, nuts symbolized fertility, and hazel in songs carried an intimate meaning (Sobotka, 1879) (e.g., "do not cut down hazelnut, let it have nuts").

Among the fruit trees, the pear was mentioned most often. In nearly half of the cases, the pear tree was associated with loneliness, most often in the simile "alone like a pear tree in a field."

The rose was used in all aspects of traditional folk culture, and its irreplaceable role as a symbol was expressed through the color, scent, shape of the flower, and also by its thorns. In general, the rose symbolized feminine beauty and love (Náplavová, 2003; Herrero & Cardaño, 2015; Fisher, 2022), and it also represented a girl ('she blossoms as a rose in the garden').

Certain herbaceous plants were also symbolically associated with different emotions and meanings. For instance, clover represented sadness and forgetfulness, as its presence signified abandoned paths (as in the song "paths towards the windows of my girl have overgrown with thorns and tiny clover"). The same symbolic meaning of the clover (probably *Trifolium repens* L., and/or *Trifolium pratense* L.) can also be found in other cultures and has been documented, for example, in Slovenia (Fisher, 2022).

Rosemary and basil were symbols of faithful love (Tarcalová, 2003) (e.g., in the song - "in Kostelanský grove are four rosemaries, I don not care abut them, none of them smells to me"), but as documented also by Fisher (2022), they can also represent sad love or love that is prevented ("I sowed rosemary - it did not grow up, he promised to come and he did not", "I planted basil in my garden, for myself and my sweetheart, someone tore it out, beat up my sweetheart, and neither me or him did not get her").

Marjoram and violet symbolized both faithful and sad love. This dual symbolism for marjoram was documented by Fisher (2022), as shown in Slovak folk songs like "what is the marjoram for in my garden, if I do not have a sweetheart?" or "the young men entered the garden, and they trampled the violets.".

Strawberries and raspberries often appeared in the girls' similes (e.g., in the song "I will go down the valley - for my raspberry").

Cultural Keystone Places

A cultural keystone place is a location that is central to preserving the cultural identity of people with important historical and cultural roles. It is a site where cultural memories and practices can be accessed, enabling the renewal of cultural, ecological, and socioeconomic processes (Cuerrier et al., 2015). Folk songs, literature, and art also reflect a strong connection between people and places. In Slovak

folk songs, the most mentioned place was the Danube River (121 mentions). The Danube is the largest river in Slovakia, and its significance for the country is substantial. As a major waterway connecting various regions of Central Europe, the Danube facilitated trade and communication between nations. Since 1830, a regular shipping service for people and goods has been in operation. In the first half of the twentieth century, the harbor in Bratislava was one of the largest inland river ports in Central Europe (Dubiny, 2016). In this way, the Danube played a vital role in the region's economic and commercial life, contributing to the growth of cities and fostering cultural exchange among different nations.

The Tatra Mountains were also frequently mentioned, along with Mount Kriváň, which many people consider a symbol of Slovakia (13 mentions). The Váh River was mentioned nine times. For Slovaks, these places hold deep significance. Their importance is also reflected in people's awareness, as they view them as part of their identity and cultural heritage.

Conclusion

Slovak folk songs provide profound insights into the cultural framework in which ecological knowledge is deeply rooted. They help understand the emotional and value-based aspects of people's relationship with nature. The uniqueness of this folk song collection lies in its broad coverage of nearly all regions of Slovakia and in its authentic material, which has been preserved in written form for almost 150 years. I identified 73 ethnoecological landscape categories. The greatest variety of categories related to natural landscape features—39 in total, with 19 characterized by vegetation named after indicator plants, followed by 19 agricultural elements and 12 waterscape features. The most cited plants related to landscapes included trefoil, pear, beech, oak, and maple. In total, 59 plant taxa closely associated with landscapes were identified. Folk songs reveal a wide range of nature-related knowledge, reflecting a deep human connection to the land in the past. They preserve traditional ecological knowledge and provide insight into how our ancestors interacted with and understood the natural world. Regarding landscape elements such as vineyards, orchards, swamps, and others mentioned in these songs, integrating these cultural references into modern landscape planning can help honor or revive the land's memory and assist in preserving both the tangible and intangible aspects of biocultural heritage.

Author Contributions Z.B. wrote the main manuscript and prepared all additional material such as maps, figures and tables.

Funding Open access funding provided by The Ministry of Education, Science, Research and Sport of the Slovak Republic in cooperation with Centre for Scientific and Technical Information of the Slovak Republic. This work was supported by the Scientific Grant Agency of the Ministry of Education of the Slovak Republic [No. 2/0135/22 Research of specific landscape elements of bio-cultural landscape in Slovakia and No. 2/0015/24 Multi-criteria approach to the sustainable multifunctional use and determination of highly vulnerable areas]. Statements and Declarations: Competing interests: The author declares no competing interests.

Data Availability No datasets were generated or analysed during the current study.

Declarations

Competing interests The authors declare no competing interests.

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