

Symposium 4

Rearing Honey Bee Queens on Cups of *Apis mellifera* and *Apis dorsata* Wax

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ABSTRACT

We compared the grafting success in total of 364 rearing *A. mellifera carnica* colonies, to which we grafted 6975 larvae. The mixed wax for cups we prepared from 50% of pure *A. mellifera* and 50% of pure *A. dorsata* wax. From the 1080 grafted larvae into the *A. mellifera* wax bees accepted 279 queens cells, only (25.83%). From the 2475 grafted larvae into the *A. mellifera* wax bees accepted 841 queens cells (33.98%). However, into the mixed with *A. dorsata* wax bees accepted again less - from the 2340 grafted larvae the bees accepted 567 queens cells, only (24.23%). In the preference test the grafting success in the *A. mellifera* wax cups were by 17.09% better (35.15%) than in the mixed with *A. dorsata* wax (18.06%). The results show better acceptance of larvae grafted into the pure *A. mellifera* wax cups.

INTRODUCTION

In India and Nepal plenty of honey and wax is still harvesting from the giant bees *Apis dorsata*. Because of them is quite difficult to find pure *A. mellifera* wax. Beekeepers who are doing queen rearing usually use the wax cups (Koehnen 2000, Thakur et al. 2000, Wilde 2000). We observed less successful of grafting by using of cups, which were made from wax available in Indian market. It stimulate us for an experiment in which we compare the grafting success on cups made of pure *A. mellifera* wax and mixed one with *A. dorsata* wax.

MATERIALS AND METHODS

The experiment was conducted in 2 periods, from 5-29.05.1999 and 3-24.11.1999 in Apiculture Centre in Jugedi (Chitwan, Nepal). We compared the grafting success in total of 364 rearing *A. mellifera carnica* colonies, to which we grafted 6975 larvae. We grafted to each colony half number of larvae into the pure *A. mellifera* wax cups and another half into mixed wax cups, in the first period of experiment, only (preference test). To check the grafting success when the colonies had no possibilities to choose the better cups, we grafted one by one into the pure *A. mellifera* or mixed with *A. dorsata* wax cups, to the same colony..

This test we compared with the preference test in the second period of experiment, only. The mixed wax for cups we prepared from 50% of pure *A. mellifera* and 50% of pure *A. dorsata* wax. The queen cell cups were prepared with a silicon mould. Standard method of queen-rearing involving grafting of appropriate-aged larvae was followed. The rearing colonies we prepared as new nuclei with 4 sealed brood frames, 2 frames with honey and bee-bread and 1,5 kg of bees. The percentage acceptance was recorded when sealed cells were removed from the frames and placed in an incubator 6 days after grafting.

RESULTS AND DISCUSSION

The grafting success was very low before monsoon time, due the drought weather. From the 1080 grafted larvae into the *A. mellifera* wax bees accepted 279 queens cells (tab. 1), only (25.83%). However, into the mixed with *A. dorsata* wax bees accepted even less 221 queens cells, only (20.46%). We achieved better success in the second period of experiment although it was before blooming the mustard. From the 2475 grafted larvae into the *A. mellifera* wax bees accepted 841 queens cells (33.98%). However, into the mixed with *A. dorsata* wax bees accepted again less - from the 2340 grafted larvae the bees accepted 567 queens cells, only (24.23%). Much more different we received in the second experiment, when we divided the colonies into two groups: preference and one by one test (tab. 2). In the preference test the grafting success in the *A. mellifera* wax cups were by 17.09% better (35.15%) then in the mixed with *A. dorsata* wax (18.06%). By the test one by one the better success was observed by the pure *A. mellifera* wax also, 38.89 and 26.42% respectively. The results are much worse than usually achieved the beekeepers, who reared the *A. mellifera* queens (Laidlaw 1979) and *A. cerana* as well (Wongsiri at al. 1988, Wongsiri 1995, Kumar & Kumar 2000). Probably they are 2 reasons for that: quite weak cell builders and lack of natural nectar and pollen conditions.

The results show better acceptance of larvae grafted into the pure *A. mellifera* wax cups. It is so workable first to produce pure *A. mellifera* wax for making the queen cups before a beekeeper starts with grafting.

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REFERENCES

- KUMAR, R. AND KUMAR N.R. (2000.) Queen-rearing and royal-jelly production in Asian honeybee *Apis cerana*. Asian Bees and Beekeeping. Progress of Research and Development: 145-147.
- LAIDLAW, H.R. Jr. (1979.) Contemporary Queen Rearing. Dadant & Sons, Hamilton, Ill.
- KOEHNEN, B. AND Y. (2000.) C.F. Koehnen & Sons, Inc., personal communication.
- THAKUR, R.K., GUPTA, J.K. AND DOGRA G.S. 2000. Production of quality queens of *Apis A. mellifera* L. under mid-hill conditions of Himachal Pradesh for use in instrumental insemination. Asian Bees and Beekeeping. Progress of Research and Development: 116-119.
- WILDE, J. (2000) Rearing of 300 000 honey bee queens during 100 days of bee season. Pszczelarstwo 51(3): 11-13. [Polish]
- WONGSIRI, S. (1995.) Queen production. In: The Asiatic hive bee: Apiculture, biology, and role in sustainable development in tropical and subtropical Asia. Edited by P. G. Kevan. Cambridge: 91-106.
- WONGSIRI, S., POTCHIHOT, S. AND CHAO F. (1988.) Queen rearing with *Apis cerana* in Thailand. Proceedings of the Fourth International Conference on Apiculture in Tropical Climates, Cairo, Egypt: 466-470.

Table 1 Acceptance of larvae grafted into the pure *A. mellifera* and mixed with *A. dorsata* wax cups

Kind of wax cups	No of grafting colonies	No of larvae		Success of acceptance of all colonies in %		Success of acceptance in single colony in %
		grafted	accepted	Range	average	range
Before monsoon time 5-29.05.1999						
Pure <i>A. mellifera</i>	72	1080	279	18.33-30.30	25.83	6.67-60.00
Mixed with <i>A. dorsata</i>	72	1080	221	6.67-36.97	20.46	0-73.33
After monsoon time 3-24.11.1999						
Pure <i>A. mellifera</i>	112	2475	841	17.78-51.43	33.98 ^b	0-70
Mixed with <i>A. dorsata</i>	108	2340	567	9.74-38.10	24.23 ^a	0-70

a, b - significant differences at $P=0.05$

Table 2 Acceptance of larvae grafted into the pure *A. mellifera* and mixed with *A. dorsata* wax cups after monsoon time 3-24.11.1999 by two tests

Kind of wax cups	No of grafting colonies	No of larvae		Success of acceptance in all colonies in %	
		grafted	accepted	Range	average
Preference test					
Pure <i>A. mellifera</i>	55	825	290	6.67-86.67	35.15 ^B
Mixed with <i>A. A. dorsata</i>	55	825	149	0-67.67	18.06 ^A
One by one test					
Pure <i>A. mellifera</i>	27	810	315	6.67-70	38.89 ^b
Mixed with <i>A. A. dorsata</i>	27	810	214	3.33-70	26.42 ^a

a, b - significant differences at $P=0.05$
A, B - significant differences at $P=0.01$



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