

J. Woyke : Dwindling of bee colonies : 16 June

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DWINDLING OF CAPE HONEYBEE COLONIES HEADED BY LAYING WORKERS

Dwindling of colonies headed by laying workers is characteristic for all honeybee subspecies. This is obvious, because drones develop from eggs deposited by laying workers, and the colonies must perish. However, in *Apis mellifera capensis* worker bees develop from eggs deposited by laying workers. Nevertheless, *A. m. capensis* colonies headed by laying workers also dwindle.

There are several reasons for that phenomenon:

- 1./ A laying worker has fewer ovarioles than a queen, and therefore lays fewer eggs than a queen. Several laying workers may be active in a colony. Nevertheless, the number of eggs deposited by those workers is lower, than that of eggs deposited by a queen.
- 2./ Many larger workers, the so called false queens, develop in colonies headed by Cape laying workers. Behaviour of those workers differs probably from that of normal workers.
- 3./ Survival of brood produced by laying workers is lower, than that of brood produced by queen bees.

The last phenomenon was investigated by us.

Brood produced by laying workers is scattered. It is believed, that this is caused by irregular egg deposition by laying workers. However, this is not the cause. Eggs are found in quite compact area of a comb, only few empty cells are present within area occupied by eggs.

Woyke (1976, 1977, 1980) demonstrated that cannibalism of bee larvae occurs in quite high degree, in different conditions. Therefore survival rate of brood produced by queen and laying workers was compared. Several investigations were conducted. Below, just one is presented.

Two pieces of Cape brood combs, one with eggs deposited by queen and the other by laying workers were inserted into brood combs of a queenless colony. Position of cells with eggs were determined by method described by Woyke (1976). Survival of larvae was checked daily. Results are presented in tab. 1.

Table 1. Survival of larvae originating from eggs deposited by *A. m. capensis* queen and laying workers

Origin of eggs	No eggs	% larval survival, 1 day	2 days	3 days	4 days	5 days	6 days
Queen	417	91	83	81	80	79	78
L worker	493	41	29	27	26	25	25

The highest loss of larvae originating from laying workers occurred the first day after hatching. Less than 50% survived. After 6 days, when the brood was sealed, there survived 78% of larvae originating from queen and only 25% originating from laying workers.

The low survival of larvae originating from laying workers, might suggest, that this was caused by the homozygosity of sex alleles. However, preliminary efforts to rear diploid drones from eggs deposited by laying workers failed.

Thus, one of the cause of dwindling of Cape colonies headed by laying workers, which produce worker brood, is the low survival of larvae originating from the workers.

References

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