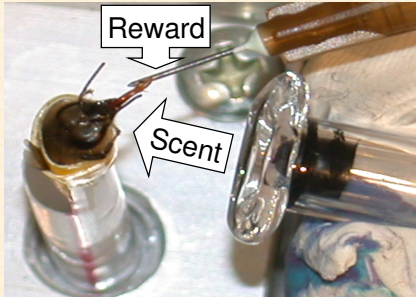


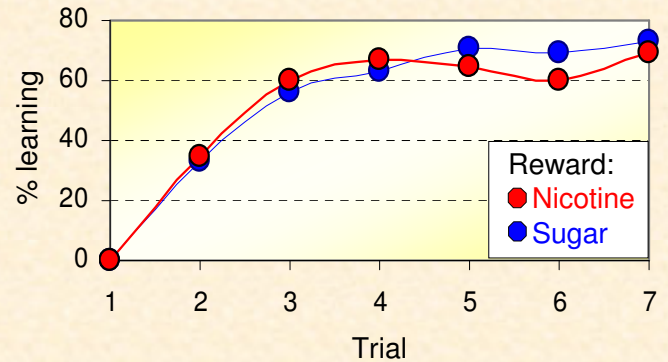
Individual level – learning performance

Harnessed bees were rewarded with 1µl of sucrose solution (20% w/w) with or without 10ppm nicotine, 3 sec after exposure to odor of geranyl acetate. The percentage of bees that extended their proboscis in response to the odor was measured.

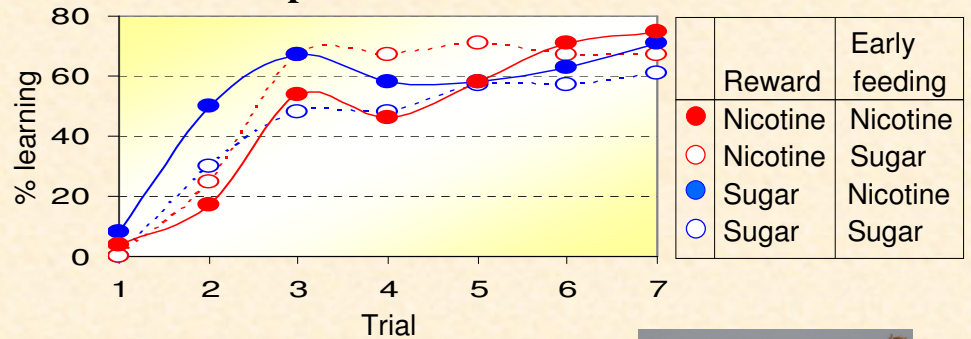


Conclusion 3: Adding nicotine to reward or to early feeding did not affect learning performance.

Naïve bees

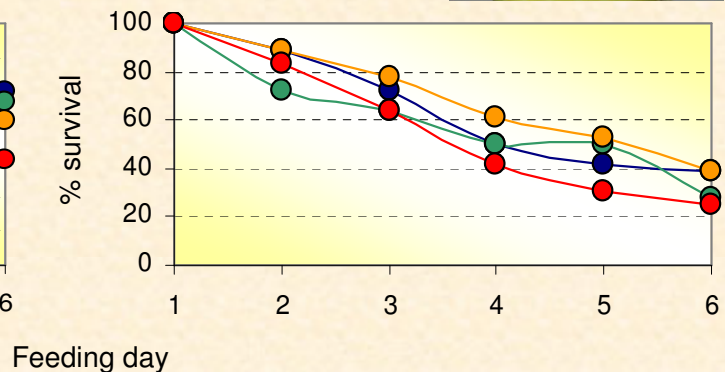
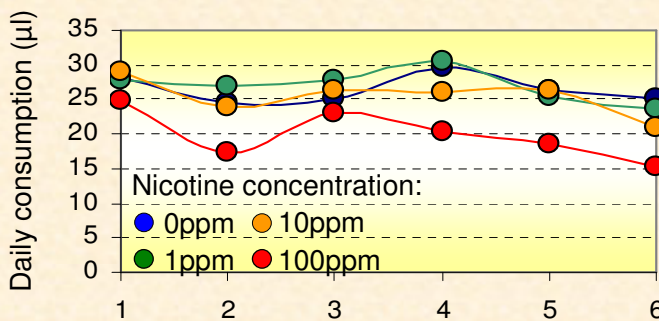
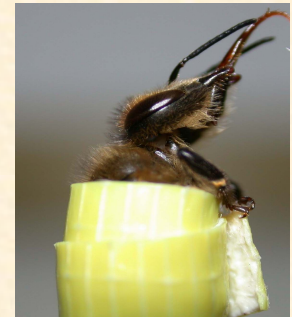


Experienced bees



Individual level – Consumption and survival

Harnessed bees were fed ad lib twice a day with 30% sucrose solution with various nicotine concentrations. Daily consumption and percent of surviving bees were measured.



Conclusion 4:

High nicotine concentration decreased food consumption but did not affect survival

Summary: We tested the effect of various nicotine concentrations in nectar on honey bees as a model system. We found that nicotine concentrations in the range that is naturally found in nectar (up to about 2.5 ppm) repelled bees. Higher concentrations were more repellent and reduced consumption. Interestingly, prolonged exposure to nicotine resulted in habituation to nicotine (though a follow up experiment failed to confirm this effect). Thus, nicotine in floral nectar may serve as a repellent for occasional visitors, but less so to regular visitors, which would be more efficient pollinators.