Issue 8 • JFebruary 2025

NO BEES LIFE

EBA MAGAZINE

28 COUNTRIES

FROM WHICH EBA HAS MEMBERS

(45 beekeeping organizations)

In order of confirmation of the Statute of EBA

372.865 beekeepers

Serbia
Slovenia
North Macedonia
Bulgaria
Greece
Romania
Malta
Germany
Hungary
Ukraine
Montenegro
Lithuania
Bosnia and Hercegovina
Sweden
Croatia
Czech Republic
Poland
United Kingdom
Netherlands
Italy
Ireland
Belgium
Cyprus
Türkiye
Switzerland
Prishtina
Portugal
Spain
Slovakia

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BEEKEEPING IS A VERY IMPORTANT PART OF THE ENVIRONMENT

Beekeeping is not just an agricultural sector, it is a very important part of the environment! One of the priorities of the EBA in the next period is to achieve that beekeeping is also classified as an environmental "sector" in the field of EU legislation. We know that bees are important for preserving the environment and it is URGENT that funds to help beekeepers - pollination services for preserving biodiversity and the like, are also provided from environmental programs.

THE EBA CELEBRATES ITS FIRST BIRTHDAY

It is one year since the European Beekeeping Association was founded. This year has been very busy, because most of the work is done by just four members – Biljana, Rodoljub, Urška and yours truly. Biljana, Rodoljub and Urška deserve great praise. I would also like to thank everyone else who helped us. That being said, a greater response would be extremely welcome, especially in promoting the work of the EBA among its beekeepers in the Member States and in increasing the number of contributions to the EBA MAGAZINE. We appreciate any feedback regarding our work and support for EBA activities.

Although we have only been in existence for one year, we have almost 400,000 beekeeper members from 28 countries. Nevertheless, I am sure that we could have many more, because we do not charge a membership fee and our objectives are common to all beekeepers in Europe. We do not differentiate between small and large beekeepers, nor between those in the EU and those outside the EU ... Our main goal is to work for every beekeeper across Europe! I am delighted that we have decided to not charge a membership fee and that we are able to cover all costs through sponsors and donations. Thank you very much to all of you who support us financially!

When I accepted the EBA presidency, I also made it clear that I would offer my resignation after one year in office, and that is exactly what I did on 27 January 2025. In 2024, the EBA has been actively working on the realisation of its objectives, but despite all the hard work, unfortunately there are no concrete results yet. The EBA needs leadership that members trust to deliver on its objectives. I wanted all members to evaluate our performance and to decide how to move forward. . However, EBA member organisations evaluated our work as impressive for such a short time and rejected my resignation.

I personally put a lot of effort into working with the key legislators in Europe, and I also foster strong relationships with important people in this regard, so I believe we will succeed! Above all, I am glad that from 31 January 2025, we will already have five scientific committees, and I would like to thank them all for their willingness to cooperate with the EBA. The composition of the committees, made up of top scientists coming from different countries (including non-EBA countries), is proof that they also believe in our vision and want to help beekeeping! What is important is that our decisions are based on expert opinion.

All activities and results of EBA's work are presented on the website https://ebaeurope.eu/ and in the EBA MAGAZINE, which we can rightly be proud of. We are currently preparing an ambitious work plan for 2025, which will be published in the next issue of EBA MAGAZINE. However, we will undoubtedly need more help from our members to implement such a programme, as the workload is simply too big for just a few people and the EBA cannot yet afford professional staff.

The EBA has made several offers to all beekeeping organisations in Europe to cooperate, unfortunately always without success. Any cooperation for the same objectives is welcome, but some do not want to accept the existence of the EBA as a fact.

The only reason this association exists in the first place is because European beekeepers felt that there was no organisation currently in place that would fight for them. The doors of the EBA are open to all!

None of us at the EBA is paid – personally, I have not received a single euro in one year of service, not for work, not for material or travel expenses, not even per diems ... We work for free and with one purpose – to HELP beekeepers and to PROTECT consumers!

Boštjan Noč

President of the EBA
and the
Slovenian Beekeepers Association

A LETTER FROM THE OFFICE OF THE KING CHARLES III

On November 05. 2024 EBA sent a letter (in physical form) to the King Charles III to familiarize himself with the activities of EBA.

On December 20. 2024. it was written and on December 31. 2024. kind reply was received from the King's Office, which thanked us for our efforts and activities and referred us to an organization in the United Kingdom of Great Britain and Northern Ireland that shares the same values and goals as EBA.

We thank His Majesty for his kind reply and greetings and wish him good health, with his bees to continue working.

SUCCESSFUL VISIT OF THE PRESIDENT OF EBA TO MADRID

On organized by Slovenian Embassy in Madrid, on January 21, 2025 a meeting was held between the Beekeeping Association of Slovenia, the European Beekeeping Association and Spanish beekeeping organizations.

The meeting was attended by Paola Vecino,president El Rincón de la AbejaJesús Llorente, president Fundación Amigos de la Abeja Jaime de Jaraíz, CEO LG Espana, Juan José Cid García, MielekoElvira García Camino, Mieleko-Jorge Carabaña FernándezLaura Fernández GetinoJosé Jiménez Colado, president beekeepers associationi Madrid -Juan Antonio Plaza Nicolás, APISCAMEBA .

Mr Boštjan Noč said at the time: "We realized that we have the same problems and agreed to cooperate".

The outcome of the meeting between the President of the EBA and the Spanish beekeepers' associations is also described in the letter we received.

Please convey to Mr. Boštjan Noč my sincere thanks for the time he gave me during the event held on January 21st. It was an honour to meet such an honest, noble and brilliantly intelligent person, qualities that are reflected in his extraordinary work as a defender of bees and as a leader in the field of beekeeping.

I am deeply impressed by his dedication and commitment to the protection and development of beekeeping, and I would be very grateful to be able to maintain closer communication with him in the future. I am convinced that an exchange of ideas and experiences with a person of his worth will be of great benefit to all of us working in this sector, and I trust that language differences will not be an obstacle to establishing a productive collaboration.

Please convey to him my appreciation and willingness to collaborate on any initiative he considers appropriate.

Best regards,

José Jiménez Colado. President of Apiscam

We thank the President José Jiménez Colado and continue our cooperation in the future

EBA continues its activities so that all beekeepers' associations in Europe, together in EBA, can fight for a better tomorrow for bees, beekeepers and consumers.

NEWS FROM THE SCIENTIFIC COMMITTEE OF APITHERAPY OF THE EBA

As the he European Beekeeping Association (EBA) continues to expand its efforts in various areas of beekeeping, in the end of the November 2024 announced the formation of the Scientific Committee on Apitherapy and established the Committee in the beginning of year 2025.

Members were confirmed by the Executive Board on the 8th of January. Currently, it consists of 6 experts from 6 countries with expertise in apitherapy with education in medicine, pharmacy, chemistry but in management and promoting too.

Members of Scientific Committee on Apitherapy are:

President: Jana Irsakova, MD., Slovakia

Members (in alphabetical order):

Simona Bisboaca, M. ENG., Switzerland,
Zorica Plavšić, MD. PhD. MPH., Serbia,
Dr. rer. nat. Thomas Gloger, Germany,
Nika Pengal, Slovenia,
Prof. Kristina Ramanauskienė, Lithuania,
Project acquisition consultant:
Žiga Jenko, Slovenia

The Committee held its first meeting on the 14th of January. Main part of this meeting was devoted to discussing the goals and creation of the Committee's program.

The Scientific Committee will provide expert guidance to support and advance the objectives of the EBA, and helps answer questions of the European apitherapy community.

Its main mission includes:

- Promoting apitherapy, ensuring qualified education for apitherapists and producers of bee products used in apitherapy.
- Uniting apitherapists across Europe and supporting the legalization of apitherapy at a European level.
- Education, promotion, and popularisation of apitherapy among the general public.
- Offering professional support for EBA events such as symposia, workshops, congresses, program preparation, etc.
- Preparing expert opinions and advisory input for apitherapy-related initiatives for EBA and its members.
- Collaborating with other EBA scientific committees and external beekeeping or research organizations.

You will be able to read more about the activities of the Committee Apitherapy in the future issues of EBA Magazine and first article from apitherapy field is coming soon.

Jana Irsakova, MD.
President of the Scientific Committee
of Apitherapy,
European Beekeeping Association

LETTER FROM DR. STEFAN STANGACIU TO EBA

EBA President Mr. Boštjan Noč sent a congratulatory letter to Dr. Stefan Stangaciu for election as President of the International Federation of Apitherapy (IFA).

Answer Dr. Stefan Stangacia is transmitted in its entirety.

Mereni (Contesti), Dambovita county, Romania, January 29, 2025

Dear Mr. President Boštjan Noč,

On behalf of the International Federation of Apitherapy (IFA), I would like to extend my sincere gratitude for your warm congratulations and kind words following my election as President. Your support is truly appreciated, and it further motivates me to pursue our shared goals in advancing apitherapy on a global scale.

We are honoured to have the opportunity to cooperate with you and the European Beekeeping Association (EBA) at all levels. We look forward to working closely not only through the International Federation of Apitherapy but also with the newly created European Apitherapy Federation (EAF), in which various national associations from across Europe, including Germany, Italy, Romania, and Croatia, have already agreed to participate.

We acknowledge that the EBA, like Apimondia too, is primarily focused on the production, promotion and use of all beehive products, and we, too, within our federations, share a deep respect for the potential of these natural resources.

Our focus extends beyond the production and use of beehive products, emphasizing their therapeutic potential in addressing the specific health needs of patients and customers. Our approach begins from the perspective of the patient or customer, starting with their health challenges and working backwards to tailor solutions helped by bee products. Much like your own EBA Apitherapy Commission, our efforts are dedicated to improving health and enhancing quality of life through the specific use of apitherapy.

Together, the EBA and IFA/EAF can function harmoniously as two hands working in unison, ultimately sharing the common goal of creating a better life for all on our planet. I believe this cooperation holds tremendous potential for the benefit of both beekeepers and consumers, and I am eager to see where our combined efforts will take us.

Once again, thank you for your congratulations and the opportunity to collaborate. We look forward to a fruitful partnership.

Warm regards,
Dr. Stefan Stangaciu
President, International Federation of Apitherapy www.api-terra.org

INVITATION TO JOIN THE EBA SCIENTIFIC COMMITTEE FOR YOUNG BEEKEEPERS

The European Beekeeping Association (EBA) has established its Scientific Committee for the Safety and Quality of Bee Products and its Scientific Committee for Bee Health, and we are in the final stages of establishing an EBA Scientific Committee for Apitherapy.

As the EBA continues to expand its efforts in different areas of European beekeeping, the need for additional specialized committees has become apparent. In light of this, we are pleased to announce the establishment of the EBA Scientific Committee for Young Beekeepers.

In addition to the many challenges that are represented in the world of beekeeping, we are also very aware of the fact that beekeepers are aging, that it is necessary to involve young and enthusiastic people, new energy that will connect with the beautiful world of beekeeping. Therefore, it is necessary to help young people through education and training to enter this magical world.

In addition to acquiring knowledge and skills, a very important and essential part of the Committee's work is the cultural and social program that will contribute to connecting young people in Europe and once again showing that bees do not have a borders.

If you are passionate about contributing to our mission, we invite you to apply for membership on the Scientific Committee for Young Beekeepers.

Please submit a brief application (maximum 300 words) to eba@ebaeurope.eu by January 31th, 2025. Your application should include a statement of motivation, your area of expertise, and a brief list of references highlighting your professional or academic contributions in the field of your work.

We look forward to your participation.

Boštjan Noč
President of the European Beekeeping Association

MEETING OF THE EBA EXECUTIVE BOARD AND IMPORTANT DECISIONS FOR FUTURE WORK

The EBA Executive Board held a meeting on January 9, 2025, where many important and significant decisions were made for the future activities of the EBA.

The Scientific Committee for Apitherapy was established, future activities of the EBA at the upcoming Apimondia in Denmark were agreed upon, new activities were agreed upon so that as many non-member associations as possible could join the EBA – without financial obligations because we in the EBA do not have membership fees, the date of the EBA General Assembly was agreed upon, the President spoke about the future activities of the EBA, improving the quality of the EBA Magazine, many future meetings were agreed upon and many more topics were discussed by the members of the Executive Board today in a constructive manner, all with the aim of improving the work of the EBA in the future, in order to realize all important goals and do the best for bees, beekeepers and consumers in Europe.

THE THIRD MEETING OF EBA MEMBERS WAS HELD IN ONLINE FORMAT ON JANUARY 27, 2025

At meeting of EBA members on January 28, 2025, the activities of EBA in 2024 were summarized and the foundations and plans for work in 2025 were laid.

The conclusion from yesterday's meeting is that only together and with joint efforts can EBA members achieve the set goals.

The year 2025 is extremely important for the work of EBA, the work of 3 Scientific Committees has been formed and two are in the process of being formed, the approach to relations with the media has been agreed, the date of the EBA General Assembly has been planned, activities towards Brussels have been agreed and many more topics have been developed and agreed, all with the aim of implementing future activities.

We thank the EBA members who attended the meeting and contributed to the future work and growth of the EBA in the coming period.

NEW IDEAS FROM EBA MEMBERS FOR NEW ACTIVITIES IN 2025

INVITATION TO JOIN THE EBA SCIENTIFIC COMMITTEE FOR THE CONSERVATION OF INDIGENOUS HONEY BEES

The European Beekeeping Association (EBA) has established its Scientific Committee for the Safety and Quality of Bee Products and its Scientific Committee for Bee Health, and we are in the final stages of establishing an EBA Scientific Committee for Apitherapy.

As the EBA continues to expand its efforts in different areas of European beekeeping, the need for additional specialized committees has become apparent. In light of this, we are pleased to announce the establishment of the EBA Scientific Committee for the Conservation of Indigenous Honey Bees.

The ultimate goal of establishing the Committee is to improve bee welfare by developing and disseminating comprehensive breeding strategies that include colony vitality and the conservation of locally adapted populations through cooperation, exchange of ideas and mutual support, in order to disseminate and implement sustainable breeding strategies at European levels.

The Committee will work in the field of bee breeding and conservation, bringing together expertise from different scientific and beekeeping communities, collaborating with breeders and sharing a strong commitment to knowledge dissemination and transfer.

If you are passionate about contributing to our mission, we invite you to apply for membership on the Scientific Committee for the Conservation of Indigenous Honey Bees.

Please submit a brief application (maximum 300 words) to eba@ebaeurope.eu by January 31th, 2025.

Your application should include a statement of motivation, your area of expertise, and a brief list of references highlighting your professional or academic contributions in the field of your work.

We look forward to your participation.

Boštjan Noč
President of the European Beekeeping Association

FIRST COOPERATION BETWEEN EBA AND EPBA

On January 9, 2025, after reaching an agreement with EPBA, the EBA Executive Board decided that the EBA magazine NO BEES NO LIFE will be published in cooperation with EPBA starting with the February issue.

This cooperation will be reflected in the publication in the magazine of all information about the work of EPBA that EPBA provides, as well as the publication of event announcements or expert texts. We hope that this type of cooperation will deepen in the coming period.

EBA hereby demonstrates its good will to cooperate with all organizations for the benefit of European beekeeping.

IMPORTANT VISIT OF THE PRESIDENT OF THE EPBA BERNHARD HEUVEL TO SERBIA

The President of the European Professional Beekeepers Association (EPBA), Bernhard Heuvel from Germany, visited Serbia on January 6, 2025.

The aim of his short visit is to bring honey samples for innovative accredited analysis by the ANA LAB laboratory in Pančevo.

He visited the ANA LAB laboratory, where the director Ivan Smajlović explained in detail the EIM-IRMS method, which has achieved high recognition for its results in all meridians, from the USA, through Germany and Russia, to India and China, in various projects and scientific exchanges. Now it is time for another practical "test" on the samples brought from Germany. Since highly accurate results are expected, it is also expected that after that its spread throughout Europe will begin, because the method is extremely precise and detects all types of foreign sugars that can be added to honey in the process of adulteration.

The guest had the opportunity to learn in detail about all parts of the honey analysis process using this new method, he had numerous questions to which he received answers. He showed high awareness of all honey analysis methods and an excellent understanding of the honey market. We agreed that almost all European laboratories today do not want to accept the reality that their analyses for detecting counterfeits are simply outsmarted by professional counterfeiters and their chemists. Only a combination of all existing analyses can reach a percentage of counterfeit detection of up to about 80%, and such a combination is almost 10 times more expensive than innovative methods. Currently, only three laboratories in Europe have innovative honey analyses that counterfeiters cannot outsmart for now, and it is expected that they will also be able to outsmart permanently. These are two laboratories that use the DNA method, one

from Estonia and the other from Austria, and the third is ANA LAB from Serbia. We are eagerly awaiting the results of the ANA LAB analysis, which will now be compared with the DNA method for the first time, so to speak. Of these three laboratories, only ANA LAB currently has completed accreditation in accordance with EU standards.

The President of the European Professional Beekeepers Association (EPBA), Bernhard Heuvel, was welcomed by the President of Serbian Federation of Beekeeping Organizations -SPOS, and had a detailed conversation with him in his capacity as both the President of SPOS and, of course, first and foremost, the Vice-President of the European Beekeeping Association (EBA), and on behalf of the President of EBA, Boštjan Noč. First of all, let us clarify that the European Beekeeping Association (EBA) includes all beekeepers in geographical Europe, while the European Professional Beekeepers Association (EPBA) only includes professional beekeepers from the territory of the European Union.

The EBA's proposal to the EPBA was to harmonize positions and adopt a common platform for acting towards the EU and the governments of our countries. Yesterday, it was agreed that an Agreement will be signed on this, by which both sides will commit to the goal of forming a common platform of action, but also to generally begin closer cooperation on this issue. There is currently no such common platform. There are several ideas, both EPBA and EBA, which were discussed in detail yesterday, but we do not believe that it is good to talk about them publicly, so as not to "open the cards" to honey counterfeiters. We agreed that we cannot wait for the completion of the work of the Honey platform working group formed by the European Commission, because the meetings of that working group are held once every 6 months, and if it continues at this pace, it will take 5 years to complete its work, and by then there will be no more beekeepers! Therefore, something needs to be done urgently, a final proposal is in sight, and it should be proposed to the European Union as an urgent solution that MUST stop counterfeiting and suppress it at its root already this year. Because, realistically, it is already too late, irreparable damage has been done to beekeeping throughout Europe and the world, but we have to fight for survival, because the current purchase prices are below the production cost price both in Europe and here. We are almost ashamed to announce what those prices are, because they do not depend on us beekeepers in any way, and beekeepers will only be further frustrated and disappointed.

We have received information that a large European market, which also exists in Serbia, is currently visiting both DNA laboratories for honey (in Estonia and Austria), and in the foreseeable future it will probably decide to apply one of the innovative methods for the honey it sells, and if it does so, other competing markets will follow suit. That would be very good, if part of the problem could be solved in this way.

We also agreed that it is very important to animate consumer associations, so that both, EPBA and EBA can work together with them to solve this global problem. There is great power in consumer associations. It is also necessary to work on consumer education, which was emphasized in today's press statement by the President of SPOS and the Vice President of EBA, and SPOS recently took the first step in that direction by launching the innovative mobile application – MEDOTEKA (ALL ABOUT HONEY), through which consumers can reach their beekeeper quickly and easily, but also learn literally everything about honey that interests consumers.

It was agreed that Bernhard would visit Serbia again as soon as possible, but in such a way that he would spend more time getting to know SPOS and our beekeepers better, visiting the Plant "Naš med" and SPOS premises, as well as visiting some of our best beekeepers, as well as meeting with the SPOS Professional Beekeepers Group. We also invited him to attend the XVI National Beekeeping Fair on February 8th, and the accompanying Symposium dedicated to combating counterfeit honey on the market.

We are very satisfied with today's meetings, everything was recorded, and the material will be used both for EPBA public announcements and for our(Serbian) national television.

Many thanks to Mr. Bernhard, we hope for his return visit to Serbia soon.

Vice – president of the EBA
MD Rodoljub Živadinović

MEP MS. ZALA TOMAŠIČ VISITS BEEKEEPING ASSOCIATION OF SLOVENIA (ČZS) AND EBA

On January 11, 2025, Ms. Zala Tomašič visited ČZS and EBA. The meeting was extremely effective, the agreements were concrete. On World Bee Day on May 20th, we will be visible and active in the EU Parliament… Through honey and a honey breakfast, we will send a message to MEPs regarding the issues in beekeeping, … She also promised EBA's help in meetings with the EU Parliament's committees for agriculture, environment, food and consumer protection.

Thank you Ms. Zala!

MEP MATJAZ NEMEC VISITED THE HEADQUARTERS OF EBA

MEP Matjaž Nemec visited the headquarters of ČZS and EBA on January 31, 2025.

He supports beekeeping and has promised to help organize meetings with representatives of those who decide on beekeeping in Brussels.

We asked him if he could also help by making EU MPs aware of the problems of European beekeepers and urging them to support the EBA proposals.

He promised to help!

APIMONDIA FOCUS ON EUROPE

Apimondia is the International Federation of Beekeepers' Associations and other organizations working within the apiculture sector since 1895. As a global organization, Apimondia's Executive Council comprises the members of the Management Board, the seven Chairpersons of the Scientific Commissions, and the five Chairpersons of the Regional Commissions.

The purpose of the Regional Commissions (RC) is to act as a liaison between the beekeeping sector of each continent and Apimondia, ensuring better cooperation among regional beekeeping associations. These commissions support national beekeeping associations and help local organizations promote Apimondia Congresses, symposia, and other regional events. They also coordinate the activities of the Working Groups with the Scientific Commissions at a regional level.

Apimondia has members from 36 European countries, covering nearly the entire continent. In some countries, there is a single beekeeping association that represents a significant portion of beekeepers, while in others, there are two or more organizations. Apimondia has two categories of members:

- Full Members: Beekeepers' associations operating at the national level (currently 42).
- Associate Members: Local beekeepers' associations, federations, beekeeping research institutions, universities, etc. (currently 18).

There are several formal and informal European platforms coordinating activities and initiatives related to the beekeeping sector in Europe. Regional, cultural, or linguistic affiliations remain visible, like in Apislavia, the Nordic–Baltic Bee Council, the Mediterranean Beekeeping Federation (Fed Api Med), the V4 Beekeeping Council, the Balkan Federation of Apicultural Associations, and the Beekeeping Federation of Turkic Nations. Some European beekeeping coordination activities focus only on EU countries (e.g., BeeLife and the European Professional Beekeepers Association, EPBA), while others aim to cover the entire European territory, such as your European Beekeeping Association (EBA).

We try to be as close as possible to our members, in 2024 I had the opportunity to discuss with beekeepers in person during events in the Czech Republic, Estonia, Greece, Hungary, Poland, Austria and Turkyie and to meet with representatives of beekeepers from many more European countries. The primary goal of Apimondia RC Europe is to bridge the gap between EU and non-EU countries. In this context, Apimondia RC Europe serves as a coordination and communication hub, sharing ideas and initiatives. We are not policymakers, but we can provide support to national beekeeping associations with their governments or regional entities.

Closer cooperation and specialization are necessary, as most individuals actively working in these federations are volunteers with limited time to address various challenges, from ecological concerns (e.g., pesticide protection) to legislative matters (e.g., proposing legislative changes and lobbying at the European Commission or European Parliament levels).

Apimondia's Involvement in European Projects

Apimondia actively participates in European projects. The BeeGuards project, a four-year initiative, aims to provide sustainable management practices, novel breeding strategies, and digital and forecasting tools to help the beekeeping sector adapt to a changing environment. The B-Thenet project is a collaborative effort promoting sustainable beekeeping practices across Europe. Led by a network of 18 partners, it brings together beekeeper representatives and research institutions from 13 EU member states. Apimondia plays a dual role in this project, serving as both a national and international center.

Our work primarily involves discussions, organizing meetings and congresses, and preparing Position Papers. Some of our recent European activities include participation in EU Pollinator Week, The Technical Round Table of the HarmHoney Project or the first International Forum for Action on Sustainable Beekeeping and Pollination held in Slovenia. Apimondia has a longstanding collaboration with FAO on sustainable beekeeping, spanning over 60 years.

In March 2024, we organized an online Apimondia Webinar on invasive species. In June, the Apimondia Bee Health Symposium took place in Madrid. The Apimondia Statement on Honey Fraud will soon be updated with a Statement on immature honey. Apimondia is also a member of the EU Honey Platform and is actively engaged in EU beekeeping-related policy discussions. Our representatives participate in Copa-Cogeca's Working Party on Honey and meetings of major European beekeeping federations.

In March or April, Apimondia will organize a Honey Adulteration Hybrid Event in Italy.

Apimondia Congresses A Key Networking Tool

The main platform for beekeeper networking is Apimondia Congresses. On behalf of Scandinavian beekeepers, we invite you to participate in the 49th Apimondia Congress in Copenhagen, September 2025. The event will be jointly organized by beekeeper associations from Sweden, Norway, and Denmark. Our goal is to create a congress for bees, beekeepers, scientists, the industry, and people from around the world who care about bees, honey, and beekeeping.

The proposed Apimondia 2025 Congress program will feature Europe-focused round tables and workshops addressing key challenges in European beekeeping, changes in European legislation, and presentations on ongoing EU projects.

For more information on Apimondia activities, visit www.apimondia.org, where you can find links to our social networks, allowing you to watch video streams, read newsletters, download congress proceedings, and stay updated on the latest news. You can also follow updates on the world's largest beekeepers' meeting in Copenhagen at www.apimondia2025.com.

Robert Chlebo

Apimondia RC Europe


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THE DILEMMA WITH HONEY

Anyone who buys honey believes that it comes from bees. Last but not least because there is a requirement in Germany according to the Honey Regulation: Honey is nectar collected by bees and is then processed and matured in the bee colony. Nothing is taken from it or added to it.

But far from it: honey is now the third most counterfeit food in the world. Criminal activities in this area have been developing worldwide for decades. There are excesses that leave you speechless: At the 2019 Apimondia in Canada, 46% of honeys were disqualified from the traditional honey competition due to adulteration or excessive residues. In 2023, a study was published by the European Anti-Fraud Office: 46 % of the honeys were classified as "suspicious". The European Union therefore also took action

and reached an agreement in 2024. According to this agreement, the term “mixtures from EU/non-EU countries” belongs to the past. Instead, the honey platform was launched, which will also determine how we will test honey in the European Union in the future.

How does Germany ensure the quality of its honey?

Honey is only allowed to be removed from the bee colony if it has a water content of less than 20% - ideally less than 18% according to the guidelines of the German Beekeepers' Association.

The guidelines of the German Beekeepers' Association for “Real German Honey” set a stricter standard for harvesting honey. The “Genuine German Honey” brand was founded 100 years ago, in 1925 to be precise. The aim back then was to protect consumers from counterfeits, which at that time entered the market with so-called artificial honeys. They also wanted to distinguish themselves from foreign honeys. For the first time, the brand not only had a uniform label, but also standardized jars, lids and lid inserts. It is still popular up to now and saves resources: around 80% of the jars and lids purchased are being returned to their seller.

In addition, special care is taken to ensure that the “Echter Deutscher Honig” brand remains natural. Filtering the honey is prohibited.

The brand label is only allowed to be used by beekeepers who are members of the German Beekeepers' Association through their regional association and who have undergone special training about the subject ‘honey’. There is one small exception: it is possible for companies to market honey from beekeepers belonging to the German Beekeepers' Association centrally.

In addition, the German Beekeepers' Association carries out controls of the beekeepers. During the so-called brand control, beekeepers are asked to send their honey to the German Beekeepers' Association. Then the honey will be checked in the laboratory.

According to the Bavarian State Ministry of the Environment and Consumer Protection, methods that are established in official monitoring must undergo extensive validation in accordance with the requirements of Article 34 (4) of Regula-

tion (EU) 2017/625 on official controls. It is not possible to predict the extent of newly published analytical methods will pass these requirements.

A new and modern solution for honey quality and honey authenticity is currently being worked on with the participation of the European Beekeeping Federation in the so-called honey platform. Its main tasks are as follows:

- Collecting data on methods for improving honey authenticity checks, in particular methods for detecting adulteration in honey, with regard to their possible harmonization;

- To make recommendations for a European Union traceability system to trace honey back to the producer or importer;

Making recommendations on the possible need to update the compositional criteria and other quality parameters laid down in this Directive. The Honey Platform board consists of representatives of beekeepers' associations, national organizations, national authorities and laboratories. This honey platform will then propose the new guidelines on quality and authenticity to the EU Commission.

New methods to track down counterfeiters are long overdue. The new DNA analysis presented in the media is currently not permitted in Germany, which means that the alarming results of the recently published DNA analyses cannot be legally applied.

The media coverage has also clearly shown this. Quote: Until DNA analyses are also standard in Germany, the following suspicion remains when buying honey: “Honey from the supermarket might not be pure honey at all”.

The European honey market must be protected in the long term, far beyond the borders of the European Union. All European beekeepers produce a wonderful honey with their honeybees. Consumers must regain confidence in the quality of real honey and at least have no doubts when buying it.

Then honey consumption, which has fallen in Germany over the last 30 years from 1,300g per capita per year to just under 920g per capita per year, will at least rise again. If we succeed in increasing honey consumption and consumers would buy more local honey, we will have a honey-sweet future. In case we can stop honey counterfeiters and punish their actions.

Stefan Spiegl

EBA Vice-President
Vice president of the German Beekeepers Association (DIB)
President of the Bavaria Beekeepers Association

SERBIA, THE FIRST EUROPEAN COUNTRY TO DETECT ALL TYPES OF FOREIGN SUGARS ADDED TO HONEY!

As experts and well-informed beekeepers know, Europe currently lacks a reliable method or set of methods to detect absolutely all foreign sugars added to honey by skilled counterfeiters. There is an ongoing search for innovative methods to uncover these adulterations.Until now, laboratories in Serbia could not reliably detect foreign sugars derived from C3 plants, only those from C4 plants.

On April 20, 2023, after 15 years of research and development, the laboratory "Analab" from Pančevo successfully accredited a method to detect all sugars, including those derived from C3 plants. This was huge news not only for Serbian beekeeping but for the global beekeeping community. Scientific institutions from New York to Moscow, New Delhi, and Beijing took notice, and eventually, the United Nations included Analab in an international study. Their method proved dominant compared to other methods currently available on the planet. Thus, Serbia has positioned itself among the more technologically advanced countries in the world. After exactly 18 months and 3 days since SPOS - SFBO (Serbian Federation of Beekeeping Organization's) first requested the Ministry of Agriculture, Forestry, and

Water Management to confirm the accreditation of this method and include Analab on the list of authorized laboratories on January 27, 2025.

Analab is now officially authorized to verify the authenticity (naturalness) of honey in Serbia. Veterinary inspectors can now send official samples to Analab for analysis.This is a great day for Serbia and the entire world. Now we have something that practically no one else has. We thank the Minister of Agriculture for signing the decision today, as well as all other representatives of the Serbian government who participated in this process of progress for Serbia in detecting economic fraud in food production, specifically honey.

kMost of them attended the final meeting in the Government 6 days ago, including the Chief of Staff of the Prime Minister, advisors to the President of the Republic and the Prime Minister for agriculture, assistants to the Minister of Agriculture, the Director of the Veterinary Directorate, the Director of the Accreditation Body of Serbia, and others. We also thank NALED, which has supported us throughout the process of market regulation, from the early days of fighting counterfeit products to the construction of the "Our Honey" facility and up to today.Since beekeepers are generally unfamiliar with what C3 and C4 plants are (industrial plants processed to produce various types of sugars), we are publishing both groups of plants along with their laboratory result ranges:

C4 plants: corn, sugarcane, sorghum (δ13C from -9 to -14)

C3 plants: sugar beet, wheat, rice, potatoes, barley, rye, etc. (δ13C from -23 to -30)

By the way, many European beekeeping associations and three countries have shown interest in all three innovative methods currently available in Europe (though only the Serbian one is accredited so far). These include DNA methods from Estonia and Austria. They have sent a large number of honey samples from the market to all three laboratories, and a relatively quick implementation is expected.

The first major step has been completed. Now it is up to the state to fulfill the second part of the agreed set of measures to further combat fraudulent practices in honey production, as discussed at the Government meeting 6 days ago. This includes conducting a large-scale sampling campaign from all markets in Serbia to determine the current real situation, followed by continuous monitoring of the market, updating regulations, and improving the food safety system in the Republic of Serbia in the coming years.

ANA LAB

BEEKEEPERS UNSUNG HEROES IN THE BATTLE AGAINST INSECT DECLINE

Global insect decline

Over the last 50 years, insect populations have drastically decreased by up to 50%. On average, insect numbers decline by 2.5% annually, with 41% of species facing severe reduction or extinction. An estimated 5.5 million insect species exist, but only about 1.3 million have been identified. Many species will vanish from Earth without ever being recorded. As shown in Figure 1, nearly 70% of Caddisflies have disappeared, over 50% of the world's butterflies have perished, and almost half of all beetles and bees are also lost. Other affected insects include dragonflies, flies, and more.

The consequences of insect loss are catastrophic for the planet. Birds, reptiles, frogs, and fish rely on insects for food. Insects also break down organic matter into essential building blocks for the food chain. Bees, butterflies, flies, and beetles contribute to crop and wild plant pollination, forage and feed production for livestock, soil fertility, biodiversity, and overall ecosystem balance.

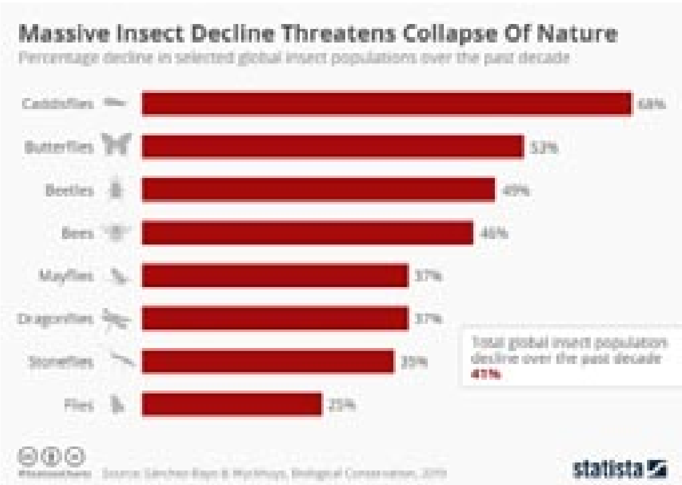

Figure 1. Insect losses over the past decade

Figure 2. Agrochemicals, urbanization, intensive farming, monocultures, invasive species, wildfires, floods, and climate change are all consequences of human activity, with insects as victims, leading to dramatic impacts on the ecosystem and our lives

Causes of Insect Loss

The primary cause of insect decline is human interference in ecosystems. Habitat destruction, urbanization, intensive agriculture, and monocultures are key factors (Figure 2). Humans also introduce widespread pesticides, insecticides, herbicides, fungicides, and other agrochemicals, which harm insects and even human health. Additionally, human activities have driven climate change, extreme temperatures, air and water pollution, and light pollution. These factors collectively contribute to significant insect losses. The slogan "Save the insects, save the bees" should evolve into "Don't kill the insects, don't kill the bees."

Bee Losses

Beekeepers experience significant annual hive losses due to human activities, especially from pesticide poisoning. The damage extends beyond direct toxicity from crop protection chemicals. Chronic toxicity from sublethal concentrations contaminates stored pollen, propolis, and wax, disrupting bee communication, reducing their sense of smell, impairing foraging abilities, disorienting them, and causing memory loss in foragers. It also reduces egg-laying, kills brood, raises queen replacement rates (up to 60%), suppresses immunity, and predisposes bees to diseases and other problems.

Wild bees face greater challenges. In addition to the issues affecting honeybees (Apis mellifera L.), wild bees struggle with habitat loss. Formerly, fallow lands and uncultivated areas provided nesting grounds for non-social insects. However, intensive farming and indiscriminate chemical use have drastically reduced nesting spaces and insect populations. For instance, glyphosate, an active ingredient in many common herbicides, kills ground-nesting bumblebees and wild bees by 96% within 24 hours.

Figure 3 illustrates the rapid decline in bee populations from the early 1990s to 2017 in the

Figure 3. The number of bee colonies in the U.S. declined sharply from 1990, with a slight recovery observed after 2007
ecosystem and our lives

U.S. Losses have been attributed to multiple and unknown factors, collectively termed "Colony Collapse Disorder." However, intensive land use, monocultures, extensive pesticide use, and different beekeeping practices in the U.S. compared to Europe must be considered.

The Beekeeping Paradox

Despite significant bee population declines, official statistics show an increase in hives. Figure 4 demonstrates the upward trend in bee populations from 1960 to 2017, with a notable decline between 1987–1990 likely due to Varroa mite infestations during the first decade after its invasion in Europe.

Figure 5 shows hive numbers in European countries for 2019 (blue), 2020 (red), and 2021 (green), with most countries showing an upward trend. EU hive numbers increased from 16,965,604 in 2016 to 18,926,625 in 2020, surpassing 20 million in 2021. The average annual increase in Europe is 1.9%. In Greece, hive numbers rose from 1,450,000 in 2019 to 1,620,000 in 2020 and 2,180,000 in 2021.

The paradox is that the annual losses of bees are not disputed, nor is their simultaneous annual increase. In most countries of the European Union, there is an official annual recording of bees. Electronic National Beekeeping Registers are already in place, where officials from each state visit apiaries and record the number of bees after thorough inspections, from the beginning of September to the end of December each year. This minimizes the possibility of errors or false declarations.

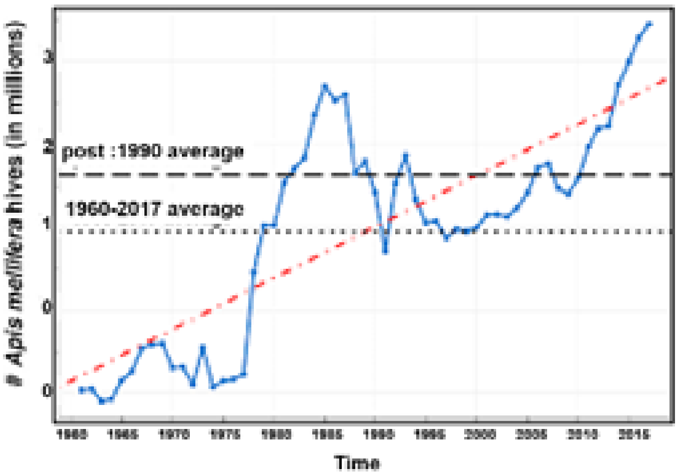

Figure 4. The upward trend in the increase of bee colonies from 1960 to 2017 (data from FAO, uploaded by Thomas Wood).

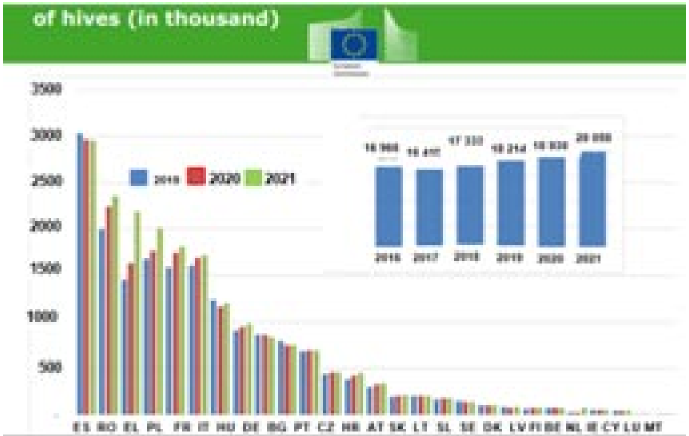

Figure 5. The number of bee colonies in European countries during 2019–2021. The inset chart shows the increase in bee colonies from 2016 to 2021.

Explaining the Paradox

The paradox lies in simultaneous hive losses and increases. Beekeepers compensate for losses by multiplying surviving hives. However, this effort reduces honey production, as splitting strong hives for multiplication weakens them. Strong hives are the most productive, and dividing them reduces their strength.

Globally, 41% of insects have been lost in the past decade, including 46% of bees. The term "bees" encompasses all 20,000 bee species, not just the common Apis mellifera.

Wild bees, which include solitary, aggregative, semi-social, and social species, are particularly vulnerable. Most wild bees nest in soil,

tree cavities, and crevices, with few species artificially managed by humans.

Wild bees are entirely unprotected and directly impacted by human intervention and climate change, leading to rapid population declines. Figure 6 shows the floods in Thessaly following the catastrophic Daniel storm in 2023, which drowned 110,000 hives and burned another 2,800 hives in the area of Evros the same year. All wild bees in these areas were lost permanently due to their inability to recover or reproduce, unlike managed bee colonies which were replaced by beekeepers. If not for beekeepers replenishing Apis mellifera hives, global bee loss rates would exceed the current 46%.

Figure 6. Bee colony losses due to floods in the Thessaly region. The destruction of wild bees was total

This activity of beekeepers remained unnoticed and was not highlighted as it should have been. This may also be due to the questionnaires distributed annually to beekeepers by research entities and organizations. These questionnaires mainly ask beekeepers to report losses of bee colonies due to diseases or other causes. Almost none of them include questions that emphasize the efforts of beekeepers to replenish losses and restore the number of their lost colonies.

From Decline to Resilience: Beekeepers as Stewards of Nature's Pollinators

Insects are continuously declining due to human intervention, and so are unprotected bees. Unprotected bees are wild bees, which are neither protected nor artificially bred by humans. On the other hand, common honey bees, despite suffering significant losses, are increasing in numbers. This is because beekeepers act as their protectors.

Beekeepers are the ones who remove beehives from areas treated with pesticides, who tirelessly advocate and raise awareness about the dangers of chemical poisons released into the environment, and who replace the losses of hives that are destroyed.

Few other groups of people fight as persistently as beekeepers to save insects from human intervention, limit pesticide use, and mitigate the impacts of intensive farming.

Common honey bees may be the only insect species on the planet that is not declining but rather remains stable or is increasing, and this is entirely thanks to beekeepers. Beekeepers have a critical role in preserving pollinators .

How unfair it is to claim that, beekeepers exploit bees, mistreat them, kill them, or remove them from their natural environment. Equally unfair is the argument that wild bees are declining due to competition with common honey bees. On the contrary, beekeepers are the ones who protect and preserve bees, enabling them to fulfill their magnificent role in pollination. Bees will disappear if they lose the protection provided by beekeepers.

According to the European Parliament resolution of 2018 (C 129/25), bees contribute €14.2 billion annually to the European Union economy. In contrast, the European Commission allocates only €36 million to national beekeeping programs—a sum that represents just 0.25% of the bees' economic contribution. This is the reality.

Beekeeping organizations must highlight the efforts made by beekeepers to protect and replenish bee populations. These efforts deserve recognition and financial support, as they are carried out at the personal expense of beekeepers, often at the cost of their own economic expectations. Acknowledging the role of beekeepers is vital for maintaining bee populations and the ecological balance they sustain. Beekeepers and Bees are partners in Protecting our planet's Future

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VARROA REINFESTATION

THE THIRD "R" CONCERNING TREATMENTS

It's quite frequent to hear reports from beekeepers who credibly claim to have done a proper summer treatment but find extremely high numbers of varroa mites after a winter treatment. Or even damaged colonies from the mite. That's usually due to varroa reinfestation. This happens by drifting of workers from highly infested colonies or by robbing. In the latter case, workers from strong colonies enter weaker colonies to rob their stores. In both cases, varroa mites from one colony get into another one. Re-infestation it's called because the mites come back (which is said by the prefix re-) after a treatment.

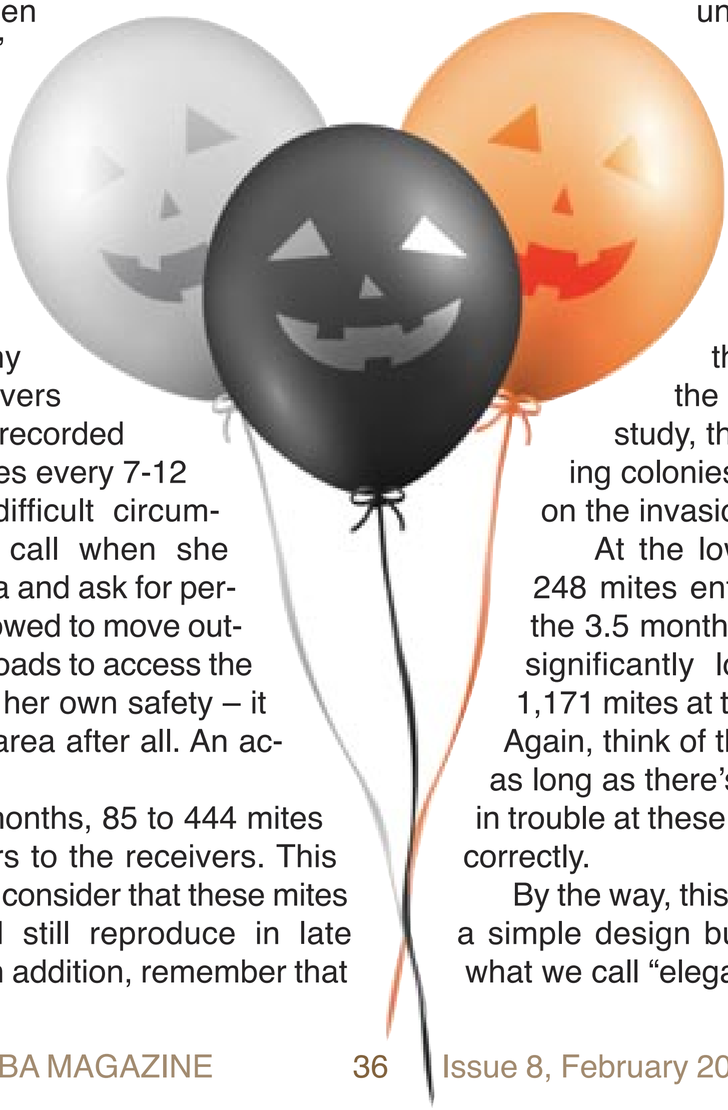
High colony density is a risk factor for reinfestation. And by the way, this is also the reason why I sometimes spend quite a bit of time searching for a good apiary site in clinical studies. It's another reason to coordinate treatments in regions with many beekeepers – besides avoiding resistance against varroa treatments.

The effect of varroa reinfestation

How many mites can enter honey bee colonies by such reinfestation events wasn't clear for quite a while. My colleague Eva Frey worked on this during her doctoral thesis. She worked on a quite unusual place: A military training area.

This area isn't accessible to the public usually, so it was isolated from other beekeepers. It's also a quite vast area, so ideal to study varroa reinfestation in isolated conditions.

She placed four heavily infested “mite donors” in this area. Then they put 10 “receiver” colonies in 1-1.5km distance. The receivers were continuously treated against varroa to monitor the incoming varroa mites. From August to October, she assessed the colony strength of the receivers every three weeks and recorded the invading varroa mites every 7-12 days. All this under difficult circumstances: She had to call when she wanted to enter the area and ask for permission. She wasn't allowed to move outside some designated roads to access the colonies. Obviously for her own safety – it was a military training area after all. An active one.



During these two months, 85 to 444 mites made it from the donors to the receivers. This may not seem a lot. But consider that these mites enter brood cells and still reproduce in late summer and autumn. In addition, remember that the infestation doubles every month as long as there is brood. So, this number would have increased if these receiver colonies hadn't been treated continuously. The other interesting finding was to see that 1-1.5km of distance didn't protect the receiver colonies. So, your neighbours, even if they're not immediately next door, can give… some naughty “present”.

Too many honey bee colonies?

I already mentioned that colony density in an area can favour varroa reinfestation. Eva also studied this in more detail. This time, she placed honey bee colonies in two areas, 14 at each site. In one area, there was a high colony density, in the other this density was lower. However, these were more realistic management conditions than found in the military training area, for sure. At each apiary, she treated half of the colonies continuously, like in the study before. The other half was treated before the experiment and then left untreated until its end.

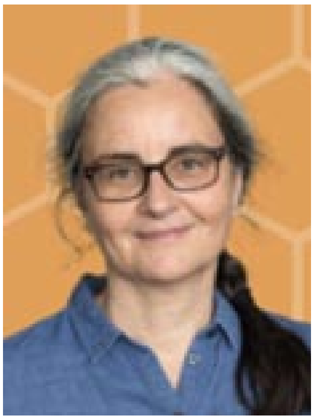
From end of July to November – this time without the risk of being shot – she monitored the colonies. Again, she monitored the colonies regularly during this period. In contrast to the distance in the previous study, the number of neighbouring colonies had a significant effect on the invasion rates of mites.

At the low density apiary, 72 to 248 mites entered the colonies over the 3.5 months of the study. This was significantly lower than the 226 to 1,171 mites at the high density apiary… Again, think of the doubling each month as long as there's still brood. We can get in trouble at these places, even if you treat correctly.

By the way, this kind of experiment, with a simple design but highly informative, is what we call “elegant” in science.

Dr. Claudia Garrido

BeeSafe – Bee Health Consulting for Agriculture and Veterinary Medicine



This article was published as a blog post on www.bee-safe.eu

Drifters or robbers?

Let me finish with another study which looked at the main cause for this phenomenon. As I said, both drifting and robbing can cause reinfestation. In this study, the researchers placed six colonies with very low infestation around a cluster of highly infested colonies. They then observed the movement of the bees between the colonies and their mite levels. The highly infested colonies collapsed during the study and they could see that this was the moment when the mites began to arrive in the low infested colonies. Therefore, robbing seems to be the more important cause for reinfestation than drifting.

Why this is important for practical beekeeping? Well, because varroa reinfestation can hit even those who treat correctly, as I already mentioned at the beginning. It's important to understand that good practices, in this case treating against varroa, affect also others. Varroa reinvasion is also one of the reasons why I'm not that convinced about resistance breeding. But that's for next time.

WINTER SURVIVAL

OF INDIVIDUAL HONEY BEES AND HONEY BEE COLONIES DEPENDS ON LEVEL OF VARROA INFESTATION

Abstract

Background: Recent elevated winter loss of honey bee colonies is a major concern. The presence of the mite Varroa destructor in colonies places an important pressure on bee health. V. destructor shortens the lifespan of individual bees, while long lifespan during winter is a primary requirement to survive until the next spring. We investigated in two subsequent years the effects of different levels of V. destructor infestation during the transition from short-lived summer bees to long-lived winter bees on the lifespan of individual bees and the survival of bee colonies during winter. Colonies treated earlier in the season to reduce V. destructor infestation during the development of winter bees were expected to have longer bee lifespan and higher colony survival after winter.

Methodology/Principal Findings: Mite infestation was reduced using acaricide treatments during different months (July, August, September, or not treated). We found that the number of

capped brood cells decreased drastically between August and November, while at the same time, the lifespan of the bees (marked cohorts) increased indicating the transition to winter bees. Low V. destructor infestation levels before and during the transition to winter bees resulted in an increase in lifespan of bees and higher colony survival compared to colonies that were not treated and that had higher infestation levels. A variety of stress-related factors could have contributed to the variation in longevity and winter survival that we found between years.

Conclusions/Significance: This study contributes to theory about the multiple causes for the recent elevated colony losses in honey bees. Our study shows the correlation between long lifespan of winter bees and colony loss in spring. Moreover, we show that colonies treated earlier in the season had reduced V. destructor infestation during the development of winter bees resulting in longer bee lifespan and higher colony survival after winter.

Funding: The project was funded by Ministry of Agriculture, Nature Conservation and Food Quality (LNV) of the Netherlands and by the European Union (project numbers NP11/2.1, NL08/2.1, BO-06-012-001, and BO-12.03-007-001). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Introduction

The parasitic mite Varroa destructor is considered to be one of the main causes for colony losses in honey bees (Apis mellifera L.) [1–4]. For example, the total number of honey producing colonies in the U.S. was reduced by 1.560.7% (mean 6 s.e.) per year since the introduction of V. destructor, while the decrease per year used to be on average 0.0660.5% [1]. This decline reflects the loss of colonies as well as the decline in number of beekeepers due to increased expenses and efforts needed to combat mite infestations [1,5]. Although there is a general agreement that there is no single explanation for the extensive colony losses, and that interactions between different stresses are likely to be involved, the presence of V. destructor in colonies places an important pressure on bee health [2]. V. destructor reduces the body weight and protein content of individual bees, which is found to shorten their lifespan [6–8]. This is especially important during winter in temperate regions when long lifespans are a primary requirement to survive until the next spring and to nurse the first brood [7,8]. In the temperate regions, the main colony losses due to V. destructor occur during winter [8]. Nowadays, winter losses are often up to 20% or more in many areas [1,3], while twenty years ago, 5 to 10% colony losses during winter were common [2].

In temperate regions, the number of bees and brood in a colony increase between April and July and decrease between August and October [9]. However, the main peak of the number of bees and brood occur earlier in the season than the peak of mite abundance [10,11]. Hence, mite infestation strongly increases during the period in which the number of bees and brood decrease [9] (Figure 1), resulting in an increasing number of brood cells infested with V. destructor over time. It is exactly during these months of reduction in the number of brood and rapid increase in mite infestation, that bees hatching from this highly infested brood will become winter bees [9,12].

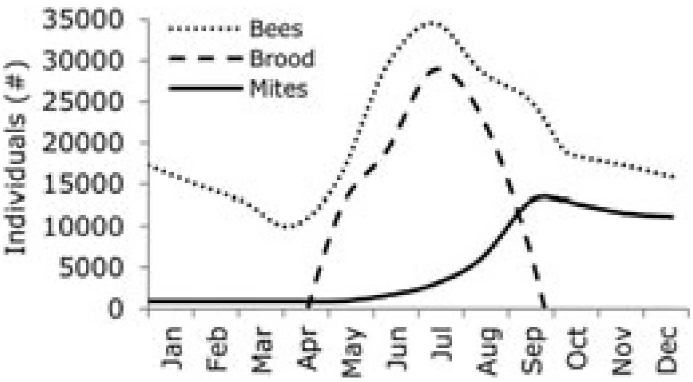


Figure 1. Colony development for adult bees, worker brood, and Varroa destructor mites. The daily number of individual adult bees (dotted line) and worker brood (striped line) was modelled over one year. The number of mites (solid line) was modelled as being the second year of mite infestation with a starting population of 100 mites in the first year. Figure was redrawn from Martin [9].
doi:10.1371/journal.pone.0036285.g001

Adult bees, which are infested by V. destructor as pupae, do not fully develop physiological features typical of long-lived winter bees compared with non-infested workers [6–8], making it unlikely for them to survive until spring and contribute to the build-up of the colony in early spring [2]. To date, however, the relation between the lifespan of individual bees and colony losses for different levels of V. destructor infestation has not been tested.

When the European honey bee (Apis mellifera) was moved to areas where the Asian honey bee (A. ceranae) was endemic, V. destructor switched to A. mellifera and spread nearly worldwide [2,4]. During the first years after its introduction in Europe and North America, V. destructor could be easily controlled and be kept below damaging infestation levels by one to two acaricide treatments per year. However, colony losses have recently started to increase drastically, despite the development of more intensive acaricide treatments [1,2]. Absence, poor timing and poor application of acaricide treatment have been reported to be important causes for honey bee colony loss [13,14]. Especially when honey is harvested at the end of the bee season in temperate regions, acaricide treatments are often postponed until after the harvest to avoid residues in honey. However, the mite population has often already reached injurious levels at this time, namely the time that winter bees are produced (Figure 1). Consequently, timing of acaricide treatment in the second half of the summer season (July to September) may thus affect winter survival of the colony.

In this study, the effect of different levels of V. destructor infestation during the transition from short-lived summer bees to long-lived winter bees on the lifespan of individual bees and the survival of bee colonies during winter was investigated. We manipulated the level of V. destructor infestation by reducing the number of mites using acaricide treatments at different times (during July, August, September, or not treated), resulting in increased mite fall directly during acaricide treatment and in reduced V. destructor infestation level in the months after this treatment (Figure 2 gives the expected infestation levels for different treatment moments). We expected a longer lifespan of bees in colonies treated earlier in the season, as low infestation levels during the development of winter bees should benefit the lifespan of these bees compared to colonies treated later in the year or not at all. Consequently, colonies with relatively low V. destructor infestation during the development of winter bees are expected to have higher colony survival during or after winter. The experiment was performed in two consecutive years as environmental conditions such as weather or food resources are expected to also affect winter bee development and colony survival.

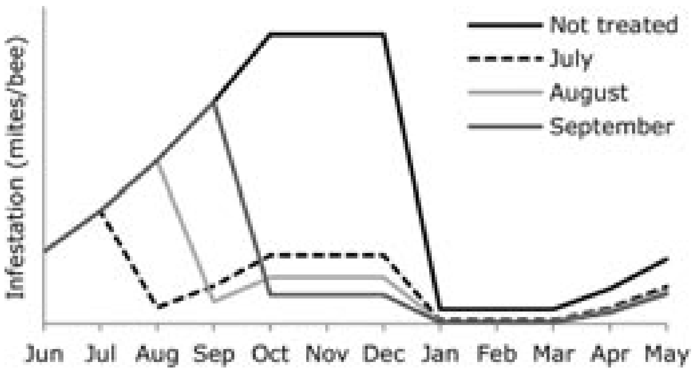


Figure 2. Expected infestation levels of Varroa destructor manipulated using acaricide treatment. Infestation levels of V. destructor (mites/bee) were manipulated using acaricide treatment applied at different moments (July, August, September or not treated at all). For the expected mite infestation, we used a simplified curve from mite infestation in Figure 1, with an exponential increase in mite infestation until October, after which the infestation remained equal. Efficacy of the acaricide Thymovar (July, August, September) was assumed to be 90%, while efficacy of oxalic acid (December) was assumed to be 95%. doi:10.1371/journal.pone.0036285.g002

Materials and Methods

Experiment

The fieldwork took place in 2005/2006 and 2006/2007 at an apiary of Wageningen UR, The Netherlands (51u59932.350N, 5u39946.810E). Colonies (N = 24) were kept in one-story wooden hives with 10 frames and contained brood in all developmental phases. In the first year (2005/2006), mite fall was monitored in the colonies for one week in July. The colonies with the lowest daily mite fall (2.960.78, N = 6) were used to represent the low V. destructor infestation from July onwards. The remaining colonies were randomly allocated to 3 groups: treated in August, treated in September, or not treated at all. The mean daily mite fall in these groups did not differ from each other (overall mean daily mite fall 18.863.5, N = 18), but were all higher compared to the colonies with low infestation from July onwards (daily mite fall was Log10- transformed, Anova, F3,20= 9.31, P,0.001, Sidak post hoc test). In the second year (2006/2007), colonies were randomly allocated to 4 groups: treated in July, treated in August, treated in September, or not treated at all. Colonies were treated with the acaricide Thymovar^{R} during three weeks in the allocated month. The experiment in the second year was performed with new colonies. Colonies that became queenless or swarmed were removed from the study.

Daily mite fall in debris was monitored to give an indicative efficacy of the Thymovar^{R} treatment during and after the treatment periods, starting in August. Outside these periods, mite fall was counted once a week (trapping period of 4 days with a bottom board) to get an indication of the infestation level. In winter (November/December), when there was no more brood, all colonies were treated with an oxalic acid solution (trickling, 37 gr oxalic acid dihydrate in 1 L sugar water, 1:1 weight ratio for sucrose: water). Mite fall was counted after trapping for one week continuously following the oxalic acid treatment. Thereafter, mite fall was monitored every two weeks (trapping period of 2 days).

Counting mite fall has been shown to be effective to estimate the population of mites [15,16].

In half of the colonies of each experimental group, the number of capped brood cells was estimated by superimposing a grid with 2.562.5 cm squares over the brood area. Solid squares were counted directly and partial squares estimated. The number of brood cells was then calculated from the number of grids multiplied by 25 brood cells (we counted 400 cells in one dm2). Brood was measured every two weeks from mid-August until midNovember. During 2006/2007, due to the high winter temperatures, brood measurements were continued every month until mid-April.

Every fortnight, cohorts of approximately 100 newly emerged bees were marked with a unique colour (colour marker Posca) and returned to their original colony. In 2005 marking cohorts started in July, resulting in eight cohorts in four (out of six) colonies per treatment. In 2006 marking started in August, resulting in seven cohorts in four (out of six) colonies per treatment. Marking cohorts was stopped at the beginning of Novem-

ber in both years. At equal intervals, the presence of bees from previously marked cohorts was recorded. Based on the unique colour the age of the bees could be determined. Recording cohort survival continued until mid-April the following year or until no more marked bees were observed. If colonies could not be examined during winter, it was assumed that worker mortality was constant.

After winter in April, the size of the colony was estimated by counting the number of frames with bees. Non-surviving colonies had zero frames with bees.

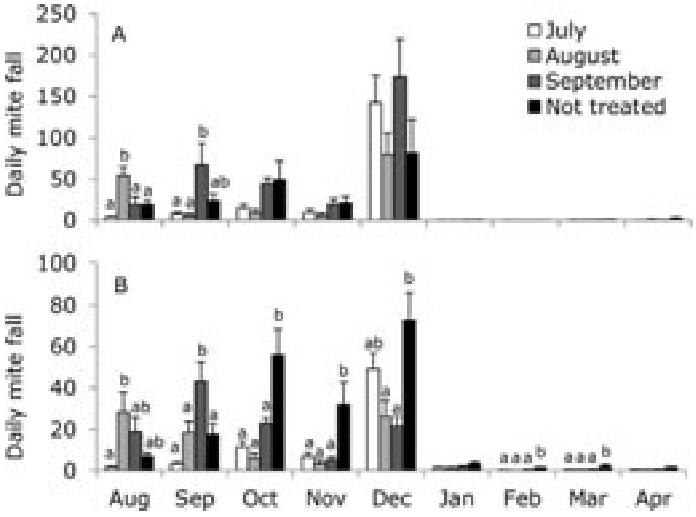


Figure 3. Mean daily mite fall in 2005/2006 (A) and 2006/2007 (B). Colonies were treated with ThymovarH in July (white bars), August (grey bars), September (dark grey bars), or not treated at all (black bars). All colonies were treated in December using oxalic acid (3%). Letters denote significant differences between treatments within each month. No letters mean no significant differences between treatments were found. Differences between months were not given.
doi:10.1371/journal.pone.0036285.g003

Statistics

To test whether the weather differed between the two years, the differences in ambient temperature were tested with a paired t-test (paired for month) for the period July–November and the period December–April separately in 2005/2006 and 2006/2007.

Mean daily mite fall per colony was calculated per month. Repeated measures ANOVAs were used to test mite fall for 2005/ 2006 and 2006/2007 separately, as mean daily mite fall in one month was assumed to be correlated to mean daily mite fall in the previous month. Sidak posthoc tests were used for pair wise comparison of differences between means. In 2005/2006, one colony from the group treated in September was excluded from the analysis due to missing data on mite fall for several months. One colony (treated in September) missed data on mite fall only in August. We interpolated this missing data in August using data from another colony, which was selected based on similar mite fall in September. Two colonies of the group that was not treated lacked data in March and April due to mortality of these colonies. To be able to use the Repeated measures ANOVA, we estimated the mite fall in these colonies to be similar to the highest mite fall found in the months March and April for all treatments. Slight changes in the estimated mite fall (approx. 10%) did not qualitatively change the results. Final number of colonies used in the Repeated measures ANOVA for mite fall in 2005/2006 were 6 (treated in July), 7 (treated in August), 5 (treated in September), and 5 (not treated).

In 2006/2007, in total 11 colonies were excluded from the analysis for mite fall due to missing data on mite fall for several months: two colonies in the group treated in July, two in the group treated in August, one in the group treated in September, and eight in the group that was not treated. All these excluded colonies were lost between October and November 2006, possibly due to high V. destructor infestation. To test whether excluded colonies showed higher mite fall until October than the remaining colonies, we used the Repeated measures ANOVA for mite fall in August to October, for excluded colonies (N = 11) and colonies still in the experiment (N = 24). Final number of experimental colonies used in the Repeated measures ANOVA for mite fall in 2006/2007 was 7 (treated in July), 6 (August), 6 (September), and 5 (not treated).

We calculated the survival rate for each cohort of bees marked in a colony, using survival analysis with Cox Proportional Hazards Models for treatment (timing of acaricide application), for the number of days since the cohorts were

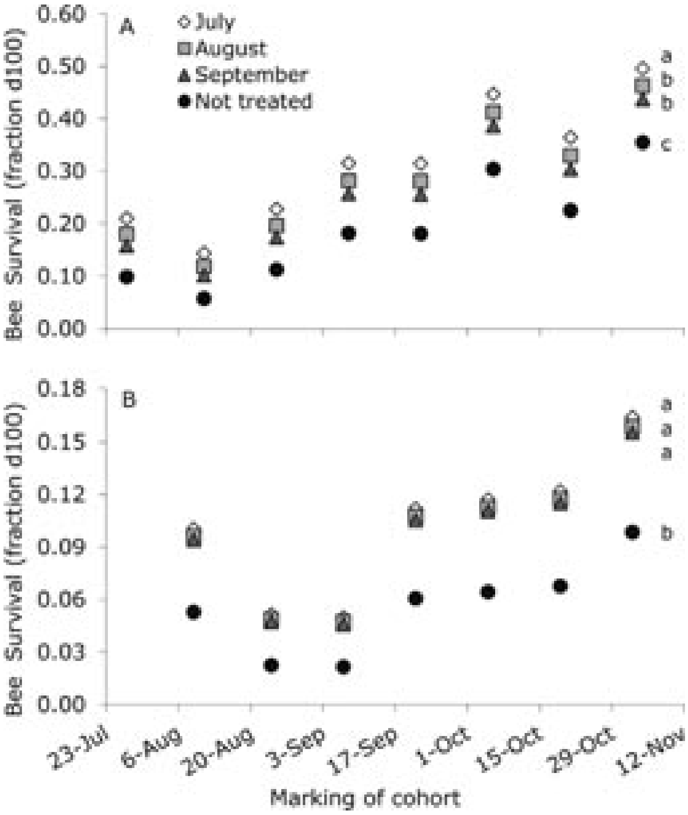


Figure 4. Bee survival as a function of time and treatment in 2005/2006 (A) and 2006/2007 (B). Bee survival (fraction d100) was the predicted fraction of bees that was still alive at the age of 100 days, and calculated using a Cox Proportional Hazards Model. Time was the marking date of the cohort (scatterplot). Different months of acaricide application show the treatments, where letters denote significant differences (over all marking dates). doi:10.1371/journal.pone.0036285.g004

marked (is equal to the day the bees in that cohort were born), and for 2005/2006 and 2006/2007 separately. In addition to testing the differences between treatments and the differences over time, the Cox Proportional Hazards Model was used to predict the fraction of bees in a cohort that is still alive (in statistical terms this is called the predicted survival probability) at a certain age of the cohort, from here onwards called 'bee survival'. To compare treatments over time, we calculated bee survival at 100 days (fraction of bees still alive at the age of 100 days). As summer bees only live for about 35 days, while winter bees live for about 135 days [12] or 150 days [17], we assume that bees that are alive after 100 days are winter bees. Low bee survival at 100 days means that the mean lifespan of the bees in the cohort is short. Consequently this means for winter bees that fewer bees will survive until spring and be able to contribute to spring development of the colony. To test whether bee survival at 100 days differed between 2005/2006 and 2006/2007, Repeated measures ANOVA was used. As the days the cohorts were marked did not coincide perfectly between the years, we paired the days most similar for both years (maximum difference was 2 days) and excluded the cohorts marked in July 2005 (no cohorts were marked in July 2006). Additionally, as we had only one mean value per day of marking per treatment, the treatments were pooled (N = 4 per day of marking).

Repeated measures ANOVAs were used to analyse the change in the number of capped brood cells over time in 2005/2006 and 2006/2007 separately. When colonies were lost during the experiment, brood measurements of other colonies within the experiment were used to continue the brood measurements. In 2005/2006, capped brood cells were counted from August to November and in April. Between November 2005 and April 2006, actual counts of capped brood cells were suspended due to cold temperatures and dense clustering of bees. The final number of colonies for counting capped brood cells was 3 for colonies treated in July, 3 for colonies treated in August, 2 for colonies treated in September, and 3 for colonies that were not treated. In 2006/ 2007, brood cells were counted continuously from August to April. The final number of colonies for counting capped brood cells was 4 for colonies treated in July, 3 for colonies treated in August, 3 for colonies treated in September, and 3 for colonies that were not treated.

To test whether the fraction of winter bees in a cohort increased during the decrease of brood in autumn we used a General Linear Model. Mean bee survival at 100 days of the different treatments (timing of acaricide application, fixed factor) was tested as a function of the number of brood cells (as covariate) for 2005/2006 and 2006/2007 separately. Possible interactions between treat ments in relation to the decrease in brood were added to show differences in the rate of change in bee survival. Sidak posthoc tests for

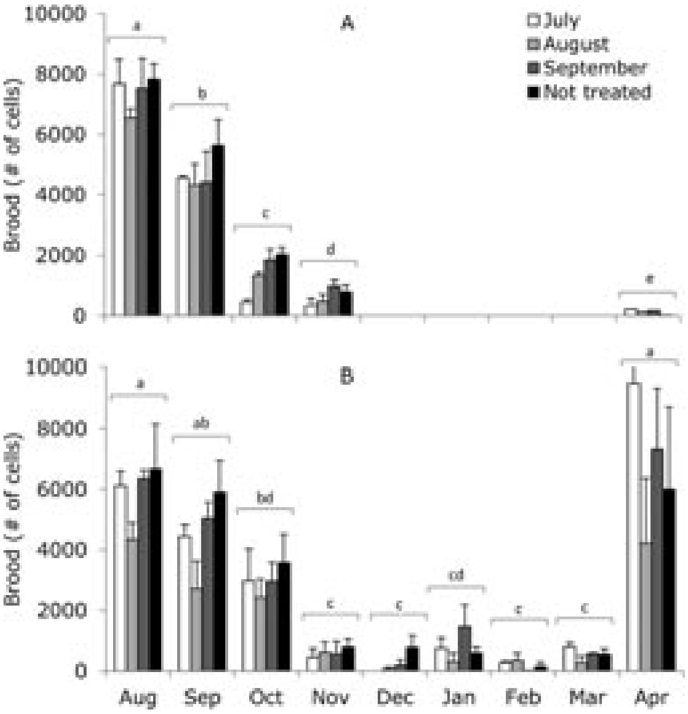


Figure 5. Mean number of capped brood cells in 2005/2006 (A) and 2006/2007 (B). Colonies were treated with ThymovarH in July (white bars), August (grey bars), September (dark grey bars), or not treated at all (black bars). Number of capped brood cells between December 2005 and March 2006 were not measured due to cold winter temperatures. Letters show significant differences between months. doi:10.1371/journal.pone.0036285.g005

pair wise comparison were used to test for differences between treatments.

To test the differences in colony size in April between the treatments, we calculated the mean fraction of frames that was occupied with bees in April using a Generalized Linear Model. If a colony had died before April, the number of frames occupied by bees was zero. The mean fraction of frames was estimated with the number of occupied frames in April as dependent variable and the 10 frames that were available in each hive as fixed number of trials (binomial distribution and logit link function).

Sidak posthoc tests for pair wise comparison were used to test differences in the mean fraction of frames between treatments.

A Pearson correlation was used to test if there was a correlation between bee survival at 100 days for the cohort that was marked (born) in November and the fraction of frames occupied with bees in April.

Results

Ambient temperature

The mean ambient temperature during summer and autumn (July–November) in The Netherlands did not differ between 2005 (14.061.9uC) and 2006 (15.962.2uC; paired t-test: t4= 22.38, P = 0.08). Mean temperature between December 2005 to April 2006 was however lower (4.361.3uC) than between December 2006 and April 2007 (8.161.3uC; paired t-test: t4= 27.35, P,0.01).

Acaricide treatment effectiveness (mite fall)

In 2005/2006, mean daily mite fall differed between the treatments per month (Repeated measures ANOVA: treatment F3,19= 2.76, P = 0.07; month F8,152= 32.87, P,0.001; treatment6 month F24,152= 2,39, P = 0.001; Figure 3A). As can be expected, mean daily mite fall in August was highest for colonies treated in August, and highest in September for colonies treated in September. In 2006/2007, mean daily mite fall also differed between the treatments per month (Repeated measures ANOVA: treatment F3,20= 7.63, P = 0.001; month F8,160= 41.38, P,0.001; treatment6month F24,152= 8.17, P,0.001; Figure 3B). Again, daily mite fall in August was highest for colonies treated in August, and highest in September for colonies treated in September. Daily mite fall for colonies that were not treated remained high during the year. In 2006, colonies that were lost between October and November and excluded from the analysis above indeed showed higher daily mite fall (overall 38.764.9) than colonies included in the analysis (overall 18.663.3), where the daily mite fall increased with time (month), but more for the colonies excluded than for colonies included in the analysis (Repeated measures ANOVA: in/ excluded F1,33= 11.33, P = 0.002; month F1,33= 13.82, P = 0.001; in/excluded6month F1,33= 5.59, P = 0.02).

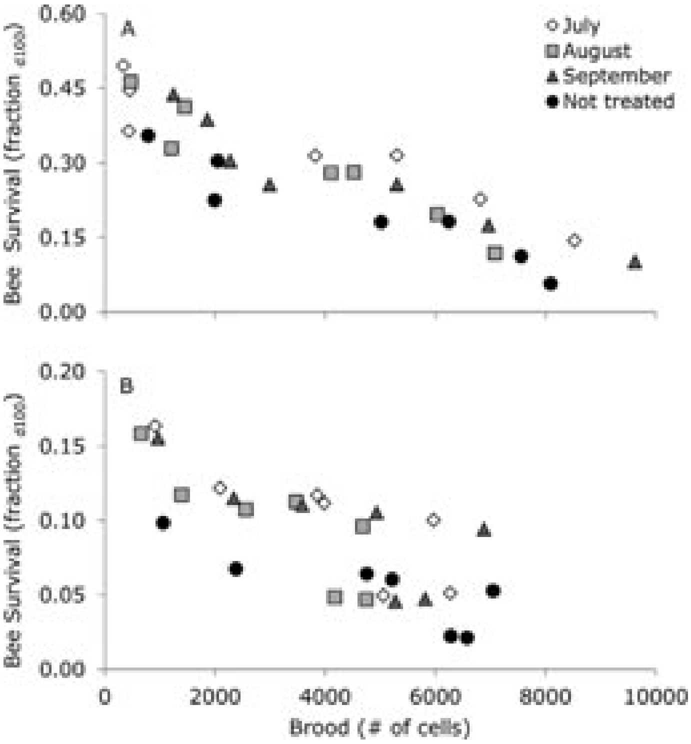


Figure 6. Bee survival as a function of brood in 2005/2006 (A) and 2006/2007 (B). Bee survival (fraction d100), the predicted fraction of bees that was still alive at the age of 100 days, as function of the number of capped brood cells for the different months of acaricide application. Symbols show means per marking day. doi:10.1371/journal.pone.0036285.g006

Bee survival

Mean survivorship curves for marked cohorts of bees are shown in Figure S1. For the survival analysis, the Cox Proportional Hazards Models used 6398 uncensored cases and 353 censored cases for 2005/2006, and 8458 uncensored cases and 600 censored cases for 2006/2007. The cumulative survival curves for the different treatments over time clearly showed a lower bee survival in colonies that were not treated compared to all other treatments in both 2005/2006 (Wald = 123.2, df = 3, P,0.001) and 2006/2007 (Wald = 87.2, df = 3, P,0.001; Figure S2). We found that the cumulative survival increased with time in both 2005/2006 (Wald = 435.1, df = 6, P,0.001) and 2006/2007 (Wald = 200.4, df = 6, P,0.001; Figure S2), suggesting an increasing fraction of winter bees in the cohorts. Bee survival at day 100 (fraction of bees still alive at the age of 100 days) was predicted by the model as a function of time and treatment in 2005/2006 and 2006/2007 (Figure 4). For both 2005/2006 and 2006/2007, using day 50, 75 or 120 did not qualitatively change the results. When marked in 2005, bee survival at 100 days was higher than in 2006 from August 24th onwards (2006, coinciding with August 25th for 2005), and this difference became larger towards the end (Repeated measures ANOVA: year F1,21= 805.70, P,0.001; marking day F6,21= 13.83, P,0.001; year6marking day F6,21= 29.31, P,0.001). For example, from bees that emerged on November 4th 2005 4463% was still alive at an age of 100 days, while from bees that emerged on November 2 nd 2006 only 1461% was still alive at an age of 100 days.

Colony development (brood)

In 2005/2006, the number of capped brood cells decreased between August and November (Repeated measures ANOVA: treatment F3,7= 1.59, P = 0.28; month F4,28= 223.65, P,0.001; treatment6month F12,28= 1.20, P = 0.33; Figure 5A). Brood rearing had not yet shown the expected spring increase in April 2006 for any of the treatments. In 2006/2007, the number of capped brood cells also decreased between August and November (Repeated measures ANOVA: treatment F3,9= 3.89, P = 0.05; month F8,72= 38.25, P,0.001; treatment6month F24,72= 1.20, P = 0.38; Figure 5B). Brood rearing continued at a low rate during winter and was much increased in April 2007 for all treatments. Although the Repeated measures ANOVA showed a borderline significant effect of treatment for 2006/2007, the Sidak posthoc test did not show differences between treatments (the number of capped brood cells for colonies treated in July was almost higher than brood for colonies treated in August, Sidak P = 0.08).

Bee survival in relation to number of capped brood cells

In 2005/2006, bee survival increased with a decrease in number of capped brood cells (General Linear Model: treatment F3,23= 6.52, P,0.01;

brood $F_{1,23}$= 162.39, P,0.001; Figure 6A; if the interaction was included, then both the interaction between treatment6brood and the main effect treatment were not significant). In relation to brood, there was a lower bee survival for colonies that were not treated than for colonies treated in July or September, but not lower than colonies treated in August. In 2006/2007, bee survival also increased with a decrease in number of capped brood cells (General Linear Model: treatment $F_{3,23}$= 3.60, P,0.05; brood $F_{1,23}$= 38.59, P,0.001; Figure 6B; if the interaction was included, then both the interaction between treatment6brood and the main effect treatment were not significant). There was a lower bee survival for colonies that were not treated than for colonies treated in July, but not compared to colonies treated in August or September.

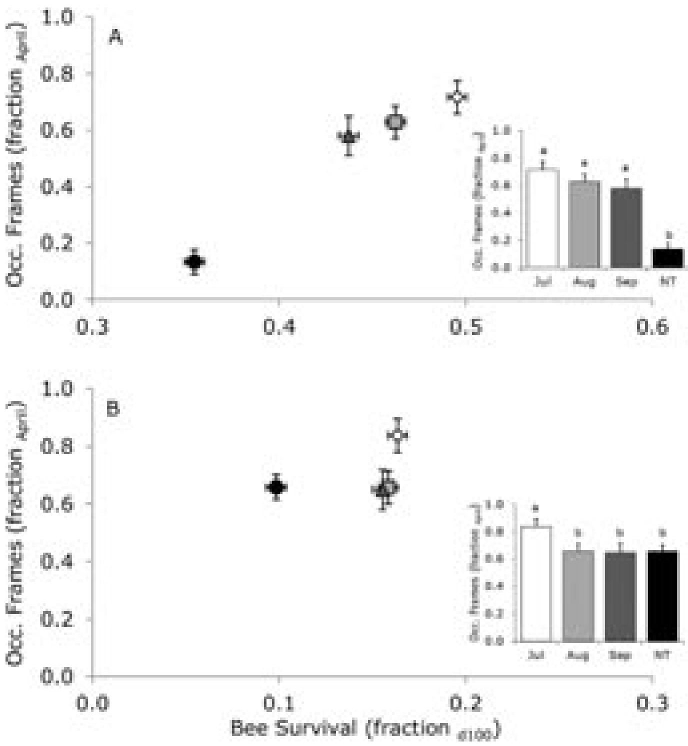


Figure 7. Winter survival as a function of bee survival in November 2005 (B) and 2006 (B). Fraction of frames occupied with bees in a colony in April in relation to bee survival at 100 days for the cohorts marked in November 2005 (A) and November 2006 (B). We used the data for November as an example, the relationship is similar for all days of marking, the trend only showed lower bee survival for cohorts marked earlier. Inserts show the differences in the fraction of frames occupied between for the different treatments (timing of acaricide application, NT = not treated). Letters indicate significant differences. doi:10.1371/journal.pone.0036285.g007

Winter survival

Between November 2005 and April 2006, four colonies were lost in the group not treated with acaricide, while no winter colony loss occurred in the other groups. The fraction of frames (out of 10) that were occupied with bees in April 2006 was the lowest for colonies that were not treated in 2005 (Generalized Linear Model: Wald Chi-Square = 38.1, df = 3, P,0.001; Figure 7A insert), and increased with an increase in bee survival (Pearson correlation: r = 0.98, n = 4, P = 0.02; Figure 7A). During the winter of 2006/ 2007, no colonies were lost. The fraction of frames (out of 10) that was occupied with bees in April 2007 was highest for the colonies that were treated with acaricide in July 2006 (Generalized Linear Model: Wald Chi-Square = 9.2, df = 3, P = 0.027; Figure 7B insert), but did not relate to bee survival (Pearson correlation: r = 0.42, n = 4, P = 0.58; Figure 7B). For the relation between the fraction of frames that were occupied with bees in April and bee survival, data from November was used as an example: the relationships were similar for all days the cohorts were marked, the trend only showed lower bee survival for cohorts marked earlier.

Discussion

In this study, we found that low V. destructor infestation levels during the development of winter bees resulted in an increase in lifespan of bees compared to colonies that were not treated and that had higher infestation levels. Acaricide treatment before the expected transition period from summer to winter bees resulted in the highest lifespan of bees. Colonies with low infestation levels had fewer losses in number of bees and higher survival during and after winter. A large number of bees in the bee colony at the start of the growing season in temperate regions has indeed shown to increase survival and production of bee colonies [18]. Several studies reported the decrease in lifespan of individual bees due to V. destructor infestation [6,7,19] or the altered physiology in bees suggesting a decrease in lifespan [8]. Here, we link the decreased lifespan of individual bees due to V. destructor infestation to colonies losses in at least some circumstances.

Mattila et al. [12] showed an increase in bee longevity between August and the beginning of November, which fully agrees with our findings: the number of capped brood cells decreased drastically between August and November, while at the same time, the lifespan of the bees increased indicating the transition of short-lived to long-lived winter populations [20]. When low infestation of V. destructor occurred earlier in the period of winter bee transition, lifespan of the bees increased and consequently the winter survival of the colonies increased, which supports previous findings by Delaplane and Hood [13] and Currie and Gatien [14].

In our study, however, mean lifespan (estimated by bee survival at 100 days) was longer during the winter in 2005/2006, compared to the winter of 2006/2007. A variety of stress-related factors such as winter temperatures or foraging conditions in autumn, could have contributed to the variation in lifespan between years. The much shorter lifespan for bees during the winter 2006/2007 at least suggests that bees were more active during this winter. Possibly due to the observed rearing of brood, as long lifespan is inhibited by brood pheromones [21] and reduced by brood rearing activities depleting body reserves [20,22]. This shorter lifespan, however, may have been less problematic due to the earlier start of spring [8] illustrated by the high number of brood cells in April 2007 compared to the year before.

Although winter temperature was not included as a replicated treatment, we observed that mean lifespan (estimated by bee survival at 100 days) was longer during the colder winter in 2005/ 2006, compared to the relatively mild winter of 2006/2007. Mean longevity in the study of Mattila et al. [12] was longer than in our study, for comparison: on October 6th longevity ranged between 125–150 days in the study of Mattila et al. [12], while in our study on this date mean longevity was 62 days for 2006/2007 and 93 for 2005/2006 (calculated using the method described in Matilla et al. [12]). Mattila et al. [12] performed their experiments in the south of Manitoba, Canada, which has approximately the same latitude as The Netherlands, but has a continental climate characterized by large annual amplitudes in temperature instead of an oceanic climate as in our site with narrow annual temperature amplitudes. The even lower winter temperatures in Canada compared to the Netherlands can maybe explain the longer lifespan of the Canadian bees. We therefore hypothesize that the negative effect of V. destructor (i.e., shortened lifespan of winter bees and possible colony loss) is larger under colder winter conditions.

Colony survival, measured by the number of frames with bees occupied in April, was highest with treatment against V. destructor applied in July, due to the longest lifespan of the bees (bee survival at 100 days) in autumn for these colonies. Delaplane and Hood [13] also studied the effects of timing of acaricide treatment (with Apistan) on honeybee colonies parasitized by V. destructor, where type of one-story hives, colony sizes and amounts of brood were comparable to our experiment. They found that colony survival and colony size, measured in December, was higher by acaricide treatment in August (in contrast to treatment in June or October). In their study, colonies treated in October resulted in unacceptably high bee mortality in December. Mite

fall before treatment of these colonies was 145630 mites per 1865 h, which was much higher than mite fall in November in our study (max. 32611 mites per 24 h; mite fall in December in our study was not representative for 'natural' mite fall due to the acaricide treatment in this month). In our study, however, at this relatively low level of mite fall, colony loss already occurred. Our late treatment (September) did not show an increase in colony size (in April), and nor did theirs (October, resulted in a 45% decline in colony size in December). Acaricide treatments to kill V. destructor in late autumn may thus fail to prevent losses of colonies because many of the adult bees are no longer able to survive until spring [8].

We manipulated the level of V. destructor infestation by using acaricide treatments at different moments. This acaricide treatment with Thymovar[R] was effective because mitefall was indeed increased during the month the acaricide treatment was applied. The pattern of mite fall directly after the acaricide treatment for the different moments (Figure 3) confirms with the expected infestation level after the month of treatment (Figure 2). The efficacy of Thymovar[R] as an acaricide has been shown before: 72% for one-story and 94% for two-story colonies [23], or 97% for one-story colonies with low amount of brood [24]. Although mite fall was reduced after the acaricide treatment in July, August or September, it was not as much reduced as after the treatment using oxalic acid in December. Oxalic acid however only affects mites in the phoretic phase, which is the predominant phase during winter when brood rearing has stopped or is reduced [25,26]. This is supported by the slightly higher mite fall during winter 2006/2007 compared to 2005/2006, and the most likely higher amount of reared brood (assumed during winter 2005/ 2006, not measured).

Previous studies showed that V. destructor infestation reduces the body weight and protein content of individual bees, which shortens their lifespan [6–8]. Our study supports these findings and shows the relation between decreased lifespan of individual bees and increased colony losses. Additionally, colonies treated earlier in the season had reduced V. destructor infestation before the development of winter bees resulting in longer bee lifespan and higher colony survival after winter (Figure 7). This study contributes to theory about the multiple causes for the recent elevated colony losses in honey bees. Our study shows that high V. destructor infestation during the transition to winter bees can cause these colonies losses due to decreased lifespan of winter bees. We can expect that other environmental stresses, such as pesticides, other pathogens, decreased food availability, or reduced diversity of this food [1,3,27], in combination with V. destructor will further reduce lifespan of bees and increase colony losses during and after winter.

Cumulative survival curves were calculated from the Cox Proportional Hazards Models for cohorts of bees marked. For the survival analysis, we had 6398 uncensored cases and 346 censored cases for 2005/2006, and 8458 uncensored cases and 547 censored cases for 2006/2007. During the winter of 2005/ 2006, actual counts of marked bees were suspended due to cold temperatures; mortality was assumed to be constant for that period. (TIF)

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IMPACT OF POSTHARVEST CONDITIONS ON THE MICROBIAL QUALITY AND PHYSICOCHEMICAL PROPERTIES OF BEE POLLEN

Nowadays, bee products are gaining rising attention from various industry sectors, such as pharmaceuticals, dietary supplements, food, and cosmetics, due to consumers' increasing demands for natural products (Boyacioglu et al., 2022). Likewise, bee pollen has been widely used as a food supplement due to its high nutritional value and biological activities, such as antioxidant, anti-inflammatory, and antiproliferative (Aylanc et al., 2023; Campos et al., 2008; Morais et al., 2011; Straumite et al., 2022; Szczêsna, 2006; Yang et al., 2013; Zou et al., 2020). Several countries have established legislative criteria for bee pollen that mainly focus on physicochemical parameters such as moisture, proteins, carbohydrates, lipids, etc. However, limits regarding pollen's microbiological quality, have not yet been specified, although comprising a major safety criterion from a hygienic point of view. As a result, controls for bee pollen follow the same hygiene standards dictated by the food code for consumer safety (Commission Regulation (EC) No 2073/2005), where the following limits are included: Salmonella sp. (absent/10 g), Staphy-


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lococcus aureus (absent/1 g), Enterobacteriaceae (<100/g), Escherichia coli (absent/1 g), total aerobic plate count (<100,000/g), and Yeasts & Moulds (<50,000/g) (Campos et al., 2008; Feás et al., 2012).

Bee pollen is commercially available in fresh, dried and rarely in tablet form. In Greece, due to the Mediterranean's warm-dry climate, pollen is mainly available in its fresh form, while in other countries, producers are processing pollen into a dry form, in order to extend its shelf life and avoid maintaining it at low temperatures, thus facilitating marketing of the product. In fact, countries such as Brazil (Brazil, 2001), Argentina (Codigo Alimentario Argentina, 1990), Poland (PN-R-78893, Polish legislation for bee pollen), and Switzerland (Swiss Food Manual: Pollen, 2006) have established national legislation imposing a strictly low water content for the final marketable product, usually lower than 6–8%.

It has been observed that the heat processing of fresh bee pollen, aimed at reducing moisture content, also affects its organoleptic characteristics as well as its content of polyphenols, flavonoids, and vitamins (Almeida-Muradian et al., 2005; Collin et al., 1995; Canale et al., 2016; Liolios, 2017). On the other hand, the moisture content of fresh bee pollen can exceed 20% in several cases, a percentage that creates a particularly favorable environment for the growth of pathogens (yeasts, bacteria), resulting in the degradation of pollen's nutritional value and, in general, in the deterioration of its quality (Barajas et al., 2012). Indeed, various references highlight the benefits of dehumidifying bee pollen, preventing microbial growth, extending at the same time the postharvest life and commercial value of the product (Ares et al., 2018; De Melo et al., 2015; Estevinho et al., 2012; Keskin & Özkök, 2020; Morgano et al., 2011; Serra-Bonvehi & Jorda, 1997).

In the present study, we evaluated the effect of storage time and temperature on the microbiological quality of fresh bee pollen, taking into account the possible change in physicochemical characteristics that the product may undergo during storage. Specifically, we analyzed the alteration of pollen's microbial load regarding Mesophilic Total Viable Counts (MTVC), Yeasts & Molds (Y&M), Enterobacteriaceae (ENT), Lactic Acid Bacteria (LAB), and Escherichia coli, while regarding physicochemical characteristics, we analyzed colour (CIE L*, a*, b*), moisture, protein and lipid content, and the concentrations of main fatty acids (C 18:0, C 18:1, C 18:2, C 18:3) and main sugars (fructose, glucose, sucrose). It is noted that the examined samples were produced under proper beekeeping treat-

ments in order to minimise the effect of erroneous beekeeping practices at the collection stage. In addition, for the dried samples, the most suitable procedure was followed, to ensure that possible deterioration caused by heat treatment was limited to the minimum. The present study aims at shedding some light on the effect of postharvest treatments on the microbiological quality of fresh bee pollen, that has been produced under proper beekeeping practices.

Results

Effect of storage time and temperature on the microbial load of fresh bee pollen

Regarding fresh bee pollen stored at –18 oC (Figure 1) for one year, a downward trend was observed in MTVC, ENT, and LAB counts at rates of 2.96%, 3.38%, and 26.37%, respectively (Figure 1A), whereas the Y&M counts showed an increase (33.7%) during the storage of pollen for twelve months at the same temperature (-18oC) (Figure 1A). However, there were no statistically significant differences (p=0.087–0.635, >a=0.05) among the examined groups (selected microorganisms) over time (Figure 1A). None of the samples/specimens was recorded to exceed the permitted limits defined by the food hygiene standards regarding the levels of the microorganisms under examination.

A swift change of the microbial load was observed during the storage of fresh bee pollen samples in the refrigerator (4oC), compared to the storage at freezing temperature (-18°C). Specifically, after six months of storage, MTVC and ENT values were outside the corresponding legal limits (5 and 2 log cfu/g, respectively), while at nine months, the mean value of Y&M was 5.04 log cfu/g, exceeding the legislative limit of 4.7 log cfu/g (Figure 1B). A larger upward trend was found in the ENT and Y&M counts, where a rise of 92.5% and 76.49% from the initial counts was recorded, respectively, within twelve months of storage, followed by MTVC with an increase of 42.46%.

On the contrary, regarding LAB counts, after a period of twelve months, the initial value of 3.83 log cfu/g, shifted to a final mean value of 2.78 log cfu/g, showing a reduction of 27.41%. Statistically significant differences (p=0.001–0.005, <a=0.05)

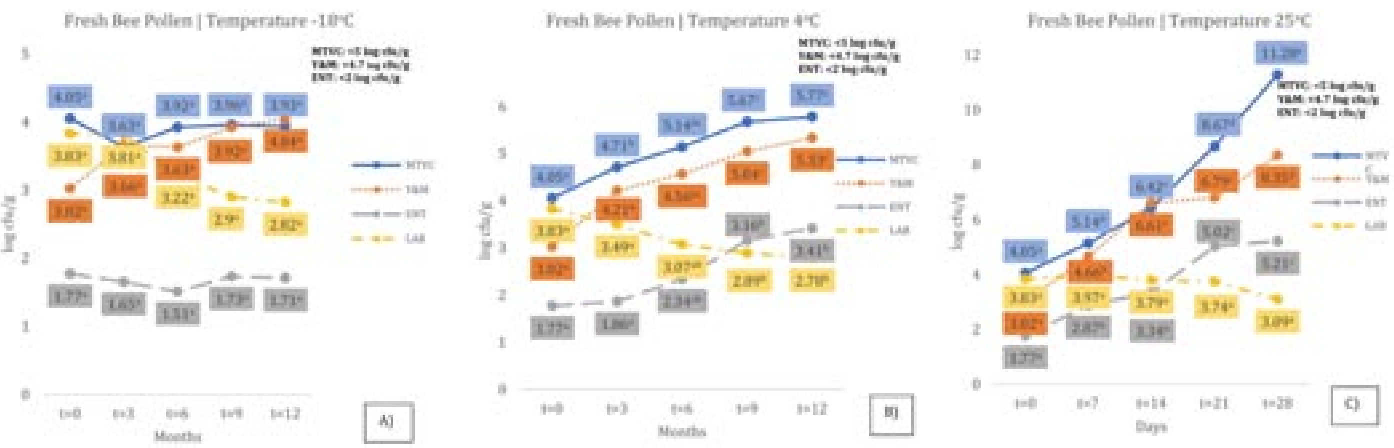

Figure 1. Mesophilic Total Viable Counts (MTVC), Yeasts & Molds (Y&M), Enterobacteriaceae (ENT), and Lactic Acid Bacteria (LAB)counts in fresh pollen while storing at freezer (-18 °C) (A), refrigerator (4 °C) (B) and room temperature (25 °C) (C) at different times.
Note: Different Latin letters in each group show statistically significant differences according to Duncan's multiple range test, a = 0.05.

over time were presented in all the examined groups.

The biggest change in the growth of the studied pathogens was observed during the storage of fresh pollen at 25oC, over a short period of four weeks. Specifically, a greater increasing trend was observed in the ENT, MTVC, and Y&M counts, where a rise of 194%, 178%, and 176% from the initial counts was recorded, respectively, within 28days of storage, thus clearly indicating an impractical environment for the storage of fresh pollen. Indeed, after only seven days of storing fresh pollen at 25oC, MTVC and ENT were counted outside the corresponding commercial limits, and Y&M counts were only marginally within limits (4.7 log cfu/g) (Figure 1C). The recorded changes in the MTVC, ENT, and Y&M counts also showed significant differences among the groups (p<0.05) (Figure 1C). Finally, it is pointed out that no E. coli colonies were found in any sample of fresh pollen, regardless of storage conditions and time.

Effect of storage time and temperature on the microbial load of dried pollen

Immediately after the end of the drying process (t=0), the moisture content was reduced from 15.85% to 5.13%, while the water activity was also decreased, from awf =0.546 in fresh pollen to awd=0.354 in dried pollen. Likewise, a significant decrease in the microbial counts was observed, corresponding to percentages of 36.79%, 25.82%, 27.68%, and 37.33% for MTVC, Y&M, ENT, and LAB, respectively. In addition to the initial reduction (t=0), the pollen that has undergone the drying process also showed better postharvest behaviour compared to the fresh one. Indeed, in all cases of the studied pathogenic microorganisms, regardless of storage temperature, the counts were found within the corresponding limits defined by food hygiene standards (Figure 2). In fact, at freezing (-18oC) and refrigerator (4oC) conditions, no statistically significant differences were observed regarding storage time (p=0.282–0.948) in any of the examined groups (Figure 2A,B), while during storage at room temperature (25oC), statistically significant differences were found only in the MTVC values (p=0.011) (Figure 2C). Similar to the case of fresh pollen, no E. coli counts were detected in dried pollen either.

Effect of storage time and temperature on physicochemical parameters of fresh and dried bee pollen

Most of the physicochemical parameters remained stable during the storage of both fresh and dried bee pollen at –18oC, without significant changes (Figures 3A and 4A). The colour parameters a* and b* were the only exceptions, but they decreased at a fairly slow rate during storage for 12months. A faster colour change was observed in fresh pollen samples during their storage in the refrigerator (4oC), as L* and b* and

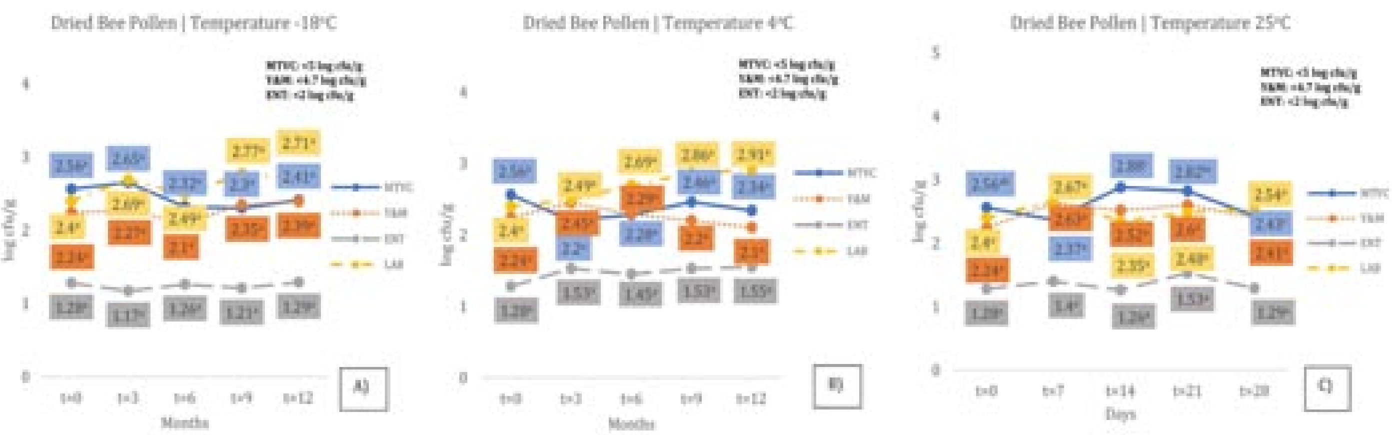

Figure 2. Mesophilic Total Viable Counts (MTVC), Yeasts & Molds (Y&M), Enterobacteriaceae (ENT), and Lactic Acid Bacteria (LAB) counts of dried pollen while storing at freezer (-18 °C) (A), refrigerator (4 °C) (B) and room temperature (25 °C) (C) at different times.
Note: Different Latin letters in each group shows statistically significant differences according to Duncan's multiple range test, a = 0.05.

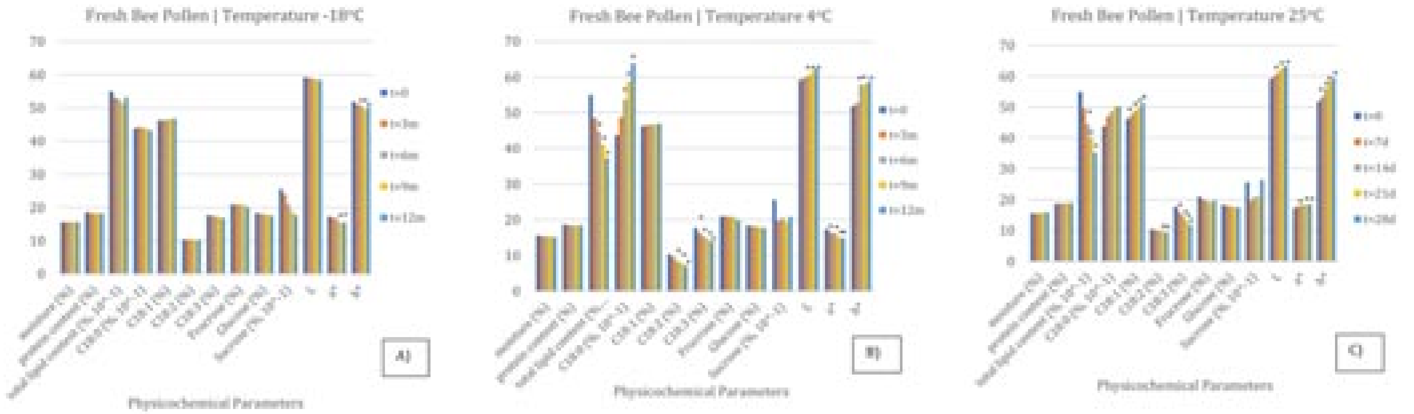

*Figure 3. Physicochemical parameters in fresh pollen while storing at freezer (−18°C) (A), refrigerator (4°C) (B) and room temperature (25°C) (C) at different times (m=months, d=days). *: Statistically significant differences in each parameter among groups, according to Duncan's multiple range test, a=0.05.*

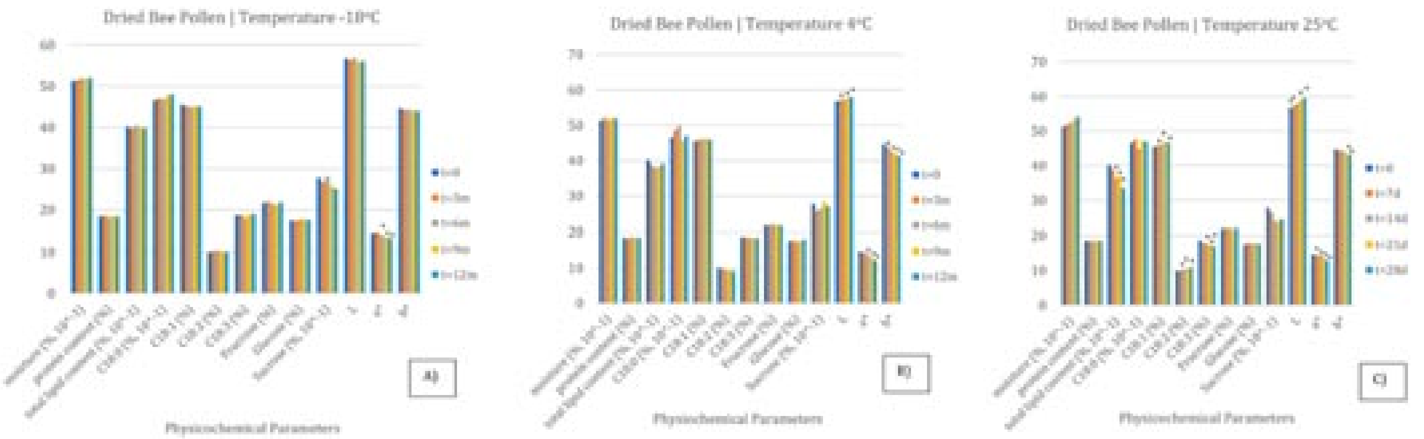

*Figure 4. Physicochemical parameters in dried pollen while storing at freezer (-18°C) (A), refrigerator (4°C) (B) and room temperature (25°C) (C) at different times (m=months, d=days). *: Statistically significant differences in each parameter among groups, according to Duncan's multiple range test, a=0.05.*

parameters showed an increase of 5.02% and 11.72%, respectively, while a* parameter showed a decrease of 13.98% (Figure 3B). Additionally, changes were observed in total lipid content (32.18% decrease) as well as in fatty acid composition, as C18:2 and C18:3 showed a reduction of 31.68% and 21.56%, respectively, and C18:0 showed an increase of 31.5%. Changes in total fat content and fatty acid profile were also recorded in dried pollen during storage at 4oC for a period of one year, but to a lesser extent than fresh pollen, while the values of colour parameters a* and b* significantly decreased (16.58%, and 7.43%, respectively) and the value of L* significantly increased (2.29%) (Figure 4B). On the other hand, the decolourisation of fresh pollen occurred faster, and the largest changes in the colour parameters L*, a*, and b* (6.46%, 6.48%, and 12.70% increase, respectively) were observed at room temperature (25oC), in a period of only 28 days (Figure 3C). Changes in total lipid (36% reduction) and fat content were also observed, mainly in the percentages of unsaturated fatty acids (C 18:1, C 18:2, C 18:3). Dried pollen generally demonstrated better performance compared to fresh pollen, stored at room temperature. Here, the colour parameters a*, b*, total lipid content and C18:3 showed a significant decrease (11.39%, 3.49%, 16.41%, and 7,97%, respectively), while L*, C18:0, and C18:2 presented a significant rise (4.75%, 0.63%, and 8.69%, respectively).

Discussion & Conclusions

According to the results of the present study, it seems possible to produce fresh pollen that can be harmonized with the standards of the European food hygiene and safety code. Taking advantage of the warm-dry, Mediterranean climate of Greece and following proper beekeeping practices during harvesting and postharvesting stages, pollen can be marketed in its fresh form, keeping unchanged its organoleptic and physicochemical characteristics. It is also suggested, according to the results, that the storage of fresh pollen should be carried out exclusively at freezing temperature (-18^{o}C), where a significant slowing down of the growth of pathogenic microorganisms was observed, while the colour change also seems to progress quite slowly over the course of 12months. Furthermore, at freezing temperature (-18^{o}C), no changes were observed in moisture content, total proteins, total fat, carbohydrate, and fatty acid composition. In contrast to fresh pollen, dried pollen behaves better when stored at room temperature (25^{o}C), in the refrigerator (4^{o}C), and in the freezer (-18^{o}C), due to the reduction in moisture content it has undergone, which generally makes long-term storage easier. The research data may contribute to the optimized production of bee pollen and form the basis for developing a guide for good beekeeping practices in postharvest management, leading to the production of high-quality pollen, harmonized with hygiene standards.

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MOBILITY AND INNOVATION IN BEEKEEPING PRESENTATION OF MOBILE BEEHIVES

In modern beekeeping, where challenges are linked to weather changes and access to diverse foraging areas, mobility is crucial for increasing honey production and maintaining the health of bee colonies. The company Prevozni čebelnjaki, boasting more than 30 years of experience in construction and technology, is particularly renowned for its high-quality mobile beehives. These innovative products enable beekeepers to easily move hives to the most advantageous foraging locations.Thanks to their compact design, these beehives are suitable for transport with a car trailer, enabling quick and efficient relocation between different foraging sites.

Reliable Construction for Every Terrain

Ciglič Mobile Beehouses are designed with stability and safety in mind. Their construction is based on high-quality steel tubes, ensuring durability and resistance to weather conditions. Adjustable legs with trapezoidal threaded spindles allow adaptation to various terrains, providing optimal stability even on uneven surfaces.

Stability and Durability of Construction

Technical Precision

Every detail of the mobile beehive is carefully designed. The roof is made from galvanized and painted sheet metal, resistant to hail and other weather influences, providing excellent rust protection. The unit's sides are insulated to maintain

Roof Made of Galvanized Sheet Metal

a stable internal temperature, protecting bees from extreme weather conditions. Additionally, the door-lifting mechanism has been enhanced with cylinders, enabling automatic door opening.

Flexible Solutions for Individual Needs

The company offers various customization options. The mobile beehives are specifically adapted for AŽ hives of different sizes. Standard models support 8 or 10 AŽ hives, with available add-ons such as:

• Installation of bear protection mesh
• Space for hive weight measurement
• Adjustable walls to fit different hive sizes
• Detachable landing boards for easier handling

Thanks to their compact design, these beehives are suitable for transport with a car trailer, enabling quick and efficient relocation between different foraging sites.

We can send you a packet od our product via delivery system. For more info contact us: info@cebelnjaki.si

Watch a video on beehive setup here:

Conclusion

With Ciglič Mobile BeeUnits, Slovenian innovation is reaching European markets. Their adaptability, mobility, and robustness allow beekeepers to efficiently move hives to various foraging areas, contributing to greater diversity and quality in honey production. These solutions help beekeepers optimize their production while ensuring the health of their bees.

For more info find us on our web site: www.cebelnjaki.si

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THE CHRONOLOGY OF ESTABLISHING QUALITY CRITERIA FOR ROYAL JELLY AND ITS INCLUSION IN THE GREEK FOOD AND BEVERAGE CODE

A. Fundamental Research Necessary to Document the Quality Characteristics of Royal Jelly by the Laboratory of Apiculture-Sericulture at Aristotle University of Thessaloniki (AUTh) from 2004-2014

-Research was conducted to develop methods for identifying pollen grains in royal jelly (RJ) to determine its botanical and geographical origin.

The results were published in the journal Grana (Dimou et al., 2017)

-The impact of syrup feeding, protein-based food, the collection season, geographical origin, and other factors on RJ composition was studied. Results were published in Journal of Apicultural Research (Dimou et al., 2015) and in Open Journal of Applied Science (kanelis et al., 2018).

-A significant number of Greek RJ samples from various regions were collected using a specific protocol ensuring their authenticity. Microscopic and physicochemical analyses were conducted on 950 RJ samples and 1650 pollen samples using methods developed by the Laboratory of Apiculture at AUTh . Results were published in: Grana (Dimou et al. 2013)

-Global legislation on RJ was gathered, and Greek sample criteria were compared with international standards. Findings were discussed at international conferences (Croatia 2014, Turkey 2015, South Korea 2015) and published in Arh Hig Rada Toksikol (Kanelis et al., 2015)

Since 2012, the laboratory has been identifying RJ from various Greek regions using pollen recognition over three consecutive years. This allows differentiation of local products from those produced in other areas or countries (e.g. China). The findings support the inclusion of geographical indications on labels.

B. Efforts by Beekeeping Organizations and the State to Establish Quality Criteria for RJ at the Greek Ministry

15/01/2014: The Laboratory of Apiculture proposes quality criteria for RJ and pollen to the Ministry of Rural Development and Food (MRDF).

17/11/2014: MRDF convenes stakeholders, including the National Interprofessional Honey Organization, the Royal Jelly Producers Association, the Hellenic Food Authority (EFET), the State General Laboratory (GCC), and others. The proposed RJ and pollen criteria receive unanimous approval with minor corrections.

30/01/2015: GCC submits draft regulations for RJ to MRDF and EFET, incorporating AUTh's proposals, ISO standards, and agreements from the November 2014 meeting. Key points:

a) RJ is a natural product with no additives or processing allowed.

b) Prepackaged RJ must indicate Greece as the country of origin.

c) The provisions for RJ concern products produced in Greece, while any product that has been lawfully manufactured and/or marketed in other EU Member States or in an EFTA Member State that is a party to the EEA Agreement or in Turkey may be marketed in Greece, provided it has been manufactured in accordance with standards, specifications, or manufacturing and testing procedures that demonstrably ensure an equivalent level of quality and safety to the requirements of this regulation for the protection of human health and safety as well as the environment.

07/10/2015: The General Chemical State Laboratory (GCSL) sends the draft provisions for RJ to Andreas Thrasyvoulou, as the coordinator of the effort.

08/10/2015: Thrasyvoulou informs the National Interprofessional Organization of Honey and Other Bee Hive Products, the Association of Royal Jelly Producers and Other Bee Hive Products, the Hellenic Scientific Society of Apiculture-Sericulture, and the two University Apiculture Laboratories—Athens and Thessaloniki—about the draft provisions for RJ and the GCSL's comments. He simultaneously makes related proposals and asks the organizations for their opinions on the three specific comments so the Ministry can proceed with signing the decision. The response from the organizations was immediate and positive. All organizations fully agreed with the proposed specifications for RJ.

07/04/2016: The Supreme Council of Chemistry (SCHQ), after studying the University's scientific documentation and the proposals of the organizations and the Ministry officials, unanimously approved the proposed quality criteria for

RJ (Decision 47/2016) and forwarded them to the Alcohol and Food Directorate for RJ to be incorporated into Article 87a of the Food and Beverages Code (1318/04-04-2016).

C. Approval of Greek RJ Quality Criteria by the EU and Official Legislation

22/06/2016: GCC submits RJ quality criteria to the EU Council for approval (notification number 2016/292/GR).

19/09/2016: EU requests consumer opinions on the geographical indication on RJ labels.

01/10/2016: The Consumers' Association (EPOIZO) conducts an online survey; over 2,000 consumers support the inclusion of geographical indications.

23/02/2017: MRDF finalizes and submits its response to the EU regarding geographical indications.

21/06/2018: The Supreme Chemical Council unanimously legislates RJ quality criteria, completing the process initiated with unanimous stakeholder agreement.

10/08/2018: Joint Ministerial Decision 135/2018 is published (Government Gazette 3416/B/10-8-2018), amending the Food and Beverage Code to include RJ as a primary product with specific quality criteria. Greece becomes the only EU country to legislate RJ quality criteria after EU approval.

D. Benefits of RJ legislation for beekeepers:

a) The product gains recognition in the Food and Beverages Code. Channels for importing the product as "animal fat" from China and other countries are closed.

b) The product is assigned quality criteria and can be inspected to benefit both the producer and the consumer. Consumers can now trust the product, which can be tested for quality and safety.

c) The label "Produced in Greece" can now be placed on the packaging. Combined with the identification of RJ from various regions of the country, the chronic issue of distinguishing Greek BP from Chinese BP can be effectively addressed.

d) As a primary product, the VAT on RJ is reduced to 13%.

E. Quality Criteria of Royal Jelly as Published in the Official Government Gazette of the Hellenic Republic 3416 (B)10-8-2018 (Article 87a Royal Jelly)

Definition:

Royal jelly is a mixture of secretions from the hypopharyngeal and mandibular glands of worker bees of the species Apis mellifera L. It has a creamy or gelatinous, viscous texture at normal temperature and is milky or pale yellow with an iridescent hue. Its smell is sharp and penetrating, and its taste is strong and spicy.

Product Purity:

The product must be free of bubbles and foreign substances. Minimal presence of microcrystalline structures may be acceptable as a result

of storage. Royal jelly must not contain larvae or crushed larval tissues of bees. Its color, taste, and aroma must remain unaltered, and it must not show signs of fermentation.

Specifications:

Royal jelly must comply with the specifications outlined in Annexes I and II. It is a natural product to which no other ingredient, including food additives, or any form of processing, is permitted.

Hygiene Standards:

Royal jelly must be produced following the hygiene conditions specified by food hygiene legislation, including specific rules for animal-derived food products. It must also meet the microbiological criteria outlined in Annex II.

Pesticide Residue Limits:

Royal jelly must conform to the applicable European Union legislation regarding maximum residue levels of plant protection products.

Storage and Handling:

Royal jelly is classified as a perishable food under Article 20 of this Code. Therefore, it must be stored and transported under refrigeration and, for extended periods, under freezing conditions.

Packaging Materials:

The packaging materials for royal jelly must comply with both EU and national legislation on materials and articles in contact with food.

Labeling:

The labeling of prepackaged royal jelly must include all indications required by EU legislation. It may also indicate the country of collection.

Market Availability:

The provisions apply to products produced in Greece. Any product lawfully produced and/or marketed in other EU Member States, Turkey, or a member of the EFTA that is a party to the EEA agreement may also be marketed in Greece if produced according to standards, specifications, or procedures that guarantee quality and safety for human health, safety, and the environment.

Commercial Use:

When sold as royal jelly or used in any product intended for human consumption, royal jelly must meet the composition characteristics of Annex I and the microbiological criteria of Annex II.

Annex I

Component	Value %
Moisture	60-70
10-Hydroxy-2-decenoic acid (10-HDA)	1,0-6,0
Proteins %	>10
Fructose %	2-9
Sucrose %	0-6
Total Sugars %	7-16

Annex II

Παράρτημα II

Microbiological Criteria	Value
Total Microbial Flora (cfu/g)	less than 500
Coliforms (mpn/g)	not detectable
Salmonella (mpn/g)	not detectable

Andreas Thrasyvoulou

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APIPEDAGOGY

Pedagogy is a living science that grows and transforms over time. It draws on past experiences and knowledge, preserving the wisdom that heritage offers. At the same time, it creates bridges to the future with new approaches, methods, and understandings of a world that is constantly changing. Pedagogy is as alive as language, like a bee colony – it has roots in the past, builds for the future, while responding to the social changes of the present.

WHAT IS APIPEDAGOGY?

Apipedagogy is an innovative pedagogical program, a new branch of education. It enjoys trademark protection and full copyright protection of the approach, activity, and substantive validity, either in individual parts or as a whole.

The essential feature is the protected pedagogical-apitherapeutic approach, i.e. the implementation of apitherapy as part of pedagogical work at any location (apitherapy apiary, institution, association, etc.). It is used in kindergarten or organized care or school or as part of a kindergarten/school/organized group; an approach in which bee products enter the pedagogical process to achieve curricular goals in the form of structured or unstructured didactic elements, with simultaneous goals of strengthening resilience, exercising children's rights in the field of a healthy environment, supporting developmental problems, and the development of children themselves. The pedagogical-apitherapeutic approach focuses on supporting students or users of apitherapy to develop/maintain their potential.

The founder and author of Apipedagogy is Nina Ilič from Slovenia. She is the president of the Apitherapy, Children, and Pedagogy Commission in the International Federation of Apitherapy and the coordinator of the APIS RETIS Network of API Kindergartens and Schools.

In her manual Apipedagogy & Apitherapy for Children in Kindergartens, Schools, and Parent

Schools, she defines Apipedagogy and its individual elements in greater detail. She combines her gentle love for children, enthusiasm for bees, and dedication to creativity with a vision of a society where people live in solidarity and harmony with nature. Apipedagogy is a professional program for education and upbringing that supports sustainable development, enhancing the concept of sustainable urban development.

Apipedagogy is not just a pedagogy but a way of life, focusing on sustainable coexistence with nature. It is characterized by seven principles that serve to promote "the life of human rights and fundamental freedoms" and sub-programs: API kindergarten, API school, Apipedagogy for the class hour, Apitherapy camp, Honey massage for children, API sensory path, Etiquette of good behavior in the vicinity of bees, Safety and responsibility at the apiary, API-workshops according to the pedagogical-apitherapeutic approach (including aerosol apitherapy in kindergarten/school/organized group, magic with propolis, etc.), API school for parents.

BENEFITS FOR CHILDREN

Apipedagogy provides beneficial support for the health and immunity of children in kindergartens and schools, along with numerous developmental benefits: it aids in the development of concentration and perseverance in activities, fosters imagination, promotes intellectual development, encourages motor and mental development, supports prosocial growth and empathy, aids in speech development, fulfills emotional needs, and more. Through Apipedagogy, children feel comfortable, better cope with the challenges of adjusting to kindergarten, enjoy the activities, experience learning as a pleasant activity, and build a positive self-image.

For educators and teachers, Apipedagogy offers opportunities for career development, workplace health, and the freshness of new activities. The knowledge they gain also benefits their personal lives.

WHERE DO WE USE APIPEDAGOGY?

We use the pedagogical-apitherapeutic approach in various organized groups, such as kindergartens, schools, nursing homes, holiday care, and others.

HOW TO PARTICIPATE?

Apipedagogy is implemented exclusively through the Network of API Kindergartens and Schools APIS RETIS, which applies to all stakeholders (individuals and legal entities) worldwide. When collaborating, it is mandatory to obtain the certificate and mention that it is Apipedagogy and include the APIS RETIS logo. The APIS RETIS network is responsible for carrying out activities based on Apipedagogy in a way that is safe for children and contributes to the good reputation of the kindergarten/school.

To use the Apipedagogy program, its name, pedagogical-apitherapeutic approach, or individ-

ual parts, one should obtain written consent from the author and/or a license to use the Apipedagogy program.

In the APIS RETIS Network, we welcome cooperation and networking, which is why we are happy to open up opportunities for professional training and various options for obtaining a license agreement for using the program. You are cordially invited.

The coordinator of the APIS RETIS Network of API kindergartens and schools, apitherapist Nina Ilič can be contacted via the network's email address apisretis@gmail.com. She can also be reached through the International Federation of Apitherapy, where she was elected as one of the main coordinators of the commission: Apitherapy, Children, and Pedagogy Commission on January 25, 2025.

APIS RETIS Network
of API Kindergartens and Schools

BEES LIFE

EBA MADE A FLAG

EBA made flags.
You can buy it
for 50 euros + shipping

Orders to ines.zunic@czs.si

NORTH MACEDONIA: FIGHTING HONEY COUNTERFEIT

On December 27, 2024, a meeting of the permanent sub-sectoral group for regulating the honey market was held, which was attended by the Chairman of the EBA Supervisory Board, Mr. Mende Trajkovski and three representatives-inspectors from AHV (food and veterinary agency) were present at the meeting.

The meeting report was delivered by Mr. Mende Trajkovski, who also spoke about the activities of the EBA at the meeting and provided us with a report from the meeting.

We thank Mr. Trajkovski for his efforts and for introducing the representatives of his home country to the work and activities of the EBA.

Report from the PPGM meeting held(the permanent sub-sector group for regulation of honey markets).On December 27th, a PPGM meeting was held at the Ministry of Agriculture,Forestry and Water Management with the following AGENDA:

1. Increased inspection supervision over bee products
2. Harmonization of the annual ordinance for animal health protection

Three representatives-inspectors from AHV (food and veterinary agency) werepresent at the meeting.After the first point, the president of PPGM – Mende Trajkovski explainedto the audience that regarding the presence of honey of dubious quality(counterfeit honey) present on the market, there is a lot of discussion in theEBA (European Beekeeping Union) but also that we at the local level should takeover certain actions, so for those reasons we have scheduled today's meeting,for which we are very grateful to the representatives from AHV who are presenttoday at this meeting and to agree on future steps together.After a long discussion (in whichalmost everyone present participated), several conclusions were reached:

1. In the future, the inspectors of the green markets (where honey is alsosold) should carry out inspections once a month (and not once a year asbefore), and with a recommendation, if possible, that the inspectors be fromother cities (not local) in order to avoid possibility of no relationships andfriendships.

2. We ourselves proposed to carry out controls at the events themselves(organized by local associations, Unions, etc.) where the promotion of honeyand other bee products is carried out, all in order to protect ourselves andamong ourselves (because maybe among us there is someone who makes a living byadulterating honey), and to the question of the representatives from AHV whowill pay for those analyses, we all agreed that we, through the associations (Union), will pay for everything in order toreach a result.

3. And in the markets, more frequent control should also be carried out, and tocontrol whether the labels state the origin of the honey and where it isfilled, and all of this should be visible so that consumers can read it.

4. And when we are with consumers as PPGM and as SPZM we will also contact theorganization of consumers in order to work together to create a campaign forconsumer education.

5. To discuss with the Faculty of Veterinary Medicine, and the Faculty ofAgricultural Sciences and Food (and possibly with other interested parties) forthe introduction of an appropriate method for laboratory analysis of honey.

6. In the future, the cooperation between AHV and beekeepers (associations,Unions, etc.) will be raised to a higher level.After the second point (by the representatives of AHV) we were informedthat (according to the animal health protection law) a clinical examination ofthe bee colonies must be carried out, and for 2025. it is planned to be carriedout in August and September (which was our request for the previous year aswell), and to be in constant contact with the Chamber of Veterinary Doctors,and with an appeal that the examinations be carried out on the spot. 27.12.2024, Skopje

President Mende Trajkovski

SICAMM CONFERENCE

From 27-30 March 2025 there will be a SICAMM beekeeping Conference **in Stavanger, Norway.**

We are particularly excited because it is the 30th Anniversary of SICAMM's formation and we are hoping to have fun as well as a great Conference !! Norway was the site of the first SICAMM Conference ever and so it is particularly apt that we are back with Norsk Brunbielag as our local hosts. The full programme will be available shortly but we already know that we have some exciting Presentations and activities on the Agenda. Please visit our new website, www.sicamm.org, and get a taste of things to come !! On the website you will see a way to register to attend, lots of information on the Homepage and our first Newsletter. For those of you who do not know SICAMM we are an International Federation of European Beekeepers primarily dedicated to the European Dark Honey Bee but with genuine concern for all of our localised, wild and free living honey bees. We are very proud that the European Beekeeping Association (EBA) has promised support to the Conference. We hope to see you in Stavanger.

John Greenaway, SICAMM Vice- President

European Beekeeping Association (EBA)
Serbian Federation of Beekeeping Organizations (SFBO - SPOS)

Organize

EUROPEAN SYMPOSIUM

"SCIENCE AGAINST FORGERS"

The symposium “SCIENCE AGAINST FORGERS" will gathered the leading European laboratories for the detection of fake honey, which threaten beekeepers and beekeeping today like never before, leading it into a bottomless abyss, considering that honest beekeepers and businessmen can no longer do their business, because they are completely defeated by disloyal competition.

Speakers:

1) **Boštjan Noč**
president od the European Beekeeping Associtation (EBA)

2) **Uwe Karassek**, **Philip Krafzig**
INTERTEK, Bremen, Germany

3) **Kaarel Krjutškov**
CELVIA, Tartu, Estonia

4) **Ivan Smajlović**
ANA LAB, Pančevo, Serbia

Simultaneous translation into Serbian language will be provided through loudspeakers for all gathered visitors, and into English language through headphones for the invited participants of the Symposium.

Attendance at the Symposium is free for all visitors to the XVI National Beekeeping Fair. Entrance fee to the fair is 4.3 EUR, and it is free for members of the Serbian Federation of Beekeeping Organizations.

EUROPEAN MEAD MAKERS' CONFERENCE – EBA IS OFFICIAL PARTNER

We are happy and proud to announce that this year our company supports two international events for mead makers.

The European Mead Makers' Conference is the largest event of this type. It is available to home and non-standard mead makers, beginners, and amateurs, and every year attracts guests from all over the world. Meanwhile, the Mead Madness Cup competition is an offer in the world and one of the most prestigious competitions for meads.

Today, we invite you to visit the conference section and submit the meads to the competition. more information at:

emmconference.com
meadmadnesscup.com

BEES LIFE

Ulster Beekeepers Association

ANNUAL CONFERENCE

Friday 14th to Saturday 15th February 2025

CAFRE, Greenmount Campus, 45 Tirgracy Road, Antrim BT41 4PS

READING OUR BEES

THE NEXT CHAPTER

Two days of Science, Practical Beekeeping & Workshops covering:

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Featuring an Extensive Trade Exhibition

EXPERT SPEAKERS INCLUDE:

Prof Lars Chittka – Queen Mary University of London

Dan Basterfield – BBKA Master Beekeeper

Colm O'Neill – North Kildare Beekeepers Association

Ruth Wilson – AIPP Farmland Pollinator Officer

Dr Rowena Jenkins – Microbiologist, Swansea University

Ass. Prof Dalial Freitak – University of Graz, Austria

Richard Noel – Brittany Bee Farmer

Prof Robert Paxton – Martin Luther University, Germany

Lock this important conference into your diary now!

BOOKING OPENS ON 1st OCTOBER 2024 ON-LINE AT:

https://buytickets.at/ulsterbeekeepersassociation/1321240

For more information contact: **Brian Grzymek - Conference Organiser**

Email: **bgrzymek@icloud.com** or Visit our Website: **www.ubka.org**

TO THE EBA WITHOUT MEMBERSHIP FEE

At the meeting of the EBA Executive Board, on the proposal of the EBA President Mr. Boštjan Noč, an important decision was made regarding membership in the EBA in the upcoming period: "**Membership in the EBA is free for the duration of the mandate of the EBA President Mr. Boštjan Noč**."

Decision of the EBA Executive Board is another confirmation that the EBA continues to work only in the interest of bees, beekeepers and consumers in Europe.

SPONSORSHIP REQUEST

AND METHOD OF ADVERTISING IN THE MAGAZINE

On behalf of the European Beekeeping Association (EBA),I am writing to seek your support in the form of sponsorship to help ensure the smooth and effective operation of our Association.

The EBA is dedicated to promoting and supporting beekeeping across Europe. The Association was founded out of necessity, as bees and beekeepers are essential for our ecosystem and society. Without beekeepers there are no bees, and whithout bees there is no pollination, leading to a lack of food on planet Earth.

EBA works for bees, beekeepers and consumers.

Our mission is to:

1. Fight against counterfeit honey that flooded the European market;
2. Introduction of incentives per beehive as agro-ecological programme;
3. Fight against the improper use of chemicals that are harmful to bees;

In return for your generous support, we offer various sponsorship benefits. We believe that this partnership would be mutually beneficial and would significantly contribute to the advancement of the european beekeeping sector.

ADVERTISING IN THE MAGAZINE:

1. Through sponsorship packages;
2. It is possible to pay for an ad only for 1/4 page (100 euros), for a larger area by agreement. The entire page cannot be obtained, it belongs only to the General Sponsor.

IT CONTINUES

EBA sponsorship packages

GOLD sponsor - 5.000 euros:
Advertisement on the EBA website
Presentation at all EBA events, logo on all EBA correspondence
12 advertisements in the EBA monthly e-magazine in A4 page size

SILVER sponsor - 3.000 euros:
Advertisement on the EBA website
Presentation at all EBA events, logo on all EBA correspondence
12 advertisements in the EBA monthly e-magazine in half A4 page size

BRONZE sponsor - 2.000 euros:
Advertisement on the EBA website
12 advertisements in the EBA monthly e-magazine in the size of 1/4 A4 page

EBA SUPPORTER - 1.000 euros:
Advertisement on the EBA website
12 advertisements in the EBA monthly e-magazine in the size of 1/8 A4 page

These are basic packages, but we are open to different forms of cooperation, which we agree on individually. We would be delighted to discuss this opportunity further and explore how we can align our goals with your organization's values.

Thank you for considering our request. We look forward to the possibility of working together.

Yours sincerely,

Boštjan Noč
President of the European Beekeeping Association


BEES
LIFE
CONTENT

EBA informative and professional monthly magazine "NO BEES, NO LIFE"

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Downloading and printing texts from "NO BEES, NO LIFE" in other magazines and electronic media is allowed and free of charge, but it is mandatory to indicate the source of the text immediately below the title. Magazine sharing is preferred.

The contents of the texts and advertisements are the responsibility of the autors.

The responsibility for the correctness of the English language in the magazine lies with the authors of the texts.

The editor reserves the right to publish a larger advertisement than the size specified by the sponsorship package, if it improves the design of the magazine.

Advertising in the magazine: 1. Through sponsorship packages; 2. It is possible to pay for an ad only for 1/4 page (100 euros), for a larger area by agreement. The entire page cannot be obtained, it belongs only to the General Sponsor.

The total number of pages in the magazine is not fixed.

There are no fees for published texts and photos.

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