

Effects of Salt Feeding on Honeybee Colony Growth

Mikio Yoshiyama, Kiyoshi Kimura

National Agriculture and Food Research Organization,
National Institute of Livestock and Grassland Science

Summary

In Japan, approximately 100,000 managed honeybee colonies have been used in the greenhouse for pollinations. Traditionally, beekeepers have added salt to sugar water and fed honeybees. Although honeybees have requirements for minerals which are essential for numerous biochemical reactions, the actual dietary requirements for minerals by honeybees have not been well elucidated. In this study, we focus on the effects of salt intake on honeybee health. Salt was mixed in sugar water in the concentration of 1 mg/ml, 10 mg/ml and 100 mg/ml and fed with 24 worker bees in the cages. The mortality was recorded over 2 weeks. As a result, all worker bees which were fed with 100 mg/ml of salt were dead after 3 days. On the other hand, below the concentration of 10 mg/ml of salt, there were no significant differences in the mortality. Also, we surveyed the differences of the effects on mortality of honey bees between salt and NaCl. There were no differences in the mortality between salt and NaCl fed honeybees. However, even in the low concentration (2.5 mg/ml), relatively high mortality rates were observed after 2 weeks compared to controls. These results suggested that excess salt can be toxic to honey bees, and we need to pay attention to influences of salt over a long period of time.

Furthermore, we estimated the effects of salt feeding at colony levels by measuring the colony weight, the area of capped brood cells and stored pollens. Brood areas reflect a queen productivity and nursing ability of worker bees. We developed a method to record the capped brood and pollen areas quantitatively using digital technology. In spite of salt feeding for two months, there were no significant influences in the area of capped brood and stored pollens as well as weight of hives compared to controls.