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## Plants and animals in the oikonyms of Lithuania

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### ABSTRACT

Two toponymical maps presented in this paper show 2332 inhabited places of Lithuania that have names (oikonyms) associated with vegetation and animals. The maps and the dataset are the outcomes of a project that is aimed at combining the outcomes of professional onomastic research with an environment that fosters exploration. The oikonyms were extracted from the reference base dataset of Lithuania by means of an automated algorithm. Original cartographic symbols have been designed for depicting categories and species. The multiscale map application, with its exploratory tools, makes it easy to see spatial distribution of geographic names related with particular groups of plants and animals. Analysis of map data enables the assertion that local toponymy reflects a distribution of species that were characteristic to the territory over past centuries. The maps are supplemented by comparative density maps and statistical charts. The reference scale of the main maps is 1:500,000.

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animals; origin

### 1. Introduction

Toponymical maps represent names of inhabited places, hydrography, forests, forms of relief, natural and cultural heritage and other features that were given names by people – geographical names or toponyms. The toponyms reflect the characteristics of spatial objects that were important for local people and sometimes remain the only source of information about these characteristics after the named objects ceased to exist. The importance of place names as a carrier of history and heritage of the place has been demonstrated in various contexts (Chloupek, 2018; Hakala, Sjöblom, & Kantola, 2015; Qian, Kang, & Weng, 2016; Tucci, Ronza, & Giordano, 2011). Toponyms may be included in the official databases or remain informal. The names of inhabited places (oikonyms) of Lithuania often associate with nature, specifically the names of plants, mushrooms, fish, birds and mammals that take very diverse and characterful forms as toponyms. Several published onomastic studies focus on the origins of Lithuanian toponyms (Grybauskienė, 2004; Kačinė, 2008; Vanagas, 1981; Vanagas, 2004).

Information on origins is presented in dictionaries of place names (Razmukaitė & Pupkis, 2002; Vietovardžių žodynas, 2014). There are interesting studies on particular groups of Lithuanian toponyms associated with living nature: myconyms (Lubienė, 2009, 2012), phytonyms (Genelytė, 2001; Gritėnienė, 2006) and zoonyms (Auksoriūtė, 1995; Gaivenis, 1995).

However, to date there have been no serious attempts to study peculiarities of the spatial distribution of toponyms. The development of spatial data infrastructure since 2003 (Beconytė & Kryžanauskas, 2010; Beconytė, Govorov, Ningal, Paršeliūnas, & Urbanas, 2008) and the launching of a Lithuanian spatial information portal (geoportal.lt) in 2009 led to better availability of the toponymical data, both within spatial datasets and on the historical maps in raster format. In 2014 the National Land Service under the Ministry of Agriculture and the state enterprise ‘GIS-Centras’ published a toponymical gazetteer service compliant with the requirements of Directive 2007/2/EC of the European Parliament and of the European Council of 14 March 2007 (INSPIRE). For this purpose a joint toponymy dataset was generated from several official sources: reference base datasets, state cadastres, the road information system and the scientific database of the Institute for Lithuanian Language. An internet application facilitating work with toponymical data was developed, available for viewing free of charge by the public (Viliūvienė, 2015). In 2015, a spatial toponymy data set was made publicly available for download on geoportal.lt. It is natural that over that decade the interest of Lithuanian residents in toponyms increased. The interest manifested itself with discussions on social media platforms on the common origins of Lithuanian toponyms.

Several geographers raised the issue of lost toponyms (Kavoliūtė, 2014). Over the twentieth century, place names on the territory of Lithuania changed because of historical events, including mass

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collectivization, land reclamation, land occupation and Sovietization. Some authors contend that during the period 1959–1989 over 5,500 names of abolished homesteads and hamlets were removed from the official data set of inhabited place names (Trakymas & Vaitekūnas, 2006). More recently, as a result of depopulation, some settlements were merged or abolished. According to the data provided by the Centre of Registers, the names of 240 inhabited places were removed from the national register of Addresses in the period 2010–2015 (Viliuvienė, 2015).

The Lithuanian Society of Geographers is calling for action to preserve the oikonyms as a part of the nation's intangible heritage. The year 2019 has been announced as the Year of Toponyms in Lithuania. The authors of this paper decided to contribute to the toponymical initiatives underway by adding a geographic dimension – with expectations of discovering what the pattern of oikonyms may reveal. As a significant part of Lithuanian oikonyms are immediately associated with the names of plants, mushrooms or animals, that, in turn, may reflect past or present characteristics of the environment, we plotted them on maps in order to explore their distribution over the territory and their possible relationships with local fauna and flora.

Two maps presented in this paper (Main Maps) show 2,332 inhabited places of Lithuania that have names associated with plants (691 oikonyms, or 29.5% of the total number of target oikonyms) or plant communities (584 oikonyms, 25%), fungi (36 oikonyms, 1.5%) and fauna (1,021 oikonym, 44%). The maps have been designed for printing at scale 1:500,000. The digital dataset can be explored online at <https://lietuvoskartografija.lt/mapping-oikonyms-in-lithuania>.

## 2. Project goal and related work

The initial goal of the project was to demonstrate the power of cartography for dissemination of knowledge, in our case on national toponyms. For this, maps have to meet three requirements:

- (a) the represented information must be of public interest;
- (b) the data, not necessarily scientific, must be comprehensive, systematically selected and carefully processed; and
- (c) the cartographic design must be original and attractive, and the system of symbols consistent and associative.

The maps presented thus continue the series of 'curious' thematic maps designed with this purpose at the Institute of Geosciences of Vilnius University (Beconyte, Alekna, & Rociute, 2011; Beconyte, Eismontaitė, Kuodytė-Dūdė, & Žemaitienė, 2014; Beconyte,

Maneikaitė, Bružas, & Balčiūnas, 2015; Vasiliauskas & Beconyte, 2016). Two popular map series that inspired our work on toponyms must be mentioned. The maps of the *Atlas of True Names* (Hormes, 2012; Hormes & Preust, 2008) show the native language meanings of familiar present-day geographic names. The atlas contains about three thousand names of cities, countries, rivers, oceans and mountain ranges of the world, Europe, the British Isles, Canada and the United States. As the meanings are presented as texts, maps can be explored by reading individual names but cannot be used for visual analysis. A series of maps designed by Steven Kay (Kay, 2016) shows the patterns of distribution for some place names in Britain by origin (e.g. Old British, Welsh, Pictish). The data is not consistent. Hexagonal choropleths only show simple statistics but an original design and the clarity of patterns make the maps attractive and memorable. In our approach we combine the individual place names and pictograms that show the taxons of the associated species. Thus the user can quickly identify a pattern and then proceed with analysis of individual names that generate that pattern. The online application developed allows for searching by the place name and by the name of a taxon as well as browsing the available scientific data about the name's origin.

Another goal was to elucidate the spatial distribution and make informed assertions concerning the spatial patterns and the semantic relationships of oikonyms with the real-life characteristics of the environment. We strongly support the statement by Jan Tent about the possibilities of extensive (geographic) research in toponymy (Tent, 2015), and share his observation that, although digital toponymy data sources are widely available and research itself is 'more straightforward to conduct' than intensive (etymological) research, only a small part of toponymic studies that actually exist are by their very nature extensive. Extensive studies often focus on the relationship between toponyms and the natural (landscape) elements (Capra, Ganga, Filzmoser, Gaviano, & Vacca, 2016; Cox, Maehr, & Larkin, 2002; Derungs, Wartmann, Purves, & Mark, 2013; Shi, Ren, Du, & Gao, 2015; Tucci et al., 2011). Moreover, the links between linguistic and biological diversity have been demonstrated (Axelsen & Manrubia, 2014; Fagundez & Izco, 2016a,b; Grant, 2012; Harmon, 1996; Sousa & García-Murillo, 2001; Sutherland, 2003). The term 'toponymic species' coined by Fagundez and Izco (2016b) reflects the relationship between the more persistent place names and local species that change and can disappear over time. As stated by the authors, toponyms are 'stable, spatially-explicit elements that may be used as indicators of bio-cultural diversity'.

Mapping oikonyms that relate to specific species is the first step towards answering the research question: does the distribution of toponyms in Lithuania reflect

**Table 1.** The types and numbers of oikonyms in the database.

Associated common name	Number of toponyms	Number of taxons or types	Example	
			Oikonym	Associated word
<b>Plants</b>				
Biological taxon	691	75	Pušinėlė	<i>Pušis</i> (a pine; <i>Pinus</i> )
<b>Fungi</b>				
Biological taxon	36	4	Gryblaukis	<i>Grybas</i> (a mushroom; <i>Fungus</i> )
<b>Plant community</b>				
Informal name	584	6	Pašilė	<i>Šilas</i> (a pinewood)
<b>Animals</b>				
Biological taxon	999	95	Gegutė	<i>Gegutė</i> (a cuckoo; <i>Cuculus canorus</i> )
Informal name	22	2	Žiogai	<i>Žiogas</i> (a grasshopper)
	<b>2332</b>	<b>182</b>		

past biodiversity? The same question can be raised concerning the distribution of particular toponymic species at present and in the past. Indeed, if ‘place names function as independent variables which can be tested against dependent variables...’ (Tent, 2015), the research would be possible and could potentially yield valid results.

In the context of toponymy research, our work, being an extensive study, does not attempt to investigate the original meanings of individual toponyms. Instead, it focuses on toponyms (oikonyms) that associate with the names of plants and animals by way of the same radical elements. It is aimed at inspiring geographic analyses and facilitating such analyses by utilization of the tools provided by the online application developed. Some scholars of onomastics have expressed an objection to this idea, because a significant part of our toponymy data is linked to common names without providing detailed proofs for the assertions concerning their origins. We will touch upon this criticism and make remarks on it further on in the text. On the other hand, other researchers (including the authors of this paper) believe that this project has the potential to integrate with the extant and extensive geographic and onomastic research and to foster more such research in the future.

### 3. Data and methods

The oikonyms were selected from the Lithuanian reference base dataset at scale 1:10,000 that contains exhaustive data on the presently inhabited sites in the country – over 20,000 of oikonyms.

The scope of the study entails the set of oikonyms in Lithuania that associate with the names of species or higher taxons of biological kingdoms of plants, fungi and animals. In addition, we included the toponyms that originate from two groups of informal, commonly used names:

- (a) generic, such as *a beast*, *a beetle* and
- (b) collective, such as *a garden*, *a grove*, *a meadow*.

According to the toponym taxonomy developed by Tent and Blair (2011), the target toponyms are mostly

associative. Descriptive toponyms that indicate an inherent characteristic of the feature, e.g. *Paberžynė* (literally, ‘[the place] near the birch grove’), *Padidmiškis* (‘[the place] near the great wood’), *Užugiris* (‘[the place] behind the wood’) account for only a small part of the set – about 200 toponyms. The types and numbers of the represented oikonyms are shown in Table 1.

The initial selection of oikonyms from the reference base dataset was partially automated, based upon comparison of radical elements of the oikonyms and a thesaurus containing the names of species. Due to the complexity of the Lithuanian language, the dialectal variation, homonymy and various transformations of common names during the process of optimization, the percent of errors was high – about 20% false positives and about 5% false negatives. This was not acceptable. Therefore, several iterative manual revisions followed. Then the data set was verified against the available publications and scientific toponymy databases that contain explanations of origin: the *Geoinformational Database of Lithuanian Toponyms* (2013) and the *Online Database of Lithuanian Last Names* (2018) that helped to track the links to common words in the cases of transonimization.

Two attributes from the national toponymy dataset, an explanation of origin and explanation of formation of the toponym, provided by the Institute for Lithuanian Language, were linked to the collected oikonym data. Unfortunately, only about 12% of the zoo-botanical oikonyms had these attributes’ values provided.

In quite a few cases, toponyms that have the same roots as the names of birds, animals or plants originate from them indirectly, for example, through personal names. The toponyms may be directly or indirectly derived from the common names that share the same root, but have no relationship with fauna and flora at all – the associations are only due to distortions or to homonymy. Deeper etymological studies are necessary for revealing the true origin of such names. For example: the name of the village *Pušėnai*, located in a wooded area of southern Lithuania, most likely originates from the distorted personal name *Puišys*, not directly from the tree name *pušis* (a pine tree) as common sense would suggest (Palionis, 2008); the name



**Figure 1.** The most frequent names of plants in the oikonyms of Lithuania.

*Arklėnai*, though immediately associated with *arklys* ('horse') is, most likely derived from this word indirectly, via a personal name that means a man who is strong and sturdy as a horse. The oikonym *Bitėnai* derives from the personal name *Bitėnas* that originates from *bitė* ('bee'). Such oikonyms were not included in our database in cases of reliable evidence of transnimation. As the identification of the actual local origin of each individual toponym is a resource-consuming and sometimes utterly impossible task, we decided to include all the oikonyms that *could have been* derived from the names of plants, fungi and animals even though their origin is arguable and incapable of demonstration. Being aware of that, users are encouraged to suggest alternative explanations. We expect to receive readers' negations of the claimed zoo-botanical origin of some names. That would demonstrate the interest of users in the dataset and maps. The web application provides the tools for users to submit their comments regarding individual names. If the dataset is maintained as planned, the number of false attributions will gradually decrease.

Why only oikonyms? The original selection algorithm would work equally well for other Lithuanian toponyms. As noted above, the semantic associations of oikonyms are often not primary, they are rather transferred not only from personal names but also from hydronyms. For example, the oikonym *Palokis* ('[the place] near *Lokys*'), derived from the name of the rivulet *Lokys* ('bear'), were among the oikonyms

included in our database. All the registered hydronyms of Lithuania are stored in the official cadastre. The main reason for postponing the inclusion of hydronyms is the geometry of the features (mainly lines) that requires visualization solutions different from those for the point geometry of oikonyms. Oronyms, names of forests, names of islands and various microtoponyms of Lithuania also very often have semantic associations with fauna and flora, but they are scattered across multiple datasets. If the oikonym project succeeds in raising the level of interest, other groups of toponyms will be added subsequently.

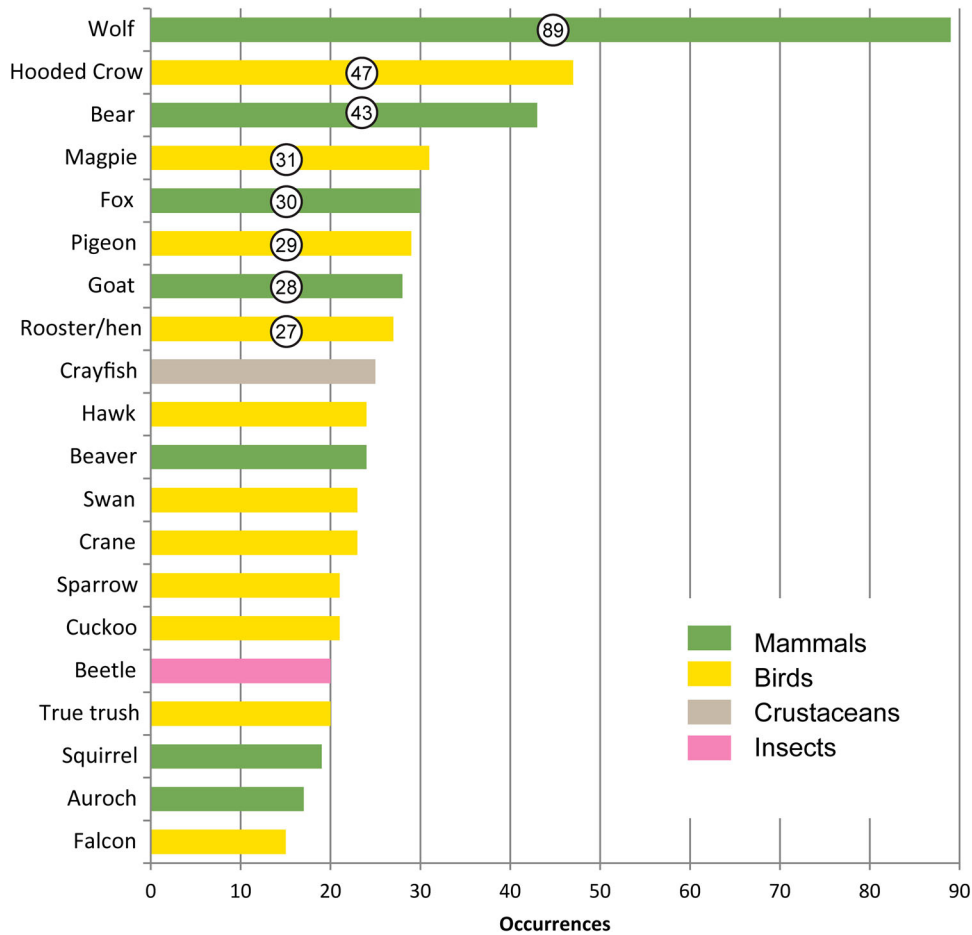
#### 4. The results

The dataset contains 2,332 records of oikonyms that associate with the names of animals, plants and fungi. These oikonyms comprise 11% of the 21,171 residential areas of Lithuania. They are all represented on two maps.

The charts show the numbers of the most frequent (10 or more occurrences) common names of plants (12 species, Figure 1) and animals (20 species, Figure 2) in the oikonyms of Lithuania. Of fungi, only the generic name *Grybas* (Mushroom) has 18 occurrences.

The initial idea was to group and represent all the names by the corresponding biological taxons. However, a simple survey (80 persons were asked to comment on proposed classifications) revealed that whereas biological classification of animals is intuitive





**Figure 2.** The most frequent names of animals in the oikonyms of Lithuania.

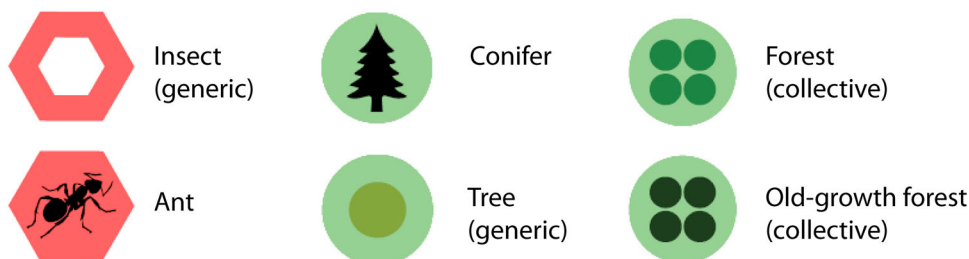
and acceptable to typical users, the grouping of plants requires a different approach. The physical appearance of many common plants differs within the same family (e.g. apple tree, rowan, raspberry and several herbaceous plants belong to the same *Rosaceae* family). Moreover, a large portion of plant-related names are names of plant communities (e.g. *a pinewood*) or generic names that represent physical properties (e.g. *a tree*, *a flower*). For this reason the plants were informally grouped into relatively large groups according to physical appearance, use and habitat: trees and shrubs (conifers, fruiters and other leafy trees); herbaceous/flowering plants; water plants; crops and vegetables.

Cartographic symbols represent three levels of grouping:

- (i) biological kingdom level, represented by shape: hexagons for animals, circles for plants and fungi;
- (ii) class for animals / group for plants, represented by the colour;
- (iii) family for animals / subgroup for plants, represented by individual pictograms.

Collective and generic names are represented by abstract pictograms (Figure 3).

On the maps, it is easy to see the spatial distribution of names related with particular groups of plants and animals – they are represented by different colours. The maps are supplemented with comprehensive legends, hexagonal grid density maps, and statistical charts. On the background main hydrographic features, forest areas, roads and railways and the five



**Figure 3.** Examples of representation of concrete, generic and collective names.

ethnographic regions of Lithuania are represented. Hexagonal grid maps with the cells of 15 km<sup>2</sup> containing up to 19 inhabited places allow for visual comparison of the pattern of distribution of the oikonyms related with plants or animals vs. all oikonyms. The number of target oikonyms in a cell is represented by thickness of the cell contour while the value of the cell background colour shows the total number of named places. From these maps it is obvious that the pattern of distribution of the oikonyms related with animals and plants is different from the overall pattern of settlements. Deeper analysis of the map data allows for asserting that local toponymy reflects the distribution of species that were characteristic to the territory in past centuries. Wooded areas in northwestern and southeastern Lithuania and, specifically, the regions with high landscape fragmentation still contain larger number of and larger diversity of the placenames associated with species.

It must be said that there also exists a collection of historical names of settlements, most of which are no longer extant; however, this collection is still far from exhaustive. In the future, we would consider adding historical oikonyms as well as hydronyms and oronyms to the web application.

## 5. Discussion and concluding remarks

The presented maps constitute one part of a continuous project. Hydronyms, names of forests' and relief forms' will be investigated and the data used to test various hypotheses concerning the characteristics of a place or landscape that the toponymy reflects, and, how this reflection is transformed over time. The maps not only serve to underpin common beliefs (correlation between landscape diversity and density of oikonyms related with the species; reflection of prevalent species in oikonyms etc.) but they may also reveal some unexpected things. To take some examples, birch and lime trees prevail over the more common pine and spruce trees; there is an abundance of corvids while there is no single occurrence of *stork*, considered to be a national bird of Lithuania. It would be interesting to compare the numbers and spatial patterns of such oikonyms in different countries.

The biological names that associate with the oikonyms are presented in different ways on the two maps: only biological taxons for the animals, and, both taxons and common terms for the plants and fungi. We expect comments from users concerning the usability of these two maps.

The web application was designed with the intent to test the statement that 'place names give rise to feelings of individual and collective identity attached to the places in question' (Helleland, 2012). We believe that users will study various aspects of the data and possibly contribute to the development of an attribute-rich and

linguistically tenable spatial inventory of Lithuanian toponyms.

## Software

The spatial data was collected and maintained in the ESRI *ArcGIS* geodatabase. *ArcGIS* 10.6 was used for data processing. *Adobe Illustrator* and *Adobe Photoshop* graphic design software was used for the design of cartographic signs and charts. *ArcGIS* 10.6 was used for the final cartographic design.

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## Disclosure statement

No potential conflict of interest was reported by the authors.

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