

Varroa destructor

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Varroa destructor



Scientific classification

Kingdom: Animalia
Phylum: Arthropoda
Class: Arachnida
Subclass: Acari
Order: Parasitiformes
Suborder: Mesostigmata
Family: Varroidae
Genus: *Varroa*
Species: *V. destructor*

Binomial name

Varroa destructor

Anderson & Trueman, 2000



Low temperature scanning electron micrograph (LTSEM) of *Varroa destructor* on a honey bee host



Varroa mites on pupa



Varroa mites on pupae



Varroa destructor on bee larva

Varroa destructor is an external parasitic mite that attacks Honey Bees *Apis cerana* and *Apis mellifera*. The disease caused by the mites is called **varroosis**.

Varroa destructor can only replicate in a honey bee colony. It attaches at the body of the bee and weakens the bee by sucking Hemolymph. In this process RNA viruses such as the Deformed Wing Virus (DWF) spreads to bees. A significant mite infestation will lead to the death of a honey bee colony, usually in the late autumn through early spring. The *Varroa* mite is the parasite with the most pronounced economic impact on the beekeeping industry. It may be a contributing factor to Colony Collapse Disorder (CCD).

Physical description

The adult mite is reddish-brown in color; has a flat, button shape; is 1–1.8 mm long and 1.5–2 mm wide; and has eight legs.

Reproduction, infection and hive mortality

Mites reproduce on a 10-day cycle. The female mite enters a honey bee brood cell. As soon as the cell is capped, the *Varroa* mite lays eggs on the larva which hatch into several females and typically one male. The young mites hatch in about the same time as the young bee develops and leave the cell with the host. When the young bee emerges from the cell after pupation the *Varroa* mites also leave and spread to other bees and larvae. The mite preferentially infests drone cells.

The adults suck the "blood" of adult honey bees for sustenance, leaving open wounds. The compromised adult bees are more prone to infections. With the exception of some resistance in the Russian strains and *Varroa* sensitive hygiene (VSH) developed by the USDA, the European *Apis mellifera* bees are almost completely defenseless against these parasites (Russian honey bees are one third to one half less susceptible to mite reproduction).[2]

The model for the population dynamics is exponential growth when bee brood are available and exponential decline when no brood is available. In 12 weeks the number of mites in a Western honey bee hive can multiply by (roughly) 12. High mite populations in the autumn can cause a crisis when drone rearing ceases and the mites switch to worker larvae, causing a quick population crash and often hive death.

Varroa mites have been found on flower feeding insects such as the bumblebee *Bombus pennsylvanicus*, the scarab beetle *Phanaeus vindex* and the flower-fly *Palpada vinetorum*. [3] Although the *Varroa* mite cannot reproduce on these insects, its presence on them may be a means by which it spreads short distances (phoresy).

Introduction around the world

- Early 1960s Japan, USSR
- 1960s-1970s Eastern Europe
- 1971 Brazil
- Late 1970s South America
- 1980 Poland
- 1982 France
- 1984 Switzerland, Spain, Italy
- 1987 Portugal
- 1987 USA
- 1989 Canada
- 1992 England[4]
- 2000 New Zealand (North Island)

- 2006 New Zealand (South Island)[5]
- 2007 Hawaiian Islands[6]

As of the second half of 2010, Australia was thought to be free of the mite.[7] In early 2010, an isolated sub-species of bee was discovered in Kufra (south-eastern Libya) that appears to be free of the mite.[8]

Identification

Varroa destructor was, until recently, thought to be a closely related mite species called *Varroa jacobsoni*. Both species parasitize the Asian honey bee, *Apis cerana*. However, the species originally described as *V. jacobsoni* by Anthonie Cornelis Oudemans in 1904 is not the same species that also attacks *Apis mellifera*. The jump to *mellifera* probably first took place in the Philippines in the early 1960s where imported *Apis mellifera* came into close contact with infected *Apis cerana*. Up until 2000, scientists had not identified *Varroa destructor* as a separate species. This late identification in 2000 by Anderson and Trueman corrected some previous confusion and mislabeling in the scientific literature. [9]