

Tropilaelaps mites

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Introduction

Tropilaelaps mites are sometimes referred to as Asian mites, but this common name also refers to Varroa mites. Tropilaelaps mites are considered to be a major parasite of honey bees (*Apis mellifera*) in many Asian countries. This mite has been found in Papua New Guinea and throughout tropical Asia. It shares some similarities to Varroa mites as a major lethal parasite of honey bees.

If this mite was to enter and establish in Australia it would be expected to cause major losses of honey bee colonies.



Giant honey bee, natural host for *Tropilaelaps* mites. The bee is approx 2.5 cm long.

There are at least four species of *Tropilaelaps* including: *T. clareae*, *T. koenigerum*, *T. mercedesae* and *T. thajii*. The natural host for this mite is the giant honey bee, *Apis dorsata* and *A. laboriosa*. The mite is also known to be found on *Apis cerana* and *Apis florea* but it does not cause these species of bees any harm and may be using these species for dispersal.

Appearance

The mites are very athletic and large enough to be observed in a hive. They are reddish brown in colour and are a similar size to Varroa mites but only half as wide. Given that adult mites on emergence from a brood cell are likely to enter another brood cell to reproduce within 24 hours it is unlikely they will be noticed by a beekeeper until their numbers are quite high.

In one study only 3 to 4 per cent of the adult mites were found on the adult bees in a colony. The remaining 96 to 97 per cent were found to be reproducing in the brood.

An observation of affected adult bees may reveal deformed bees with distorted abdomens, missing legs and stubby wings. Crawling bees and brood discarded at the entrance of a colony may also indicate a colony heavily infested with mites.



Varroa mite on the left, *Tropilaelaps* mite on the right.

Biology

The breeding cycle of *Tropilaelaps* mites is similar to *Varroa* mites, but with a much greater reproductive rate. Mites will continue to breed throughout the year while ever honey bee rearing is occurring. The amount of reproduction is proportional to the amount of brood in the colony.

The development period is six days on a honey bee brood, with a limited adult life of only up to three days on adult worker bees. Up to 88 per cent of adult mites will have died by the end of two days.

The reproduction rate of *Varroa* mites is a lot slower than *Tropilaelaps* mites. One study counted 25 *Tropilaelaps* mites for every *Varroa* mite in a colony of honey bees. Up to six *Tropilaelaps* mites have been found reproducing in a single brood cell. In another observation in Thailand, 14 adult mites and 10 nymphal forms of the mites were found in the one brood cell. The same report indicated that between one and four mites per brood cell was more typical.

The adult mother mites are capable of re-entering another brood cell on emergence and laying more eggs.

Management

Making a colony of bees broodless will effectively kill all *Tropilaelaps* mites in that colony within three days. Beekeepers in Pakistan are reported to constantly treat colonies due to the reproduction rate of this mite. Treatments are not well documented, but it would appear as though the same treatments used to control *Varroa* mites are also effective in managing *Tropilaelaps* mites.

Treatment frequency would be greater than that for *Varroa* mites due to the rapid reproduction rate of this mite.

As the brood area of a colony diminishes, natural mite mortality will increase. Grooming behaviour of adult bees is also responsible for the removal of adult mites.

Heavily infested brood will be removed by hygienic bees, thus helping reduce the mite population.

Impact in Australia

If this mite was to successfully enter and establish in Australia, it could cause massive losses of bee colonies and seriously reduce the viability of the commercial beekeeping operations affected. The rapid build-up in mite populations would make this parasite difficult to manage.

Extensive mortality of honey bee colonies due to *Tropilaelaps* mites has been reported from Pakistan, Afghanistan and Thailand.

With the experience in Papua New Guinea to consider, where this mite spread rapidly across the Highlands before petering out, this could also be a scenario in Australia. Whenever colonies are broodless, the adult mites will die within three days.

This is distinct from *Varroa* mites which are able to survive on adult honey bees for months without breeding. In areas where honey bee colonies maintain a brood nest all year, the mite will probably persist and remain as a serious parasite.

Given that this mite needs to be continually breeding, the probable means of this parasite entering Australia will be via an established honey bee (*Apis mellifera*) colony or a giant honey bee colony on a shipping container arriving from a tropical Asian country. Although possible, the risk of entry is small.

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