

## THE USE OF GEOGRAPHIC INFORMATION SYSTEMS IN COMBINATION WITH MOBILE APPLICATIONS FOR THE NEEDS OF COLLECTING TOURISM

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**Abstract.** *In this paper the definition of the term "collecting tourism" was revealed. The positive impact of the development of information technologies on the field of tourism and the possibilities of applying geographic information systems in tourism were considered. It is suggested to use the mobile application "Seek by iNaturalist" during the organization of collecting tourism.*

**Key words:** *collecting tourism, geographic information systems (GIS), Google Maps, Seek by iNaturalist.*

It is advisable to start the presentation of the main material with the definition of the concept of "collecting tourism". Having analyzed the works of Ukrainian scientists among the available resources (scientific publications of various profiles, manuals, textbooks, etc.), we can conclude that Ukrainian tourismologists have not singled out collecting tourism as a separate phenomenon in tourism until now. Such a result of the review of the available materials is quite natural, since tourismology as a scientific discipline in Ukraine is only at the beginning of its development and formation, therefore it is characterized by incompleteness and gaps in certain issues.

We offer our own definition of collecting tourism and a vision of its place in the classification of types of tourism by objective. To our mind, collecting tourism is a type of tourism that is organized for the purpose of collecting components of the natural environment for basic needs, i.e. food, or to satisfy cognitive and aesthetic needs. Thus, hierarchically smaller taxa will be its subspecies: one – for the first necessity (this definition includes the collection of mushrooms, berries, nuts and other plants for the purpose of their further consumption) and the second – for cognitive and aesthetic pleasure (collecting of samples of natural components (plants, mushrooms, insects, mollusks' shells, minerals or rocks, etc.) to supplement your own thematic collection).

We believe, that it would be appropriate to consider this type of tourism activity as one of the components of a large group of active types of tourism. Based on the fact that active tourism refers to all tourist trips in a diverse natural environment which are characterized by an active way of moving along the route, i.e. making physical efforts of the tourist, it is possible to testify that collecting tourism falls within this category of tourism activity because of meeting two main criteria: conducting tourist activities in the natural environment and making physical efforts of the tourist [1].

With the development of science and technology, their active involvement into all spheres of human life began. The tourism sector was not an exception. It will be appropriate to use geographic information technologies for its development since tourism is directly related to the geographic rind of the Earth. Ukrainian authors in their scientific work define geographic information technologies (GIT) as a set of methods, technical and software tools that deal with geographically coordinated information (spatial data) and ensure the formation of information products endowed with useful consumer properties on its basis. Geographic information systems (GIS) is a modern computer technology for mapping and analyzing objects of the natural environment, as well as real events that take place in it. GIS-technology provides a new, more modern, more efficient, convenient and fast tool for analyzing and solving problems [2, 3].

One of the most common ways of applying GIS in tourism activities is orientation and georeferencing through the use of mobile applications. The Google Maps platform is very popular (more than 10 billion downloads from GooglePlay and rate №1 in section “Navigation” by AppStore) as a separate application and as an addition to other mobile applications (<https://play.google.com/store/apps/details?id=com.google.android.apps.maps>, <https://apps.apple.com/us/app/google-maps/id585027354>). We suggest considering one of the application options in the case of interaction with a third-party application.

A person directly interacts with all the components of nature that are the objects of his attention during collecting tourism. It is common knowledge, that tourists have different levels of experience. People need to orient themselves in the objects that interest them in the case of this tourism activity. So, for example, tourists can study in advance and take thematic guides with them on the hike in order to recognize the types of plants, mushrooms, mollusks, etc. Programs that can replace paper manuals appear with the development of technology. One of these is the mobile application named “Seek” which is a mobile supplement to the “iNaturalist” program – a joint initiative of the California Academy of Sciences and the National Geographic Society ([www.inaturalist.org/](http://www.inaturalist.org/)). The interface of both the “Seek” application and the “iNaturalist” program are quite convenient and will be understandable to tourists of different ages and experience.

The main purpose of using this mobile application during collecting tourism is to recognize types of biodiversity. It is important to note, that the recognition accuracy is quite high because the computer vision model includes 15,798 species and 12,524 broader taxonomic groups such as kingdom, phylum, class, order, family and genus.

The user must have a smartphone with a serviceable camera to work with the application. This software is installed on iOS and Android operating systems, which makes it possible for a wide range of people to use it. A person needs to point the smartphone camera, turned on inside the application, at a live object and wait for the specified name to appear to identify a species. After that the user takes a photo of the object and receives an informational report, which includes his own photo taken by the user, a photo example, the name of the species in Latin, the date of the study, the area of distribution, the taxonomic series, the number of similar studies in the world published in “iNaturalist”, and seasonality of recorded studies. All studies are stored in the application and the user can view them at any time. Anyone can publish a researched species in the “iNaturalist” environment with the help of the “Seek” application, thereby enriching the publicly available information base.

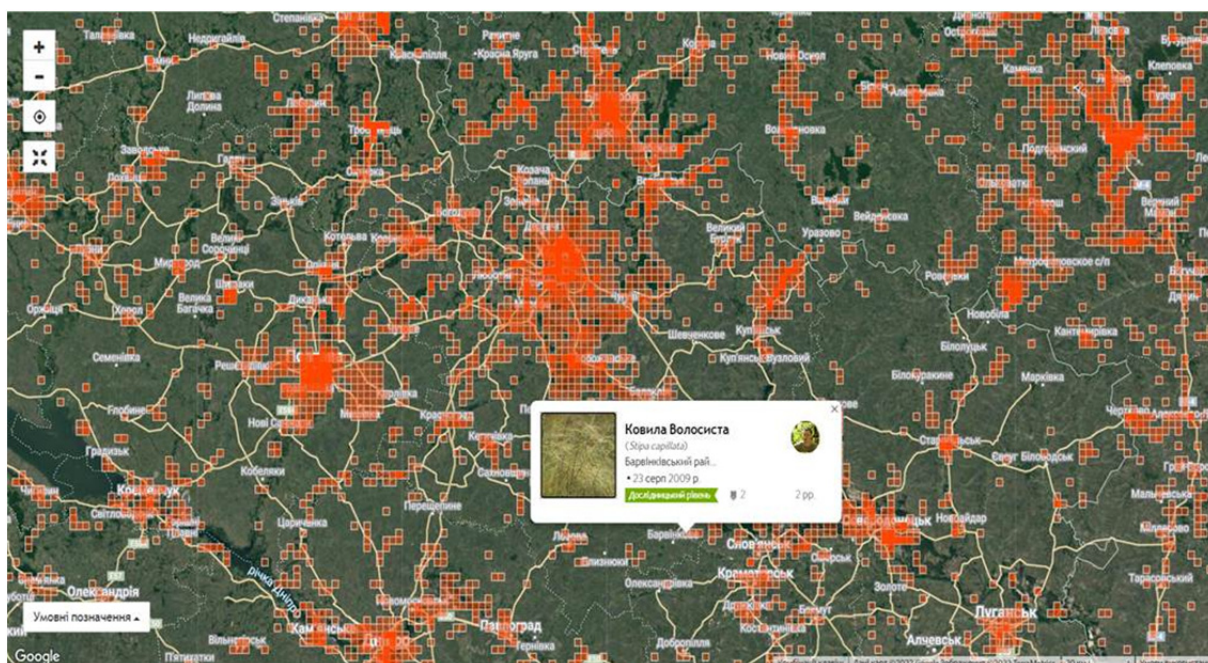


Fig. 1. Locations of the studied species in the “iNaturalist” on the example of an area of the territory of the Kharkiv region, Ukraine

A significant advantage of this application is its combination with Google Maps. The tourist can use the web-map to view the species that have already been explored in his location and beyond in addition to orientation. Figure 1 shows the geographical distribution of the studied components of nature on the example of an area of the territory of the Kharkiv region.

The use of this application in the process of collecting tourism is expedient, as it greatly facilitates the process of recognizing objects of tourist interest, namely representatives of plants, insects, mushrooms or mollusks, and also makes automatic georeferencing thanks to the connection with the GPS-module built into the smartphone. Indeed, it is worth noting the problematic points that may arise when using it, namely the definition of a unit of biodiversity at higher taxonomic levels, i.e. the difficulty of definition to the species level. The reason for this may be the lack of exploration of the territory on which the hike is planned.

Summing up, we can conclude, that the development of information technologies provides new opportunities for conducting tourism activities. In particular, the use of geographic information technologies and web-maps facilitates the organization of tourism. The use of the mobile application “Seek by iNaturalist” during collecting tourism makes sense and is expedient in order to increase the level of convenience of the hike for the tourist, as it is compact and rich of information.

In the course of further research on this topic, it is possible to consider the issue of developing travel routes for collecting tourism using GoogleMyMaps based on the database of the “iNaturalist” platform.

### References

1. Derebchynska A. V. Development of active tourism in Ukraine//Materials of the 3rd All-Ukrainian scientific and practical conference “Modern trends in tourism development”. Part II. Mykolaiv: VP “MF KNUKIM”, 2015. 145 p. p.27-30.
2. Pasichnyk V. V., Artemenko O. I., Popyk I. V. Geoinformation technologies oriented to the needs of different groups of tourists//Bulletin of the Lviv Polytechnic National University. Series: Information systems and networks: digest of scientific works №832, 2015. 407 p.p. 216-224.
3. Shevchuk V. Ya., Satakin Yu. M., Bilyavskiy G. O. and others. Environmental management: Textbook. Kyiv, Lybid, 2004. 432 p.