



Harmonised Diagnostic Methods for *Tropilaelaps* Mites: Strengthening Surveillance and Control Against an Emerging Global Threat to Beekeeping

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WOAH Reference Laboratory for Infestation of Honey Bees with *Tropilaelaps* spp., European Union Reference Laboratory (EURL) for Bee Health

Background:

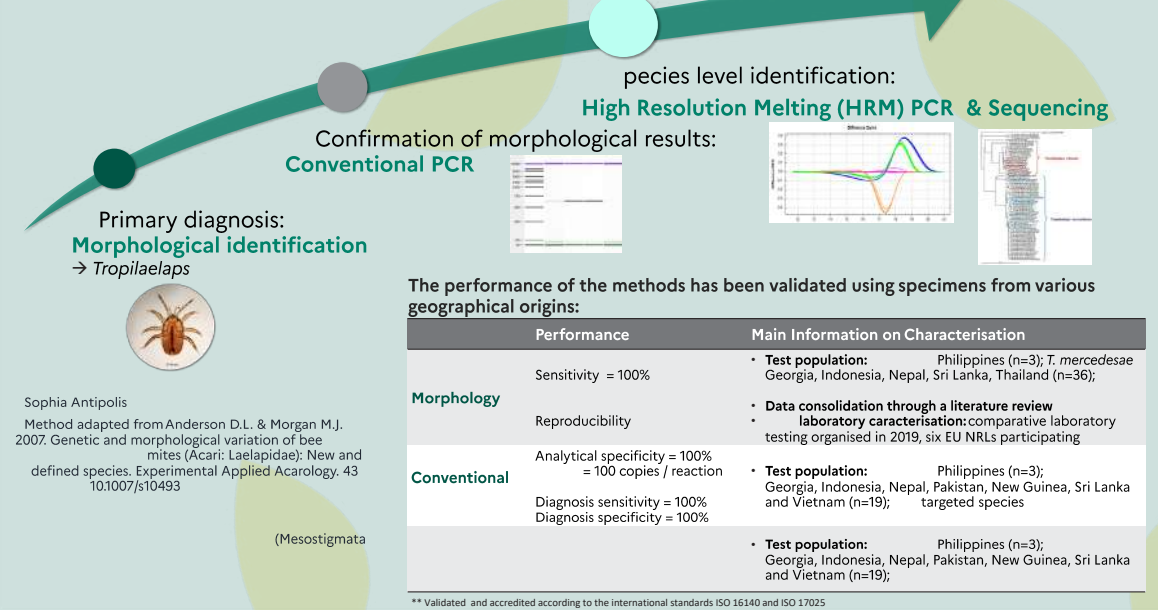
- *Acari: Laelapidae* external parasites of honeybees, native to East, South and Southeast Asia.
- morphologically species are described: *T. mercedesae* *T. koenigerum*
- Species known to parasitise
- *Tropilaelaps* mites feed and reproduce in the brood, transmit viruses, and can cause high severe damages to colonies: weakening, absconding, and mortality.
- Infestation by *Tropilaelaps* listed by the World Organisation for Animal Health (WOAH) and regulated in the European Union (EU).



The recent spread of *Tropilaelaps* mites into Central Asia, Western Siberia, Eastern Europe poses an increasing threat to global beekeeping, exacerbated by climate change and global trade.

Reliable, standardised diagnostic tools are essential for early detection, particularly in regions where *Tropilaelaps* has not yet been reported.

Official Methods for Identification of *Tropilaelaps* spp. and Differential Diagnosis from Other mites in Honey Bee Hive Environment:



Methods published in the WOAH Terrestrial Manual of Diagnostic Tests and Vaccines



And disseminated within the European Union network of national reference laboratories: publication on the EURL for Bee Health website, organisation of trainings, reference material for PCR adoption, proficiency

Establishing a robust, harmonised diagnostic framework ensures reliable identification, supports surveillance programs, and strengthens international efforts to prevent the spread of *Tropilaelaps*

These tools are essential for early detection and response, helping to safeguard honeybee populations and mitigate the potential impact of *Tropilaelaps* on apiculture.



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Tropilaelaps mites are external parasites of honeybees, native to East, South and Southeast Asia. They reproduce and feed within the brood, weakening and ultimately killing colonies, leading to significant production losses. Among the four known Tropilaelaps species, *T. mercedesae* and *T. clareae* are capable of infesting *Apis mellifera*. Given their impact on honeybee populations, Tropilaelaps spp. infestation is listed as a notifiable disease by the World Organisation for Animal Health (WOAH) and is subject to regulation within the European Union (EU). Reliable, standardised diagnostic tools are essential for early detection, particularly in regions where these mites have not yet been reported.

To address this need, the Anses laboratory in Sophia Antipolis (designated as the EU Reference Laboratory for Bee Health and the WOAH Reference Laboratory for Tropilaelaps) has developed and validated a set of analytical methods for the identification of Tropilaelaps mites and their differentiation from other mite species found in honeybee colonies. These methods include: i) Morphological identification, allowing Tropilaelaps spp. mites to be recognised in less than an hour based on distinctive features, ii) Conventional PCR, providing confirmation of morphological results, ii) High-Resolution Melting (HRM) PCR and sequencing, enabling species-level identification.

The inclusivity and specificity of these diagnostic tools have been verified using specimens from various geographic origins. The protocols have been officially published in the WOAH Terrestrial Manual of Diagnostic Tests and Vaccines and disseminated within the EU network of national reference laboratories for bee health.

The recent spread of Tropilaelaps mites into Central Asia, Western Siberia, and Eastern Europe poses an increasing threat to global beekeeping, exacerbated by climate change and global trade. Establishing a robust, harmonized diagnostic framework ensures reliable identification, supports surveillance programs, and strengthens international efforts to prevent the spread of this parasite. These tools are essential for early detection and response, helping to safeguard honeybee populations and mitigate the potential impact on apiculture.