

## ACTIVITIES OF MEMBERS

### My Vacation with *Apis Mellifera*

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At the invitation of Dr. Bert Holldobler, I spent three months in the summer of 1993 at the Theodor-Boveri Institute for Biowissenschaften at Wurzburg in Germany. During this period Dr. Wolfgang Kirchner, who is famous for developing, along with Dr A. Michelsen of Denmark, a robot bee for studying the bee dance language, mentioned to me that while the ability of worker honey bees to discriminate nestmate queens from non-nestmate queens and nestmate workers from non-nestmate workers is well known, whether worker honey bees can discriminate nestmate drones from non-nestmate drones is not well understood. However, there is something like a folk knowledge among bee keepers that drones freely move between one nest and another.

This seemed paradoxical to us and Kirchner and I therefore set out to investigate workers' ability to discriminate nest mate drones from non-nestmate drones. In order to study behaviour of workers under conditions as close to nature as possible, we attached, at the entrance of observation hives, wooden tubes (50 mm x 650 mm with a height of 15 mm), covered by a plexy glass lid which served as walkways for bees entering and leaving the hive. We then introduced nestmate workers, non-nestmate workers, nestmate drones and non-nestmate drones into these walkways, and recorded the behaviour towards the introduced bees. This experimental set up allowed us to simultaneously measure discrimination ability of the guards with respect

to workers and with respect to drones. Using a total of 159 workers (65 nestmates and 65 non-nestmates), we found that both non-nestmate workers and non-nestmate drones were bitten significantly more often, compared to the corresponding nestmates. We were also able to demonstrate that non-nestmate workers and non-nestmate drones were discriminated from corresponding nestmates with about the same efficiency.

These results are satisfying. We expect workers to have the ability to discriminate against non-nestmate drones for, there must be some cost to accepting foreign drones. We also expect similar proximate mechanisms of nestmate discrimination to be used against non-nestmate workers and non-nestmate drones which should give similar efficiencies. There remains the folklore and also some experimental evidence that drones in fact are found more often in foreign colonies than workers are. We have attempted to explain this discrepancy by arguing that foreign robbing worker bees stay in foreign colonies only briefly and then return to their own nest, whereas drones, once they have gained entry into the foreign nest, do not really need to go back. Thus, even with an equal chance of being detected, foreign drones are likely to accumulate in large numbers than foreign workers. The details of these experiments will be published in the August 1994 issue of *Insectes Sociaux*.

I thoroughly enjoyed doing these experiments and working with Wolfgang Kirchner and this was not only because I did not have administrative chores during my stay in Germany!