

Varroa Mite Infestation in Honey Bees

The Biosecurity Authority of Fiji (BAF) in delivering its key objectives of keeping Fiji safe from the introduction and spread of exotic pests and diseases is continuously working with relevant stakeholders and partners nationally and internationally. In doing so BAF also ensures that where issues are detected which impedes the agricultural industry and biosecurity, it engages in smooth eradication mechanisms to safeguard the respective industry.

In 2018, mites were detected in a bee hive in the central division and identified as the species, *Varroa jacobsoni* (Acari: Varroidae). Upon confirmatory diagnosis of this exotic incursion, BAF actively expanded the varroa surveillance program and successfully initiated a consultative training program through collaboration with PHEL andASUREQuality New Zealand for the BAF apiculture Team to undergo training on varroa identification, sample collection and treatments.

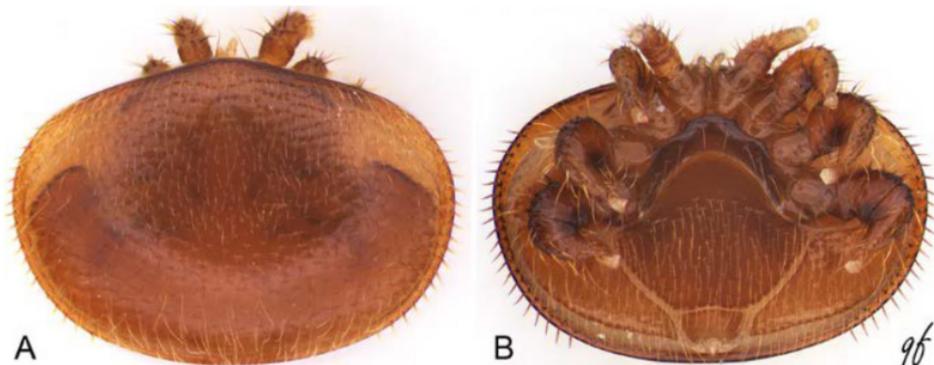
In this week's article we take look at what is Varroa Mite and its threat to honey bees.

What is Varroa mite?

The Varroa mite is considered as the most serious pest of European honey bee (*Apis mellifera*) throughout the world. This mite was first described on the Asian honey bee (*Apis cerana*) from Java, Indonesia in 1904. The mite was originally called *Varroa jacobsoni* Oudemans, but a research published in 2000 revealed more than one Varroa species existed (<http://extension.msstate.edu>). In this week's article, we will become familiar with these devastating mites.

Currently, four species of Varroa mites are known: *V. jacobsoni*, *V. destructor*, *V. underwoodi* and *V. rinderi* (OIE). *V. destructor* is the main species that infects European honey bees. *V. jacobsoni* does not normally reproduce on the European honey bees, however, a recent survey in Papua New Guinea (PNG) did find *V. jacobsoni* on this species.

The adult *V. jacobsoni* is brown to dark brown, flattened, oval, 1.1 mm long and 1.5 mm wide (Picture 01). It is usually found inside the capped drone brood cells and worker brood cells, as well as on adult bees.



Picture 01: Microscopic view of *Varroa jacobsoni*
A. dorsal view, B. ventral view (photos by: Qinghai Fan, PHEL, NZMPI)

The threat of varroa mite to honey bees

Varroa mite, *V. jacobsoni* is a serious external parasite of honeybees. It harms honeybees through feeding on the brood and adult bees. The mite acts as a vector for viruses particularly Deformed wing virus (DWV) that also affects honey bees. Varroa mite infested colonies are significantly weakened and usually cannot survive for more than one or two years.



Picture 02: Varroa mite on adult bee (photo by: Stephen Ausmus, ARS, USDA)

Varroa mites pose a threat to the agricultural and forestry industries through the damaging effects it has on honeybees and pollination. There is a potential risk of Varroa mites invading all the areas with honeybees in Fiji if appropriate measures are not adopted by beekeepers.

The mites are obligate parasites and do not survive long away from its host (bees). Colonies with low infestation generally show very few symptoms which only become more apparent when the mite population increases. Heavy infestations can cause scattered brood, crippled and crawling honey bees, impaired flight performance, a lower rate of return to the colony after foraging, reduced lifespan and a significantly reduced weight of worker bees.

Colony symptoms, commonly called parasitic mite syndrome, include an abnormal brood pattern, sunken and chewed cappings and larvae slumped in the bottom or side of the cell. This ultimately causes a reduction in the honey bee population, supersedure of queen bees and eventual colony breakdown and death (<http://beeaware.org.au>).

Where can you find Varroa mites?

Varroa mites are widespread and found in Asia (including Indonesia, the Philippines, and Malaysia), Africa, North, South and Central America, the Caribbean, Europe and Oceania. *V. jacobsoni* is recorded from Australia, Papua New Guinea, Solomon Islands, Vanuatu and Fiji.



Picture 03: Varroa mites on pupae (photo: BAF file©)

How does Varroa mite spread?

Varroa mite spreads by direct contact from adult honey bee to adult honey bee and by the movement of infested honey bees, bee brood, bee products and used apicultural equipment. Short-distance spread of varroa mites among colonies is mainly the result of swarming, workers entering another hive by mistake (drifting workers) and/or drones and robbing of weak colonies. The movement of beehives, nucleus colonies, tools and queen shipment are the key factors for the long-distance spread of varroa mites.

Moreover, varroa mites can spread between continents via commercial transport of bees by beekeepers and by swarms that move long distances through hitch rides on ships, yachts and vehicles/machinery.

What should I do if I find varroa mites?

Beekeepers should adopt good husbandry and colony management to effectively control Varroa mites in their apiary. Keeping a close eye on honey bees is up most important to know their health. Continuous supervision will assist beekeepers in identifying any changes to the bee hives. Identifying the signs of low levels of Varroa mite infestation (early stages) will assist in curbing the infestation before it becomes widespread. To aid in this, regular inspection and monitoring should take place at least four times a year.

You can help us eradicate Varroa mites. If you have seen these mites or suspect you have seen it, please contact the Biosecurity Authority of Fiji (BAF) on 3312512 or via email info@baf.com.fj or via hotline on 5997 (toll free).