

STATE OF DEVELOPMENT OF BEEKEEPING IN THE PROVINCE PODKARPACIE AND THE PROVINCE MALOPOLSKA

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Abstract:

Beekeeping is a very important part of agricultural production. Honey is a rich source of vitamins, minerals, flavor responsible compounds (essential oils, organic acids), colorants (eg. carotenoids). It consists principally of carbohydrates such as glucose, fructose and maltose. Among the honey proteins, enzymes play an important role. It has anti-inflammatory, detoxification, antibacterial and renewing activities. Honey is a valuable nutritional product, mainly for long term tired people, because of physical or intellectual work. Honey consumption is very important for older people, children and athletes. In Podkarpacie region beekeeping has a very old tradition and preferred natural conditions resulted in rapid development of beekeeping. Currently, there are about 3.000 beekeepers producing honey according to the traditional method.

The aim of the study was to determine what is the current state of development of beekeeping in the province Podkarpacie and the province Malopolska.

INTRODUCTION

The honey bee has been valued since ancient times. It is the most valuable sweet food product, supplied by nature. It is produced under natural conditions by a kind of bees, as well as a few wasps, by remaking nectar and honeydew (a substance excreted by aphids which feed on conifers and deciduous). Honey produced by bees is different in composition from the honey produced by other insects. Bees at the beginning of turning it in its body and then sliced to age. Mature honey has a consistency of thick syrup, which crystallized upon storage. Liquid honey is called molasses, moreover the honey in a crystallized form is called - krupiec. Depending on the raw material from which the honey was made, there are three essential types of honey:

- Honeydew honey, collected by bees from the secretions of aphids or Polish cochineal, mixed with the juice of the trees on which parasites thrive. They include a variety of substances that assist some treatments for example, treatment of the upper respiratory tract.

In Poland, there are two species of honey, honey from honeydew softwood with a mild, slightly resinous taste and honeydew leaf with a unique taste that not everyone tastes.

- Nectar honeys (flower), which have a clear smell. They come from nectars of various plants. We can get honey from the nectar of one plant predominance, by taking it out of the hive after flowering certain plants melliferous. Then honey specifies the name of the plant. In Poland we have honeys such as rapeseed, heather, buckwheat, acacia, lime, clover, cornflower, manuk, raspberry, dandelion, goldenrod, multiflorous and savory.

- Mixed honeys (honeydew and nectar-nectar-honeydew). These types of honeys are different in color (light or dark), smell, taste and composition [2, 3, 7, 8, 10, 14].

Honey is rich in vitamins (A, B1, B2, B6, B12, C, folic acid, pantothenic acid and biotin) and minerals (potassium, chlorine, phosphorus, magnesium, calcium, iron, manganese, cobalt). The largest group of compounds quantitatively present in honeys are carbohydrates, especially monosaccharides such as glucose (in an amount of about 34%), fructose (about 39%), maltose (approx. 7.3%). Organic acids, mainly gluconic acid, malic acid, citric acid and essential oils derived from the nectar of honey flavor have the most significant impact on the taste. What's more, the most important are carotenoids, mainly xanthophyll and β -carotene affect the colour of honey. Enzymes derived from the salivary glands of bees play a significant role. A significant role is played by invertase, amylase and oxidase, causing the oxidation of glucose. In this reaction produces hydrogen peroxide with strong antiseptic properties. A very important component are also pollen, which allows to distinguish natural honey from the honeycomb material [5, 7, 8, 14].

Honey is a valuable nutritional product, especially for people tired of physical or mental work. Parent content of monosaccharides - glucose and fructose, determines the reinforcing properties of honey. They also take part in the detoxification of the body, to a certain extent protect against environmental pollutants, for example, by reducing the harmful effects of stimulants (mainly alcohol and nicotine). Moreover, the current acetylcholine reduces blood pressure and improves blood circulation, choline, in turn, protects the liver and reduces the secretion of bile. Honey has a bactericidal and anti-inflammatory properties. Eating honey stimulates children's mental development and increases resistance to infections. Because of its natural occurrence in honey of bacteria - *Clostridium botulinum* can cause botulism, do not give this product to children under one year of age. Besides children and athletes eating honey is very important for the elderly. It is also recommended in the states of weakness after surgery, convalescence, promotes antibiotic treatments [3, 5, 7, 8, 10, 14].

Podkarpacie province is located in the south-eastern part of the Polish. It includes the Carpathian Foothills and Sandomierz Basin. It has favorable natural conditions, socio-economic and ecological history. The region produces a lot of products that flow out of the local culture, traditions and history. In this area, from year to year, an increasing number of tourist farms with their own apiary where the tourist can deepen knowledge about honey production, as well as participate in meetings of the thematic scope. Products bought in by the tourists on public festival, market or at the farm are considered then the unique souvenirs and specialties at the same time.

Traditional and regional products, manufactured and made available for mass consumption, allows us to activate a number of household Podkarpacie region. Contribute to increasing the attractiveness, shaping the image of the region and improve its tourism competitiveness. It is also important to create additional income-generating opportunities [1].

The aim of the study was to determine what is the current state of development of beekeeping in the Podkarpacie province and Malopolska province.

MATERIAL AND METHOD

Materials were websites including CSO statistical yearbooks, reports, and expert Apiculture Division in Pulawy Institute of Pomology and Floriculture. S. Pieniążek in Skierniewice, materials of the Polish Association of Apiculture (CAP), brochures and other promotional materials Carpathian honey producers.

The study article has been used in the scientific literature and popular science. The data primarily affecting the general issues relating to the issue of beekeeping and the production of honey.

The study used a descriptive method, the comparative aspects. It should be noted of a certain difficulty in the analysis of the subject. The problem stems from the fact that Poland does not lead to the current database for observing current changes in beekeeping.

RESULTS AND DISCUSSION

Beekeeping in Malopolska

In the area of Malopolska province honey is sourced mainly in the south, in the foothills, in the Gorce Mountains, Tatras, Pieniny and the Beskid Mountains. Beekeeping in Malopolska province was created from the former beekeeping. Currently, the region operates three thousand beekeepers who have more than 60 000 bees colonies. In this region, mainly producing honeydew, which is in high demand in the country and abroad, mainly in Germany.

In Malopolska there are several compounds focusing beekeepers. These include: Pogórski Beekeepers Association in Tarnów Regional Beekeepers Association in Krakow, Foothills Beekeepers Association of Trade in Kamianna with registered office in Rabka, Regional Apiculture Cooperative "Beekeeper" in Cracow [15, 16, 18].

In the Malopolska province four species of honey are inscribed on the List of Traditional Products Ministry of Agriculture and Rural Development. They are: Suski honeydew from conifers (UNESCO 24.11.2011), Malopolska honeydew (UNESCO 29.01.2008) Sądecki honeydew (UNESCO 31.01.2008) and flower honey forest of Podksiężę. (UNESCO 06.12.2013) [17].

Malopolska region is famous as the subject of beekeeping is presented through special centers, emphasizing the centuries-old tradition of production of honey. You can visit the Museum of Beekeeping "Sadecki Bartnik" in Stroze, and Polish Beekeeping Museum in Kamianna.

Stróże city is located between Nowy Sacz and Görlitz. Furthermore, we can there the picturesque foothills of the Carpathian mountain, and there is Poland's largest Beekeeping Farm, producing honey "Sadecki Bartnik" and Beekeeping Museum with a riches collection of hives. Stróże are situated among the gently rolling hills covered with forests and orchards. Beekeeping Farm has approximately 1.300 own bee colonies, they buy honey, acquire milk and other bee products, distributed on the Polish market and also exporting abroad. The hosts occupy the beekeeping since 1973, while the Beekeeping Museum named after Bogdan Szymusiak and founded in 2000. The aim was to sharing knowledge about beekeeping, even among those that have little knowledge about bees and honey production. The collection of the museum, you can find over a hundred hives, also known as the "Kin", and another called "Dzierżona" Frame-called "hive Hubner", and figural beehives, otherwise known as "Saint. Ambrose" and "The Devil". Museum also has two beehives from Africa. The cottages restored from original elements, you can see collections of accessories beekeeping, including honey extraction Hruska, who was the first in the world for the purpose of one patch. Exhibitions also include work items beekeeper such as frames, clothing, historical centrifuges, smokers beekeeping and leziwo (device made of ropes and webbing for climbing the tall trees beekeepers). Around the museum's Park Zarebow with many monuments of nature it possible to organize open air painting and photographic. What's more, in the museum there is organized outdoor event, called the "feast at Bartnik", on the first Sunday of July. During this celebration, they show presentations on beekeeping, honey tasting, regional dishes and Honey Harvests. It is also possible to use of accommodation for visitors with tastings of honey, as well as other traditional dishes. Every year these events comes more and more tourists, who want to obtain information on beekeeping and relax from the hustle and bustle of everyday life [21, 22].

The picturesque village of Kamianna, known as the Polish Centre Apitherapy, or treatment with bee products and honey production, is called the Honey Capital of Polish. Surrounded by mountains, covered with forests of fir. There are several facilities worth visiting: it was the church of the wealth of sculptures of John Stefaniak, House beekeeper, House St. Philip of Neri a beautiful chapel and a museum of apiaries and the Board of memory. In

Kamianna bees produce one of the best in Poland honeys in many varieties, and is produced propolis, royal jelly and bee pollen used in "bee therapy". The town is a network of self-catering and is very well developed. In the House beekeeper every year are organized rallies beekeepers from across the Polish. The apiary "Barc" we can learn about the history of beekeeping, observe the life of bees and see the ancient beehives in the museum. Apiary is also engaged in breeding of queen bees, bee products harvesting, processing and manufacturing, conducting workshops and training in beekeeping. Museum, located in Kamianna, collects items related to beekeeping, including ancient beehives. Many of the exhibits in the museum in an apiary farm called Bartnik are associated with, a priest Henry Ostach thistles, promoter of beekeeping in Poland and long-term president of the Polish Association of Beekeepers. The farm also offers the opportunity to use the accommodation and long-term stays in the mountain scenery [23, 24].



Figure 1. Presentation of the apiary farms in the Malopolska province [26]

Source: http://www.sot.org.pl/web_images/miody_mapa.jpg

Beekeeping in Podkarpacie

The Podkarpacie region has a tradition of bee-keeping as far as in the Malopolska region and the preferred natural conditions resulted in rapid development of beekeeping. Currently, there are about 3,000 beekeepers (amount similar to that in the Malopolska region), most of whom raise honey in a manner consistent with the craft tradition [14].

For Podkarpacie are several organizations of honey producers. Mention may be made, inter alia: Regional Beekeepers Association was founded in Rzeszow, Industry Earth Beekeepers Association in Przemyśl, Bieszczadzkie District Beekeepers Association in Sanok, Pogórzański Beekeepers Association (aka Association of Beekeepers Region Jasło) and Regional Beekeepers Association in Yaroslavl. Their aim is to support beekeepers and the dis-

semination of information in this regard. Regularly organizes training, seminars, meetings and study trips abroad, during which Podkarpacie honey producers exchanging experiences and acquired knowledge [14].

The high level of skills of beekeepers of the region is reflected in the selection of apiary, skills acquisition honeydew honey, cold centrifugation and the principles of storage and trans-fusion.

At the foothills and in the Bieszczady and Beskid Low promotes beekeeping develop-ment of conifers. In this area there are two national parks (Bieszczady National Park and Ma-gura National Park) and 15 nature reserves that protect mainly fir trees. Honeydew honey from the region is unique and strictly linked to the area of origin. Is produced because of the huge basin of coniferous trees, in which silver fir dominates uninterruptedly for a long time [14].

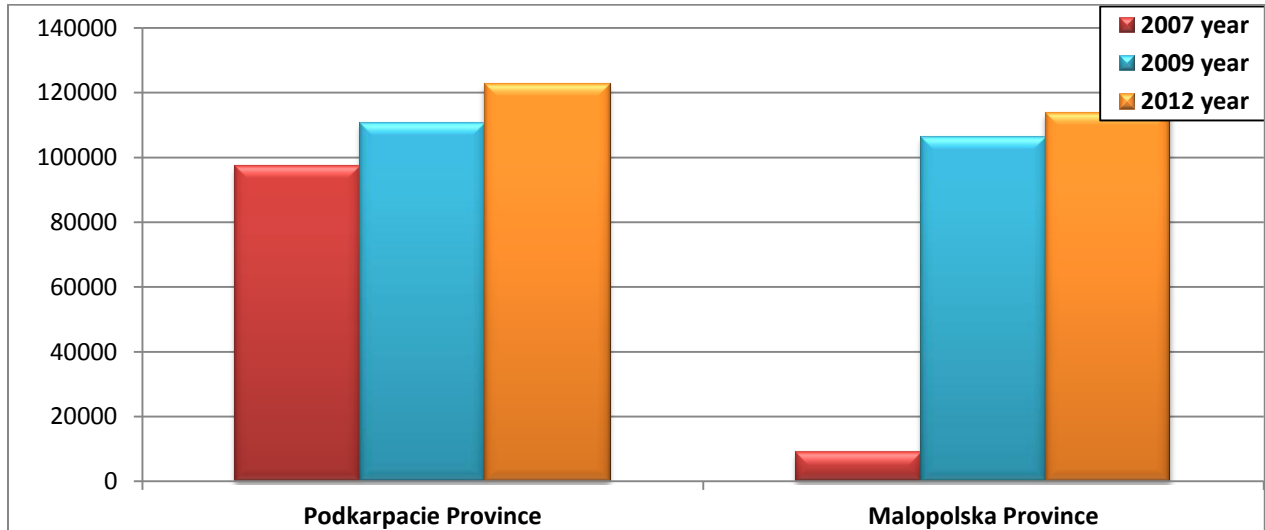
In Lubaczów City the tradition of beekeeping is very carefully cherished The number of colonies is estimated here for 5500, and the production of honey per year is 200 tons. The Circle of Beekeepers Associations in Lubaczów has about 150 members and 50 non-members. In this region, which is surrounded by well-preserved nature and high concentration of lime, the honey unique is being produced [14]. In Jarosław and its surroundings bee-keeping has developed from ancient times, mainly in poor soils and large forest complexes. Honey- multiflower and honeydew nectar produced here while maintaining traditional recipes [14].

In the province of Podkarpacie there are inscribed on the List of Traditional Products Ministry of Agriculture and Rural Development three species of honey (in the Małopolska region - four). They are: honey Korzenicy multiflower and honeydew nectar (included on the list 29.04.2008.), Honey Lubaczowski (included on the list 20.12.2007) and the Lower Carpa-thians honeydew (included on the list 22.02.2007) [14].

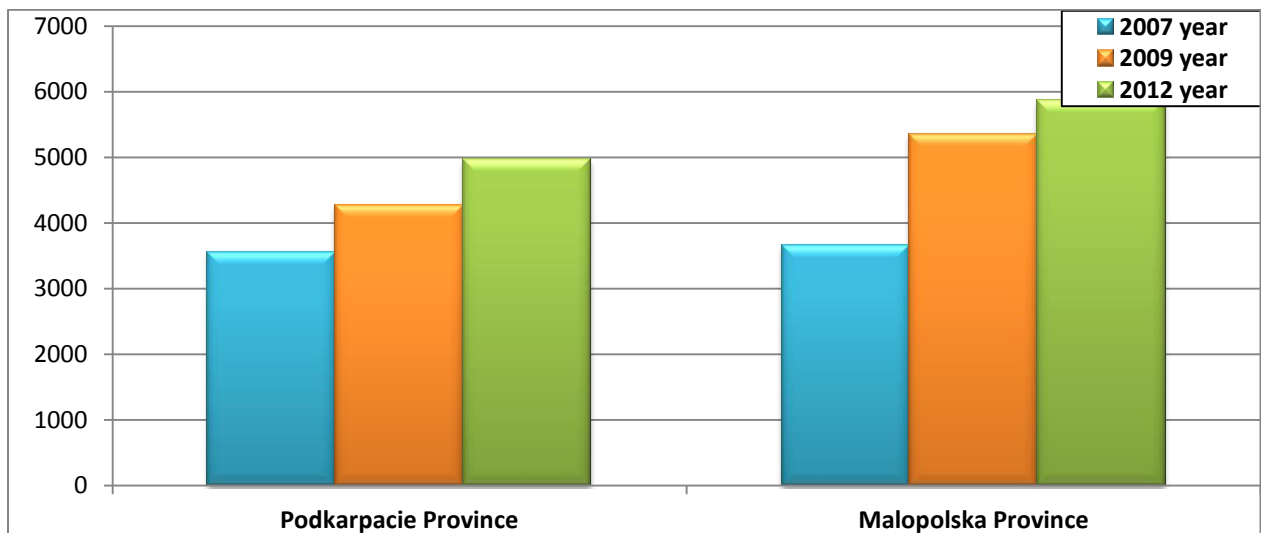
"Tourism Beekeeping" enjoys in the Podkarpacie region growing interest among visi-tors to the region. Consecutively increasing the number of apiaries, giving the opportunity to expand their knowledge of beekeeping, honey production and allow for tasting so popular honeys. There are also offered visitors the opportunity to rate and taste regional dishes and food on farms engaged in the production of bees and honey production. These tourists can get information about the life and habits of bees, as well as how to influence people. Have the opportunity to taste the honey and other products based on honey. Are also being organized annual event, namely Podkarpacie Honey Festival in Rzeszow. During the meeting are shown honeys of different taste and aroma. Also there are awarded prizes, such as Best Producer of honeydew and the tastiest honey. A large role in the promotion of Carpathian honeys plays media that publicize such events associated with beekeeping events. Honey Podkarpacie earned a certain reputation, as evidenced by tours of tourists from across the Polish and for-eign visitors. Because that the region, particularly in the area of Jaroslaw, land Lubaczów whether Foothills is very attractive for tourists and general visitors, beekeepers wish to further develop tourism related honeys produced [4, 9, 15].

The Podkarpacie region compared with the Malopolska region has fewer farms involved in beekeeping. This area, however, thanks to its beautiful landscape and cultural wealth is like in the region of Malopolska one of the most popular Polish tourist regions. Particular roles fullness of the Bieszczady Mountains, which attracts thousands of tourists who want to relax surrounded by nature unique, shared by the tourist paths perfect for those communing with nature. Depending on your preference, there are tourist accessible hiking trails of varying dif-ficulty in the Bieszczady and Magura National Park. Iwonicz Zdroj and Rymanow Zdroj are the best known Podkarpacie spa. Cycling and horse riding trails are very popular and they are still being discovered. Tourists visit the sacred and secular objects, preserved in very good condition, among others. Krasiczynie castle, the Church and the Holy WNMP. Michelangelo

Haczów Palace Sieniawski in Sieniawie, Church of the Intercession of Our Lady of Komanicza Folk Architecture Museum in Sanok, synagogue in Great Eyes, Team Franciscan monastery in Kalwaria Paławska. Are visited Bieszczady pastures, reserve "Spinner" in Czarnorzeki, and charming lakes Duszatyńskie. These and other valuable architectural monuments and natural sites provide a unique religious and cultural diversity of the region [19, 20].



Graph 1. Comparison of the number of colonies [in a thousand.] In Podkarpackie and Malopolska
 Source: Own calculations based on data from the article: *Analysis of the beekeeping sector to develop a 3-year Apiculture Programme in Poland in the years 2007-2010; Analysis of the beekeeping sector in Poland for the development of the National Apiculture Programme in 2010-2013; Beekeeping in Poland in 2012 and CSO statistics from 2010*

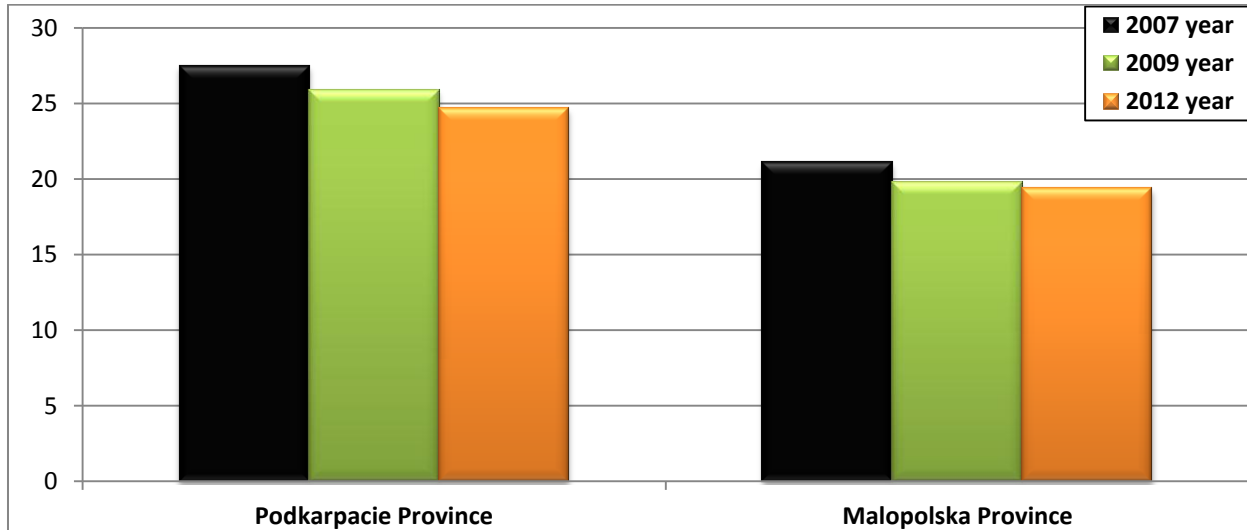


Graph 2. Comparison of the number of beekeepers [a thousand.] In Podkarpackie and Malopolska
 Source: Own calculations based on data from the article: *Analysis of the beekeeping sector to develop a 3-year Apiculture Programme in Poland in the years 2007-2010; Analysis of the beekeeping sector in Poland for the development of the National Apiculture Programme in 2010-2013; Beekeeping in Poland in 2012 and CSO statistics from 2010*

Podkarpackie values can be comparable with the Malopolska. However, the tourism segment of beekeeping missing a real centre, museum or the medium in which would be promoted in knowledge related to the breeding of bees and honey production, as is the case in Malopolska Kamianna and Stroze. Comparing both the region in terms of the number of colo-

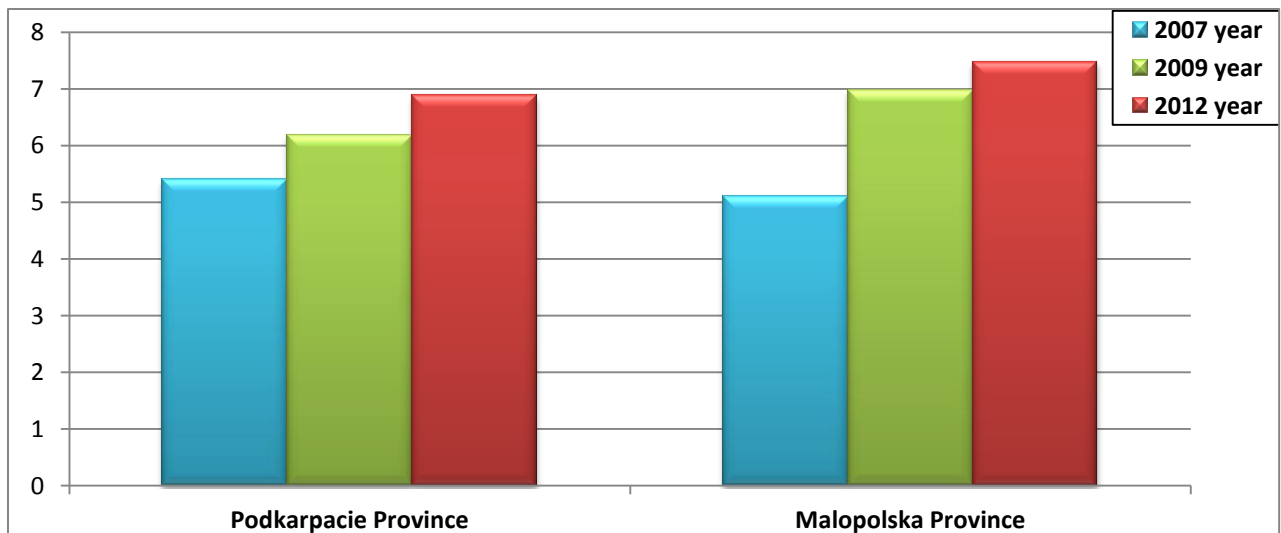
nies is more in the province of Podkarpacie. In both regions can be observed steady their growth [Figure 1].

The graph 2 was illustrated by the number of beekeepers in the province of Lesser Poland and Podkarpacie province. Both presented the province over the years show an increasing trend. Number of beekeepers is higher in the Malopolska region, and lower in Podkarpacie province.



Graph 3. Comparison of the average number of hives [families] in Podkarpackie and Malopolska [6, 11, 12, 13]

Source: Own calculations based on data from the article: *Analysis of the beekeeping sector to develop a 3-year Apiculture Programme in Poland in the years 2007-2010; Analysis of the beekeeping sector in Poland for the development of the National Apiculture Programme in 2010-2013; Beekeeping in Poland in 2012 and CSO statistics from 2010*



Graph 4. Comparison of napszczelenia [number of families / km²] in Podkarpackie and Malopolska [6, 11, 12, 13]

Source: Own calculations based on data from the article: *Analysis of the beekeeping sector to develop a 3-year Apiculture Programme in Poland in the years 2007-2010; Analysis of the beekeeping sector in Poland for the development of the National Apiculture Programme in 2010-2013; Beekeeping in Poland in 2012 and CSO statistics from 2010*

The graph 3 presents the average number of hives [families] in Lesser Poland and Podkarpacie region. It may be noted that in both regions the trend is decreasing. In the prov-

ince of Podkarpacie average number of hives is higher compared to the province of Malopolska.

The graph 4 is presented a comparison of napszczelenia [number of families / km²] in the Podkarpackie and Lesser. The provinces shown a tendency over the years has shown increasing. Number of colonies per km² is higher in the Malopolska region, and lower in Carpathian mountains. Only in 2007 was higher napszczelenie Podkarpackie province.

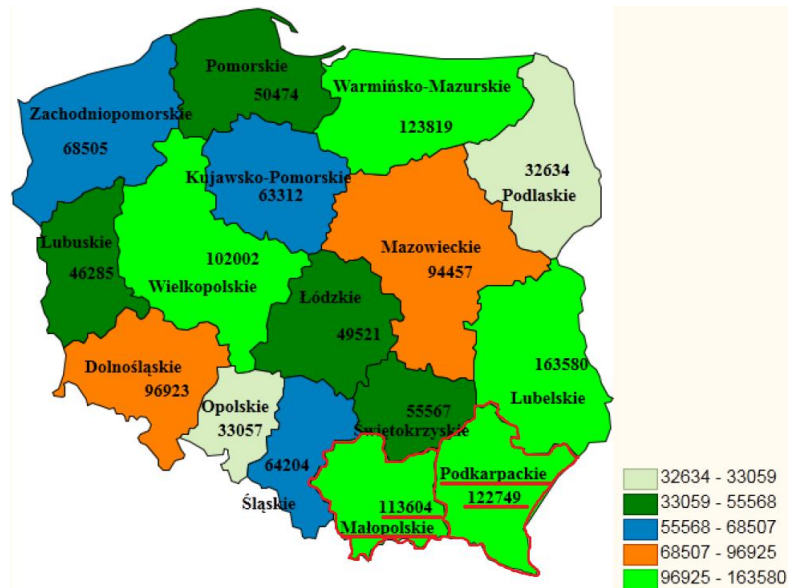


Figure 2. Distribution of colonies in the provinces in 2012 [25]

Source: http://www.miesiecznik-pszczelarstwo.pl/artykuly/2007_18/artikul_2007_18.html

In Figure 2 is presented distribution of the total number of colonies in the provinces across the Polish of 2012. It can be observed that their number is greater in the Podkarpackie, and less in the Malopolska province.

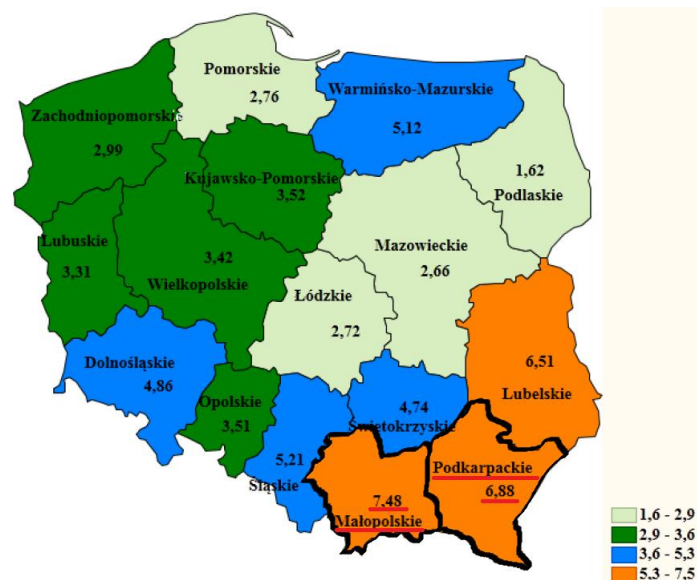


Figure 3. Arrangement of the number of colonies per 1 km² provinces in 2012 [25]

Source: http://www.miesiecznik-pszczelarstwo.pl/artykuly/2007_18/artikul_2007_18.html

Malopolska reached in a higher position in the distribution of colonies, falling on the surface area of the province in 2012 compared to the Podkarpacie region [Figure 3]. Province takes a little smaller surface distribution of colonies.

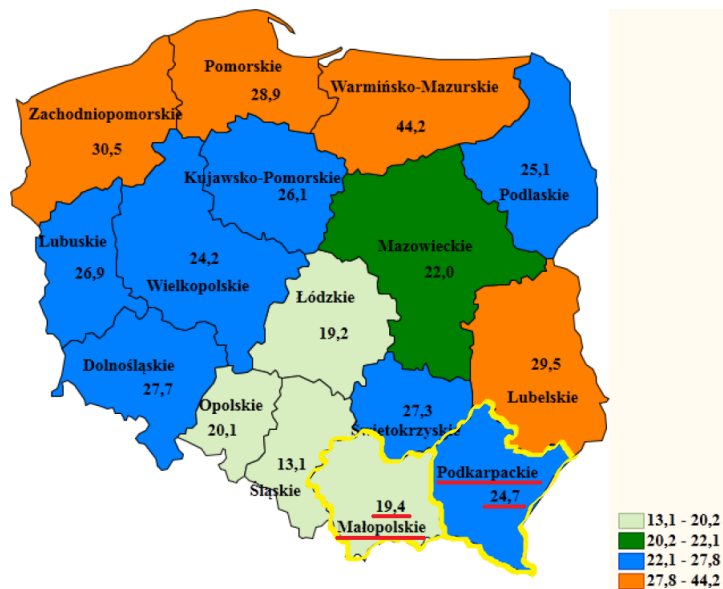


Figure 4. Average size of apiaries in the provinces in 2012 [25]

Source: http://www.miesiecznik-pszczelarstwo.pl/artykuly/2007_18/artykul_2007_18.html

In Figure 4 presents the average size of apiaries in the provinces in 2012. It may be noted that their number is greater in the Podkarpackie, and less in the Malopolska province.

CONCLUSIONS

1. Tourism associated with beekeeping is more developed in the Malopolska province than Podkarpacie. This involves greater promotion of Malopolska areas where the centers are located beekeeping and museums in the Stone and Stroze disseminating knowledge about beekeeping and honey production. While in Podkarpacie such facilities do not exist yet,
2. Number of beekeepers and the number distribution of colonies on occupied area is higher in the Malopolska province, and lower in the Subcarpathian province. This involves longer and more developed tradition of beekeeping in these areas,
3. On the Podkarpacie region is more colonies and the number of hives in comparison to the Malopolska. This is due to thriving beekeeping Podkarpacie,
4. Traditional and regional products manufactured and sold farms cause activation of the Podkarpacie region. They contribute to increasing the attractiveness, shaping the image of the region and improve its competitiveness,
5. Podkarpacie and Malopolska creates favourable conditions for the development of "tourism beekeeping" through beautiful landscapes and numerous monuments,
6. Podkarpacie and Malopolska has adequate conditions to breed bees and produce honey,
7. In Podkarpacie we can find many festivals, bazaars and taste carnivals, which promote kitchen and honey with different flavour values,
8. In Podkarpacie there is center or museum, which concentrate apiarian culture and spread knowledge about honey production, which take place in this kind of places in Malopolska

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