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Beekeeping round the World

The Varroa mite

In the last few years bee journals in almost every country seem to have carried articles on the *Varroa* mite, and readers may have been puzzled at the apparently sudden eruption of these mites in different parts of the world. It is explained here how this came about, and how further spread can be prevented. A guide is also provided to the more substantial publications on *Varroa*.

How beekeepers have spread the mites

Varroa jacobsoni was first reported in 1904, on *Apis cerana* in Java. By 1963¹² it had been found on *A. cerana* in Malaya, and also on *Apis mellifera* in Hong Kong. An analysis published in *Bee World* in 1968¹¹ showed that by then it had been recorded on *A. cerana* in India, the Far Eastern Province of USSR (on the Pacific coast), and possibly in mainland China. It had also parasitized *A. mellifera* in the Philippines, Japan³, Vietnam, and the USSR Far East. The mites had been causing heavy colony

losses in these areas. Then they were found in European USSR, and 1975 *Bee World* carried a note of warning¹ by Drs. Akwatanakul and Burgett "*Varroa jacobsoni*: a prospective pest of honeybees in many parts of the world". The mite has now spread as a parasite of *A. mellifera* to many European countries via European USSR, and to South America from Japan.

Professor V. V. Alpatov has provided me with some details, and the story seems to be as follows. *Apis cerana* bees were indigenous in the Far East of the USSR, living wild in the forests of Ussuriysk. Peasants who migrated there from European Russia in the last century tried to keep these bees in log hives, but they had difficulties and lost many colonies through swarming¹⁰. These bees, like *Apis cerana* in much of its habitat, were parasitized by *Varroa**. Later, peasants from the Ukraine settled in the area, taking with them their own Ukrainian bees (*Apis mellifera*), which in due course became infested with *Varroa*. This seems a likely fate for any European bees taken into *cerana* territory.

In more recent years, there have been many reports of high honey yields in the Far Eastern Province, which led some beekeepers in European USSR to believe that the bees there must be of a very good strain, although the high yields are in fact due to excellent flows from limes (*Tilia*) and other plants. Queens of these "honey-getting" strains were purchased from the Far East for apiaries in European USSR, and with these queens came *Varroa* as well. The next European country to find the mites was Bulgaria, presumably introduced with queens imported from USSR. Beekeepers in other countries, too, imported foreign queens and *Varroa* with them. There has also been at least one direct importation of *Varroa* into Europe on *Apis cerana*, brought from Asia to Germany for experimental purposes, but this infestation seems to have been quickly contained. Bees imported from Japan brought *Varroa* to Paraguay in South America, and thence to Argentina.

How the mite damages colonies

Up to twelve eggs are laid by the female in a single brood cell, just before it is capped. The nymphal stages of the mite feed on the haemolymph of the immature honeybee, and can kill it. The mites also attach themselves to emerging adult bees, and gain access to the haemolymph through the less chitinous parts of the exoskeleton, for instance near the wing base. Mites, which are brown, about 1.1 × 1.6 mm, overwinter in the colony, and readily move from one bee to another, inside or outside the hive. So the mites spread easily from one hive, apiary or area to another—even at the other side of the world if infested bees are sent by airmail.

Individual bees may appear to have deformed wings, and colonies may be killed within a few years or less; it has been reported that in one recent year 55 000 colonies were destroyed in the USSR alone. No very satisfactory cure has yet been found, although many acaricides have been tried. The most effective so far is a Japanese fumigant Varostan-Bayer, but this is also quite toxic to bees¹⁴. Phenothiazine can also be used.

How to check if Varroa is present in a suspected colony

The mites can be seen with the naked eye and are slightly smaller than the bee louse, *Braula coeca*. They may be anywhere on the adult bee, but especially where the

* The first known evidence for this comes from V. G. Bregetova⁹, according to whom the mite had been observed in wild *Apis cerana* in the Far Eastern Province of USSR since 1950.

chitin is softer, on the intersegmental membrane and the wing bases. A single bee may carry a dozen mites.

At the early stages of an infestation, when it may not be easy to find mites, the following methods may be used⁸:

1. *In the apiary*: Insert a piece of stiff white paper into a suspect hive through the flight entrance, and ignite a Folbex strip at the top of the frames in the hive. Remove the white paper carefully 20-30 minutes later, and examine for *Varroa* mites.
2. *In the laboratory*: Collect about 100 live bees in a cage with a wire-mesh base, and insert it in an oven at 46-47°C, RH, 20-30%, with the cage and contents on a white card, and search for mites as in 1 above. The whole operation takes 10-15 minutes.

Publications on Varroa

For those who want to read more about these mites, the damage they can do to honeybee colonies they infest and methods tried for killing them, there is plenty of material. Apimondia has published a book (available from IBRA) which includes reports from a 1976 meeting on *Varroa* in Bulgaria, and a list of 163 further references⁷. An annotated Bibliography was prepared by Dr. R. A. Morse in 1974 and revised in 1976¹³, with fifty items, some not in the book mentioned above. In 1977 a conference on *Varroa* was held in Lunz-am-See, Austria, and Ing. H. Ruttner kindly sent a copy of the conference papers to IBRA¹⁵. Another 1977 publication is a collection of articles from the USSR, "Varroa infestation of honeybees", edited by Professor V. V. Alpatov and others². Mrs. Kathleen Donaldson has kindly translated four of these papers into English (see pages 169-170).

The present position

As far as can be ascertained, *Varroa* now occurs in all countries in Asia as a parasite of *Apis cerana*, and as a parasite of *Apis mellifera* wherever this bee is present. In Europe it already parasitizes *A. mellifera* in parts of Bulgaria, Hungary (June 1978), Poland, Romania, USSR, and Yugoslavia; it is also present in Argentina and Paraguay in South America. The following countries are believed to be free from *Varroa*: in Europe, Austria, Czechoslovakia, Finland, Greece, Ireland, UK; in America, all countries except Argentina and Paraguay; also Africa, Australia, New Zealand and the Pacific Islands.

If readers will send corrections and additions to the above list, an updated list can be published in the next issue of *Bee World*. Already, as proofs are being corrected, *Varroa* has been reported in Iran and Tunisia.

Conclusion

The story of *Varroa* should serve as a cautionary tale in respect of transporting queens from one country to another, or indeed between different ecological regions within a single country. If queens had not been transported from the Pacific coast of Asia to northern Europe, *Varroa* could have been confined to Asia, where indeed it causes great problems in beekeeping. The only gain from its spread across the world may be the greater attention now given to devising control methods, and it is to be hoped that this will in the end help beekeepers in Asia. Governments of many countries are hastily amending their bee disease legislation in an attempt to prevent the importation of *Varroa* into their own countries. If the beekeepers of the world will refrain from importing bees or queens from infested areas (and from purchasing any that have been imported), whether or not such imports are prohibited by law, the spread of *Varroa* to countries now free from the mite can be prevented.

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