Apimondia
First World Conference on Organic Beekeeping

Program and Abstracts

27 – 29 August 2010
Sunny Beach, Bulgaria

Edited by Stefan Bogdanov

Apimondia
First World Conference
in Organic Beekeeping

27 – 29 August, 2010
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The goal of this conference is to make a state-of-the-art on the current organic beekeeping practices in different countries and to develop ideas leading to common organic beekeeping standards.

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Let the beekeeper treat his bees

like the bee treats the flower,

according to the advice of the Buddha:

"Let the wise man live

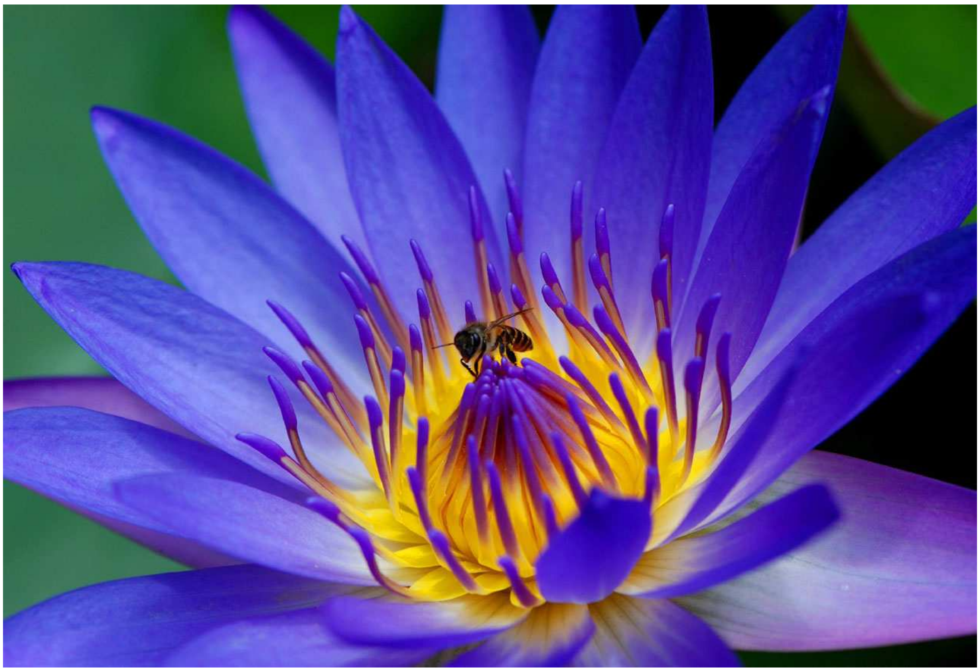
in the flower of his village,

like the bee, gently taking flowers' honey,

but not harming the blossom

and it's colour and scent."

The Buddha, 483-563 BC



ORGANIC BEEKEEPING, THE WAY TO PURE NATURAL HONEY

Consumers expect that bee products are natural and healthy. However, bee products are as natural as the environment where they are produced. Indeed, the quality of the bee products can be influenced by pollutants from the environment and by improper beekeeping practice. The objective of organic beekeeping is to produce bee products which are ecologically as pure as possible.

In developing countries, beekeeping practice is often with local methods that are organic or are near to organic, as beekeepers produce honey without the use of chemicals. Indeed there are now examples of certified, organic honey production in developing countries.

In industrialised countries organic beekeeping is a relatively new branch of organic agriculture. In Europe it started with the elaboration of an organic beekeeping regulation in 1991 with Council regulation 2092/91 which was then revised in 1999 (834/2007) and 2008 (889/2008). Now EU countries have also established national organic regulation. Non-European countries such USA, Canada, Australia New Zealand and others, have also established standards and rules for organic honey production. In addition, national (e.g. Bioland, Germany) and supranational organic organisations (e.g. Demeter) have defined their own standards and rules for organic beekeeping.

On the markets of industrialised countries there is an increased demand for organic honey, which achieves higher prices than conventionally produced one. However, these countries cannot produce enough organic honey and there is a big need for import. In Germany, a major honey importing country, 420 companies from 54 countries are registered for trade with organic honey by mid 2010 in www.organic-bio.com. Leader is Italy with 117 companies. The marketed organic honey in Germany is estimated to be about 5 % of the total marketed honey. Especially appreciated is unifloral organic honey.

The production of organic honey in less developed countries is interesting from financial point of view because beekeepers can sell their organic honey for a higher price than the conventionally produced one. On the other hand, home market consumers in these countries are generally not ready yet to pay a higher price for organic honey than for the conventional one.

The implementation of organic legislation by controlling and certification bodies differs considerably between countries. The same honey may be labelled as organic in one market but not in another – depending on each nation’s specific legal settings. Different geographical and climatic conditions, as well as differences of bee species require different strategies for the safeguard of bee health in organic beekeeping. Also, there are different market and trade rules all over the world.

Scientists and beekeepers from 28 countries have submitted abstracts for this conference. The goal of the conference is to make a state-of-the-art on the current organic beekeeping practices in different countries and to develop common organic beekeeping standards and strategies.

ORGANIC BEEKEEPING IN DIFFERENT COUNTRIES

Stefan Bogdanov

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Some presentations at this conference describe organic beekeeping in individual countries. A survey was conducted with the participants of the present conference, where they had to give information about the organic beekeeping in their country. Based on the survey and on other available information summarised, the data given in the below table, following conclusions can be made.

European Union

In 9 surveyed EU countries organic beekeepers represent between < 0.1 % and 13 % of all beekeepers. In all countries but Italy with 13 %, less than 1 % of the beekeepers are certified organic. The number of certified organic hives is the better mass for honey production. The number of certified hives in 7 surveyed countries varies between 1000 and 100 000, representing from 0.1 to 8 % of the total hives, the maximum being in Italy. One beekeeper in these 7 countries manages from 11 (Italy) to 300 (Bulgaria and Spain) colonies. On the average one organic beekeeper in these countries manages 141 colonies while each conventional beekeeper manages only 28 hives. Italy is a leader with about 100 000 certified organic hives, making about 8 % of all hives of the country[1], followed by Spain with 57 600 hives. On the third place is Bulgaria with 44 861 certified hives. Although no information concerning certified organic hives from Romania or Hungary was received, production of organic beekeeping seems to be significant as organic honey from these countries is marketed quite frequently in Germany, especially acacia and linden honeys.

Non EU countries

In most non EU countries organic beekeeping is only at the beginning, excepting the Repubic Macedonia, with 15 000 certified colonies, representing 15 % of the total bee colonies.

Non European countries

Brazil is the world biggest producer of organic honey. An important part of its total annual production of 40 000 tons is organic and there are several big honey companies trading exclusively with organic honey, most of it for export, e.g. Minamel, Cearapi, Novomel and Apiduoro. Argentina, the second honey producer in the world, also produces organic honey. According to a recent report at the end of 2008 there were 51 970 certfiied organic hives with a total honey production of 1279 tons (http://www.lawebdelagro.com/portal/content/view/680/8/). Mexico has also a significant potential for organic honey production and produces at present about 1 150 tons.

ORGANIC BEEKEEPING IN DIFFERENT COUNTRIES

Compiled according to the information provided by the congress participants

Country	Number of organic beekeepers (% of total)	Number of beekeepers	Remarks
Aizerbaidjan	-	30 000	No officially registered organic beekeepers
Bulgaria	150 (0.3 %)	45 000	44 861 or about 6.5 % of all hives are certified, 300 hives per beekeeper. 10 certification organisations, individual and group certification.
Canada	10 000* (2 %)	600 000*	Organic beekeeping mostly in Quebec with 9 certified organic beekeepers, biggest obstacle GMO crops.
Germany	600 (0.7 %)	85 000	25 000 or about 3 % of all hives are organic, 42 hives per beekeeper. EU, national and different private regulations, 8 certification organisations. Acaricide residues in wax: < 0.5 mg/kg for each a.i.
France	219 (0.3)	80 000	42 500 or 3 % of all hives are certified, 194 hives per beekeeper. 7 % increase from 2007 to 2008. 194 hives per beekeeper.
Georgia	15 (0.2 %)	6 600	Regulation: Elkana and National regulation, Certification: Caucascert.
Greece	100 (0.4 %)	24 000	11 certification organisations.
Italy	9 000 (13 %)	70 000	About 100 000 or about 8 % of all hives are certified. 11 hives per beekeeper. 13 certification bodies, organic honey consumption 3.6 % of the total. Acaricide residues in wax < 0.1 mg/kg for each a.i.
Lebanon	none	132 000*	Two certification organisation, there is an Association for Lebanese Organic Agriculture
Republic of Macedonia	*15 000** (20 %)	*75 000**	Biocert and Procert mainly individual labels.
Mexico	448 (1 %)	45 000	46 300 or about 2.3 % of the hives are certified. 1,150 tons of organic honey, about 5 % of the honey export. Certification by IMO and Certimex.
Moldova	1	6 000	5 beekeepers in transition
Poland	60 (0.1 %)	44 000	1000 or 0.1 % of all hives certified, 17 hives per beekeeper, honey production about 25 tons. 17 hives per beekeeper. 11 certification organisations.
Portugal	49 (0.15 %)	16 267	6 120 or about 1 % of all hives certified, 124 colonies per beekeeper. 7 certification organisations, individual and organisation labels.
Romania	620	80 000	20 % of total organic operators.

	(0.8 %)		
Russia	none	300 000	No officially certified beekeepers, but sometimes honey is sold under the label „organic“
Slovakia	1 (< 0.1 %)	20 000	400 or 0.2 % of all hives are certified. A New 2010 regulation should create better conditions for the development of organic beekeeping
Spain	194 (0.8 %)	25 000	57 600 or about 3 % of all hives are certified, 300 hives per beekeeper.
Switzerland	150 (0.7 %)	20 000	6 000 certified hives. National, Demeter and Bio-Suisse regulations, organisation and individual labels; Acaricide residues in wax: < 0.5 mg/kg for each a.i.
Turkey	147 (0.1 %)	115 000	318 beekeepers in transition, no residues allowed. 400 tons of organic honey produced or about 5 % of the total.
UK	1 to 6 (0.01%)	40 000	No official statistics on organic beekeeping. 6 certification bodies, each of them having own standards according to the UK Organic Standard
Ukraine	1 (< 0.01 %)	50 000	

*** - number of colonies**

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www.agni.ch

BEEKEEPING IN BULGARIA: TRADITIONS AND HABITS

Dimo Dimov and Stefan Bogdanov

Beekeeping exists in Bulgaria since ancient times. It was practised by the Thracians who lived on the territory of Bulgaria from 2000 BC until they merged in the first centuries AC with the Slavs and with the Bulgarians, who came to these lands from Asia at 681. According to the Greek historian Plutarch (205-118 BC) the Thracians used honey in their meals and sold a lot of honey and wax to the Greeks. The Bulgarians and also the Slavs were familiar both with beekeeping.

Beekeeping in the monasteries until the present times

After the adoption of Christianity in 864 under the Bulgarian king Boris the 2nd, beekeeping developed mostly in the Bulgarian monasteries. The first mention of beekeeping was made by Joan Exarch (860-935) a famous ancient Bulgarian writer and philosopher. In his book “Shestodnev” he describes the life of a bee colony and compares it to the life of the humans. According to him the life of the bee kingdom should be a model for the human one. Beekeeping was introduced in the monasteries because honey and beeswax had a high economical value. Monasteries were given royal diplomas by the authorities, called “Chrisovuli” (from the Greek, meaning golden seal). With these diplomas the exploitation of the monastery bee hives were exempted from taxes, thus promoting the development of beekeeping. Such a Chrisovuli was given to different Bulgarian monasteries, e.g. in 1259-1260 to the monastery Sveti Georgi near Skopie and in 1378 to the monastery Ivan Rilski in the Rila mountains.

In the archives of the Troyan monastery of 1833 it is written, that the monastery has 10 hives. Until recently there was a “healing inn” in this monastery, where bee products were used for healing purposes.

After the liberation from the Turkish occupation the first law on beekeeping of 1904 says that all monasteries in Bulgaria have to keep bees in the most modern hives, as prescribed by the beekeeping associations.

Beekeeping in the religious traditions

The saint Haralampi (Greek Haralambos) was a Greek Christian saint from the 2nd century AC. The Greek word “haralambos” means “glowing with joy”. Haralambos, persecuted very severely by the Roman emperor of that time, survived the Roman tortures and helped many persecuted brothers by healing them with the use of honey, propolis and herbs. He lived until he was executed at the age of 112 years. Before the execution Haralampi said the following prayer: “May God bless the fruit of our labour and may there be abundance of milk and honey, by which all beekeepers can make their living by caring for their harvest and for life in general”. Then, before the executioner could touch his neck with his sword, he passed away. The 10th of February, the day of Saint Haralampi, is celebrated in Bulgaria as the Day of the Beekeepers. On that day honey sanctification ceremonies are carried out in churches. Honey and other bee products are brought on that day to the church for sanctification. Water, mixed with honey has healing powers on humans and is also given to the bee colonies for optimal health.

The icon St. Haralampi in the St. Haralampi and St. Marina church in Assenovgrad is famous in all Bulgaria. According to the tradition honey is brought to the icon on the 9th of February. On the next day there is a special prayer on honey and health. People believe that honey, but also the water that has been sanctificated on that day, have special healing powers. Honey sanctificatons are carried out in other Bulgarian churches.

Today, on major beekeeping festivities a high religious official will mostly opens the festivities by a bee and honey blessing ceremony.

ABSTRACTS

ORAL PRESENTATIONS

1. SUSTAINABLE APICULTURE

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Apiculture may be considered sustainable only when examined from ecological, social and economic perspectives. In this paper we will address aspects of sustainability that are not currently addressed within the European organic standards. Practised well, tropical African beekeeping is sustainable for both the individual colony and the whole honey bee population.

In tropical, sub-Saharan Africa, beekeeping methods have remained unchanged and represent an enduring example of sustainable apiculture. These beekeeping systems are typically extensive, as opposed to the intensive practices of conventional, 'global' beekeeping. Beekeepers in tropical Africa regard their production base to be the whole population of honey bees within their local area, in contrast to intensive beekeepers whose focus is at the individual colony level. Labour is invested in making many no-cost or low-cost hives and spreading them far apart in natural forest areas. Day to day colony management is not done and this keeps colony stress levels low and saves labour. The spread of colonies resembles the natural system and minimises the risk of disease spread, drift, or localised forage shortages. Colonies abscond as a strategy to cope with pathogens, and migrate in response to seasonal changes, and beekeepers regard this as normal. Accepting that at harvest time a significant percentage of hives may be empty is a key tenet of extensive beekeeping: high yields are achieved by harvesting from many colonies.

Extensive beekeepers do not alter the genetic identify of locally adapted populations, nor do they translocate honey bees for the benefit or convenience of humans. Instead, they benefit from the morphological, behavioural and population biological characters that achieve survival and natural reproduction of honey bees (and their associated pathogens) in their local, natural environments. Increase is achieved by natural swarming, and beekeepers rely, with success, on natural swarms to acquire bees. The bees' nest comprises all natural combs, and whole combs are harvested. The constant replenishment with fresh comb probably reduces build up of diseases, and income from beeswax negates any additional benefit that might otherwise be gained from the replacement of drawn comb.

The outcome is that tropical, sub-Saharan Africa remains the last place where intact, indigenous populations of *Apis mellifera* thrive and are free from the deleterious effects of imported pests and diseases, and where the forces of natural selection allow the persistence of well adapted populations both in the wild and within the ownership of beekeepers.

2. HONEY BEE EPIDEMIOLOGY AND BEEKEEPING PRACTICES: THE EXAMPLE OF AMERICAN FOUL BROOD

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The mode of transmission between hosts (horizontal vs. vertical) of disease agents is important for determina90

tion of the evolution of virulence in pathogens. For disease management, it is imperative that the epidemiology of the disease is understood and pathogen transmission rates between hosts is a key factor for this understanding. Surprisingly little is known about transmission rates in honey bee pathology in general. In principle, disease transmission for a given pathogen can be vertical (between generations) or horizontal (within generations) both at the individual level (between bees) and at the colony level (between colonies). Vertical transmission mainly selects for benign host-parasite relationships because the pathogen relies on host reproduction, whereas horizontal transmission often results in more aggressive host-parasite relationships. We have studied the rate of colony level vertical transmission of *Paenibacillus larvae*, the causative agent of American foulbrood (AFB) in honey bee colonies, as colonies reproduce by colony fission (swarming). The results demonstrate vertical pathogen transmission from swarming mother colonies to daughter swarms. The spore density declines over time in both mother colonies and daughter swarms if mother colonies do not exhibit clinical disease symptoms. Occasional positive samples more than a year post swarming, also in daughter swarms, indicate production of infectious spores from diseased larvae, without clinical disease observable by beekeepers, and/or maintenance of infective spores in the hive environment, allowing both horizontal and vertical transmission to be maintained. The results suggest that the virulence of AFB, being lethal at colony level in contrast to other bee diseases shaped by evolution, could be dependent on apicultural practices and that the pathogen probably would be maintained without causing frequent colony mortality in a natural system. In general, beekeeping increases horizontal disease transmission relative to natural systems, at the expense of vertical disease transmission. Thus, apiculture probably selects for more virulent pathogens compared to disease agents in natural populations of honey bees.

3. ORGANIC BEEKEEPING IN MEXICO

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Mexico is often described as a cornucopia, a land with high diversity in ecosystems, crops, fauna and flora. These are superb preconditions for organic honey production. Already the pre-hispanic Maya cultures produced honey from the native stingless bee (Meliponini) before the Spanish introduced European honey bee (*Apis mellifera* L). The main beekeeping product in Mexico is honey. Mexico ranks sixth in the world in honey production (57,000 t) and third as an exporter (25,000 t).

Two conditions allow Mexico to possess an enormous potential for organic honey production. First, the beekeeping with Africanized honeybees: despite the problems derived from their defensiveness, these bees have great qualities in terms of natural defences against main diseases, including Varroa, so that beekeeping can be realized almost without the use of medicines, contrary to beekeeping with European bees. Second, the southern states of Mexico have a low industrialization level with small scale agriculture characterized by a rather low use of pesticides. Thus, a big part of the territory is suitable for organic honey production as it fulfils the low exposure levels of contaminants.

Mexico produces approximately 1,150 tons of organic certified honey, that is about 5% of the Mexican honey export. 20 operators are certified organic. Most organic producers are cooperatives with small scale beekeepers. In 2010, more than 448 organic beekeepers (and 291 beekeepers in transition) are managing more than 46,318 organic hives (and 8,629 hives in transition). Organic honey is mainly produced in the states of Yucatan, Campeche, Quintana Roo, Chiapas, Oaxaca, Morelos and Jalisco. Some of the organic beekeeping cooperatives also hold Fair Trade certificates. The first cooperatives were certified in the 1990's in Oaxaca y Guerrero state. Naturland/IMO organized the first organic beekeeping workshop in 2001. Since 2003, El Colegio de la Frontera Sur (ECOSUR) has offered annual courses with diplomas in organic beekeeping. Naturland/ IMO trained the inspection agency Certimex on auditing organic beekeepers in 2004. The First Forum of Organic Apiculture was held in 2005 in Chetumal, followed by a second Forum in 2008 in Mérida. The premium price placed on organic honey makes the transition to organic production very attractive. For small scale beekeepers in cooperatives, an Internal Control System (ICS) has to be developed and full traceability of the product must be ensured. The documentation of the beekeepers' activities, as well as the accounting of the honey and wax, can present some difficulties at the beginning, particularly because many of the indigenous beekeepers are illiterate.

Wax from organic beekeeping is used for wax exchange within the organic projects to guarantee a closed wax cycle. Organic certifiers like Naturland, IMO and Certimex carry out wax analysis in order to ensure the absence of conventional Varroacides in the wax. If wax is contaminated, it has to be replaced and the cycle of home-grown wax has to be established.

Mexico presents the most suitable conditions of biodiversity and nectar sources from extensive natural forests, traditionally not intensively developed, and more than 400,000 ha of certified agriculture land. It has the potential to increase organic honey production considerably, so that many cooperatives of small farmers may benefit by including organic beekeeping in their production.

4. ORGANIC BEEKEEPING IN TURKEY

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Turkey has a big share in the world in terms of honey production and number of honeybee colonies. The country has a wide area suitable for the production of organic bee products like pasture and grassland, forest trees, pine forests in the Aegean and the Mediterranean regions, and nectar and pollen plants in the Eastern Anatolia and Black Sea regions. There were 256 certified organic beekeepers in 2004. The number of organic beekeepers in 2009 was only 147 and 318 beekeepers were also in the transition process for organic production. The reasons for the decrease in the number of certified organic beekeepers are the implementation difficulties of organic beekeeping, low honey yield per colony, and low honey price. Therefore, a small number of professional beekeepers should be directed and supported in organic beekeeping. Also conventional beekeepers should be encouraged to produce bee products without residues. This review is aimed to discuss organic beekeeping in Turkey and to compare it to traditional beekeeping.

5. DEVELOPMENT OF BEEKEEPING IN INDONESIA

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Indonesia has huge natural and human resources for beekeeping. The honey production of indigenous honey bees *A. dorsata* and *A. cerana indica* is greater than that of A. *mellifera.* The increase of industrial forest plantations (*Acacia mangium*, *Eucalyptus spp*.) and estate plantations with palm oil and rubber trees as honey plants, have caused increase in the populations of *A. dorsata*, and *A. cerana indica* in Sumatra island, while *A. mellifera* cannot survive in this area because of lack of pollen producing plants such as corn, sorghum and *Acacia auriculiformis*. However, the development of beekeeping with *A. mellifera* since its introduction in Indonesia in 1975 is relatively slow in comparison to China, Vietnam and Thailand, due to the following reasons: lack of public and private support; weak research and development; insufficient support for small beekeepers; bee plants are present in only small areas of Java, making migratory beekeeping with *A. mellifera* difficult; lrge areas of honey plants, available in Sumatra and outer islands of Java are suitable only for *A. dorsata; A cerana indica* is suitable for stationary beekeeping by small beekeepers in all villages and islands - which grow a lot of coconut trees as pollen resource. Small beekeepers are contracted by big companies that buy their bee products and supply training, funding, queens, equipment and drugs against bee pests.

Facing such conditions there are three options for Indonesia: 1. To develop migratory beekeeping on Java Island with imported *A. mellifera* bees. 2. To manage the indigenous *A. dorsata* bees in the outer islands of Java. 3. To develop *A. cerana indica* for stationary beekeeping in all villages and islands that grow coconut trees, enriched with *Calliandra callothyrsis* and fruit trees.

Constraints face the development of migratory beekeeping of *A. mellifera* because Indonesia consists of 17,503 islands, and the migration between islands is expensive and difficult. For the time being, the development of stationary beekeeping with the indigenous bees *A. dorsata* and *A. cerana indica* is much better. For long term development we plan to develop *Integrated Bee Farming* with sweet sorghum as a pollen producer and *Calliandra callothyrsis* (a small, thornless leguminous tree) as a nectar producer. *A. mellifera*, *A. cerana indica* and *A. dorsata* beekeeping can be developed in all ofIndonesia for the increased production of honey, bee pollen/bee bread, royal jelly, beeswax, propolis and bee venom. The following main projects have to be followed in the future: 1. a tree planting movement with the bee plants *Acacia mangium*, *Calliandra callothyrsis*, *Sweet sorghum*, *Acacia auriciliformis*, rubber and palm oil trees. 2. The development of Integrated Bee Farms to increase bee products production, improvement of the beekeepers' and people's health and wealth.

6. NATIONAL SYNDICATE OF BEEKEEPERS AND FARMERS OF CAMEROON

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Cameroon has ten provinces and every province counts on average at least 3,000 beekeepers. We use several types of hives: traditional hives, hives in rattan, hives in terra-cotta and hives in tree trunk. Our Yaoundé organisation was born in 2007 and is composed of 14 beekeepers. We have beekeeping and agriculture as main activities, with honey production being the main one. The members of our organisation have at least 50 hives and each colony produces about 40 kg of honey. Our beekeepers produce mainly the following honey types: coffee honey, forest honey, eucalyptus honey, mixed blossom honey, mountain honey.

In Cameroon, we have two honey seasons, the small season from September until January and the big season from March to June. We have different honeys: coffee, eucalyptus, mixed blossom, forest, mountain and savannas honeys. Honey has a relatively high price, about 5 euro per kg, that is very high in comparison with other basic food products.

7. BIRTH OF THE FIRST ORGANIC APICULTURAL ENTERPRISE IN CENTRAL AFRICA: ACHIEVEMENTS, DIFFICULTIES AND FUTURE CHALLENGES

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Guiding Hope is a socially-orientated enterprise in Cameroon, trading in organic honey, wax and propolis, nationally and internationally since 2007. PAELLA-E is a development association that since 2007 provides technical support, builds confidence within the apicultural chain, and assists Guiding Hope in its mission. Our joint goal is to develop a secure market for high quality bee products from rural beekeepers, while contributing to increased incomes and improved livelihoods.

Currently more than 800 registered beekeepers hang traditional fixed comb hives made of local materials (raffia, grass and rattan) in an expanse of savannah covering more than 25,000 km², which is otherwise used for small-scale organic agriculture and grazing land. There are no bee diseases present and wild flowering trees and shrubs provide forage for bees all year round.

Guiding Hope has been exporting conventional wax since 2007. In January last year, we received our first organic certificate and are registered for organic sales in Europe and North America. We successfully lobbied and supported the Cameroon Government in setting up a Residue Monitoring Scheme for honey that was accepted by the EU in October 2009. The first container of honey to be exported from Central Africa in at least 20 years was sold by Guiding Hope early in 2010. We are now registered to sell organic wax in the EU for apicultural purposes.

Our 'innovative and entrepreneurial approach to sustainable development, [and our] potential to contribute to economic growth, social development and environmental protection…' was recognised by the SEED Initiative in 2008 when we were selected as one of five Global Award Winners.

Obtaining organic status has involved introducing an innovative traceability and quality control system in an area where literacy is measured at less than 10%. Ensuring that the HMF level in our honey remains within EU norms requires effective methods for limiting heat exposure in a context where temperatures are above 30°C most of the year and transport infrastructure is limited.

Driven on by our beekeepers' vast production potential, we must find new organic market outlets that will allow us to reach an economy of scale. Beekeeping is threatened by human and physical elements such as the bauxite mining project due to start in our region in 2011, and by climate change. However, we are guiding hopes onwards through community-led initiatives such as bamboo and rattan regeneration and *weave-a-hive-kick-a-ball* football tournaments, which are encouraging the youth to pick up the ancient beekeeping skills and wear the beekeepers' football strip.

8. EFFECTS OF TRADITIONAL AND SUSTAINABLE BEEKEEPING TECHNOLOGY ON HONEY, BEES AND HUMAN IN NIGERIA

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This presentation is a comparative study that unveils traditional beekeeping practices in Nigeria and compares them with the sustainable practices, revealing their effects on the produced bee products (e.g. honey), bees themselves and the humans that manage the bees and use the products. Beekeeping in Nigeria is presently dominated by traditional beekeepers and honey hunters that lack the real tool to work in beekeeping field (untapped gold mine) in the country. Honey collection by this group of people results in poor yield and low quality. The worst of all is that this technology leads to massive murder or destruction where bees of all ages and the honey are destroyed. What will then happen to the human beings that consume the dead products? This, among other things, calls for organic beekeeping that leads to sustainable beekeeping.

9. ORGANIC BEEKEEPING AND PRODUCTION OF ORGANIC HONEY IN OMAN

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Beekeeping, bee forage plants, honey production and different activities of honey bees were studied in the mountains of Oman, where organic beekeeping is practised and organic honey is produced. In Oman, the relative importance of organic beekeeping is high, about twice that of conventional honey. In the north Jabal Akhdar (or green mountain) and in the south Jabal Dhofar, Omani bees are reared or occur naturally. No pollution exists in these districts, and no chemicals are used against bee diseases or parasites, while this is not true in the plains - with low rearing of honey bees. The physicochemical properties of non-organic honeys from the plains, and organic honeys from mountains, were investigated, using more than 150 samples of honey. Significant differences were detected with respect to: specific gravity, water content (%), total soluble solids (%), pH-values and potassium content (ppm.), in organic honeys from the mountains and non-organic ones, from the plain. Highly significant and positive correlation was detected between sodium or potassium content (ppm.) in dark non-organic honeys from the plains, and amber or light organic honeys from the mountains. Highly significant and positive correlation was found between pH-values and potassium content in studied honeys. Significant and positive correlations were observed between water content (%) in studied honeys, and relative atmospheric humidity (%). Problems of water and soil salinity, and their effect on nectar secretion from plants, and consequently honey productivity from honey bee colonies, are discussed.

10. POSSIBLE FACTORS OF COLONY LOSSES AND HOW TO REDUCE THEM UNDER ORGANIC STANDARDS

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For the last decade, the beekeeping community worldwide has been facing a problem of losses and/or weakening of bee colonies. Eight groups of possible factors are described in details: pesticides and other exogenous pollutants, Varroa, other parasites, diseases, viruses, bee diet, colony management, other endogenous factors and climate changes. The multifactorial system becomes more complex by the possible synergism between the different factors and the agricultural/beekeeping practices.

We cannot simply count on the resilience of our bees because their immune system is being reduced. The bees and beekeepers no longer have room for errors! But solutions do exist for each of the possible factors of colony losses. To help preserve biodiversity, both beekeepers and farmers have to work together to save not only the bees but all other pollinators too.

As beekeepers working closely with nature and providing noble products, we must encourage politicians, scientists, consumers and farmers to support sustainable agriculture with organic standards as a viable alternative. The best way is to set an example by practicing organic beekeeping, respecting the 24 articles which make up its “terms and conditions”. Six of them are directly connected with the possible factors of colony losses.

11. KEY ELEMENTS OF ORGANIC BEEKEEPING MANAGEMENT

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Most of the beekeepers’ business is devoted to honey production. Thus, this presentation will concentrate on the production of this bee product. The honey industry offers us often a uniform and easily consumable product, for example an always liquid, often pasteurized honey, with the same colour and flavour. On the other hand, organic beekeeping aims at the production of a unique product, with changing characteristics, like its environment. Thus, like wine, organic honey too will vary depending on the year of production. The production of organic honey should involve natural technologies in all steps of its production, and secondary technological techniques for the improvement of honey quality should be kept to a minimum.

We know that organic agricultural practices are more labour intensive than conventional ones. This applies also to organic beekeeping management. Thus, organic beekeepers should be innovative to be able to compete, also economically, with conventional beekeepers.

Organic beekeeping management in Europe is regulated by CE Regulation (889/2008). In this regulation, the rules and restrictions are given to develop organic beekeeping in a way common to all European countries. Organic beekeeping associations often have regulations of their own, which have to comply with national regulations.

The key elements of organic beekeeping management are:

1. Good selection and utilization of local ecotypes of bees and of ecological hive systems, best adapted to the natural environment and allowing efficient management
2. Efficient ecological strategies for the control *Varroa destructor* and other bee pests
3. Regular control of the bee colonies and their environment.

4. Safeguard of sufficient amounts of honey and pollen in the colony throughout the whole season
5. Correct management of the colonies all year round , based on building a sufficient number of young bee colonies
6. Regular renovation of comb wax

12. DEMETER BEEKEEPING CULTURE: A WAY TO SUSTAINABLE BEEKEEPING

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Organic beekeeping mostly means production of honey and wax free from chemical residues. It is an integrated part of the general organic agricultural movement. This movement developed in the last decades to become a solid agricultural activity based on different values: dignity, sustainability, intrinsic value and residue free.

Commonly, organic beekeeping fits to only one of these components: free from chemical residues, and belongs to an earlier stage of organic agriculture. According to the basics of organic agriculture, it is necessary to develop organic beekeeping further to reach the Demeter values, especially in the current situation, when beekeeping comes into an existential crisis and bees die because of illness and weakness.

This presentation points out that in order to respect the dignity and the intrinsic value of bees, a new beekeeping practice should be created, which is in better agreement with bees' nature and especially with regard to their biological requirements. This type of organic beekeeping corresponds not only to the ethical values mentioned above, but leads also to a better vitality and health of the colonies. This is confirmed by the experience in the SEKEM beekeeping project in Egypt (see www.sekem.com) and by my experience as a Demeter professional beekeeper in Germany for more than 15 years.

Demeter beekeeping, founded in 1995, is very natural beekeeping. The Demeter beekeepers do not focus directly on honey production. They look first at the needs and the biological requirements of their bees. Consequently, the basics of Demeter Beekeeping are: 1. Rearing new queens and new colonies within a natural swarming process, and 2. Use of natural comb building, at least in the brood chamber.

After 15 years of Demeter beekeeping, I can conclude that this beekeeping can be easily practiced. Honey production lies about 30% less than the intensive, conventional level, but colonies and queens are strong and vital. It is possible to see the beginning of a substantially self-regulative process, leading to a better equilibrium and harmony of the bee colonies. It can also be observed, that the bees develop defence strategies against enemies like wasps or hornets.

Thus, Demeter beekeeping could be the first step to improve the vitality of the bees. It could be the first step to help bees resist diseases by themselves.

13. DISEASE CONTROL IN ORGANIC BEEKEEPING

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Disease control in organic beekeeping differs from disease control in conventional beekeeping mainly in the absence of synthetic medicaments in the former. As some medicaments, like antibiotics may harm treated colonies, the organic approach to beekeeping has certain advantages, also for the bees. The control of Varroa destructor mites without synthetic products is possibly the main challenge for organic beekeeping, but appropriate ecological alternatives are available although some may require more skill compared to other control options. All beekeeping needs to consider the well being of colonies, which includes selection of suitable apiary locations, keeping strong colonies and management appropriate for the bee race and geographic location. However, the well being of colonies are also determined by the genetic ability to withstand pathogens. Thus, breeding for disease tolerance should be at the core of all forms of beekeeping. At the individual bee/larval level, the host-defence system is complex and involves both humoral and cellular aspects. Synthesis and secretion of a number of different antimicrobial peptides in the fat body are released into the haemolymph and compose a general non-specific humoral line of defence. In addition, host-defence in insects relies on cellular reactions, which involve a number of specialized blood cell types, so called haemocytes. Phagocytosis (engulphing) of foreign objects and parasites, and participation in the control of infection through production of secreted molecules, occur through haemocyte activity. Presently, selection of individuals based on genetic markers for specific disease resistance traits is not possible, because such markers are not available. Nevertheless, selection based directly on the genome has enormous advantages and will undoubtedly increase in importance in the future. Interestingly, the sequencing of the honey bee genome has revealed fewer genes for disease resistance compared to other insects. This should indicate that investment in an individual level of defence is less important in social insects, where there is also a colony level defence. There is a social component in resisting various pathogens in social insects. The social component consists of behaviour of individuals, but where no single individual need to include all traits for certain behaviours to be accomplished. The best example from honey bees is the hygienic behaviour where different activities needed to remove diseased brood (detection, uncapping, removal) are controlled by different genes independently inherited. The gene frequency of these traits in the population will determine the efficacy of the behaviour. The hygienic behaviour is the most important line of defence for brood diseases. Variations in individual level pathogen resistance is difficult to measure. The best practical approach here is to simply not breed from colonies where diseases can be diagnosed. Variations in colony level disease mechanisms, are easy to monitor, at least for brood diseases. Measurements of the level of hygienic behaviour should be part of any serious attempt to breed bees more tolerant to brood diseases (including the parasitic mite V. destructor). As Varroa mites are the main challenge, not only for organic beekeeping, it is encouraging for future selection work that documented mite tolerant strains of bees have been produced independently in several places, where bees an mites have been exposed to forces of natural selection.

14. INTEGRATED PEST MANAGEMENT AGAINST *VARROA DESTRUCTOR*

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Our research goal was to establish an efficient strategy for the control of the Varroa mite (*Varroa destructor* Anderson & Trueman) in honey bee colonies (*Apis mellifera* Linnaeus). Synthetic acaricides such as Fluvalinate, Coumaphos, and Amitraz are very efficient but resistance develops rapidly. This occurred in Canada during spring 2003 when over 40% of our colonies died. Following this disastrous event, beekeepers rapidly decided to work with researchers to develop an integrated pest management strategy (IPM) that would reduce our dependence on synthetic pesticides.

Our IPM strategy is based on the use of treatment thresholds and the combined use of organic acids (oxalic and formic acid) and thymol (Apigard® and Thymovar®). Different Varroa population estimators were tested (natural mite fall, alcohol wash, Varroa counts in honey bee male and female pupae) and compared using correlation indexes. Seasonal economic thresholds were obtained by following 48 Varroa infested honey bee colonies for two consecutive years. Regression analysis between Varroa levels versus honey production and honey bee population were used to calculate economic treatment thresholds for spring, mid summer and fall. We also conducted a series of efficacy trials using selected organic acaricides that showed good results in Europe (Switzerland, Italy and Germany).

Our results show that the best estimator of Varroa population in honey bee colonies is the natural mite fall (R^2=0,8 whole bottom surface sticky board). Treatment thresholds based on natural mite fall in spring, mid summer and fall, are respectively: 1 Varroa/day, 11 Varroa/day and 11 Varroa/day. Spring treatments with organic acids are inefficient in controlling the Varroa mites. Midsummer treatments with formic acid reduce mite populations below economic threshold until fall but care must be taken to avoid formic acid residues in honey. Oxalic acid is inefficient during the same time. Autumn treatments with formic acid and thymol are the most efficient in reducing mite populations during beekeeping season. A late fall oxalic acid treatment has high efficacy when queen laying and brood populations are at their lowest. Our results confirm European results on Varroa control and suggest that it is possible to transpose these results in the Canadian beekeeping industry. In conclusion, we suggest that a good Varroa IPM control strategy must aim an optimal fall treatment in order to avoid a spring and midsummer treatments.

15. TREATMENTS OF BEE DISEASES IN BULGARIAN ORGANIC BEEKEEPING

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The ecological treatment methods of the main bee diseases in Bulgaria are reviewed.

American and European foulbrood: Both diseases are present in Bulgaria. Antibiotic treatments are not allowed and the following preventive measures are used: quarantine of diseased bees, destruction of diseased combs (hives should be burned completely), and displacement of healthy bees into new hives.

Bacterial Septicemia and Viral diseases: *Acute bee paralysis virus (ABPV) or (APV), Israel acute paralysis virus (IAPV), Kashmir bee virus (KBV), Black Queen Cell Virus (BQCV), Chronic Paralysis Virus (CPV), Cloudy Wing Virus (CWV), Deformed Wing Virus (DWV), Sacbrood virus (SBV), Kakugo virus (KV), Varroa destructor virus 1*): quarantine of apiary, destruction of diseased combs (burning), transfer of bees into new hives with new honeycombs.

Fungal diseases (*Chalkbrood; Stonebrood*): Improvement of worker bees hygienic behaviour by management and selection; requeening of the hive.

Pests and parasites

Varroa mites: broodright colonies. Use of Apilife-Var (Chemical Life, Italy), Apiguard, (Vita Europe LTD, ‘Ecostop (Primavet, Bulgaria), Thymol powdered crystals, formic and oxalic acids, use of broodless colonies.

Acarine (tracheal) mites: therapy with grease patties and menthol;

Nosema: the Bulgarian biological preparation Nozestat, containing iodine and formic acid, is used.

Small hive beetle: this parasite has not been discovered in Bulgaria

Wax moths: treatments with B401 (*Bacillus thuringensis*) or freezing of combs to kill wax moth larvae and eggs.

16. USE OF ECOSTOP AGAINST VARROA IN ORGANIC BEEKEEPING

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According to Regulation 889/2008 EU and to the legislation of Bulgaria, specific medical treatments are used in accordance with the EU and the Bulgarian legislation.

The Primavet Company developed and obtained authorization for the veterinary product Ecostop© for use in organic beekeeping against *Varroa destructor*. The active substances of the product are menthol and thymol, in accordance with EU Regulation 889/2008. This product has been tested under the conditions of conventional and organic beekeeping in Bulgaria, Turkey and Serbia.

For the product Ecostop a good acaricidal efficacy of 94 – 95% was found after its use during the summer period in an extreme situation of *Varroa destructor* invasion. Under the same conditions the efficacy of Apiguard of Vita-Europe, England lied between 85 – 90%.

17. HISSOPUS OFFICINALIS L. ESSENTIAL OIL FOR VARROA CONTROL

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This study was performed to investigate the effects of *Hissopus officinalis L*. essential oil treatment in the winter on 20 equally strong colonies parasitized with Varroa. Strips soaked with *Hissopus* essential oil were placed on top of the colonies and sticky boards placed on the bottom boards of the hives in October for counting the Varroa. The numbers of Varroa mites were determined on the sticky boards in next February. The efficacy of the essential oil treatment was 80.1 %.

The use of *Hissopus* essential oil did not cause any negative effects on bees or beekeepers and can be used as an ecological control method against Varroa in winter.

18. CONTAMINANTS OF BEE PRODUCTS FROM THE ENVIRONMENT

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The quality of bee products is influenced by a multitude of factors. Beside the beekeeper, chemicals used in agriculture and environmental pollution are the important factors.

The criterion that often showed a clear difference between organic and conventional agriculture production is the measurable contamination of certain products with veterinary medicines and pesticides in the conventional sector, and in comparison, organic products being relatively free from these residues. Looking at results of residue analysis in different bee products, the following tendencies can be seen with regard to contaminants originating in the environment:

1. In the field of environmental pollution, many countries started activities to reduce the industrial, the motor traffic and other emissions. With regard to the contamination of honey with heavy metals, in Germany the situation improved in the last decade in such a manner, that honey was taken out of the national food monitoring program.

2. There is a decreasing use of chemicals in the conventional sector due to Integrated Pest Management in the agricultural practice.

3. There is a change in the cultivation pattern of land. In many countries, there is a decline in the number of flowers in wild vegetation and in agriculture. The availability of pollen and nectar sources, and their variety, is influenced by radical changes in agriculture, driven by economic and political decisions. The possibility for honey bees to avoid cultivations (oilseed rape, orchards) which are treated with plant protection pesticides becomes more and more difficult. In some countries, the nectar and pollen sources for bees from organic and conventional beekeeping become more or less the same. Thus, the risk to get in contact to pesticides increases.

4. There is a remarkable improvement of residue analysis methods, leading to extremely low limits of detection and quantification. With regard to hydrophilic pesticides, this causes new discussions about the pureness of conventional and organically produced bee products.

Nowadays the measurable differences between organic and conventional bee products regarding the degree of contamination seem to disappear. Thus, it is necessary to move the actual goals of organic beekeeping into the awareness of the consumers towards other values, concerning mainly the environmental protection. This applies also for other sectors of organic agriculture production.

19. CONTAMINANTS OF BEE PRODUCTS FROM BEEKEEPING

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There are different contaminants originating from beekeeping practice. Persistent lipophylic synthetic acaricides are used in many countries for long-term control of Varroa. These substances pollute mainly beeswax and propolis rather than honey. On the other hand, non-toxic acaricides, such as organic acids and components of essential oils do not endanger honey quality when used according to the prescriptions. Under these conditions, the thymol levels found in honey are low and safe. The thymol residues in wax are much higher, but they do not endanger honey quality. Antibiotics, used for the control of American and European Foul Brood are a major source of honey contamination. Different types of antibiotics have been detected in honey: sulfonamides, aminoglycosides, tetracyclines, amphenicols, macrolides, beta-lanctams, nitrofurane metabolites and others. Worldwide mostly tetracyclines, streptomycine, sulfonamides, and chloramphenicol are found at present. Other contaminants from beekeeping are: para-dichlorobenzene, used for the control of the wax moth; insecticides (e.g. coumaphos), used for the control of the small hive beetle (SHB); repellents, used at honey harvest; pesticides, used in wood protectants and substances, that diffuse out of honey recipients into honey. Coumaphos treatments against SHB cause especially high residues in wax and in honey. The most important contaminants originating in beekeeping for the bee products are antibiotics for honey, royal jelly and propolis, and synthetic lypophilic acaricides for wax and propolis.

Beeswax in organic beekeeping should have no or very low amounts of synthetic acaricides. The acaricide limits for organic beeswax set up in different countries are in the range from < 0.1 to 0.5 mg/kg. The most efficient diminution of beeswax comb residues can be carried out by making an artificial swarm out of the contaminated bee colony and placing it into a pre-cleaned hive on residue-free foundations. After 2 bee seasons there are no measurable wax residues.

20. DIFFERENT METHODS IN CONVERSION TO ORGANIC BEEKEEPING AND ACARICIDE RESIDUES IN BEESWAX

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The number of Italian bee colonies managed according to organic procedures has increased steadily over the past 10 years, reaching around 100,000 colonies, representing about 10% of the total number nationwide. Because of the high interest shown by beekeepers towards organic production methods, and due to the problems encountered due to wax replacement, an experiment was carried out to assess the best comb change-over procedure. Two methods of replacement of old combs were compared: 'fast' (five combs per year) and 'slow' (two combs per year), by measuring the levels of acaricide residues in the newly built combs. Considered acaricides were coumaphos (Perizin and Asuntol), fluvalinate (Apistan), and chlorfenvinphos (Supona). Significant differences between the two replacement groups were observed only for the Apistan group in the third year, confirming the high lipophilicity of fluvalinate. The residue levels in the new combs three years after beginning the conversion were significantly lower than initial levels for all products. Direct contamination of the combs was highest in Asuntol-treated hives and lowest in Perizin-treated hives. Residues in honey exceeding EU Maximum Residue Limit were found only in the case of Asuntol.

21. QUALITY OF BEESWAX, RAW HONEY, COMB HONEY, POLLEN, BEE BREAD, PROPOLIS AND ROYAL JELLY FOR APITHERAPEUTICAL AND COSMETIC USE

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Organic certification is not sufficient to guarantee the quality of bee products, especially when they are used in natural apitherapy. The origin of the raw materials, the beekeeping management and the type of the hive used are more important factors than chemical analysis of the products (beeswax, comb honey, raw honey, raw propolis, propolis tincture and bee bread). This is overseen in many cases by producers of natural beehive products. Propolis products offered in supermarkets or drug stores sometimes contain not only harmful pollutants, but also sugar substitutes like isomalt or aspartame. The quality of food and of the bee products cannot be determined by common analytic methods and techniques. Analytic procedures are often not powerful enough and foodstuff inspectors can be cheated. Also, the methods for harvesting propolis and pollen are often anything but according to the needs of the bees. Even so called 'organic' beeswax may be contaminated with beeswax containing low amounts of pesticides or paraffin. Thus, raw honey, beeswax, bee bread, pollen and propolis may be contaminated, especially if beekeeping methods are not according to the standards of the Centre for Ecological Apiculture. Honeybees in countries that allow genetically modified (GM) crops collect pollen from maize, and thus GM-maize pollen can be found in bee products such as pollen, bee bread, combs, propolis and beeswax. Foods containing GM-maize or compounds of other GM crops are toxic as shown by the latest scientific findings. The cosmetic industry offers low budget products, creams, lotions and fragrances without skin friendly natural ingredients such as beeswax and herbal oils. Instead, it uses low value and potentially carcinogenic compounds such as liquid paraffin, microcristalline wax, vaseline, polyethylene glycol, aluminium, benzoic acid etc. Even expensive cosmetics may contain substances such as inorganic and doping-like substances that can cause tumours and respiratory diseases. Candles without beeswax are often made of plant oils from genetically modified cotton seeds.

22. FARM TO FORK TRACEABILITY OF ORGANIC HONEY

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Together with other organic foods, organic honey production and trade is gaining popularity in recent years but it remains a rare product. On one hand, there is a higher consumer demand, on the other, they have to pay a higher price for organic honey than for the conventionally produced one.

Turkey is a rare country having four seasons at the same time. High plateaus, wide plains and forests that surround thousands of hectares, contain a rich range of flora. Having a rich abundance of flora, Turkey has a production of many different varieties and flavours of honey and has become one of the 10 largest producers of honey in the world, being also the biggest producer of pine honey. There are 400 tons of organic honey in Turkey, the number of organic beekeepers in 2009 was 147, and 318 beekeepers were also in the transition process for organic production. Organic honey production and certification show an increasing trend each year.

Farm to fork traceability is not only a necessity regarding the legal requirements, but also an important issue for consumers. In this study, traceability applications are described with examples from the honey sector in comparison with other organic products. Difficulties in organic production, certification, inspection and trade are also underlined from the perspective of traceability and quality. Finally, requirements of honey packers and consumers are described for the improvement of organic honey production.

23. BIOLMIEL: THE INTERNATIONAL ORGANIC HONEY COMPETITION

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Organic food production has caught consumers' attention in recent years. This growth is due to an increasing awareness and sensitivity of consumers and producers regarding health and environmental safety. Honey has not escaped this general tendency, even though it is considered a natural product par excellence. However, organic production requires greater professionalism from operators: generally, this means less product and the treatment process can be more difficult, leading to an unavoidable growth in production costs. Consequently, operators have to increase prices and persuade consumers to buy organic products.

Sensory analysis today in Italy is considered essential in the evaluation of honey, particularly for the evaluation of its botanic origin and quality. It is also the most powerful means that can be used to promote and add value to the product. For this reason, over the years, honey competitions all over the country, regionally as well as nationally, have flourished.

A special competition has been held annually in Sicily since 2008: the Honey Prize *BiolMiel*. It is primarily unique because it is an international prize and because it is restricted to certified organic honey.

The ICEA (Ethical and Environmental Certification Institute) in association with both CRA (Research Unit for Apiculture and Sericulture of Bologna) and Cibi (Italian Consortium for Organic Products), has promoted the competition to select the best national and international organic honeys, and to promote its consumption.

The participating samples are judged by a jury of Italian and foreign experts. The method was in accordance with the regulation of the National List of Experts in Sensory Analysis of Honey.

The twelve countries that took part in the competition were: Italy, Albania, Croatia, Moldavia, Slovenia, Spain, Palestine, Egypt, USA (Hawaii), Brazil, Greece and Lebanon and a wide variety of honeys were presented. Ninety-six honeys were entered into the competition in 2008, the number of samples increasing to 135 in 2009.

To improve production quality further, the participants received results of the chemical and sensory analyses and a judgment on their samples' quality.

24. OPTIMAL ENVIRONMENT FOR ORGANIC BEEKEEPING

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Beekeeping is an important activity that contributes to the maintenance of biodiversity and agriculture-forest production through the pollination activities of bees. On the other hand, the optimal development of bee colonies depends to a great extent on biodiversity and on terrestrial ecosystems. It is necessary to avoid high beehive density because of over-exploitation of resources (pollen and nectar), because it can affect not only the survival of the honeybees under unfavourable conditions, but also the pollinators of the whole ecosystem.

The environment is in constant change (e.g. pesticide accumulation, climate changes etc.) which can make honey production uncertain. In Mediterranean countries, beekeepers often force their colonies to produce honey during the whole year, independently of the environmental resources. On the other hand, since the introduction of modern beehives, a global decrease of genetic diversity of *Apis mellifera* has taken place.

The following key points are important for the installation of organic apiaries:

1. It is necessary to have information on the annual climate of the apiary: the micro-climate of each place, the annual temperatures, rain fall and ombrothermal diagrams.

2. The abundance and shortage periods of nectar and pollen resources should be known. Also, the abundance and diversity of pollen is very important, to assure optimal colony development.

3. The installation of conventional apiaries should not be allowed near to organic apiaries. This is not an environmental factor, but conventional apiaries can negatively influence the bee pest control, e.g. by re-invasion of sick bees carrying parasites and various pests.

4. The fragmentation of apiaries should be avoided to minimize the spread of bee diseases.

5. There is a norm for a minimum of 3 km distance to agricultural contaminants. However, research is necessary to determine the safe distances from different industrial contaminants, as these can vary depending on the contamination type and the ecological cleanness standards of the plants.

At present, there are no precise data on the optimal organic beekeeping environment. For this purpose, it is necessary to establish nets of monitored beehives and to integrate data from different landscapes, climates and flora types. This is necessary to gain understanding about the most favourable environmental conditions for organic beekeeping.

25. ALTERNATIVE MEASURES FOR PROTECTING THE ENVIRONMENT OF HONEY BEES IN ORGANIC BEEKEEPING

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Field observations have shown that honey bees have ways of knowing about food sources that seem to defy the use of the normal four or five senses. They are capable of orientating to subtle electromagnetic or other fields emitted by plants. The necessary communication is based on principles and mechanisms similar to inter-cellular and inter-individual communication.

Similar to brain and social mechanisms in human groups or societies, such communication and cohesion is, among other, impacted by unbalances in metabolism and pollution of various pathways which are necessary for understanding communicated signals and for clarity in expression. Although most likely the interaction of multiple factors is necessary, the result may be incoherent behaviour.

Even without understanding all factors and being able to proof all details of such complex interactions, there are practical steps that can be undertaken for preventing or correcting some of the negative impacts. Preventative approaches range from the more obvious like organic high quality food instead of sugar and pollen substitutes, over queen selection, disease management, pesticide free foraging areas, providing a supportive environment (hive material, special planting) to the less obvious like selection of the hive location based on more subtle and weak energy fields, energetic cleansing and protection, and fostering natural collaboration and synergies. The result should be a healthy thriving 'organic' colony well protected and connected to the environment's life supporting services.

26. ORGANIC BEEKEEPING IN BULGARIA

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Organic Beekeeping in Bulgaria started in the 1990's when following the 2092/91 directive the first apiaries were certified. After the appearance of the Bulgarian organic beekeeping regulation 35/2001 the first certifying firms Balkan Biocert and QC&I Bulgaria began their activity. At present there are 10 certification organisations.

At present, every organic beekeeper receives 15 euro per hive to cover the costs or the more labour intensive organic beekeeping. At the end of 2009 there were 44 861 certified apiaries working according to the 834/2007 EC directive. The number of certified beekeepers is not exactly known as some of them are certified as a group, but it is estimated to be around 150.

In 2003 the Bulgarian Organic Beekeeping Association (BOBA) came into being, its 35 members have at present about 5000 apiaries. The organisation promotes the development of organic beekeeping and the trade with organic bee products. It takes part in all major national beekeeping forums and took part in the Apimondia in Montpellier in 2009. BOBA also took the initiative to organise the present symposium.

Bulgarian organic beekeeping is carried on Dadant-Blatt and Langstroth hives, mainly on stationary beekeeping. All types of honeys are produced in organic beekeeping: different blossom honeys as well as honeydew honey. One part of the honey and the other bee products propolis, royal jelly and pollen are sold directly to the consumers. Another part, mainly honey, is sold to organic certified firms for the home market and for export in the EU.

The Bulgarian organic beekeepers use preparations for controlling bee diseases, which are allowed according to EC 834, some of them are produced by the Bulgarian company Primavet: Ecostop for Varroa control, Nosestat for Nosema control and B-401 *Bacillus thuringiensis* preparation against the wax moth.

27. ORGANIC BEEKEEPING IN GREECE

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The main goal is to understand that organic beekeeping is not just viable and feasible, but that it is ‘the only way’ in Greece. The needs for organic beekeeping, shaped in Europe and the rest of the world, can be of mutual advantage by:
- Production of organic products with high quality and biological activity.
- Networking and promotion of these products in external markets.

Organic beekeeping, and beekeeping in general, are useful because:

A. Honey, pollen, beeswax candles, royal jelly, and propolis are products of high biological value, used in nutrition, medicine and cosmetics.
B. The honeybee offers, through pollination, the maintenance of biodiversity and the maintenance of life.

In Greece there are about 100 certified beekeepers out of 24,000 beekeepers. Certification is carried out by 11 certification organizations. The new regulation 834/2007, the problems and possibilities for beekeeping according to the principles of Organic Agriculture, as well as some proposals and ideas for easier and more accurate establishment of organic beekeeping in Greece are discussed.

28. BEEKEEPING IN LEBANON: FROM TRADITIONAL TO ORGANIC

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Lebanese agriculture contributes only to about 5% of the national GDP, yet beekeeping itself has always been considered an important income generating for the Lebanese agriculture and a factor of sustainability on the farm. In Lebanon, beekeeping is a traditional industry that requires little or no beekeepers’ input except in times of transhumance and cold weather. With the boom in the organic market in Lebanon, local researchers and beekeepers are contemplating the opportunity of converting from traditional beekeeping to organic beekeeping especially that quality requirements for organic honey are not far from those of marketed traditional honey. This study is looking closely at the existing beekeeping practices, Lebanese market of honey, and the existing policies for organic honey certifications.

Most of the traditional beekeeping operations use predominantly the *Apis mellifera syriaca subspecies*, whereas the new subspecies Apis *mellifera ligustica* is now common in modern apiaries. According to the ministry of Agriculture, beehives numbers have been increasing steadily in the past few years and are now estimated at around 132,000 beehives. Quality testing for honey is available through research agencies and has shown a better quality for the locally produced honey as compared to the imported products, encouraging a slight increase in high quality exports and a decreasing trend for imported lower quality honey. Traditional beekeeping is based on a vertical transhumance following temperature variations, in which apiaries are moved from the cost during winter to a higher altitude during the summer months, alternating between orchards and forests. Winter supplements are mostly provided in the form of sugar syrup and pollen grains. Local certification agencies such as IMC and LibanCert are currently working on developing certification rules that are awaiting legislation. These rules mostly look at an ease of transition from traditional to organic and allow for flexibility in such apiaries safeguarding international organic product guidelines. In Lebanon, organic label by itself has shown to be a great marketing tool and thus switching the local traditional apiaries to certified organic holds potential benefits on the local and international market due to the excellence of the Lebanese traditional honey.

29. OPPORTUNITIES FOR THE DEVELOPMENT OF ORGANIC BEEKEEPING IN THE PROTECTED AREAS IN THE REPUBLIC OF MACEDONIA, SERBIA AND BOSNIA-HERZEGOVINA

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Following the world trend for organic agriculture, the number of organic farmers and areas where organic agriculture is possible increases constantly in the Balkan countries.

Beekeepers from the Republic of Macedonia, Serbia, and Bosnia and Herzegovina follow this trend and the numbers of beekeepers practising organic beekeeping has increased in the past five years.

The aim of the investigation is to give an overview of the current situation of organic beekeeping in the Republic of Macedonia, Serbia, Bosnia and Herzegovina, as well as of the opportunities for the development of organic beekeeping in protected areas (national parks, nature parks, nature reserves, sites with natural character, green belts etc.).

The research will give an outline of the legal framework (opportunities and limitations), natural conditions of the protected areas, and opportunities for further development of beekeeping as an economic activity in such areas.

The regional approach to the investigation gives an opportunity for the development of a network between different stakeholders in the involved countries.

30. ORGANIC BEEKEEPING IN POLAND

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The Polish Ministry of Agriculture supports organic beekeeping, also the work of the scientists and of the agriculture experts, as well as the advertisement for organic beekeeping. In 2004 the first experiments for the transformation of our conventional apiary into an organic one were carried out in our institute, in agreement with EU organic regulations. At the beginning there were difficulties for finding organic beeswax foundations, organic sugar and suitable mating queens. We received an organic beekeeping certificate in 2008 and 2009. Popular and scientific publications were made on the transformation of conventional to organic beekeeping, on organic beekeeping management and on the utilization of organic medicines to treat bee diseases.

In 2006 the first organic apiaries were founded in Poland. Since then there is a steady increase and at the end of 2008 there are about 56 organic apiaries. At present there is a total of 997 hives, producing on average of about 26 kg of honey per colony, while the total honey production is about 25 tons. So far organic beekeeping is not very popular in Poland because the costs of organic beekeeping are significantly higher than the ones of the conventional apiculture. The difference between them is about 15 EUR per bee colony in disfavour of organic beekeeping. While organic farmers are paid per hectare of farm land the greater production costs of organic beekeeping are not counterbalanced as there are no supplementary payments for organic beekeepers and the price for organic honey is not high enough.

At present there are eleven certification bodies for organic farming and beekeeping while there were only seven of them in 2006. The costs for organic beekeeping certification per year and beekeeper are about 75 EUR. Organic apiaries are controlled by the certification body every year. During the last years organic beekeepers try to form common organizations for an easier marketing of their products.

31. ORGANIC BEEKEEPING IN PORTUGAL

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Beekeeping in Portugal is an agricultural activity that over the past years has seen a reduction in the number of registered operators. However, this behaviour is not the result of abandonment, as found in general for other agriculture activities, but is due to an increase of beekeepers professionalism, as evidenced by the steady number of registered hives. The decrease in the number of beekeepers reflects the actual disappearance of hobbyists and those farmers who practiced beekeeping as a complementary rural activity (low number of hives / beekeeper) and the appearance of new operators, with higher numbers of hives, where the economic result of beekeeping reflects its core profit.

Despite the favourable conditions in terms of spontaneous flora richness and suitable locations, until 2003 organic beekeeping did not show great vitality at national level, with only 248 registered colonies in organic production. It was therefore vital to encourage this production mode, outlining their advantages and disadvantages (including the use of sanitarian treatments against the Varroa mite), clarifying the applicable regulation, and most importantly identifying the obstacles to be overcome if a beekeeper wishes to convert an apiary to organic beekeeping.

In 2004, we started a four year project in organic beekeeping, together with two regional beekeepers organizations, in the northeast of Portugal. The project aims, at the first stage, to overcome the difficulties evidenced by the few organic beekeepers installed, particularly regarding the regulations/certification procedures/costs and the beekeeping practices in controlling Varroa (until 2005 there were no authorized treatments available for organic beekeeping in Portugal). At the final stage, the goal of the project was to create regional clusters of successful organic beekeepers that could spread along the country.

After the project reached is end in 2008, the number of registered colonies increased over 2,500% (more than 2,000 colonies were located in the northeast region), with the first organic certified beeswax company arising from inside the project. Today many organic beekeeping workshops are organized every month by beekeepers organizations throughout the country. The importance of organic products in today's market and in European agriculture policies is also essential.

Thanks to the beekeepers associations of Parque Natural de Montesinho and Parque Natural do Douro Internacional.

32. ORGANIC BEEKEEPING IN ROMANIA

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Organic beekeeping in Romania is a dynamic sector, having a continuously rising trend in the last years. The first certified beekeepers in this field were registered in 2000. The number of operators in organic beekeeping increased each year, so that, in 2008, 584 beekeepers were registered at the Romanian Ministry of Agriculture and Rural Development, representing 13% out of the total number of registered operators in organic agriculture. In 2009, the number of operators in organic beekeeping increased to 620, representing 20% out of total agriculture organic operators. Romania has about 80,000 beekeepers.

Individual beekeepers and members of beekeeping organizations are involved in organic beekeeping. Certified organic honey and other organic beekeeping products are traded, both on the Romanian and external markets.

33. ORGANIC BEEKEEPING IN RUSSIA

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There are no standards for organic beekeeping and organic honey in Russia. The word 'organic' is prohibited in honey labelling. In spite of this, certain commercial organizations give out certificates for ecologically pure products and ecologically safe products. This is nothing but dishonesty towards the consumers. Until now, there are no certified methods to analyze the antibiotic residue content in honey in Russia. Even though Russia presented to the European Union a plan for monitoring the residue contents of veterinary medicinal products in honey, there is in reality no monitoring whatsoever. On the other hand, there is an instruction for the use of antibiotics in honey production, including chloramphenicol. Presently methods to determine the residues of some antibiotics in honey are being developed.

34. ORGANIC BEEKEEPING IN SLOVAKIA

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In Slovakia, there is only one certified organic apiary with 400 hives. The main reason for this low number is the complicated certification and controlling process together with stagnating prices for organic honey and the absence of special supporting financial schemes. However, many beekeepers keep their bees according to organic farming principles and there is a presumption that the number of certified organic beekeepers will grow after the ratification of a new supporting scheme for establishing bio-apiaries in September 2010. Legislation framework is covered by a new Regulation No. 189/2009 on organic farming. According to it, organic beekeeping can be practiced on stationary apiaries, no migratory beekeeping is allowed, traditional agriculture is not allowed within 3 km from the apiary. Also, sources of contaminants for bee pasture must be not presented in the distance of the bee flight (e.g. towns, highways, landfills, industry, power plants). Local races of bees are preferred, feeding is based on own honey and pollen reserves, only natural materials are allowed for the hive construction (usually wooden hives protected by flax varnish, propolis and natural pigments). Conversion period lasts usually 2 years, closed cycle of wax and foundations at the apiary is necessary. Some traditional anti-swarming practices are not allowed (e.g. queens' wing clipping, queen cells or drone brood removal). For anti-Varroa treatment, formic acid and some plant extracts (common tansy and walnut leaves) are used. Some special certification schemes are offered for organic farmers (e.g. Demeter, Ekoniva, and Kosher). Alongside with domestic organic honey and organic mead, imported bio honey, mainly of Italian origin, is also offered on the marked. Consumption of organic honey in Slovakia can be estimated to be around 5 tons, the price is usually 20% higher compared to that of conventional honey, when sold directly from the apiary.

35. ORGANIC BEEKEEPING IN SWITZERLAND

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In Switzerland, bees are kept in lowland as well as in alpine regions. The beehive density is high. Besides wild flowers, the major honey plants are fruit trees, dandelion, rape and chestnut in the lowlands, and alpine rose in the Alps. Bees are traditionally kept by amateurs, and most colonies are kept in stationary apiaries. The annual average yield of honey is ca 10 kg per colony. Swiss beekeeping practices ensure mostly honey production without major residues, while many beekeepers use alternative measures for Varroa control.

Organic beekeeping in Switzerland differs from conventional beekeeping mainly in the sustainability of the production methods. Production methods are regulated by the Swiss organic farming ordinance (which is very similar to the corresponding European Regulation). The majority of Swiss organic beekeepers are members of Bio Suisse. Bio Suisse does not allow the use of thymol against Varroa mites, because the presence of residues in organic honey is considered unacceptable to consumers, even if they are small and unproblematic from tte toxicological point of view. Some organic farmers are members of Demeter. Demeter requires biodynamic beekeeping practices and does not allow thymol. The private association 'Arbeitsgruppe naturgemässe Imkerei' (AGNI) is the umbrella organization of all organic beekeepers in Switzerland. Most of the organic honey is sold by direct marketing and by organic traders. Presently the honey traders also buy large quantities of organic honey. The demand for organic honey is much larger than the Swiss production; therefore, large quantities of organic honey are imported.

The main challenges for organic beekeepers in Switzerland are: 1. **Varroa**: formic, lactic or oxalic acid to control Varroa, but not thymol. 2. **European foulbrood**: it spreads epidemically since 2000. 3. **Beeswax**. Organic beekeepers try to rely on their own beeswax. However, this is not always simple because of the relatively low production. Uncontaminated beeswax is imported, mainly from Africa, and can be supplied by the market.

36. A SUCCESSFUL STORY: ORGANIC BEEKEEPING USING CAUCASUS HONEYBEES IN THE NORTH EAST OF TURKEY

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Turkey with its geography and pristine flora, harbour the highest honeybee diversity and one of the oldest beekeeping sites in the world. The latter is well documented in the Ottoman laws and in the excavations of archaeological findings. Thus, beekeeping is very important since antiquity. Beekeeping in Turkey can be divided into two types, primitive and modern. A new third type has recently started: organic beekeeping. New regulations were set forward for those willing to carry out organic beekeeping practices. The best example is the success story in the North East of Turkey where a cooperative was formed among beekeepers to reduce the cost for organic beekeeping and to support each other for a better harvest, and thus a better income. This success can be explained not only by the beekeeping management, but also by the use of a selected *Apis mellifera caucasica* eco type, much suited to this area of a high altitude. In this talk, the answer to the following questions is given: How did such success come? How are such cooperative forms built? Do beekeepers like what they are doing? How is certification carried out? How are bees treated against diseases? Where foundation comes from or how is it made? How is honey harvested? All steps in organic beekeeping in this win-win story will be presented.

37. ORGANIC BEEKEEPING IN THE UKRAINE

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Organic beekeeping production methods in the Ukraine are established, similar to the principles in organic agriculture. All organic apiaries should have a veterinary-sanitary passport in which all results of laboratory investigations of brood, honey residues (different drugs and pesticides) are indicated. For monitoring of the environment, honey and bee pollen are tested regularly for heavy metals and pesticide residues. This monitoring system gives the possibility to select bee farms that are placed in a clean environment, producing non contaminated honey and other bee products.

Methods for improving the bees' immunity and their hygienic behaviour have been developed. Artificial combs to guarantee sterility and purity are also produced. Disease treatments with natural and organic substances (thymol, menthol, oxalic acid, natural plants) while suitable technological methods and bee selection guarantee optimal bee health. The organic beekeeping methods should be at least as effective as the conventional beekeeping methods. We improve our Good Beekeeping Practice (GBP) and HACCP principles for organic production of bee products.

At present five apiaries are being certified by IMO, according to EU 8-834/2007, while one apiary has been already certified. Organic beekeeping in the Ukraine is at the beginning but it has a big potential: The Ukraine produces about 70,000 tons per year and is one of the leading world honey producers.

38. WORLD SAVE THE BEES FUND IN SUPPORT OF HEALTHY BEEKEEPING IN A HEALTHY ENVIRONMENT

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Currently, along with global environmental problems, the world faces serious issues concerning the mass death of bees and the consequences, which may appear from the disappearance of honey bees as a species, for the global ecosystems and agriculture around the world. Thus, humanity comes very close to the point where the survival of honeybee becomes problematic.

In recent years, mass death of bees has been registered in North America, Europe and Asia, resulting in drastically reduced honeybee populations and honey production. There are problems with pollination that reduce yields of important crops. Only in 2007 in the U.S., Germany, Switzerland, Spain, Portugal, Italy, Greece and Britain, the bees' death rate ranged from 20 to 80%! Today the problem concerns also Russia and Asian countries. Scientists say that there are different causes of these problems: reduction of melliferous herbs, use of chemicals in food production, bee diseases and the general weakening of the bees' immunity.

In many countries, there are various organizations that contribute to a solution of this global problem, notably the National Beekeepers Association of France, the Foundation for the Preservation of Honeybees (Inc.), COLOSS project and many others.

A group of researchers from Germany and Russia, working on the problem of bees' protection, decided to form an association that would work with concerned organizations and private individuals for project funding to conserve bees.

World Save the Bees Fund e.V. (**WSBF e.V**.) was registered in Dresden, Germany, on the 18th of June 2009**.** The aim of the fund is to prevent the mass death of bees and to preserve the global ecological balance of nature.

The main problems that confront WSBF e.V. are popularization of beekeeping, funding of research and development of beekeeping, worldwide monitoring of beekeeping practices, support of research studying the causes of the bees' disappearance, and attraction of wide public's attention to the problem of bees' conservation.

WSBF announced a contest of scientific and practical projects aimed at the development of beekeeping and the study of its concerns. The receipt of applications was finished in late May. The winner of the contest will be announced on the 1st of September 2010 and will be awarded with the grant of WSBF e.V. for the project's implementation.

If today we do not start to take measures for the preservation of the honeybee, the world will face many troubles, the main of which is a food crisis. Only our joined efforts can preserve bees and ensure sustainable development of beekeeping, society and life on the planet as a whole.

39. ASPECTS OF QUALITY BUILDING AND CONTROL BY CERTIFICATION OF ORGANIC APICULTURE

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Worldwide there are about 30 different guidelines for organic apiculture (OA), which confuse producers, processors, exporters, certifying agencies and consumers. National legislations and superimposing private association's standards differ substantially with each other. The same bee product may be labelled as organic in one market but not in another – depending on each nation's specific legal settings. While in some regions of the world apicultural organic practice (or better: what is respectively defined as being organic) can be implemented without difficulty because of easy access to e.g. materials and equipment, beekeepers in other countries face considerable problems to fulfil even the basic international standards as suggested by FAO or IFOAM. Different geographical and climatic conditions, regionally varying impact on bee health by AFB, Varroosis, Nosema or pests, the (non-)availability of alternative substances for treatment and/or organic sugar for feeding, securing beeswax quality, the presence of concurring agriculture, trade restrictions - to name just a few factors - prevent an easy and suitable finding of a minimal common denominator for overall binding guidelines. Accordingly, for certifying personnel it is not simple to apply the specific rules in an understandable and equitable way. Depending on the particular standard the certification is applied for, the focus of the annual inspection of the enterprise is on foraging resources, environmental factors, bee origin and identification, working methods, equipment and tools, health management, wax quality, labelling and documentation of operations. Evaluation, assessment, decisions in case of irregularities and major non-compliances with regulations must be done instantly. A professional background and special trainings are pre-requirements for the auditor's qualification. The quality of all elements related to production and the product – bees, beekeeper, forage grounds, working methods and technique, care in handling and processing, overall a basic 'good beekeeping practice', as well as the quality of the certification process itself can be looked upon as a chain, being only as strong as its weakest link. My presentation tries to work out critical points in performing organic production and its certification on all levels: legislation, resources, production, products, commercialization, control and consumer's concern.

40. ORGANIC BEEKEEPING IN GERMANY- STANDARDS AND INSPECTION SYSTEM OF BIOLAND

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Bioland is Germany's largest organic farmer association. It was founded in 1971 and as of January 2010 has about 5,000 certified members with a total certified farm area of about 250,000 ha. Among these farmers are about 250 who also keep bees or are professional beekeepers with in total more than 12,000 certified bee colonies.

The Bioland Standards

Based on the organic-biological method the Bioland farmers gave themselves organic farming standards, which they continuously maintained, adapted and developed, so that it now includes all aspects of a modern organic agricultural production, animal husbandry as well as food processing – and since the early 1990's also standards on beekeeping.

The Bioland Inspection System

All Bioland members and contract partners submit to the Bioland inspection system. The compliance with the Bioland standards is inspected in addition to the legal requirements as stipulated by the EU-regulation 834/2007 on organic agriculture. The Bioland inspection system supports the high credibility of the Bioland trademark and concerning beekeeping, some of the important additional standards and inspection procedures include:

- it is compulsory that colonies are provided with the possibilities for constructing naturally built combs (without foundation) during the breeding season;
- comb foundation or strips thereof are allowed only if they derive from Bioland wax out of naturally built combs or Bioland decapping wax;
- permitted Varroa treatments in addition to bio-technical and bio-physical methods are limited to lactic acid, formic acid and oxalic acid:
- the inspection system foresees regular wax and honey analysis with each apiary to ensure that wax and honey are in compliance with the standards and free of residues which may indicate the use of any forbidden pesticide for the treatment of e.g. the Varroa mite or wax moth;
- in addition to the annually announced and unannounced inspections of the apiaries in compliance with the EU regulation, the Bioland inspection system foresees random sampled inspections during the honey flow season for estimations of honey yields;

The Bioland Standards regulate also the processing of honey-wine and the collection and processing of pollen, as well as the external treatments of bee hives.

41. CERTIFICATION AND CONTROLLING BY CSI

Cord Luellmann

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Organic standards in Europe have been developed since 1991. Organic certification systems in Europe have become a necessary framework to ensure the credibility of organic certified products and to build consumer trust. In Germany *Certification Services International* (CSI) GmbH is an official accredited certification body since 1993. This presentation will focus on regulations and processes for carrying out organic certification of conformity. It will explain the European Standard EN 45011/ ISO 65 which is the accepted international norm for certification bodies operating a product certification system. It looks at handling the supervision of certification bodies in Europe, especially in Germany. The EU Regulation on Organic Farming (EC No 834/2007) with the implementing rule (EC No 889/2008) and the new organic label will be addressed. Finally, a day-to-day experience from an auditor with the organic certification system will be presented.

42. IMPROVEMENTS OF REGULATIONS ON ORGANIC FARMING TO FACILITATE THE PRACTICE OF ORGANIC BEEKEEPING

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Organic beekeeping obeys regulations, restrictions and controls. The new EU implementing rules for organic farming in Reg.889/2008 certainly improved the vacancies of the previous regulation 1804/99 but can be further improved. One example is the apiary site. According to article 13, bee colonies shall be placed in an area within a radius of 3 km, and the nectar and pollen sources should consist essentially of organically produced crops and/or spontaneous vegetation and/or crops treated with low environmental impact. This article causes significant difficulties in practicing of organic beekeeping because organic crops are extremely limited and cultivated plants are sporadically found everywhere. Furthermore a 3 km distance from conventionally cultivated crops is unnecessary since hive products are not readily polluted by pesticides applied in the bee pasture and since pesticides clouds may move through the air much farther than 3 km. Article 13 states also that the Member States of the EC may designate regions or areas where organic beekeeping is not practicable. At least in Greece and in some other countries, such provision was never made. On the other hand, the legislators demand that when no areas are identified by the Member States, the beekeeper must provide the control authority with the appropriate documentation and evidence including suitable analyses that the area meets the conditions required by the regulation of organic farming (article 78). Many beekeepers cannot fulfil this 'must' and do not proceed in organic beekeeping although they would like to do so.

For the conversion period of 12 months, there is no rule concerning the time of replacing of the combs and some Organic Farming Control Bodies are more pliable than others, permitting the complete replacement within 1-2 even 3 years. Because of this, suggestions were made to complete replacement of old combs with new non-contaminated combs within a few weeks time. In this case, a 6-month conversion period is enough. The specific rules on bee disease prevention may mislead the beekeepers. According to article 25, if the colonies become sick or infested, they should be treated immediately. Obviously, the legislator overlooked that endemic bee diseases cannot be eradicated and should be treated only when necessary. The different requirements of the certification bodies make the practise of organic beekeeping more complicated.

POSTERS

43. ORGANIC BEE PRODUCTS FROM THE INDONESIAN GIANT BEE APIS DORSATA

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Indonesia has a very big biodiversity of flora and fauna. Many national parks with the protection of specific fauna and flora have become attractive tourism and recreation areas. Seven out of nine honey bee species are living in Indonesia: *A. dorsata, A. cerana indica, A. andreniformis, A. koschevnikovi*, *A. nigrocincta, A. nuluensis* and *A. mellifera*. The other two species not yet found in Indonesia are *A. laboriosa* and *A. florea*. The most important for honey production *is A. mellifera*, the other honey bee species are not important in honey production, except *A. dorsata* or giant bee, found in almost all big islands in Indonesia. The population of the latter has decreased since in 1967 when the Indonesian government gave logging concessions to cut the production forests. Different other activities led to the destruction of the natural forest trees, the home of *A. dorsata*, leading to a rapid decrease of its population. *A. dorsata* survives in the Indonesian national parks, which are now protected by the National Conservation Law. Honey collectors from *A. dorsata* built a network for sharing experiences in the seven national parks. As a result, they can market their honey with a certificate *'Organic honey of A. dorsata'* with a high price.

Indonesia has a big potential to produce organic bee products from its indigenous giant bee, which can find now forage in the recent man-made forests of *Acacia mangium* and *Eucalyptus sp.*, in the rubber and oil palm forests and in the national parks. *A. dorsata* honey and other bee products such as pollen, bee bread and wax are also becoming important (see 'Beebread of the Indonesian giant bee, Soekartiko, Apitherapy conference Passau, 2010). In order to increase their income, the honey collectors are trained to harvest *bee bread* (pollen) and wax beside honey. Indonesia is now ready to become an exporter of organic bee products such as honey, *bee bread* (pollen) and beeswax from the giant bee, to the European and world markets.

44. PERSPECTIVES FOR ORGANIC BEEKEEPING IN BULGARIA

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Bioselena is a non-governement foundation dedicated to the development of organic agriculture, and also of beekeeping, in Bulgaria, founded in 1997.

Bulgaria is situated in the Northeastern part of the Balkan Peninsula and has a territory of 110 910 km^2. With length of 520 km^2 and width of 330 km^2, Bulgaria is 22% of the Balkan Peninsula. From the available data, following territories are certificated as ecological: 1 557, 930 км^2 grazing grounds and 2 426, 770 км^2 woods. For 2005 23 508 bee hives were certificated produced 984 tons of organic bee products, most of it being honey. At the end of 2009 there are about 35 000 certified apiaries working according to the 834/2007 EC directive, producing 1680 tons of organic honey per year. The number of certified beekeepers is not exactly known as some of them are certified as a group, but it is estimated to be between 100 and 150.

In 2010 the next counting of ecological agricultural areas has to be carried out in Bulgaria in connection with EC requirements. In spite of the lack of actual accurately information about the moment situation for all agricultural areas, we could analyze data from the last available counting from 2003. From these data the total agricultural area in the land was 29 045, км^2. If we adopt as 100% total area from Bulgaria (108 489 км^2), we see that workable agricultural areas amount to 26, 7 % (29 044, 8 км^2), and the rest 73, 3% (79 444, 2 км^2), must belong to uncultivated areas.

Organic beekeeping is beekeeping practiced in clean areas, without intensive agriculture. We could generalize that, these uncultivated areas are good sites for organic beekeeping, on the condition that there are no contaminating industries. Thus organic beekeeping in Bulgaria has very good conditions from territorial point of view.

45. ORGANIC BEEKEEPING IN THE CENTRAL PART OF SERBIA

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The aim of this study was to determine the possibility of economic honey bee breeding in the central part of Serbia using the principles of organic beekeeping and the utilisation of biological measures for ensuring a successful organic honey production.

The research was conducted on a newly formed apiary in the central part of Serbia in the village of Gornji Vratari near Župa Aleksandrovac. The apiary was established using packaged bees. The experiment was carried out on 12 bee colonies, of which three control colonies were settled in the standard Langstroth hives, and other experimental colonies were settled in primitive and modified Langstroth hives adapted for organic beekeeping. In this experiment, the indigenous local race of Carniolan honey bee (*Apis mellifera carnica*), sampled from the surrounding terrains of Župa Aleksandrovac, were used. In the conventional control colonies, Amitraz, Taufluvalinat and Propargit were used for Varroa control while in the organic colonies, formic acid and Thymovar were applied, together with biotechnical measures (increased use of frames with new foundations). The number of fallen Varroa mites during and after treatment was determined on a net installed in the bottom board. The productivity of the control colonies was assessed by the amount of acacia and forest honey produced in both studied years. The development of experimental colonies was measured by measuring the mass of hives in the period from the beginning of intense honey flow until the wintering of the colonies.

Based on the research results, it can be concluded that cost-effective honey yields, combined with a successful survival and exploitation of the bee colonies can be achieved by the organic beekeeping methods described above.

46. THE BEE GUARDIAN MODEL OF BEEKEEPING

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Our focus is sustainable beekeeping with backyard top-bar hives using a 'bee guardian' model of beekeeper.

There are many issues affecting honeybees in the world today including disease, habitat destruction, pesticides, the use of chemicals in hives; an overly commercialized beekeeping industry focused on forced productivity, and colony collapse disorder. Honey bee populations have been depleted severely by this onslaught of problems and we believe the honey bee genetic pool is shrinking and losing eons of behavioural traits.

In response to this growing problem, we decided to establish a program to introduce bee colonies into broad ecological regions that are cared for and maintained by independent backyard 'Bee Guardians'. A Bee Guardian is interested in aiding bees as a species in order to recapture their genetic vitality and diversity. Bee Guardians utilize organic, sustainable beekeeping methods that respect the honeybee. They also oversee the local environment, ensuring it to be safe for the bees.

We are introducing new hobby beekeepers to the rewards of beekeeping. Our goal is that there will be eventually Bee Guardians worldwide that will help to bring back the bee population and improve the genetic diversity of the honeybee. This diversity is critically important for the survival of this most precious natural resource.

To date we have introduced our natural beekeeping methods and philosophy to 16 States in the USA, and three countries. We have set up over 300 backyard beekeepers in Boulder and Denver, Colorado alone. We have also a website that offers information to people from all over the world on how to care for bees in an organic, sustainable way. We are currently doing work refining our top-bar hive designs and experimenting with innovative hive materials for alternative hives that can be used in developing countries.

We believe in improving bee ecology and using beekeeping methods that respect the honeybee. Our methods are sustainable, chemical-free and focus on a new way of caring for and living with bees. We continue to develop alternative beekeeping methods that consider organic approaches and develop guidelines and best practices for backyard Bee Guardians. In our research, we synthesize information gathered from different fields of science and use non-standard methods of inquiry to look at the problem from a diverse perspective. Our hope is that enclaves of Backyard Bee Guardians using alternative hive designs and organic methods will be able to restore genetics through natural breeding while providing a sheltered setting until the dire situation facing the honeybee has a chance to rebalance itself.

47. QUEEN CAGING COMBINED WITH TREATMENTS WITH ESSENTIAL OILS AND ORGANIC ACIDS AS INTEGRATED PEST MANAGEMENT (IPM) AGAINST *VARROA DESTRUCTOR*

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The growing sensibility towards food safety has lead to a growing percentage of beekeepers converting to organic beekeeping (12% of the organic animal production in Italy). Organic beekeeping methods include acaricide and fungicide treatments using natural compounds, a system of specialized beekeeping practices and honeybee nutritional supplements that promotes strong honeybee colonies. Over the last few years the Istituto Zooprofilattico Sperimentale of the Latium and Tuscany regions (IZSLT) has been testing different integrated pest management methods (IPM) to reduce the Varroa infestation.

We will report on the results obtained by caging the queen to obtain an artificial brood block combined with the use of compounds with low environmental impact like essential oils and organic acid (above all, thymol and oxalic acid).

Even if differences have been detected, due to the environmental and climatic conditions, the results show that caging of the queen to obtain a complete block of egg deposition, enhances the efficacy of the different natural acaricides.

48. DISEASE CONTROL IN ORGANIC BEEKEEPING

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In a bee colony, the adult bees and the brood can be diseased. Especially in organic beekeeping, the health status is always defined on the basis of the status of the whole bee colony.

By using a natural and species-appropriate beekeeping, the defence capacity of the bee colonies against diseases can be strengthened. Stress and additional unfavourable conditions make bees inevitably more susceptible to disease, leading to outbreak. Also, the place of the apiary is of great importance. Especially in case of diseases like Nosemosis and Acarapidosis, an enhanced number of not returning infested bees can strengthen the defence mechanisms to an extent even facilitating self-healing. However, the bee colony's dead bees must be replaced in order to avoid a decrease of the colony size. This requires a corresponding brood turnover, which can be achieved only with a sufficient provision of pollen and nectar.

In organic beekeeping as in the conventional one, an outbreak of disease cannot be always avoided. Thus, the colonies can be infested by pathogen agents of contagious diseases like foulbrood from contact with other neighbouring bees. Moreover, other, unknown pathogens, parasites and predators can be introduced.

In organic beekeeping, bio-technical and bio-physical methods should preferably be used for pest control. In order to avoid brood diseases, methods to improve the natural hygiene behaviour of the bees so that they can recognize and remove infested brood have proved to be effective. By contracting the brood nest or by migration to better bee forage this behaviour can be supported. A treatment with allopathic synthetic chemical substances (medicaments of the mainstream medicine) is not allowed in any case. There are only some exceptions for natural substances like organic acids and essential oils. Their use is unavoidable for the control of Varroa.

Most synthetic medicaments but also nearly all pesticides have lipophylic characteristics, thus special attention must be paid to the wax residues. This is of special importance for apicultures in transition to organic management. For these conditions, EU law allows also in organic beekeeping the application of all medicaments licensed in the respective country. However, if synthetic (allopathic) medicaments are used in organic apiculture, the total quantity of wax must be removed from the isolated colony stands, if organic honey production from these colonies is planned to be continued. In this case, another year of transition has to be respected.

Bio-technical methods represent an essential part of the control concepts of Varroa, although the removal of drone brood, or the artificial swarm method practiced by conventional beekeepers are not regarded as being species-appropriate by organic beekeepers.

In this case, the natural behaviour of the original host, the eastern honey bee (*Apis cerana*), can offer an orientation, because it developed similar defence mechanisms against the parasite to facilitate the survival of the colonies. Thus, the eastern honey bee forms the capping of the drone brood cells by compact and thick-walls, from which Varroa infested drones cannot emerge. Afterwards, the bees conserve the cells containing dead brood with propolis, which become a trap for the parasite. Moreover, a colony over infested by Varroa mites will leave its nest as a swarm leaving the strongly infested brood behind in order to make a new start with a reduced number of mites.

When diseases are transferred to new regions in global bee trade, the beekeeper cannot rely exclusively on the natural defence capacity of bee colonies. Because, like in the case of the Varroa mite, a balanced parasite host relation only develops in the course of evolution and this requires hundreds if not thousands of years. In the control of newly introduced diseases we must therefore also take into account the defence behaviour of the original host. Thus, the organic beekeeper must use appropriate management techniques in natural and species-appropriate beekeeping.

49. VARROA CONTROL UNDER THE CONDITIONS OF BIOLOGICAL BEEKEEPING

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Metican (Ecostop®, Primavet Ltd) is a natural acaricide composed of Thymolum and Menthae piperitae oils. This preparation was successfully used for Varroa control during three bee seasons from 2001 to 2003 in an apiary, situated in an ecologically clean area. The apiary was situated in a semi-mountainous region, at altitude of about 450 m above the sea level; with moderate continental climate with minimal winter temperatures reaching -18°C and maximal summer ones about 32°C. The treatment was carried between 11th July and the 24th of August.

On the basis of experiments and observations in an apiary with 25-30 honey bee colonies of various strength, a convenient, easy to use and effective drug for Varroatosis control was tested. The treatment efficacy of Ecostop was better than that achieved with organic acids (formic, oxalic or lactic acid). There was no influence on the organoleptic characteristics of the harvested honey.

Robbing behaviour in bee colonies may occur while Ecostop is applied at the end of the active beekeeping season when there is low or no honey flow. In this case, the utilization of Ecostop®, is recommended before the decrease of bee pasture.

The low expenditure of labour and time for the treatment as well as the high curative effect of Ecostop®, make this product applicable for Varroa control in biological beekeeping as well as in the conventional one.

50. STUDY ON THE ACARICIDAL EFFECT OF SOME ESSENTIAL OILS ADDED TO THE BEES FOOD

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The acaricidal effect against Varroa of essential oils of salvia *(Salvia sclarea L.)*, basil *(Ocimum basilicum L.)*, white marjoram *(Origanum heracleoticum L)* and dill (*Anethum graveolens L*) added to bees' food (honey–sugar candy) was investigated. Two control and one experimental group are formed from equal bee colonies.

Bee colonies are fed three times at an interval of seven days with honey-sugar candy (100 g single dose) including 1% essential oils for the experimental groups. Colonies from the first control group are treated with Rodovar (active substance amitraz) and those from a second control group are not treated with acaricidal preparation aiming to measure the naturally mite fall. Control treating with Apiprotect (active substance coumaphos) is done at the end of experimental period.

The efficacy of the above described treatments was between 37 % and 43 %.

51. TREATMENT OF THE NOSEMA DISEASE WITH A NATURAL PLANT EXTRACT

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Nosema is a disease of the *Apis mellifera* intestines caused by the parasite *Nosema apis*. This parasite develops from spores in the intestines, damages the intestine cells and produces new spores, which are spread to other bees through excrements. The disease is transmitted and spread by the contact among bees and through unhygienic water sources.

Microscopic examination (×400 magnification) of homogenates of the abdominal contents of diseased bees revealed the oval spores of *Nosema apis*, which are approximately 5-7 × 3-4 µm. In tropical and subtropical regions this illness proceeds without the classical symptoms, but this does not mean that the illness is not harmful. Even without obvious symptoms, the illness reduces the bee productivity by 20 to 40%.

For nosema treatments, our beekeepers use herbs, a water or ethyl alcohol extract of *Artemisia absinthium* in 30-40 ml on 1 l sugar syrup. Usually three-four times of 500-1000 ml of this mixture are fed to bees in an interval in 3-5 days.

Medicinal raw material is the grass *Artemisia absinthium*. Prepare the grass during the plant's flowering period. Cut off tops of 20-25 cm length, dry in the attic or in the shade displaying a 3 to 5 cm layer by periodically turning (in a good weather, dry the raw material for 5-7 days) or in dryers at temperatures not above 45 °C. The raw material can be used for 2 years.

52. APPLICATION OF OXALIC AND LACTIC ACID FOR VARROA CONTROL IN ALGERIA

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Today, the chemical control of Varroa with pyrethroids is difficult, as they are no longer effective. Thus, it is interesting to use natural products such as organic acids. Oxalic and lactic acid were used for the first time in Algeria on 30 colonies of *Apis mellifera intermissa* in Langstroth hives:

A. 45 g of oxalic acid dehydrate dissolved 1 litre 50 % sucrose syrup
B. 30 g of oxalic acid dehydrate dissolved 1 litre 50 % sucrose syrup
C. Two applications with 5 ml 15 % lactic acid carried out by pouring the acid between the frames, with a 7 day interval

Dead Varroa were counted during the trial period by means of greased bottom inserts covering the hive bottom two weeks after the use of the organic acids.

The efficacy of the oxalic lactic acid depends on the presence of brood at the time of the treatment. Following efficacies were measured: Application A.: 82.6 %, application B: 65.5% and application C: 75.23 %.

Organic acids must be considered as products for integrated Varroa control in Algeria.

53. PRELIMINARY EVALUATION OF THE GROOMING BEHAVIOUR TO *APIS MELLIFERA CARPATICA* IN RELATION TO THE USE OF BEEVITAL, AN ALTERNATIVE PREPARATION FOR VARROA CONTROL

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The grooming behaviour of *Apis mellifera carpatica* against *Varroa destructor* was studied in an experimental apiary propriety of ROMAPIS.

The variations in grooming behaviour during one year and the efficacy of a Bee-Vital, an acaricide based on oxalic acid, were estimated by counting the mites dropped on control paper, placed under brood nest.

Preliminary results revealed a connection between the treatments against *Varroa destructor* with this organic acaricide product and a high intensity level of grooming behaviour.

In the same time, three different types of Varroa chitin lesions were observed in apiary and laboratory examinations. The presentation describes these Varroa lesions and their possible causes.

54. BIOLOGICAL PREPARATION IN PREVENTIVE MEASURES AGAINST BEE LOSSES

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Bee losses have different causes such as chemicals, bee diseases etc., but they have a common symptom: the decrease of bee health and vitality. A biological preparation for improving the immunity of bees and their hygienic behaviour was developed: ***Apitotus®***, a complex of amino acids and short polypeptides. Application of this biological preparation increased the activity of different resistance factors, such as lysozyme, nonspecific agglutinins and bee larvae haemolymph phagocytes.

The biological preparation **Apitotus®** was fed to honey-bee colonies in spring, during the colony development. It promoted the increase of the bee colony strength by strengthening its resistance. This fact correlated with the increase of activity the hygienic behaviour of the honey bees during the summer period.

Application of this method improved the sanitary conditions on the apiaries and confirmed its high practical effectiveness in comparison to traditional methods with antibiotics or other type of chemotherapy. This method guaranteed the health of bees and the high quality of bee products - honey, pollen and wax.

The feeding of **Apitotus®** after the Varroa control treatment in autumn restored the honeybees' immune response and metabolism and favoured the formation of very vital winter honeybees. Application of this biological preparation in autumn helps the bee organism to develop the fat body reserves for overwintering.

55. TWO YEARS SURVEY OF ACARICIDE RESIDUES IN HONEY COLLECTED FROM AN ORGANIC BEEKEEPING FARM IN TRANSYLVANIA

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A certified organic Transylvanian beekeeping farm was controlled over the last two years in respect of acaricides from honey, using a quick, easy, cheap and efficient extraction method. Acacia, lime, raspberry, multifloral and honeydew honey were analysed in our APHIS Laboratory in Cluj-Napoca. Acaricide determination was performed after using a rapid and simple extraction method, the analytical method utilizing GC with MS detection. Spiked blank samples were used as standards to counteract the matrix effect observed in the chromatographic determination. Recovery percentages from the extraction method ranged from 95-101%, the minimum detection levels ranged from 0.005-0.02 mg/kg for the analysed acaricides. The different substances were confirmed by their retention times and their specific MS characteristics. Two of the samples analysed were found to be contaminated with *tau*-fluvalinat (0.03 and 0.05 mg/kg). As expected, Amitraz was not found in the honey samples analysed, due to the instability in acidic environment. There was no contamination with its degradation products (2,4-dimethyl aniline and dimethylphenyl formamide). No coumaphos or bromopropilate was found in the samples analysed.

56. HONEY CHARACTERISTICS FROM A SERENTINE AREA IN AN ECOLOGICALLY PURE REGION OF THE EASTERN RHODOPES, BULGARIA

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The aim of this study was to evaluate a serpentine area as a possible contamination source from the environment in honey originating from one of the biggest Bulgarian serpentine areas near Fotinovo village, Eastern Rhodope mountains. Serpenitine geological areas contain increased levels of heavy metals while the region of Fotinovo is an ecologically pure region.

Five honey samples, harvested in the spring months May and June 2008 and 2009 from the region were analysed regarding electrical conductivity and different minerals by atomic emission spectrometry with inductively coupled plasma (ICP-AES) method in a certified laboratory.

The range the honey electrical conductivity was 0.199 - 0.760 mS cm^{-1} indicating that they were from floral origin or mixed blossom-honeydew origin. The concentration of the minerals measured in mg/kg were: K: 184 - 770; Ca: 24 - 50; Mg: 9 – 48; Na 9 - 15; Al: 0.4 - 7 mg; Fe: 0.7 - 4.5; Mn: 0.3 - 4.7; Zn: 0.4 - 0.7 mg; Ni: 0.2 - 1.2; Sr: 0.08 - 0.2 mg , Cu: 0.05 - 0.2 mg; Cr: <0.01 - 0.02 mg, Cd: <0.01 - 0.01, Co: <0.01; As: <0.01. Maximum values of Al, Ca, Cu, K, Mg, Mn and Zn were found in the sample with the highest electrical conductivity, which was partly of honeydew origin.

The bee honey reflected some specific potential of plant species grown on serpentine substrata, e.g. low Ca/Mg ratio, 1.8 in average, and higher maximum value of Ni: 1.25 mg kg^{-1} found in a sample with considerable amount of Brassicaceae pollen.

These concentrations do not present a health hazards. Future comparative studies with similar honeys from other ecologically pure regions will show the influence of serpentine substrata on honey characteristics.

57. MINERAL CONTENTS IN HONEYDEW HONEY FROM DIFFERENT REGIONS OF BULGARIA

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The principles of organic beekeeping exclude contamination of honey by heavy and toxic metals. Due to the specific way of deposit of the source (honeydew) - on the surface of the plant leaves - honeydew honey is subjected to the higher environmental contamination than that of blossom honey, especially when the contamination comes from the air. Therefore, honeydew honey may be viewed as an environmental marker.

The mineral content of 32 samples of honeydew honeys produced by local beekeepers was analyzed. Honey dew authenticity of honey samples has been proven by measuring their electrical conductivity and the ash content. The contents of lead (Pb), cadmium (Cd), copper (Cu), zinc (Zn), manganese (Mn), cobalt (Co) and iron (Fe), were determined. Analysis of elements was carried out by atomic absorption spectrometry.

The concentrations in mg/kg varied in following ranges: Pb: 0.09 – 0.31; Cd: 0.006 - 0,047; Cu: 0.23 -1.26: Zn: 0.63-4.17; Mn: 0.34 – 4.38; Co: 0.023 – 0.056; Fe: 3.42 – 28.80.

It is suggested that honeydew honey may be useful for assessing the presence of environmental contaminants. The differences of contamination, depending on the region of the honey harvest are discussed. We recommend that the honeydew honey from apiaries with organic production should be screened for the content of toxic heavy metals.

58. EFFECT OF THE BIOLOGICAL STIMULATING PRODUCT APISANIRAN ON THE PRODUCTIVE PARAMETERS OF BEE COLONIES

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In recent publication there are publications about the use of KAC-81 (extract of pine needles and wormwood, *Artemisia absinthium*) and extracts of pine needles, juniper and wormwood for Varroa control and bee colony stimulation. Especially it was found that bee colonies were stimulated when pollen is insufficient;that the resistance of bee colonies to factorial diseases, such as ascospherosis and nosematosis was enhanced and that the Varroa infestation rate was reduced under 3-4%. The objective of the research was to study the effect of the stimulant product Apisaniran on the productive parameters of bee colonies (strength, quantity of sealed worker brood, honey production capacity, etc.). Apisaniran are manufactured by „Primavet – Sofia” Ltd and it is a mixture of pine and wormwood extract.

Experiments showed that pine and wormwood extracts, and also their combination has a stimuation effect on bee colonies. Apisaniran can be used in autumn as stimulating supplemental feeding of bee colonies. In spring, when there is insufficient pollen supply „Apisaniran” can be used as a stimulant for the development of bee colonies when there is insufficient pollen supply.

59. CONTAMINANTS IN HONEY OF THE PERM TERRITORY, RUSSIA

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24 honey samples from 2007 harvest, and 23 samples from 2008 harvest in the northern Perm regions were examined according to the State Standard 19792-2001. Most honey samples corresponded to the Russian standards for general quality, as measured by the determination of humidity, colour specifications in Pfund units, apparent sucrose and apparent reducing sugars content, pH value, total acidity, electrical conductivity, specific rotation, diastase activity and HMF content.

The ecological quality of the Perm production was determined by the measurement of toxic inorganic elements, radio nucleotides and pesticides.

The radio nucleotide concentration was not more than 3 Bq/kg for Cs^{137} (the Russian norm is 100 Bq/kg) and 1 Bq/kg for Sr^{90} (the Russian norm is 80 Bq/kg). The Cd content varied between 0.005 and 0.047 mg/kg (the Russian norm is max. of 0.05 mg/kg, the EU norm proposal is max. 0.1 mg/kg), the Pb content - between 0.11 and 0.46 mg/kg (the Russian norm is max. 0.5 mg/kg, the EU norm proposal is max. 1 mg/kg), the As content was less than 0.06 mg/kg (the Russian norm is max. 1 mg/kg). The amount of hexachlorocyclohexane (α, β, γ-isomers) and organochlorides (DDT and its metabolites DDE and DDD) was less than 0.0025 mg/kg (the Russian norm is max. 0.005 mg/kg).

This first study shows that there is no significant contamination of the Perm region by contaminants such as radio nucleotides, toxic inorganic elements and pesticides.

60. PHYSICO-CHEMICAL PROPERTIES OF SOME LOCAL AND IMPORTED HONEYS, WITH SPECIAL REFERENCE TO THE HEAVY METALS CONTENT

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Twenty eight local honey samples, 20 samples from southern Egypt, and 8 from northern Egypt, and 9 imported samples from Africa; Kenya, Uganda; Asia; India, Yemen; Europe; Croatia, France, Slovenia, UK; and Latin America; Uruguay, a total of 37 samples, were analyzed by physical and chemical methods. Significant differences were found in honey viscosity, glucose/water ratio, total soluble solids and HMF content between local and imported honeys. Significant differences were found in moisture percentage, between honeys of northern Egypt and imported honeys. pH values in Assiut and northern Egypt honeys also differed significantly. Significant difference in total acidity was found between Sohag's honeys and other localities of Egypt. Significant difference in fructose and reducing sugars content was noticed between Assiut and Sohag honeys. Significant difference in maltose content was found between Sohag honey, and northern Egypt or imported samples. Significant differences in Na content was detected between northern Egypt and Sohag honeys. Correlations between different honey parameters were studied and correlation coefficients and regression equations were calculated. Thus, it is possible to measure total soluble solids, moisture, specific gravity, colour and electrical conductivity in order to calculate the other physico-chemical properties of honey.

The Cd content was close to zero in all tested honey samples while Pb was below the detection limits in honeys from villages away from traffic, cities and factories. The Pb levels were higher in honey samples from cities, near main roads and factories. In Northern Egypt, where there is more pollution, 50% of samples contain more than 1 ppm. of Pb, and in three samples from El-Behera the Pb was close to zero. Minimum Pb content was found in Sohag and maximum in Northern Egypt, honeys from Assiut had intermediate values. Maximum Pb content was associated with maximum pH value in the honey samples from Assiut, Egypt.

61. QUALITY AND STANDARDISATION OF ROYAL JELLY

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Royal jelly (RJ) is a valuable bee product with different functional health enhancing properties. It is produced in Bulgaria only in conventional beekeeping. The study was carried out to update the present Bulgarian RJ standard.

30 RJ samples from whole Bulgaria were analysed. In general, the methods described in Sabatini et al., (2009) were followed. Following results were obtained: 1. Expressed in g/100): water content: 61.0 - 65.1; protein: 11.25 - 20.80 g; glucose: 4.25 -5 .61, fructose: 3.29 - 6.59, sucrose: 0.79 - 4.25, 10-hydroxy-decenoic acid: 1.6 - 2.2. 2. Acidity in cm^3: 0.1 n NaOH/G: 3.33-4.90. The pH varied from 3.2 to 4.1.

Analysis of the drone brood of the same quality criteria showed that there were differences regarding the water and the carbohydrate content, and of the acidity, while 10-DHA was absent. These differences allow the detection of adulteration of RJ by drone brood. Based on the above data, a standard for Bulgarian RJ is proposed.

Organic royal jelly: The conventional and organic production methods for RJ are discussed and a RJ production method for organic beekeeping is proposed. The next step is to test organic RJ and to see if it corresponds to the quality criteria established for conventional RJ.

62. ELABORATION OF TECHNICAL REGULATIONS ADJUSTED TO THE EUROPEAN STANDARDS FOR 'NATURAL HONEY' IN MOLDOVA

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Under the regulation No. 866-XIV from 10th of March 2000 regarding technical barriers of commerce (Official Monitor of Republic of Moldova, 2000, no. 65-67, art. 462) and regulation Nr. 186-XV from 24th April 2003 regarding the evaluation of products conformity (Official Monitor of Republic of Moldova, 2003, nr. 141-145, art. 566), technical regulations 'Natural Honey' adjusted to European standards were elaborated.

The technical regulation 'Natural honey' establishes minimal food safety and quality requirements, presentation and labelling, which must be respected during the production and trade of natural honey. The quality and food safety of the honey involves the conformity to the prescribed requirements during the honey production process from the raw material to the consumer. The honey producers should make records on different apiary activities such as apiary management and preparations used for the control of diseases and pests in order to allow product traceability and, if necessary to provide documentary evidence of compliance with food safety and quality requirements.

The honey should not be artificially modified or heated to high temperatures, which destroy its natural enzymes, and should not be fermented. The producer should check the quality indices, food security, forms of presentation, marketing and labelling. Each production batch should be analysed for: 1. Organoleptic indices (honey type, appearance, consistency, colour, taste and smell) 2. Physico-chemical analysis such as moisture, ash, acidity, invert sugar, sucrose, diastasic index, pollen grains, HMF, colorimetric index, electrical conductivity and contaminant residues.

Natural honey not complying with the requirements of the presented technical regulation cannot be marketed. For the verification of the compliance with the requirements of the technical regulation, a sample of the finished product is taken from the place of production or from the market to be tested with approved official methods. If the honey does not correspond to the prescribed requirements, the certification body must inform the producer, importer and the market surveillance office about the contested noncompliance.

63. APIDIETETICS: OUR EXPERIENCE WITH BEE PRODUCTS IN THE PREVENTION AND TREATMENT OF METABOLIC DISEASES

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Apidietetics is an important part of the apitherapy – prevention and treatment of diseases with nutritional products, enriched with different bee products. The bee products are a milestone for the healthy Balkan nutrition, so-called the Balkan diet. Modern apidietetics comprises bee products in combination with the main nutritional ingredients – proteins, fats, carbohydrates, vitamins, salts etc. Our studies stress the important role of apidietetics (nutritional regiment, enriched with propolis, honey, royal jelly, bee pollen, laclarville etc.) in the prevention and treatment of the atherogenic risk factors. Dietary menus, enriched with pectin, fibres, propolis, fruit and vegetable juices reduce the coronary risk and ameliorate the metabolic parameters in shift and night workers. Based on our studies we created a series of dietary products for prevention and treatment of obesity and metabolic syndrome. One of them, Biocorect +, contains a mixture of propolis, multi-blossom honey, bee pollen, various herbs and bioactive substances. Our hypothesis is that the bee products in Biocorect + have an effect on the stomach mucosa, respectively on the secretion of the stomach hormone ghrelin, an appetite stimulating hormone.

In Bulgaria, there are quite a high number of organically certified apiaries. For optimal quality and activity, Biocorect+ should be produced based on certified organic bee products.

64. APITHERAPY WITH DRONE LARVAE

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Preclinical studies with rats were carried out with atomized larval drones (ALD). No acute and chronic toxicity was observed. Following effects were observed in rat male genital tract: increased trophicity of the entire genital tract as a result of improved vascularisation; boosting spermatogenesis in the testicles (stimulating maturation of the spermatogonia) compared with the untreated group; no anti-metabolic phenomena; decrease or disappearance of stasis in the seminal vesicles and prostate; normal structure of the testicles; mild interstitial congestion; the multiplication and ripening (spermatogonia spermatocyte, sperm) was slightly accelerated preserving the stimulating testicular effect also after discontinuation of the product. ALD does not intervene in the testosterone contents of the blood; it prevents weight loss of the blocked testicular and the testicle testosterone has not decreased.

In the female rat genital tract following effects were observed: oogenesis stimulation, as well as stimulating multiplication and physiological maturation of the ovarian follicles; the reproduction process showed that there is gain weight in newborns. None of the newborns showed malformations.

Clinical effects on professional sportsmen showed that ALD acts as hormone replacement treatment for secondary menopause (induced surgical = oophorectomy), lowers the Green score and influences positive evolution of calcium, cholesterol and triglycerides in serum. ALD tested on active football players influenced positively the aerobic and anaerobic power of muscular contraction, decreased urinary mucoproteines (marker of the metabolic fatigue), as well as decreased the level of post-effort fatigue.

Conclusion: ALD might act as anti-aging drug for increasing physical performance and for better adaptability to competitive stress; it is a hormonal compensation for men and women and for couple sexual dysfunction (impotence, premature ejaculation, frigidity, disorders climacterium and andropause). **For optimal quality of drone brood and its best therapeutic action it should come from drones originating from organic bee hives.**

65. OBTAINING ECOLOGICALLY CLEAN BEE PRODUCTS FOR APITHERAPY BY CORRECT BEEKEEPING PRACTICE

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For obtaining ecologically clean organic bee products for optimum apitherapy, conventional methods of beekeeping should be changed to new organic technological methods, in order to prevent the accumulation of toxic substances in bees and bee products.

Specific doses should be used in prophylaxis and apitherapy for 1. the maintenance and improvement in the health; 2. the prevention of functional disturbances, and 3. the treatment of different pathologies.

With respect to the tasks of these of three application modes, specific doses of bee products in preventive, therapeutic, antibacterial, antifungal, regulatory, bio-stimulating, anaesthetizing, inhibitory, antipyretic, antiviral, restoring, cosmetic and other useful properties were determined.

In order to produce ecologically clean bee products it is important to select territories, free from industrial enterprises, having rich honey flora to ensure sufficient nutrition of honeybees with carbohydrates and proteins. For the republic of Moldova the forests of Kodry zone should be suitable for this purpose.

66. First report on bee Colony Collapse Disorder in Azerbaijan

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The information about the honey bee Colony Collapse Disorder made us pay close attention to the situation in Azerbaijan. Our preliminary data 2006-2009 show that mass colony losses occur all the year round in a wavelike pattern. In the fall 2006 there was 16.2 – 22.5% colony loss in the North-East. In the spring-summer 2007 in the same region, losses varied from 25 to 60%. In the central part of the Greater Caucasus Range lowland, 30% of colonies were lost in the winter-spring 2008, and 60% in the fall. Some farmers lost up to 90% of their bee stock. There were cases of losses even in farms with favourable conditions (enough food good reproduction in the fall). In the spring 2009, 20 to 50% colonies were lost in the east part of the Greater Caucasus Range and in the South (Talysh mountains). The situation is worsening, as there is no program in Azerbaijan to study the phenomenon.

No pesticides were used in the farm. The losses and the swarming pattern were similar to those described by the American researchers.