



# Varroa Mite

*Varroa destructor* Anderson and Trueman

(Acari: Varroidae)

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**Figure 1.** Enlarged photo of an adult varroa mite. Length is about 1 mm with a width near 1.5 mm (1/16”).

**Introduction.** In April 2007, a beekeeper in Manoa on the island of Oahu observed tiny red mites in several abandoned honey bee hives which he obtained several miles away in Makiki. After reporting it to the Hawaii Department of Agriculture (HDOA), specimens were collected and identified as the varroa mite, *Varroa destructor* Anderson and Trueman. The identification was confirmed by the USDA Systematic Entomology Laboratory in Beltsville, Maryland. Prior to this detection, Hawaii was one of the few places in the world free of this very destructive honey bee pest.

Adult varroa mites are tiny 1–1.5 mm reddish-brown, crab-shaped, flattened mites (Figure 1). They are external parasites which attack honey bee adults, larvae (Figure 2), and pupae (Figure 3) and use their piercing-sucking mouthparts to feed on the hemolymph (blood) of bees. In varroa mite-infested honey bee colonies, newly emerging bees are malformed. Severe infestations of the mite will result in an eventual decline of bee colonies and a reduced honey bee population.

Commercial beekeeping in Hawaii, which includes queen bee and honey production, has been estimated at over \$4 million. However, the most important value of bees is their ability to pollinate fruit trees, vegetables, and seed crops. With the presence of the varroa mite in Hawaii, there is a great potential for the honey bee population to decline. This will significantly reduce pollination of many commercial and residential fruit trees and vegetable crops, resulting in poor yields and low quality produce.



**Figure 2.** Enlarged photo of a honey bee larva with varroa mites attached to the body.

**Hosts and life cycle.** The varroa mite has been found in Florida on several other insects that visit flowers. The mite cannot reproduce on these other insects, but can use them as a means to disperse (Sanford et al, 2007). Elsewhere in the world, the varroa mite can use other species of bees in the genus *Apis* to multiply. In Hawaii, the only known host is the European honey bee, *Apis mellifera*. According to Sanford (2007), the life cycle of the varroa mite is synchronized with that of the honey bee. The female mite lays eggs in developing bee brood cells. After hatching, the developing mites feed on the honey bee larvae. After copulation, the pregnant adult female mites emerge from the cell along with their bee host and seek another cell to repeat the cycle.

**Distribution.** Varroa mites are now found worldwide. In the State of Hawaii, surveys for the mite conducted soon after it was first detected revealed it to be widely distributed on Oahu, in both managed and feral hives. Based on its wide distribution and relatively heavy infestation levels, it is estimated that the mite had been present on Oahu for at least one to two years prior to its detection. In August 2008, varroa mites were extracted from honey bees caught in a swarm trap near Hilo Harbor. This is the first detection on Hawaii Island. Subsequent surveys in the Hilo area have uncovered additional infestations of the varroa mite in feral hives and swarm traps within two miles of the original detection. Efforts to eliminate the varroa mite from these locations are ongoing through the use of swarm traps, baiting and destruction of feral hives, and monitoring of managed hives. HDOA surveys conducted elsewhere on the Big Island and on the neighboring islands of Maui, Molokai, Lanai and Kauai have not revealed any other varroa mite infestations.

**Current objectives.** In order to minimize the impact of the varroa mite in Hawaii, a management plan has been implemented to suppress mite infestations on Oahu and prevent the movement of mites to the neighboring islands. For the neighboring islands, the plan provides for the detection and elimination of any new mite incursions at an early stage before they have a chance to spread. The plan involves intensive monitoring, training of staff and beekeepers on management techniques, and public outreach.



**Figure 3.** Enlarged photo of a bee pupa with a varroa mite attached to its body.

### **Reporting suspect varroa mite infestations.**

Hilo residents are asked to report wild beehives and bee swarms the State's toll-free Pest Hotline at 643-PEST (7378). HDOA is also asking beekeepers and the public not to transport bees or beekeeping equipment in or out of a 15-mile radius of Hilo Bay. More information on varroa mites in Hawaii is available on the HDOA webpage at: <http://hawaii.gov/hdoa/pi/ppc/varroa-bee-mite-page>

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### **Reference**

Sanford, M.T., H.A. Denmark, H.L. Cromroy, and L. Cutts. 2007. Varroa mite. In: *Featured Creatures*. University of Florida and Florida Dept. Agric. & Cons. Services. [http://creatures.ifas.ufl.edu/misc/bees/varroa\\_mite.htm](http://creatures.ifas.ufl.edu/misc/bees/varroa_mite.htm)