

## Ideas About Varroa Destructor Reproduction In The Honey Bees (Hymenoptera: Apidae)

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**Abstract :** The mite *Varroa destructor* Anderson & Trueman (Mesostigmata: Varroidae), is an exclusive hematophagous parasite of the *Apis* honey bees (Apidae: Hymenoptera). The early phoretic female mites have multiple small inactivated oocytes. Consequently, for the initial growth and vitellogenesis of the oocytes, the mother mite must feed on the hemolymph of the host, as a unique food source, by taking intermittently variable number of blood meals: 1. During the phoretic phase, to initiate vitellogenesis of the terminal oocyte, 2. From a freshly capped bee cell with a bee larva, up to the apolysis stage, to complete vitellogenesis and embryogenesis of the terminal oocyte, and 3. From all pupal stages, up to the imago stage, to induce oogenesis and vitellogenesis of the would-be nonembryonic female eggs. Additionally, oogenesis and vitellogenesis expressions in *Varroa destructor* and other Varroidae varies according to environmental conditions, e.g., chemical attractions produced by the adult bee and larvae, race of bees, sex of the larva, developmental period of the bee larva, food quality and quantity, and superparasitism (several cofoundresses). Also, the feeding stimuli obtained from the host hemolymph, indirectly regulate the reproductive physiology of the mite, by inducing different vitellogenin expressions, the production of a male egg first in the sequence followed by vitellogenesis of the would-be female eggs during the pupal stages. Furthermore, the different uptakes of hemolymph from the host, also indirectly induce the production of the male egg first in the sequence, local mate competition (LMC) and variable adaptive female sex ratios in the broods, especially when superparasitism occurs. Consequently, reproduction in *Varroa destructor*, and probably in other Varroidae, depends exclusively on feeding in the hemolymph of the bee host, even during the phoretic phase, the prepupal stages and during the pupal stages; and that, the feeding factors are common syndromes in other Varroidae.

**Keywords :** oogenesis, sex determination, varroa destructor, vitellogenesis

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