

## BREEDING OF BEE FAMILIES IN SKEPS AND ORGANIC HONEY PRODUCTION ON TRADITIONAL WAY IN THE REPUBLIC OF MACEDONIA AND IN THE BALKAN REGION

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### Abstract

In the Republic of Macedonia, the number of beekeepers that produce honey in skeps is falling down. Today 1.7% of beekeepers are using traditional hives for production of honey in our country. In this paper we investigate various skeps used for beekeeping on the whole territory of the Republic of Macedonia compared to the Balkans.

We have investigated various techniques of skeps making, materials that are used, provided conditions for the bees, and their impact on honey safety and quality. Skeps are made in a way that allows heat keeping enough for bees and are ideal for organic honey production, because obtained final product was safe and tasty honey.

As a result of our research we found out that this way of breeding bees in skeps is less labor intensive compared to others. Skeps are ideal for organic production, because they are made from natural materials, offer favorable conditions for bees and are easy to use. There are unfavorable conditions for development of *Varroa destructor*.

Honey production in skeps is technique that was practiced in the past. Skeps are suitable to physiological needs of bees, have a low cost, easily manufactured and maintained. The end product obtained on this traditional way in skeps has high quality. Honey production in skeps is a traditional technique that has significance for the development of beekeeping and is rich heritage of each nation and country.

**Key words:** *Traditional, Skeps, Organic, Bee families, Quality of honey.*

### 1. Introduction

Albert Einstein in one occasion said: "If the bee disappeared off the surface of the globe then man would only have four years of life left". Bees are main pollinators, because they pollinate 80% of plants. If bees disappear, 20,000 species of plants will also disappear and it would have cataclysmic consequences for the world. As every living being, bees have its place of living, where they perform all the processes that they need for proper growth and development.

There are no reliable and precise evidence when the people started to breed bees. First data of role of the bees in human lives are from the Paleolithic era. On the wall of a cave in Valencia, Spain dating from that period was found a drawing of two beekeepers that were hunting bees. That drawing represent an important part of the history of beekeeping. First the bees lived only in the forests, in holes of trees. Except in the cavities of trees, bees lived in caves and cracks in the soil. Bees were discovered by the man during the hunt of animals and search for food. Reaching the honey in the past wasn't easy, because bees were defending its place of living and honey. Since people realized the great meaning of honey and wax, they started to make special beehives. Skeps represent the heart of beekeeping, actually those are the first hives made by the man.

Approximately fifty years ago bee breeders from Macedonia and the Balkans breed their bees in skeps. It is believed that the tastiest honey comes from the skeps. Today, unfortunately, very few beekeepers rise their bees in skeps because bee hives with better characteristics were invented. Traditional techniques of breeding from the past represents rich legacy for every nation. Although now new technologies are utilized, we cannot forget the fact that skeps have big influence

into development of beekeeping. In Serbia and also in other places there are still monasteries where honey is produced on traditional way in skeps.

## 2. Skeps

Today there are many types of hives (Dadan-Blat, Langstroth, Farrar) but our attention will be put on skeps. Skeps usually have the shape of bell [1]. Some beekeepers believe that this hive should stay in the past and new hives should be invented, unlike other beekeepers' belief that this hive should still be used in the beekeeping.

There are beekeepers who have perfected their techniques of raising bees in skeps. In Republic of Macedonia 1.7% of beekeepers breed bee families in skeps [2]. According to one survey from 1946, on the territory of the Balkans, 60% of beekeepers use bee hives with fixed frame honeycomb [4].

Skeps' volume for swarms usually are 18 litres, unlike the skeps for honey that should have the volume of 30 litres. From skeps can be swarmed three swarms per year. Because of its construction the skep looks like a natural living habitat and that's why bees have optimal conditions for regular development. In most cases bees in skeps better cope with *Varroa destructor*, because swarming bees are naturally protected from *Varroa*. Eighty years ago beside skeps in form of cup, skeps in form of bell were also used [3]. According to the author, it had several flaws, including:

- Small dimension in which large swarm cannot be developed. It is known that larger swarms are more profitable.
- Skep in form of bell is smaller than skep in a form of cup and can not fully use the good pasture. If the skep is full of brood, honey and pollen, bees do not have a place to gather their honey, so they are forced not to work even if they have the best pastures.
- It is harder to take out honey from bell skep than from cup skep. Because of the lower volume of the skep, beekeepers are forced to take out the honey in a much harder and violent way. Honey keepers usually took out the honey by poisoning the bees with sulfur. With this method hundred of thousands of bees were killed per year. Killing bees with sulfur only to get honey is same like farmer to plant the tree and to cut it just to have its fruits. Poisoning of bees represents non human act in which bee breeders get honey but they loose whole colonies.

Beside the flows that bell skep has it also has positive characteristics [3]. According to this author these are positive characteristics:

- Well made skep of straw suits the best to the physiological needs of bees. Conditions in skeps look like the natural living habitat of bees.

- The cost of skep is lower compared to other hives.
- Every bee breeder can make the skep by itself, because materials are available and the process of knitting is not very hard.
- It is easy to maintain.

Except by its shape, bell skep is different then the cup skep, because it is closed on the top with board and fully covers and closes the skep (Figure 1). The board is about 3 cm thick, so it holds enough heat for bees. It is attached on the top of the upper part of the skep mostly with wire. In the board there is a four angled hole that can be from 6 to 22 cm. This hole serves the bees as an entry and it closes with a special small board that exactly covers the upper part.

It is recommended that every skep should have special board on the floor [3]. Bell skeps were favorite among Greek beekeepers because of its simplicity in the fifties of previous century.

Beekeepers, also called "skeppers", in most cases check out the bees only twice in the honey production year. First time beekeepers visit bees while they are swarming and the second time when they are taking out the honey. In the past, honey usually was taken out with poisoning the bees. When the second time beekeeper goes to visit bees he must do several things. The most important thing that the beekeeper must do is to be careful which bees will be used for breeding. For breeding in skeps most important is to use very well developed, strong and young bee colonies or a colony older one year but with new queen bee [3].

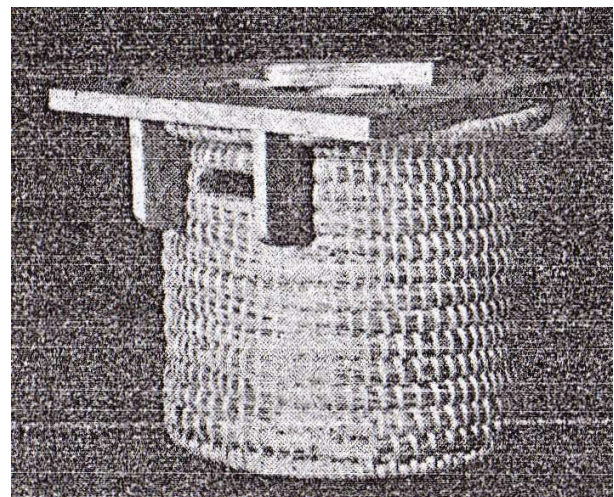


Figure 1. Skep with covering board on the top

### 2.1 Required materials and the process of making a skep

Skep are knitting easiest with rye straw. Straw is the best material for skeps making. Fastest skeps are knitted with clematis (*Clematis vitalba*). Skeps knitting is done during

the winter months, when the percentage of water in branches is lowest. There are many ways of knitting skeps but making skep with certain volume cannot be done without a pattern. Knitting of skep starts from the top of the basket, and continues down to the end (Figure 2).

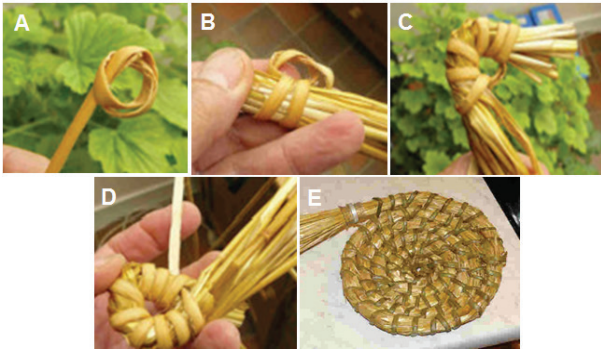


Figure 2. A, B, C, D, E - Phases of making a skep

## 2.2 Making a skep

There are several techniques for skeps knitting. Skeps must be: well made, without cracks, have sufficient heat for bees, and must be covered with a large layer of a mixture of ash and cow dung. The mixture of ash and cow dung is an excellent insulator. Some beekeepers in Serbia during the preparation of skeps as insulator do not use cow dung, but they coat them with polyurethane foam. It is easier and simpler for application unlike previous described method. But here is the question: if we make skeps we need to keep the traditional way of preparation because our ancestors had already worked that way, why would skeps be modified using unconfirmed chemical materials that may harm bees.

## 2.3 Complete knitted skep (basic technique)

The appearance of skeps was not very important to beekeepers. It was of great meaning what conditions bees had in the baskets. Today, unlike the past, at the end of their preparation, skeps are painted with color. Usage of oil based color is leading to clogging skep pores, and bees are not feeling comfortable.

The bee keepers in the past only inhabited skeps with natural swarm, instead of artificial swarm. Some beekeepers in the past wrapped them with a sack or covered them with a cloth.

This method protected skeps from mice and birds, while they kept the heat inside the basket. Today skeps are used for: catching swarms, production of natural swarms, extracting pure beeswax and producing honey with high quality.

## 2.4 Organic honey production in skeps

According to experience of many countries and our own knowledge and experience, organizing and introducing of organic production of honey in the Republic

of Macedonia is required. This is one way to preserve the environment and to produce biologically valuable products in order with the environmental regulations. Organic beekeeping comply with strict international rules prescribed by the document (EU Regulation 2009/1/2, and 834/2007). In the Republic of Macedonia the Law on Organic Agriculture is adopted [5]. The Law on Organic Agricultural Production, regulates the general provisions related to the production, processing, marketing and labelling of organic production and applies to all types of organic agricultural products intended for human consumption and animal feeding. The Law also provides the basic conditions for inspection and certification of organic agriculture. The reasons for the law implementation are: human health protection, biological diversity protection, consumer protection, ensuring food safety, food monitoring and quality. Each country in Balkan region has certain institutions that are eligible for certification process. In Republic of Macedonia, accredited inspection bodies for performing expert control in organic agricultural production are Balkan Biocert - Skopje and INCEBO.

The first condition of making organic honey in skeps is choosing the right species of honey bees and its accommodation to the environment, its vitality, resistant to pests and diseases. In organic breeding of bees it is allowed 10% of queen bees and swarms per year to be changed from conventional production for revitalizing the apiary. In this kind of production, organically manufactured bee wax is used. Skeps are ideal baskets for organic production because they are made from natural materials without any chemicals and other products that can harm the environment and the honey. The location of bee pasture around the apiary in a radius of 3 km must have plants that are organically grown. Apiary cannot be located nearer than 1,000 m of highways, industrial zones, urban areas and other pollutants of the environment. It is desirable the apiary not to be moved on a different locations. In organic production of honey antibiotics are not used for treating of diseases. In case of *Varroa destructor*, oxalic acid, menthol, eucalyptic oil or camphor are used.

## 3. Conclusions

- Honey production in skeps is very traditional technique that was practiced in the past. Although nowadays this way of producing honey is not fully spread, it presents valuable technique, because skeps are environment friendly hives.

- There is one proverb: "Eat honey today as a food if you don't want to eat it as a medicine tomorrow". The end product obtained on this traditional way in skeps has high quality. Honey production in skeps is a traditional technique that has significance for the development of beekeeping and it is rich heritage of each nation and country.

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