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VARROA JACOBSONI DOES REPRODUCE IN WORKER CELLS OF APIS CERANA IN SOUTH KOREA

David DE JONG

Depto. de Genética Faculdade de Medicina, USP, 14.049 Ribeirão Preto-SP BRASIL

SUMMARY

Contrary to previous reports from Sri Lanka and Indonesia of an inability of *Varroa jacobsoni* to reproduce on worker brood of its original host, *Apis cerana*, successful reproduction in worker cells was found in *Apis cerana* colonies in South Korea.

INTRODUCTION

Varroa jacobsoni, an ectoparasitic bee mite, causes extensive damage to *Apis mellifera* colonies in much of the world, however the original host, *Apis cerana* is reported as little affected (DE JONG *et al.* 1982).

Some of the factors which may contribute to the resistance of *Apis cerana* have been investigated. PENG *et al.* (1987) observed that *Apis cerana* workers rapidly attack and kill *Varroa jacobsoni* introduced into their colony. KOENIGER *et al.* (1981, 1983) reported that *Varroa jacobsoni* greatly prefers drone over worker brood, and only reproduces in the drone brood of *Apis cerana* colonies in Sri Lanka and Indonesia. In *Apis mellifera* the mites also prefer drone cells, but can reproduce effectively in both worker and drone cells. The capacity to reproduce in worker brood cells apparently emerges as an important adaptation to the new host, greatly increasing the potential of the mite populations for increase and also causing much greater damage to the worker bee populations, and therefore to the welfare and production capacity of *mellifera* colonies.

MATERIAL AND METHODS

During two visits to South Korea in 1986 and 1987, combs from five *Apis cerana* colonies from four apiaries located in four separate provinces were examined for *Varroa jacobsoni* infestations. Sealed brood

cells were opened individually with the aid of a forceps and both the larva or pupa and the interior of the cell examined carefully for mites.

An evaluation of mite reproduction was made for all mites found associated with bee pupae. The categories distinguished were : original females, new adult females, female deutonymphs, female protonymphs and males (not discriminated), and eggs. Mites in cells containing bee larvae would not have had time to reproduce and therefore the reproduction was not evaluated.

RESULTS

Drone brood cells were much more frequently infested than the worker cells ($P < .001$, chi square test). *Varroa jacobsoni* reproduced on all of the infested drone pupae and on the few infested worker pupae encountered in these samples (Table 1).

TABLE 1. — Reproduction of *Varroa jacobsoni* in worker and drone brood cells of *Apis cerana*

	Total cells	Cells infested	Infested pupae	Original females on pupae	New females	Female Deutonymphs	Female Proto-nymphs or males	Eggs
Worker brood	720	3	2	2	0	1	1	1
Drone brood	132	18	14	19	2	17	19	2

DISCUSSION

It is clearly demonstrated that *Varroa jacobsoni* can reproduce in both worker and drone cells of *Apis cerana*, though there is a preference for drone brood.

Mite progeny which have attained the deutonymphal stage on a worker pupa can be expected to attain the adult phase by the time the bee emerges. Therefore their appearance signifies an effective reproduction.

The supposed recent adaptation of *Varroa jacobsoni* for reproduction on *Apis mellifera* worker brood had apparently already occurred on the original host, *Apis cerana*.

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RÉSUMÉ

REPRODUCTION DE *VARROA JACOBSONI* DANS DES CELLULES D'OUVRIÈRES
D'*APIS CERANA* EN CORÉE DU SUD

Contrairement aux informations venant de Sri Lanka et d'Indonésie concernant l'incapacité de *Varroa jacobsoni* à se reproduire sur le couvain d'ouvrières de son hôte primitif *Apis cerana*, on a trouvé en Corée du Sud des colonies d'*Apis cerana*, dans lesquelles l'acararien se reproduisait dans des cellules d'ouvrière.

ZUSAMMENFASSUNG

IN SÜDKOREA VERMEHRT SICH *VARROA JACOBSONI* AUCH IN ARBEITERINNENZELLEN
VON *APIS CERANA*

Im Gegensatz zu früheren Meldungen aus Sri Lanka und Indonesien über die Unfähigkeit der Milbe *Varroa jacobsoni*, sich auf Arbeiterinnenbrut ihres ursprünglichen Wirts, *Apis cerana*, zu vermehren, konnten wir nun in Südkorea die erfolgreiche Reproduktion der Milbe in Arbeiterinnenzellen von *Apis cerana* nachweisen.

BIBLIOGRAPHY

- DE JONG D. MORSE R.A. EICKWORT G.C., 1982. — Mite pests of honey bees. *Annu. Rev., Entomol.*, **27**, 229-252.
- KOENIGER N. KOENIGER G. WIJAYAGUNASEKARA N.H.P., 1981. — Beobachtungen über die Anpassung von *Varroa jacobsoni* an ihren natürlichen Wirt *Apis cerana* in Sri Lanka. (Observations on the adaptation of *Varroa jacobsoni* to its natural host *Apis cerana* in Sri Lanka). *Apidologie*, **12**, 37-40.
- KOENIGER N. KOENIGER G. DELFINADO-BAKER M., 1983. — Observations on mites of the Asian honeybee species (*Apis cerana*, *Apis dorsata*, *Apis florea*). *Apidologie*, **14**, 197-204.
- PENG Y.S.C., FANG Y, XU S, GE L., 1987. — The resistance mechanism of the Asian honey bee, *Apis cerana* Fabr., to an ectoparasitic mite. *Varroa jacobsoni* Oudemans. *J. Invertebr. Pathol.*, **49**, 54-60.