

# Nicotine in nectar: Consumption and perception by honey bees and its effect on their survival

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**Introduction:** The role of secondary compounds in deterring herbivores from vegetative parts of plants is well established, whereas their role in plant reproductive organs remains unclear. The present study tested various effects of nicotine on honey bees as a model system to understand possible roles of secondary compounds in floral nectar.

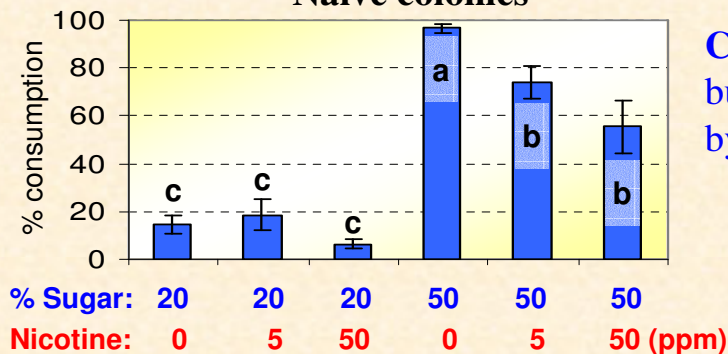


**General methods:** Naïve colonies had no prior experience with nicotine. Experienced colonies are the same colonies after three weeks of feeding with 20% (w/w) pure sucrose solution or 20% sucrose solution enriched with 10ppm nicotine. Naïve and experienced bees were taken from these colonies.

## Colony level – preference experiments

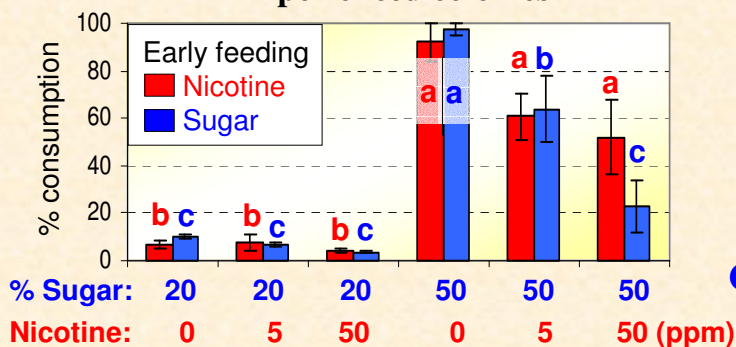
6 feeders containing all the combinations between two sugar concentrations and three nicotine concentrations were presented to naïve and experienced colonies.

### Naïve colonies



**Conclusion 1:** Nicotine repels honey bees, but repellency can be partially overcome by increased sugar concentration.

### Experienced colonies



**Conclusion 2:** Early exposure to nicotine may decrease its repellency to bees.



| Sugar:    | 20%  | 20%  | 20%   | 50%  | 50%  | 50%   |
|-----------|------|------|-------|------|------|-------|
| Nicotine: | 0ppm | 5ppm | 50ppm | 0ppm | 5ppm | 50ppm |