

# BPRACTICES

NEW INDICATORS AND ON-FARM PRACTICES TO IMPROVE HONEYBEE  
HEALTH IN THE AETHINA TUMIDA ERA IN EUROPE

## WP 4 - "Aethina tumida"

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## WP 4 - "Aethina tumida"

Lead: Partner 1, Partner 6



### Objectives:

- Identification of GBPs to submit for beekeepers' approval
- Identification of innovative GBPs for prevention of clinical cases and colony mortalities:  
sampling (apiary level) and laboratory analysis
- Identification of sustainable protocols for disease control



## Task 1.

A list of GBPs identified by partners as general prerequisite and specific to *Aethina tumida* prevention (e.g. avoiding to breed weak colonies or to have empty combs in the apiary, etc.) will be compiled.

This list will be provided to WP5 for validation by the beekeepers at the international level.



## Task 2.

A new hive inspection method, making more practical and faster the SHB on-field surveillance, will be identified.

A new PCR method for *Aethina tumida* detection from debris and soil will be developed

The yeast *Kodamaea ohmeri* will be tested as a non-invasive indicator to detect SHB presence at the apiary level using honey (biological sensors and culture method) and debris (PCR and culture method). Moreover, the risk for humans with low immune competencies will be assessed considering: the mean amount of honey assumption, the number of positive samples and the amount of yeast in the samples

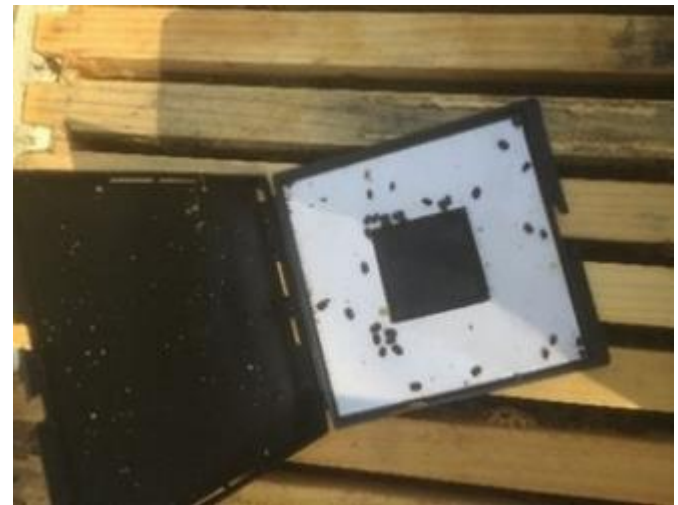
The best features of sentinel apiaries to optimize the efficacy in attracting SHB will be addressed. Supplements to the sentinel nucleus will be identified (e.g. traps provided or not with baits)



### Task 3.

Sustainable protocols for SHB control, avoiding the application of high environmental impact chemical treatments and their impact on bee product quality will be considered in the available scientific literature. The application of mechanical traps associated with baits or yeasts will be preferred. An updated final review will be published.

All partners will participate in carrying out a review of affordable *Aethina tumida* control methods with mechanical traps associated with baits or yeasts.



#### Task 4.

An electrochemical biosensor will be developed to investigate the cyclic voltammetry response from the interaction of specific enzymes with the organophosphates (OP) residues in honey, frequently used against SHB.

A biosensor based on a quartz crystal microbalance for the early detection of the *Kodamaea ohmeri* will be developed as SHB's presence indicator. The biosensor will take advantage of proper transducer surface functionalization to give rise to an immunosensor. Anti-yeast antibodies will be immobilized on the transducer surface in order to maximize yeast binding efficiency.

A final review of WP4 with GBPs approved by beekeepers, innovative GBPs for monitoring, sustainable protocols for *Aethina tumida* control and the innovative use of biosensors will be published. Analyses will be performed on honey samples obtained from Partners

