

PROSPECTS OF BEEKEEPING DEVELOPMENT IN THE TRANSCARPATHIAN REGION

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Abstract. *The article presents the prospects for the development of beekeeping in various directions in the Transcarpathian region. It is known that beekeeping has healing properties when resting in an apiary, and not only beekeeping products or bee venom can be used for health purposes, but also the healing energy of the bee colony (sleeping on the hives), and successful examples of such use are already known and attract consumers. Therefore, the modern realities of the man-made environment dictate the urgent need to restore the physical and spiritual strength of a person, which he loses in the process of work and everyday life. It is recreation as an activity aimed at the realization of recreational needs, restoration and development of physical and spiritual forces, and its intellectual improvement, which is the most dynamically developing segment of the hospitality industry in the world today.*

One of the directions in beekeeping is apitourism as a type of tourism, which aims to taste, consume, and buy beekeeping products (honey, wax, propolis, royal jelly, bee venom, bee podmor, perga, zabrus, homogenate from drone larvae) directly on the spot at the manufacturer, which significantly reduces the cost of production and is convenient for consumers, because by visiting the apiary and getting acquainted with the production technology, the buyer can be sure of the quality of the product.

Research and practice of advanced farms have proven that pollination by bees increases yields of sunflower, buckwheat, mustard, safflower seeds, alfalfa, clover, apple, cherry, cherry, and other fruit trees and fruit crops by 25-30 percent or more.

Pollination by bees also improves the quality of the seeds, increases the size, juiciness and taste of the fruits. The benefit that bees give when pollinating agricultural crops is 10-15 times greater than the direct income from beekeeping.

Thus, beekeeping has not only honey, but also pollination, which is a fairly developed branch of agriculture.

Key words: *beekeeping, recreational areas, apitourism, apitherapy, beekeeping products, apiaries, honey, queen, drone, bees, beehives, honey plants.*

The study of beekeeping as a branch of agriculture is quite important, since beekeeping is a special and extremely valuable branch of agriculture. It is based on the breeding of honey bees, which are *Apis mellifera mellifera* – a kind of biological unit.

The economic value of beekeeping is also complemented by the fact that bees are used for pollination of crops; beekeeping also plays a very important role in increasing the yield of many entomophilous crops (Zhulynskyi et al., 2028, Bilym et al., 2018, 2019, Bukovsky et al., 2007, Ganych et al., 2018, Danchenko et al., 2020, Senkiv et al., 2020, Omelchenko et al., 2022).

As we know, it has long been known that beekeeping has the healing properties of resting at the apiary; and the modern realities of the technogenic environment make it urgently necessary to restore physical and spiritual strength that a person loses in the course of work and everyday communication. It is recreation as an activity aimed at fulfilling recreational needs, restoring and developing physical and spiritual strength; its intellectual improvement that is the fastest growing segment of the hospitality industry in the world today.

In many countries, recreational areas are emerging in new areas of world exploration, so apiaries are becoming a tourist attraction. There are examples of successful cooperation between travel agencies and bee apiary owners in Slovenia (considered the world's leader in apiculture), Austria, Ukraine, Poland, the USA, and Israel.

Apiculture (honey tourism, bee tourism) is a type of tourism that involves tasting, consuming, and buying bee products (honey, wax, propolis, royal jelly, bee venom, bee submor, parchment, zabrus, drone larvae homogenate) directly from the producer.

This gives humanity an insight into one of the oldest cultures – the culture of beekeeping. The biology, physiology and “sociology” of the bee family, the mystery of honey creation, modern advances in beekeeping technology – all this can be not only interesting but also entertaining. And living in an apiary and working with bees gives people wisdom and brings them closer to harmony with the world around them – few other types of recreation can surprise them with this.

True connoisseurs of honey and other bee products will welcome the opportunity to taste and buy them right at the place of production, where, among other things, they will be able to verify the compliance with technology and the high quality of the apiary's products. And tourists will be especially attracted to products that they have personally helped to produce.

It should be noted that medical tourism can become a powerful component of apiculture. Not only bee products or bee venom can be used for health purposes, but also the healing energy of a bee family (sleeping on hives), and successful examples of such use are already known and attract consumers (Zhulynskyi et al., 2008, Bilym et al., 2019, Tourist resources of health tourism, 2018, Resources of health tourism in the Kherson region Varna, 2018, Bilym et al., 2018, Law of Ukraine “On Beekeeping” 2000, Kalinichenko et al., 2021, Klyap et al., 2011, Omelchenko et al., 2022, Omelchenko et al., 2021).

It is known that tourists are very convenient buyers of beekeeping products, because they come themselves and buy products directly at the apiary, which significantly reduces the cost. This is also convenient for consumers, as when they visit an apiary and learn about the production technology, the buyer can be sure of the quality of the product.

Therefore, by all accounts, apitourism is a sustainable type of tourism that does not deplete resources but contributes to their enrichment. Its development contributes to the socio-economic revival of rural areas, ensures the diversification of agricultural production, and creates new jobs (Zhulynskyi et al., 2008, Mamenko 2012, Senkiv et al., 2020, Omelchenko et al., 2021, Omelchenko et al., 2022, Pylypenko et al., 2019, Polischuk et al., 2008, Polevyi et al., 2011, Polevyi et al., 2012).

The purpose and objectives of the study are to reveal the potential of beekeeping as an important element of forestry and hunting, parks, squares, to ensure sustainable development of both industries and preservation of natural resources: park and recreation areas, forest areas, meadows, etc.

The main promising areas for the development of beekeeping in the Zakarpattia region are identified. The variety of forest crops and adjacent parks, squares that affect the quality and quantity of honey production, as well as the development of bee colonies, additional bee products and their properties are analysed; the current development of a new direction (apiculture and apiary houses as a type of promising tourism) is studied.

Research results. The main task is to identify the main problems of beekeeping development, to find out the peculiarities of distribution and promising directions of development of this industry, to analyse the most optimal measures to improve the current level of beekeeping development, as well as to identify ways to popularise new directions in beekeeping in Transcarpathia.

In the current conditions of Ukraine, with its developed intensive agriculture and horticulture, bees are an important factor in increasing the yield of many grain, industrial, vegetable, fruit and berry crops. Thus, beekeeping has not only honey but also mainly pollinating activities and is a fairly developed branch of agriculture (Bilym et al., 2019, Ganych et al., 2018, Danchenko et al., 2020, Guidelines for the use of the complex probiotic preparation “Baikal” EM-1U – 2001, Omelchenko et al., 2022, Koshkalda et al., 2022, Sedoi et al., 2012, Factors influencing the development of tourist attractiveness of the region, 2018, Hamid et al., 2020).

Research by scientific institutions and the practice of advanced farms has shown that bee pollination increases yields of sunflower, buckwheat, mustard,

sainfoin, alfalfa, clover, apple, cherry, sweet cherry and other fruit trees and fruit and berry crops by 25-30% or more. Bee pollination also improves seed quality, increases the size, juiciness and taste of fruits. The benefits provided by bees when pollinating crops are 10-15 times higher than the direct income from beekeeping.

It should be noted that the development of the industry is facilitated by the presence of large forestry and hunting farms with various different age groups of honey-bearing trees and shrubs, such as raspberries, blackberries, linden, acacia, wild pears, and apple trees. Over the past 20 years, bees of the Ukrainian Carpathian breed have been intensively sold by Transcarpathian beekeepers to various countries: Hungary, the Czech Republic, Slovakia, Romania, Moldova, Poland, which have a combination of interesting breed qualities under the influence of abiotic and biotic factors. Moreover, the selected Carpathian bees are already successfully used in China, Korea, and Cyprus, and have shown great interest in Canada.

Today, 70,000 bee families are kept in the Zakarpattia region, of which approximately 65,000 are kept in private households and about 2,000 in agricultural enterprises.

To analyse the registered beekeepers' associations for the reproduction of special breed qualities of bee breeds in the Zakarpattia region, we analysed the percentage of the total population of the districts and the number of registered bee farms, and identified the main areas of their distribution.

Analysing this location, we can say that among the registered associations of beekeepers and bee farms, the largest percentage is observed in Mukachevo district (0.007%), namely: Association of Beekeepers of Zakarpattia, SE "Bdzhilka", SE Mukachevo Research Breeding Bee Farm, Society of Amateur Beekeepers, PE Gaidar E.V. and others.

In terms of percentage, it is possible to observe that Khust (0.004%) and Svalyava (0.003%) districts stand out among others. The following beekeepers' unions are concentrated here: Beekeepers' Union "Narcissus", PE Pap V.V. and Svalyava District Beekeepers' Association, respectively.

Irshava, Tyachiv and Rakhiv districts are next in terms of number, with 0.001% of registered bee farms. They are: The Union of Beekeepers of Tyachiv district, the Society of Beekeepers and Honey Lovers of Irshava district and the private enterprise "Soima V.G." of Rakhiv district.

In other districts (Berehove, Velykyi Bereznyi, Vynohradiv, Volovets, Mizhhirya, Perechyn and Uzhhorod) there are no registered beekeepers' unions or bee farms.

It can be concluded that beekeeping in Zakarpattia is mainly carried out by amateurs. And the main areas of concentration of bee farms can be observed in lowland and foothill regions. The reasons for this are:

- a wide variety of honey plants;
- large areas covered by the necessary vegetation;
- small temperature differences.

In our opinion, the main task for the future is to improve the quality of bee colonies.

Accelerating scientific and technological progress in beekeeping should start with the comprehensive implementation of domestic and foreign scientific achievements and best practices. One of the most important prerequisites for accelerated STP in beekeeping is to improve the quality and productivity of bee colonies. This can be achieved under the following conditions:

- improving the pollination qualities of bees;
- application of advanced beekeeping methods;
- providing apiaries with platforms, mobile pavilions, which will allow more frequent roaming, directly to the honey plantations,
- increase the range and quality of products;
- organisation of a market for beekeeping products, development of modern methods for determining honey falsification;
- search for rational ways to combat diseases and pests;
- introducing mechanisation of the main production processes in beekeeping, which will increase labour productivity and profitability of apiaries;
- guaranteeing the safety of bee colonies in winter (Bilym et al., 2017, Bukovsky et al., 2007, Kalinichenko et al., 2021).

The urgent problems that need to be addressed in the beekeeping sector include:

- preserving and strengthening the training of highly professional young personnel;
- intensifying control over changes in biodiversity and the quality of the feed base;
- ensuring the production of high-quality and safe products that meet international requirements using the latest modern technologies;
- improving the regulatory framework; market development and development of marketing strategies;
- improving the efficiency of the industry by adding new revenue streams.

It is known that in addition to the main product of beekeeping – honey – beeswax, propolis, pergue, pollen, brassicas, royal jelly, bee venom, bee submor, homogenate, bee packages, queen cells, and rebuilt honeycombs (sushi) are also extracted from apiaries.

According to its origin, honey is divided into monofloral and polyfloral flower honey, plant and animal honey, and mixed honey. According to the technological characteristics, honey is divided into centrifugal, pressed, and honeycomb (Bilym et al., 2017, Bukovsky et al., 2007, Ganych et al., 2018).

Currently, many beekeepers use beehive therapy in their apiaries, i.e. a medical house is placed directly on the apiary, with 3 bee colonies below and a bed above them. Immersed in an aura of calm and honey aroma, a person lies quietly, and the micro-vibrations from the bees' movement heal the entire body. The success of the treatment depends on several elements, namely:

- micro-vibration arising from the work of bees in the hive;
- powerful insect biofield and phytoncides from bee products;

➤ the temperature of the nest, as bees maintain it in hives or in their natural habitats within 36-37 degrees, which is the same as the temperature of the human body.

Apitherapy is a very popular trend that is gaining momentum in the country. Apitherapy is the medical and preventive use of bee products. The products used are honey, beehive, wax, propolis, royal jelly, bee venom, bee submor, wax moth, and drone homogenate. According to the current legislation of Ukraine, apitherapy is defined as “the treatment and prevention of diseases with the help of bee products” (Zhulynskyi et al., 2008, Bilym et al., 2019, Tourist resources of health tourism – 2018, Resources of health tourism in the Kherson region – 2018, Bilym et al., 2018, Bilym et al., 2017, Bukovsky et al., 2007, Ganych et al., 2018). It is popularised as an exotic form of ecotourism – apiculture.

Apitourism involves tasting (testing and/or evaluating the quality of food products by tasting bee products) directly from the producer, consuming and buying bee products at the place of residence or apiary location, and the medical use of bee products in the treatment and prevention of diseases.

Medical tourism can become a powerful component of apiculture. Not only bee products or bee venom can be used for health purposes, but also the healing energy of a bee colony, and successful examples of such use are already known and attract consumers. Honey tourism can solve a number of problems, one of which is the disorder of the mental stress of the human condition, health improvement and rehabilitation through the impact of natural physiological and environmental factors on human health.

The popularity of apitourism as a type of recreation is due to the fact that it best meets the physiological and recreational needs of people living in an urbanised environment, in areas with a difficult environmental situation and constant nervous stress.

It should be noted that the main goal of apitourism development is to develop a national tourism product that can meet the needs of both our citizens and foreigners to the fullest extent possible. In order for this to gradually come into effect, it is necessary to:

➤ ensure the preservation and restoration of the natural environment and historical and cultural heritage;

➤ promote sustainable growth by ensuring the integrated development of recreational areas and tourist centres, taking into account the socio-economic interests of their population (Naboka et al., 2020, Lysenko et al., 2007, Rudenko et al 2000, Polischuk et al., 2001, Kalinichenko et al., 2022, Senkiv et al., 2020, Tertyshnyi et al., 2004, Shandova et al., 2019).

Conclusions: So, we have examples and experience of apitourism in the world, and Ukraine also has unique opportunities for the development of this area. In addition, apitourism is a sustainable type of tourism that does not deplete resources but contributes to their enrichment. Its development contributes to the socio-economic revival of rural areas, ensures the diversification of agricultural production, increases the profitability of beekeeping and creates new jobs.

Ukraine has a great potential for apiculture development, but it requires a favourable regulatory framework and the creation of regional beekeeping development programmes. It is necessary to ban the cutting down of honey-bearing trees (acacia, linden, etc.) and protect bees from pesticides. Ukrainian apitourism can become a hallmark of our country's development in the international tourism market and will help to increase respect for Ukrainian culture, especially in the Zakarpattia region.

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