

New molecular method to detect and quantify three microsporidia infecting bees, *Vairimorpha (Nosema) apis**, *Vairimorpha (Nosema) ceranae** and *Vairimorpha (Nosema) bombi**

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**Nosema apis*, *N. ceranae* and *N. bombi* have been reassigned in 2020 from the genus *Nosema* to the genus *Vairimorpha*

BACKGROUND

- These three microsporidia are **intracellular parasites of bees**: *V. apis* and *V. ceranae* are honey bee parasites, *V. bombi* is a bumble bee parasite.
- Current molecular methods do not allow the **quantification of the three *Vairimorpha* species**.

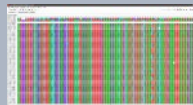
OBJECTIVE

To develop and validate a **harmonised molecular method** (quantitative PCR) enabling the specific detection and quantification of these three parasites in honey bees, bumble bees and mason bees.

DEVELOPMENT

Based on the single-copy gene *RPB1*

- *In silico* development (bioinformatics)

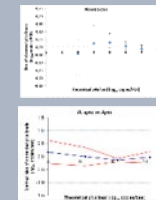


- Assay *in vitro*



VALIDATION

- Performances and specificities of the quantitative PCR
- Method performances: in *Apis mellifera*, in *Bombus terrestris*, in *Osmia bicornis*



PERSPECTIVES

- Study accurately *Vairimorpha* (co)infections, especially those devoid of clear clinical signs
- Study the microsporidia spillover between bee species
- Study the dynamics of coinfection/synergism with other pathogens and parasites
- Transfer to high-throughput methods for the analysis of big sample sets