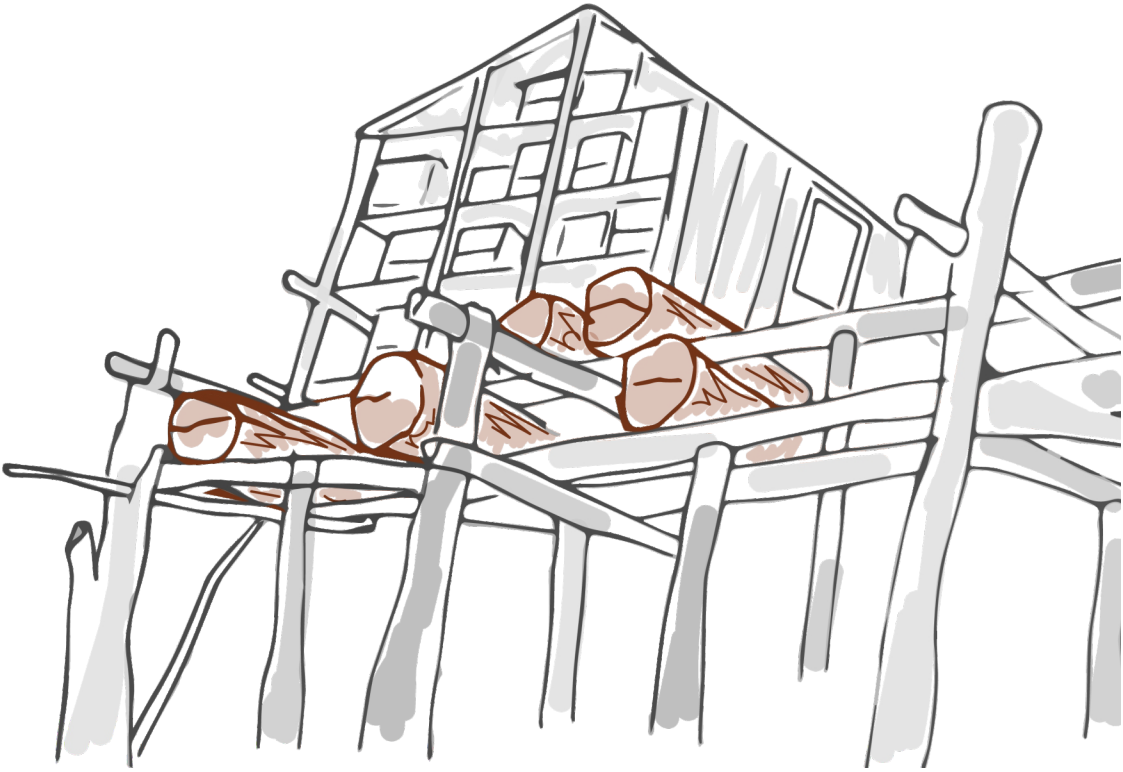
JARA HONEY PRODUCTION HANDBOOK

for Beekeeping Programmes at VET Colleges



CONTENT

INTRODUCTION

Beekeeping in Georgia has a long history. Archaeological evidence dates honey to 8000 years, exceeding honey remnants found in Tutankhamen's tomb dated to approximately 4500 years. There are many legends and folktales in different regions of Georgia providing evidence of early domestic beekeeping in Georgia.

There are three main stages in beekeeping development: wild - when people used to go to the forests specifically to collect honey; semi-wild (Gejuri), when hunters used to bring wild bee swarms home, settle them in hollowed wooden logs or pottery and place them in forests or rocks defined in advance; and modern - when harvesting and life phases of bees are controlled in a specially made home for bees – a beehive.

There are few places in the world where Gejuri beekeeping is still practiced. Beekeepers in Georgia use modern methods to make honey. This type of beekeeping is very rare and found in subtropical and alpine zones, remote villages and populated areas in western Georgia specifically mountainous Ajara. Locals continue the difficult, but century-old tradition of domestication of wild bees. A hollowed wooden log is called a Jara by the locals.

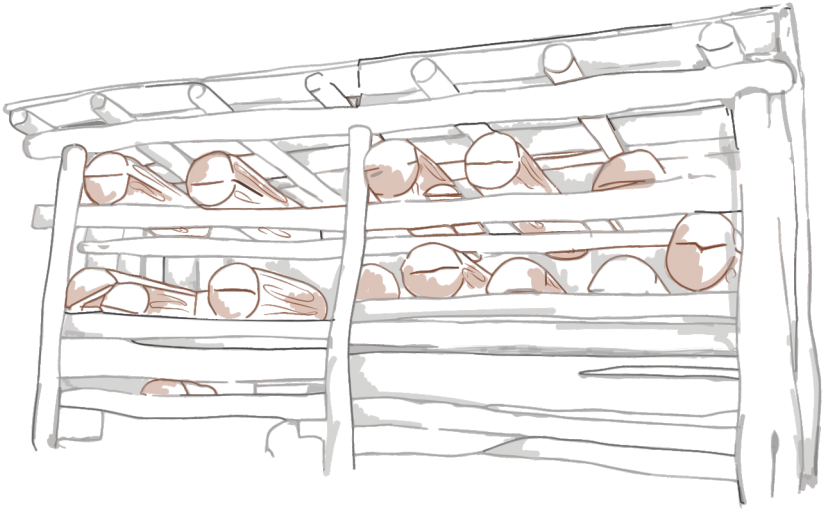
According to recent studies, the demand for high quality, bio honey is rapidly increasing. The Deep and Comprehensive Free Trade Agreement (DCFTA) signed with the EU in 2014[1], formed the basis to allow Georgia to export honey to the EU market after complying with all necessary standards[2]. Jara honey, with its history, production in a bio diverse environment and natural honeycomb has great potential to meet bio certification requirements as well as compete in the international market as a unique niche product.

[1] June 2014

[2] Compliance with requirements which mainly mean having a national Residue Monitoring Plan in place mean that Georgia can be placed on the Third Country List for honey and on meeting import requirements in terms of certification and testing can import honey to the EU. Georgia was put on the Third Country List for honey in November 2016. Please see Honey export Guidelines for export details.

For the first time in 2018, with the facilitation of the Jara Beekeepers Association[3], Jara honey was commercially harvested by a Georgian honey producer and exporter company. It was packaged and labeled according to international standards, making Jara honey available for consumers on both local and international markets. As a result of this first successful commercial harvest in 2018, beekeepers' income and motivation increased. Twelve more beekeepers took up Jara honey production for the first time and the amount of honey harvested and sold in 2019 nearly tripled. In February 2020, in a country first, eighteen Jara beekeepers in Ajara received Bio certification. Six more Jara beekeepers, including the Jara apiary in the Goderdzi Alpine Garden, are currently undergoing the certification process and might obtain certification by the end of 2020. The 2020 harvest is anticipated to be up to 3 tonnes[4]. As the demand for Jara honey increases so the production becomes more attractive for experienced and beginner beekeepers.

The aim of this educational module in Jara Honey Production is to help both beginner and experienced beekeepers interested in Jara beekeeping, to set up a Jara apiary in accordance with the Jara honey production standards defined by the Jara Beekeepers Association. These guidelines describe all the basic steps that should be followed by the interested parties when starting production of Jara honey and form the framework of this module. To see the Standards and more about the Jara Beekeepers Association please go to www.jarabeekeepers.org for more information.



[3] The Jara Beekeepers Association was formed in 2018 as a result of and as part of interventions facilitated by the Alliances Caucasus Programme (ALCP) a Swiss Development Cooperation market systems development programme with light touch facilitation and low visibility, implemented by Mercy Corps Georgia. The programmed facilitated the Batumi Honey Festival, the Jara film the Ajara Beekeepers Business Association, and the Georgia Beekeepers Union. Jara honey production was thought to have died out but the ALCP started to compile a database of producers and negotiate a commercial sale of Jara to a local factory and manufacturer.

[4] Jara honey harvest 2018 - 0,7 tonnes; Jara honey harvest 2019 - 1,85 tonnes

WHAT IS JARA?

A Jara is a traditional Georgian beehive - an ancient way of domesticating bees in Georgia dating back to ancient times. There is no exact evidence for when exactly Jara appeared in Georgia. However, several local folktales note that ancient inhabitants found the bees in a tree hollow and that they called this place in the forest 'the bee tree'. Later, locals realized that the 'bee trees' could be replicated. They collected swarms of wild bees and settled them into hollowed wooden logs and then placed them high up in trees to protect them from bears. Such wooden logs were called Jara.

In the 19th century, after the invention of the frame beehive, the number of Jara beehives dramatically declined. However, they are still used in the Ajara region alongside modern beehives.

JARA HIVE STRUCTURE

The model of the Jara beehive is similar to the natural habitat of bees in tree hollows. It is made from a hollowed log cut in two.

Picture 1: Structure of a Jara hive

Jara beehive sizes differ. The length of the beehive is one of the basic factors determining the volume of production. Average dimensions of Jara beehives are: length: 80-120cm, external width: 40-60 cm and internal diameter: 25-35cm. Generally, Jara beehives are made from coniferous trees. Jara hives made from Linden tree (Tilia Caucasia) wood are light-weight, without any specific smell; A Jara made from Spruce tree (Picea Orientalis) wood can absorb moisture helping bee colonies to avoid disease. Apart from that, there are some Jaras made of Chestnut (Castanea Sativa) and Alder (Alnus Subcordata) woods, though these types of hives are cold and make it difficult for bees to survive in winter.

No nails should be used in the construction of the Jara hive, they should be made only from wood. The bottom half of the hive should have three one cm holes made in the lip of the front end of the log for bees to enter and exit. The upper half should contain a 'divider' which is a short stick which is wedged in the top half of the hive to mark the division between the front half of the honeycomb which is occupied by the bee colony and which should not be disturbed* and the back part which is harvested by the beekeeper. The 'divider' not only divides the honeycomb into two but it also has a protective function against moths. It is recommended that the 'divider' be made of Spruce tree root which has a special smell to protect the hive from moths.

The front half of the honeycomb requires renewal after two years. This means removing the old part of the comb on its third and fourth years and after which bees produce the new wax. In the third year, part of the front half of the honeycomb, which does not contain the brood should be removed, in the fourth year the rest of the old comb is removed. After two years the same process should be repeated. The renewal or removing of the old combs usually happens at the end of February or beginning of March, before the main flower bloom begins.

SELECTION OF THE ENVIRONMENT
for the Apiary and Placement of Jara hives

Jara hives should be situated in bio diverse environments in remote villages, surrounded by forests. They should be situated at least 3km from potential sources of contamination such as densely populated areas, industrial zones and factories, plantations/farms treated with pesticides, highways and frequently used main roads/ transit roads.

The productivity of a Jara apiary significantly depends on proper selection of location. An apiary should be located in a dry, sheltered place, on solid ground protected from harsh winds. In wet and cold areas bee colonies can be weakened with a higher risk of diseases and low production rates. Neither should an apiary be placed near electricity transmission towers. In addition, Jara beehives should not be placed in areas where bees may come in contact with potential sources of contamination like cattle sheds, open toilets and waste water.

Beehives should be placed in an area where within a radius of about three kilometers sufficient amounts of melliferous flowers are available, blooming through different periods of the year, ensuring long-lasting forage. Bee colonies should have access to both fresh and salty water. A special watering pond should be arranged in an apiary for provision of salty water for bees[5].

Jara beehives should be conveniently placed for both bees and beekeepers. A beekeeper should be able to easily access each beehive. While inspecting a Jara hive, a beekeeper should not prevent bees from other hives from flying.

Beehives should not be arranged in a way that the beehive entrances are facing each other. Such placement can cause disturbances inside bee colonies. They can attack each other resulting in the death of a queen bee.

The arrangement of Jara beehives depends on the area of the apiary. If the area is sufficient, then the distance between Jara hives may be several meters. In such case, an individual wooden platform is arranged for each beehive and wooden/metal sheet covers are used to protect the hive from rain/snow. If the area of the apiary more confined, the beehives may be placed side by side in a row. In such a case special beehive shelters can be arranged; which should be made of wood. The shelter protects Jara hives from severe weather. The distance from the ground for Jara hives must be from 70-90 cm[6].

In the case of the relocation of Jara hives, they must be sealed with clay and carried upside down in order to prevent damage to the honeycomb.

[5] Bees require both salty and ordinary water. In order to avoid bees visiting open toilets, cattle sheds and waste water to access salty water beekeepers should arrange a strategically located reserve of it.
[6] In order to avoid moisture absorption, it is necessary for Jara hives to be situated above ground.

MANAGEMENT OF THE APIARY AND RECORD-KEEPING

To get a stable annual harvest and achieve maximum productivity in each Jara hive, it is important for the beekeeper to consider the following principles of apiary management:

Opening the hive: Jara beehives should be opened only in the case of necessity, such as vital observations or treatment of bee colonies and honey harvesting. Spring inspection of the apiary starts from March. Jara hives should be opened in good weather when the air temperature is more than 10°C. A beekeeper should clean the bottom of the hive of fallen honeycomb pieces and other waste. During this period a beekeeper should observe and evaluate the amount of food left in the Jara to make sure that bee colonies have sufficient food left after winter.

Supplemental feeding of bee colonies in a Jara hive is generally prohibited. It is only allowed in special circumstances such as severe weather conditions, when the lack of supplemental feed would mean the death of colonies; or when a bee colony is new (the bee colony being settled in the Jara the previous year) or because of limited nectar supply during the summer period and bees being unable to collect enough for honey. In the cases listed above only pure raw honey is permitted as a feed.

Spring treatment of Jara hives starts from the beginning of April. Bee colonies are treated with biological vet drugs[7]. From the end of April (it depends on weather and environment conditions) to the end of May a beekeeper should be most attentive. During this period new swarms comes out from hives[8]. The beekeeper should prepare empty Jara hives in advance to settle these swarms. It is important to clean these Jaras of debris and then disinfect them with hot water and flame.

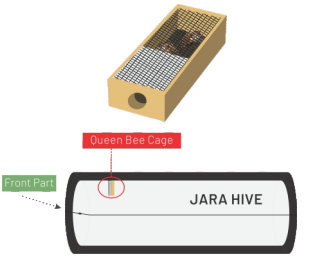
Autumn Treatment: After the honey harvest, in late autumn and during the non-larvae period[9] treatment using oxaloacetic acid and formic acid are conducted against the Varroa mite. These acids should only be used in consultation with a qualified specialist[10]. A beekeeper should wear protective gloves, glasses and use a respirator.

Record Keeping: documents/records[11] relevant to all activities being conducted in the apiary should be kept. Records enable a beekeeper to do a financial analysis, compare outcomes of the previous years and plan future activities aimed to providing increased productivity or financial profit. Records should include general information about the apiary, such as the number of Jara hives according to years, volume of honey harvested, vet-drugs used and dates of its' usage, spring and autumn inspections, as well as financial recordings, such as financial expenses for purchased vet-drugs, Jaras, employee salaries or other expenditures and income from honey sold.

[7] See detailed information about bee diseases and relevant biological vet-drugs in Annex 1: Bio Certification Guidelines for Beekeepers.
[8] Swarming is the natural reproduction of a bee colony. It usually starts in late spring at the time of the flowering period.
[9] Cells are capped in the larvae period. Oxalic acid cannot reach capped cells to effect varroa mites inside cells. So, oxalic acid treatment cannot be effective during the larvae period (spring-summer). Also, it may result in the death of uncapped pupa and young bees. Therefore, the period from late autumn until spring the non-larvae period, when there is no nectar available for bees and the queen bee cannot lay eggs is the best period to conduct oxalic acid treatment against the parasites.
[10] Members of the Jara Beekeepers Association receive consultation free of charge.
[11] Samples of beekeepers' records are available in Annex 1 the Bio Certification Guidelines for Beekeepers.

SETTLING A SWARM IN JARA HIVES

A beekeeper, who wants to increase the number of Jara hives or arrange a new apiary, can do this by catching a swarm and or by purchasing bee colonies from another beekeeper's apiary. Bee swarming in Georgia differs according to regions and depends on location and air temperature. Apple trees in blossom are considered indicative of when swarms coming out from hives. Since bees have more space in a Jara hive compared to a frame hive, the emergence of swarms from Jara hives takes place about one week later than from frame hives. The swarm is placed in Jara hives from the front (bee hive entrance) side. Where bee colonies are purchased, the following recommendation applies for the placement of the colony: firstly, a queen bee is placed in a cage which is hung in the upper part of the hive *(see Picture 2: Queen bee cage)*, after which the bee colony is settled in it. The cage is attached in the upper part of a Jara temporary for several hours by a stapler to make the colony to get used to the hive and stimulate start to construction of comb. After several hours a queen bee is released and a cage is removed from a hive.



Picture 2: Queen bee cage

JARA HONEY HARVEST

The Jara honey harvest starts from the middle of July and lasts until the end of September. As in late autumn the number of bees in the hives decrease[12], it becomes difficult for them to protect hives against insect pests entering the Jara. The most problematic pest is the wax moth Galleria mellonella. Eggs of the moth may occur in a hive from pollen cells left after honey harvest which can go through all the stages of their life cycle inside a comb cell. Therefore, it is recommended to conduct timely harvest of honey, remove extra pollen[13] cells and combs, conduct timely appropriate treatment and maintain hygiene in a hive in order to have stronger bee colonies, able to defend a hive against insect pests. All of these will reduce the threat of moth appearance in honeycombs.

Before harvesting honeycomb from Jara hives, a beekeeper should consider the following:

- Harvesting honeycomb from the hive should be conducted up to the "divider" placed in the internal upper part of the hive (see the picture 1).
- Before harvesting, it is important to observe and asses the honeycomb. Honeycombs should be sealed; there should not contain moths, worms or other insects.
- The honey harvest should be carried out in compliance with FS&H requirements which are: having clean hands, using natural smoking materials (e.g. dried corncobs), cutting honeycombs with stainless steel knives and using only food grade packaging.

[12] Most bees in a hive are worker bees. Their life span depends on the period in which they were born, the more work they do in the summer period the shorter their life span is. The average life span of a worker bee born during the summer period is 35-55 days. As the flowering period comes to an end in autumn, the queen bee reduces egg-laying, the worker bees die gradually and hence number of bees in a colony decreases.

[13] After the honey harvest, it is recommended to remove bee pollen cells and honeycomb that are outside the nest area or close to the "divider" and may contain the moth eggs.

- After harvesting , it is important to clean the Jaras, taking out waste honecomb and other small pieces fallen in the hive.

- Jara honey should not be filtered, pasteurized or homogenized; it may be served as honeycomb or may be extracted. One of the advantages of Jara honey is a honeycomb naturally made by the bee.

- Apart from honey, Jaras provide propolis and beeswax. Taking royal jelly from Jara hives is impossible[14].

JARA HONEY

Jara honey differs from frame hive honey. Its major advantage is that there are no frames with artificial wax foundation in Jara hives, the honeycomb is naturally made by bees. Artificial wax foundation in frame hives enables bee colonies to start collection of nectar as soon as the flowering period starts; while in a Jara hive, the colony needs make comb first, starting the collection of nectar afterwards. However, artificial wax foundation can be a source of honey contamination containing prohibited substances, compared to natural honeycomb which makes Jara production highly adaptable to organic conversion. As the harvesting of Jara honey is conducted at the end of the flowering period, nectar collected by bees is of all seasons from all kinds of honey flowers, hence creating the poly-floral characteristic of Jara honey. The current coverage area of Jara bees determines its special characteristics. Jara hives are found in remote high-mountaneous villages, near forests rich in biodiversity, far away from potential pollutants, such as densely populated urban areas, industrial zones and factories, large lands/farms treated with pesticides, highways and frequently used main/transit roads.

Bio Certification: Due to the above production characteristics Jara honey has high potential for organic conversion. Organic beekeeping is an ecology-based system contributing to the maintenance of agro ecosystems, promoting health, animal welfare and human health through good agricultural practice. Caucascert Ltd is the first local organic certification company in Georgia. Its main purpose is to inspect and certify bio products. The company operates according to the quality system of "Green Caucasus" accredited by Germany. Those wishing to obtain bio certification must follow the proscribed standards. Please see below and Annex #1 Bio Certification Requirements for Beekeepers.

[14] Royal jelly is the food fed to queen bee larvae. Production of royal jelly is stimulated by a beekeeper by taking a queen bee from the colony and hence stimulating colonies in movable frame hives to produce a queen bee. Royal jelly is collected from each individual queen cell when the queen larvae are about four days. Due to the fact that there are no frames in a Jara hive and it is hard to control and monitor the process, thus production of royal jelly in a Jara hive is impossible.

BIO CERTIFICATION REQUIREMENTS FOR JARA BEEKEEPERS

According to recent studies, the demand for high quality, bio honey is rapidly increasing. The Deep and Comprehensive Free Trade Agreement (DCFTA) signed with the EU in 2014[15], formed the basis to allow Georgia to export honey to the EU market after complying with all necessary standards[16]. Jara honey, with its history, production in a bio diverse environment and natural honeycomb has great potential to meet bio certification requirements as well as compete in the international market as a unique niche product.

[15] June 2014

[16] Compliance with requirements which mainly mean having a national Residue Monitoring Plan in place mean that Georgia can be placed on the Third Country List for honey and on meeting import requirements in terms of certification and testing can import honey to the EU. Georgia was put on the Third Country List for honey in November 2016. Please see Honey export Guidelines for export details.

The information given below describes main terms of biocertification, which are important for the beekeepers to follow

ENVIRONMENT:

- Jara hives should be situated in bio diverse environments in remote villages, surrounded by forests;
- They should be situated at least 3km from potential sources of contamination such as densely populated areas, industrial zones and factories, plantations/farms treated with pesticides, highways and frequently used main roads/ transit roads;
- Enough forage and fresh water should be available for bees.

HIVES:

- Jaras should be made of only natural material;
- Jaras should be identified/numbered.

BEESWAX:

- The use of artificial wax and wax frames in a Jara hive is prohibited; all wax is produced by the bees within the hive.

TREATMENT:

- Treatment with vet-drugs containing antibiotics and pesticides is prohibited;
- Only biological substances are allowed to be used, such as: formic acid, oxalic acid, lactic acid, sulfur, natural essential oils, eucalyptus, thyme.

BEE FEED:

- Only pure raw honey is allowed as a supplemental bee feed to a bee colony in a Jara hive.
- Supplemental feeding with honey of a Jara colony is only allowed in specific circumstances such as severe weather incidents where a lack of supplemental feed would result in the death of the colony.

RECORD-KEEPING:

- It is important to keep detailed records;
- All activities conducted in the apiary should be described in detail in a beekeepers journal.

MANAGEMENT:

- The destruction of bees in the combs as a method of harvesting of honey is prohibited;
- Clipping of the wings of queen bees is prohibited;
- The use of synthetic chemical repellents during the honey extraction process is prohibited;
- Smoking should be kept to a minimum. Only natural smoking materials (e.g. dried corncobs) are acceptable when harvesting honey;
- It is recommended to carry out the process of extraction and processing of honey or other beekeeping products at low temperature;
- Extraction of honey from the brood combs is prohibited.
- Smoking should be kept to a minimum. Only natural smoking materials (e.g. dried corncobs) are acceptable when harvesting honey; It is recommended to carry out the process of extraction and processing of honey or other beekeeping products at low temperature;[17]

[17] Extraction of honey should start early in the morning until noon when temperature is relatively low. Warmer temperatures spreads the smell of honey which can agitate bees, which may result in one bee colony attacking another.

JARA BEEKEEPERS ASSOCIATION

The Jara Beekeepers Association (JBA) was created under the umbrella of the Ajara Chamber of Commerce and Industry, which has been the member of Georgian Beekeepers Union[18] since 2019. The goal of the Jara Beekeepers Association is to strengthen, promote and protect the interests of its members, raise their awareness, provide necessary information and assist in the bio certification process. All of this eventually ensures stable income for rural beekeepers.

The Jara honey promotion web-page www.jarahoney.com and catalogue were created on behalf of the JBA, aimed at ensuring the promotion of both jara honey and jara beekeepers locally and internationally. The association actively presents Jara honey at both local festivals and international beekeeping exhibitions resulting in the significant increase in the demand for Jara honey. The Jara Beekeepers Association has developed Quality Assurance Standards for the Production of Jara Honey to preserve the traditions of Jara beekeeping and prevent Jara honey falsification. This module is based on the above mentioned Standards. The Association has registered the Jara trademark at the National Agency for Intellectual Property; Sakpatenti. Beekeepers, who will meet the standards, will be allowed by the JBA to use the Association's trademark on their label.

[18] www.geobeekeepers.ge

These guidelines were developed by the Jara Beekeepers Association with the facilitation of the Alliances Caucasus Programme (ALCP) a Swiss Development Cooperation (SDC) project in cooperation with the Austrian Development Cooperation and implemented by Mercy Corps Georgia.

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