

Incidence of Vairimorphosis (nosemosis) across continental Croatia over two consecutive years

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BACKGROUND

- Vairimorphosis (nosemosis) is a widespread disease in adult honey bees across Croatia.
- Many beekeepers are unaware of its presence in their hives and underestimate its impact.
- Vairimorpha ceranae* is now the predominant species causing the disease.
- Unlike *V. apis*, *V. ceranae* infections do not leave visible faecal marks on hives and combs.
- This lack of visible signs leads to a misconception among beekeepers that the disease is absent from their apiaries.

AIM

- The study aimed to assess the prevalence of Vairimorphosis in honey bee colonies.
- The research focused on continental Croatia.
- It targeted large apiaries (100+ colonies) managed by experienced beekeepers.
- The assessment was conducted over two consecutive years on the same apiaries.

METHODS

- The study was conducted in 2017 and 2018.
- Samples were collected in late summer from 30 apiaries.
- At each apiary, 60 bees were sampled from 25 to 70 randomly selected colonies.
- Microscopy (OIE Terrestrial Manual, OIE; Paris, France: 2013. Nosemosis of Honey Bees. Chapter 2.2.4.)
- In total, 2,122 colonies were included in the laboratory analysis.
- R Studio, v 2025.05.1



- Data were classified by region, taking into account variations in climate and forage resources

RESULTS

Apiaries	Year	No samples	Positive samples	Spores average no
30	2017	1020	462	2.675.392
	2018	1102	392	487.976

ns p<0,05

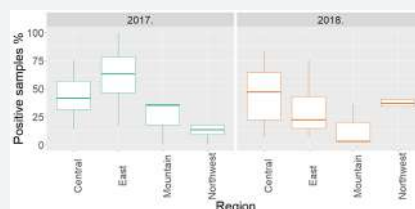


Figure 1. Percentage of samples testing positive for *Vairimorpha* sp. across regions and years

CONCLUSIONS

- Vairimorphosis detected in all apiaries
- Spore counts vary across years
- No significant difference in the proportion of positive cases between years
- High prevalence among large-scale beekeepers:
 - 45.29% and 35.57% of positive samples
- Further research needed:
 - Year-round monitoring of the same apiaries
 - Collection of additional relevant data



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Vairimorphosis (nosemosis), a disease affecting adult honey bees, is widespread across the territory of the Republic of Croatia. Despite its prevalence, beekeepers often remain unaware of its presence within their hives and, as a result, generally do not pay significant attention to its potential impact on colonies. This is particularly the case since the emergence of *Vairimorpha (Nosema) ceranae*, which has now become the predominant species. The clinical signs of infection caused by *V. ceranae* differ considerably from those associated with *Vairimorpha (Nosema) apis*, a species more familiar to beekeepers. The absence of visible faecal marks on hives and combs, a common sign of *V. apis*, has contributed to a widespread misconception among beekeepers that Vairimorphosis is not present in their apiaries. This study aimed to assess the prevalence of Vairimorphosis in honey bee colonies across continental Croatia, focusing on apiaries managed by experienced beekeepers who maintain 100 or more honeybee colonies. The research was conducted over a two-year period to evaluate the occurrence and spread of the disease. Samples were collected in late summer from a total of 30 apiaries for Vairimorphosis analysis conducted in 2017 and 2018. At each selected apiary, a total of 60 bees were sampled between 25 and 70 randomly selected colonies. In total, laboratory analysis was conducted on samples from 2,122 colonies. Microscopic examination of the collected samples revealed the presence of *Vairimorpha* spp. spores in 45.29% of the analysed colonies in 2017. In 2018, the prevalence of infection was 35.57%. Beekeepers were informed of the 2017 results and recommendations. Recommended interventions included maintaining hygienic water sources, replacing old combs, and disinfecting stored combs using acetic acid fumes. Beekeepers also made independent decisions regarding the use of commercially available compounds registered on the Croatian market. Some decided to dismantle weak and heavily infected colonies, followed by disinfection of hives and combs.