

## Executive Summary

# Strengths, Weaknesses, and the Effect on the Health of Honeybees

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Ectoparasitic mites, such as *Varroa destructor*, are currently the most dangerous parasites for adult honeybees and their larval forms. The worrying global decline of hives is largely due to the mite, which can spread numerous illnesses. Honeybees that are parasitized frequently exhibit indicators of weight loss, decreased size, shorter lifespans, behavioural abnormalities, and malformed wings. These symptoms can be linked to the parasite's role as a viral vector. As a result, severely infested colonies experience varroosis, a parasitic mite illness. This study has a lot of practical applications since it helps beekeepers choose the best method for diagnosing their hives, an essential step in the breeding process.

The experiments were conducted in the Catanzaro province (Calabria, Southern Italy). In April 2022, the trials were conducted in two apiaries. A period of low nectar imports and somewhat humid days was preferred for the count to minimize the variables that could potentially affect the diagnostic accuracy of the sugar roll method. Two adult bee samples were collected from the same frame of each hive on day zero. Within the colony, *V. destructor* is not distributed uniformly on adult honeybees, and foragers have a different *V. destructor* load than immature honeybees do. The samples were then prepared for the two procedures.

The diagnostic efficacy of the CO<sub>2</sub> injection and sugar roll techniques was examined in the current research investigation using the identical apparatus. This particularity removed the distortion elements in the result brought on by the instrument's variability. When compared to CO<sub>2</sub> injection utilizing the same sort of instrument, the data from the current investigation demonstrated that the sugar roll approach had a higher diagnostic accuracy and efficacy. Given the importance of protecting honeybees, it is important to emphasize that neither of the diagnostic techniques utilized was in any way unethical compared to washing with alcohol. Both did not harm and kill the honeybees under examination.

A proper diagnosis is crucial and must be made immediately. Even two or three mites counted, more or fewer, could influence the breeder's decisions when determining the severity of infestations. In our investigation, differences between samples from the same colony were seen in various situations. Variations varied between a comparable number, but occasionally doubled.

In conclusion, the CO<sub>2</sub> approach was less accurate in measuring the parasite load of *V. destructor* on adult bees. On the other hand, the sugar roll test confirmed its efficacy and significantly increased the



accuracy of the diagnosis of *V. destructor* infestations by providing a valid figure for the number of mites present in the samples.

Source: [Veterinary Sciences](#)

**KEYWORDS**

Integrated pest management (IPM); honey bee (*Apis mellifera*); *Varroa destructor*; CO2 injection; powdered sugar roll; honey bee welfare and health

