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Genetics and Physiology of *Varroa* mites

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Highlights

- *Varroa* mites are a key threat to honey bee colonies
- Genetic resources shed light on *Varroa* biology and interactions with their hosts
- Work describing reproductive cues and host finding shows mite vulnerabilities
- *Varroa* and honey bees carry shared and unique microbes
- Novel rearing and delivery methods are needed to understand and control mites

Abstract

Varroa destructor is the primary biological threat to domesticated honey bee colonies in much of the world, impacting host fitness both directly and by transmitting RNA viruses. Genomic, proteomic, and functional-genetic resources provide a framework for *Varroa* biology. When coupled with physiological analyses of development, host finding, and reproduction, these resources reveal general traits of arthropods and offer new strategies for mite control. Efforts to develop novel controls are focused on efficacy, efficient delivery, and the avoidance of both host impacts and the swift evolution of resistance by mites.

Introduction

Varroa destructor is the most important parasite of the ubiquitous European honey bee, *Apis mellifera*. This mite causes honey bee

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