Issue 18 · December 2025

NO BEES LIFE

EBA MAGAZINE

31 COUNTRIES

FROM WHICH EBA HAS MEMBERS

(59 beekeeping organizations)

In order of confirmation of the Statute of EBA

420.069 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
Austria
Albania
Iceland

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EBA EXPRESSES GRATITUDE TO PRESIDENT ROBERTA METSOLA FOR HER ATTENTION TO THE CONCERNS OF EUROPEAN BEEKEEPERS

The European Beekeeping Association (EBA) wishes to extend its sincere gratitude to the Office of the President of the European Parliament,

Ms. Roberta Metsola, for the kind response acknowledging the concerns raised by EBA regarding the proposed abolition of the beekeeping envelope under the new Common Agricultural Policy framework.

We highly appreciate the reassurance that the views of European beekeepers will be brought to the attention of those involved in agricultural and environmental policy discussions.

EBA remains committed to working closely with European institutions.

European Beekeeping Association (EBA)

EBA AND EPBA RAISE CONCERN OVER FRAUDULENT HONEY IMPORTS

The European Beekeeping Association (EBA) and the European Professional Beekeepers Association (EPBA) have sent a joint letter to EU Agriculture Commissioner Christoph Hansen and EU Agriculture Ministers, warning about the risk of fraudulent honey entering the EU market following the increase of Ukrainian honey import quotas.

Both associations stress that current testing methods fail to detect adulterated honey, making it impossible for honest European beekeepers to compete.

They call for urgent EU action to protect market integrity, fair competition, and consumers' trust.

Signed by:
Boštjan Noč (EBA) and EPBA Board Members — Mario Kalvet, Gianni Alessandri, Yngve Kihlberg, Wolfgang Pointecker, and Toms Grudovskis

Letter is on the next pages:

European Professional Beekeeping Association,
Postfach 2032, 34502 Willingen, Germany

European Beekeeping Assocaiton,
Brdo pri Lukovici 8, 1225 Lukovica, Slovenija

Concern about Ukrainian honey imports and the future of European beekeeping

Tuesday, 14th of November 2025

Dear Commissioner Hansen,
Dear Ministers,

European professional beekeepers express deep concern regarding the amended DCFTA Regulation (EU 2025/2199), which foresees a **significant increase in Ukrainian honey import quotas** from October 2025 onward.

For many years, everyone in the sector has been aware that **the origin of much of Ukraine's honey is highly questionable**. This has been repeatedly confirmed by laboratories, professional associations, and independent investigators across Europe.

The QSI Bremen laboratory presentation **"Is my honey authentic?"** (SPMF Meeting, Bordeaux, April 2024) clearly demonstrates that **current honey authenticity testing methods are unreliable up to 100% syrup** may remain undetected, and such samples are still classified as "authentic honey."
https://www.spmf.fr/wp-content/uploads/2024/04/Is_my_honey_authentic_QSI_Presentation_SPMF_Meeting_Bdx.pdf

In addition, **FAO-based data and ZDF investigative reports** highlight a highly inconsistent trade pattern: **Ukraine has for years exported nearly as much honey as it produces, while imports are minimal and domestic consumption has remained unchanged.**
This means that Ukraine cannot realistically increase its exports yet ever larger volumes of "Ukrainian" honey are being sold within the EU.
This strongly suggests that the declared origin and composition of this honey are unreliable, and that "laundered" or relabelled fake honey is entering the market.

It is therefore widely acknowledged that:

- the authenticity of much imported honey cannot be verified;
- retailers and consumers are being misled; and
- honest European beekeepers are being forced out of the market, unable to compete with systematic fraud.

European beekeepers fully support **fair competition and free trade**,
but it is impossible to compete with **syrup-based honey sold as genuine honey**.

We therefore respectfully ask for clear answers to the following questions:

1. How will the Commission and Member States ensure that increased Ukrainian honey imports will not further harm the EU market and genuine producers?
2. Are independent control measures applied before products enter the EU market, and what specific methods are being used?
3. Is the European Commission prepared to urgently review the current framework for honey authenticity testing, which has proven clearly inadequate?
4. How and when does the European Union intend to compensate beekeepers for the economic damage caused by its policies and decisions?

Furthermore, beekeepers are increasingly asking whether **the EU's inaction and extremely slow response are no longer mere negligence but rather deliberate behaviour that harms European beekeepers and enables fraud to flourish**.
Honest producers cannot survive in a market where political decisions and weak controls reward deception instead of integrity.

We call upon the European Commission and Member States to act immediately to:

- protect the integrity of the EU honey market,
- ensure fair competition, and
- safeguard the livelihoods of Europe's professional beekeepers as well as consumers' trust in authentic honey.

Respectfully,

Member of Board Mario Kalvet (Estonia)

European Professional Beekeepers Association (EPBA)

Member of Board Gianni Alessandri (Italy)

European Professional Beekeepers Association (EPBA)

Member of Board Yngve Kihlberg (Sweden)

European Professional Beekeepers Association (EPBA)

Member of Board Wolfgang Pointecker (Austria)

European Professional Beekeepers Association (EPBA)

Member of Board Toms Grudovskis (Latvia)

European Professional Beekeepers Association (EPBA)

President Boštjan Noč

European Beekeeping Association, (EBA)

SUPPORT FOR CROATIAN BEEKEEPERS

"The European Beekeeping Association (EBA), which includes more than 420,000 beekeepers from 31 countries, was surprised to read the news that Croatia has limited the retail price of honey to 5.70 for 900 g (https://www.agroklub.com/pcelarstvo/pcelari-ogorceni-odustaju-od-prodaje-pitaju-kome-se-ide-na-ruku-ograničenjem-cijene-meda/108547/).

(https://www.vecernji.hr/barkod/pcelari-vladi-ogranicenom-cijenom-meda-otvorili-ste-police-prevarantima-1910717)

This price does not even cover all the production costs of honey in Europe, so the EBA absolutely supports Croatian beekeepers in their demands to remove this price from the list of products with limited prices. The EBA advocates that honey be purchased from local beekeepers and that counterfeit honey, which according to the EU Commission represents 46% of the European market, be removed from the market.

Such price regulation does not support local beekeepers, but will lead to more counterfeit honey appearing on the market, which is the only one available at such prices!

We consume honey to improve our health, but counterfeit honey, which is mostly sugar syrup and has never been seen by bees, can even be harmful to our health"! - said the President of EBA Mr. Boštjan Noč.

MEETING PRESIDENT EBA WITH THE EU COMMISSIONNS INNER CABINET THE EU – EUROPEAN COMMISSION DG AGRICULTURE AND RURAL DEVELOPMENT

Boštjan Noč said: “I had a video meeting with MEP Matej Tonin from Slovenia.

He absolutely supports all EBA initiatives and wants to actively help.

In 2026, with his help, we will organize a major beekeeping event in the EU Parliament. The content will be dedicated to the preservation of bees and beekeepers and consumer awareness.

We have set ourselves the goal of having at least one MEP from each country at the event and for each MEP to host at least one beekeeper from their country. We will also invite all relevant commissions and committees and consumer protection organizations.

We will meet again soon to set the exact date and final content.

Matej Tonin and I really want all Slovenian MEPs to be included in the joint event.”

About today’s meeting, Mr. Boštjan Noč, President of the EBA, said:

“Today, on video conference, I met with the EU Commission’s inner cabinet – European Commission DG Agriculture and Rural Development.

At the meeting, I highlighted the following:

In May, in Slovenia, EU Commissioner Mr. Hansen promised the possibility of per-hive support under environmental measures as compensation for bee pollination services. I asked the cabinet:

– I would like to know where the current procedure is,

– when will this be adopted in the EU

– when could member states introduce this in their countries

ANSWER:

The EU legislation regarding per-hive support is currently being changed. It will be adopted shortly. From next year, this will be possible in EU countries, of course, each country must regulate this in its acts.

I further highlighted:

According to your EU Commission, 46% of honey on the market is counterfeit, and according to our data from the field in some countries, even more. Most of these counterfeits have not even been seen by bees, and this honey, which is not honey, is not beneficial to the health of consumers, but can even harm them.

The EBA supports the work of the honey platform and participates constructively in it. Unfortunately, there is no decision yet, everything is going very slowly. In the meantime, we need immediate measures:

1. Honey is bought to improve health, and counterfeit honey only harms the health of consumers. Therefore, the Commission must protect consumers and beekeepers

2. introduce greater traceability controls at the borders of Europe

3. we need an immediate ban on the import of honey from those countries where it is known that the majority of imported honey is counterfeit – a precautionary measure to protect consumers.

4. We need a clear definition of the method for detecting counterfeits as soon as possible

I also highlighted:

The problem of honey from Ukraine, the EBA is in no way against the import of real honey from Ukrainian beekeepers, but unfortunately, according to our information, most of this honey that comes to Europe has not even seen Ukraine. Most of it has not even been seen by bees… therefore, the release of additional quotas without traceability and quality controls is harmful to both Ukrainian beekeepers and all European beekeepers. We expect and demand that the Commission consult with European beekeepers about such measures!

The new CAP proposal foresees the abolition of the independent beekeeping envelope in the future, which is suicide for the beekeeping sector. 30% of food depends on bee pollination, honey can be imported, but pollination cannot. Therefore, a call, preserve the beekeeping envelope!

EBA proposes that the EU Commission SUPPORT a single European promotional campaign BUY LOCAL FOOD, BUY LOCAL HONEY!

We received the following answers from those present:

– The EU Commission is aware of the problem of counterfeit honey

– A list of countries from which the most problematic honey is produced has been made and greater control of honey is being carried out in these countries

– The problem is the right method for detecting counterfeit honey and this is the priority of the Commission

– They agree that the work of the honey platform is slow, but at the same time they emphasize that quality work takes time, and they expect the first results of this platform in early 2026

– They praised the work of the EBA and our members in the Honey platform

– The problem of the honey platform is disagreements in this group and different opinions

The most important thing is the following:

– Europe has a joint research center (https://commission.europa.eu/about/departments-and-executive-agencies/joint-research-centre_en) which, with its experts, is preparing a proposal for a harmonized method for detecting counterfeit honey. They are now testing different methods, the goal is to check all methods and find a harmonization of all. On this basis, a special EU delegated act will be drawn up, which will be received by all EU member states for adoption and will have to be confirmed. It is realistic that the harmonized method will be finalized in 2026, and the member states will confirm this in 2027.

Special emphasis is also placed on the feasibility study in practice.

The message that there will still be a special envelope for beekeeping for EU funding is also very important, with special emphasis on the fact that support per hive will also be possible.

We agreed to be in constant contact and to help each other achieve common goals"!

MEETING OF EBA PRESIDENT MR. BOŠTJAN NOČ WITH MEP MATEJ TONIN

Boštjan Noč said: "I had a video meeting with MEP Matej Tonin from Slovenia.

He absolutely supports all EBA initiatives and wants to actively help.

In 2026, with his help, we will organize a major beekeeping event in the EU Parliament. The content will be dedicated to the preservation of bees and beekeepers and consumer awareness.

We have set ourselves the goal of having at least one MEP from each country at the event and for each MEP to host at least one beekeeper from their country. We will also invite all relevant commissions and committees and consumer protection organizations.

We will meet again soon to set the exact date and final content.

Matej Tonin and I really want all Slovenian MEPs to be included in the joint event."

LETTER FROM THE EBA – BEE HEALTH SCIENTIFIC COMMITTEE

The European Beekeeping Association (EBA), through its Bee Health Scientific Committee, has sent a formal letter expressing serious concerns about the European Commission's recent proposal on pesticide approvals.

Reason is THERE.

The letter is addressed to:

Members of the European Commission
EU Commissioner for Agriculture and Rural Development, Mr. Christophe Hansen
President of the European Parliament, Ms. Roberta Metsola
EU Commissioner for Environment, Water Resilience and a Competitive Circular Economy, Ms. Jessika Roswall
Chair of the Agri Committee, Ms. Veronika VRECIONOVÁ
EU Members of Parliament

In this statement, the Bee Health Scientific Committee highlights the risks posed by unlimited pesticide approvals and the removal of obligations for Member States to consider the most recent scientific evidence. The Committee urges EU institutions to prioritize independent science, protect pollinators, and safeguard ecosystems for current and future generations.

Below is the full text of the letter sent to EU policymakers.

Subject: Concerns of the Scientific Commission of the European Beekeeping Association Regarding the Recent Proposal on Pesticide Approvals

Dear Members of the European Commission,
Dear EU Commissioner for Agriculture and Rural Development, Mr Christophe Hansen,
Dear President of the European Parliament, Ms Roberta Metsola,
Dear EU Commissioner for Environment, Water Resilience and a Competitive Circular Economy, Ms Jessika Roswall,
Dear Chair of the Agri Committee, Ms Veronika Vrecionová,
Dear EU Members of Parliament,
Dear Copa Cogeca,

On behalf of the Scientific Commission of the European Beekeeping Association, we wish to express our profound concern regarding the Commission's recent proposal on pesticide approval procedures, as presented in the communication referenced in the PAN Europe report.

The proposal, as currently formulated, appears to prioritise the interests of the pesticide industry at the expense of the One Health paradigm, which encompasses the health of the environment, pollinators, animals, and the public. This approach is incompatible with the EU's stated commitments to biodiversity protection, environmental stewardship, and sustainable agriculture.

We are particularly concerned that the proposal seems designed to neutralise the effects of the April 2024 ruling of the Court of Justice of the European Union, which reaffirmed the obligation of Member States to consider the most up-to-date scientific evidence when authorising the use of pesticides. Weakening these requirements would represent a serious setback for science-based policymaking and would undermine public trust in regulatory processes.

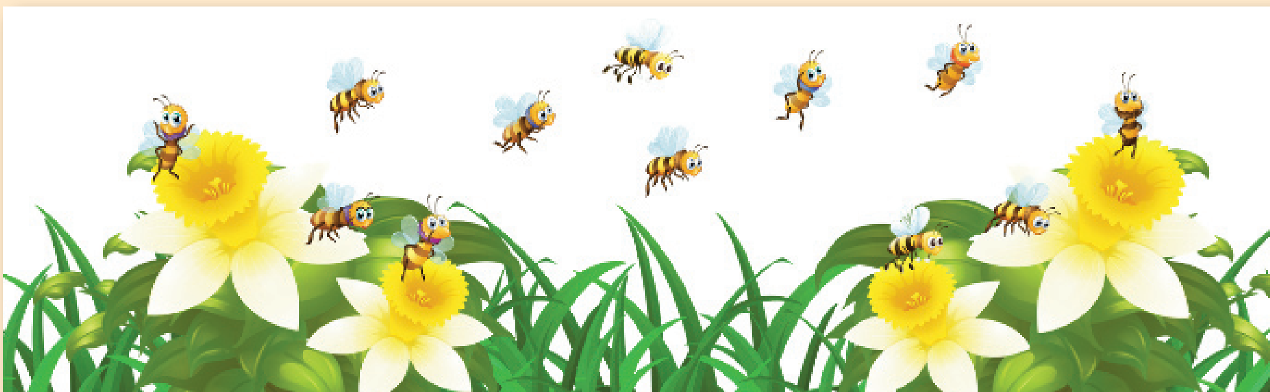
Furthermore, the provision allowing hazardous pesticides to remain on the market for up to three additional years after a ban has been imposed raises significant risks. Substances recognised as harmful — including endocrine disruptors, carcinogens, and neurotoxic compounds — could continue to be sold and applied long after their dangers have been formally acknowledged. Such delays are unacceptable given their potential impacts on pollinator health, ecosystem stability, food safety, and human well-being.

This proposal, if adopted, would reverse decades of progress in environmental and public health protections. It would weaken the foundations of scientific assessment in favour of short-term economic interests, with long-term consequences for society and the environment.

We strongly urge the Commission to reconsider this proposal and to reaffirm the central role of independent, current scientific evidence in all decisions related to pesticide regulation. Protecting pollinators and safeguarding ecosystems must remain a priority for the European Union, not only for beekeepers but for the resilience of agriculture and the health of present and future generations.

We remain at your disposal for scientific consultation and constructive dialogue.

Respectfully,
President Boštjan Noč – President of European Beekeeping Association
Prof. Dr. Aslı Özkırım – President of EBA Bee Health Scientific Commission
Dr. Giovanni Formato – Vice-President of EBA Bee Health Scientific Commission



EBA MADE A PROMOTIONAL VIDEO IN 34 LANGUAGES

Adulterated honey is a growing problem across Europe and worldwide. Many cheap honey products sold in stores are not real honey — they can be mixed with sugar syrups or imported from unknown sources. By choosing honey from local beekeepers, you support honest producers, protect pollinators, and help maintain a healthy, sustainable environment. Real honey makes a real difference — for you, the bees, sustainable beekeeping, food production, and our planet.

Learn more about supporting local honey and beekeepers. Make informed choices and help us fight honey fraud!

Produced by EBA – European Beekeeping Association.

https://www.youtube.com/@ebaeurope

STATUS REPORT

EBA HONEY CAMPAIGN

“Real European Honey for Commissioner Hansen”

Overview of EBA Member Associations That Have Submitted Honey Jars

Associations That Have Confirmed Shipment

1. Slovenia

Slovenian Beekeepers’ Association
Sent one jar of Slovenian honey with Protected Geographical Indication.
Shipped to MEP Peter Agius.
Date: November 11, 2025

2. Greece (Hellas)

Organic Beekeeping Community (Hellas)
Sent a honey sample as part of the EBA campaign.
Date: November 13, 2025

3. Serbia

Serbian Federation of Beekeeping Organizations
Honey delivered to the office of the Maltese MEP by Ms. Nataša Šofranac.
Date: November 20, 2025

4. Spain

Apicultores de La Unió

Confirmed shipment of their honey sample to the European Parliament.

Date: November 21, 2025

5. Czech Republic

Čapis – Czech Apitherapy Society

Sent honey to the European Parliament.

Date: November 24, 2025

6. Montenegro

Honey from Montenegro shipped to Brussels as part of the EBA action.

Date: November 24, 2025

7. Romania

Honey from Romania shipped to Brussels.

Date: November 24, 2025

8. Germany

Deutscher Imkerbund e.V.Confirmed shipment of the honey jar on November 25.

Date published: November 26, 2025

9. Croatia

Association of Beekeepers' Associations of Primorje-Gorski Kotar County

Confirmed delivery of the honey jar for the Commissioner.

Date: November 30, 2025

10. Malta

Malta Beekeepers Association

Confirmed shipment of Maltese honey to Brussels as part of the EBA campaign.

Date: December 2, 2025

11. Lithuania

Lithuanian Beekeepers Association

Confirmed shipment of Lithuanian honey to Brussels as part of the EBA campaign.

Date: December 2, 2025

EBA THANKS MEP PETER AGIUS FOR SUPPORTING OUR HONEY INITIATIVE

The European Beekeeping Association (EBA) warmly thanks MEP Peter Agius for providing the official address to send authentic honey from all 31 EBA member countries to EU Commissioner Christoph Hansen.

We appreciate MEP Agius' support in promoting local, European and authentic honey.

WILL THERE BE A BIG BEEKEEPING EVENT IN THE EU PARLIAMENT?

The European Beekeeping Association and the Beekeeping Association of Slovenia have invited President Roberta Metsola to support and host a special event in the European Parliament on May 2026. marking World Bee Day and highlighting the importance of bees, beekeepers, and the protection of the honey market.

Official invitation is there:

Beekeeping Association of Slovenia
European Beekeeping Association
Brdo Pri Lukovici 8
1225 Lukovica

European Parliament
President Ms. Roberta Metsola

Dear President Ms. Roberta Metsola!

I am writing to you on behalf of the Beekeeping Association of Slovenia and on behalf of the European Beekeeping Association (31 countries, 420,000 beekeepers).

Every third spoonful of food depends on pollination by bees; without bees, there would be much more hunger in the world. Unfortunately, bees cannot survive today without the help of beekeepers.

Since 2018, the world has celebrated May 20th as World Bee Day. This day is dedicated to raising awareness of the importance of bees and other pollinators.

The European Parliament is the place where decisions are made about our future, and bees and beekeepers are an important part of this.

We therefore ask you to organise a special beekeeping event in the European Parliament in May. Together with you, we would like to organise a special event that would raise awareness among experts, politicians and the general public about the importance of bees.

We have several proposals, namely:

– A round table in the European Parliament on the importance of bees and pollinators and the issue of counterfeit honey on the market

– Exhibition and tasting of bee products from all EU Member States in front of the European Parliament

We would like you, as President of the European Parliament, to be the honorary patron of the event. We would like you to address us at the event. We will do our best to bring as many MEPs as possible to the event. Our aim is to have MEPs from all 27 Member States and at least one beekeeper from all over Europe represented at the event.

Could you please provide us with the contact details of the responsible person in your office with whom we could then coordinate all the technical details.

We believe that together we could organize an exceptional event that will help preserve bees and European beekeeping.

Sincerely,
Boštjan Noč
President of the ČZS
President of the EBA

SUPPORT RECEIVED FROM MEP DAVID CORMAND'S OFFICE REGARDING EBA SCIENTIFIC COMMISSION'S EBA CONCERNS ON PESTICIDE APPROVALS

The European Beekeeping Association (EBA) has received supportive feedback from the office of MEP David Cormand following the letter titled "Concerns of the Scientific Commission of the European Beekeeping Association Regarding the Recent Proposal on Pesticide Approvals."

In their response, Mr Cormand's office confirmed that he shares the EBA Scientific Commission's concerns about the potential consequences of the proposed "chemicals omnibus," particularly its impact on pollinator health, environmental safeguards, and the integrity of scientific assessments within EU pesticide approval procedures.

His team also expressed readiness for further dialogue, which the EBA warmly welcomes.

We extend our sincere appreciation for this constructive engagement.

Such support strengthens our ongoing efforts to ensure that EU policies remain firmly grounded in science and that pesticide regulations continue to protect bees, biodiversity, and the wider environment.

EBA RECEIVES SUPPORT FROM BEEKEEPER MEP THOMAS WAITZ

The European Beekeeping Association (EBA) has officially sent a letter to the Members of the European Parliament, urging them to maintain the special beekeeping envelope within the new Common Agricultural Policy for 2028–2034.

In the letter, signed by EBA President Boštjan Noč, the EBA emphasized the critical role of bees and beekeepers.

We are pleased to share that EBA has received a positive response from Mr. Thomas Waitz, Member of the European Parliament and a beekeeper himself, through his office:

"As a beekeeper himself, Mr. Waitz will of course do everything in his power to support beekeepers in Europe and will defend them during the negotiations on the new CAP."

The European Beekeeping Association sincerely thanks Mr. Waitz for his support and solidarity. His commitment reinforces the vital importance of protecting real honey, supporting beekeepers, and safeguarding the pollination services that are essential for biodiversity and Europe's food security.

WEBINAR - FROM HIVE TO HEALTH: THE ROLE OF BEE PRODUCTS IN PREVENTING AND TREATING RESPIRATORY VIRAL INFECTIONS

Lecturer: Zorica Plavšić, MD, PhD, MPH, Apitherapist, Serbia
Date: November 23, 2025
Duration: 10:00–11:30

The webinar explored the scientific foundations and practicalapplications of bee products in supporting immunity and respiratory health.

Dr. Zorica Plavšić presented how viral infections affect the respiratory system and explained the mechanisms through which bioactive components of honey, propolis, royal jelly, bee venom, beepollen, bee bread, beeswax, and hive air may contribute to antiviral protection and faster recovery.

Special emphasis was placed on the antiviral, anti-inflammatory, antioxidant, and immunomodulatory properties of bee products, as wellas their role in managing symptoms of colds, acute bronchitis pneumonia, and in preventing exacerbations of chronic respiratory diseases.

Dr. Plavšić highlighted that apitherapy should be used as a complementary approach, alongside standard medical treatments, and pointed out important safety considerations, especially for individuals with allergies or chronic conditions. The webinar concluded that although bee products show significant potential in respiratory viral infections, further high-quality clinical studies are needed to establish standardized therapeutic guidelines.

NEW MEMBER APPROVED TO THE EBA SCIENTIFIC COMMITTEE ON BEE HEALTH

During the written meeting of the EBA Executive Board, members voted to approve the admission of a new member to the EBA Scientific Committee on Bee Health.

The European Beekeeping Association is pleased to welcome Prof. Uroš Glavinić, PhD, DVM Associate Professor and Research Associate, Chief of the Laboratory for Animal Genetics, Faculty of Veterinary Medicine, University of Belgrade (Serbia). Prof. Glavinić's expertise in veterinary medicine and bee health will further strengthen the work of the Scientific Committee and contribute to EBA's mission of protecting honey bees and supporting sustainable beekeeping across Europe.

CONSUMER DECEPTION WILL NOT END IN 2026 AND MAY WORSEN

Introduction

The view that consumer deception will end on 1 June 2026, when the provisions of Regulation (EU) 2024/1438 on mandatory indication of countries of origin enter into force, reflect an optimism that I respectfully cannot share.

My intention is not to challenge or diminish the so far efforts that have been made on this issue, but to explain why, based on evidence and long-standing experience, I believe the problem may persist or even intensify unless immediate corrective measures are taken.

For more than two decades, structural weaknesses in legislation, enforcement, and traceability have enabled the expansion of fraud in the European honey market. The new legislation corrects past mistakes, but without effective implementation, adequate control mechanisms, and a functional traceability system, the new rules may simply provide fraudsters with new opportunities.

National Requirements for Listing Countries of Origin Before Regulation 2024/1438

Since Directive 2001/110/EC was introduced, the true origins of honey blends were concealed under the generic phrase “Blend of EU and/or non-EU honeys.” This practice was ideal for importers, who effectively hid the origin of honey by simply using the word “blend.” In Greece, we examined 216 honey samples from 31 supermarkets (2010–2012). Every single product was labelled as a "mixture," and none came from a single country!

A decade later, several Member States—including France, Spain, Portugal, Italy, Greece, Cyprus, and others—introduced national rules requiring the full list of countries of origin for honey blended. However, these stricter national measures applied only to honey packed within the country. Honey already bottled elsewhere could continue to use the generic EU/non-EU indication due to the mutual-recognition principle

In 2020, with the initiative of the Slovenia Beekeeping Association, 16 Member States jointly signed a Council declaration calling for mandatory EU-wide indication of all countries of origin for blended honey regardless of the country of bottling (ST5389/2020 ANNEX).

Did National Origin-Labelling Reduce Consumer Deception?

Unfortunately, no. Importers of low-quality honey know that consumers view domestic honey as superior. To overcome this distrust, they hide the countries of origin on the back of the label, among other texts, symbols, and images—where consumers are unlikely to look. This practice violates Regulation (EU) 1169/2011, which requires origin information to be clearly visible and not obscured.

In Greece, most imported honeys use misleading labels that violate this regulation. Many list Greece first in the blend, even when present in minimal amounts, and we have observed labels listing up to 12 different countries. China, the main supplier of imported honey, almost never appears, despite being a dominant component.

Despite repeated reports from beekeepers and scientists, enforcement authorities have taken no meaningful action. Thus, even a valuable obligation, origin labelling, failed completely due to weak enforcement.

Why Consumer Deception May Worsen After June 2026

Regulation EU 2024/1438 mandates that all countries of origin must be listed in descending order of proportion, and the percentage contribution of each must be declared. These rules apply from 14 June 2026, with transposition into national law required by 14 December 2025.

The Commission acknowledges that, since 2001, the origin indications for honey blends were misleading and undermined both consumers' rights and the functioning of the internal market. However, serious risks remain:

a) **No analytical method exists to verify the declared percentages**. There is currently no scientific method capable of verifying the percentage composition of blended honeys. Without validated analytical tools and strong administrative measures, the new rule becomes unenforceable, opening the door to sophisticated fraud.

b) **Administrative controls in Europe have repeatedly failed**. Despite strict border legislation, large volumes of non-compliant honey enter the EU freely (EU Report from the Hive, 2023). Even worse, this honey is sold as authentic in supermarkets. If authorities cannot enforce existing rules, it is unrealistic to expect them to enforce even more complex ones.

c) **The EU traceability system will not be implemented until 2029**. The Union-wide traceability system, essential for verifying origin, will only be defined by June 2029. This creates a four-year gap during which fraudsters will have enough time to find their ways to falsify traceabil-

The import of baker's honey with characteristics of filtered honey without origin labelling, the absence of minimum pollen thresholds in genuine honey, the unregulated removal of HMF and addition of industrial enzymes, the lack of enforcement of Regulation 1169/2011 on clear labelling and others. These gaps allow fraudsters to falsify origin and authenticity with ease.

Taken together loopholes, misleading advertising, and pricing anomalies, consumer deception will likely worsen rather than improve unless urgent action is taken.

The system will continue exactly as it has for the last 23 years.

ity documents and to exploit the absence of verification tools.

The Commission first recognized the need for traceability in 2015–2017. By 2029, twelve years will have passed with no system in place.

d) **Legislative loopholes remain open**. Several unresolved issues continue to facilitate fraud:

What Can Be Done to Reduce Consumer Deception?

Beekeepers and organizations must continue to demand implementation of existing legislation,

Table 1. National Labels Promoted by Beekeepers' Federations

Country	**Label/Mark**	**Managing Organisation**	**Purpose & Key Characteristics**
Germany	EchterDeutscherHonig (EDH)	Deutscher Imkerbund (D.I.B.)	Strict rules for purity, moisture, HMF, enzymes, origin exclusively from Germany. Used only by members of the beekeepers' federation.
Cyprus	Cyprus Honey / ΚυπριακόΜέλι	Cyprus Beekeepers' Associations	Used widely to distinguish local from imported blends. Appears in national promotion campaigns and fairs.
Serbia	Naš Med" (Our Honey)	Serbian Federation of Beekeeping Organizations (SPOS)	National program ensuring origin, purity, and authenticity of Serbian honey. Includes traceability, quality control, and branding to protect beekeepers from imported blends.
Italy	Miele Italiano / Consortium Labels	CONAPI & other beekeeper cooperatives	Strong national marketing for Italian-origin honey. Some cooperatives use strict origin-labelling rules.
France	Miel de France	French beekeeping organisations (UNAF, ADA, etc.)	Widely promoted label for 100% French honey. Used to differentiate domestic honey from imports.
Poland	Miód Polski / regional PDO–PGI honeys	Polish Beekeepers' Association (PZP) + regional groups	National promotion of Polish honey origin. Used to emphasize domestic honey and defend against imported blends

closure of legislative gaps that enable fraud, and immediate action by the Commission well before June 2026. But history shows that relying solely on EU institutions is insufficient. Beekeepers must also take independent action to protect consumers and themselves.

Fraudsters mislead consumers primarily by obscuring the country of origin. Therefore, beekeepers must counteract this deception by showing consumers what genuine domestic honey looks like and where to find it.

Two effective tools already exist: National distinctive labels, and digital traceability labels (e.g., Slovenia's GS1 system).

Distinctive label. Several countries already use national labels that clearly distinguish domestic honey. Table 1 indicates the countries that have a beekeeper-promoted label clearly differentiating domestic honey from imported honey.

For these labels to work, strong promotion is needed so consumers instantly recognize authentic domestic honey. In Cyprus, for example, supermarkets place labelled local honey separately from cheap imports, accompanied by educational material and often beekeeper presence (fig. 1).

Digital Link labels. Slovenia has implemented a national digital traceability system using GS1 standards. Consumers can scan a QR code to view the country of origin, the producer, the packer, and the validity of certification. This system aligns with upcoming EU requirements and may become the model for Member States.

Traceability is already required by law. The Directive creates a legal obligation for EU-level traceability rules, and the Commission cannot avoid it, only postpone. Without an EU system, each member State will improvise their own digital or paper traceability method and this will create chaos, cost, and incompatibility.

Slovenia's GS1-based model may become a reference case because is the only European

Figure 1. Cyprian Beekeeping Organization has reached an agreement with supermarket owners to place separately the local honey with banners promoting Cypriot Honey

country with a national digital traceability system for honey. It's system is very likely to be looked at as a practical template. From a policy standpoint, Slovenia has a functioning system that can demonstrate feasibility and cost realism. This matters because many Member States are worried that traceability will impose high burdens on small beekeepers or small packers.

Conclusion

Unless immediate and decisive measures are taken, the optimistic expectation that consumer deception will end in June 2026 is unfounded.

The new origin-labelling requirements are positive, but without enforcement, analytical verification, and traceability, they may instead create new opportunities for fraud.

Beekeepers and their organizations must continue to demand action, while simultaneously developing national tools (labels, traceability systems, consumer education) that protect the market independently of EU delays.

Only a combination of regulatory pressure, strict traceability, and beekeeper-led initiatives can restore consumers' trust and protect European honey from fraud.

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POPULATION DYNAMICS OF THE MITE VARROA DESTRUCTOR IN HONEY BEE (APIS MELLIFERA) COLONIES IN A TEMPERATE SEMI-ARID CLIMATE

Simple Summary

The mite Varroa destructor is the most damaging parasite of honey bees (Apis mellifera) worldwide. When necessary, mite control is mainly accomplished with acaricides. Optimal parasite control is achieved when the acaricide is applied during times of little or no brood in honey bee colonies, which varies by region. Therefore, in this study we analyzed the population dynamics of the mite in honey bee colonies established in a temperate semi-arid climate in Mexico by periodically sampling brood and adult bees, as well as by counting mites falling to the bottom board of hives over 10 months. We also measured brood and adult bee populations and food stores. It was found that the sampling period influences the population of V. destructor in the colonies. The mite population increased by 26% in the 10 months of sampling. It was observed that as the worker brood population increased, the mite infestation rate in adult bees decreased, and the opposite occurred when the amount of brood in the colonies was reduced. Monitoring V. destructor populations by recording fallen mites is more reliable than determining mite infestation rates in adult bees and brood. The best period to apply an acaricide treatment in the region of study is between November and December.

Abstract

This study aimed to analyze the population dynamics of the mite Varroa destructor in honey bee (Apis mellifera) colonies in a temperate semi-arid climate in Mexico. Ten colonies homogeneous in population, food stores, and levels of mite infestation were used. The mite infestation rate in brood and adult bees, total number of mites, daily mite fall, brood and adult bee population, and food stores were determined periodically for 10 months. There was a significant effect ($p < 0.05$) of sampling period on the population of V. destructor in adult bees, brood, total mite population, and daily fallen mites. The total mite population increased by 26% on average per colony. The increase in brood amount reduced the mite infestation rate in adult bees, and the oppo-

site occurred when the brood decreased. Monitoring V. destructor populations by recording fallen mites is more reliable than determining mite infestation rates in bees, as mite fall has a dynamic pattern similar to that of the total mite population. The best period to apply an acaricide treatment in the region of study is between November and December because most mites were in the phoretic phase, since there was less brood in the colonies compared to other times.

1. Introduction

The mite Varroa destructor (Acari: Varroidae) [1], is the main health problem for the beekeeping industry worldwide [2]. This is because the mite has had a relatively recent association with Apis mellifera, the western honey bee, and has rapidly spread to almost all regions where western honey bee colonies are managed [3,4]. The mite feeds on the fat tissue and hemolymph of the brood and adult bees, inhibiting their immune system and making them more susceptible to bacteria, viruses, fungi, and pesticides [5,6,7,8,9,10]. Additionally, V. destructor transmits several viruses to its hosts [11,12,13]. It also shortens the lifespan of parasitized bees [14], reducing the populations and honey yields of their colonies [15,16,17]. For all these reasons, V. destructor is one of the main factors associated with the high loss of colonies worldwide [18,19,20].

Besides the damage caused by V. destructor to honey bee colonies, the application of acaricides (synthetic and organic) used for its control represents another problem because, in general, all have been shown to have adverse effects on the bees [21,22,23,24,25].

To control mite populations in honey bee colonies and at the same time reduce the use of acaricides, it is necessary to identify the appropriate times to apply treatments. This knowledge would help reduce the negative effects of acaricides on bee health, the selection pressure for mites to develop resistance to the active ingredients of the chemicals, the risk of contamination of hive products, and production costs for beekeepers due to unnecessary or excessive treatment applications [26,27,28,29,30].

Several reports on the population dynamics of V. destructor in honey bee colonies from different countries have been published [31,32,33,34,35], but none from Mexico. These reports are valuable for specific countries, but it is critical to take into consideration that the population dynamics of the mite varies regionally due to the seasonality of the brood period in the colonies and its effects on mite reproduction [28,29]. Additionally, very few studies have jointly evaluated the population levels of V. destructor in its different life phases (phoretic and reproductive) along with recording daily mite drop and the population and food stores of honey bee colonies.

Studies on the population dynamics of V. destructor in honey bee colonies provide information on its evolution and changes in a given region and allow for the establishment of timely control strategies. This study reports for the first time in Mexico the population dynamics of V. destructor and considers its phoretic and reproductive phases, as well as natural mite drop, in relation to the population dynamics and food stores of honey bee colonies established in a temperate semi-arid climate.

2. Materials and Methods

2.1. Study Region

The study was conducted at an experimental apiary belonging to the Veterinary and Animal Science Academic Unit of the Autonomous University of Zacatecas in El Cordovel, General Enrique Estrada, municipality of the state of Zacatecas, Mexico (22°59′42″ N, 102°44′24″ W). This region is characterized by a temperate semi-arid climate, with an average annual precipitation of 400 to 700 mm and an average annual temperature of 18 °C [36].

2.2. Experimental Colonies

Ten nucleus colonies homogeneous in bee population, food stores, and V. destructor infestation levels were used for the experiments. Six commercial honey bee colonies of mostly European ancestry (previously verified by morphometric analyses) that had not been treated with acaricides for more than two years were used to create the nucleus colonies. The bees from these six colonies were shaken into a large wire cage to blend them. Each nucleus colony was composed of three frames with capped brood and one frame containing honey and pollen. The frames were randomly taken from the six source colonies, while 2 kg of bees were taken from the cage for each nucleus colony [37]. These new colonies were housed in Langstroth hives identified with a number and distributed in a circular arrangement in the apiary separated by 2 m from one another. Three days after establishing the colonies, sister queens of the same age and origin were introduced to the colonies and their presence was monitored during each inspection. The queens were derived by grafting larvae from a colony of European honey bees that was maintained at the research unit for research purposes. The nucleus colonies were established on April 3, 2018—three months before the evaluations began—to ensure that the bee populations studied were daughters of the introduced queens. The colonies were fed weekly with 1.5 L of a 1:1 water/sucrose syrup and 250 g of a commercial food supplement containing 20% protein (Nutra®, X-Nox, Aguascalientes, Mexico). Additionally, frames with wax foundation were added as needed by the colonies.

2.3. V. destructor Infestation in Adult Bees, Brood, and Daily Mite Fall

The infestation level of V. destructor in adult bees and worker brood, as well as the number of mites fallen in the experimental colonies, was determined on five occasions over a 10-month period (3 July, 25 September, and 6 December, 2018, and 28 February and 6 May, 2019).

The mite infestation level in adult bees was determined as per De Jong et al. [38]. This technique involves collecting a sample of approximately 300 adult bees from the brood nest of each colony in a container with 75% ethanol. Subsequently, mechanical agitation was used to remove the mites adhered to the bees. The mite infestation rate was determined by dividing the total number of mites counted by the number of bees analyzed, and the result was multiplied by 100. The infestation level in worker brood was determined by dividing the number of mite-infested cells in a section of capped brood comb (10 × 10 cm) by the number of cells analyzed and multiplying by 100 [39].

With the data on V. destructor infestation levels in adult bees and brood, and the population estimates of adult bees and capped brood (described later), the total population of mites in adult bees (phoretic phase) and in the brood (reproductive phase) of the experimental colonies was estimated. This was accomplished by multiplying the average number of mites per bee or brood by the estimated population of adult bees or brood, respectively.

To record fallen mites, a galvanized metallic sheet (28 × 43.5 cm) impregnated with petrolatum was placed on the bottom board of each hive, and a metal mesh (3 mm) of the dimensions of the hive was installed between the sticky sheet and the brood chamber, so that the fallen mites would pass through the mesh and adhere to the sticky sheet. The daily average of fallen mites was obtained by dividing the number of recorded parasites by four, which was the number of days that the adhesive sheets remained in the hives [38].

2.4. Bee Population, Brood, and Food Stores of Experimental Colonies

The adult bee population, as well as the comb area containing honey and pollen in the colonies, was calculated by visually estimating the proportion of the surface of each side of combs occupied by these variables. This estimation was performed twice by two different observers, and the values were averaged. To calculate the population of adult bees, the surface proportion occupied by adult bees on each comb was multiplied by 2430, which is the estimated number of adult individuals for a Langstroth brood chamber frame [37]. The proportions for honey and pollen were converted to area (cm2) using the surface area of a Langstroth frame on both sides (1760 cm^2) [37]. The brood population was estimated by determining the area (cm^2) of capped brood in the colonies. For this purpose, all the combs of each colony were photographed on both sides, and the area in cm2 of capped brood in each comb and colony was determined using the ImageJ® software 1.50 National Institute of Health, Bethesda, Maryland, USA). The amount of brood was estimated by multiplying the areas of capped brood by the number of brood cells per cm2 (3.9) [37]. Measurements were taken between 6:00 PM and 7:00 PM, when most of the bees were inside the hives. The estimates of the population size of bees, brood, and food stores were also determined every 72 days for 10 months, starting in July 2018.

2.5. Statistical Analyses

The data on V. destructor infestation rates in brood and adult bees were arcsine-square-root transformed to normalize their distribution. For non-percentage data, normality was verified using the Shapiro–Wilk test. Analysis of variance was used to compare the initial values of V. destructor infestation rates, daily mite fall, bee population, and food stores of the experimental colonies. Measures of central tendency and dispersion were obtained for V. destructor infestation levels, bee population, and food stores of the colonies. Repeated measures analysis of variance and Tukey tests were also used to compare the effect of sampling time on the measured variables. Additionally, Pearson correlation tests were performed to establish relationships between the evaluated variables. All analyses were conducted using SAS software, version 9.0 [40].

3. Results

The colonies did not differ at the beginning of the study in terms of infestation levels in adult bees ($F_{1,9} = 2.51$, $p = 0.35$), brood ($F_{1,9} = 2.42$, $p = 0.36$), and daily fall of V. destructor ($F_{1,9} = 3.0$, $p = 0.33$). There were also no differences between colonies in initial bee population ($F_{1,9} = 1.72$, $p = 0.41$), amount of brood ($F_{1,9} = 0.81$, $p = 0.53$), and areas of pollen ($F_{1,9} = 0.48$, $p = 0.61$) and honey ($F_{1,9} = 1.69$, $p = 0.42$).

During the course of the study, significant differences were found between sampling periods for V. destructor infestation rates in adult bees ($F_{4,46} = 4.08$, $p = 0.008$) and brood ($F_{4,46} = 11.82$, $p < 0.0001$), as well as for the number of fallen mites ($F_{4,46} = 7.81$, $p = 0.0001$), amount of brood ($F_{4,46} = 39.27$, $p < 0.0001$), adult bee population ($F_{4,46} = 13.33$, $p < 0.0001$), mite population in brood ($F_{4,46} = 10.33$, $p < 0.0001$), mite population in adult bees ($F_{4,46} = 5.36$, $p = 0.001$), total mite population ($F_{4,46} = 13.51$, $p < 0.0001$), areas of pollen ($F_{4,46} = 15.19$, $p < 0.0001$), and areas of honey ($F_{4,46} = 25.59$, $p < 0.0001$).

In September, the colonies had the lowest infestation rates in brood and adult bees and the lowest number of estimated total mites, while in December, the colonies had the highest mite infestation rate in the brood. In May, the colonies had the highest number of mites fallen onto the adhesive sheets and the highest estimated number of total mites in the colonies (Figure 1).

Figure 2 shows that there was a greater population of adult bees and brood during the months of September and May, while the estimated number of V. destructor mites on adult bees showed significant differences only between September and May. Additionally, the estimated number of mites in the brood was significantly higher in May compared to the period between the previous June and December. Moreover, a reduction in the population of V. destructor in adult bees was observed in response to an increase in the amount of brood in the colonies, and an increase in the population of V. destructor in adult bees was observed when the amount of brood in the colonies decreased. The lowest estimated number of V. destructor mites in the brood compared to the number of mites on adult bees was also observed in December.

A decrease (although not significant) in the estimated total number of V. destructor mites (including mites in both the reproductive and phoretic phases) relative to the populations of brood and adult bees, which increased significantly, was observed from July to September. The estimated total population of V. destructor in the colonies was lowest in September, with an average of 782 ± 168 mites, a number that progressively and significantly increased to reach 2715 ± 350 mites in May. Following a similar pattern, the daily average of fallen mites showed no significant differences from July to February, with an average

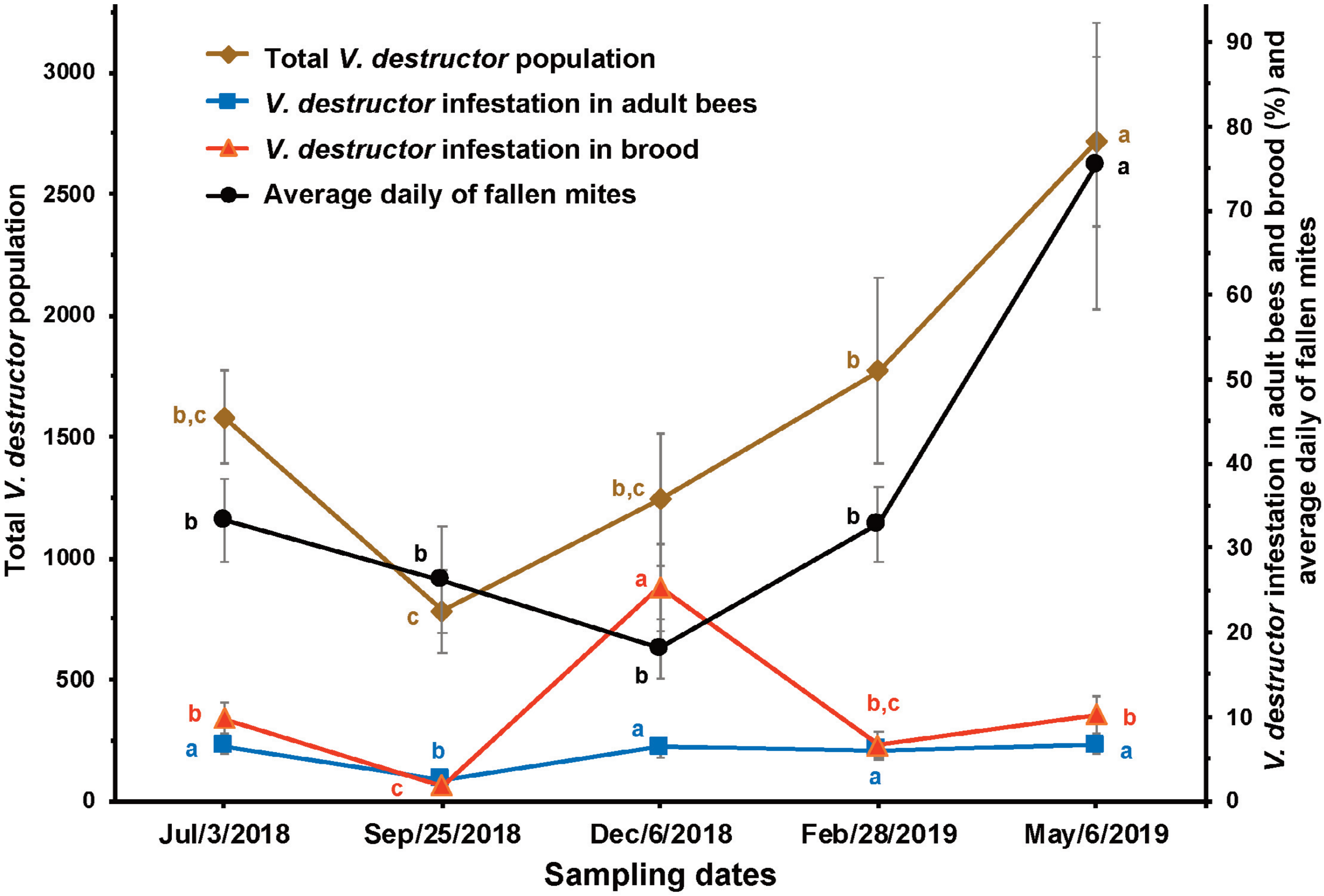


Figure 1. Estimated total population of V. destructor, brood and adult bee infestation (%), and average daily mite fall (±SE) at different times of the year in honey bee colonies (n = 10) established in a temperate semi-arid climate. Different letters between means for each variable indicate significant differences based on analyses of variance and Tukey tests

of 27.6 ± 1.6 parasites, while the mean of that variable was significantly higher in May (75.3 ± 5.6; Figure 3).

From September through February, there was a parallel and significant increase in the total population of V. destructor and the honey and pollen stores in the brood chambers of the experimental colonies (Figure 4).

Significant correlations were found between the rates of V. destructor infestation (in adult bees

Table 1. Correlation coefficients between V. destructor infestation rates in brood and adult bees, daily mite drop, total V. destructor population, adult bee population, amount of brood, and areas of honey and pollen in honey bee colonies (n = 10) established in a temperate semi-arid climate

Variable	Infestation Adult	Infestation Brood	Fallen Mites	Total Mites	Brood Amount	Adult Population	Pollen Area
Infestation brood	0.48 ***						
Fallen mites	0.43 **	0.12 ns					
Total mites	0.73 ***	0.40 **	0.62 ***				
Brood amount	−0.30 *	−0.65 ***	0.13 ns	0.04 ns			
Adult population	−0.23 ns	−0.18 ns	0.17 ns	0.15 ns	0.59 ***		
Pollen area	0.20 ns	0.19 ns	0.18 ns	0.10 ns	−0.12 ns	−0.02 ns	
Honey area	0.17 ns	0.18 ns	0.10 ns	0.30 ns	0.15 ns	0.21 ns	0.45 ***

***, $p < 0.001$; **, $p < 0.01$; *, $p < 0.05$; ns = Not significant. The correlation coefficients were obtained using Pearson's test.

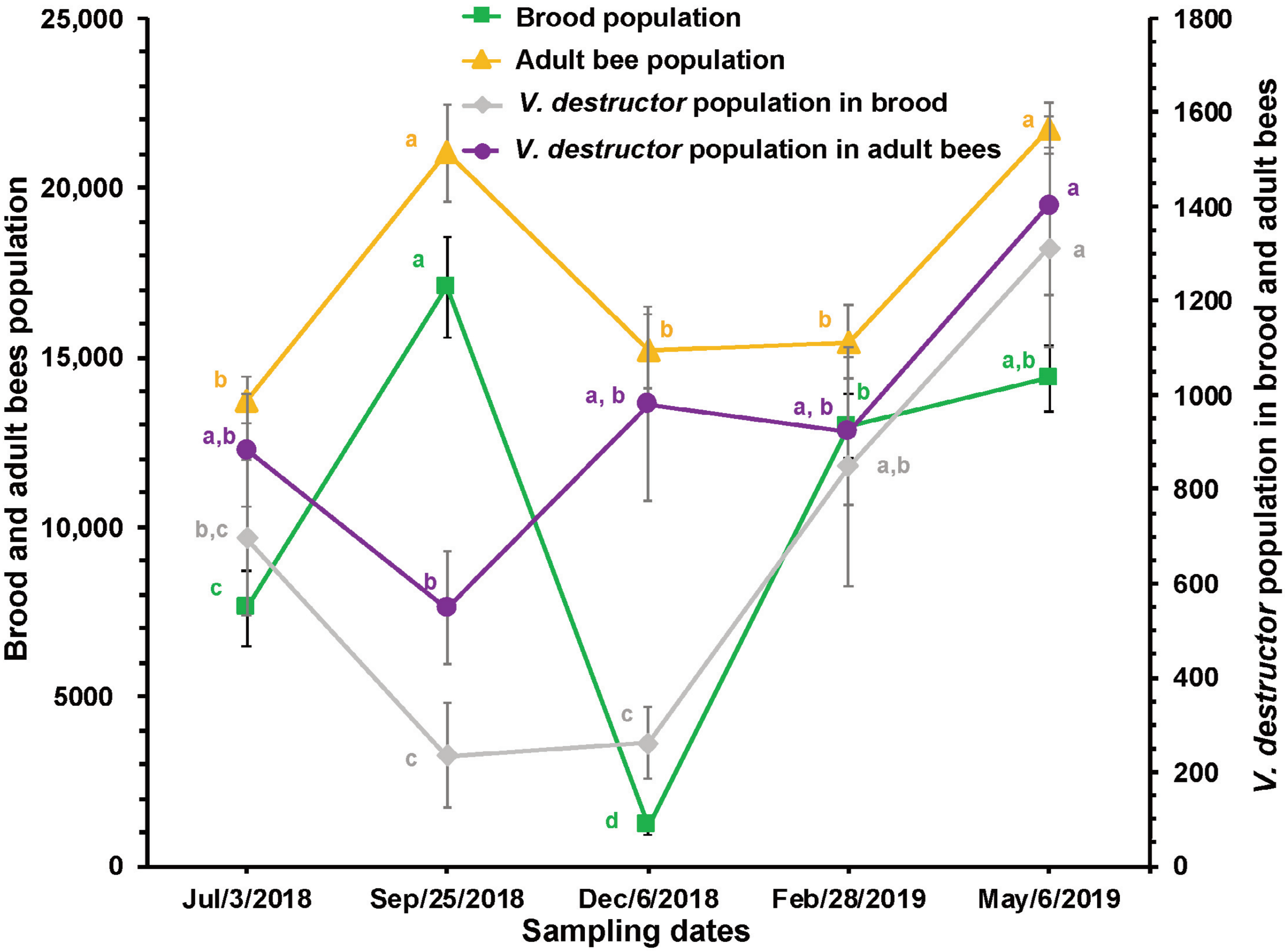


Figure 2. Estimated population of brood, adult bees, and V. destructor in brood and adult bees (±SE) at different times of the year in honey bee colonies (n = 10) established in a temperate semi-arid climate. Different letters between means for each variable indicate significant differences based on analyses of variance and Tukey tests

and brood) and daily mite drop, total V. destructor population, and amount of brood. The daily mite drop was related to the infestation rate in adult bees. Additionally, the amount of brood was also related to the adult bee population, while the honey areas were significantly correlated with the pollen areas of the colonies (Table 1).

4. Discussion

The differences found in the estimated populations of V. destructor in brood, adult bees, and total mites, as well as in the number of parasites fallen between the analyzed time periods, are likely due to changes in environmental conditions and the availability of food resources for the colonies over the 10 months monitored. These factors are known to influence variations in the queen's egg-laying rate [28,29,41] and consequently, in the availability of brood for the reproduction of V. destructor.

There is a close relationship between the population dynamics of the parasite and its host, which is apparently confirmed by the reduction in mite infestation rate in brood and adult bees between July and September. This appears to be due to the increase in the brood and worker bee populations observed during that period, causing a dilution effect on the mite infestation rates. The increase in the amount of brood encouraged many mites in the phoretic phase to leave the adult bees to enter cells containing larvae to reproduce. Conversely, the increase in the infesta-

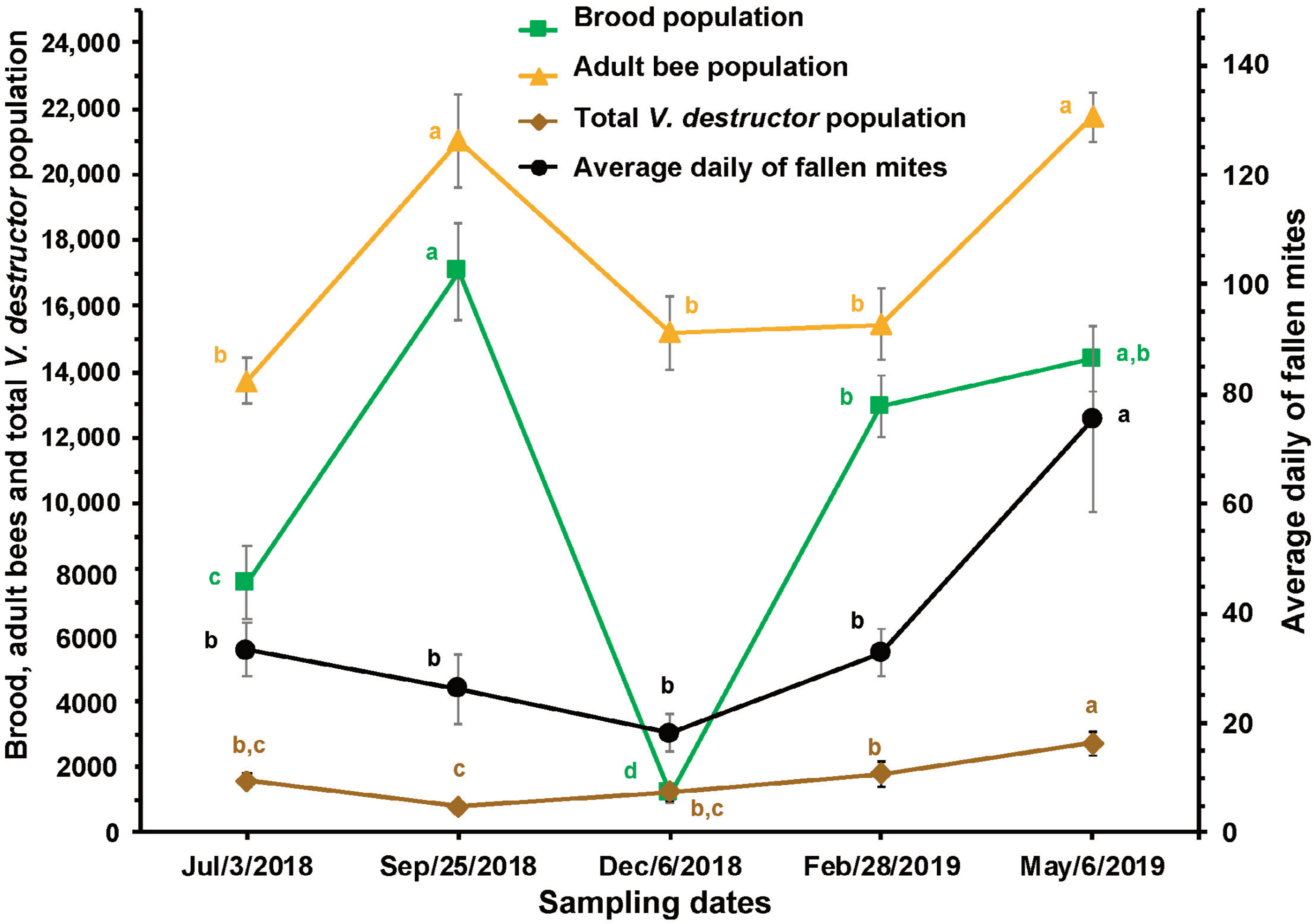


Figure 3. Estimated brood, adult bees, and total V. destructor populations and average daily mite drop (±SE) at different times of the year in honey bee colonies (n = 10) established in a temperate semi-arid climate. Different letters between means for each variable indicate significant differences based on analyses of variance and Tukey tests

tion rate of V. destructor in adult bees in December is likely a consequence of mite reproduction between July and September and a reduction in the bee and brood populations (see Figure 1 and Figure 2). From September to January, the amount of brood decreased, thereby reducing the possibilities for mite reproduction and population growth.

From February to May (spring blooming season), the amount of brood increased, leading to a significant multiplication of V. destructor, probably due to the greater availability of food resources for the colonies during that time of year, resulting in greater production and availability of larvae for the mite to reproduce. Although there was no significant correlation between the V. destructor population and the stores of honey and pollen, Figure 4 shows an increase in the mite population when food stores increased. In September and October, as well as between February and May, there are many plants blooming in the study area, which favored colony development and the storage of honey and pollen in the combs. It has been reported that the amount of pollen in the colonies is related to the fertility of the mite [42].

The results of this study show that when the amount of brood increases (between July and September), the mite infestation rate in adult bees decreases because many parasites migrate from the adult bees to the brood. Inversely, when the amount of brood decreases (September to December), the number of mites and the infestation rate in adult bees increase because there are not enough larvae for the parasites to reproduce [35].

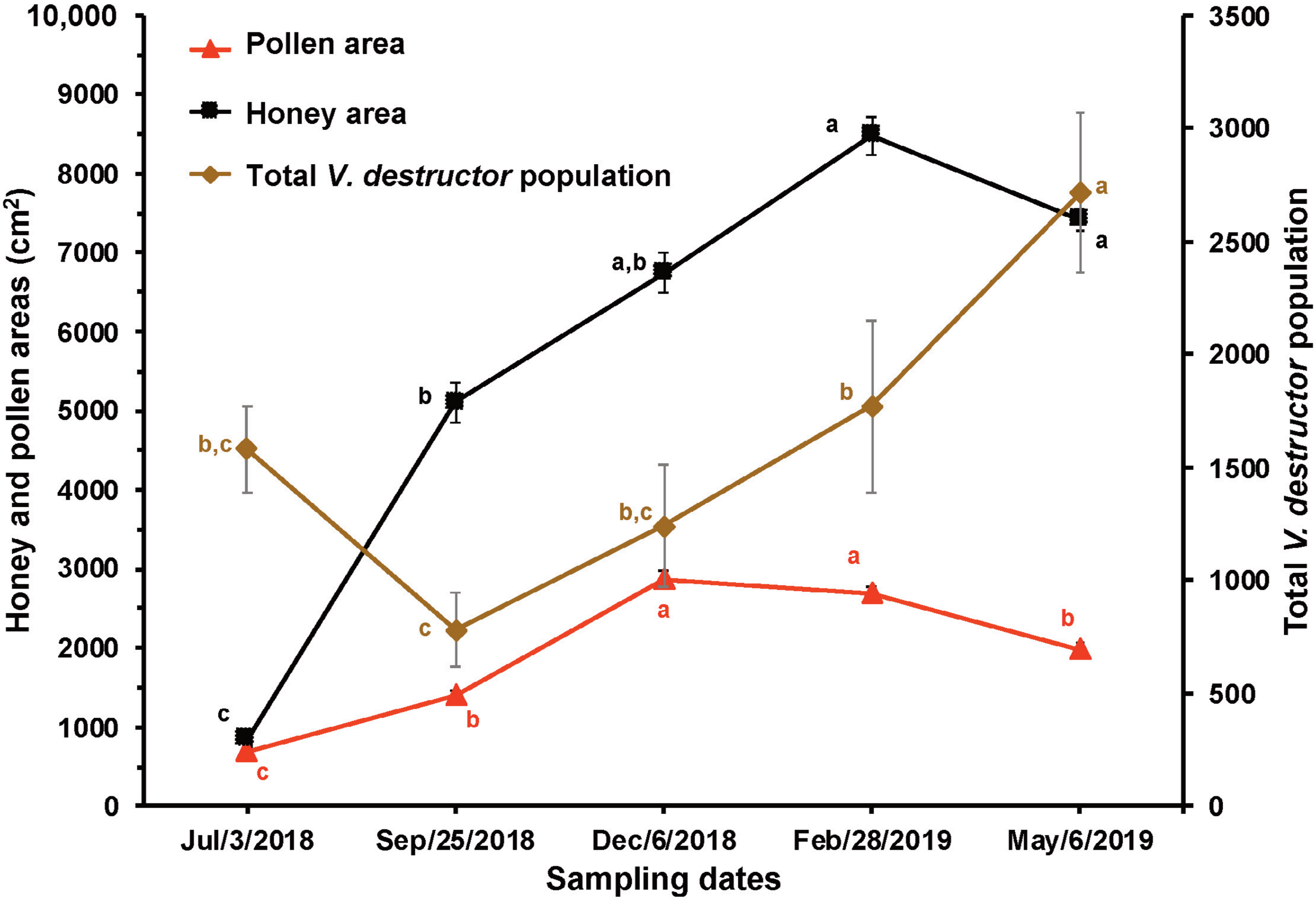


Figure 4. Honey and pollen areas (cm2) and estimated total population of V. destructor mites (±S.E.) at different times of the year in honey bee colonies (n = 10) established in a temperate semi-arid climate. Different letters between means for each variable indicate significant differences based on analyses of variance and Tukey tests

The estimated total mite population tended to decrease when the bee population in the colonies increased (see Figure 3). This is possibly because before July there was little brood available for the parasite to reproduce, and this is simply a delayed effect of the population dynamics, resulting in a decrease in mite population due to low reproduction during the period of little brood before July. However, from September onward, there was a progressive increase in the mite population.

The results presented in Figure 1 and Figure 3 show that monitoring V. destructor populations by recording fallen mites is more reliable than determining mite infestation rates in bees, as mite fall has a dynamic pattern similar to that of the estimated total mite population. Additionally, the techniques for determining infestation levels in brood and adult bees are destructive, negatively impacting the colony population, particularly when infestation levels are determined frequently [43]. This conclusion is reinforced by the correlation found between daily mite drop and the estimated total mite population in the colonies. Overall, the results confirm that mite fall is a relatively effective technique for determining V. destructor infestation levels in colonies.

Contrary to what was reported by Branco et al. [43], our results suggest that the rate of V. destructor in adult bees and brood is an imprecise and uninformative measure for estimating the total mite population in the colonies. This is due to the migration of V. destructor during the phoretic and reproductive phases of the mite, and the fact that the population dynamics of the parasite are related to the cycle and amount of brood and adult bees in the colonies, which vary across different seasons of the year [28,29]. The increase in the brood and adult bee population in the colonies reduces the proportion of mites relative to the bee population, while a decrease in the colony population leads to a higher mite infestation rate [44]. Additionally, when the amount of brood decreases and the number of adult bees increases, the percentage of mite infestation in adult bees rises, as occurred during December; this is the time of year with the least brood area in the colonies, which causes most mites to remain in the phoretic phase, concentrating the V. destructor population on adult bees (see Figure 2).

For colonies with Varroa infestation levels exceeding the treatment threshold, the period from November to December is optimal for applying an acaricide, as most of these chemical products do not affect mites inside capped brood cells but do affect them in the phoretic phase. Thus, during these months (at the end of the fall honey harvest), there is a window of opportunity to apply an acaricide treatment in regions with a temperate semi-arid climate of the Mexican highlands. Specifically, this is the time of year when products such as oxalic acid are most effective [45]. Additionally, it is important to consider that acaricide treatment during this period will limit V. destructor reproduction before the expected increase in bee population in the early part of the year (starting in February). It is also important to consider that the treatment threshold suggested for Mexico by SAGARPA [46] is 5% infestation in adult bees and/or 10 mites fallen in 24 h, which aligns with the results of a study conducted in the central highlands region of Mexico, where it was found that infestation levels of 4.5% in adult bees do not significantly affect population parameters, food stores, or colony weight [47]. Proper and timely application of a treatment helps reduce the negative effects of acaricides on bees and brood, as well as the selection pressure for resistant mites, the risks of contamination of hive products, and the production cost for beekeepers due to unnecessary treatment applications; it also prevents selection pressure from relaxing to develop mite-resistant honey bee colonies [26, 27, 28, 29, 30].

In a study conducted with Africanized honey bee colonies in the Mexican tropics, it was found that the population of V. destructor decreased by more than 1000 mites over twelve months. This was attributed to the low production of fertile mites in each reproductive cycle of V. destructor (0.7) during a time of year with high worker larvae mortality [48]. Conversely, in the present study conducted in a temperate semi-arid region of Mexico using colonies of bees with greater European ancestry, an increase of 1136 mites per colony on average over ten months was observed, representing a 26% increase in the total mite population. The record of mites fallen onto the adhesive boards of the hives showed a 39% increase in final infestation levels compared to the initial levels (33 ± 1.5 mites in July vs. 75.3 ± 5.6 in May). The increase in mite population observed in this study is similar to that reported in honey bee colonies in Costa Rica [33]. The population size of drone brood in the colonies and the low expression of bee resistance mechanisms against the mite may have been factors that partly explain the V. destructor population increase in this study, although many more factors not studied here could have contributed to the mite's population growth and its temporal variations.

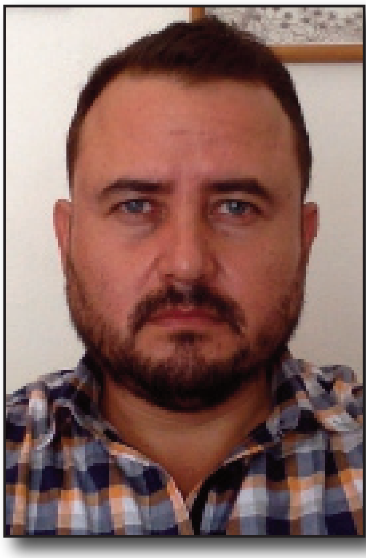
Jack and Ellis [49] developed a formula to estimate the overall population of V. destructor in a honey bee colony based on the number of mites naturally fallen onto an adhesive board installed in a hive. We found that our total estimate of mites/hive was on average lower than the number of mites predicted by the formula. This is probably due to the fact that in our study we did not consider the population of V. destructor in drone brood.

The population dynamics of V. destructor are variable and depend on multiple factors and their interactions [45,50]. The main factors that determine the population growth rate of V. destructor and its pathogenicity in honey bee colonies are its reproductive ability and longevity [45,51], as well as the climatic conditions and nectar flow that influence the availability of brood and drones, the generation of swarms [28,29,41], management practices [50], and the overcrowding of colonies, which can favor bee drift and robbing [52,53,54]. Other factors include the genotype of the colonies [55,56,57] and the expression of bee defense mechanisms that limit the reproduction and survival of the mite. The mechanisms of resistance that most restrain the population growth of V. destructor in honey bee populations of Latin America include hygienic behavior, grooming behavior, low brood attractiveness, suppression of mite reproduction, and other mite non-reproduction related mechanisms that result in low fertility and fecundity of the mite [58,59].

Studies have reported variable results regarding the correlations between colony population parameters and V. destructor infestation levels, as well as correlations between infestation levels measured by different methods [27,31,33,42,43,48,55]. Therefore, there is no consensus on the effect of these parameters on the population dynamics of the mite. Moreover, complex multifactorial interactions exist that make it difficult to accurately predict mite populations in colonies [45]. The results of this study provide new insights into the population dynamics of V. destructor in a temperate semi-arid climate region and suggest that more studies are needed to identify the limiting factors of mite reproduction, as well as the seasonality of mite population dynamics in different regions and climates. This knowledge will help establish sustainable control strategies for this harmful parasite of honey bees.

5. Conclusions

The results of this study demonstrate a close relationship between the population dynamics of V. destructor and that of honey bee colonies. In December, there was an increase in the number of mites infesting adult bees, as well as a decrease in the number of mites infesting brood. Therefore, it is advisable to apply an acaricide treatment during this period. Another significant finding of this study is that relying on mite drop data for estimating the V. destructor infestation levels of honey bee colonies provides a more reliable indication of the mite population in the colonies than data on brood and adult bee infestation rates. Similar studies are needed for other regions and climates, as well as studies that relate climatic variables to the population dynamics of V. destructor in order to generate knowledge that will enable the development of effective and sustainable mite control strategies.



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“HOMEMADE” MASS SELECTION OF BEES

AN IMPERATIVE FOR SUSTAINABLE BEEKEEPING

Today, as social media increasingly promotes various bee races due to beekeepers’ dissatisfaction with current results—primarily caused by climate change and the excessive use of chemicals in agriculture and beekeeping—it is essential to recognize that the true issue is not the race of our bees.

To increase honey yields and reduce winter losses, we need to find the best ways to implement selection and breeding.

The Quality of Queen Bees on the Market is Often Questioned

Many queen bee breeders, over time, in pursuit of profit, became queen bee "producers". It is high time we, as beekeepers, take control of the selection process.

Three Levels of Bee Selection

Selection is primarily performed on queens and drones. However, colony characteristics depend on the combination of these individuals. Much like in card games, some combinations work better than others. This naturally leads to significant differences in colony productivity. From the best colonies, we collect genetic material for further selection.

Interestingly, traits that are harmful to individual bees or colonies, such as disease susceptibility, can sometimes be advantageous to the overall population. Eliminating less resistant individuals that cannot adapt strengthens the species as a whole.

Honeybee Colonies as Superorganisms

A bee colony is a superorganism, not just a single organism like other domesticated animals. Queens usually mate with at least 10 drones, meaning the colony contains at least ten times more genetic information (DNA) than a single bee. It's easy to imagine that some colonies perform better than others. The challenge is in replicating this pattern. The best we can do currently is to select colonies with desirable traits for multiplication—by rearing queens from the best colonies and replacing queens in colonies that do not meet certain criteria.

Why Bother with Bee Improvement?

Should we leave this to "experts"?

Introducing good queens from other races covertly might seem tempting, but over time this causes deterioration in quality due to uncontrolled natural mating with local drones, leading to hybridization. To preserve the purity of our race, it is necessary to import and buy queens annually.


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Queens imported from different climates are often poorly adapted to local conditions and forage. The COLASS report from 2014 showed that “locally adapted” bees perform better than imported ones: "The spread of imported genes within local bee populations can increase genetic diversity, but this is not necessarily beneficial, as unadapted genes can lead to colony losses."

Who Should Be Involved in Selection?

All beekeepers can participate in improving their bees—better bees, less queen purchases, better yields, better overwintering...! It is essential to keep records of the performance of all colonies. This will enable everyone to select the best “breeding queen” stock and, if possible, identify areas where “good” drones can dominate. Start by renewing local bee populations through selective breeding or replacing queens in weaker colonies; this approach can rapidly improve the overall quality of bees within your community.

Traits Selected by Beekeepers – "Artificial Selection"

Nature chooses traits vital for species survival, but beekeepers also desire additional qualities such as:

• Honey yield: Comparing each colony to the apiary average.

• Swarming or supersedure queen replacement: Preferably colonies with less swarming tendency (no swarming in the queen's first full season)..

• Sugar consumption: By comparing the amount of sugar consumed and the amount of food stored for the winter, evaluate the colonies (the greater the difference, the better the colony).

• These qualities are determined at the end of the season, while those below are checked at each inspection.

• Varroa resistance: Selecting colonies that have the lowest infestation levels during the season.

• Hygienic behavior: The ability to keep the hive clean and free of disease is paramount.

• Defensive behavior: The goal is to breed calm bees.

• Calmness on honeycomb: Peaceful bees that do not "running" around the honeycomb during inspections simplify hive management.

• Brood quantity: Measured throughout the season, indicating the queen's productivity.

• Brood pattern: Bee brood should be arranged concentrically, with proportions of approximately 3:6:12 (eggs: larvae: capped brood).

Inspection diaries and scoring sheets should be standardized for these traits, with ratings from 1 to 4. Honey production is recorded at the end of the season, along with the honey reserves for overwintering and sugar consumption throughout the year.

The Key to Maintaining a "Strain" Lies in the "Breeder Queens"

Selected queens from strong and productive colonies pass all their genes to the drones — and that is the first step toward successful selection. This way, we obtain "good" drones.

In the following season, the queens reared from other "breeder queens" will have plenty of "good" drones available for mating. Continuous selection of both mother queens (from colonies that produce drones) and colonies used for raising new young queens is the key to progress.

How would such a program work?

Participants would be encouraged to:

• Refrain from bringing bees from other regions

• Keep records of each hive's performance

• Work together in groups within local associations whenever possible

• Develop a local bee strain based on the native honey bee

By following these principles, every beekeeper can improve the quality of their bees — even without formal cooperation with associations.

The image provides a diagram explaining a two-year process for „homemade" breeding "purebred" queen bees. It shows how a new "purebred" queen is introduced to an apiary with existing drones, resulting in a "hybrid" generation of queens and workers. In the second year, the process is repeated using the newly-bred "purebred" queen to produce a "purebred" generation of drones and workers, ultimately replacing all the old queens. The process spans two years.

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Plan for the first Year

Select four "purebred" mother queens (1) from colonies with the most desirable traits (hygiene, honey yield, gentleness) to ensure genetic diversity. Begin queen rearing at the beginning of May, using any standard method of queen production. The goal is to produce a sufficient genetic mix of newly raised queens (2) to replace all queens in the apiary (except the breeder mother queens) by the end of the season. The newly raised queens (3) will be “hybrid” after mating with the drones already present in the apiary. The aim is for these queens to produce purebred-reared drones (4) the following year.

Plan for the second Year

All drones in the apiary will now be purebred-reared (4). In early spring, each hive should receive a drone comb frame to ensure the apiary becomes “flooded” with drones. The previous year’s breeder mother queens (1) will be used again to produce new queens (5). These new queens will now mate in the apiary with purebred drones, producing purebred-reared queens (6). All colonies that had last year’s “hybrid” queens will receive these newly raised purebred queens. The offspring — workers, drones, and queens — will now all be purebred-reared.

Plan for the third Year and Each Following Year

Using the experience gained in the second Year , evaluate all colonies again and select new breeder queens to further improve the stock. The newly raised queens should be used throughout the year — by autumn, replacing any queens that fail to meet the desired standards.

If all beekeepers were to follow this plan, the quality of bees would reach an impressive level within just a few years. This approach requires no additional financial investment, and the results would be more than satisfactory.

If the quality of your bees does not yet allow you to select enough good breeder queens, you can obtain them from reputable breeders in your area.

It is essential to involve beekeepers in your neighborhood in this program — and, if necessary, help them with queen rearing or provide queen cells — thereby ensuring there are enough quality purebred drones in your region.

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IS THIS THE SOLUTION – NORROA – AN INNOVATIVE MEDICINE AGAINST VARROA

A new Varroa mite treatment is on the market in the USA. I have asked the EBA Bee Health Committee for its opinion on this treatment and in particular for its assistance in its registration and approval for use in Europe.

Boštjan Noč

President of the EBA

https://www.mannlakeltd.com/varroa-mite/norroa/?srsltid=AfmBOooQU-GbpP3231KncVwEmroQiRsJ9S7yJoYI-ycVKFXBIiSveIBM

https://www.croplife.com/management/sustainability/greenlight-biosciences-launches-norroa-the-first-rna-based-treatment-for-varroa-mites/

https://www.mannlakeltd.com/varroa-mite/norroa/?srsltid=AfmBOorPVDUiBIwX8MJRGQMEs9-g69WnSk4Kqon0JdRNRQPU9xfcmozm

https://www.prnewswire.com/news-releases/greenlight-biosciences-launches-norroa-the-first-rna-based-treatment-for-varroa-mites-offering-new-hope-amid-record-bee-losses-302567592.html


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Net Contents:
1 Treatment
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THE MOST NATURAL ANTIBIOTICS COME FROM THE BEEHIVE

With the start of World AMR Awareness Week (WAAW) and European Antibiotic Awareness Day (EAAD), we want to remind you of the enormous antimicrobial potential found in the beehive.

As antimicrobial resistance (AMR) to classic antibiotics continues to rise, it becomes essential to explore safe, natural alternatives — such as propolis, where AMR is not an issue, and honey, known for its powerful antibacterial and wound-healing properties.

But even with natural solutions, the message remains clear:

Antibiotics must be used prudently — only when truly needed — to preserve their effectiveness for future generations.

FROM HIVE TO HEALTH

THE ROLE OF BEE PRODUCTS IN PREVENTING AND TREATING RESPIRATORY VIRAL INFECTION

Exploring scientific evidence and natural strategies for better immunity and lung health

Introduction

During autumn and winter, viral infections of respiratory system are relatively common. These infections can range from a mild cold to serious pneumonia. It depends on many factors.

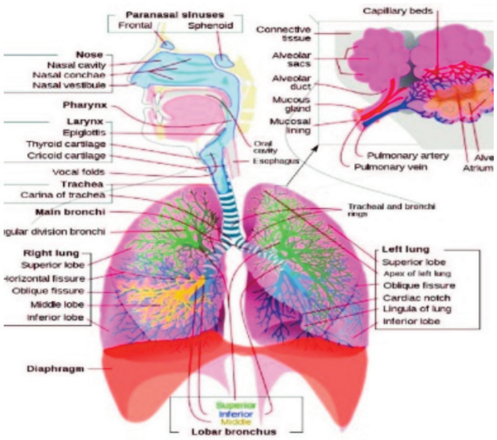
We know that antibiotics have no effect on viruses.

What about apitherapy?

Apitherapy is the use of honeybee products—such as honey, propolis, royal jelly, bee venom, bee pollen, bee bread, beeswax and air from the active hive — for therapeutic purposes. In the context of viral infections of the respiratory system, apitherapy has attracted interest due to its antiviral, anti-inflammatory, antioxidant, and immunomodulatory effects. Apitherapy is a promising source of pharmacological and nutraceutical agents for the treatment and prophylaxis of COVID-19. (18)

Each bee product contain a lot of bioactive components that can act in prevention and treatment viral infections.

Respiratory system



*Schematic Illustration of the Human Respiratory Tract

When we mention the respiratory system, we first think of the lungs. And that's okay. However, the respiratory system begins with our nose. Why is it important to remember this?

In the nose there are some hairs that act as a coarse filter that will keep larger particles from reaching the lower parts of the respiratory system. The mucous membrane of the nose is moist, so the air we inhale is moistened, the mucous membrane of the nose is at body temperature, so the air cools down or warms up to body temperature.

From the nose, the air descends into the pharynx, then into the trachea and continues through large bronchi to right and left side and then to the shorter and narrower respiratory tubes to the terminal bronchioles and alveoli.

It is only in the alveoli that O_2 - oxygen from the air enter the blood vessels and goes to every cell of the body. At the same place, CO_2 - carbon dioxide from the blood passes into the alveoli, and with the act of exhalation, the CO_2 is expelled into the external environment.

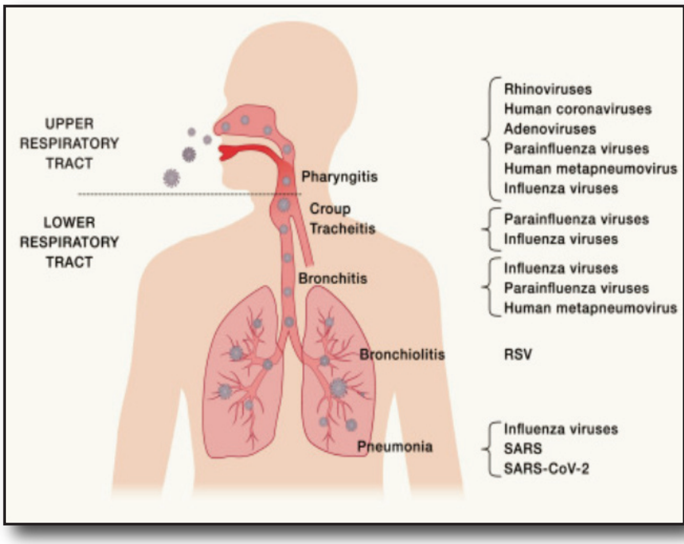
What are viruses?

By definition, viruses are an infective agents that typically consists of a nucleic acid molecule in a protein coat, are too small to be seen by light microscopy, and are able to multiply only within the living cells of a host.

Which viruses are the most common causes of respiratory infections?

The most common causes of respiratory infections include rhinoviruses, coronaviruses (including SARS-CoV-2, COVID 19), influenza viruses (the most common), and respiratory syncytial virus (RSV). Other common viruses are adenoviruses and parainfluenza viruses, which can cause a wide range of illnesses from a common cold to very severe infections.

**Clinical Presentations Associated with Different Respiratory Viruses that Infect Particular Parts of the Upper and Lower Respiratory Tract:*



How does the virus reach the respiratory system?

Viral respiratory infections result when a virus infects the cells of the respiratory mucosa.

Viruses may enter the respiratory tract in aerosolized droplets produced by coughing, sneezing, or simply talking or even during quiet breathing. Infection may also be spread by contact with saliva or other respiratory secretions from an infected individual. The larger aerosol droplets land in the nose, while smaller ones may venture deeper into the respiratory tract, even as far as the aveoli. (2)

Virus is also spread by the airborne route in the form of small (<5 µm) droplet nuclei that can remain suspended for long periods of time and can be inhaled into the lower respiratory tract. (6)

What Happens When the Virus Reaches the Respiratory Mucosa?

The respiratory epithelium is composed of a variety of cells that include ciliated and non-ciliated epithelial cells; goblet cells, which produce mucus that forms the first barrier for an incoming virus; and club cells, which produce proteases. (4)

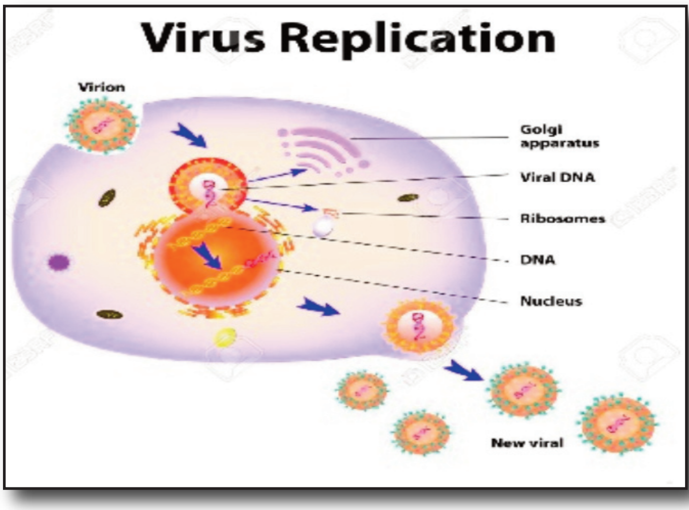
After attachment to the receptor, the virus gains entry into the cell, and the viral genome is uncoated, releasing the viral genetic material, which is RNA o DNA. Viral transcription to produce viral proteins and viral replication to copy the viral genome are complex events unique to each viral family, although all viruses have crucial interactions with host cell proteins.

What Are the Consequences of Infection in the Host?

When a person is infected with a respiratory virus, there is an incubation period before onset of clinical signs and symptoms. During the incubation period, the virus attaches to infects cells, replicates its genome, and spreads to infect adjacent cells. The incubation period vary from 1–2 days, up to 4– 6 days.

Productive viral infection of respiratory epithelial cells results in clinical symptoms and signs that depend on which part of the respiratory tract is infected.

A respiratory virus can only replicate inside a living cell. Progeny virions are released from the infected cell into the respiratory tract, where they are shed by coughing and sneezing.



Bee products

Apitherapy is the use of honeybee products for therapeutic purposes. In the context of viral infections of the respiratory system, apitherapy has attracted interest due to its antiviral, anti-inflammatory, antioxidant, and immunomodulatory effects. Each bee product has bioactive substances that have these properties, but one is always characteristic for the product.

Honey

• Antiviral & Antibacterial Action: Honey contains hydrogen peroxide, flavonoids, and phenolic acids that inhibit the replication of several respiratory viruses such as influenza and RSV (respiratory syncytial virus).

• Immunomodulatory effect: Honey act as substrate for probiotic bacteria causing the modulation of the intestinal microbiome. (6)

• Symptom Relief: It soothes sore throats, reduces coughing, and improves mucosal healing. Studies have shown that honey can significantly reduce the duration and severity of upper respiratory symptoms. (7)

Propolis

• Antiviral Compounds: Rich in flavonoids (e.g., chrysin, galangin, and caffeic acid phenethyl ester—CAPE) that block viral entry and replication. (8)

• Anti-inflammatory Effects: Helps reduce cytokine release and oxidative stress, which can prevent severe inflammation in viral infections.

• Some studies suggest that propolis may inhibit influenza A, adenovirus, and coronavirus replication in vitro. (9)

Royal Jelly

• Contains 10-hydroxy-2-decenoic acid (10-HDA), which enhances immune system function and modulates inflammatory pathways. (10)

• Can promote recovery and resistance against viral respiratory infections by boosting antibody and interferon production.(11)

Bee Venom

• Melittin and phospholipase A2, has antiviral and anti-inflammatory activity.

• Melittin has been studied for its potential to disrupt viral envelopes, including those of influenza and coronaviruses. (12, 13)

• However, bee venom therapy must be used cautiously due to the risk of allergic reactions and anaphylaxis.(14)

Bee Pollen and Bee bread

• Provides vitamins, amino acids, and antioxidants that support immune resilience and may reduce respiratory inflammation. Among the anti-inflammatory cytokines, pollen, bee bread and propolis were found to increase the levels of IL-4, IL-10 and IL-1RA the most, and decreased IL-6 and TNF-α, IL-1β the most ($p < 0.001$). It was found that all bee products have significant anti-inflammatory activities. The highest anti-inflammatory activity was found with pollen administration, followed by bee bread. (15, 16)

Bees wax

1. Bees wax is a complex natural material secreted by Apis mellifera worker bees. It contains over 300 chemical compounds, though the main antiviral and bioactive ones include:

Long-chain fatty acids (e.g., palmitic acid, oleic acid, cerotic acid) Long-chain alcohols and esters, Hydrocarbons.

2. Action: These lipophilic compounds can disrupt viral envelopes (the lipid membrane around many viruses like influenza or herpes), block viral attachment to host cells, reduced viral entry and replication rates. While its primary use in the hive is structural and protective against humidity and some microbes, specific extracts have shown potential antiviral effects in in vitro studies. (17)

While beeswax is less potent than honey or propolis in direct antiviral effects, but it can be used in balms and ointments (e.g., against cold sores or shingles), in other words its antiviral potential is mostly supportive and surface-protective.

Volatile substances from bee hive

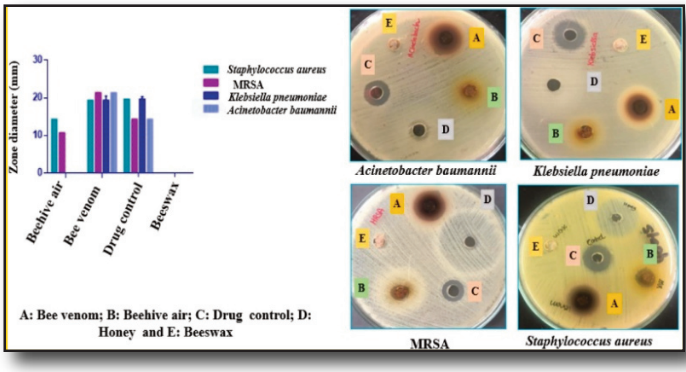
Pharmacists agree that the best treatment effect is achieved when you can put the medicine on the affected area. This is precisely achieved by inhaling air from the hive. Many components of bee products are volatile or semi-volatile organic compounds that evaporate into the hive atmosphere and can be measured as VOCs. (18, 19, 20)

Volatile organic compound from the bee hive

WAX	HONEY	POLLEN	PROPOLIS	ROYAL JELLY	VENOM
Hydrocarbon	Aldeids	Phenolic Compounds	Phenolic Compounds	Amphiphatic acids	Melitine
Fatty acids	Ketones	Aminoacids	Flavonoids	Phenolic Compounds	Phisphlpase A2
Esters	Acids	Hydrocarbons	Terpens	Sugars	Apamina
Alcohols	Alchohols	Esters	Esters	Proteins	Histamine
Diols	Hydrocarbons	Alcohols	Sugars	Fatty acids	Peptideos
Palmitic acid	Esters	Sugars	Hydrocarbons	Minerals	Hyaluronidase
	Phenols	Fatty acids	Minerals	Carboniled Compounds	

**Tiago Guardia de Souza e Silva. 46th Apimondia. Canada. Montreal. Quebec. September 2019.*

Antimicrobial activity



**Journal of King Sauad University- Science. Volume 33 Issue 5, July 2021,101449*

What determines where those airborne substances deposit in the respiratory tract

• Particle size / aerodynamic diameter is dominant.

o Particles >10 µm mostly deposit in the nose and oropharynx (and are often swallowed).

o 5–10 µm deposit in central airways (bronchi).

o 0.5–5 µm are most likely to reach peripheral airways and alveoli. Very tiny particles (<0.5 µm) may remain suspended and mostly be exhaled. This size–deposition relationship drives which cells/tissues are exposed.

• Gas vs particle behaviour. True gases/VOCs distribute by diffusion and solubility

— highly water-soluble VOCs are absorbed in the nasal and upper airway mucosa, less soluble gases penetrate deeper.

Upper airways

The nasal mucosa serves as an effective site for the absorption of many volatile substances and drugs due to its high permeability, extensive vascularization, and large surface area. (21) Volatile substances are primarily absorbed in the nasal mucosa through transcellular passive diffusion into the epithelial cells and the rich underlying vasculature. The efficiency of this absorption depends largely on their lipophilicity (ability to dissolve in fats) and molecular weight.

o **Mucociliary clearance**: mucus traps particles and cilia sweep them toward the pharynx for swallowing — a major removal route for most deposited particles in the nose.

o **Epithelial uptake**: small molecules and some nanoparticles cross the epithelium via transcellular routes (passive diffusion). Dendritic cells and M cells in mucosa can sample antigens and carry them to initiate an immune response.

Passive diffusion is the movement of molecules across a cellular membrane from an area of high concentration to low concentration.

Paracellular Transport: Hydrophilic (water-soluble) molecules, particularly those with a molecular weight less than 1000 Daltons, can pass through the tight junctions (spaces) between adjacent epithelial cells. This route is generally slower and less significant for highly volatile, typically nonpolar, compounds than the transcellular route.

Olfactory Pathway (Nose-to-Brain): Between the root of the nose and the brain there is a barrier, but not a bone but a porous mass, and the sense of smell is located there. Thus, during inhalation, we feel all the smells coming from the hive at the same time. In the olfactory region of the upper nasal space, volatile substances can bypass the blood-brain barrier and be transported directly along olfactory neurons into the central nervous system (CNS). This pathway is particularly relevant for odorants. (22)

Bronchial mucosal cells

The absorption of volatile substances in bronchial mucosal cells is a heterogeneous and complex process.

• Diffusion: Volatile substances cross the airway epithelium primarily by non-steady-state diffusion from the air interface into the underlying tissue and capillary bed.

• Lipophilicity/Lipid Solubility: Highly lipid-soluble substances are absorbed more slowly, and diffusion-limited. Poorly soluble substances are absorbed more rapidly and are blood flow-limited.

• Polar Surface Area: The pulmonary epithelium is highly permeable to drugs with a wide range of lipophilicity and even to those with a high molecular polar surface area.

• Mucociliary Transport: The bronchial mucosa is lined with a mucus layer and cilia (mucociliary escalator) that act as a primary defense mechanism. Inhaled substances can be trapped in the mucus and transported toward the throat to be swallowed, which is an elimination mechanism rather than absorption into the cells.

In essence, the bronchial mucosa acts as both a barrier and a site of interaction for volatile substances, with absorption kinetics and cellular effects determined by the chemical properties of the substance and the active biological processes of the airway cells. (23)

Peripheral airways / alveoli

o Alveolar absorption: the alveolar epithelium is thin and highly perfused — small, soluble bioactives can be absorbed into pulmonary capillaries and enter systemic circulation rapidly. This principle is a key reason why the inhalation route is effective for delivering certain medications and is being explored for the systemic delivery of various bioactives and new therapeutic agents.(24)

o Cellular clearance: insoluble particles deposited in alveoli are phagocytosed by alveolar macrophages and in them occurs local immune responses.

Bioactivity and immune effects

• Local immune modulation. Some components from bee products have anti-inflammatory and antimicrobial activity in vitro and in animal models; inhaled exposure could therefore modulate mucosal immune responses — but whether inhaled hive air delivers biologically meaningful doses to human mucosa it is still incompletely established. (25)

• Clinical / human evidence are limited. There are some small/early clinical and safety studies of propolis or propolis-containing nasal sprays and reports of “propolis inhalation” therapies, but high-quality, large randomized trials proving efficacy or defining optimal doses/routes for inhalation are sparse. Safety signals appear mild in small studies but long-term safety and standardized dosing are not well established. (24)

What we do know

• Hive air contains VOCs derived from bee products in measurable though small quantities.

• Some of these compounds have known biological activities (antimicrobial, anti-inflammatory)

• There are early clinical/observational reports of “hive air therapy” for respiratory conditions. (26)

What we do not know

• Whether inhaled hive-air VOCs significantly penetrate into bronchial epithelial cells, alter cell signalling in a clinically meaningful way, or get absorbed systemically via the airway.

• Whether vitamins/minerals from hive air are delivered to the epithelium or systemic circulation via inhalation — the evidence suggests this is very unlikely.

• There is none randomized controlled trials demonstrating benefit for respiratory disease.

Clinical evidence is limited and heterogeneous: a few small randomized or open-label trials and several observational studies (some in COVID-19) suggest possible symptomatic or supportive benefits for selected bee products — but trials are generally small, sometimes unblinded, and results are not yet strong enough to recommend apitherapy as only treatment.

• Safety: topical/ingested bee products are usually well tolerated but can cause allergic reactions (including life-threatening anaphylaxis) and should be used cautiously in people with bee/food allergies, asthma, or on immunosuppressants.

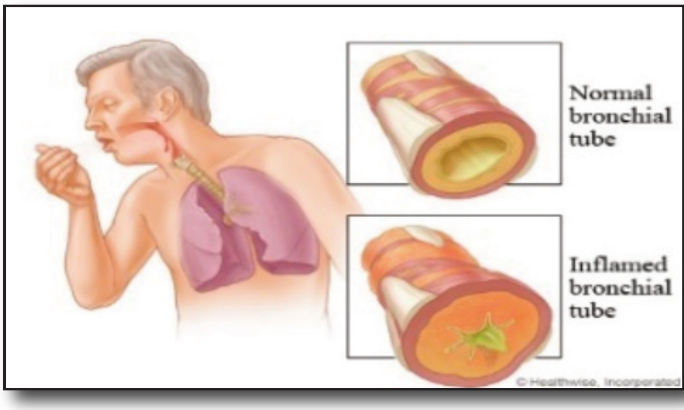
• Honey must not be given to infants <1 year. (Do you agree with this? I do not)

The most common acute viral infections of the respiratory system and apitherapy

Acute sore throat

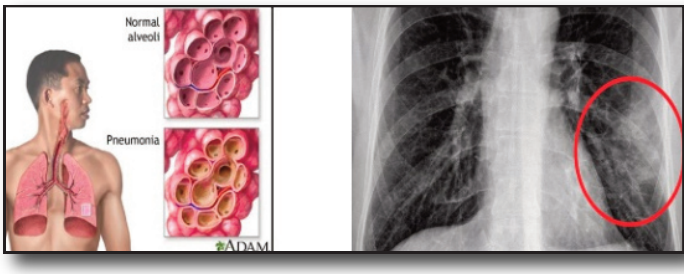
Symptoms	Apitherapy
• Pain when swallowing, often spreads to the ears • Elevated BT • Malaise • Headache • Hoarseness	• Local application of honey in the nose • Chewing honey with wax • 1ts honey + 20 - 30 drops of 25% or 30% propolis per os • Propolis spray • Propolis lingualettes • Inhalation of row propolis • Inhalation of air from the active hive

Acute bronchitis



Symptoms	Apitherapy
• Increased TT • Cough - initially dry, irritating • Coughing up • Weakness • Muscle pain	• Hot tea sweetened with honey • Inhalations: 1 tsp of honey in 1 cup of warm water or tea • Inhalations in the apicomora • Inhalations: row propolis • Mix: honey, bee pollen, bee bread, propolis, royal jelly

Pneumonia

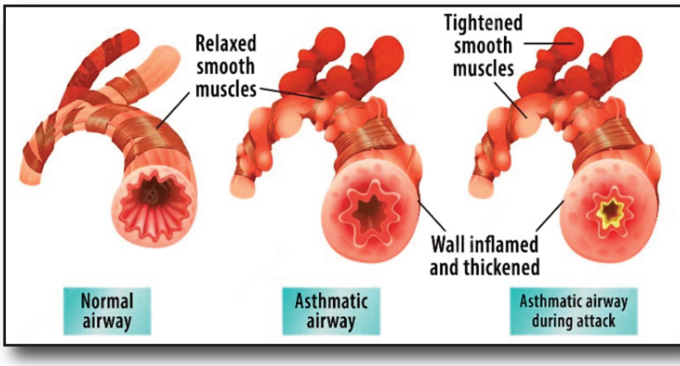


Symptoms	Apitherapy
• Fever • Fatigue • Chest pain • Sweating • Cough • Expectoration • Short breath • Muscle and joint pain • Headache.	• Very light beathing exercises in the apicomora and inhalations • Inhalations with row propolis • 1 teaspoon of honey with 30-40 drops of propolis 3-4 times a day per os • Rubbing cream with bee venom over the site of inflammation • Wraps made of bee wax

Chronic diseases of the respiratory system

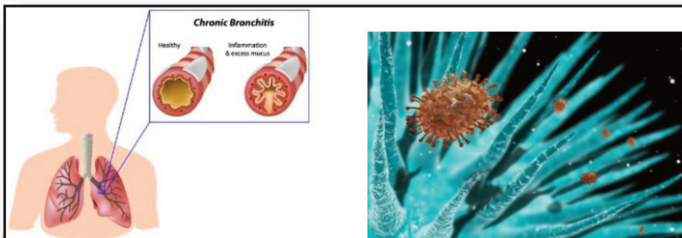
Chronic diseases of the respiratory system do not arise as a result of viral infection. However, viral infections always lead to exacerbation of chronic diseases such as asthma and COPD

Bronchial asthma



Symptoms	Apitherapy
• Wheezing • Shortness of breath • Cough • Discomfort in the chest (only during the attack)	• As prevention - inhalation of bee hive air, 10 days , 3-4 times, from April to September. Never during acute attack. • 15 drops of 30% alcoholic solution of propolis per teaspoon of honey (these values can be doubled in acute crises). • Chewing honey in honeycomb 30g/a day, chew for some time and swallow together with the honeycomb. Divide the total amount into 2–3 doses during the day.

Chronic bronchitis



Symptoms	Apitherapy
• Lack of air (dyspnea) • Chest tightness • Whistling (continuously)	• *Inhalation* beehive air, once or twice a day. It is necessary to take at least 20 treatments, and then take a break. Repeat the treatment 3-4 times during the sason. • Herbal teas sweetened with honey. • Propolis tincture 25% or 30% 10 to 15 drops with honey (the dose of Propolis can be higher) • Chest compresses: Mix 20 g of honey and 2 g of salt in 1 dl of water • Wax wraps on the chest: Place four layers of gauze on a flat surface, heat the wax and spread it over the gauze, then fold the gauze and place it on the chest. Apply the wraps in the evening before going to bed. • Apply bee venom cream to the skin of

Cautions and Considerations about Apitherapy

• Never advise the patient to stop the therapy prescribed by the medical doctor.

• Bee products and medical drugs, when taken at the same time, have a synergistic effect.

• Always consult a qualified healthcare professional before using apitherapy, especially if the patient has allergies, asthma, or autoimmune conditions.

• Apitherapy should be used as a complementary, not a primary, treatment for viral respiratory infections.

• It is essential that you have anti-shock therapy and an ApiPen

Conclusion

Bee products have garnered scientific interest for their potential benefits in managing viral respiratory infections. Most laboratory (in vitro / animal) studies show antiviral, anti-inflammatory, and immunomodulatory effects, which could contribute to their therapeutic efficacy. Honey contains a variety of bioactive compounds, including phenolic acids, flavonoids, and enzymes, that have demonstrated antiviral activity by inhibiting viral entry, replication, and assembly in vitro. Propolis, a resinous substance, contains polyphenols, cinnamic acid derivatives, and flavonoids that enhance immune responses, reduce inflammation, and exhibit direct virucidal effects. Experimental studies suggest that both honey and propolis can modulate cytokine production, thereby helping to regulate immune responses during viral infections. Clinical evidence is limited and heterogeneous: a few small randomized or open-label trials and several observational studies (some in COVID-19) suggest possible symptomatic or supportive benefits for selected bee products — but trials are generally small, sometimes unblinded, and results are not yet strong enough to recommend apitherapy as the only treatment. The clinical evidence supporting their efficacy remains limited and inconsistent due to variability in preparation, dosage, and study design.

Case studies and descriptions of individual cases gives promising preliminary data.

Therefore, while bee products hold considerable potential as adjunct therapies for viral respiratory illnesses, rigorous randomized controlled trials are essential to substantiate their efficacy, clarify mechanisms of action, and establish appropriate therapeutic protocols.

Continued research may ultimately validate the role within integrative treatment strategies for respiratory viral infections.

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KRANJICA 3D CARNIOLAN

PHYSICAL MODEL OF A CARNIOLAN HONEYBEE

3D Carniolan is a physical model of a Carniolan honeybee on a scale of 100:1 with more than 90% morphological similarity with the real worker bee Apis mellifera carnica. 3D Carniolan, which was first presented on 27th of August 2021 at the Beekeeping Centre of Slovenia, is a unique educational and promotional tool produced with the help of the latest technologies of Micro CT 3D-printing and a computer-controlled mechatronics system. The 3D Carniolan model is set on a spinning platform and is accompanied by instructive animations in Slovenian or English. The first 3D Carniolan model is constantly on display at the Beekeeping Centre of Slovenia, while the second one is transportable.

If you would like the 3D Kranjica to enrich your event, please contact us regarding available dates.

For more information about the borrowing conditions, please contact the Slovenian Beekeepers' Association - https://www.czs.si/content/3dkranjica

Conceptual design: Boštjan Noč

Project leader: Marko Borko

Expert review of animations: Andreja Kandolf Borovšak, DSc, Peter Kozmus, DSc, Nataša Lilek, DSc, Tomaž Samec

Realisation: Intri, d. o. o.

3D Carniolan was funded by the Public Beekeepers' Advisory Service.

Boštjan Noč,

President of European Beekeeping Association

KRANJICA 3D CARNIOLAN

3D Carniolan is a physical model of a bee on a scale of 1:100 with more than 90% morphological similarity with the real worker bee *Apis mellifera carnica*.

3D Carniolan, which was unveiled at the Beekeeping Centre of Slovenia, Brdo pri Lukovici 8, 1225 Lukovica on 27th of August 2021, is a unique educational and promotional tool produced with the help of the latest technologies of Micro CT 3D-printing and a computer-controlled mechatronics system. The 3D Carniolan model is set on a spinning platform built into a replica apiary; it contains moving parts along with nine instructive animations in slovenian or english (1. Proboscis and honey sac, 2. Antennae, 3. Compound and simple eyes, 4. Internal organs, 5. Pollen, 6. Propolis, 7. Wax gland, 8. Varroa mite and 9. Stinger) and a honeybee sight simulation. Alongside the model there's also a 20 cm 3D printed model of a bee for the blind and visually impaired.

3D Carniolan is constantly on display at the Beekeeping Centre of Slovenia. Viewing animations is free of charge as a part of beekeeping training and presentations by the Slovenian Beekeepers' Association. For the public, it is possible to view the animations by purchasing a chip during the working hours of the Čebelica inn.

ČZS ČEBELARSKA ZVEZA SLOVENIJE
www.czs.si

Save the Bees • May 20 • World Bee Day

Conceptual design: Boštjan Noč • Project leader: Marko Borko • Expert review of animations: Andreja Kandolf Borovšak, DSc, Peter Kozmus, DSc, Nataša Lilek, DSc, Tomaž Samec • Realisation: Intri, d. o. o. • Beekeeping Association of Slovenia, Brdo pri Lukovici 8, 1225 Lukovica, 2021


KRANJICA
CARNIOLAN

DALMATINA BEEKEEPING EVENT

The President of the Slovenian Beekeepers' Association and the President of the European Beekeepers' Association Noč Boštjan attended the Dalmatina beekeeping event near Split.

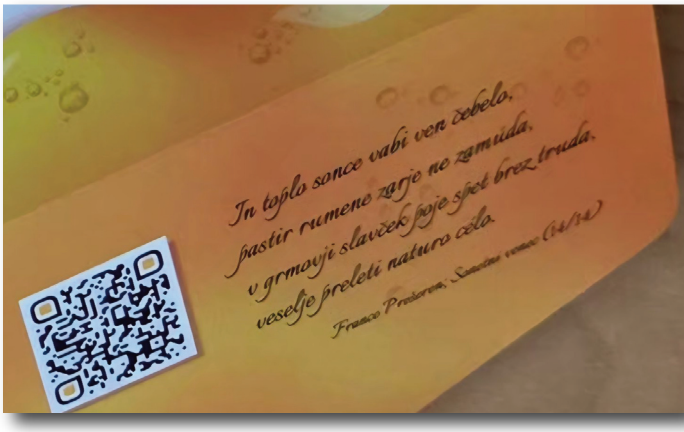
He introduced the participants to the BUY LOCAL HONEY campaign and invited them to join the joint European BUY LOCAL HONEY campaign.

COMMEMORATIVE BANKNOTE – A SYMBOL OF SLOVENIAN TRADITION IN GIFT FORM

Part of this year's offer of the Beekeeping Association of Slovenia is a new commemorative banknote in a limited edition, designed as a symbolic tribute to Slovenian beekeeping. In the foreground, it depicts the Carniolan honeybee, an indigenous subspecies of bee in Slovenia, recognizable for its calmness, excellent orientation and adaptability.

A special place on the banknote is also occupied by the design of a typical honey jar, which beekeepers use to fill honey of Slovenian origin - including Slovenian honey with a protected geographical indication, which is depicted in a crafted jar. The banknote thus combines the key symbols of Slovenian beekeeping and represents a unique souvenir, a perfect gift and a long-term collector's investment.

Purchase at ines.zunic@czs.si



BANKNOTE EUROSOUVENIR

ČEBELARSKA ZVEZA SLOVENIJE SLOVENIAN BEEKEEPERS' ASSOCIATION - Front : version

135 x 74 mm

Čebelarstvo v Sloveniji, način življenja, je vpisano na Unescov Reprezentativni seznam nesnovne kulturne dediščine človeštva. Spominski bankovec prikazuje kranjsko sivko, avtohtono slovensko čebelo, prepoznavno po sivo-rjavi barvi. Čebele tvorijo družino z matico, delavkami in troti. V Sloveniji prebivajo v AŽ-panjih, postavljenih v tradicionalne slovenske čebelnjake. Na desni strani je načrt zaščitenega tipiziranega kozarca za med in čebelje pridelke slovenskega porekla. Kozarec ima prepoznavno dno z reliefom kranjske sivke. Slovenski med z zaščiteno geografsko označbo, ki je umeščen znotraj načrta kozarca, zagotavlja sledljivost, poreklo in nadzorovano kakovost. Prepoznamo ga po prelepki z evropskim znakom kakovosti. Celota poudarja tesno povezanost naravne in kulturne dediščine ter dolgoletne tradicije in kakovosti slovenskega čebelarstva.

Beekeeping in Slovenia, a way of life, is inscribed on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity. The commemorative banknote depicts the Carniolan honeybee, a native Slovenian bee species recognizable by its gray-brown color. Bees form a family consisting of a queen, workers, and drones. In Slovenia, they live in AŽ hives, placed in traditional Slovenian apiaries. On the right side is a design for a protected standardized jar for honey and bee products of Slovenian origin. The jar has a distinctive bottom with a relief of the Carniolan honeybee. Slovenian honey with a protected geographical indication, which is placed inside the jar design, guarantees traceability, origin, and controlled quality. It can be recognized by a sticker with the European quality mark. The whole design emphasizes the close connection between natural and cultural heritage and the long-standing tradition and quality of Slovenian beekeeping.

Izdajatelj / *Publisher*: **Čebelarska zveza Slovenije**
Idejna zasnova / *Conceptual design*: **Boštjan Noč**, **Tina Žerovnik** in **Mara Golob Meserko**
Oblikovanje in ilustracija / *Design and illustration*: **Matjaž Učakar**
Foto / *Photo*: **Arhiv Čebelarske zveze Slovenije**
Produkcija / *Production*: **VESEL Design d.o.o.**
Lukovica 2025

BUY LOCAL HONEY T-shirts

The Buy Local Honey promotion will be effective if we inform the public in various ways. T-shirts with the Buy Local Honey logo are available for 17.90 euros + shipping. Orders at ines.zunic@czs.si

14th INTERNATIONAL MEETING OF YOUNG BEEKEEPERS – IMYB 2026
Belfast, Northern Ireland, 4th July – 8th July 2026

Dear Beekeeping Friends,

We are pleased to invite you to the International Meeting of Young Beekeepers IMYB 2026. After previous successful years of IMYB events recently held in Slovakia , France, Slovenia, Dubai, it is now possible to experience all that Northern Ireland has to offer Northern Ireland is the homeland of Apis Melifera Melifera, the beautiful black bee.

Young Beekeepers at Shanes Castle, Northern Ireland – 2025

The 14th meeting is set to be held in Northern Ireland, a land steeped in myths and legend, within the distinguished grounds of world renowned Queen's University Belfast.

Apis Melifera Melifera
The Irish Black Bee

The event aims to inspire a new generation of young beekeepers to follow in the footsteps of their experienced mentors and to foster in them a lasting appreciation for this independent profession that benefits society as a whole.

Young Beekeepers in the Apiary
Randalstown and District Beekeepers

IMYB 2026 Belfast will blend exciting competition with a rich mix of educational, cultural, and social activities, offering young participants the chance to learn together, build a sense of community, and make lifelong friends who share their love of beekeeping.

Titanic Museum Belfast

Queen's University Belfast
Founded 1845 by Queen Victoria

With the scope to host up to forty countries from all over the world, **IMYB 2026 Belfast** promises to be the largest and most vibrant global gathering of young beekeepers to date.

IMYB 2026 Belfast MAIN INFORMATION

Expression of Interest

To apply to enter a team, please complete the IMYB 2026 Belfast Expression of Interest Form by 1st December 2025.

You can access this form and additional details online via this link.

Ulster Folk Museum
Holywood, Northern Ireland

IMYB 2026 Applications and Registration

- Timely country registration via the online Registration form by 1st December 2025
- Confirmation of successful applications will be provided in due course, with remaining applications added to the waiting list.
- Payment of the Participant Fee (£1,000 GPS) will be required for final registration no later than 12th January 2026, at which time teams will also be asked to submit finalised participant names.
- Should a team withdraw for any reason, the next team on the waiting list will be offered the available place.

Participants

- Each team consists of THREE young people aged 12 to 17. Team members must not turn eighteen during the event.
- Each team must be accompanied by up to two adults, who will be responsible for the team members and must remain with them for the entire duration of the event.

Competition tasks

- The competition features a variety of disciplines that may include: theoretical knowledge test, microscopy, beekeeping tools identification, assembling a beehive, assembling a comb frame, honey extraction, honey recognition, bee plant identification, alternative pollinators, queen bee marking, grafting larvae, other beekeeping tasks and a special regional discipline.
- Participants will take part in the competition as individuals, as part of their national team, and within mixed international groups. Results will be displayed for each of these areas.
- We are committed to creating an exciting and diverse experience for everyone involved. The main competition will be complemented by social events and a dedicated program for accompanying adults.

Communication

The official language at this event will be English.

Location and Venue

Accommodation, competition and travel details will be provided upon final registration.

Nearest airports

- Belfast City Airport (BHD)
- Belfast International Airport (BFS)
- Dublin Airport (DUB)

Costs

- Payment of the Participant Fee (£1,000 GPS) is required to complete final registration no later than 12th January 2026.
- Accommodation, Food and Hospitality costs related to the program for participants and accompanying persons are covered by the Northern Ireland organisers.
- Teams are responsible for covering their own travel expenses to the nearest designated airport (as listed above).
- IMYB 2026 Belfast will provide onward transport from these airports, and further details will be shared with participating teams in due course.

International Meeting of Young Beekeepers - Northern Ireland

- **Submit your Expression of Interest:** Enter a Team
- **Email Contact:** IMYBNI26@gmail.com
- **IMYB 2026 NI Website:** International Meeting of Young Beekeepers 2026 - Northern Ireland

Join us in Belfast for an unforgettable experience that combines learning, culture, and the shared passion for beekeeping.

Yours faithfully,

RNDr. Jiří Píza
ICYB Chair
piza@icyb.cz
Coordinator IMYB 2026

Valentine Hodges
Ulster Beekeepers Association
UBKA Chairman, Organising Team
IMYB 2026

Susie Hill
Ulster Beekeepers Association
Education Chair, Organising Team
IMYB 2026

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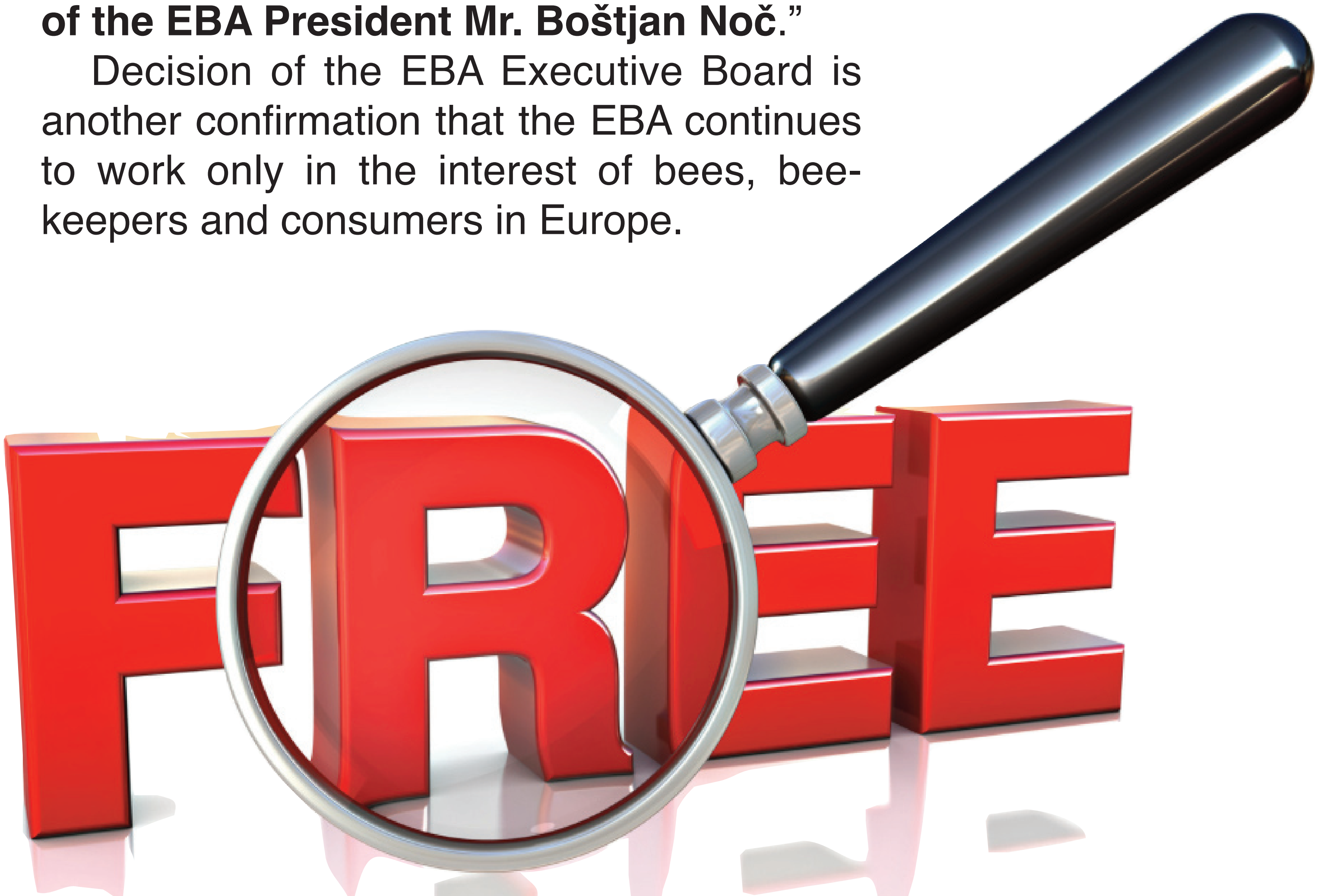
TO THE EBA WITHOUT MEMBERSHIP FEE

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


BEES
LIFE
CONTENT

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

December 2025.
Issued since July 2024.
Publisher: **European Beekeeping Association** (EBA)
Head office: Brdo pri Lukovici 8, 1225 Lukovica, Slovenija
eba@ebaeurope.eu
www.ebaeurope.eu

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.

Editor in chief of the electronic edition of the magazine:
MD Rodoljub Živadinović, Epidemiology Specialist, Apitherapist
apikult@gmail.com, +381 60 444 01 01 (Viber, WhatsApp, Telegram, Signal, WeChat, Daze)