

# Apimondia 2025 matka Kööpenhaminaan



Pertti Harmaala, Sadonkorjuuseminaari

# Matkaan lähdettiin Oulusta 20.9 klo 7:00



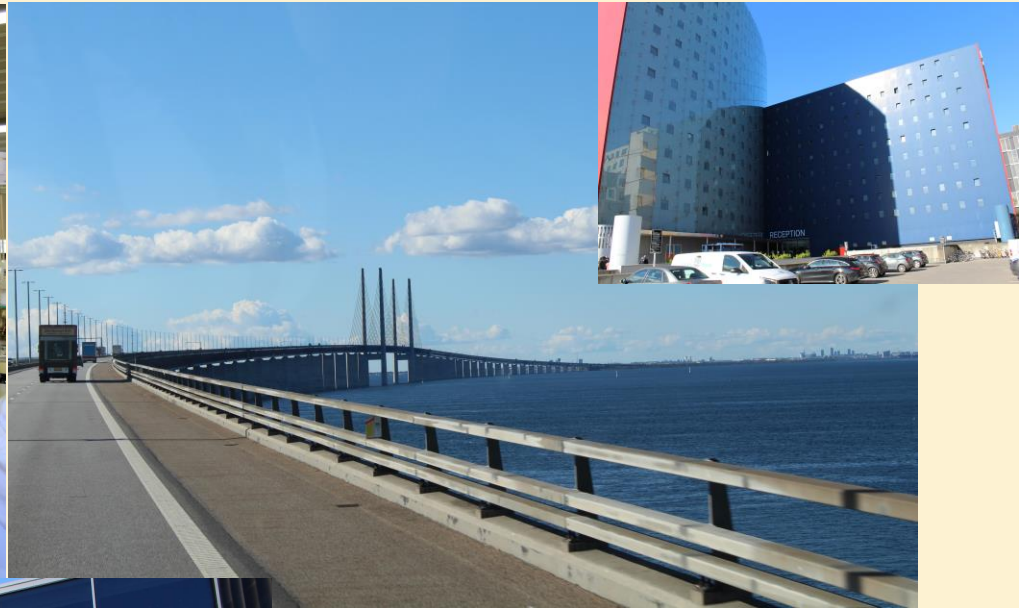
# 21.9 Halki ruotsin 1. päivä



# 22.9 Halki ruotsin 2. päivä



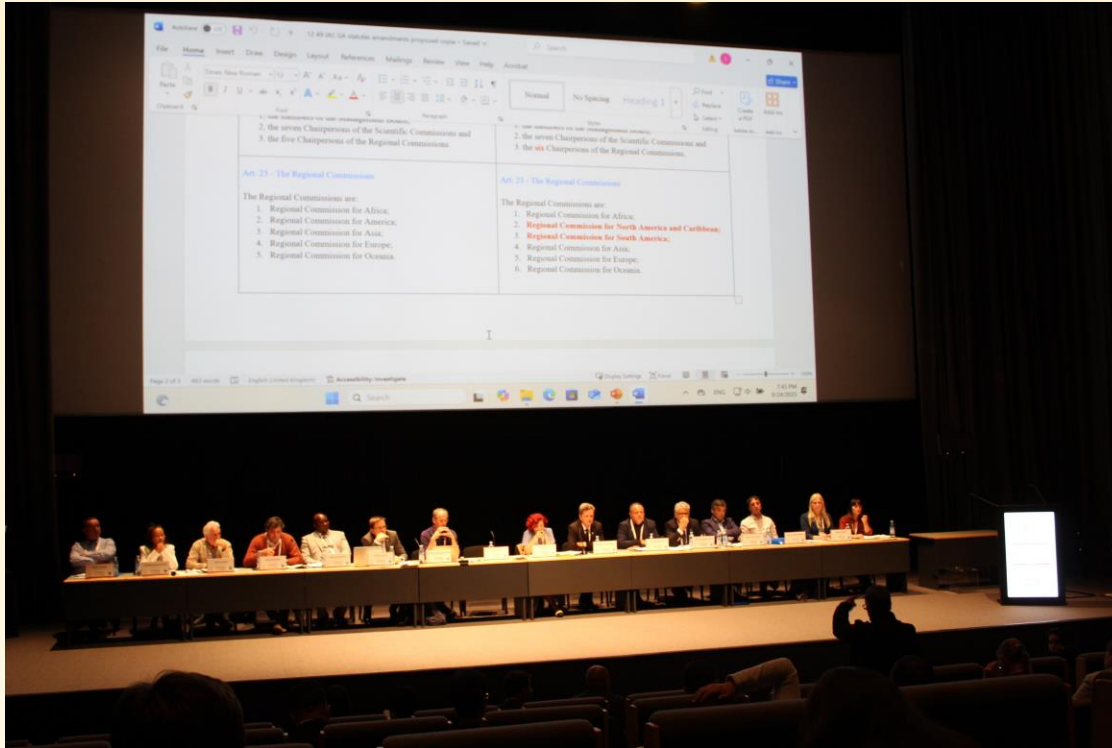
# 23.9 Kohteessa



# Hunajabaari



# General Meeting



# Tautiluennoilta, *Tropilaelaps* punkki



In conclusion

How might *Tropilaelaps* be transmitted?



Swarms



Bee sales

- Young bees in queen cages and packages
- Dead bees in queen cages and packages



Used equipment

- Dead bees or brood in used beekeeping equipment and combs



# Tropilaelaps



# Tautikortti



## INFESTATION WITH TROPILAELOPS MITES

<b>Latin Name:</b>	Infestation with <i>Tropilaelaps</i> spp. is a statutory notifiable disease in the European Union (EU). Under EU legislation, any detection must be reported to the competent authorities.
<i>Tropilaelaps clarseae</i> <i>Tropilaelaps mercedesae</i> <i>Tropilaelaps koenigerum</i> <i>Tropilaelaps thali</i>	Among the four <i>Tropilaelaps</i> species, only <i>T. clarseae</i> and <i>T. mercedesae</i> are known to parasitise <i>Apis mellifera</i> .

*Tropilaelaps* is not yet present in the EU. However, there is a significant risk of its introduction due to its recent spread in Central Asia and the Black Sea-Caucasus region.

**Damage in Colonies:** In colonies with high mite levels, *Tropilaelaps* causes damage similar to that of *Vorror*, another mite commonly parasiting honeybees. Both brood and adult bees suffer high mortality, leading to colony decline, collapse, or absconding. *Apis mellifera* colonies can completely collapse within two to three months of *Tropilaelaps* infestation.

**Beekeeper National Registration:** It is essential that all beekeepers register in their national database. If locations of colonies at risk of *Tropilaelaps* infestation are not known, the chances of detecting its arrival, achieving eradication, or even controlling it in the event of an introduction are severely compromised.

**EU Legislation:** Infestation with *Tropilaelaps* spp. is subject to surveillance within the EU and measures to prevent its introduction and spread between Member States.

**EU legislation prohibits imports of package bees or colonies from Third Countries, except from Switzerland. The importation of honeybee queens is allowed from a very limited number of non-EU countries. These import regulations serve as the main defence against the introduction of *Tropilaelaps*.**

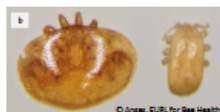
***Tropilaelaps* can no longer be eradicated once it is well established. Vigilance is essential to early detection.**

### How to Recognise Tropilaelaps?



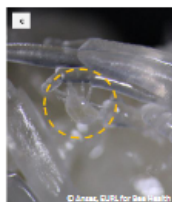
- The mite has four pairs of legs, with the first pair held upright, resembling antennae (a).
- Adult body colour: reddish-brown, lighter than *Vorror* destructor (b). Immature mites are whitish (c).
- Size: approximately 1 mm by 0.5 mm (a). Visible to the naked eye, but smaller than *Vorror* (b).
- The body of *Tropilaelaps* is longer than it is wide. In contrast to *Vorror*, which is crab-shaped (b).

- When examined under a magnifying glass, the mite displays characteristic chitinous plates on its ventral side (a).
- Tropilaelaps* is a fast-running mite, whereas *Vorror* is moving relatively slowly.



### Biological Cycle

- The life cycle of *Tropilaelaps* is quite similar to that of *Vorror*, as both mites reproduce within the honeybee brood. It lasts approximately one week. Adult mites lay their eggs inside the brood cells, where the emerging immature mites (c) feed on the haemolymph (bee blood) of developing bees, causing multiple injuries and eventually transmitting viruses. Mating is not necessary for reproduction: unfertilised females can lay eggs. Females can reproduce without going through a phoretic phase on adult bees (time spent on adults). These characteristics enable *Tropilaelaps* to multiply much faster than *Vorror*.
- Tropilaelaps* feeds exclusively on brood and cannot feed on adult honeybees as it is unable to pierce their cuticle. As a result, it cannot survive more than six days without brood.



EURIL for Bee Health, Anses Sophia Antipolis Laboratory (France) - euril.bee@anses.fr / Welcome to the website of the EU RL for Bee Health / EURIL Tropilaelaps leaflet - Version of June 2023

### Means of Spread

*Tropilaelaps* disseminates between colonies through adult honeybees (phoretic) via natural processes such as drifting, robbing, and swarming. Beekeeping practices, such as dividing colonies, or transferring brood frames, also contribute to the spread of the parasite. The principal and fastest route of long-distance transmission is the movement of infested colonies or packaged bees to new areas.

### How to Suspect Infestation?



Clinical signs of *Tropilaelaps* infestation are similar to those of varroosis:

- Spotty brood pattern (irregular brood), with dead brood, perforated cappings, and, in case of highly infested colonies, "bald brood" resulting from workers removing the cappings over pupae (d);
- Adult bees or pupae with malformations: e.g. shrunken abdomen, atrophied wings, deformed or missing legs (d);
- Weak, crawling bees unable to fly may be observed in front of the hive entrance;
- Small, fast-moving mites on frames, in brood or on adult bees (e).



### How to Check your Hive?

Main detection methods	Brief description
<b>Examining Capped Brood</b> ✓ High sensitivity ✗ Time-consuming, induces brood destruction	1) Open 100-200 capped brood cells, preferably by using fine-nose forceps (instead of honey uncapping fork) to avoid damaging <i>Tropilaelaps</i> . 2) Remove the brood from each cell. 3) Inspect the brood and the inside of the cells for mites.
<b>Examining Hive Debris</b> ✓ High sensitivity ✗ Time-consuming	1) Use sticky boards placed at the bottom of the hive to collect <i>Tropilaelaps</i> naturally dropping from the colony. Protect the board with a mesh to prevent the bees from removing the dislodged mites. 2) Leave the board in the colony for 24-72 hours. 3) Collect and examine the debris for dead mites.
<b>"Bump test"</b> ▲ Low/Moderate sensitivity ✓ Quite fast ✗ Induce brood destruction	1) Select a brood frame containing capped brood. 2) Remove all adult bees by shaking the frame over the colony. 3) Firmly hit one end of the frame over a white metal pan. 4) Rotate the frame and repeat the process three more times. 5) Examine the pan for mites.
<b>Examining Adult Bees</b> ▲ Low/Moderate sensitivity ✓ Rapid, non-destructive method (if using icing sugar)	1) Collect approximately 200-300 bees in a jar. 2) To dislodge the mites from bees, treat them by the 'icing sugar roll' method. (or eventually wash them in ethanol/soapy water).

#### TIPS:

- Use a headlamp and a magnifying glass to spot *Tropilaelaps* among hive debris and other mites that may be present (f).
- To collect the *Tropilaelaps* mites, use a fine paintbrush wetted in honey or water, or a pair of fine tweezers.



### What to do in case of suspicion?

**As soon as possible, alert the competent authority, who will implement the adequate measures.**

All suspect *Tropilaelaps* should immediately be sent to the national reference laboratory and/or to the competent authority for identification:

- Please provide as many details as possible (i.e. your name and address, the apiary name and location);
- Use a sealed container to collect the mites;
- Do not send live mites in the post. Kill them first by keeping them in a freezer overnight.

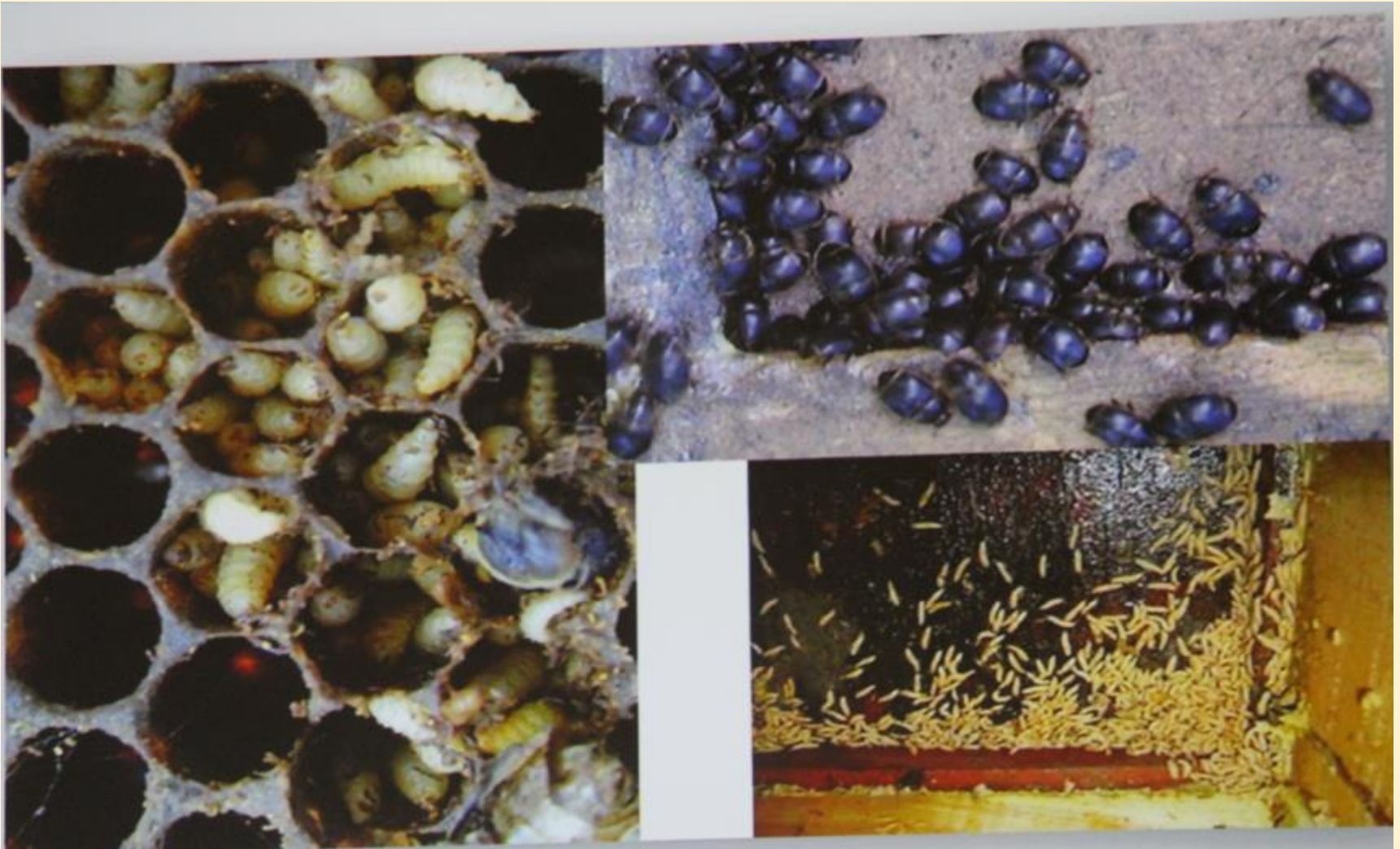
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# Pieni pesäkuoriainen

## Small hive beetle distribution



# Pieni pesäkuoriainen



# Pieni pesäkuoriainen (PPK) Italiassa

- 5.9.2014 PPK havaittiin ensimmäisen kerran EU:ssa, Calabria – Italia
- Syys – Joulukuu 2014 PPK levisi viereiseen Vibo Valentia provinciin
- Vuodesta 2017 PPK:sta on jatkuvasti raportoitu Calabria provinssista
- 7.12.2014 PPK vahvistettu Sisilian Siracusa provinssissa
- 20.6.2019 toinen PPK havainto Siracusassa
- 9.10.2024 Kolmas PPK havainto Sisilian Messina provincissa, 11 saastunutta tarhaa
- PPK jatkaa yhä leviämistään...



# Italian kansalliset selviytymisohjelmat ja emojen vientikielto Calabriasta ja Sisiliasta



- PPK saastunnat voidaan kontrolloida ja hoitaa ilman saastuneen kaluston pakollista polttamista
- Nykyisten hätätoimenpiteiden mukaisesti Calabriasta ja Sisiliasta on kuningattarien vienti muualle EU:hun ja kolmansiin maihin kiellettyä.

# Cold climate beekeeping network

Who do we invite to the network?

- other people acting as advisors or educators in bee health
- as genetic researchers or other people who can share relevant knowledge
- beekeepers/bee professionals (e.g. scientists) that live in a place with cyclical dearth + cold + broad interruption conditions.
- People who transfer and educate beekeepers (cold climate = cold induced brood losses)
- Farmer and Beekeeper representatives, gov. inspectors, research professionals



Why do we want a cold climate beekeeping network?

→ Share knowledge and experience

- we share similar geographic/climate conditions/conditions, but different solutions (beekeeping) + regulatory contexts. Can we learn from each other?
- Share / support / Bee challenged
- Connect with each other
- Be prepared for climate change and its challenges
- Discuss new challenges related to climate change (stronger protection, risk reduction, e.g. a blue book, from early stages on)

Why...

- Communicate
- Share research and education
- Be on the same page
- Share info
- Panels and group discussions on specific topics
- Share problems and solutions (brainstorm with together)
- Share Research
- Share case studies of successful practices
- Promote citizen science

What do we want to do?

- Communicate and educate about beekeeping
- Share research and other relevant papers & share information and discuss on
- Be on the same page for beekeeping
- Share information on research + education/panels etc.
- Panels and group discussions on specific topics
- Share problems and solutions (brainstorm with together)
- Share Research
- Share case studies of successful practices
- Promote citizen science

# Hunajaväärennökset

Honey can only be honey – a strong EU policy commitment for authenticity and traceability

Carlos MARTÍN ÓVILO, UNIT E3 ANIMAL PRODUCTS (DG AGRI)

EU 2024/1438 katselmus

1. Alkuperämerkinnät (Art. 2(4))  
Hunajan alkuperämaan ilmoittaminen pakkausmerkinnöissä
2. Termi "suodatettu hunaja" poistetaan (Art. 2, 3 & Liite I (2)(b)(viii))  
Termiä ei enää käytetä hunajan luokittelussa
3. Analyysimenetelmät (Art. 4)  
Täytäntöönpanosäädös neljän vuoden kuluessa
4. Koostumus ja jäljitettävyys (Art. 4a)  
Delegoidut säädökset viiden vuoden kuluessa
5. Hunajafoorumi (Art. 4b)
6. Täytäntöönpano: 14.12.2025 mennessä  
Soveltaminen: 14.12.2026 alkaen (varastojen tyhjennys)

## Review of the Honey Directive

Dir 2024/1438 published on 24 May / in force since 13 June  
[https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ.L\\_202401438](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ.L_202401438)

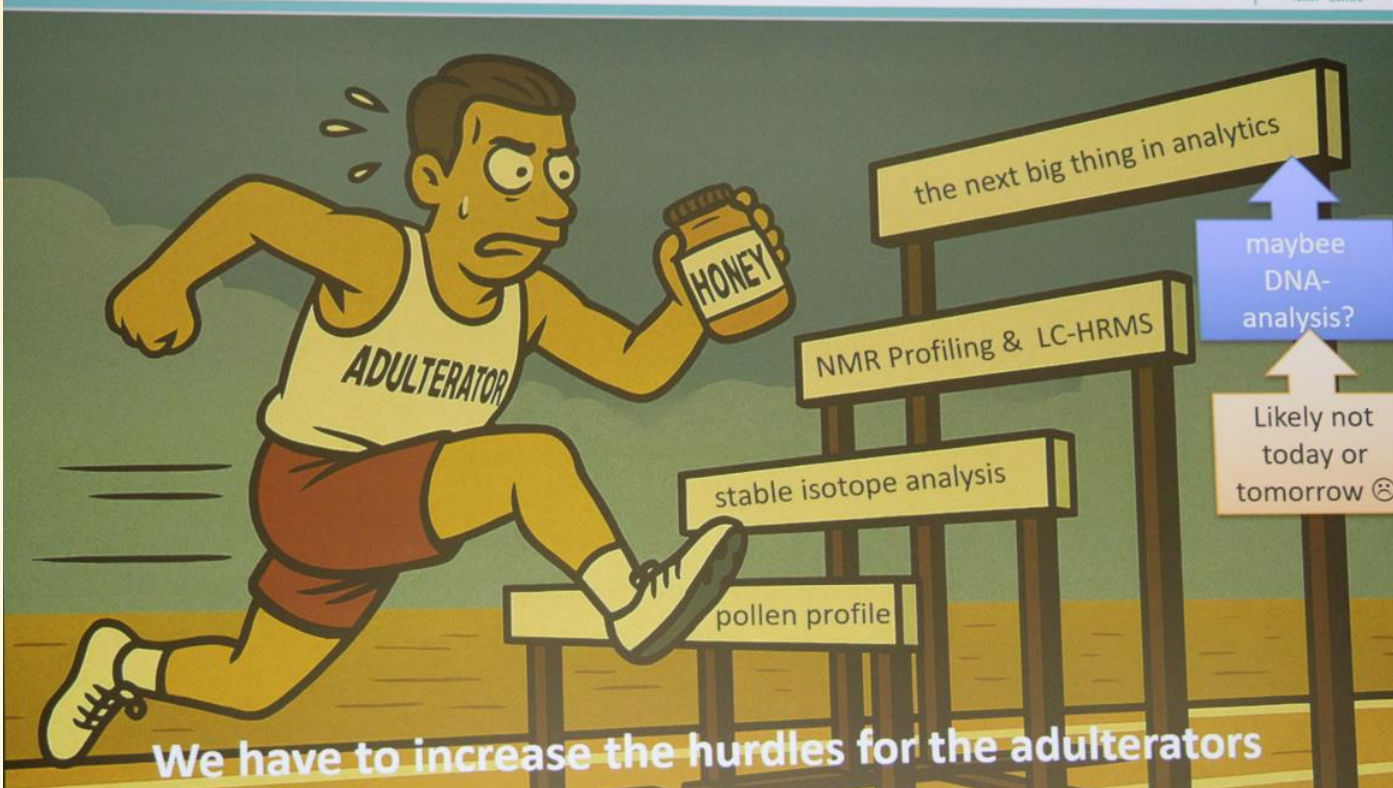
6 main areas:

- **Origin labelling** (Art. 2(4))
- Removal of the term "filtered honey" (Art. 2, 3 & Annex I (2)(b)(viii))
- Analysis methods (Art. 4) – implementing act within 4 years
- Composition and Traceability (Art. 4a) – delegated acts within 5 years
- **Honey Platform** (Art. 4b)
- Transposition by 14.12.2025, application by 14.06.2026 (stock exhaustion)

# Hunajaväärennökset

Let's state it clearly:

NEW ANALYTICAL METHODS ARE NEEDED & WELCOME!



"Meidän on lisättävä esteitä väärennysten tekijöille"

# Hunajaväärennökset

What has happened ... a review:

Comparison of Methods for Honey Authenticity Testing  
Presented at APIMONDIA 2019 in Montreal



	Adulteration	Quality Parameters	Variety	Origin	targeted	untargeted
EA & LC- d <sup>13</sup> C-IRMS	X				X	
Sugar Profile	X	X	x		X	
Enzymes (β-FE, amylases)	X	X			X	
Colorants (E150cd)	X				X	
Markers						
Rice (Glycosylisomaltol)	X				X	
Beet (3-Methoxytyramine)	X				X	
Mannose	X				X	
Psicose	X				X	
Difruktoseanhydrid	X				X	
Arsenic	X				X	
→ NMR	X	X	X	X	X	X
→ HR-LCMS (several variants)	X		x	X	X	X
→ DNA	X		X		X	X
→ Volatiles	x		X	x	x	
→ Trace metals	x	x	(x)	x	x	x
Pollen analysis	X		X	X	X	x
Conductivity, water, ...	X	X	X		X	

Many of these methods require large sample numbers!

- Testimenetelmien liian varhainen tuominen markkinoille voi aiheuttaa kuluttajien luottamuksen menetyksen  
Esimerkki DNA-analytiikasta: lupaava, mutta ei vielä valmis

# Hunajaväärennökset

## Comparison between traditional pollen analysis and modern DNA analyses

Eero Vesterinen

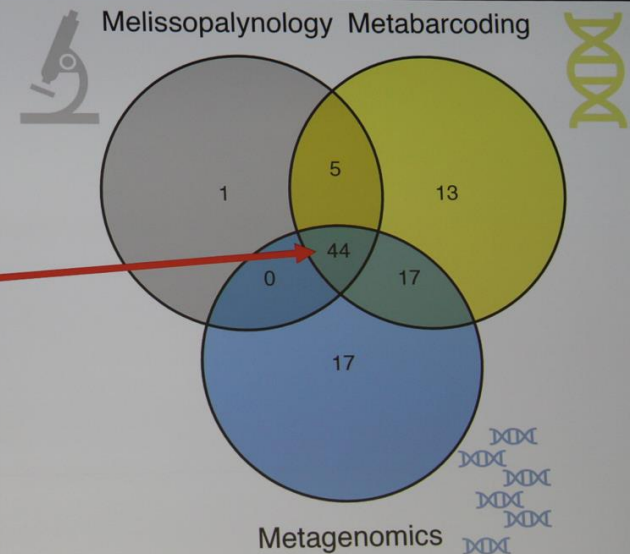
Bioname Ltd and University of Turku

with Elisa Monto, Mikhail Ozerov, Anneli Salonen, and Helena Wirta

Apimondia 2025

## Results

- Most plant families detected by all methods
- Only one family detected by microscopic analysis but NOT by DNA (Juncaceae, *Juncus*: one pollen grain in one sample)
- Both DNA methods reveal more families than microscopic analysis



## Conclusions

1. DNA gives comparable results with microscopic analysis
2. DNA is more sensitive, revealing more plant taxa
3. Generally, DNA is a very promising tool for honey producers
4. Honey DNA analysis requires accreditation before used "for real"
5. Also, the determination of honey origin requires more work → more honey samples from all over the world
6. Honey adulteration detection using DNA might be possible, but requires extensive expertise → one should not jump into conclusions too quickly!

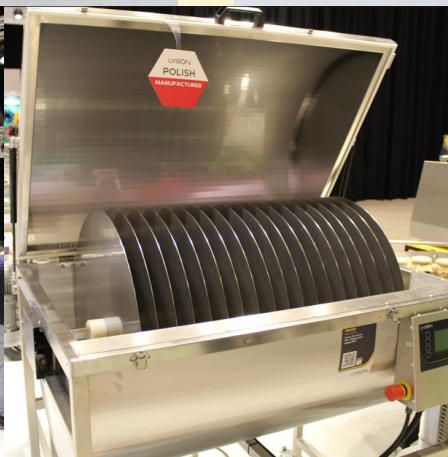
## Conclusions

1. DNA antaa vertailukelpoisia tuloksia mikroskooppisen analyysin kanssa.
2. DNA on herkempi ja paljastaa enemmän kasvilajeja.
3. Yleisesti ottaen DNA on erittäin lupaava työkalu hunajantuottajille.
4. Hunajan DNA-analyysi vaatii akkreditoinnin ennen kuin sitä voidaan käyttää "oikeasti".
5. Myös hunajan alkuperän määrittäminen vaatii enemmän työtä → enemmän hunajanäytteitä eri puolilta maailmaa.
6. Hunajan väärennösten tunnistaminen DNA:n avulla saattaa olla mahdollista, mutta se vaatii laajaa asiantuntemusta → ei pidä tehdä johtopäätöksiä liian nopeasti!

# Paljon nähtävää



# Paljon nähtävää



# Paluumatka



# Paluumatka, kommuuni vierailu



# Paluumatka jatkuu



# Kiitos

