

PREVALENCE OF *Varroa destructor* IN AFRICANIZED HONEY BEES (*Apis mellifera scutellata* Lepeletier) IN LARA STATE, VENEZUELA

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SUMMARY

This study was conducted during June-July 2003 and April-May 2004 in colonies of Africanized honey bees distributed in two different communities in the state of Lara, Venezuela. These colonies belonged to the Apicultural Research Station facilities of the Universidad Centroccidental “Lisandro Alvarado” (UCLA). The colonies were maintained in one deep brood chambers and managed to prevent swarming. These colonies had not changed the queens in the last five years and had never been treated for *Varroa* infestation. Samples of worker bees were collected from brood combs, placed into a plastic jars inside a cooler and taken to the lab. The bees were placed in a detergent solution, shaken for about 5 minutes and strained to separate mites from the bees (De Jong *et al.* 1982). The worker brood were unsealed, examined for the presence of mites and the number of foundress adult mites was recorded. Infestation prevalence of *Varroa* was determined as the number of adult female mites per 100 adult bees and 100 worker brood cells respectively. It was found statistical significant differences between the proportions in the colonies under study ($P < 0.01$). The average *Varroa* infestation rate in adult worker and brood in both locations decreased from one year to another without treatment of the colonies during these periods. Curiously, all colonies inspected in this study in both locations the female *Varroa* was not reproducing. The female was found alone inside the cells, even though there were abundant available cells in the brood nest.

Key words: *Varroa destructor*, Prevalence, Africanized bees, Infestation

INTRODUCTION

The ectoparasitic brood mite *Varroa jacobsoni* Oud., was first described in colonies of *Apis cerana* Fabr., its native host, in Java in present day Indonesia (Oudemans, 1904). However, new findings have determined that only two of the 18 haplotypes within the complex of mites have become pests of *Apis mellifera* colonies worldwide and belong to *V. destructor* (Anderson & Trueman, 2000). Beginning in the middle of this century *V. destructor* has been anthropogenically spread worldwide causing severe damage to infested colonies especially in temperate regions of Europe where the mites have been reported to cause high mortality rate on *A. mellifera* colonies (De Jong *et al.* 1982). However, in tropical and sub-tropical countries such as Brazil where the mite has been present for over 20 years, low infestation levels have

been maintained naturally in colonies without the application of chemical intervention (Moretto et al. 1991a ; Moretto et al. 1995).

In Venezuela, the mite was first reported in Barinas state (Principal-D' Aubeterre *et al.* 1991) in apiaries of commercial beekeepers where the mite had an incidence of ca. 44%. Although the infestation prevalence of *Varroa* at that time was not determined, it was presumed that the mite had been present for several years before being reported.

The main purpose of this study is to evaluate the degree of *Varroa* infestation in colonies of Africanized bees (*A. m. scutellata*) in two locations in the state of Lara, Venezuela, and to ascertain colony damage caused by the parasite in order to establish measures of control.

MATERIALS AND METHODS

This study was conducted during June-July 2003 and April-May 2004 in ten colonies of Africanized honey bees distributed in two different communities in the state of Lara, Venezuela. These colonies belonged to the Apicultural Research Station facilities of the Universidad Centrocidental "Lisandro Alvarado" (UCLA). The colonies were maintained in two deep brood chambers and managed to prevent swarming. These colonies had not changed the queens in the last five years and had never been treated for *Varroa* infestation.

Samples of worker bees were collected from brood combs, placed into a plastic jars inside a cooler and taken to the lab. The bees were placed in a detergent solution, shaken for about 5 minutes and strained to separate mites from the bees (De Jong *et al.* 1982). The worker brood were unsealed, examined for the presence of mites and the number of foundress adult mites was recorded. The prevalence of *Varroa* infestation was determined as the number of adult female mites per 100 adult bees and 100 worker brood cells respectively. The data collected was analyzed by descriptive statistical.

RESULTS

Infestation prevalence of *Varroa* in adult bees (measured as the number of mites per 100 bees) sampled from colonies established in two different locations is presented in table 1. It was observed that the average *Varroa* infestation rate in adult worker and brood in both locations decreased from one year to another without treatment of the colonies during these periods.

TABLE 1. Infestation Prevalence of *Varroa destructor* in adult bees and worker brood in colonies of Africanized honey bees collected from 2 different locations in Lara State, Venezuela during June-July 2002 and April-May 2004.

Locations	2002		2004	
	Adults	brood	adults	brood
Tarabana	7.09	4.82	2.97	1.97
Bobare	6.25	7.35	4.02	3.09

Curiously, in all colonies inspected in this study in both locations the *Varroa* was not reproducing. The female was found alone inside the cells, even though there were abundant available cells in the brood nest.

DISCUSSION

Prevalence infestation rate of apiaries sampled from two different locations decreased in adult workers as well as in brood cells from one year to another without treatment of the colonies during those periods. Although the infestation prevalence did not reach high levels, signs of wing deformation in worker bees, queen supersedure and weakness in infested colonies were observed. However, some colonies in sampled infested apiaries appeared not to be injured by the mite. The highest worker brood infestation of *Varroa* (7.35) was observed in colonies located in Bobare. At this time (rainy season) of the year, in this particular state, most of the migratory beekeepers from other parts of the country move their colonies to this particular region where nectar flows from arid zone are abundant, thus stimulating brood rearing in the colonies and facilitating mite reproduction. Curiously, all colonies inspected in this study in both locations the female *Varroa* was not reproducing. The female was found alone inside the cells, even though there were abundant available cells in the brood nest.

In some areas of South America, Africanized bees have developed at least partial resistance against *V. destructor* attributable in part to the removal behavior of the workers (Moretto *et al.* 1991 a). These authors reported a *Varroa* removal rate, within 30 min after infestation, to be approximately 38% compared to 5.7% of that in Italian honeybee workers in Brazil, such as a lowered fertility rate of female mite in worker brood cells and shorter pupal development time may well be involved in observed resistance (Camazine, 1986 ; Ruttner *et al.* 1984). Since *Varroa* infestation level in the apiaries in this study did not exceed 10% and some colonies exhibited an apparent tolerance for the mite, the authors believed acaricidal intervention was not necessary.

Biotechnical management such as drone brood removal and restricting brood rearing in the colonies may be sufficient to keep *Varroa* population levels under control, epidemiological surveillance to detect any changes in the degree of *Varroa* infestation in the colonies was recommended. Further studies need to elucidate the variation of *Varroa* infestation in different regions of the State to determine whether or not Africanized bees have developed permanent resistance to this mite.

CONCLUSION

- It was found statistical significant differences between the proportions in the colonies under study ($P < 0.01$).
- The average *Varroa* infestation rate in adult worker and brood in both locations decreased from one year to another without treatment of the colonies during these periods.
- Curiously, all colonies inspected in this study in both locations the female *Varroa* was not reproducing. The female was found alone inside the cells, even though there were abundant available cells in the brood nest.

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